PURPOSE

To ensure the use of appropriate company approved personal protective equipment wherever and whenever there is a potential for exposure, either real or assumed, to hazardous working conditions, or where a hazardous condition exists and a need is indicated for using such equipment to adequately reduce the hazard to its personnel, visitors and/or subcontractors

POLICY

Plummer Concrete & Associates, Inc. reserves the right to select and/or approve all personal protective equipment to be issued and used by its employees, visitors and/or subcontractors, and only such equipment issued or approved will be allowed on its job sites. Failure to comply with this procedure will result in disciplinary action up to and including termination.

HARD HATS (Mandatory at ALL Times)

ALL construction workers must wear company issued hard hats at all times when working on construction projects or areas of an existing facility which has been designated as a 'HARD HAT Area," This includes visitors subcontractor, engineers, inspectors and anyone else who has authorization to be on the project.

Hard hats that have been altered by drilling or cutting will not be permitted. When it is necessary to use additional personal protective equipment, which must be attached to the hard hat, only those hard hats designed for this purpose may be used.

Headband assemblies must be in good condition and should be exchanged whenever they become broken or weakened. The area between the top of the headband and the top of the hard hat should never be used for storage.

SHOES AND BOOTS (Mandatory at ALL Times)

Sturdy work shoes/boots are required and safety shoes are recommended for use by all construction workers. All safety shoes shall meet nationally recognized standards. When working with 'wet concrete, workers must wear rubber boots, Shoes and boots must be kept in good repair, and those with worn heels or thin or worn soles should not be worn. In addition, the wearing of sneakers, sandals, or shoes that have been slit or have holes cut in them, will not be permitted. **Safety toe tennis shoes are not allowed on Plummer Concrete & Associates, Inc. projects.**

EYE AND FACE PROTECTION (Mandatory

Approved eye and face protection must be worn while on site, ANSI approved safety glasses with full side shields must be worn in all circumstances The wearing of contact lenses Is prohibited when handling chemicals, Full-face shields must also be used when doing such work as grinding or chipping.

Welders must wear a welder's hood with lenses, which have the correct color density for the type of welding involved. Welders' helpers must wear the same, or at the minimum, must wear burning goggles with the correct color density lenses. See Exhibits J and K. Safety glass must be worn behind the welders' shaded lenses.

GLOVES

Where needed, construction workers should wear work gloves in good condition which are suited to the type of work involved. However, employees who are required to operate or work around drill presses, power saws, and similar rotating machinery should not wear gloves. Use of special type gloves such as neoprene or rubber to handle chemicals shall he issued to those workers who have a need for them, Welders shall wear gloves during welding operations.

RESPIRATORS

Company issued respiratory protective devices, appropriate for the hazard, must be used where airborne contaminates, such as fibers, dust, smoke, vapors, mist, etc. exist. See also the ***Silica Exposure Control Plan***. Respiratory protective devices must be used in accordance with the provisions of the Safety Policy.

SAFETY BELTS/HARNESSES AND LANYARDS

Safety harnesses with lanyards, must be worn by all employees who are working at elevated levels which are not protected by standards handrails, or safety nets or when working from suspended scaffolds. See ***Fall Protection.***

Employees are required to wear and use safety harnesses to protect them from falling when they are exposed to falls from heights of six (6) feet or more if they are working over machinery), moving equipment or objects posing an implement hazard, or in the case of entering a confined space, with an attended lifeline.

All safety harnesses and lanyards shall be inspected and each inspection documented with the harness serial number. Inspections shall be performed by the employee who is to wear and use the equipment- Quick release belts shall only be used when working over bodies of water. Lanyards shall have locking snaps that require two actions to open.

TRAFFIC VESTS

Whenever employees am required to work in the immediate vicinity of moving traffic, all personnel must be required to wear, as a minimum, a fluorescent orange or lime green traffic safety vest, which will be provided by the company.

PERSONAL WORK CLOTHING

The minimum work clothing that is acceptable for all employees working on a construction site is: long pants, good work shoes or boots, and a shirt that completely covers the worker's shoulders and provides adequate protection against such hazards as concrete splash, abrasions to the skin, oil or grease spills, and slag from welding or cutting. Tank top type shirts are not allowed on Plummer Concrete & Associates, Inc. projects.

Welders should be cautioned against wearing any type of highly flammable clothing, such as polyesters, double-knits etc. Clothing that has become torn, ragged, or frayed is not acceptable, since it presents a hazard of catching on rough corners or machine parts which could cause the wearer to trip or fall.

For the most part, construction workers should wear clothing that is reasonably snug, particularly about the neck, wrists, and ankles. Workers shall be cautioned against wearing loose clothing, rings, watches, and necklaces or having long hair, all of which may catch in power driven equipment.

HEARING PROTECTION

When employees are subject to sound levels exceeding those in Exhibit L, hearing protection will be provided and used to reduce the sound levels. Training in the proper use and care of hearing protection equipment will be provided. Monitoring and training shall be by competent persons.

(EXHIBIT J)

FILTER LENS SHADE NUMBERS FOR PROTECTION AGAINST RADIANT ENERGY

Welding Operations

Number	Shade
Shielded metal-arc welding 1/16, 31/32, 1/8, 5/32 inch diameter electrodes	10
Gas-shielded art welding (non-ferrous) 1/16, 3/32, 1/8, 5/32 inch diameter electrodes	11
Gas-shielded arc welding (ferrous) 1/16, 3/32 1/8, 5/32 inch diameter electrodes	12
Shielded metal-am welding 3/16, 7/32, 1/4 inch diameter electrodes	12
Shielded metal-arc welding 5/16, 3/8 inch diameter electrodes	14
Atomic hydrogen welding	12 to 14
Carbon arc welding	14
Torch soldering	2
Torch brazing	3or4
Light cutting, up to I inch	3 or 4
Medium cutting, I inch to 6 inches	4 or
Heavy cutting, over 6 inches	***5*** or 6
Gas welding (light), up **to** 1/8 inch	4 or 8
Gas welding (medium), 1/8 inch to 1/2 inch	4 or 5
Gas welding (heavy), over 1/2 inch	6 or 8

(EXHIBIT K)

APPLICATIONS CHART

Operations	Hazards	Protectors *
Acetylene - Burning	Sparks, Harmful rays	5, 6, or 7
Acetylene – Cutting	molten metal	5, 6, or 7
Acetylene-Welding	flying particles	5, 6, or 7
Chemical handling	Splash, acid bums	3 (for severe exposure add 8)
Chipping	Flying particles	1, 2 (for severe exposure add 8)
Electric (arc)	Sparks intense rays	8 with tinted lenses
Welding	Molten metal	(in combination with 1)
Furnace Operations	Glare, heat molten	5, 6, 7 (for severe metal exposure, add 8)
Grinding - Light	Flying particles	1, 2 (for severe exposure add 8)
Grinding-Heavy	Flying particles	2 (for severe exposure add 8)
Laboratory	Chemical splash	3 (for severe glass breakage exposure add 8)
Molten Metals	Heat, glare, sparks, splash	5, 6 (8 in combination with 1 in tinted lenses)
Spot Welding	Flying particles sparks	1, 2 (tinted lenses advisable; for severe exposure, add 8)

(EXHIBIT L)

PERMISSIBLE NOISE EXPOSURE

[OSHA 29 CFR 1910.95 (b)]

Duration Per Day (Hours)	Sound Level (dba)
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

CONSTRUCTION NOISE Average dB Level

All Purpose Saw	107	Hilti gun	103
Breaker	115	Jackhammer	115
Chainsaw	112	Ramset	103
Chipping Gun	110	Roller	108
Circular Saw	100	Saber saw	94
Compressor	100	Sawzall	94
Drill	95	Vibra-plate	107
Generator	88	Wacker (compactor)	108
Grinder	98	Water Pump	95
Hammer Drill	102		

PURPOSE

To provide guidelines for the safe use of power tools.

POLICY

General Requirements

- Follow all manufacturers' instructions regarding the safe storage, operation, and maintenance of power tools.
- Do not use a power tool unless you have been trained on how to use it properly and safely.
- All guards must be in place before operating the tool.
- Appropriate eye protection must be worn when operating or working near power tools.
- Do not wear loose fitting clothing or jewelry when using power tools.
- Disconnect the tool before changing blades, bits, etc.
- Remove chuck keys, etc. before using a power tool.
- Disconnect power tools from the power source by pulling out the plug – do not pull on the power cord.
- Make sure that tools are either double insulated, or have three prong plugs with grounded extension cords and receptacles.
- Keep your finger off the trigger and make sure the switch is "off" before plugging in a tool.
- Do not use electric tools that have worn or damaged plugs or cords.
- Secure small pieces of work with a clamp, or in a vise.
- When using power tools, keep the work area free of any trip hazards, or slippery conditions.
- Never use compressed air to blow off equipment or clothing; use a brush.

SAWS

- Do not jam or force saws into the work.
- Portable saws should have a spring-loaded operating switch.
- Stay out of the saw's line of cutting.
- Start and stop the saw outside the work piece.
- Wear appropriate eye and hearing protection.

CIRCULAR SAWS

- Do not retract the lower guard while the blade is moving.
- Use the retracting handle or safety lift lever to move the lower guard.
- Do not clamp or tie the guard open.
- Do not operate the saw if the guard is not working properly.
- Keep your hand away from the blade while using the saw.
- Keep the power cord out of the line of the saw cut.

RECIPROCATING SAWS

- Do not lock the trigger if the saw needs to be stopped quickly.
- Do not use the saw unless the insulating boot is in place.
- Be especially careful to keep your hands away from the blade when using this tool.

PORTABLE BAND SAWS

- Return dull or damaged blades to the tool room. Do not leave blades in work area. They create serious trip hazards.

RADIAL ARM SAWS

- The radial arm shall be self-retracting.
- Do not remove any manufacture's guards.
- Only approved and trained employees are to use a radial arm saw.

DRILLS

- Wear appropriate eye protection.
- Do not use dull or chipped bits.
- Let the bit cool down before changing or adjusting.
- Do not force the drill into the work.
- Use light oil to keep bit lubricated and cool during use.

PNEUMATIC TOOLS

- Wear appropriate eye and hearing protection.
- Pneumatic power tools must be securely attached to the compressed air hose.
- Do not make adjustments to pneumatic tools until you are sure that no air pressure is being supplied to the hose or tool.
- Do not hoist or carry a tool by the hose.
- Pneumatic impact tools must have safety clips or retainers to retain tool bits.
- Follow the manufacturer's guidelines for safe operating pressures.
- Locate all air hoses so they do not present a tripping hazard.

GRINDERS

- Wear appropriate eye protection.
- Grinding wheels must be covered with a safety guard.
- Tool rests must be well supported and be no more than 1/8" from the wheel. Never adjust a tool rest while the wheel is in motion.
- Do not grind on the side of the wheel unless it is designed to be used as a slide grinder.
- Never leave a running grinder unattended.
- Make sure the work area around the grinder is clear before starting it up. Stand off to one side of the grinder at start-up.
- Bench grinders shall be set up in a non-traffic area.

PORTABLE GRINDERS

- Always wear full-face shield over safety glasses.
- Always tuck shirt in when using grinders.
- Do not operate grinders without proper guards.
- Do not use a portable side grinder as a replacement for a bench grinder.

BENCH GRINDERS

- Abrasive wheel bench or stand grinders must have safety guards strong enough to withstand bursting wheels.
- Adjust work rests on grinders to a clearance not to exceed 1/8 inch between rest and tool surface.
- Inspect and ring test abrasive wheels before mounting.
- Always leave wheel in working condition for the next user.

PURPOSE

To establish procedures for the safe use of powder-actuated tools.

POLICY

General Requirements

All manufacturers' recommendations and applicable local laws governing the proper use, inspections and maintenance of powder-actuated tools shall be followed.

Only authorized, certified employees will be allowed to use powder-actuated tools.

General precautions applicable to all types of powder-actuated stud guns:

- The explosive powder-actuated tool and ammunition must be kept in a locked box at all times (other than when being used) to prevent unauthorized use.
- Storage of the tool, ammunition and studs shall be controlled so that only ***AUTHORIZED TRAINED PERSONNEL*** can withdraw them for use.
- The manufacturer's representative of the tool to be used shall train, qualify, and certify site employees in the proper use and maintenance of the stud gun.
- A current certification card for the powder-actuated tool being used must be in the operator's possession while tool is being used.

The powder actuated tool shall not be used where the stud is to be driven into surface hardened steel, cast iron, glazed brick or tile, marble, granite, live rock or similar brittle materials.

Tools must not be used in any location where explosives, flammable gasses, vapors or dusts are present.

The tool operator and nearby workers must wear safety glasses or goggles when the tool is being used. Ear protection shall be used 100% of the time when this tool is used. Other workers in the near vicinity shall wear ear protection.

The utmost care must be exercised to insure that ammunition, studs, nails, etc., are of the proper specification.

The tool must at all times be equipped with the proper ricochet or spall guard.

Signs shall be posted warning of the use of powdered-actuated tools in use.

HIGH VELOCITY GUNS

Only the "captive stud" type gun should be used. Guns capable of firing a stud into free flight at high velocity are prohibited.

No stud is to be driven closer than three inches to the edge of brick, concrete or masonry surfaces because of their tendency to split or crack. Exception to this rule may be made where steel safety shields are placed on the sides of the surfaces as in the case of concrete curbs to prevent flying spalls.

In case of misfire, the tool shall be kept in operating position for one full minute and then placed in vertical position, muzzle down while the charge is removed.

The tool shall never be pointed at anyone. The line of fire, whether up, down, or across, must be clear of personnel. Do not assume the stud will not shoot all the way through something.

Studs shall never be driven through pre-drilled or pre-punched holes in fixtures or material without a special guard designed for this type operation.

LOW VELOCITY, HIGH INERTIA GUNS

Where stud or fastener velocity does not exceed 300 FPS at 6.5 feet from muzzle – "Powder-Actuated Tool Manufacturer's Institute, Inc." code:

> This type of gun employs the principle of a powder-actuated captive piston (high mass) driving a free stud at low velocity. Stud-driving energy is derived from piston inertia. Once free of the piston, the stud alone has insufficient inertia to produce free flight, ricochets, penetration, etc. This type gun is recommended from both safety and productivity standpoints.
>
> Adherence to the general precautions as noted in this section will afford adequate protection.

PURPOSE

To establish uniform guidelines for complying with the requirements of the Occupational Safety and Health Administration (OSHA) for Respiratory Protection, Title 29, 1926.103, which provides procedures for the proper selection, use and care of respiratory protective equipment.

DEFINITIONS

Abrasive-blasting respirator – A respirator designed to protect the wearer against inhalation of abrasive material and against impact and abrasion from rebounding abrasive material.

Aerosol – A system consisting of particles, solid or liquid, suspended in air.

Air-regulating valve – An adjustable valve used to regulate, but which cannot complete shut off, the airflow to the face piece, helmet, hood, or suit of an air-line respirator.

Air-supply device – A hand-operated or motor-operated blower for the hose mask, or a compressor or other source of respirable air for the air-line respirator.

Approved – Tested and listed as satisfactory by the Bureau of Mines (BM) of the U.S. Department of Interior, or by the National Institute for Occupational Safety and Health (NIOSH) of the U.S. Department of Health and Human Services, or jointly by the Mine Safety and Health Administration (MSHA) of the U.S. Department of Labor and the National Institute for Occupational Safety and Health (NIOSH) of the U.S. Department of Health and Human Services.

Breathing tube – A tube through which air or oxygen flows to the face piece, moth piece, helmet, hood, or suit.

Canister--(air-purifying) – A container with a filter, sorbent, or catalyst, or any combination thereof, which removes specific contaminants from the air drawn through it.

Canister—(oxygen-generating) – A container filled with a chemical which generates oxygen by chemical reaction.

Carcinogen – A substance known to cause cancer.

Catalyst – In respirator use, a substance which converts a toxic gas (or vapor) into a less-toxic gas (or vapor).

Ceiling concentration – The concentration of an airborne substance that shall not be exceeded.

Confined space – An enclosure – such as a storage tank, process vessel, boiler, silo, tank car, pipeline, tube, duct, sewer, underground utility vault, tunnel, or pit – having limited means of egress and poor natural ventilation and which may contain hazardous contaminants or be oxygen deficient.

Contaminant – A harmful, irritating, or nuisance materials that is foreign to the normal atmosphere.

Emergency respirator use – Wearing a respirator when a hazardous atmosphere suddenly occurs that requires immediate use of a respirator either for escape from the hazardous atmosphere or for entry into the hazardous atmosphere to carry out maintenance or some other task.

Exhalation valve – A device that allows exhaled air to leave a respirator and prevents outside air from entering through the valve.

Eyepiece – A gas-tight, transparent window(s) in a full facepiece, helmet, hood, or suit, through which the wearer may see.

Facepiece – That portion of a respirator that cover the wearer's nose and mouth in a quarter-mask (above the chin) or half-mask (under the chine) facepiece or that covers the nose, mouth, and eyes in a full facepiece. It is designed to make a gas-tight or particle-tight fit with the face and includes the headbands, exhalation valve(s), and connections for an air-purifying device or respirable gas source, or both.

Face shield – A device worn in front of the eyes and a portion of, or all of, the face, whose predominant function is protection of the eyes and face.

Filter – A media component used in respirators to remove solid or liquid particles form the inspired air.

Goggles – A device, which contour-shaped eyecups with glass or plastic lenses, worn over the eyes and held in place by a headband or other suitable means for the protection of the yes and eye sockets.

Hazardous atmosphere – Any atmosphere, either immediately or not immediately dangerous to life and health, which is oxygen deficient or which contains a toxic or disease-producing contaminant exceeding the legally established Permissible Exposure Limit (EPL) or, where applicable, the Threshold Limit Valve (TLV) established by the American Conference of Governmental Industrial Hygienists (ACGIH).

Head harness – That part of a facepiece assembly which secures the facepiece to the wearer.

Helmet – That portion of a respirator which shields the eyes, face, neck, and other parts of the head.

Hood – That portion of a respirator which completely covers the head, neck, and portions of the shoulders.

Immediately Dangerous to Life or Health (IDLH) – Any atmosphere that poses and immediate hazard to life and produces immediate irreversible debilitating effects on health.

Inhalation valve – A device that allows respirable air to enter a respirator and prevents exhaled air from leaving the respirator through the valve.

Irrespirable – Unfit for breathing.

Maximum Use Concentration of filter, cartridge, or canister – The maximum concentration of a contaminant for which an air-purifying filter, cartridge, or canister is approved for use.

Mouthpiece – That portion of a respirator which is held in the wearer's mouth and is connected to an air-purifying device or respirable gas source, or both. It is designed to make a gas-tight or particle-tight fit with the mouth.

Negative pressure respirator – A respirator in which the air pressure inside the respirator-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.

Nose clamp – A device used with a respirator equipped with a mouthpiece that closes the nostrils of the wearer (sometimes called a nose clip).

Odor threshold limit – The lowest concentration of a contaminant in air that can be detected by the olfactory sense.

Oxygen deficiency – The concentration of oxygen, by volume, below which atmosphere supplying respiratory protection must be provided. It exists in atmospheres where the percentage of oxygen, by volume, is less than 19.5 percent oxygen.

Particle matter – A suspension of fine solid or liquid particles in air, such as: dust, fog, fume, mist, smoke, or spray. Particulate matter suspended in air is commonly known as an aerosol.

Permissible Exposure Limit (PEL) – The legally established time-weighted average (TWA) concentration of a contaminant that shall not be exceeded.

Rescue respirator use – Wearing a respirator for entry into a hazardous atmosphere to rescue a person(s) in the hazardous atmosphere.

Resistance – Opposition to the flow of air, as through a canister, cartridge, particulate filter, orifice, valve or hose.

Respirable – Suitable for breathing.

Respiratory-inlet covering – That portion of a respirator which connects the wearer's respiratory tract to an air-purifying device or respirable gas source, or both. It may be a facepiece, helmet, hood, suite, or mouthpiece/nose clamp.

Routine respirator use – Wearing a respirator as a normal procedure when carrying out a regular and frequently repeated task.

Sanitation – The removal of dirt and the inhibiting of the action of agents that cause infection or disease.

Service life – The period of time that a respirator provides adequate protection to the wearer – for example, the period of time that an air-purifying device is effective for removing a harmful substance from inspired air.

Sorbent – A material which is contained in a cartridge or canister and which removes toxic gases and vapors from inspired air.

Supplied-air suit – A suit that is impermeable to most particulate and gaseous contaminants and that is provided with an adequate supply of respirable air.

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

Valve (air or oxygen) – A device which controls the pressure, direction, or rate of flow of air or oxygen.

Vapor – The gaseous stage of a substance that is solid or liquid at ordinary temperature and pressure.

Welding helmet – A device designed to provide protection for the eyes and face against intense radiant energy and molten metal splatter encountered in the welding and cutting of metals.

Window indicator – A device on a cartridge or canister that visually denotes the service life of the cartridge or canister.

GENERAL REQUIREMENTS

Every consideration will be given to the use of effective engineering controls to eliminate or reduce exposure to respiratory hazards to the point where respirators are not require; however, when feasible engineering controls are not effective in controlling toxic substances, appropriate respiratory protective equipment will be provided by the company at no charge to the employee.

These respiratory protective devices will be of the type approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) or acceptable to the U.S. Department of Labor (OSHA) for the specific containment to which the employee is exposed.

Employees required to use respiratory protective devices because of exposure to toxic substances would do so as a condition of employment. Employees required to use respirators will be properly fitted, appropriately tested, medically screened, and thoroughly trained in their use.

PURCHASE OF APPROVED EQUIPMENT

In order to comply with the provisions of OSHA's standard, all respiratory protective equipment purchased by *Plummer Concrete & Associates, Inc.* will have been tested by the National Institute for Occupational Safety and Health and will carry a joint NIOSH/MSHA approval number for that specific respirator assembly.

WORK AREA SURVEILLANCE

The Respiratory Protection Standard 29 CFR 1910.134 standard requires "appropriate surveillance." This should include identification of the contaminant, nature of the hazard, concentration at the breathing zone, and, if appropriate, biological monitory. The Industrial Hygienist, who is conducting the air sampling, should carefully and fully document any apparent deficiencies in surveillance necessary to the respirator program.

RESPIRATOR SELECTION

In selecting the correct respirator for a given circumstance, the following factors must be taken into consideration:

Nature of the Hazard. In order to make subsequent decisions, the nature of the hazard must be identified to ensure that an overexposure does not occur. These include oxygen deficiency, physical properties of the hazard, chemical properties of the hazard, physiologic effects on the body, actual concentrations of the toxic substances, the Permissible Exposure Limits (PEL), and the warning properties.

Nature of the Hazardous Operation. For proper respirator selecting, it is necessary to know the details of the operations, which require employees to use respiratory devices. These include operation or process characteristics, work area characteristics, materials used or produced during the process, the employee's duties and actions, and any abnormal situation characteristics which may necessitate alternate respirator selection.

Location of the Hazardous Area. This is important in the selection process so that a backup system may be planned if necessary. Respirable air locations must be known prior to entry into a hazardous area so escape or emergency operations may be planned.

Time Respiratory Protection is Required. The length of time a respirator will have to be worn by an employee is a factor that must be evaluated. This is most pronounced when using SCBA equipment, where, by definition, the air supply is finite. However, time is also a factor during routine use of air-purifying respirators when the employee's breathing and comfort become affected by a clogged filter cartridge which needs changing.

Employee's Health. Effective usage of a respirator is dependent on an individual's ability to wear a respirator, as determined by a physician. Most respiratory devices increase physical stress on the body, especially the heart and lungs. Care should be taken to ensure that a medical determination has been made that an individual is capable of wearing a respirator for the duration of the work assignment.

Work Activity. The type of work activities to be performed while wearing a respirator is vitally important in the respirator selection. The proper respirator will be one, which is least disruptive to the task being conducted yet providing the desire protection.

Respirator Characteristics, Capabilities and Limitations. Refer to the Tables in ANSI Z88.2-1980. They provide a description of various respirator characteristics, capabilities and limitations.

Protection Factors. The protection afforded by respirators is dependent upon the type of respirator used, seal of the facepiece to the face, leakage around valves, and leakage through or around cartridges or canisters. Depending on these criteria, the degree of protection may be ascertained and a relative safety factor assigned. Protection factors are only applicable if all elements of an effective respirator program are in place and being enforced.

COMFORT

Once the type of respirator has been selected that is applicable and suitable for the purpose intended, the selection process should give consideration to the fit and comfort of the respirator.

The employee should be given the opportunity to select a respirator that provides the most comfortable fit. Since each respirator represents a different size and shape, a respirator which fits better during selection will provide better protection after fit testing. The employee should be shown hot to assess a comfortable device and should eliminate those that are obviously ill-fitting.

An assessment of comfort should include the following points:

- Chin properly placed
- Fit across nose bridge
- Positioning of mask on nose
- Room for safety glasses
- Strap tension
- Distance from nose to bridge
- Room to talk
- Tendency to slip
- Cheeks filled out
- Hindrance to movement

ISSUANCE OF EQUIPMENT

The issuance of respirators to employees shall be, at a minimum, based on the following considerations:

- A person must have received appropriate, documented training and must have received medical clearance, where applicable.
- A person who has hair, e.g., beard growth, moustache, sideburns, stubble, low hairline, bangs, which passes between the face and the sealing surface of the respirator facepiece shall not be permitted to wear such a respirator.
- A person who has hair which interferes with the function of a respirator valve(s) shall not be permitted to wear the respirator.
- A corrective vision spectacle which has temple bars or straps which pass between the sealing surface of a full face piece and the wearer's face shall not be permitted.
- A head covering which passes between the sealing surface of a respirator facepiece and the wearer's face shall not be permitted.
- The wearing of a spectacle, a goggle, a face shield, a welding helmet, or other eye and face protective device, which interferes with the seal of a respirator to the wearer, shall not be permitted.

- If scars, hollow temples, excessively protruding cheekbones, deep creases in facial skin, the absence of teeth or dentures, or unusual facial configurations prevent a seal of a respirator facepiece to a wearer's face, the person shall not be permitted to wear the respirator.

- If missing teeth or dentures prevent a seal of respirator mouthpiece in a person's mouth, the person shall not be allowed to wear a respirator equipped with a mouthpiece.

- If a person has a nose of a shape or size that prevents the closing of the nose by the nose clamp or a mouthpiece/nose-clamp type of escape respirator, the person shall not be permitted to wear this type of respirator.

Where practical, and where the above considerations are deemed acceptable, respirators should be assigned to individual employees for their exclusive use and labeled for identification in such a way as not to affect the performance of the respirator.

MEDICAL SURVEILLANCE REQUIREMENTS

Prior to the use of respiratory protection devices, a medical examination shall be required for all personnel in the following categories:

- Employees who are or may be exposed to OSHA regulated airborne contaminants at or above the established Action Level (AL) or 30 or more days per year.

- Employees who are or may be exposed to OSHA regulated airborne contaminants at or above the established Permissible Exposure Limit (PEL) for 10 or more days per year.

- Employees who are or may be required to use a Self-Contained Breathing Apparatus (SCBA), e.g., as a member of a confined space entry team, as a member of a first aid/rescue team, or during hazardous material response operations.

- Employees who use negative pressure, air purifying respirators in work areas that contain asbestos.

A licensed physician shall determine what physiological and psychological conditions are pertinent for the wearing of different types of respirators. The respirator program administrator or his designee, using guidelines established by the physician, shall determine whether or not a person may be assigned to a task requiring the use of a respirator.

When applicable, medical surveillance, including bioassay, shall be carried out periodically to determine if respirator wearers are receiving adequate respiratory protection. The licensed physician shall determine the requirements of the surveillance program.

Employees included in the medical surveillance program shall, as a minimum, be provided with annual surveillance examinations. If the examining physician determines that any of the examinations should be provided more frequently than specified, *Plummer Concrete & Associates, Inc.* would provide such examinations to affected employees at the frequencies specified by the physician.

MEDICAL FORMS

In addition to the standardized questionnaires, the physician must also be furnished with a copy of the latest OSHA Standard governing the type of exposure the employee will be subjected to. A description of the employee's duties as they relate to the exposure, the anticipated exposure level, a description of the respiratory protection equipment to be used, and any available information from previous medical examinations of the employee must also be furnished to the physician.

At the conclusion of the examination, the physician will submit a written opinion to Plummer Concrete & Associates, Inc. This will contain the results of the examination, any conditions discovered by the physician that will prohibit the employee from using a respirator and any recommendations from the physician regarding the employee's limitations. It will also contain a statement from the physician that he/she has informed the employee of the results of the examination.

The company must furnish a copy of the physician's opinion to the employee within 30 days of its receipt by the company.

SPECIAL PROBLEMS – VISION

When a respirator user must wear corrective lenses, a protective spectacle or goggle, a face shield, a welding helmet, or other eye and face protective device, the item shall be fitted to provide good vision and shall be worn in such a manner as not to interfere with the seal of the respirator to the wearer

Temple bars or straps of a corrective spectacle which pass between the sealing surface of a full facepiece respirator and the wearer's face may prevent a good seal of the facepiece to the face and therefore such a spectacle shall not be used when a full facepiece respirator is worn. Special corrective lenses, which are made to be mounted inside a full facepiece, are available, from each specified respirator manufacturer, and should be provided by the employer for the employee who needs corrective lenses.

The wearing of contact lenses by persons who must wear a respirator in a contaminated atmosphere is prohibited.

TRAINING

Respirators will not be issued to individuals (including company officials, subcontractors, or visitors) who have not received the appropriate respirator training and a medical clearance.

Training Program

The extent and frequency of employee training depends primarily on the nature and extent of the hazard. As a minimum, all employees and supervisory personnel will be trained in basic respirator practices. It must be remembered that respirators are effective only when they are acceptable to the employee and worn properly by him/her. Because proper use depends especially upon the wearer's motivation, it is important that the need for the respirator be explained fully.

The basic respirator training program must include:

- A discussion of the nature of airborne contaminants against which the employee must be protected, and why engineering controls have not been effective in controlling exposure to the point where respirators are not required.

- A discussion of why the respirator which has been selected for this job is the proper device for this particular purpose.

- An explanation of the differences between air-purifying and supplied air respirators and how their use is controlled by the amount of exposure.

- Instruction on the respirator's limitations, emphasizing such things as oxygen deficiency, toxic contaminants which are immediately dangerous to life or health, particulates, such as asbestos, which are not immediately dangerous to life or health, and the need to change filter cartridges when indicated to do so by testing, or when breathing resistance increases to an uncomfortable level.

- Instructions in how to inspect the respirator and ensure that it is in proper working condition.

- Instructions on how to put on the respirator, how it should be positioned on the face, how to set strap tension, and how to wear the respirator comfortably.

- Instructions on the method of fit testing used and the proper way to conduct positive and negative pressure tests each time the respirator is put on. During this instruction, the wearer must be made to understand that the respirator cannot be used when conditions prevent a satisfactory facepiece-to-face seal. If this condition cannot be corrected, the employee cannot be allowed into the area requiring the use of a respirator.

- Instructions in the proper care and maintenance of the respirator.

- A discussion on the value of medical surveillance and air-sample monitoring.

- Field training to recognize and cope with any type of emergency while using a respirator.

FITTING

After the employee has been shown how to assess a respirator, he/she should be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine a proper fit.

Note: This instruction should take the form of a review and should not be considered the employee's formal training.

The employee should hold each facepiece up to the face and eliminate those that obviously do not give a comfortable or proper fit.

FAMILIARIZATION

Once the proper fitting respirator has been selected, the employee should don the device, adjusting the facepiece and tensioning the straps. The employee should wear the mask for at least five minutes before taking it off and putting it on several times, adjusting the straps each time to become familiar with the respirator and adept at setting the proper tension on the straps.

FIT-TESTING REQUIREMENTS

OSHA requires that respirators be fitted properly, and that they be tested for their facepiece-to-face seal. There are currently two methods acceptable for conducting these tests; Qualitative and Quantitative Fit-Testing. The Qualitative method is a fast, easily conducted test that can be performed almost anywhere, while the Quantitative methods require the use of bulky test chambers and electronic equipment. The Quantitative method applies only to negative pressure, non-powered air-purifying respirators.

Qualitative fit-testing is based on the wearer's subjective response to a challenge atmosphere, of which three popular tests are: the irritant smoke test, the odorous vapor test, and the ammonia irritant test. (See Exhibit M for procedures). The following represents a brief summary of how to conduct each of these tests.

Irritant Smoke Test: The irritant smoke test is performed by directing an irritant smoke, usually either stannic chloride or titanic tetrachloride, from a smoke tube towards the respirator being worn. If the wearer cannot detect the irritant smoke, a satisfactory fit is assumed to be achieved.

The respirator wearer will react involuntarily, usually by coughing or sneezing, to a leakage around or through the respirator. Since this type of test provokes an involuntary response from the employee, it is the preferred testing method when available. In this type of qualitative test, the person administering the test should be interested in any response to the smoke and not necessarily to the degree of the response.

When an air-purifying respirator is being tested in this method, it has to be equipped with a high efficiency filter cartridge.

NOTE: The test substances are irritants to the eyes, skin and mucus membranes. Therefore, the respirator wearer should keep his/her eyes closed during testing.

Odorous Vapor Test: The odorous vapor test relies on the respirator wearer's ability to detect an odorous material, usually isoamyl acetate (banana oil) inside the respirator. The test is performed by passing an isoamyl acetate saturated material around the outside of the respirator. If the wearer is unable to smell the chemical, then a satisfactory fit is assumed to be achieved.

When an air-purifying respirator is tested by this method, it should be equipped with an organic-vapor cartridge that removes the test vapor from the air.

NOTE: This test is solely dependent upon the employee's honest response, since there is no involuntary reaction.

Ammonia Irritant Test: The ammonia irritant test relies upon the wearer's ability to detect an irritant organic chemical substance, usually an ammonia inhalant. The test is performed by placing an enclosure over the respirator wearer's head and shoulders and administering the inhalant vapor from an ample. If the wearer does not react to the chemical, then a satisfactory fit is assumed to be achieved.

NOTE: This test is not dependent on the wearer's honest indication of taste. There is an involuntary response, and therefore is preferred as a method of testing.

FIELD TESTS

There are two tests that are used in the field to check the seal of the respirator. These are known as the positive and negative pressure sealing tests. Each of these two tests must be performed every time a respirator is put on and prior to entering a contaminated area.

NOTE: Although both the positive and negative pressure tests are considered essential to a good respiratory protection program and should always be used prior to entering an area of exposure, they are recognized solely as a field test and cannot be substituted for the qualitative fit test.

Positive Pressure Test

- This test only applies to those respirators that have an exhalation valve that can be blocked. The exhalation valve cover may have to be removed for the test.
- Close or "block off" the exhalation valve.
- Exhale gently into the facepiece.
- If a slight positive pressure is built up with no apparent outward leakage around the seal, then the face piece-to-face seal is satisfactory.

Negative Pressure Test

- Close the inlet opening or hose of the respirator facepiece with the hand(s), tape, or other means.
- Inhale gently so that the facepiece collapses slightly and hold the breath for ten seconds.
- If the facepiece remains slightly collapsed and no inward leakage occurs, then the facepiece-to-face seal is deemed to be satisfactory.

CARE AND MAINTENANCE

Personnel involved in respirator maintenance must be thoroughly trained. Substitution of parts from different brands or types of respirators invalidates approval of the device. Repairs and adjustments should never be made beyond the manufacturer's recommendations.

Cleaning the Respirator

Respirators must be cleaned and disinfected after each day's use when they are assigned to one individual or after each use if they are assigned to more than one person. The following procedures are recommended for cleaning and disinfecting respirators:

- If required, remove and discard any filters or cartridges.
- Wash facepiece and breathing tube in detergent and warm water (120°) or a cleaner/disinfectant solution. Use a soft brush to facilitate removal of dirt. Cleaner/disinfectant solutions are available from respirator manufacturers or it can be made by using a solution of water and household chemicals, such as two tablespoons of chlorine bleach to one gallon of water, or one teaspoon of tincture of iodine to one gallon of water. A two minute immersion of the respirator into either solution is sufficient for disinfection.
- Rinse completely in clean, warm water.
- Air dry in clean air.
- Clean out other parts as recommended by the manufacturer.
- Inspect the valves, head straps and other parts and replace with new parts if defective.
- Place facepiece in a plastic bag or container for storage in an assigned area.
- Insert new filters or cartridges prior to use, making sure the seals are tight.

Storing the Respirator

When they are not being used, respirators should be individually sealed in plastic bags and stored at convenient locations in order to protect them against dust, sunlight, extreme temperatures, excessive moisture, or damaging chemicals. They should be stored in such a way, that the facepiece and exhalation valve are not being distorted.

Inspecting the Respirator

All respirators should be inspected before and after use and at least monthly by a competent person to ensure that they are in satisfactory working condition. A general inspection check list should include:

- Tightness of connections.
- Conditions of face piece, straps, connecting tubes, and cartridges.

- Condition of exhalation and inhalation valves. If the sides of the exhalation valve gap even slightly, it must be replaced with a new valve.

- Pliability and flexibility of rubber parts. Deteriorated rubber parts must be replaced. Unused rubber parts should be worked, stretched and manipulated with a massaging action.

- Condition of lenses should be checked. Lenses must be tight and scratched or damaged lenses replaced.

- On self-contained breathing apparatus, the charge of the compressed air cylinders should be checked and fully charged.

PROGRAM EVALUATION

The program administrator should periodically assess the effectiveness of the respiratory protection program during all phases of operation in which respirators are being used. Frequent walk-through inspections during these activities should be conducted to monitor and document supervisory and worker compliance with the requirements of the program. In addition to general assessment of the overall respiratory protection program, specific calculations of the respirator cleaning, inspection, maintenance, repair, storage, and use procedures should be frequently conducted to ensure that the desired results of these operations are consistently achieved.

REPORTING RESPIRATOR PROBLEMS

Occasionally, the company may find a defect in the design or performance of a respirator. The best course to follow is to report these findings to the administrator of the company's respiratory protection program, who in turn should report these findings to the *Plummer Concrete & Associates, Inc.* Safety Manager.

If the respirator carries with it the approval of the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH), the Corporate Safety Manager will report the findings to the respirator's manufacturers and to NIOSH.

This will be done by notifying the manufacturer of the defect in a report format, and forwarding a copy of the report to NIOSH. The report will include the following:

- The name, address and telephone number of *Plummer Concrete & Associates, Inc.*

- The name of the respirator's manufacturer.
- The model number of the respirator.
- The name and part number (if possible) of the defective part.
- The lot number and/or serial number of the respirator and/or defective part.
- A brief description of the respirator's use when the defect was discovered.
- A description of the defect.
- A description of the defect's adverse effect on the respirator's performance.

This report should be addressed to the NIOSH Division of Safety Research, Testing and Certification Branch, 944 Chestnut Ridge Rd., Morgantown, West Virginia 26505.

RECORDS

Respirator Training Records

Upon completion of the basic respirator training program, the employee will be required to read and sign a Respirator Training Record (See Exhibit N) attesting to the fact that they have received the basic training program and feel confident in their ability to use the respirator properly.

The signed and dated Respirator Training Record will then become a part of the employees' medical records and will be retained for the same period of time as those records.

Recordkeeping of Test Results

A summary of the test results for each employee on whom a qualitative fit test was conducted, will be documented on the Respirator Fit Test Record (See Exhibit O). This record will them become a part of the employee's medical record and will be retained for the same time period as the medical records.

Care and Maintenance Records

A written record should be maintained of the Care and Maintenance Program. Information contained on this record should include inspection reports, replacement parts used, dates of repair, cleaning and type of disinfectant used and the names of persons doing the work.

The respirator should be identified by manufacturer, model and approval number. Records should be retained for a period of five years.

Medical Records

All records pertaining to the employee's medical examination and evaluation must be retained for a period in excess of thirty (30) years.

Additional Information

Additional information about Respiratory Protection can be obtained from the Safety Manager.

(EXHIBIT M)

AIR-PURIFYING RESPIRATOR QUALITATIVE FIT TEST PROCEDURE

Subsequent to respirator training and medical approval, all personnel who request or are required to wear a respirator will be fit-tested with an air-purifying respirator (APR) prior to respirator assignment and use. Fit testing will be accomplished using qualitative methods, which incorporate pressure tests and administration of challenge aerosols (irritants or vapors). Personnel will be allowed to select a respirator that is comfortable and achieves a proper face-to-mask seal.

NOTE: To ensure proper fitting, personnel without clean-shaven faces will not be allowed to undergo fit testing nor will they be allowed to wear respirators on the job. (Moderate length moustaches are permitted if not interference is encountered.)

A written record of the fit-test result will be generated for inclusion into the project's master file and for the employee's records. The Safety Manger shall be responsible for conducting the fit test and generating the appropriate record.

Personnel will be instructed in the use, maintenance, inspection, and limitations of APRs. It will be stressed that any breakthrough (odor, taste, or irritation) or an increased inhalation resistance is reason to exit the respirator use area. Cartridges will be replaced as appropriate or specified by regulation.

RESPIRATOR SELECTION

1. The test subject should understand that he/she is being asked to select the respirator that provides the most comfortable fit for him/her. Each respirator represents a different size and shape and, if fitted and utilized properly, will provide adequate protection.

2. The test subject shall be allowed to select the most comfortable respirator from an array of various sizes and manufacturers that includes at least three sizes of elastomeric facepieces and units of at least two manufacturers.

3. The selection process shall be conducted in a room separate from the fit-test room to prevent olfactory fatigue. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to access a "comfortable" respirator. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This will not constitute his formal training on respirator use, only a review.

4. The test subject will hold each face piece up to his face and eliminate those that are obviously not giving a comfortable fit.

RESPIRATOR SELECTION *continued...*

5. The more comfortable facepieces will be recorded the most comfortable mask will be worn at least five minutes to assess comfort. Assistance is assessing comfort can be given by discussing the points in Item 6 below. If the test subject is not familiar with using a particular respirator, he/she shall be directed to don the mask several times and to adjust the straps each time, so that he/she becomes adept at setting proper tension on the straps.

6. Assessment of comfort shall include reviewing the following points with the test subject:

- Proper chin placement
- Positioning of mask on face
- Strap tension
- Room for prescription spectacle insert(s)
- Room to talk
- Tendency to slip
- Cheeks filled out
- Self-observation in mirror
- Adequate time for assessment

7. Each test subject shall wear his/her respirator for at least 10 minutes before starting the fit test.

FIT TESTING

Qualitative fit testing involves four distinct steps:

- Performance of positive/negative pressure checks
- Administration of stannic chloride smoke challenge
- Administration of ammonia inhalant vapor challenge
- Administration of isoamyl acetate vapor challenge

The test procedures incorporate aerosols, which are designed to produce an involuntary cough reflex and/or olfactory stimulation subject to face to seal breakthrough or leakage.

Fit Testing Procedure

1. Each respirator used for the fit testing shall be equipped with combination organic vapor and high-efficiency particulate cartridges (black/magenta).

2. After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for respirator selection, and shall be well-ventilated, as by an exhaust fan, to prevent general room contamination by the challenge aerosol.

3. This test subject shall conduct the conventional negative- and positive-pressure fit checks (e.g., see ANSI Z889.2-1980). Before conducting the negative- or positive-pressure check, the subject shall be told to check and confirm the mask seal by rapidly moving the head side-to-side and up and down, taking a few deep breaths.

4. The test subject is now ready for fit testing.

5. The test conductor shall review this protocol with the test subject before testing.

6. Advise the test subject that the aerosol can be irritating to the eyes and instruct him/her to keep his eyes closed while the test is performed.

7. Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part No. 5645, or equivalent. Attach a short length of tubing to one end of the smoke tub. Attach the other end of the smoke tube to an aspirator bulb.

8. The test conductor shall direct the stream of irritant aerosol from the tube towards the face seal area of the test subject. The conductor shall begin at least 12 inches from the facepiece and gradually move to within one inch, moving the whole perimeter of the mask.

9. The following exercises shall be performed while the aerosol is challenging the respirator seal. Each shall be performed for one minute.

- Normal breathing

- Deep breathing, being certain that breaths are deep and regular.

- Turning head from side-to-side, being certain that movement is complete. Alert the test subject not to bump the respirator on the shoulders. Have the test subject inhale when the head is at either side.

- Nodding head up and down. Be certain motions are complete and made about every second. Alert the test subject not to bump the respirator on the chest. Have the test subject inhale when his head is in the fully up position.

- Talking. Talk aloud and slowly for several minutes. The following paragraph is called the Rainbow Passage. Reading it will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages, which serve the same purposes, may also be used.

Rainbow Passage

"When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow."

- Normal breathing.

10. Repeat fit testing steps 5 through 9, this time using vapors from an ammonia inhalant ampoule (MSA P/N 2156, or equivalent) as a secondary challenge atmosphere.

11. Repeat fit testing steps 5 through 9, this time using vapors from an isoamyl acetate ampoule (North P/N 7002, or equivalent) as a third challenge atmosphere.

12. If the irritant aerosols produce an involuntary reaction (cough) or if the test subject notices odors, the test conductor shall stop the test. In this case, the test respirator is rejected and another respirator shall be selected.

13. Each test subject passing the challenge tests without evidence of a response shall be given a sensitivity check of the aerosols to determine whether he reacts to them. Failure to evoke a response shall void the fit test.

14. After passing the fit test, the test subject shall be questioned again regarding the comfort of the respirator. If it has become uncomfortable, another model of respirator shall be tried.

15. The test subject shall be given the opportunity to select a different facepiece and be re-tested if during the use the chosen facepiece becomes unacceptably uncomfortable.

16. Protection Factors (PF)

If a respirator passes the qualitative tests, it can be work in concentrations determined by the assigned PF. The Maximum Use Concentration (MUC) is calculated by multiplying the TLV of the contaminant by its PF. PFs for air purifying respirators are:

Half-face mask: 10

Full-face mask: 50

Example: MUC (ppm) = PF x TLV If TLV = 0 ppm and PF = 10;

Then, MUC = 10 x 10 = 100 ppm

Thus, for a substance with a TLV of 10 ppm, and half-mask respirator provides protection up to a maximum concentration of 100 ppm of the substance.

SEMI-ANNUAL TESTING

The qualitative fit-test should be repeated at least once every six months, if the user is assigned a new respirator or whenever one or more of the following occur:

- The employee has a weight change of 20 pounds or more;
- Facial scarring occurs in an area of the face seal;
- The employee has significant dental changes;
- The employee has reconstruction or cosmetic surgery of the face; and
- Any other condition that may interfere with the facepiece seating.

RECORDKEEPING

The Respirator Fit Test Record (Exhibit O) must be completed after each fit-test.

(EXHIBIT N)

RESPIRATOR TRAINING RECORD

Employee's Name (print) _____
(Last) **(First)** **(M.I.)**

Craft_____ **SSN:**_____

Project Name:_____ **Job No.:**_____

Your signature on this Respirator Training Record will attest to your having received and understood the basic respirator training program which both *Plummer Concrete & Associates, Inc.* and the Occupational Safety and Health Administration (OSHA) require as part of an acceptable respiratory protection program.

The basic respirator training program consists of the following elements:

- The reasons for the need of respiratory protection.
- The nature, extent, and effects of respiratory hazards to which the person may be exposed.
- An explanation of why engineering controls are not being applied or are not adequate and of what effort is being made to reduce or eliminate the need for respirators.
- An explanation of the operation and the capabilities and limitations of the respirator selected.
- Instruction in inspecting, donning, checking of the fit of, and wearing the respirator.
- An opportunity for each respirator wearer to handle the respirator, learn how to don and wear it properly, check its seals, wear it in a safe atmosphere, and wear it in a test atmosphere.
- An explanation of how maintenance and storage of the respirator is carried out.
- Instructions in how to recognize and cope with emergency situations.
- Instructions as needed for special respirator use.
- Regulations concerning respirator use.

Employee's Signature _____ Date____/_____/_____

Trainer's Signature _____

Trainer's Title _____

(EXHIBIT O)

RESPIRATOR FIT TEST RECORD

Employee's Name (print) _____
(Last) **(First)** **(M.I.)**

Craft_____ SSN:_____

Project Name:_____ **Job No.:**_____

RESPIRATOR INFORMATION:

Brand:_____ **Model:**_____ **Size:**_____

- ❒ Half Mask
- ❒ Full Mask
- ❒ Escape
- ❒ Air Purifying
- ❒ PAPR
- ❒ Airline ❒ SCBA

FIT TEST RESULTS	**Acceptable**	**Unacceptable**
Test Parameter	❒	❒
Positive/Negative	❒	❒
Irritant Smoke	❒	❒
Ammonia Vapor	❒	❒
Isoamyl Acetate	❒	❒

COMFORT FACTOR

❒ Very Comfortable ❒ Comfortable ❒ Tolerable
❒ Uncomfortable ❒ Very Uncomfortable

COMMENTS: _____

_____

_____

PERSON ADMINISTERING TEST: _____

TITLE: _____

ACKNOWLEDGEMENT OF FIT:

NAME: _____ DATE: _____
(Signature)

(EXHIBIT P)

PROGRAM FOR THE VOLUNTARY USE OF DUST MASKS

This program is designed to protect employee health even though it has been determined that respirators are not required. Filtering face piece dust masks will be allowed for those employees who wish to use them. This program is designed for compliance with OSHA Standard 29 CFR 1910.134(c)(2)(i) with the exception in 1910.134(c)(2)(ii).

The Safety Manager has determined that respirators are generally not required for the following jobs, tasks, or departments: Concrete, Masonry.

The use of dust mask respirators by employees is strictly voluntary.

The Safety Manager will provide and employees are to read Appendix D of the OSHA Respirator Standard 29 CFR 1910.134, a copy of which follows:

Appendix D 1910.134 (Non-Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide and additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, of if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warning regarding the respirators limitations.

2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.

3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.

4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

All employees receive safety awareness training on a regularly scheduled basis to recognize, avoid and prevent unsafe and hazardous conditions connected with particular job assignments, be aware of and understand those safety regulations applicable to particular work assignments, and document incidents.

Safety Education and Training: Supervisors

Each supervisor of Plummer Concrete & Associates, Inc. shall implement respective training programs in their areas of responsibility, as required by Company Policy, the Occupational Safety and Health Act, and specific regulations such as the Hazard Communication Standard. These programs shall be utilized under the following situations:

A. Specific safety instructions for new hires, as required.
B. Safety training for existing employees or for those beginning an unusual job task.
C. CPR and first aid training, as required.
D. Training on the use of specific personal protective equipment, as required by law.
E. Training for those employees who are exposed to hazardous chemicals and/or substances either on a routine basis or in a foreseeable emergency.
F. Annual training for those supervisors in operating positions. This type of training should include, but is not limited to:
    1. Conducting safety meetings and workplace inspections.
    2. Accident investigation.
    3. Job safety analysis.

Safety Education and Training: On-the-Job Training

It is Plummer Concrete & Associates, Inc. policy that all personnel, prior to be assigned a job, be checked out by their immediate supervisor to determine if the person is qualified to perform the job. If not properly qualified, the employee will be trained prior to a job assignment.

The responsibility for teaching job skills is usually with the worker's immediate supervisor. This training will include the use of necessary safety equipment and proper job procedures that address the safety of the employee. On-the-job training (OJT) may also be utilized because the employee can be productive while being trained. The supervisor should demonstrate the proper procedure, and observe and correct the employee when necessary.

Safety Education and Training: Regular Safety Education Efforts

Regularly scheduled safety meetings and training sessions are important to the success of our Safety and Health Program because they serve as a constant reminder to employees that their safety is of utmost importance to Plummer Concrete & Associates, Inc. Management can thus provide visible support by taking part in safety meetings within their area of control. Regularly weekly scheduled meetings will consist of Tool Box Talks or other safety issues.

Safety Training Topics

The following is a list of topics affected employees at Plummer Concrete & Associates, Inc. will be trained in:

- Company safety rules
- Personal protective equipment
- Fall protection procedures
- Electrical safety
- First aid and CPR training
- Reporting unsafe acts and conditions
- Hazard communication
- Hazard recognition and avoidance
- Ladders and scaffold safety
- Fire extinguisher/fire prevention
- Material handling/back safety
- Other topics as needed

PURPOSE

To provide safety guidelines for erecting and dismantling elevated work platforms.

DEFINITIONS

Fixed Scaffolds – includes the following: tubular welded frame, bracket scaffolds, tube and coupler (tube Lox) scaffolds, woodpile scaffolds and trestle scaffolds.

REFERENCES

OSHA 29 CFR 1926.451 – Scaffolding
ANSI A10.8 – Safety Requirements for Scaffolding

POLICY

General Requirements

Any elevated work presenting a potential fall hazard; therefore, it is essential the precautionary measures be thorough.

All working platforms must be capable of sustaining a minimum working load of 75 psf on 6 ft. spans or have as safety factor of 4 to 1 for the intended load.

Posts shall be plumb and scaffold platforms shall be level.

A stationary scaffold shall be secured to the building or a fixed structure vertically every 26 ft. starting at the base of the scaffold and horizontally every 30 ft. This rule shall also apply to rolling scaffolds at their working stations. Outriggers may be used in lieu of tying off, or scaffolds may be clamped together so that the height does not exceed four times the smallest base dimension without additional stabilization.

A qualified person shall determine the structural integrity of structural steel, reinforcing steel, and concrete or building members prior to the attachment of scaffolds by bracing or tying off.

Where persons are required to work or walk under scaffolding, a screen or mesh guard, or solid panels shall be provided between the toeboard and handrail. The screen or panels must withstand a horizontal force of at least 150 lbs.

All workers shall tie off with a safety harness when there is no or incomplete handrail, when there are openings over 18 in. in the working platform or when on suspended working platforms.

Where there is danger of tools, materials, or equipment falling from a scaffold and striking employees below, a toeboard of at least 3 ½ in. shall be installed. Toeboards shall withstand a horizontal force of at least 50 lbs.

All workers shall tie off with a safety harness when there is no or incomplete handrail, when there are openings over 18 in. in the working platform or when on suspended working platforms.

Where there is danger of tools, materials, or equipment falling from a scaffold and striking employees below, a toeboard of at least 3 ½ in. shall be installed. Toeboards shall withstand a horizontal force of at least 50 lbs.

Swinging stages floats and boatswains shall be tested before using (test by applying a dead load with unit close to floor or ground).

Crews requiring scaffolds shall requisition them well in advance to avoid delays and to allow time to provide the best scaffold for the job.

Scaffold erection crews shall inspect all components for defects as the erection proceeds. Any components found to be defective shall be set aside and tagged for repair or disposal.

Daily inspections shall be performed under the direction of competent supervision responsible for the work being performed. All defects shall be corrected at once or have "defective" tags attached.

FIXED SCAFFOLDS REQUIREMENTS

Fixed scaffolds include tubular welded-frame scaffolds, bracket scaffolds, tube and coupler (Tube-lox) scaffolds, trestle scaffolds and wood pole scaffolds.

Tubular Welded-Frame Scaffolds Requirements

- Scaffolds of 6 feet or more in height shall include diagonal braces, handrails, midrails, toeboards, and 2 in. x 10 in. or 2 in. x 12 in. scaffold planks or manufactured scaffold decking which will provide a complete working deck without gaps or openings. All legs shall have the metal base plates in place. On soft ground, wooden sills of at least 2 in. x 10 in. lumber. Scaffold planks may be rough cut undressed lumber. Scaffold planks may be painted on each end for 12 in. to designate it as an inspected plank only to be used for scaffolding and marking for overhang limits.
- When scaffold sections are erected, only scaffold pins are to be used for the corner post connections (do not use tie-wire or welding rods). Pigtail pins, latch type pins, or nuts and bolts may be used.

When casters are used for a rolling scaffold, they shall be locked except when the scaffold is being moved. No one shall be permitted on a scaffold while it is being moved.

- Scaffold screw jacks shall be extended in accordance with the manufacturer's recommendations but in no case shall they be extended in excess of 12 in. Whenever screw jacks and casters wheels are not used, metal base plates must be used for adequate base support. All supports are to be pinned and secured.

- Scaffolds shall have solid footing and shall be erected so that vertical members are always plumb and the platform is as horizontal as practical. Scaffold planks are to be cleated, wired down, or otherwise secured against accidental displacement.

- Wedge shims shall not be used. Work from incomplete scaffolds, when approved, will require that the employee take added precautions to meet accident prevention requirements.

- Safety harness must be worn if handrails are missing or the platform is incomplete or other fall hazards exist.

- Horizontal braces of 2 in. x 4 in. lumber or equivalent shall be secured across corner posts when it is necessary to remove the diagonal braces. Diagonal braces shall not be removed from more than one section in a series of sections unless there are four braces sections between.

- Ladders shall be used if access to the scaffold platform is blocked or the scaffold climbing devices are more than 16 in. apart.

- Every scaffold higher than 50 ft. must be inspected and approved by a licensed professional engineer and by the Safety Manager prior to use. This inspection shall be documented and filed in the site safety office.

- Toeboards shall be secured in a firm manner by interlocking at the corner posts with notches, wiring, nailing, U-clamping to the bearing members, or by use of approved commercial toeboard systems.

- Employees gaining access to scaffolds shall have both hands free at all times and shall use the hand-over-hand method of climbing on the rungs. Employees shall not use toeboards as handholds or footholds to gain access to the platform.

Bracket Scaffolds Requirements

The procedure when using bracket scaffolds on reinforcing steel wall installations is as follows:

- Where more than one layer of horizontal bars has been placed and conditions permit, the scaffold shall be secured to an inside horizontal bar.

- If conditions do not permit attaching the bracket scaffold to an inside horizontal bar, the scaffold shall be secured with a minimum of three 3/8 in. diameter U-bolts attached to each end and middle of the outer horizontal or vertical bar. Additionally, No. 9 wire shall be placed at a minimum of every fourth tie location.

- The horizontal reinforcing bar shall be secured to a vertical reinforcing bar that is either embedded concrete or has been spliced by an approved method.

- Each scaffold shall have a 4 ft. x ¼ in. safety chain attached to the ends of the scaffold and secured to an inner rebar other than the bar that is supporting the scaffolds.

- Guardrails and toeboards shall be installed on all open sides and ends of scaffolds.

- No more than three persons plus the necessary tools and equipment shall be permitted on a single scaffold section at any one time. The load is not to go beyond the scaffold's designed capacity. Bracket scaffolds shall be constructed to support 1,550 lbs. and the capacity shall be posted on the scaffold.

- Men working with safety harnesses shall have the lanyard secured above the point of operation, but under no circumstances shall it be attached to the scaffold.

- Scaffolds may be painted "caution yellow" to give the adjacent crane operators a better perspective when working close to them during the day or night.

Tube and Coupler (Tube-Lox) Scaffolds

- Posts shall be erected on suitable bases and maintained plumb.
- Diagonal cross bracing shall be provided as follows:
  - Horizontally every third section
  - Vertically every fourth section
  - Whenever posts are farther apart than 7 ft., the braces shall be at a 45-degree angle.
  - Runners shall be erected along each side vs. the scaffold at the bottom and top of each section.
  - Bearers and braces shall extend past the posts a minimum of 4 in., but not more than 12 in. Extensions of these shall not protrude into walking or climbing areas.

SCAFFOLD ERECTION AND DISMATLING REQUIREMENTS

A serious accident potential may exist when scaffolds are being erected or dismantled. All individuals working on scaffolds at these times shall comply with the following safety rules and regulation

Workers must keep both hands empty for secure handholds when moving about on scaffolds. Pockets, pouches, and tool belts are to be used to carry the necessary tools for the work.

Scaffold members shall be hoisted or lowered with a hand line or passed from hand to hand. Throwing items up to co-workers or dropping them is not permitted.

Constant fall prevention measures must be maintained. Provisions shall be established for using a safety harness and working on firm scaffold decks when this can be done safely.

Scaffold feet shall be established on a firm and level base of support.

When scaffolds are to be secured to fixed structures or outriggers are to be used, they shall be installed as soon as possible. When dismantling a scaffold, these should be left on as long as is practical.

The coordination of this activity with surrounding operations and environment shall be given prior consideration.

MOUNTING AND DISMOUNTING SCAFFOLDS REQUIREMENTS

This activity is most associated with scaffold accidents. Therefore, all individuals mounting and dismounting scaffolds shall comply with the following safety rules and regulations:

- When scaffold platforms are more than 2 ft. above or below a point of access, portable ladders, hook-on ladders, attachable ladders, stairway-type ladders, stair towers, ramps, walkways, integral prefabricated scaffold access shall be used. **Cross braces shall not be used as a means of access.**
- Do not carry objects in hands, but keep both hands empty for climbing handholds.
- Step only on secured ladder or access rungs.
- Hook-on, attachable ladders, and climbable end frames shall have uniformly spaced rungs with a maximum spacing between rungs of 16 ¾ in. "Walk-through" end frames are **not** designed to be climbable.
- Give full attention to stability while getting on and off the working platform. Do not use the toeboard as a handhold or foothold.

- Pay attention to each step and handhold; most falls occur near the top of the ladder or near the bottom.

SCAFFOLD TAGGING

General scaffold Tagging Requirements

- This scaffold tagging procedure is designed to ensure the safe use of all jobsite scaffolds.
- A scaffold, which is ready for use, shall be tagged with either a green or a yellow tag.
- A green scaffold tag designates a complete scaffold, as defined by the manufacturer.
- A yellow scaffold tag designates a scaffold which is not complete but which is altered to suit a specific job and may be used safely. A yellow scaffold tag shall detail the reason or reasons the scaffold is incomplete and safety measures needed.
- If a scaffold is in the process of being erected, changed, or dismantled, it shall have a red tag. A scaffold, which contains a red scaffold tag, shall be considered unsafe and shall not be used.
- If a scaffold has been damaged or is defective, a "Red Tag" must be attached.

Tag Description

The yellow, red, and green scaffold tags are approximately 3 in. wide by 5 in. long. See Exhibits Q, R and S.

Installation and Removal of Scaffold Tags

- The Supervisor/Foreman shall determine whether a useable scaffold receives a yellow or a green tag. He/She shall be responsible for completing all pertinent information on the tag and affixing the tag to any scaffold erected under his/her supervision.

- The Scaffold tag shall be affixed to each scaffold access ladder approximately 5 ft. 6 in. from the base, where it will not interfere with normal access.

- The Supervisor/Foreman or Safety Manager may remove a scaffold tag from a scaffold which has been damaged, has been improperly modified, is missing components, or is deficient in any safety aspect. A red tag may be used in these circumstances.

- After a scaffold has been repaired, the Supervisor/Foreman shall inspect it to determine whether it is ready to be re-tagged and shall do so accordingly.

- Periodic inspections shall be performed to ensure that all tags are legible and in good condition.

- Inspection, attention, and stability are three keys to scaffold safety.

- No tag on a scaffold shall be considered the same as a red tag.

Inspection and Testing – Scaffold Planks

- Scaffold planks shall be inspected and tested upon receipt, prior to use, and users shall examine each plank visually prior to each use.

- Examine planks for knots, excessive grain slope, shakes, decay, dry rot and other defects.

- Density of lumber should be equivalent to Douglas Fir and capable of supporting four times the intended load. Moisture content should not exceed 20 percent.

- All scaffold planks shall be scaffold grade or equivalent as recognized by approved grading rules. See Exhibit Y.

- Planks shall be 2 in. x 10 in. or 2 in. heavy duty (75 psi on 6 ft. span).

- Discard the plank if evidence of a defect is noted.

SPECIAL SCAFFOLDING

Any scaffold, which must be especially adapted to the work place where the above requirements cannot be met, must be approved by a qualified Supervisor and Project Manager.

STORAGE OF SCAFFOLDING

- Scaffold materials shall be temporarily stored in a manner that will protect and prevent damage to them.

- Scaffold materials shall not be left in work areas where they obstruct traffic and/or cause fire hazards.

(EXHIBIT Q)

SCAFFOLD TAG-GREEN

THIS SCAFFOLD HAS BEEN ERECTED TO MEET FEDERAL/STATE STANDARDS AND IS SAFE FOR ALL CRAFTWORK.

DO NOT ALTER

DATE: _____

LOCATION: _____

SIGNED: _____

PLUMMER CONCRETE & ASSOC. INC. No. _____

(EXHIBIT R)

SCAFFOLD TAG-YELLOW

THIS SCAFFOLD DOES NOT MEET
FEDERAL/STATE STANDARDS.

EMPLOYEES WORKING FROM THIS SCAFFOLD
MUST WEAR AND USE APPROVED SAFETY
HARNESS AND LANYARDS.

DATE: _____

LOCATION: _____

SIGNED: _____

PLUMMER CONCRETE & ASSOC., INC. No. _____

(EXHIBIT S)

SCAFFOLD TAG-RED

DO NOT USE THIS SCAFFOLD

KEEP OFF

THIS SCAFFOLD IS BEING
ERECTED OR TAKEN DOWN

ONLY AUTHORIZED EMPLOYEE USING REQUIRED PERSONAL PROTECTIVE EQUIPMENT MAY WORK ON THIS SCAFFOLD

DATE: _____

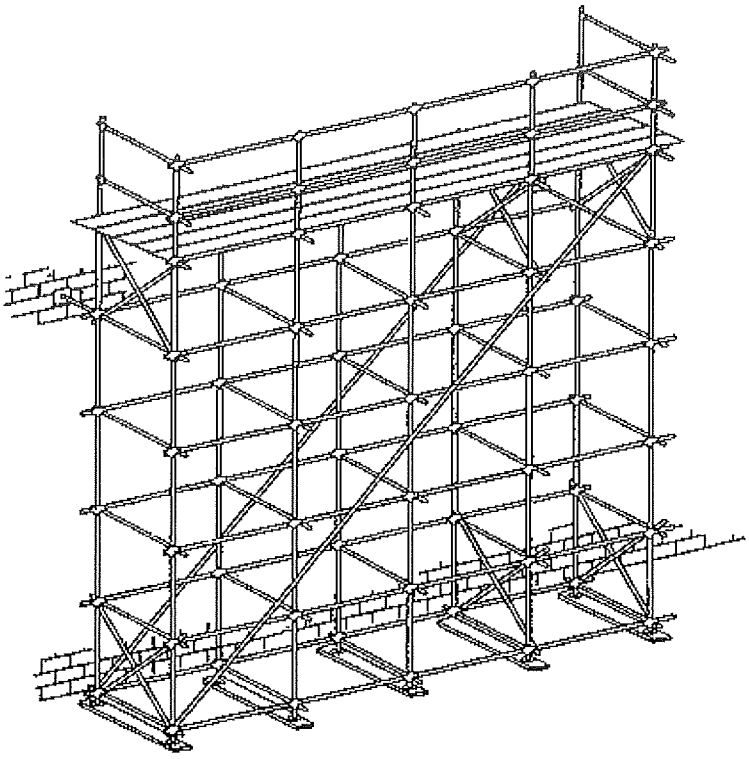
LOCATION: _____

SIGNED: _____

PLUMMER CONCRETE & ASSOC. INC. No. _____

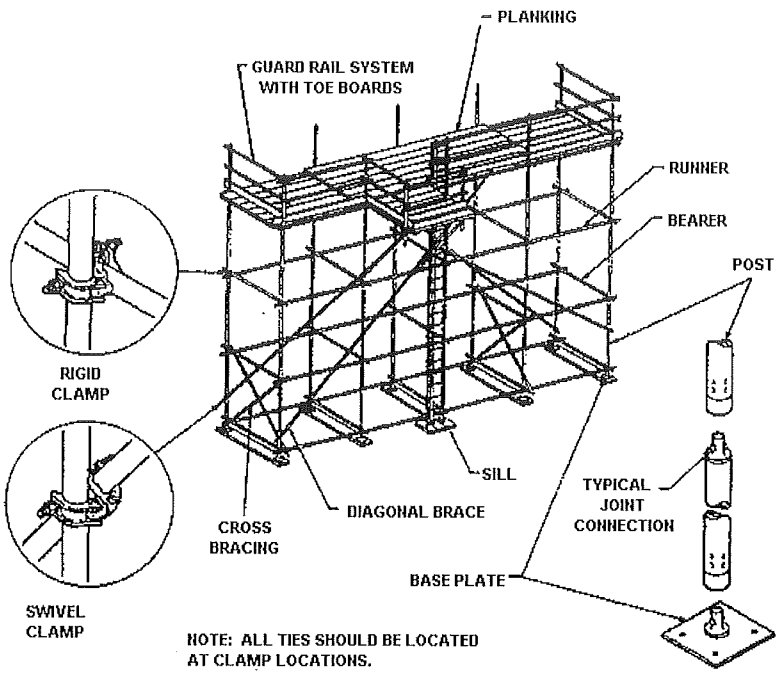
(EXHIBIT T)

BRACING - TUBE & COUPLER SCAFFOLDS



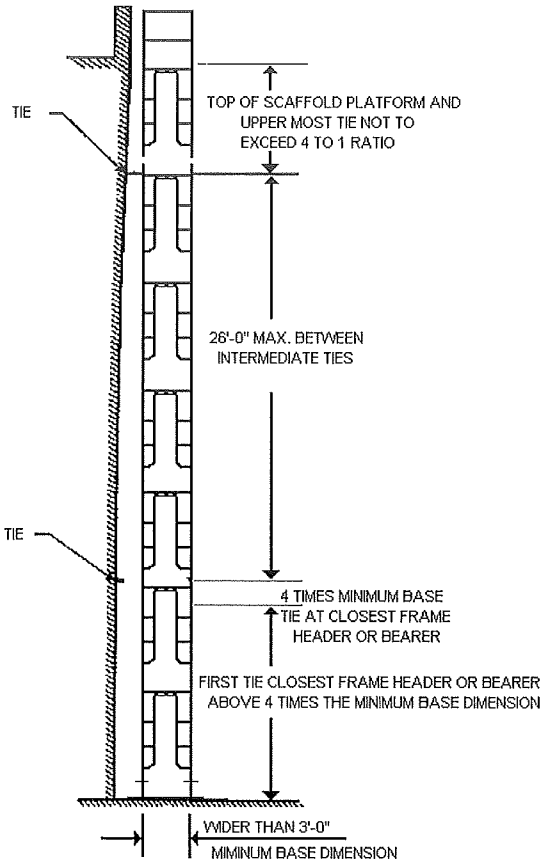
(EXHIBIT U)

TUBE and COUPLER SCAFFOLD

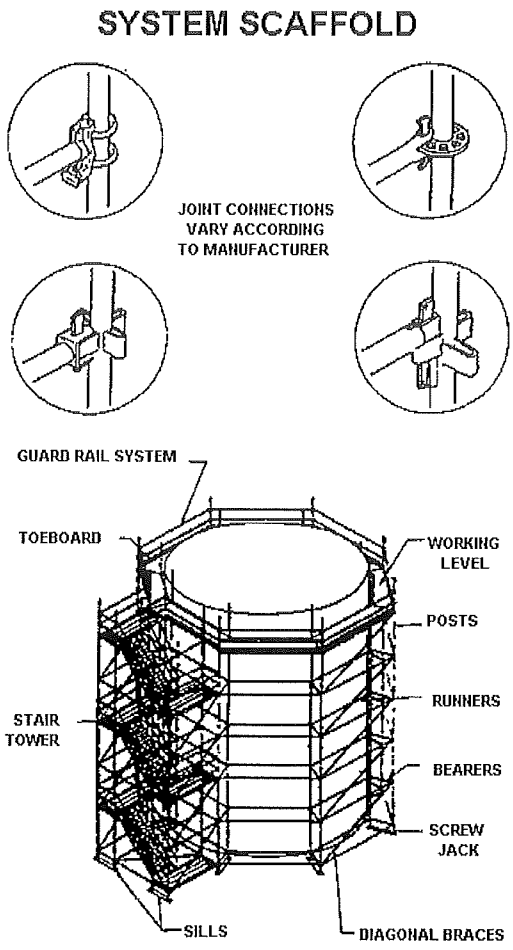


(EXHIBIT V)

MAXIMUM VERTICAL TIE SPACING
WIDER THAN 3'-0" BASES

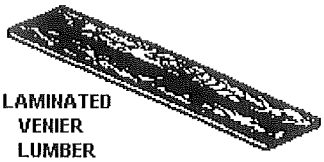


(EXHIBIT W)

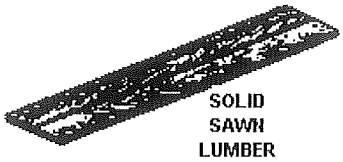

SYSTEM SCAFFOLD
JOINT CONNECTIONS
VARY ACCORDING
TO MANUFACTURER
GUARD RAIL SYSTEM
TOEBOARD
WORKING
LEVEL
POSTS
RUNNERS
STAIR
TOWER
BEARERS
SCREW
JACK
SILLS
DIAGONAL BRACES

(EXHIBIT X)

SCAFFOLDING WORK SURFACES



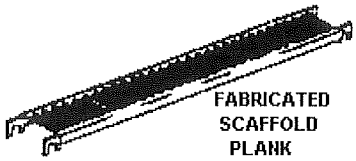
LAMINATED VENIER LUMBER (LVL)



SOLID SAWN LUMBER

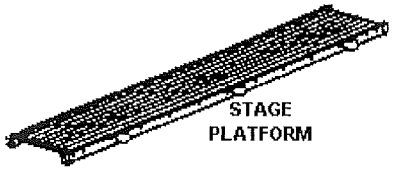
SCAFFOLD PLANKS

FABRICATED SCAFFOLD DECK



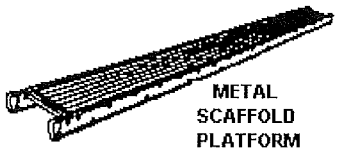
FABRICATED SCAFFOLD PLANK

DECORATOR PLANK



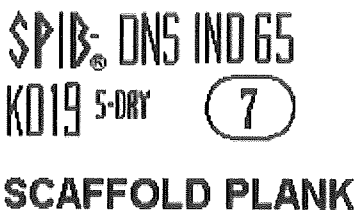
STAGE PLATFORM

WOOD SCAFFOLD PLATFORM



METAL SCAFFOLD PLATFORM

(EXHIBIT Y)



Grade stamp courtesy of Southern Pine Inspection Bureau

Grade stamp courtesy of West Coast Lumber Inspection Bureau

PURPOSE

The purpose of this policy is to:

- Provide guidelines for developing, scheduling and delivery of safety awareness training for employees on the jobsite.
- Encourage safety awareness.
- Get employees actively involved in safety.
- Motivate employees to follow proper safety procedures.
- Eliminate safety hazards.
- Introduce workers to new safety rules, practices and equipment.

POLICY

Weekly Safety Talk Meeting

With the assistance of the Safety Manager, Supervisors and Foremen will be required to conduct weekly Safety Talk meetings. These meetings are to provide employees with up-to-date safety information and discuss various aspects of job safely and health as it pertains to the work to be performed for the week.

Supervisors/Foremen will conduct a supplement Safety Talk meeting for those employees who missed the regular scheduled meeting.

These meetings will be held early in the week, in the morning, and should last no longer than I5 minutes.

RECORD KEEPING

The Supervisor or Foreman will enter the date, safety topic(s) discussed, and any safety concerns on the weekly safety meeting sheet.

- To keep track of attendance, each employee will sign the weekly safety meeting sheet.

- The weekly safety meeting sheets will be maintained in the safety department for record retention.

PURPOSE

To establish guidelines for proper use of equipment and procedures for safe vehicle operation.

POLICY

General Requirements

- All employees operating vehicles and the passengers in these vehicles are required to wear seat belts at all times except for D.O.T. exempted vehicles.
- Drivers must have a current, valid vehicle operator's license.
- Drivers must comply with all federal, state, and local traffic regulations.

TRANSPORTING PERSONNEL AND MATERIAL

- Personnel will not be used to support or steady loads while a vehicle is in motion.
- Truck running boards may not be ridden.
- Employees must be seated, with arms and legs within the confines of the vehicle. Employees may mount or dismount vehicles only when fully stopped. Personnel may not ride in the bed of a pick-up truck.
- Personnel are to vacate all vehicles being loaded by a crane, backhoe, shovel, loader, etc., and are to move away from the vehicle.
- Loads extending beyond the bed of the truck or wagon are to be flagged, and marked at night with red lanterns or clearance lights. Loads are to be secured to prevent any movement.
- Only three (3) people may ride in the cab of a truck, unless designed to accommodate more. Seat belts must be used.
- When left unattended, vehicles must be shut off, and left in gear with brakes set. For vehicles with automatic transmission, the Park Position will be used. If vehicle is parked on a grade of incline, wheels must be chocked. Vehicles are not to be left running while unattended.

VEHICLE EQUIPMENT

All vehicles used on site will be equipped in accordance with state and local laws and regulations. Plummer Concrete & Associates, Inc. Safety Standards require the following equipment:

- Non-glare rear view mirror.
- Left-hand outside rear view mirror.
- Seat belts to accommodate all passengers.
- Turn signal.
- Three flares for emergency use. Flares should be placed 300' behind, 150' behind and adjacent to disable vehicle.
- Two windshield wipers.
- Back-up lights.
- First-aid kit.
- Snow tires and chains, where conditions warrant.
- A minimum 2-1/2 pound ABC rated fire extinguisher.
- A working horn.

POWERED INDUSTRIAL TRUCKS
(Forklifts, Platform Lift trucks, Motorized Hand Trucks, etc.):

- All new powered industrial trucks shall meet requirements established in ANSI B 56.1-1969.

- All nameplates and markings shall remain in place and be maintained in a legible condition.

- Only trained and authorized operator shall be permitted to operate powered industrial trucks. Operators shall be trained in the safe operation of each powered industrial truck used at the facility.

- No person shall be allowed to stand or pass under the elevated portion of any truck, whether loaded or empty.

- No person shall ride on the lifting mechanism of a forklift, or use the forklift as a work platform. Manufacturer-approved personnel basket may be used if all stipulations of the manufacturer are met.

- When a powered industrial truck is left unattended, loads shall be fully lowered, controls neutralized, power shut off, and brakes set. Wheels shall be blocked if the truck is parked on an incline.

- If a powered industrial truck is found to be in need of repair, defective, or in any way unsafe, the truck shall be taken out of service until it has been restored to safe operating condition. Authorized personnel shall make all repairs.

RECORDS

All vehicles will be inspected daily. Completed inspection forms will be filed in the safety office.

COLD WEATHER

"Safety should never be sacrificed for production". During periods of cold weather, the safety and health of our employees are of utmost importance.

When temperatures at the jobsite is 0° F or below and the wind-chill factor is -10° F or below, outside work may be suspended for a time to be determined by the supervisor, or management. The work suspension time may vary from 20 minutes to 8 hours depending on schedule demands.

The work suspension is being put in to give workers time to come in from out of the cold to warm up. For example: employees may work for 45 minutes, warm up for 15 minutes, repeating the cycle. Work and warm up times may vary as the situation dictates and at the discretion of the supervisors.

LIGHTNING STORMS

When lighting is observed in the area, even though it may not be raining at the time, the Foreman and the project Supervisor should confer about suspending work and get personnel under cover until the storm and/or threat of lightning strikes has passed. The ultimate decision as to shutting down the job and for how long rests with the Supervisor. However, ANY workers may refuse to work without fear of discipline, if he/she feels in danger of lightning strikes. He/she must confer with his/her foreman or supervisor.

When lightning is observed and it is determined (by sight or electronic means at the site) that lightning is moving toward the site, the crane operation must suspend crane operations and lower the boom to its lowest point. If a load must be suspended and held in position during the lightning storm, the operator should stay in the cab, but not touch the controls (unless they are isolated) or unless and emergency situation exists, i.e. high winds which would swing the load uncontrollably and would endanger human life.

EXTREME HEAT

Excess heat can place an abnormal stress on a workers body. When body temperatures rises even a few degrees above normal (98.6°F) one can experience muscle cramps, become weak, disoriented and dangerously ill unless the body temperature cools down. If body temperature rises above 105°F, it could be fatal. The following guidelines will help keep a person cool in the heat and avoid the dangerous consequences of heat stress.

HOW HOT IS TOO HOT?

Do not work when the heat index is 130° or above. Shut the job down as working in that range could be dangerous to life. When the heat index (usually announced on the local radio or TV) is 90° - 130°, certain precautions should be taken.

- Adapt to the Heat

The National Institute for Occupational Safety and Health (NIOSH) suggests to all workers exposed to extreme heat gradually get used to their environment over a one-week period. This means that on the first day in a hot environment, a worker may only be able to do half of the work that a fully adapted worker would do. Each day increase the workload slightly until they are able to work at "full steam".

- Drink Water Frequently

Sweating is one of the ways your body cools itself down. Sweating results in water loss and the only way to replace the loss (and help your body continue to cool itself) is to drink water frequently. Ideally, you should drink at least eight ounces of water every 20-20 minutes while working in hot environments. Make sure the job site has plenty of water.

- Take Frequent Breaks

Working eight hours in a hot environment is stressful. Take more frequent breaks (every hour for 10 minutes). Have workers take their breaks in air conditioning if possible or at least in some shade. You may have to place fans in various areas to circulate the hot stale air and to cool employees. (Event a warm breeze will help evaporate the sweat leading to cooling.)

- Know First Aid Techniques for Heat Stress

If you or someone on the site suffers from heat exhaustion, cramps, or other signs of heat stress get medical attention immediately.

- Keep Your Cool

Heat stress *is* dangerous, but it's also preventable.

PURPOSE

To provide guidelines for the safe operation of welding and cutting equipment and to itemize some of the fundamental hazards inherent with the use of this equipment.

DEFINITIONS

Industrial Gases

Oxygen – Oxygen itself is not flammable but the presence of pure oxygen accelerates the combustion reaction. Oil and grease in the presence of oxygen, become highly explosive. Oxygen must not be allowed to contact petroleum based substances.

Fuel Gases

Acetylene – Acetylene is an unstable gas when compressed above 15 psig. Acetylene cylinders are filled with a porous material and saturated with liquid acetone. Acetylene, when pumped into the cylinder dissolves in the acetone and is held in a stable condition. If the acetylene cylinder is stored or used in the horizontal position, the acetone may leak out, leaving an explosive mixture of acetylene. It is for this reason, that all acetylene cylinders must be stored and used in the upright or vertical position.

MAPP Gas – MAPP is a stabilized mixture of methylacetylene and has considerably fewer tendencies to backfire than acetylene. Maximum allowable use pressure is 94 psig verses 15 psig for acetylene.

SETTING UP EQUIPMENT

All operators of welding and/or cutting equipment must be trained to operate the equipment they will use. Appropriate safety procedures must be reviewed and understood prior to use of this equipment.

Second stage of regulator must be closed before opening the cylinder valve.

Open valves 1/4 turn only on fuel gas cylinders (propane, acetylene, and natural gas). Open oxygen cylinder valve wide open. Keep valve wrench in place during use.

When using acetylene, do not exceed 15 psig on the torch side of the gauge.

Reverse flow check valves must be used at the regulator end on both fuel and oxygen hoses. It is strongly recommended that they also be used at the torch end of the lines. These valves are inexpensive and provide a great degree of insurance against the possibility of mixings gases in the hose and regulator, which could result in an explosion.

Remember that you never stand directly in front or in back of a regulator when opening the cylinder valve and always check for leaks on all threaded connections. If valve handles are missing and it is necessary to use a wrench to open the valves, the wrench must remain in place on the valve while the unit is in use.

LIGHTING THE TORCH

Open the oxygen valve on the torch handle and adjust the oxygen regulator to the desired pressure. Allow the gas to flow a minimum of 10 seconds for every 50 feet of hose. Now close the oxygen valve on the torch.

With the regulator valve backed out, open the fuel valve on the cylinder. Remember, for acetylene the valve is only opened a maximum of one full turn. Open the fuel gas valve on the torch and adjust the fuel gas regulator to the desired setting. Purge the lines the same way as described above for oxygen. Now, close the fuel valve on the torch.

Hold the torch in one hand and spark lighter in the other. Open the torch fuel valve approximately one-half turn and ignite the gas. Keep opening the fuel valve until the flame stops smoking and leaves the end of the tip about 1/8". Then slightly reduce the fuel supply to bring the flame back to the tip.

Open the oxygen fuel valve on the torch until a bright neutral flame is reached. If you experience a backfire or flashback, immediately turn off the oxygen valve and then the fuel valve. Begin again by holding the torch in one hand and the spark lighter in the other and proceed from there.

SHUTTING OFF THE TORCH

First, shut off the torch oxygen valve and then shut off the torch fuel valve. If this procedure is reversed, a ***"pop"*** may occur which will cause carbon to form in the torch. Now close both cylinder valves. Open the torch oxygen valve to release the pressure in the system. Now close the torch oxygen valve and release the adjusting screws on the oxygen regulator. Now do the same for the fuel valves.

SAFETY CONSIDERATIONS

The following safety procedures need to be thoroughly re-emphasized.

- Never use oil or grease on any fittings or apparatus in contact with oxygen.

- Blow out the cylinder valves before attaching the regulators to the cylinders.
- Release the adjusting screw prior to opening the cylinder valves.
- Never stand directly in front or in back of a regulator when opening the cylinder valve; stand so that the cylinder valve is between you and the regulator.
- Always open the cylinder valve slowly. If a wrench is used, keep it on the valve.
- An acetylene cylinder should never be opened more than one full turn.
- Always purge the oxygen and fuel passages individually before lighting the torch.
- Follow the procedures as outlined. Do not take short cuts or use defective equipment.
- Never begin any welding or cutting without the proper permits.
- Always check to see that you have appropriate fire protection equipment immediately available before doing any welding or cutting.
- Welders must not wear flammable or disposable-type clothing.

ARC WELDING AND CUTTING

Protective Clothing

Welders must wear head and eye protection that is required in the area in which they are working. They must wear appropriate welding helmets, long sleeve shirts, leathers and welders gloves. If grinding, chipping buffing is done, a face shield must be worn. If respirators are required, these also must be used. As a minimum, fitters who are working with welders should wear long sleeve shirts, leathers and welders gloves, and appropriately tinted eye goggles or glasses with side shields.

Heli-arc, MIG (Metallurgical Inert Gas), and TIG (Tungsten Inert Gas) welding operations emit intense ultraviolet radiation which can result in third degree burns to exposed skin areas as well as painful flash burns to the eyes. Welding hoods must be checked periodically to insure they are light tight. Arc gouging generally produces a great deal of slag and hot metal sparks. Additional personal protective equipment such as boots, Nomex suits and mini goggles may be appropriate.

EQUIPMENT AND INSPECTION

Equipment must be industrial rated, in good condition, and conform to OSHA requirements governing application, installation, and operation of arc welding and cutting equipment. Some, but not all of the OSHA requirements are repeated in this standard for emphasis. Trained and qualified people should make a complete preventative maintenance inspection at least annually. The last inspection date should be stenciled on the equipment. Open circuit voltage measurements should also be made annually and stenciled and dated on the equipment.

Before each use, the following items must be inspected:

- All leads for broken or cut insulation.
- Electrode holders or broken insulator or worn holders.
- Oil and fuels on gas or diesel powered units.
- Both power and return leads to ensure they are the same lengths so that the return lead can be attached as close as possible to the work.

ELECTRIC SHOP HAZARD

Almost all electric currents present some degree of potential shock hazard. Under optimum conditions, even welding voltages as low as 30 volts can be serious. Operating voltages listed on the ID nameplates are usually much lower than open circuit voltages. Open circuit voltages should not exceed 100 volts D.C. or 80 volts A.C.

A.C. or D.C. current can be used for welding and although both present serious shock hazard, A.C. is potentially more hazardous. Be certain not to use any equipment that is either wet now or has been drenched recently. Welding units that are powered by A.C. must be adequately grounded and in order to change polarity, the unit must be shut down.

Electrodes should never be changed with bare hands or wet gloves, or when standing on a wet floor or grounded surface. Whenever possible, welding receptacles should be interlocked so that the power must be shut off before the plug can be withdrawn. Cables that become worn enough to present a hazard must be replaced immediately. Keep welding cables away from power supply cables and high voltage wires and do not dip hot electrode holders in water to quick cool them. GFCI's cannot be used on welding machines with D.C. current.

INERT AND TOXIC GAS EXPOSURE

Many welding procedures require an inert gas, such as argon and/or helium. These gases present an asphyxiation hazard and welders and fitters need to keep these points in mind:

- Large diameter pipe will contain larger volumes of inert gas and greater potential problems.
- Temporary enclosures over field installations should be checked for oxygen level before use and monitored continuously when in use.
- Argon will register *"hot"* when checked using an explosion meter but will measure correctly when using an oxygen meter.

Welders should be familiar with special hazards related to rod coatings containing such items as cadmium, beryllium and fluorides. Proper ventilation with these rods is very important. Lead, mercury and cadmium require special written procedures. Ventilation in work areas must be checked and should conform to good safety practices. In enclosed areas, such as tanks, vessels, and columns, the Safety Manager should be contacted for appropriate ventilation rates.

STORAGE OF COMPRESSED GAS CYLINDERS

Cylinders shall be kept away from radiators and other sources of heat.

Inside of building, cylinders shall be stored in a dry, well-ventilated, well-protected location. Assigned storage spaces shall be located where cylinders will not be knocked over or damaged by passing or falling objects, or subject tampering by unauthorized persons. Cylinders shall not be kept in unventilated enclosures such as lockers and cupboards.

Empty cylinders shall have their valves closed.

Storage of empty cylinders shall be separated from charged cylinders. Storage racks shall be identified as to compressed gas cylinder content and condition ("Full" or "Empty").

Valve protection caps, where cylinder is designed to accept a cap shall always be in place, hand tight (except when cylinders are in use or connected for use).

Protection from solar radiant heat shall be provided where cylinders are directly exposed to sunlight.

Compressed gas cylinders shall be secured in an upright position at all times, including when being hoisted or transported.

- Retention chains or straps will be provided on storage racks and carts so that compressed gas cylinders will be secured against falling.
- Small, handheld compressed gas cylinders used for propane torches, gas detector test cylinders, etc. may be stored without use of retention chains or straps. However, attention should be give to storing these cylinders away from open flames or sources of heat and in a manner that will protect the cylinder from being knocked over or damaged by work activities.

Compressed gas cylinder storage area.

- A 20 pound ABC rated fire extinguisher (minimum) shall be placed no closer than 25 feet but not further than 75 feet to fuel gas storage areas.
- Warning signs shall be conspicuously placed and shall read; ***"Danger – No Smoking, Matches or Open Lights or Flames"*** or other equivalent wording.
- Inside buildings, cylinders (except those in actual use or attached for use) shall be limited to a total gas capacity of 2,000 cubic feet or 300 pounds of liquefied petroleum gas.

Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease) a minimum of 20 feet or by a noncombustible barrier at least five feet high having a fire-resistant rating of at least one-half (1/2) hour.

Plummer Concrete & Associates, Inc.

PRINT AND RETURN THIS FORM TO YOUR FOREMAN AFTER YOU HAVE READ THIS SAFETY MANUAL:

Violation of these rules and regulations will endanger the life and safety of the individual and fellow employees. Deliberate violation of these rules is sufficient cause for disciplinary action and/or dismissal.

I also understand that in case I am injured, no matter how slight, while in the course of my work with Plummer Concrete & Associates, Inc. I must report immediately to my foreman.

I hereby confirm that I have read thoroughly, and understand the safety rules of Plummer Concrete & Associates, Inc. and will to the best of my ability abide by them.

I understand that there is a Hazardous Material information available for my inspection.

_____ _____

Signature Date

_____

Print Name

This written program is not intended to provide legal advice or opinion and may not cover every regulation which Plummer Concrete & Associates, Inc. may be subject to. Further, due to the degree and changing nature of regulations in this area at the federal, state and local levels, Associated Builders & Contractors of Wisconsin, Inc. cannot, and does not, warrant that adherence to the suggestions of this program will constitute compliance with every federal, state and local regulation which might be applicable to Plummer Concrete & Associates, Inc..

For additional safety questions, contact the Construction Safety at 800-236-2224 or 608-

ABC Wisconsin Chapter

consultation or ABC Safety Director or Specialist 244-5883.