

Personal Protective Equipment

Short description

This section provides the framework for conducting a PPE hazard assessment and the minimum requirements for the use and maintenance of personal protective equipment (PPE) for Centennial employees and subcontractors on a construction project site.

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1 Objective and area of application

The objective of this personal protective equipment (PPE) section is to protect Centennial employees, subcontractors and lower tier contractors from exposure to work place hazards and the risk of injury through the use of PPE. While PPE is considered to be an essential component for worker protection in the construction industry, it is considered a last-resort, temporary type of protection. No single combination of protective equipment and clothing is capable of protecting against all potential hazards. PPE use can itself create significant worker hazards, such as heat stress, physical and psychological stress, and impaired vision, hearing, mobility and communication. For any given situation, Centennial employees and subcontractors should select protective equipment and clothing that provide an adequate level of protection based on conducting a thorough hazard assessment. PPE is not a substitute for more effective control methods and its use will be considered and utilized only when other means of protection against hazards are not adequate or feasible. Centennial employees, subcontractors and lower tier contractors will utilize the hierarchy of hazard controls in order to determine the best method to control workplace hazards.

The hierarchy of hazard controls is as follows:

- Elimination of the hazard or exposure to the hazard
- Substitution (using a less hazardous product or work process)
- Engineering controls
- Administrative controls
- PPE

Personal protective equipment will be provided, used, and maintained when it has been determined that its use is necessary to ensure the safety and health of our employees and that such use will lessen the likelihood of occupational injury and/or illness.

This section applies to all Centennial employees, subcontractors and lower tier contractors and includes general and task specific PPE requirements including:

- Head protection
- Protective clothing
- Eye and face protection
- Hand protection
- Hearing protection
- Foot protection
- Non-routine PPE
 - Fall protection equipment
 - Respiratory protection

2 Superior and additional applicable documents

1000_GP_11_01_en_6.0 Global Policy on Health, Safety, Environment and Quality (HSEQ)

This section of the HSEQ Manual applies to all Centennial employees and subcontractors who are performing work in Centennial facilities and project sites. There may be more stringent

requirements than this section as defined by specific State, local or contact specific PPE requirements. If there is a conflict between this section and other applicable regulations, the more stringent will apply.

3 Definitions

The following definitions of terms are important for an understanding of this section.

Term	Definition
Centennial	All Centennial employees, joint venture employees, subcontractors and business partners
HSEQ	Health, Safety, Environment and Quality
ASTM	American Society for Testing and Materials
PPE	Personal Protective Equipment including protective clothing
AHA	Activity Hazard Analysis
PSM	Project Safety Manager
PSO	Project Safety Officer
Incident	An event or series of events which has caused or could have caused injury, illness, and/or damage (loss) to assets or work products, the environment or reputation.
TWA	Time Weighted Average- the average exposure over a specified period of time, usually a nominal eight hours
STEL	Short Term Exposure Limit- the acceptable average exposure over a short period of time, usually 15 minutes as long as the Time weighted average is not exceeded
C	Ceiling Limit- exposure that may not be exceeded for any period of time
PEL	Permissible Exposure Limit- The legal limit for exposure of an individual to a chemical substance or physical agent
PFD	Personal floatation device
TLV	Threshold Limit Value- the level that a worker may be exposed to day after day for a working lifetime without adverse health effects
NIOSH	National Institute for Occupational Safety and Health
QLFT	Qualitative fit test
QNFT	Quantitative fit test
PFAS	Personal fall arrest system

HSEQ Director

Leads the HSEQ Team

4 PPE hazard assessment and training

The Centennial superintendent, PSO or PSM in conjunction with supervisors, will conduct a hazard assessment of each work area to identify potential sources of hazards that may expose Centennial employees to occupational injury or illness. Centennial employee hazard assessments will be documented on the Centennial Employee AHA which identifies the work area surveyed, the person(s) conducting the survey, findings of potential hazards, hazard control methods, the required equipment, training and date of the survey. The Centennial Employee AHA will be kept and maintained on site in the project safety binder or office location in accordance with section 6 of this manual (HSEQ Risk Assessment and Operations).

Potential hazards may be physical or health-related and a comprehensive hazard assessment should identify hazards in both categories. Examples of physical hazards include moving objects, fluctuating temperatures, high intensity lighting, rolling or pinching objects, electrical connections and sharp edges. Examples of health hazards include overexposure to harmful dusts, chemicals or radiation.

The hazard assessment should begin with a survey of the work area to develop a list of potential hazards in the basic hazard categories below:

- Impact
- Penetration
- Compression
- Electrical
- Chemical
- Heat/cold
- Harmful dust
- Light (optical) radiation
- Biological contaminants
- Ergonomic

Hazard assessments for PPE will be completed whenever:

- The job or activity changes
- New equipment or processes are introduced
- An incident occurs

4.1 Subcontractor PPE hazard assessment

Subcontractors and lower tier contractors (referred to collectively as “subcontractors” for the remainder of this section) are required to supply and equip their employees with all PPE as is necessary for the protection of themselves and those in their work areas from any and all hazards to which they are exposed.

Centennial subcontractors will task a competent person to conduct and perform a PPE hazard assessment for their specific feature(s) of work or tasks prior to starting any work activity and

document this PPE hazard assessment on an Activity Hazard Analysis. Centennial recognizes that some subcontractors possess specialized knowledge, skills, methods, and means of identifying and controlling industry or task specific specialized hazards and are, therefore, better equipped to identify the best form(s) of hazard controls including PPE.

Subcontractors will adhere to the following regarding the use of PPE on Centennial project sites:

- All subcontractors and lower tier contractors will wear appropriate PPE as required by the project site including the minimum required PPE in section 5 of this section
- All PPE will be used, inspected and maintained in accordance with the manufacturer's specifications and recommendations
- Prior to use, the user, will inspect all PPE
- All subcontractor employees will be trained in the use and care of all required PPE
- Any specialized PPE (PFAS, respiratory protection etc.) will require the appropriate inspections and records of inspection to be maintained on the project site
- PPE will not be modified or changed from the manufacturer's original design

4.2 Employee training

All Centennial employees or subcontractors who are required to use or wear PPE will receive training in the proper use and care of PPE before being allowed to perform work. Periodic retraining will be offered to PPE users as needed or when there is a demonstrated or perceived deficiency in use or selection. The training will include, but not be limited to, the following subjects:

- When PPE is necessary to be worn
- What PPE is necessary
- When and how PPE should be inspected
- How to properly don, doff, adjust, and wear PPE
- The limitations of the PPE
- The proper care, maintenance, useful life, and proper disposal of the PPE

4.3 Care and maintenance of PPE

PPE must be provided, used, and maintained in a sanitary and reliable condition. Each Centennial employee and subcontractor is responsible for the care and condition of protective equipment that is used. It is important that all PPE be kept clean and properly maintained. Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision. Employees and subcontractors must inspect, clean, and maintain their PPE according to the manufacturers' instructions and recommendations. Defective or damaged PPE will not be used and will be immediately discarded and replaced.

5 Minimum requirements for PPE (on a construction site)

5.1 Head protection

Hardhats will be provided and worn by all Centennial employees, subcontractors and other affected personnel when working within or visiting a Centennial project site. Hardhats will be

visually inspected prior to use for any signs of damage (dents, cracks etc.) that may affect the integrity of the hardhat.

Centennial employee and subcontractors will wear and utilize hardhats that:

- Have not been modified
- Are worn with the bill facing forwards
- Do not have ball caps, knit caps, du-rags, hoods or any other barrier that could interfere with the fit or stability of the hardhat
- Are not worn past the manufacture's end of use date
- Meet the requirements and specifications of ANSI Z89.1

5.2 Clothing

Centennial employees and subcontractors will wear work clothing suitable for the weather and work conditions. Clothing must be in good condition with no rips, tears, or hanging material that may become entangled or result in a tripping or binding hazard.

Proper clothing shall consist of:

- long pants (no shorts or sweat pants)
- short or long-sleeved shirt (no sleeveless shirts or tank tops)
- ANSI Level II retro-reflective vest or garments (level III may be required in some instances)
 - Centennial employees at all times
 - Subcontractors and guests when moving equipment or vehicles are present

5.3 Eye and face protection

Eye protection meeting ANSI Z87.1 will be worn at all times by all personnel upon entering a Centennial construction project site. Eye protection will be distinctly marked with the ANSI Z87.1 marking and be suitable for the activity or features of work that are progressing.

Eye protection is designed to protect from potential injury from hazards such as:

- Impact- flying objects such as large chips, fragments, particles, sand, and dirt
 - Spectacles
 - Goggles
 - Faceshield (as a secondary form of protection)
- Heat- anything emitting extreme heat such as sparks, molten metals or high temperature exposure
 - Spectacles
 - Faceshield (as a secondary form of protection)
- Dust- harmful dusts including nuisance dust
 - Goggles
- Optical radiation- radiant energy, glare or intense light
 - Selection of eye and face protection for optical radiation hazards depends on the work activity and site conditions.
- Chemical- splash, fumes, vapors or irritating mists
 - Goggles
 - Faceshield (as a secondary form of protection)

If a Centennial employee or subcontractor requires the use of corrective lenses, the following options are acceptable:

- Prescription safety glasses (spectacles) providing optical correction and equivalent protection to the ANSI Z87.1 standard equipped with side protection (side shields). An employee desiring prescription safety glasses can request reimbursement for this cost. Prior to selection and purchase the responsible PSM and Human Resources shall be contacted to ensure price effectiveness and insurance coverages are properly coordinated.
- Protective glasses with side protection designed to fit over corrective lenses without disturbing the adjustment of the glasses

Eye and face protection used by Centennial employees or subcontractors must meet the following requirements:

- Provide adequate protection, including side protection
- Be reasonably comfortable
- Fit snugly and do not unduly interfere with movements
- Be durable
- Capable of being disinfected and cleaned
- Kept free from damage and in good repair

5.4 Hand protection

Hand protection that at least meets ANSI Cut Level A2 and Abrasion Level A2 shall be worn or used by all personnel on the jobsite at all times unless expressly excluded in the Activity Hazard Analysis. Hand protection selection and wear shall be based on the manufacturer's criteria for wear and use, proper fit and comfort and the specific hazard potential.

A hazard assessment must be conducted in accordance with paragraph 4 of this section to evaluate tasks and make hand protection selections as needed.

Hazards can include, but are not limited to:

- skin absorption of harmful substances
- cuts or lacerations
- abrasions
- punctures
- chemical burns
- electrical shock
- vibration
- amputation
- harmful temperature extremes

Centennial employees and subcontractors will follow these basic guidelines when hand protection may be necessary:

- Verify that the hand protection selected is compatible with the specific applications, processes, and materials that are being used.

- Inspect all hand protection for defects prior to use. Never use defective or altered hand protection

See appendix 2 of this section (Hand Protection Selection Matrix) for the selection criteria for hand protection.

5.5 Hearing protection

Centennial has conducted, and continues to conduct, periodic comprehensive noise monitoring and surveying to measure our employee's exposure to noise. The results of this monitoring and surveying conclude that our employee exposure level to noise is typically less than 85 dBA Time Weighted Average (TWA).

The actual results from our most recent survey conducted in 2018 demonstrate employee average noise exposure of 58.45 dBA TWA with neither STEL nor Ceiling limits exceeded. These survey results demonstrate that additional remedial controls such as engineering controls, administrative controls or personal protective equipment (PPE) are not necessary to reduce total noise exposure to less than 85 dBA TWA. While there is not a requirement for remedial controls, we believe that certain best practices for noise control apply so that the risk to our workers or visitors hearing is minimized or eliminated.

The specific procedures that Centennial will utilize to ensure that our employees are protected from the effects of hazardous noise include the following:

- Periodic surveillance and monitoring of employee noise exposures covering a variety of construction tasks and activities including: TWA, Short Term Exposure Limit (STEL), and Ceiling Limits (C)
- Awareness training on noise hazards and the results of noise surveillance data
- Training on how to properly utilize and wear hearing protection in the event that it may be a jobsite requirement regardless of total exposure. Examples of this may include: Carpentry 82-94 dBA, Iron Work 98-108 dBA, Heavy Equipment Operations 86-94 dBA, Masonry 84-97 dBA etc.

5.5.1 Subcontractor hearing protection

Subcontractors will submit their policy for implementing a hearing conservation program or data and industrial hygiene testing to support their position that a hearing conservation is not needed based on their employee exposure to hazardous noise (negative exposure assessment). Centennial will require subcontractors, on a Centennial project site, to utilize the appropriate PPE to protect from the exposure to potentially hazardous noise whenever noise levels are greater than 85 dBA. Subcontractors are responsible to conduct all monitoring when there is potential exposure to hazardous noise. Centennial may conduct periodic surveying to verify negative exposure.

5.6 Foot protection

Leather work boots or other ASTM F2413-05 approved protective footwear shall be worn by all Centennial personnel and subcontractors when on a construction site. If there is potential exposure to additional hazards on the project, specific types of protective foot protection may be required.

Specific types of protective footwear may include, but not limited to:

- Safety toe shoes
- Steel toe shoes
- Metatarsal protection
- Slip resistant shoes

Specialized protective safety footwear is classified according to its ability to meet minimum requirements for both compression and impact tests. These requirements and testing procedures are found in the American National Standards Institute (ANSI) standards. Protective footwear must comply with the ANSI standards. Acceptable footwear shall have hard soles. Footwear complying with ASTM F2412, ASTM F2413 or stamped ANSI Z41 is highly recommended.

6 Non-routine PPE

Centennial employees and subcontractors may be required to utilize PPE that is “non-routine” during the course of their work. This use of “non-routine” PPE will be addressed after performing a hazard assessment and only after exhausting all other preferred methods of controls in the hierarchy of hazard controls.

6.1 Fall protection equipment

Fall protection PPE is discussed in the subsequent Fall Protection section of the HSEQ Manual (Section 20).

6.2 Respiratory protection

The purpose of respiratory protection equipment is to prevent occupational injury or illness caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smoke, sprays or vapors. The selection of hazard control methods for respiratory hazards will be consistent with the hierarchy of hazard controls demonstrated in section 1 of this section. When occupational exposure levels exceed the OSHA Permissible Exposure Limits (PEL) or the American Conference of Governmental Industrial Hygienist’s Threshold Limit Values (TLV) and engineering or administrative controls are not feasible, respiratory protection equipment shall be selected and used according to the exposure, process and/or specific task.

6.2.1 Respiratory program administrator

The PSM or PSO will act as the respiratory program administrator for any Centennial employee who is required to wear respiratory protection during the course of his or her work. The respiratory program administrator will manage this process within his or her assigned area of responsibility and ensure that required worksite-specific procedures and elements are implemented for respirator use and adequately addressed in the Centennial Employee AHA.

Subcontractors who are required to use and wear respiratory protection to perform their work will submit their written respiratory program to Centennial for review along with the name of their respiratory program administrator, records of employee training on the specific respiratory equipment and evidence of medical evaluation and fit test records for those workers who will utilize respiratory protection. Specific job/task procedures shall be documented in the

subcontractor's AHA.

The Centennial or subcontractor respiratory program administrator is responsible to verify that the following elements are adequately addressed:

- Perform initial and ongoing hazard assessments to identify and evaluate processes or tasks that require respiratory protection
- Assist in the selection of respiratory protection equipment as appropriate for the chemical nature and/or physical form of the contaminant (NIOSH or MSHA approved)
- Medical evaluations have been completed for all employees who will wear respiratory protection
- Fit testing procedures (QLFT or QNFT) for the specific respiratory protection used have been completed for all employees who will wear tight-fitting respirators
- Procedures have been developed for all routine and emergency scenarios
- Procedures have been developed for care and maintenance of respiratory protection
- All personnel have been trained, at least annually, in the use of the respiratory protection that they will be using for both routine and emergency scenarios including:
 - Limitations of respiratory protective equipment
 - Donning, doffing, inspecting and checking the fit and seals of the equipment
 - Maintenance and storage of respiratory protective equipment
 - How to recognize the signs and symptoms that may limit or prevent the effective use of respiratory protective equipment
- Periodically survey and audit the program to ascertain the effectiveness of the program and modify if needed

6.2.2 Employee and/or subcontractor use of respirators

Those Centennial employees and/or subcontractors who are required to use, or choose to use respirators, have the responsibility to:

- Wear the respirators when and where required
- Inspect respiratory protection equipment prior to use for defects that could affect its performance
- Use, care and maintain respirators according to the manufacturer's recommendations
- Inform project supervision if there are unanticipated hazards that were not adequately addressed
- Not use tight fitting respirators if a condition exists that would prevent an adequate seal

6.2.3 Voluntary use of respirators

Respirators are an effective method of protection against respiratory hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers.

However, if a respirator is used improperly or not properly maintained, the respirator itself can become a hazard to the worker.

If a Centennial employee or subcontractor chooses to use a respirator on a voluntary basis, he or she will be provided with the OSHA Appendix D (Appendix 1) to ensure that the following precautions are taken to ensure that respirator does not create a hazard:

- Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator's limitations
- Choose respirators certified for use to protect against the contaminant of concern
- Do not use the respirator in atmospheres containing contaminants for which the respirator is not designed to protect against

6.3 Working on or near water

When Centennial employees or subcontractors are working over / near water or where the hazard of drowning exists, U.S. Coast Guard approved PFDs shall be utilized and properly worn in the closed fashion (zipped, tied, latched etc.). All personnel who wear PFDs shall be trained in the use, maintenance, restrictions, care, storage, inspection and post-deployment procedures per the manufacturer's instructions. Prior to and after each use, PFDs shall be inspected for defects that could alter their buoyancy. Defective PFDs shall not be used. PFDs used during night operations or where there is limited visibility shall be equipped with automatic water activated lights.

There is not a specified depth of water where PFDs are required. There are several factors relevant to determining whether a danger of drowning exists. These include:

- The type of water hazard
- Depth
- Presence or absence of a current
- Height above the water surface
- The use of personal fall protection equipment

Depending on the factors present, there are some circumstances where a drowning hazard could exist where workers are near or over water that is less than 2 feet in depth. A competent person shall determine whether a PFD is required when water depth is less than 2 feet in depth and this shall be defined in the AHA.

Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. The distance between ring buoys shall not exceed 200 feet.

A lifesaving skiff shall be immediately available (retrieve an individual within 3-4 minutes from water entry) at locations where Centennial employees and subcontractors are working over or adjacent to water. Lifesaving skiffs shall be kept afloat or ready for instant launching. There is not a specified depth of water where a lifesaving skiff is required. Even in shallow water, a lifesaving skiff will greatly reduce the amount of time required to perform a rescue. If the water was so shallow that a rescuer could run in (and a skiff would foul on the bottom anyway), a lifesaving skiff would not be required. In locations where waters are rough or swift, or where manually operated boats are not practical, a power boat suitable for the waters shall be provided and equipped for lifesaving.

7 Amendment history

Date	Version	Revised content
21.02.2014	1.0	Initial Preparation
05.27.2016	1.1	Addition of paragraph 6 - Working on or near water
10.15.2017	1.2	Addition to Eye and Face protection to include Prescription safety glasses cost to be covered by Centennial, Paragraph 5.3
01.01.2018	2.0	Updates to Paragraph 2 Superior Documents (add the Group Policy and Global Standards), Paragraph 3 Definitions (Centennial and HSEQ Director), Paragraph 5.3 Eye and face protection (prescription safety glasses) and Appendices 1 and 2 (logo)
01.01.2020	2.1	Updates to Paragraph 2 Superior Documents and Paragraph 5.4 Hand Protection (minimum levels and full-time requirement)
06.01.2020	2.2	Update to Paragraph 5.4 Hand Protection (all personnel on the jobsite)

8 Appendix

Appendix 1: OSHA Appendix D Voluntary Use of Respirators (0206500_CP_11_11_en_A1.1)

Appendix 2: Hand Protection Selection Matrix (0206500_CP_11_11_en_A2.1)

Appendix D of 29CFR 1910.134 - Information for Employees Using Respirators Voluntarily:

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 an additional feel 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, or if you provide your own respirator, you must take certain precautions to be sure that the respirator itself does not present a hazard.

Individuals using respiratory protection on a voluntary basis shall do the following:

1. Read and acknowledge all instructions provided by the manufacturer and your employer's respiratory protection plan on use, maintenance, cleaning and care, and warnings 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

Employee Acknowledgment:

I have been given a copy of 29 CFR 1910.134 Appendix D regarding the proper respirator use and I have read and understand it. Contact your supervisor or the program administrator with any related questions.

Job / Task:

Respirator Make / Model:





Name (print):

Sign:

Date:

This document (or a copy) must be kept on site for record keeping at all times.

Hand Protection Selection Matrix

 Mechanical Protection			
Assessment	Test Method	Class	Limitations/Recommendations
Cut Protection	ASTM F 1790	5 Levels	Mechanical protection protects hands from direct contact of sharp and/or abrasive edges. Cut, abrasion and puncture resistance is a function of the composition of material and thickness. Using cut, abrasion and/or puncture protective gloves does not guarantee total protection. Cut level and type must be selected based on task and hazard(s). Fabric types include, but are not limited to: Leather, Kevlar®, Spectra fiber, Dyneema® and Terrycloth.
Abrasion Protection	ASTM D 3389	6 Levels	
Puncture Protection	EN 388	5 Levels	
 Chemical Protection			
Assessment	Test Method	Class	Limitations/Recommendations
Permeation Protection	ASTM F 739	6 Levels	Substances that inflame, irritate or burn the skin represents a chemical hazard. The safety data sheet (SDS) of chemical should be consulted to help identify required protective factor and material needed. Examples of chemical protective gloves include, but are not limited to: Neoprene, Butyl, Nitrile and PVC.
Degradation Protection	Rubber- ASTM D 471 Plastic- ASTM D 543	4 Levels	
 Thermal Protection			
Assessment	Test Method	Class	Limitations/Recommendations
Flame Resistant	ASTM 1358	4 Levels	Thermal protection provides protection for both hot and cold hazards that could damage the hands. This category includes: heat, fire, electrical conductive heat and frozen gases. Selection of hand protection should be commensurate with degree of hazard.
Heat Degradation	ISO 17493	5 Levels	
Conductive Heat Resistance	ASTM F 1060	5 Levels	
Protection from Cold	ISO 5085-1	4 Levels	
 Electrical Protection			
Assessment	Test Method	Class	Limitations/Recommendations
Electrical Hazards	EN 60903	6 Levels	EN60903 compliance is required for electricians gloves, which are made from insulating material suitable for handling live wires or exposure to electrical energy. There are six types of glove that fall into this category, tested against the relevant voltage present in the workplace. Selection is based on the amount of available voltage.