



HEALTHIER WORKPLACES | A HEALTHIER WORLD

Focus on Construction Health: COVID-19

Guidance Document



[aiha.org](https://www.aiha.org)

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Photo courtesy of AGC Oregon-Columbia Chapter member Kerr Contractors

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Cloth face covers serve as a source reduction measure.
(Photo courtesy of International Union of Bricklayers & Allied Craftworkers Local 1 Oregon/Washington/Idaho/Montana.)



HEALTHIER WORKPLACES | A HEALTHIER WORLD

TABLE OF CONTENTS

Executive Summary	4
Introduction	4
What Are the Key Features of This Health Hazard?	5
How Severe Are the Health Effects?	7
What Trades Are Most Commonly Affected?	7
How Does Exposure Occur?	8
A Strategy to Reduce and Control COVID-19 Hazards	11
Step 1: Designate a COVID-19 Site Safety Officer	11
Step 2: Develop a COVID-19 Control Plan	11
Step 3: Review a Site Map to Guide Location of COVID-19 Control Measures	11
Step 4: Plan COVID-19 Site Control Program Elements	12
Element 1: Source Reduction and Illness Screening	12
Element 2: Social Distancing Controls	14
Element 3: Exposure Reduction Controls	15
Element 4: Personal Hygiene Stations and Measures	16
Element 5: Surface Cleaning and Disinfection Measures	16
Element 6: Personal Protective Equipment (PPE) Measures	17
Step 5: Perform Job Safety Analyses (JSAs) to Review Tasks and Adjust Control Plans	21
Step 6: Develop a COVID-19 Case Response Plan	23
Step 7: Implement and Monitor Overall Plans	24
How Can an Industrial Hygienist Help?	25
Takeaway Messages	25
Additional Resources	27



HEALTHIER WORKPLACES | A HEALTHIER WORLD

EXECUTIVE SUMMARY

The coronavirus SARS-CoV-2 and the disease attributed to it – COVID-19 – presents a major worker health protection challenge. The American Industrial Hygiene Association (AIHA) Construction Committee prepared this guidance to give construction employers a practical plan for protecting construction workers from COVID-19. It includes key information on how the virus spreads and how exposure occurs. It spells out a seven-step plan to address COVID-19 and describes the role of the Job Safety Analysis (JSA) as an important tool to identify and control factors that could lead to higher exposures. The overall approach supports flexibility and the document provides links to many other useful resources. It is intended to complement the existing Focus Four for Health guidance which addresses four other important construction health hazards. We hope that the guidance gives construction employers the blueprint and tools needed to successfully meet the COVID-19 challenge.

Introduction

The COVID-19 disease is a new potential health hazard to workers in all industries. There have been multiple outbreaks in a variety of workplace settings including construction. The construction industry includes critical infrastructure work that cannot easily close down and has been rapidly gearing up to implement precautions to protect employees and visitors, and to continue operations. New information on COVID-19 is available daily and local and state guidance are changing with conditions.

The AIHA represents occupational health and safety (OHS) professionals (also known as industrial hygienists or occupational hygienists) who practice the science of anticipating, recognizing, evaluating, and controlling workplace hazards and conditions that may cause workers' injury or illness. The AIHA has a [Back to Work Safely](#) webpage that includes several

resources including the [Returning to Work: Construction Environment](#) document to provide guidance and a comprehensive list of precautions for safe construction work.

The AIHA Construction Committee developed this additional guidance to apply a **Focus Four for Health** approach to addressing novel Coronavirus hazards. It gives construction employers key information on the types of factors that affect workplace exposures; and provides a seven-step plan for protecting workers on construction worksites. The plan includes a Job Safety Analysis (JSA) step to tailor precautions and controls to site-specific tasks and changing conditions. Doing a pre-job JSA is a good way to address scenarios such as these:

- A task must be performed in a small enclosed space. It usually requires three employees. The HVAC system for that space is not yet operational. What are the options and controls that could be used to help reduce exposure potential?
- An outdoor task requires only a single worker and is located dozens of yards from the next closest worker. Can a face covering recommendation be relaxed for this task?
- Two workers are needed for a task to be performed on a scaffold. How should self-distancing be considered?

These are the types of questions that COVID-19 site safety officers, competent persons, and construction managers/superintendents may need to answer every day. This guide will help construction organizations implement a program, identify potentially high exposure tasks, and determine appropriate and useful controls. A resource section provides links to many other existing guidance materials useful for construction.

NOTE:

This guidance document does **not** address every possible program element that may be needed at



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every construction site or be required by a specific local or state regulation. For example, every workplace will want employees who are feeling sick to stay home. Employees who are caring for someone sick at home or who have been significantly exposed to someone sick should self-quarantine. The use of daily temperature or symptom screening when arriving at work is becoming more common, and this practice can involve medical confidentiality concerns. Some state and local health departments require contact tracing if a worker is diagnosed or presumptively identified to be COVID-19 positive. COVID-19 testing is a topic that is also in flux. The availability of testing is increasing but is not yet a common practice. It might play more of a role in future employer programs. Detailed issues related to testing, sick leave policies, confidential medical concerns, and contact tracing for public health purposes are beyond the scope of this guide and should be coordinated with your company human resources personnel. The guidance does include links to many other online resources to help readers find additional information about these and other COVID-19 precautions.

Meeting COVID-19 demands is an urgent priority, but there are other health hazards on construction jobsites to consider. Look at our original [Focus Four for Health](http://bit.ly/focus-fouraiha) guidance document at <http://bit.ly/focus-fouraiha> to learn about four other important construction health hazards (manual material handling, noise, air contaminants, and high temperatures).

Readers are reminded to monitor the latest COVID-19 developments by checking with sources such as the CDC, OSHA, NIOSH, WHO, state, provincial and local health departments, and industry and trade associations.

What Are the Key Features of This Health Hazard?

COVID-19 is the name given to the pandemic Coronavirus disease caused by the SARS-CoV-2 virus that was discovered in 2019. The virus spreads easily from person to person. The resulting illness varies from mild to fatal. No vaccine or fully effective therapy is currently available.

The virus spreads when respiratory droplets and aerosols become airborne from coughing or sneezing, speaking, and breathing. Spread is more likely when people are in close contact with each other (within about 6 feet or 2 meters) and remain in the same area for a prolonged period of time. The Center for Disease Control (CDC) reports that they do not have sufficient data to define a “prolonged” period, but they suggest that 15 minutes can be used as a functional definition. The exception is for healthcare settings where any exposure greater than a “few minutes” to ill individuals should be used.¹ In summary, brief interactions are less likely to result in transmission; however, symptoms and the type of interaction (e.g., did the person cough directly into the face of the individual?) remain important.

If a person is exposed to the virus and becomes infected, it can take from 2 to 14 days for the disease to incubate for symptoms to develop, if they develop any symptoms at all. Symptoms are not always obvious – they may be asymptomatic, mild in nature, be similar to other illnesses, or not seem to match up to COVID-19 – for example, fever is common but not always present.

A key risk of the COVID-19 hazard is that newly infected persons will be contagious (able to release virus to expose others) even before they feel sick and are aware of any symptoms. This means that there can be a few days where newly infected – but

¹ CDC Public Health Recommendations for Community-Related Exposure at <https://www.cdc.gov/coronavirus/2019-ncov/php/public-health-recommendations.html>



HEALTHIER WORKPLACES | A HEALTHIER WORLD

asymptomatic – individuals can spread the virus to others. One study that tested individuals over the course of their illness found that on average they became infectious 2 to 3 days **before** onset of symptoms and that the highest potential for spreading the virus was just before symptoms appeared. The estimate was that 44% of the virus transmissions occur before people get sick.² This asymptomatic spreading of the virus is one of the reasons for controls such as social distancing, frequent hand washing, and the use of face coverings or masks.

Isolation of those individuals testing positive or newly diagnosed with COVID-19 is done, either in the hospital or at home (depending on how sick they are), until they are symptom-free and no longer pose a risk of infecting others. Determination on when a person no longer poses an infection risk and can return to work is made with input from a healthcare provider based on the most current CDC guidance .

COVID-19 is a different kind of construction health hazard since it is an infectious disease. Whereas most health hazards arise from tools, materials, physical agents, or toxic substances, the primary source for COVID-19 in construction is contact with infected co-workers who can inadvertently infect others. The more that Coronavirus spreads throughout a community, the higher the likelihood of coming in contact with an infected individual in your workplace.

One challenge for the construction industry is that paid sick leave has not been a common practice, and working while in pain, injured, or sick has been toler-

ated. This makes it very important that all construction workers and managers know the symptoms of COVID-19, understand how it spreads, and make it acceptable for workers experiencing any illness to be able to stay home.

You should know ...

Is “super spreader” a real thing?

Yes. Some individuals are more likely to spread virus particles than others regardless of behavior or circumstances.

Studies that look at how humans generate aerosol particles find large variation between individuals. For example, one study of flu coughs found that the levels emitted by test subjects varied by a factor of 1000. Similar findings have been found for generation of aerosols via speech.⁴

You should know ...

Viruses can be spread even without sneezing and coughing.

Sneezing and coughing produce the largest amounts of large droplets that can contaminate surfaces and nearby persons.

However, speech and breathing also produce important amounts of smaller particles. Louder speaking increased the levels produced.⁵ Singing in a choir while ill has infected many other individuals.⁶

² He X, et al. 2020. [Temporal dynamics in viral shedding and transmissibility of COVID-19](#). Nature Medicine.26:672-675. May 2020.

³ CDC guidelines for discontinuing isolation and quarantine (i.e. return to work) and can be found at <https://www.cdc.gov/coronavirus/2019-ncov/hcp/disposition-in-home-patients.html> and <https://www.cdc.gov/coronavirus/2019-ncov/hcp/disposition-hospitalized-patients.html>

⁴ William G. Lindsley, et al. 2012. Quantity and Size Distribution of Cough-Generated Aerosol Particles Produced by Influenza Patients During and After Illness. *Journal of Occupational and Environmental Hygiene*, 9: 443–449

⁵ Asadi, S, et al. 2019. Aerosol emission and superemission during human speech increase with voice loudness. *Nature. Scientific Reports* | (2019) 9:2348

⁶ Hamner L, Dubbel P, Capron I, et al. High SARS-CoV-2 Attack Rate Following Exposure at a Choir Practice — Skagit County, Washington, March 2020. *MMWR Morb Mortal Wkly Rep* 2020; 69:606–610. DOI: <http://dx.doi.org/10.15585/mmwr.mm6919e6>



HEALTHIER WORKPLACES | A HEALTHIER WORLD

How Severe Are the Health Effects?

The health effects from COVID-19 vary widely. They range from mild cases where individuals did not notice any symptoms to those that caused death in days or weeks. Older adults and those with several types of underlying health conditions are believed to be at a higher risk of developing a more severe case of the disease.⁷

COVID-19 affects the lungs and respiratory system and can make breathing so difficult that ventilators are needed. Doctors and researchers are learning that damage can extend beyond the lungs. It can lead to blood clots, kidney damage, heart problems, nervous system problems, strokes, heart attacks, and pulmonary embolisms. There is also some concern about the persistence of longer-term effects of COVID-19 even in patients who recover. The susceptibility of those who have recovered from the illness and have antibodies is not yet known for sure.

It is best to consult the [CDC](#) and [Health Canada](#) for the most recent findings on any new symptoms and the latest information about COVID-19.

It is a challenge to fully weigh the danger posed by COVID-19. Some individuals will only get a mild form of the illness – but it is not possible to know for sure who will get a mild case and who will instead develop a severe case leading to death just weeks to a month after infection. There are also family members to consider. An infected worker with a mild case could expose family members, leading to additional cases of illness.

What Trades Are Most Commonly Affected?

COVID-19 affects every construction trade in areas experiencing community spread. All workers,

Watch for symptoms of COVID-19?⁸

People with COVID-19 have had a wide range of symptoms reported – ranging from mild symptoms to severe illness. Symptoms may appear **2 to 14 days after exposure** to the virus. People with these symptoms may have COVID-19:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea

“This list does not include all possible symptoms. CDC will continue to update this list as we learn more about COVID-19.”

regardless of trade, pass through, and share common workspaces such as elevator and loading dock areas, buck hoist lifts, lunch and break areas, sanitation facilities, and walkways, where contact with other infected individuals can occur. Even getting to the work site can pose a higher risk and carpooling is common not just in getting to and from the job-sites, but delivery drivers, vendors, and install crews often ride in vehicles together within close proximity of each other.

⁷ See CDC list of conditions, along with precautions that can be taken at <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/groups-at-higher-risk.html>

⁸ CDC – Symptoms of Coronavirus, at <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>, accessed 6 29 2020.



HEALTHIER WORKPLACES | A HEALTHIER WORLD

The extent of such contact likely varies based on trades and jobs. Some trades (e.g. operating engineers) do more solo work. Other trades and jobs (e.g. masonry or window installation) involve work in close proximity to co-workers. Construction sites are typically restricted-access areas and construction workers do not typically have exposure to the public while on the job. However, some types of renovation work in occupied settings might also involve interaction with building occupants or the public, and in health care settings, with health care workers.

Special consideration should be given to indoor renovation and repair work done at hospitals, nursing homes, correctional facilities, industrial facilities, private residences, or other settings where COVID-19 cases are suspected or known to have occurred. Work such as repair or upgrading of heating, ventilation, and air conditioning (HVAC) systems, plumbing, or electrical systems in these settings needs

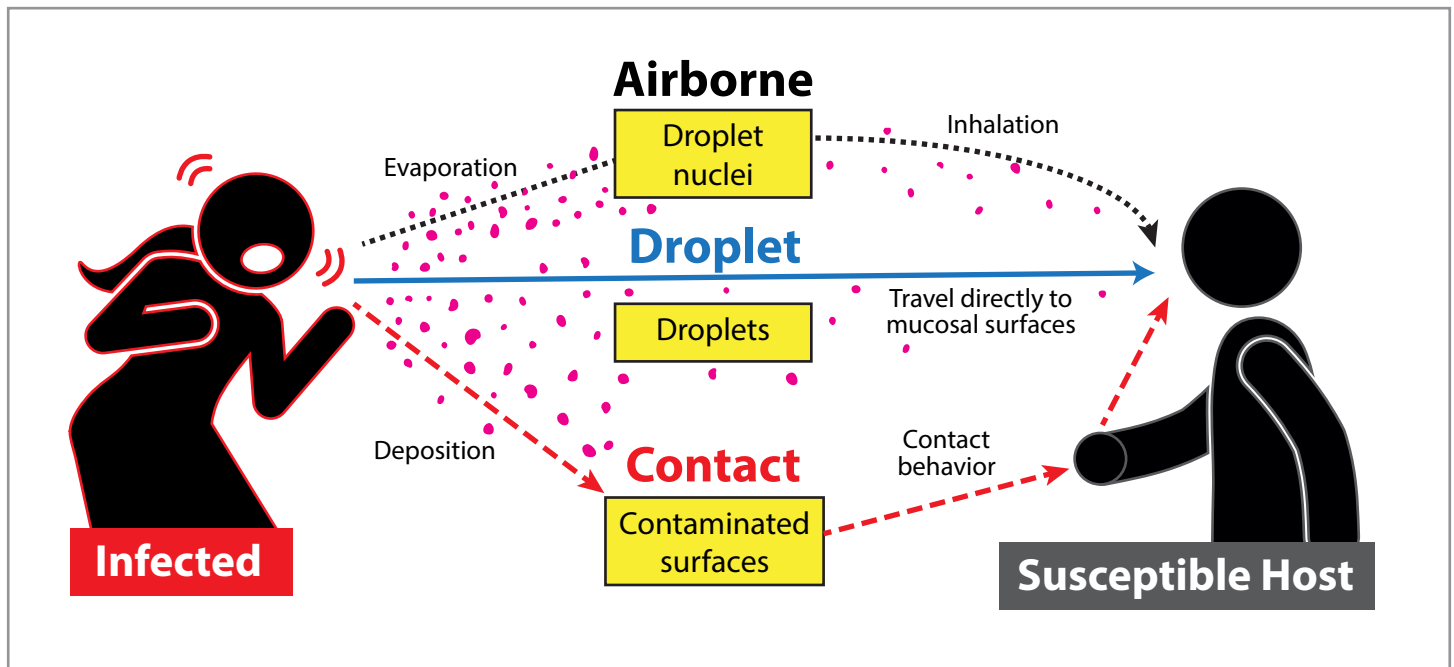
to be carefully planned, scheduled, and executed to account for exposures from ongoing or previous COVID-19 cases.

How Does Exposure Occur?

The primary sources of construction exposures are virus particles present in droplets and aerosols shed by infected individuals on the jobsite. These emissions may expose other workers via two pathways:

Airborne exposure pathways:

- Larger droplets, typically from uncovered coughs or sneezes, can spray directly onto the nose, mouth, or eyes of nearby workers (within 6 feet) where they can directly enter the mucous membranes. These droplets, along with those emitted from speaking, can stay in the air for several minutes and also be inhaled by nearby workers before settling out of the air onto nearby surfaces.



Modes of Transmission from Exhaled Pathogens. (Adapted from: The Society of Heating, Air-Conditioning and Sanitary Engineers of Japan (SHASE) and Architectural Institute of Japan (AIJ). 2020. Role of ventilation in the control of the COVID-19 infection: Emergency presidential discourse, March 23, 2020.)



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- The virus also may also be present in smaller droplets and aerosols created during speech or breathing, in addition to coughs or sneezes. These can evaporate down to smaller airborne particles. These small particles may be swept away outside on a windy day but can remain airborne for hours inside enclosed spaces or work areas with little moving air. These smaller virus particles can also be inhaled by workers both close by and further away.

Surface exposure pathways:

- Directly contaminated skin or surfaces can serve as routes to spread the virus. In the case where an infected worker sneezes or coughs in close contact with a co-worker, larger droplets could land on the co-worker's hand. This could lead to infection if that individual touches their nose, eyes, or mouth.
- Cross-contaminated high-touch surfaces can also spread the virus. Contaminated skin (see above) from either an infected individual or exposed co-worker can serve to move virus particles to additional surfaces like a doorknob or shared tool. This newly contaminated surface can then become a pathway for additional skin exposure. A co-worker could pick up virus particles from the cross-contaminated surface and then become infected if they touch their hands to their mouth or nose or eyes.

The minimum amount of virus particles needed to cause COVID-19 (the “infectious dose”) is not yet known. The SARS-CoV-2 virus has been shown to be viable (i.e. capable of causing infection) in the air for several hours, and on surfaces for up to a day or more. The virus does break down over time.⁹

⁹ Neeltje Van Doremalen, N., Bushmaker, T. et al. 2020. B Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1 NEJM 382;16 <https://www.nejm.org/doi/pdf/10.1056/NEJMc2004973>

¹⁰ OSHA 3990 Guidance on Preparing workplaces for COVID-19

¹¹ OSHA Updated Interim Enforcement Response Plan for Coronavirus Disease 2019 (COVID-19)

¹² OSHA Construction Work guidance page. <https://www.osha.gov/SLTC/covid-19/construction.html>

Until more information becomes available, it is best to consider that an infection could result from a single large exposure (e.g. a direct cough and droplets near the face from an asymptomatic individual) or from multiple smaller exposures over time (e.g. extended inhalation of small aerosols in poorly ventilated indoor spaces for several hours.)

Understanding the nature of exposure pathways is useful. It helps to explain and appreciate the rationale for precautions such as sneeze and cough etiquette, the use of face coverings, social distancing, and the value of frequent hand washing and cleaning/disinfection of surfaces.

OSHA combined exposure pathway information with likelihood of contact with COVID-19 cases to develop four risk exposure levels.^{10,11} OSHA also described construction work tasks associated with each of the exposure risk levels:¹²

- **Very high exposure risk:**

Known or suspected sources of COVID-19 exposure such as healthcare workers, lab personnel, or morgue workers doing specific medical, postmortem, or laboratory procedures.

Construction: Not applicable for most anticipated work tasks.

- **High exposure risk:**

Entering an indoor work site occupied by people such as other workers, customers, or residents suspected of having or known to have COVID-19, including when an occupant of the site reports signs and symptoms consistent with COVID-19.

Construction: Work tasks that involve renovation or repair work at a hospital or nursing home



HEALTHIER WORKPLACES | A HEALTHIER WORLD

known to have active COVID-19 cases. Could also be a special case on a low or medium risk job when responding to a construction worker on site becoming ill with COVID-19 signs and symptoms.

- **Medium exposure risk:**

Frequent and/or close contact (i.e., within 6 feet of) with the general public or coworkers who are not known or suspected to have COVID-19. This includes settings such as schools, high-population-density work environments – like meat and poultry processing, and some high-volume retail settings. It also includes employees with frequent contact with travelers returning from locations with widespread transmission.

Construction: Tasks that require workers to be within 6 feet of one another, such as riding in an elevator or boom lift. Tasks that require workers to be in close contact (within 6 feet) with customers, visitors, or members of the public.

- **Lower exposure risk:**

Minimal close contact (i.e. within 6 feet of) people (co-workers or the public) not known or suspected to have COVID-19.

Construction: Tasks that allow employees to remain at least 6 feet apart and involve little contact with the public, visitors, or customers.

Most construction work will be considered medium and lower risk from this perspective.



HEALTHIER WORKPLACES | A HEALTHIER WORLD

A Strategy to Reduce and Control COVID-19 Hazards

This section provides a “big picture” framework – using elements that can be modified as conditions change or as new information becomes available. Not every technical detail is described here, but additional references and sources are provided at the end of this document to assist construction employers with pursuing additional details.

Step 1: Designate a COVID-19 Site Safety Officer

The exact title may vary, but coordination and accountability are critical. This designated person could be like a “competent person” for a small firm or project or it could be a safety or health professional at a larger company or worksite. Employees and sub-contractors should know who this person is and how to contact them.

This competent person should have a comprehensive understanding of COVID-19 exposure potential, the value of certain controls vs exposure pathways, and the practical factors of implementing additional controls for task specific situations (and the authority to do so).

Step 2: Develop a COVID-19 Control Plan

A plan spells out roles, responsibilities, and actions. OSHA’s [Guidance on Preparing Workplaces for COVID-19](#) includes information on how to develop an “Infectious Disease Preparedness and Response Plan”. See the side box for some additional topics other than those mentioned in this guidance that might need to be addressed.

Step 3: Review a Site Map to Guide Location of COVID-19 Control Measures

Concurrent with developing a response plan, obtain and review a map of the site. A map of the worksite combined with a walk-through and information about the size of work crews helps planning by making it easier to visualize:

Planning for COVID-19:

The following are some additional key program elements to consider in developing your plan. Please see “Additional Resources” at the end of this document for other publications with detailed lists of program elements

Key Responsibilities

- Managers/Supervisors
- Safety and Health
- COVID-19 Site Safety Officer
- Human Resources
- Employees

Procedures/Practices

- Site orientation and training
 - Site layout
 - Pre-job planning and scheduling
 - Meeting policy
 - Company vehicle drivers
- Sub-contractor communication
 - Job site visitor policy
 - Equipment purchasing & supply
 - Deliveries and shipments
- Site inspections
 - Forms
- Signs and markings
- COVID-19 Human Resource policies
 - Work at Home considerations
 - Pre-work illness screening, illness reporting and response
 - Measures to be taken if a COVID-19 case is reported on the site
- Health department and health care provider contacts



HEALTHIER WORKPLACES | A HEALTHIER WORLD

- common and break areas
- potential employee density and “choke” points
- how employees, supplies, materials, and machinery will move and flow around the site
- likely high touch surfaces for further attention
- optimal locations for sanitation stations

The site map can be used for site orientation and to communicate elements of the overall plan.

Step 4: Plan COVID-19 Site Control Program Elements

A good control plan is guided by the “Hierarchy of Controls” developed by Occupational Health and Safety practitioners to ensure that the most effective methods are given priority. Methods that control the hazard at the source itself (e.g. elimination and source reduction) are considered first; followed by methods that control the exposure pathway (e.g. ventilation, social distancing, providing washing stations, cleaning); followed finally by methods that control at the worker (e.g. PPE). Until an effective vaccination is developed to help “eliminate” the hazard, the best place to start is with measures that reduce the source of coronavirus emissions on the worksite.

The following elements suggest some but not all of the questions you may wish to ask as you implement controls for COVID-19 at your jobsite. There are many more options to consider in the additional resources shared at the end of this document.

Element 1: Source Reduction and Illness Screening

- A) Policies and procedures are needed to actively encourage employees who are sick or who care for someone who is sick at home — even if they are unsure as to whether symptoms are

from COVID-19 — to stay home and seek care from a health care provider. This requires clear communication, consistency and coordination between human resources, management, and workers. For example, who do employees call in to? What are they told? See “[CDC What to Do If You Are Sick](#)” or Health Canada “[Symptoms and Treatment](#)” page for examples of information on what to tell employees. For this measure to be effective, it must not be seen as punitive.

Related to this measure, note that the Families First Coronavirus Response Act (FFCRA) recognizes the role of sick leave in addressing the pandemic. It calls for certain employers to provide employees with paid sick leave or expanded family and medical leave for specified reasons related to COVID-19. Those issues are beyond the scope of this document. Please refer to your human resources professional for additional information.

- B) Pre-shift screening is needed to check that employees coming on site each day do not present signs or symptoms that could indicate a developing COVID-19 illness. Current practices include a temperature check and a use of a medical questionnaire. One option is to have employees do this step at home and self-certify. A second option is to do screening at a site adjacent to the project entrance. There are many technical details involved with worker screening such as selecting a temperature device, maintaining separation at the screening location, secondary screening steps for those found above the “fever trigger” temperature (fever above a 100.4 degrees F or 38 degrees C), to protective measures for screening personnel. CDC describes methods and considerations for doing employee screening and temperature checks.¹³

¹³ CDC FAQ Should we be screening employees for COVID-19 symptoms (such as temperature checks)? What is the best way to do that? at <https://www.cdc.gov/coronavirus/2019-ncov/community/general-business-faq.html#Reducing-the-Spread-of-COVID-19-in-Workplaces>



HEALTHIER WORKPLACES | A HEALTHIER WORLD

The Equal Employment Opportunity Commission [What You Should Know about COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws](#) webpage provides guidance for human resource personnel on screening procedures and medical records management.

- C) Clear employer policies and procedures, combined with worker training regarding on-the-job illness reporting, are needed to ensure that workers who become ill during the shift know to stop and notify the COVID-19 site safety officer immediately. Most construction workers find a way to work through discomfort, and will finish a shift even if they are feeling ill. However, given the highly contagious nature of COVID-19, workers must understand this is not a risk worth taking.

Employees feeling ill should immediately be separated from other employees and sent home to self-quarantine and consult a healthcare provider. There should be a designated person to notify, and a designated isolation area stocked with appropriate PPE and disinfection supplies. The employee may need help – either to safely get home or to a healthcare provider. Transportation (by either family member, commercial vehicle, or company vehicle) needs to be pre-planned and communicated to workers during training. Projects with extended shifts need to include extra planning for taking these steps at times when fewer managers and healthcare providers are available.

- D) A policy regarding the use of face coverings on the worksite needs to be developed and communicated to all employees during job orientation and training. The CDC states that cloth face coverings are intended to help reduce the spread of large respiratory droplets by individuals who do

not yet know they have the virus.¹⁴ Cloth face coverings may help capture some of the large droplets emitted from coughing, sneezing, or talking. Use of face coverings does not replace the need for social distancing and other protective measures like hand washing, and they should not be used in place of respirators or medical face masks when indicated.

The CDC currently recommends that the public wear cloth face coverings in addition to social distance measures and in settings where other social distancing measures are difficult to maintain, especially in areas of significant community-based transmission.¹⁵ Many state and local health departments have similar recommendations and requirements. CDC recommends that construction workers follow this guidance as well.¹⁶

What you should know about Cloth Face Coverings

- **They are not respirators or PPE!**
- Their main intent is to help protect **others** – not the wearer
- Came about as a response to the **shortage** of medical masks
- Either home-made or available for purchase
- Not regulated or certified – and vary in how well they filter and fit
- Will not capture all droplets – some will escape out the sides and smaller aerosols will penetrate the fabric material

Medical grade disposable face masks can serve a similar purpose and are a better choice than cloth face coverings for source control – if available once shortage conditions end.

¹⁴ CDC <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html>

¹⁵ CDC <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html>

¹⁶ CDC What Construction Workers Need to Know about COVID-19. <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/construction-workers.html>



HEALTHIER WORKPLACES | A HEALTHIER WORLD

When implementing cloth face coverings, ensure that they cover the nose and mouth, include multiple layers of fabric, do not restrict breathing, are secured to the head, and are replaced or washed daily or sooner if wet, soiled, or contaminated. As with any PPE, there may be issues with wearing all day including irritation or rashes. The surfaces of the face covering may be infectious, so good hygiene (frequent hand washing) and minimizing handling of the face covering are recommended.

Additional CDC information is at [Use of Cloth Face Coverings to Help Slow the Spread of COVID-19](#). Given the wide range of construction tasks, employers should also evaluate if a mask or face covering might pose a separate risk, e.g. becoming caught in moving equipment or getting too close to hot work sources.

Local recommendations and requirements for cloth face coverings will likely vary over time as community spread conditions rise or fall. At a minimum, it is useful for all employees on the site to have a cloth face covering handy to wear if social distancing becomes difficult in any situation. It is critical that employees understand that these are not respirators or medical masks and should not be used in place of these PPE when needed. Individuals with medical conditions should consult with their primary physician before attempting to wear any face coverings.

See additional information on the differences between face coverings and respirators under Element 6.

Element 2: Social Distancing Controls

- A) Scheduling tasks to minimize site worker density serve to reduce exposure potential.
- Can the number of workers on the site at any one time be reduced? Fewer workers on the site makes it easier to do social distancing and contact tracing.

¹⁷ CDC guidance e.g. <https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-manufacturing-workers-employers.html#create-assessment-plan> refer to barriers as a separation measure.



Job site poster. (Photo courtesy of AGC of Washington.)

- Can occupancy of workspaces be managed by trades to avoid trade stacking (i.e. scheduling so that the work of multiple trades does not overlap or occur simultaneously in a single space)?
- Can delivery times be paced to avoid backups?
- Can arrival times, break times, lunch times, and departure times be staggered, since the worksite areas that typically have the highest worker density include site entry areas, wash up areas, break and lunch areas, food truck/canteen lines, trailer work stations, tool and supply stations, lifts, and delivery areas? Bottlenecks can make social distancing difficult.



HEALTHIER WORKPLACES | A HEALTHIER WORLD

- Can the size and frequency of meetings and trainings be adjusted? Can these be presented online?
- B) Separation measures to keep employees six feet apart reduce exposure potential.
- Label common areas using markings or decals to show 6-foot separations – especially in locations where bottlenecking might occur. These include site entry areas, wash up areas, break and lunch areas, food truck/canteen lines, trailer work stations, tool and supply stations, lifts, and delivery areas.
 - Identify those tasks requiring multiple workers. Can these tasks be adjusted to minimize the number of workers? Or is there a way to have the work be performed that allows accommodation of 6-foot separations?
 - Erect barriers (rigid clear plastic, vinyl shower curtains, poly sheeting, or tarp materials) where feasible, to create separation when 6-foot distance is not possible. Such barriers serve a dual purpose – they help maintain separation and can further reduce the spread of droplets.¹⁷
 - Develop policies for areas where social distancing is most likely to be challenging or taken for granted. This might include elevators, shared company vehicles, carpools, work trailers, etc. For example, employers might replace a huddle around blueprints while standing six feet apart around a large screen display.
 - Social distancing can be challenging during transportation, both during workers daily commute to site, van ride sharing, and within the site or in company vehicles. Specific JSAs may be needed.
 - Lunch areas are typically self-monitored and are areas where individuals often group together. Reminders can be given to workers to space themselves apart during lunch.

Element 3: Exposure Reduction Controls

- A) Surface control measures target contamination pathways by reducing commonly touched surface exposures
- Use open doors or kickplates to minimize the need to touch doorknobs
 - Use automatic features to open doors, run faucets, etc.
 - Eliminate or reduce shared tool use
 - Use wipeable or disposable clear covers for large equipment control panels.
 - Change the potable water supply set up to minimize common touch surfaces. For example, single use bottles can be provided.
- B) Ventilation measures target airborne exposure pathways to reduce aerosol levels.
- Are there tasks that will be done indoors in un-ventilated areas?



Making signs for stairways; one-way flow can help maintain social distancing. (Photo courtesy of Oregon State Building & Construction Trades Council.)



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- Open windows where possible
- Use portable fans to improve airflow
- Use portable negative air units (fan units on wheels with high efficiency filters to clean air) to improve airflow and reduce airborne contaminants
- Check HVAC systems in job trailers and offices and update filter systems. Check controls and settings. Change settings from run on demand only (e.g. only when heat or cooling needed) to run at all times when occupied.

Element 4: Personal Hygiene Stations and Measures

- A) Wash stations are needed for frequent washing, which in turn prevents the hands from acting as direct contamination pathways.
- Provide sufficient water, soap, and drying aids.
 - Locate wash stations adjacent to break areas, trailers, lunch areas.
 - Set up to allow proper social distancing.
 - Use no-touch trash receptacles
- B) Provide hand sanitizer (with at least 60% alcohol content) to supplement wash stations or for situations where access to wash stations is limited, such as in vehicles.



Hand-wash facilities 6 feet apart. (Photo courtesy of Boilermakers – CIMS Ltd.)

- C) Allow sufficient time for employees to wash hands each day prior to breaks, lunch, and after using restrooms. Post signs to encourage and remind employees of good hygiene practices.
- D) Job site toilets are normally grouped together on construction sites. Be sure they are set up to accommodate social distancing. Maintenance schedules may need adjustment and oversight to ensure that units are stocked with sanitizer and kept clean.

Element 5: Surface Cleaning and Disinfection Measures

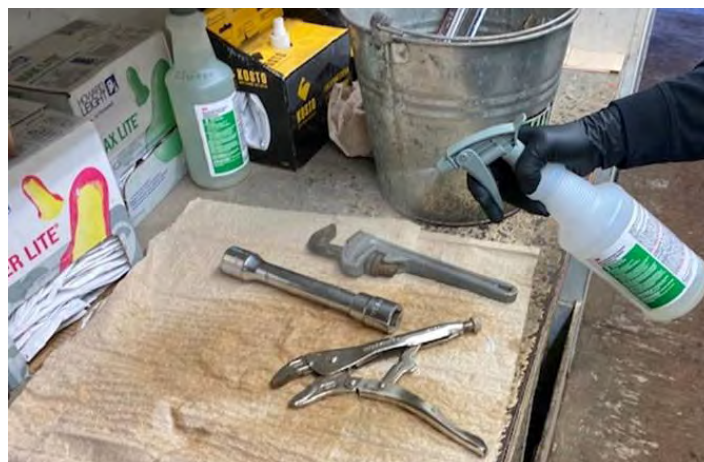
- A) Cleaning of common contact surfaces (at least daily) cuts cross-contamination as an exposure pathway.
- Assign responsibilities for cleaning and ensure that those individuals receive training on the proper use of cleaners and disinfectants. Use a checklist to specify the locations that need treatment (e.g. high touch surfaces, wash up areas, break areas, stair rails, toilets and urinals).
 - Some items (e.g. shared larger tools, vehicles, heavy equipment) or locations might require more frequent cleaning or cleaning before changing operators.
 - Visibly soiled locations need to be cleaned first with detergent prior to applying disinfecting products
 - Think through handling and disposal of used cleaning cloths to integrate into site disposal practices.
- B) For final disinfection, select products with EPA-approved emerging viral pathogens claims ([EPA List N](#)). If EPA-approved disinfectants are not available, alternative disinfectants can be used (for example, 1/3 cup of bleach added to 1 gallon of water, or 70% alcohol solutions).¹⁸

¹⁸ CDC/EPA Guidance For Cleaning And Disinfecting Public Spaces, Workplaces, Businesses, Schools, And Homes, at https://www.epa.gov/sites/production/files/2020-04/documents/316485-c_reopeningamerica_guidance_4.19_6pm.pdf



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- Follow manufacturer's instructions for use of all cleaning and disinfection products (e.g., concentration, application method and contact time, PPE).
- Always provide gloves appropriate for the chemicals being used for cleaning and disinfecting. Additional personal protective equipment (PPE) such as impervious gloves may be needed based on setting and product. Some concentrated disinfectants may be corrosive and require an eye wash nearby to mix to ready-to-use dilute strength.
- Do not mix bleach or other cleaning and disinfection products together—it can form toxic gasses or vapors that may be very dangerous to breathe.
- If using alcohol-based disinfectants or sanitizers, be cautious of potential ignition source.



Tool cleaning. (Photo courtesy of Boilermakers – CIMS Ltd.)

Element 6: Personal Protective Equipment (PPE) Measures

A) PPE is the least preferred and final option for reducing risks to workers, but PPE can play an important role when other Hierarchy of Control measures are insufficient. PPE is common in construction and both employers and workers are familiar with its use. PPE considerations for COVID-19 present several unique challenges:

- Cloth face coverings, which are not PPE - but are recommended by the CDC as a source control measure, can confuse the picture for respirators. See Table A for a comparison of key differences.
- Deciding if respirators are needed for COVID-19 is challenging because conventional tools (e.g. air sampling or construction exposure studies) are not available. A careful review using a Job Safety Analysis (JSA) is needed (JSAs are described in more detail in Step 5).

- Shortages of respirators may exist. It may be difficult to procure filtering face piece respirators such as N95s. Some but not all respirators from other countries meet standards similar to U.S. standards. Be aware of counterfeit or sub-standard respirators. Employers may need to be flexible and consider options such as elastomeric respirators, or higher classes. See [CDC guidelines](#) for shortage and crisis conditions.
- B) In selecting PPE for COVID-19, select respirators and eye protection together. If a JSA triggers a recommendation for respirators, assume that the airborne levels that could cause problems if inhaled could also cause exposures via the eyes. The eyes are part of the mucous membranes and can be a route of exposure for the virus. See [Preventing SARS-CoV-2 Eye Exposures and Infection](#) for additional information. Consider ensembles that include both respirators and some type of eye protection such as face shield or goggle.
- Respirators. Where respiratory protection is needed against SARS-CoV-2, the CDC recommends a minimum of a NIOSH approved N95 respirator or higher class air purifying filtering facepiece or half or full facepiece reusable (elastomeric) respirators with N99, N100, R95,



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R99, R100, P95, P99, or P100 filters, powered air purifying respirators (PAPRs) with HE filters.¹⁹ If supplied air respirators are being used for protection against other hazards, they may also be considered.²⁰

While properly fitted NIOSH approved respirators are more effective than face coverings and procedure masks for preventing exposures to airborne contaminants for the wearer, respirators with exhalation valves allow unfiltered air to escape and may potentially allow exhalation of droplets. Until further study can be completed, the potential for spreading of droplets through exhalation valves should be considered in the site specific JSA. Considerations include availability of different styles of respiratory protection appropriate for the application and exposure, and whether all workers in a specific task area will be wearing respiratory protection. When only valved respirators are available or are needed for other hazards, all potentially exposed workers should properly wear respiratory protection to help reduce their exposures.

- Eye protection. Where eye protection is needed against SARS-CoV-2, optimal protection is provided by non-vented or indirectly vented goggles or face shields, or a full facepiece respirator.

C) In selecting PPE for COVID-19, consider and apply the exposure categories suggested by OSHA. OSHA suggests that “most construction workers are unlikely to need PPE beyond what they use to protect themselves during routine job tasks. Such PPE may include a hard hat, work gloves, safety glasses, and a face mask. However, under OSHA’s PPE standards for construction (29 CFR 1926 Subpart E), employers must consider

whether their hazard and risk assessments, including construction site job hazard analyses, indicate a need for the use of more protective PPE”.²¹ OSHA provides these categories:

- Lower exposure risk tasks are those where there is minimal close contact with co-workers (i.e. task allows a distance of 6 feet or more to be maintained). OSHA and CDC encourage routine cloth face covering use for these tasks (not as respiratory protection but to help reduce the spread of the wearer’s large respiratory droplets to others). OSHA does not recommend additional/enhanced respiratory or enhanced eye protection for Sars-CoV-2, beyond what is needed for other hazards.²² So, if the job site assessment has determined that the task involves other hazards that might require a respirator (e.g. silica) or enhanced eye protection (e.g. welding, grinding), they must be provided.
- Medium exposure risk tasks are those where close contact with co-workers (i.e., task brings workers within 6 feet of each other) is frequent. It also includes close contact with customers, visitors, or members of the public.

There is no “one-size fits all” recommendation for medium risk job tasks. JSA considerations will vary based on task details, including the 15-minute CDC-recommended suggestion for defining a “prolonged” period. CPWR - The Center for Construction Research and Training recommends that NIOSH-approved respirators be worn if workers need to be near each other to perform tasks or when working in close quarters, such as confined space work.²³ A JSA will also identify any other types of exposures (e.g. dust or chemicals) that need to be consid-

¹⁹ <https://www.cdc.gov/coronavirus/2019-ncov/community/conserving-respirator-supply.html>

²⁰ <https://www.osha.gov/Publications/OSHA3767.pdf>, pg 16-17

²¹ OSHA. Construction Work <https://www.osha.gov/SLTC/covid-19/construction.html#personal>

²² What Construction Workers Need to Know about COVID-19, 5/19/2020” <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/construction-workers.html>, accessed 5/21/2020.



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ered. In summary, enhanced respiratory and eye protection may or may not be needed for medium risk tasks depending on the circumstances. For example:

- **Enhanced respirator and eye protection not likely needed:** A task performed outdoors by three workers who will be working 3 feet apart for a 15-minute task. No other air contaminants are involved. All three workers will be wearing cloth face coverings and safety glasses based on company policy.
- **N95 respirator or higher and goggles or face shield suggested:** A task performed indoors by two workers who will be working 3-5 feet apart for a two-hour task. No other air contaminants are involved. However, the work is to be done in an interior 20' by 20' by 10' room with no windows. Room ventilation system is not operational.
- High exposure tasks are those involving entry into an indoor work site occupied by people such as other workers, customers, patients, or residents suspected of having or known to have COVID-19, including when an occupant of the site reports signs and symptoms consistent with COVID-19. This would include, for example, the person monitoring for temperature or symptoms for workers coming on site each day. While high exposure tasks are uncommon in construction, they definitely call for enhanced respiratory and eye protection. For example:
 - **N95 respirator or higher and goggles or face shield suggested:** A construction worker on the site reports feeling ill on the job. He is coughing and is having difficulty breathing. Co-workers have him sit down and they call the COVID-19 Site Safety Officer. Site policy calls for the supervisor and the Site Safety Officer to go to the

worker and close proximity may require additional PPE and respiratory protection.

- D) **Gloves.** With appropriate hand washing, gloves should not be needed to protect from COVID-19 for most tasks. Disposable gloves may be useful to reduce skin contamination for specific tasks where contact is more frequent than surface cleaning and disinfection cycles may allow. Chemical resistant gloves are also useful for employees responsible for surface cleaning and disinfection tasks. When disinfecting, gloves should be specific to protect against the cleaning agent used.

Note: These PPE selection examples are just a few of many potential construction task scenarios. They are provided to help illustrate the issues that need to be considered during JSAs. Additional studies of exposure and virus transmission will better inform the science and allow more definitive recommendations in the future. Until then employers should be cautious and should consult an industrial hygienist for complex or high exposure conditions.

PPE can get contaminated during the shift. Avoid sharing PPE among employees where possible. Properly clean and disinfect reusable PPE such as face shields, eye wear, reusable respirators (elastomeric facepiece respirators, powered air purifying respirators (PAPR), or supplied air respirators (SAR)), and fall protection at the end of each shift. Follow the manufacturers' recommendations for cleaning agents and procedures. Per 29 CFR 1926 all shared PPE must be cleaned and disinfected between use of different people.




- E) When disposable or other respirators are used, employers must comply with the requirements of OSHA's Respiratory Protection standard ([29 CFR 1910.134](#)), including the requirement to train workers to don respirators before entry and to remove and properly dispose of respirators upon exit. See OSHA website for enforcement flexibility status.

²³ NABTU and CPWR COVID-19 Standards for U.S. Construction Sites 27 April 2020. At https://www.cpwr.com/sites/default/files/NABTU_CPWR_Standards_COVID-19.pdf



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Table A: Comparison of Face Coverings, Face Masks, and Filtering Facepiece Respirators

Comparison Feature	Cloth Face Covering	Face Mask (Procedure/Surgical)	Filtering Facepiece Respirators (FFRs)
Photo			
Description	Cloth face covering used to cover mouth and nose.	Disposable mask used to cover nose and mouth. Surgical mask also provides fluid barrier.	Disposable respirator used to cover nose and mouth.
Fit on face	Loose	Loose	Tight
Intended Use	MAY HELP PROTECT OTHERS Per CDC, may help contain large respiratory droplets emitted from coughs, sneezes, or speech by wearers who don't yet know they have the virus. ²⁴ Effectiveness depends on mask materials and design. ²⁵ Not intended to protect the wearer. ²⁶ Public Health measure	HELP PROTECT OTHERS Designed to help reduce the number of large respiratory droplets introduced into the surrounding area as a wearer talks, sneezes, or coughs. ²⁷ HELP PROTECT WEARER Surgical mask includes fluid barrier to help protect the wearer's nose and mouth from splashes and sprays of bodily fluids. ²⁸	HELP PROTECT WEARER Designed to help reduce wearer's inhalation of both large droplets and small airborne particles (aerosols). ²⁹ HELP PROTECT OTHERS May help reduce the emission of respiratory droplets and small airborne particles (aerosols) into the air as wearers sneeze, cough, or talk. ³⁰
Reduce the wearer's exposure to airborne particulate hazards when properly selected and worn	No Not intended to protect wearer. ³¹	No Do not protect wearer against small airborne particles (aerosols). ³²	Yes NIOSH approved N95 respirators are at least 95% efficient in filtering particulates per NIOSH 42 CFR 84
PPE Certification	Not considered PPE	FDA (Surgical masks only)	NIOSH

Cloth Face Covering pictures courtesy of Getty, others courtesy of 3M Company.

²⁴ <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/about-face-coverings.html>
²⁵ <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-to-make-cloth-face-covering.html>
²⁶ <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/about-face-coverings.html>
²⁷ Hospital Respiratory Protection Program Toolkit, <https://www.osha.gov/Publications/OSHA3767.pdf>, pg 6
²⁸ Hospital Respiratory Protection Program Toolkit, <https://www.osha.gov/Publications/OSHA3767.pdf>, pg 6
²⁹ Hospital Respiratory Protection Program Toolkit, <https://www.osha.gov/Publications/OSHA3767.pdf>, pg 6
³⁰ Hospital Respiratory Protection Program Toolkit, <https://www.osha.gov/Publications/OSHA3767.pdf>, pg 6
³¹ <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/about-face-coverings.html>
³² Hospital Respiratory Protection Program Toolkit, <https://www.osha.gov/Publications/OSHA3767.pdf>, pg 6



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Step 5: Perform Job Safety Analyses (JSAs) to Review Tasks and Adjust Control Plans

Steps 1 to 4 mostly address measures needed across the site for all jobs. Step 5 uses job task as a lens for a closer look at potential exposures. It calls for doing Job Safety Analyses (JSAs) to review upcoming work. This step makes sure that what is likely to be a smaller number of higher exposure tasks are not overlooked. Controls and measures for these tasks can then be tailored further to assure protection. JSAs can also be applied to loosen precautions for tasks that have less exposure potential. Here are some “exposure factors” to consider when performing JSAs for COVID-19 hazards:

- **Indoor work without ventilation – especially in enclosed or restricted settings.** Whereas outdoor air currents dilute virus aerosols, indoor aerosols may linger. Ventilation systems in buildings under construction are not typically ready to operate. Work done in enclosed settings will merit additional controls such as arranging for temporary ventilation, fans, or opening windows.
- **Close quarter tasks.** Some construction tasks are typically done by two or more individuals working together such that social distancing is difficult. For example, work on scaffolds, work in trenches, setting glass windows, installing heavy equipment, or setting block or stone. Work in close proximity means higher exposure potential from larger droplets. It is useful to identify these tasks ahead of time for additional planning. Pre-planning or use of additional equipment may allow the work to be done in less time. Temporary barriers may be helpful to reinforce distance for some tasks. Use of N95 respirators might also be an option.
- **Noisy tasks where communication is difficult without shouting.** Speaking releases droplets and aerosols and studies show that louder speaking can produce ten times the emissions of quieter

What is a JSA (or JHA)?

A **Job Safety Analysis** is a common technique to spotlight job tasks to identify and address hazards before they occur. The term “**Job Hazard Analysis**” (JHA) is also common.

A JSA focuses on the relationship between the worker, the task, the tools and the environment. It asks supervisors and workers to identify the basic steps to complete the job; the potential hazards that could occur at each step; and the safest way to do the job, including any controls or safety gear needed. Performing a JSA before completing a task and putting it in writing promotes good planning and safe work procedures.

While JSAs are most often undertaken for safety, the same approach works for health hazards. See [OSHA 3071](#) and [OSH Answers: Job Safety Analysis](#) for additional information.

talking.³³ This factor could be addressed by renting or using quieter equipment, use of radios or phones, or additional pre-planning to minimize the need for communication in the task area.

- **Heavy physical exertion tasks.** Heavy exertion or working in high temperature areas can involve heavier or rapid breathing rates that could act to increase the intake of any aerosols present in the air. It may be possible to make the task easier or shorter using alternative equipment or tools.
- **Long duration or combination factor tasks.** Tasks that are longer in duration, or that involve several of the above factors (e.g. heavy noisy exertion tasks in enclosed settings) deserve additional planning due to the likelihood of higher exposures. The likelihood of exposures can be reduced by using most of the previously mentioned controls, including the use of N95 respirators for added protection.

³³ Asadi et al. 2019. Aerosol emission and superemission during human speech increase with voice loudness. Nature. Volume 9, Article number: 2348 Published 20 February 2019. <https://www.nature.com/articles/s41598-019-38808-z>



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- **Contact with the public or other workers.** Most construction sites are restricted entry and direct contact with the public does not occur. However, renovation or repair work in occupied settings such as homes, apartment buildings, or schools may involve some public or occupant contact. Work in commercial or industrial settings may include interaction with other companies' employees. This factor can be managed using planning, scheduling, temporary barriers, dedicated entrances and elevators, and similar measures.
- **Renovation or repair work at locations where COVID-19 patients have been present.** Some construction employers specialize in renovation and repair work. These contractors may be asked to perform work at locations such as hospitals, nursing homes, prisons, food processing plants, or other locations where there have been COVID-19 outbreaks. This type of work has the potential for higher exposures. Such jobs need additional coordination and communication with facility officials, and an assumption that higher exposures need to be addressed. It is best to consult with an industrial hygienist to tailor precautions and controls for these types of jobs.

Here are some JSA examples to illustrate how they can be helpful:

JSA Example:

Two flaggers are needed for a road repair job that will last two days. Each will be positioned 200 feet from the work with a paddle sign.

The JSA finds lower exposure potential for this task because 1) it is performed outdoors; and 2) social distancing is not an issue. The two flaggers should not need to wear a face covering during the work. The employees should have a face cover with them in case they need to put it on to interact with a car passenger or co-worker.

JSA Example

A job calls for two employees to install exterior cladding. The job is expected to take two months. The work is at height and a rented lift basket will be used. The lift basket interior work platform dimensions are 3 feet by 8 feet. Two employees are needed to lift, position, and attach the cladding.

The work is outdoors but involves close quarter work in the lift basket (within 6 feet). Rather than rely on face covers and PPE, a temporary transparent plastic barrier was installed to provide breathing zone separation. The plastic was mounted on a wooden frame and attached to the lift basket using a pinch clamp and heavy-duty zip ties so that it could swing to allow access. This provided separation, included enough room to position the cladding against the building, and was easily removed at the end of the job. It did not involve any modification of the lift basket itself, which would have required the manufacturer's approval. See photo for details:

- Transparent plastic barrier
- Wood frame
- Zip tie to secure
- Removable clamp allows swivel



Photo courtesy of AGC Oregon-Columbia Chapter member Western Partitions, Inc..



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JSA Example:

Plumbing work at a hospital includes upgrading of plumbing fixtures in the Intensive Care Unit (ICU). Tasks include removal of existing toilet and plumbing fixtures and replacement with newer models. The ICU was recently used for treatment of COVID-19 patients but will be cleaned and closed for this renovation work.

The JSA finds this to be a case with higher exposure potential. The COVID-19 site officer will need to coordinate closely with the hospital safety representatives to understand what disinfection has been done beforehand, and to plan the work ahead of time. The Coronavirus has been found in

stool samples of COVID-19 patients and in hospital room toilet spaces.³⁴

While not a common exposure pathway, this would be a potential exposure pathway concern for plumbers performing this task. The International Association of Plumbing and Mechanical Officials (IAPMO) recommends that “for as long as the pandemic is still active, it should be assumed by anyone working on a sanitary drainage system that the virus is present”.³⁵ Additional PPE such as protective suits, gloves, and face shields are needed along with frequent handwashing. This is the type of work where consultation with an industrial hygienist is advisable.

Summary of JSA Exposure Factors

Higher exposure potential: Indoor work, close quarter work, higher worker density, enclosed spaces, unventilated spaces, longer tasks, heavy exertion tasks, loud speaking voice conditions, public contact

Lower exposure potential: Outdoor work, spread out work, lower worker density, good air flow, shorter tasks, lower exertion tasks, normal speaking voice conditions, no public contact

Step 6: Develop a COVID-19 Case Response Plan

The previous steps are all intended to reduce the likelihood of having someone on the construction worksite develop COVID-19 or test positive for the coronavirus. However, cases have been reported on construction sites, and a response action plan must be developed in advance of someone on your jobsite developing COVID-19.

Notification and tracing measures: The White House [Guidelines for Opening Up America Again](#) call for employers to “Develop and implement pol-

icies and procedures for workforce contact tracing following employee COVID+ test”. CDC recommends that employers perform these actions in the case of a COVID-19 case:

1. Compile information on the locations where the ill or positive test employee worked on the site for two days prior to symptoms occurring;
2. Identify co-workers who had close contact (within 6 feet of the employee during this time period) to be considered potentially exposed, and

³⁴ Zheng, S. et al. 2020. Viral load dynamics and disease severity in patients infected with SARS-CoV-2 in Zhejiang province, China, January-March 2020: retrospective cohort study *BMJ* 2020;369:m1443

³⁵ DeMarco, P. 2020. Understanding Coronavirus Exposure for Plumbing Professionals https://www.iapmo.org/media/23453/coronavirus_guidance_for_plumbers.pdf



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3. Inform these employees of their possible exposure. See guidance for additional information and updates.^{36,37}

A variety of digital tools are emerging to assist with notification and tracing. Some are phone-based applications (See [COVID-19 apps](#)), time-card management programs or wearable devices.

A designated response team should conduct a dry run exercise ahead of time to help ensure the response plan is functional. This can help:

- Determine if information to be collected is sufficient to make the necessary determinations and actions,
- Identify if additional information or help will be needed.
- Ensure methods of informing employees are sufficient while meeting appropriate confidentiality requirements.
- Evaluate that contact information for local health departments is accurate and readily available. Health departments have expertise in contact tracing and may provide guidance, training, or assistance. However, they may be lacking sufficient resources and may not be able to respond immediately. It may be up to the employer to perform contact tracing and employee communication in a timely manner.

Post Case Identification Cleaning Measures: The CDC provides the following guidance for workplaces that says, in part:

Close off all areas used by the person who developed COVID-19 until cleaning and disinfection is



Worksite COVID-19 signage. (Photo courtesy of Matt Gillen.)

done. Wait (preferably 24 hours) before cleaning and disinfection following the [CDC Cleaning and Disinfecting Your Facility](#). If it has been 7 days or more since the sick employee used the facility, additional cleaning and disinfection is not necessary. Continue routinely cleaning and disinfecting all high-touch surfaces in the facility.³⁸ Please see the link for complete details.

Additional guidance is available at the CDC [Reopening Guidance for Cleaning and Disinfecting Public Spaces, Workplaces, Businesses, Schools, and Homes](#) and AIHA guidance titled: [Workplace Cleaning for COVID-19](#).

Step 7: Implement and Monitor Overall Plans

Communicating the COVID-19 Control Plan to employees and supervisors is important. Communication should also include training workers on steps

³⁶ CDC. Implementing Safety Practices for Critical Infrastructure Workers Who May Have Had Exposure to a Person with Suspected or Confirmed COVID-19 <https://www.cdc.gov/coronavirus/2019-ncov/community/critical-workers/implementing-safety-practices.html>

³⁷ Interim Guidance for Businesses and Employers Responding to Coronavirus Disease 2019 (COVID-19), May 2020 <https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html>

³⁸ CDC: *General Business Frequently Asked Questions: What should I do if I find out several days later, after an employee worked, that they were diagnosed with COVID-19?* <https://www.cdc.gov/coronavirus/2019-ncov/community/general-business-faq.html>



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they should take such as cough and sneeze etiquette, and basic facts about how COVID-19 spreads. JSAs can be useful for communicating task-specific control measures. Signs and posters placed throughout a worksite can help reinforce the importance of COVID-19 measures.

Once the plan is up and running, the COVID-19 site officers should check and track that controls and measures are working and are being used. They should observe flow of workers and social distancing efforts. Employee and supervisor feedback is useful to further refine measures and improve consistent use. Multi-employer sites typically require additional coordination for consistent and reliable performance.

How Can an Industrial Hygienist Help?

Industrial hygienists protect worker health by assisting employers with resolving technical questions related to exposures, controls, and cleaning. They can provide COVID-19 site officer training and assist with development of control plans. They can provide expert advice on jobs identified by JSAs as being of higher risk, such as work to be done in hospital settings or in other locations that have experienced outbreaks (e.g. prisons, nursing homes and meat processing plants). They can provide quality assurance by evaluating the effectiveness of site control plans and can provide additional guidance on sites where COVID-19 cases are occurring. Please Check the [AIHA](https://www.aiha.org) website for additional information and resources at <https://www.backtoworksafely.org/>

Takeaway Messages

- COVID-19 is an ongoing health hazard until a vaccine is developed. Community spread conditions may increase, or decrease, and these precautions can be adjusted accordingly. This basic program is likely to be needed again in the future for other epidemics or regional outbreaks.
 - Actively encouraging employees to stay home if sick (or exposed/caring for others who are sick) is important. Medical leave policies are critical to successfully minimizing having sick workers on the job. The best policies are flexible and non-punitive, and allow sick employees to stay home and away from co-workers.
 - Asymptomatic individuals do not cough or sneeze much – but studies show they can still silently spread the coronavirus from speaking and breathing. This is the primary need for precautionary measures.
 - Simple site-wide controls, like mandatory social distancing or face coverings, are not always the most desired control for the wide variety of tasks on a construction site. JSAs are valuable because they help identify the smaller number of higher-risk tasks, which can be prioritized and given the proper focus to control exposures and risks.
 - COVID-19 is an urgent concern, but it is not the only health hazard on the job. Other hazards such as noise, other air contaminants, and manual material handling, and high temperatures are important in their own right and may also impact COVID-19 exposures and controls. See the [Focus Four for Health](#) guidance document for additional information.
 - Construction industry site sanitation historically has not been exemplary. COVID-19 is an opportunity to change these practices for the better on a permanent basis.
 - Testing options for COVID-19 should improve in the future and may provide additional options and dimensions to existing programs.
- In summary: COVID-19 presents an unprecedented and rapidly changing situation in comparison to other well-established construction health hazards. Measures are needed even in the face of an incomplete picture and shortages of PPE. New informa-



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tion about the spread of infection and the course and treatment of the disease continues to develop. New technologies such as wearable devices to track worker interactions are coming onto the market. Federal, state, and local requirements or guidance may loosen or tighten in the months ahead. Con-

struction industry employers need to check regularly for new information to guide their efforts. Construction is a creative, problem-solving business, and we are confident that construction employers and employees will adapt to address and move beyond the COVID-19 hazard.



Photo courtesy of AGC Oregon-Columbia Chapter member Advanced American Construction, Inc.



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Additional Resources

Many resources have already been mentioned in the text above or in footnotes. Additional resources are provided that expand on the many elements that may need to be considered in preparing a company's response plan. Some are repeated here if they provide general guidance or specific information to support COVID-19 control efforts in construction environments.

Guidance associated with Healthcare-related situations or business with active COVID-disease are generally **not** included but can be accessed at the index website for COVID-19 resources at each organization.

In general, these resources provide the title of the COVID-19 related topic and the full hyperlink to the resources when last accessed. Some resources have notes on their use for reference to specific guidance in response plans and construction specific information.

These resources are constantly changing and being updated. Please check for current versions of each one on a regular basis.

White House

- Guidelines Opening Up America Again
 - <https://www.whitehouse.gov/wp-content/uploads/2020/04/Guidelines-for-Opening-Up-America-Again.pdf>

CDC

- CDC: CDC Coronavirus (COVID-19) webpage
 - <https://www.cdc.gov/coronavirus/2019-ncov/index.html>
 - Addresses a wide variety of topics and the latest guidance for individuals, health providers, and employers.

- Communities, Schools, Workplaces, and Events - Information for Where You Live, Work, Learn, and Play
 - <https://www.cdc.gov/coronavirus/2019-ncov/community/index.html>
 - A collection of re-opening tools for specific kinds of workplaces

Some web-pages state their guidance supplements but does not replace general guidance at these web sites:

- [osha.gov/coronavirus](https://www.osha.gov/coronavirus)
- <https://www.cdc.gov/coronavirus/2019-ncov/index.html>
- Implementing Safety Practices for Critical Infrastructure Workers Who May Have Had Exposure to a Person with Suspected or Confirmed COVID-19
 - <https://www.cdc.gov/coronavirus/2019-ncov/community/critical-workers/implementing-safety-practices.html>

CDC Guidance/Planning to Reopen

- Interim Guidance for Businesses and Employers to Plan and Respond to Coronavirus Disease 2019
 - <https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html>
- Manufacturing Workers and Employers (May 13)
 - <https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-manufacturing-workers-employers.html>

For construction, there is specific CDC guidance titled:

- What Construction Workers Need to Know about COVID-19
 - <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/construction-workers.html>



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Other CDC pages of interest

- Symptoms of Coronavirus:
 - <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>
- What to Do If You Are Sick:
 - <https://www.cdc.gov/coronavirus/2019-ncov/if-you-are-sick/steps-when-sick.html>
- Public Health Recommendations for Community-Related Exposure
 - <https://www.cdc.gov/coronavirus/2019-ncov/php/public-health-recommendations.html>
 - For operational definition of “prolonged” exposure. Reference for CDC close contact/duration: < 6 ft, use 15 min: see endnote ** and ***
- Implementing Safety Practices for Critical Infrastructure Workers Who May Have Had Exposure to a Person with Suspected or Confirmed COVID-19: Interim Guidance
 - <https://www.cdc.gov/coronavirus/2019-ncov/community/critical-workers/implementing-safety-practices.html>
- Contact Tracing:
 - <https://www.cdc.gov/coronavirus/2019-ncov/php/open-america/contact-tracing-resources.html>
- Discontinuation of Isolation for Persons with COVID-19 Not in Healthcare Settings
 - <https://www.cdc.gov/coronavirus/2019-ncov/hcp/disposition-in-home-patients.html>

CDC/EPA Guidance: Cleaning and Disinfecting

- CDC/EPA Guidance for Cleaning And Disinfecting Public Spaces, Workplaces, Businesses, Schools, And Homes
 - https://www.epa.gov/sites/production/files/2020-04/documents/316485-c_reopenin-gamerica_guidance_4.19_6pm.pdf
- Cleaning and Disinfection for Community Facilities; Interim Recommendations for U.S. Community Facilities with Suspected/Confirmed Coronavirus Disease 2019 (COVID-19)
 - <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/cleaning-disinfection.html>
- Implementing Safety Practices for Critical Infrastructure Workers Who May Have Had Exposure to a Person with Suspected or Confirmed COVID-19: Interim Guidance
 - <https://www.cdc.gov/coronavirus/2019-ncov/community/critical-workers/implementing-safety-practices.html>
- Reopening Guidance for Cleaning and Disinfecting Public Spaces, Workplaces, Businesses, Schools, and Homes
 - <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/businesses-employers.html>
- Cleaning and Disinfection for Households; Interim Recommendations for U.S. Households with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19)
 - <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cleaning-disinfection.html>

CDC Guidance: Respirators/PPE

- Personal Protective Equipment: Questions and Answers
 - <https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirator-use-faq.html>
- Conserving and Extending Respirators for Non-healthcare Sectors:
 - https://www.cdc.gov/coronavirus/2019-ncov/community/conserving-respirator-supply.html?deliveryName=USCDC_10_4-DM26172
 - [interim guidance](#) that offers strategies to conserve, extend, and respond to shortages



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- “Counterfeit N95”
 - <https://www.cdc.gov/niosh/npptl/usernotices/counterfeitResp.html>
 - (See 3M below for list of international respiratory standards)

OSHA

[OSHA COVID-19 webpage](#) has a variety of topics and Spanish language information.

- COVID-19 index page
 - [osha.gov/coronavirus](https://www.osha.gov/coronavirus)
- OSHA Guidance for Workplaces for COVID-19 (03/2020)
 - <https://www.osha.gov/Publications/OSHA3990.pdf>
 - Includes general guidance on controls and risk categories and appropriate respiratory protection. Very high, high, medium, low risk
 - 5/19/20 Compliance update
 - 5-19-20 Enforcement Guidance
- OSHA ALERT: Covid-19 Guidance for the Construction Workforce
 - <https://www.osha.gov/Publications/OSHA4000.pdf>
- Construction Work
 - <https://www.osha.gov/SLTC/covid-19/construction.html>
- COVID-19 Frequently Asked Questions
 - <https://www.osha.gov/SLTC/covid-19/covid-19-faq.html>
 - Information on cloth face coverings, surgical masks, and respirators

NIOSH

- [NIOSH Coronavirus disease - 2019 webpage](#) includes the latest information on respirators and PPE, workplace guidance, and other topics.

- Construction Safety and Health
 - <https://www.cdc.gov/niosh/construction/default.html>

Other US Agencies

EPA:

- Disinfectants; List N:
 - <https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>

NIHES: [NIHES COVID-19 webpage](#) includes a variety of worker training resources

EEOC:

- The Equal Employment Opportunity Commission has a Coronavirus and COVID-19 webpage including FAQs addressing medical screening topics
 - What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws
 - https://www.eeoc.gov/eeoc/newsroom/wysk/wysk_ada_rehabilitaion_act_coronavirus.cfm

World Health Organization (WHO)

- Coronavirus Disease (COVID-19) Pandemic
 - <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>
- EPI-WIN: WHO Information Network for Epidemics
 - <https://www.who.int/teams/risk-communication>

Health Canada

Health Canada [Coronavirus disease \(COVID-19\) webpage](#) includes a wide variety of information

- Coronavirus Disease (COVID-19): Symptoms and Treatment
 - <https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/symptoms.html>



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- Many provinces have additional information, requirements, and guidance.
 - British Columbia has a WorksafeBC Covid-19 information page,
 - Ontario has construction guidance at Ontario Construction Site Health and Safety during Covid 19

States

Various states have guidance or requirements.

The National Governors Association [Coronavirus: What you need to know](#) webpage includes a link to each state, which provides an easy way to find information.

A few relevant to construction are included below.

WA Labor and Industries

- <https://lni.wa.gov/safety-health/safety-topics/industry/construction>
- <https://lni.wa.gov/safety-health/safety-topics/industry/construction#videos-training-and-prevention>
- Washington Labor & Industries – DOSH: Dealing with COVID-19 (coronavirus) in Construction (PUBLICATION F414-162-000 [03-2020])
 - https://www.lni.wa.gov/forms-publications/F414-162-000.pdf?utm_medium=email&utm_source=govdelivery

University of Washington: Dept of Occupational and Environmental Health Sciences

- Safer Cleaning, Sanitizing and Disinfecting Strategies to Reduce and Prevent COVID-19 Transmission
 - https://osha.washington.edu/sites/default/files/documents/FactSheet_Cleaning_Final_UWDEOHS_0.pdf

District of Columbia

- COVID-19 Guidelines for Construction Sites within the District of Columbia
 - https://coronavirus.dc.gov/sites/default/files/dc/sites/coronavirus/publication/attachments/COVID%2019%20Guidelines%20for%20Construction%20Sites%20FINAL_0.pdf

Organizations

AIHA

- AIHA has a [Coronavirus Outbreak Resource Center](#) webpage with a variety of resources
 - https://www.aiha.org/public-resources/consumer-resources/coronavirus_outbreak_resources
- and a [Back to Work Safely](#) page with industry-specific guidance
 - <https://www.backtoworksafely.org/>

The industry specific guidance for construction is:

- Returning to Work: Construction Environment.
 - https://aiha-assets.sfo2.digitaloceanspaces.com/AIHA/resources/Returning-to-Work-Construction-Environments_GuidanceDocument.pdf

They also have available:

- [Focus Four for Health](#) guidance document
 - <http://bit.ly/focusfouraiha>
- The Role of the Industrial Hygienist in a Pandemic: Publication preview:
 - https://go.snapapp.com/Role_IH_Pandemic

Various construction organizations also have useful sites and guidance materials. A partial list includes:

- CPWR – The Center for Construction Research and Training has a [COVID-19 Resources](#) page and a [COVID-19 Construction Clearinghouse](#), which provides a central resource for construction employers and workers to find the latest research, guidance



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documents, training, and other resources.

- They also have available the [CPWR/NABTU Guidance on COVID-19](#)
- The Associated General Contractors of America (AGC) has a [Coronavirus \(COVID-19\) webpage](#)
- Associated General Contractors Oregon-Columbia Chapter has this [COVID-19 Social Distancing Officer Responsibilities](#) guidance.
- The Canadian Construction Association has [COVID-19-Standardized-Protocols-for-All-Canadian-Construction-Sites](#)
- The Infrastructure Health and Safety Association has a [COVID-19 Links and Resources](#) webpage.
- The Boilermakers joint labor/management [COVID-19 Construction Solutions](#) page provides posters, procedures, and programs
- The Laborers Health and Safety Fund of North America has [Coronavirus and COVID-19 Resources](#) webpage
- The Association for Professionals in Infection Control (APIC) have a [COVID-19 Resources](#) webpage, which includes:
 - Construction and Renovation:
 - o <https://text.apic.org/toc/infection-prevention-for-support-services-and-the-care-environment/construction-and-renovation>

- Mental health resources related to COVID-19; several organizations provide guidance, including:
 - [AGC of Washington](#)
 - [Construction Industry Alliance for Suicide Prevention](#)
 - [Construction Business Owner: How to Prevent Workplace Violence During & After COVID-19](#)

Private Industry*

3M

- 3M COVID-19 Index website: www.3m.com/coronavirus
- Comparison of FFP2, KN95, and N95 and Other Filtering Facepiece Respirator Classes
 - <https://multimedia.3m.com/mws/media/17915000/comparison-ffp2-kn95-n95-filtering-facepiece-respirator-classes-tb.pdf>
- Filtering Facepiece Respirators FAQ: Workplace
 - <https://multimedia.3m.com/mws/media/17925390/respiratory-protection-faq-workplace.pdf>

If you have questions, comments, suggestions, data, or photos you wish to share, please sent them to the AIHA Construction Committee at tla@aiha.org.

*Any mention of specific companies or products in this guidance document does not imply endorsement by AIHA.



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