

Tunnel Laborer

Skills Standards



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Purpose

The purpose of this report is to provide the results of the effort to develop Skills Standards for CCLs involved in Tunneling projects. This effort included a job analysis conducted by THE PITTMAN MCLENAGAN GROUP, L.C. (PMG) on behalf of LIUNA and described in this report. The job analysis consisted of several virtual focus groups comprised of LIUNA stakeholders and the subsequent analyses by PMG of the results of those focus groups. The focus groups were tasked with providing expert opinion about the work necessary to be performed by Construction Craft Laborers (CCLs) assigned to work on Tunneling projects.

This report informs relevant stakeholders of the Skills Standards for the CCL and to aid the developer of a course to teach CCLs to perform the tasks required of them when working on Tunneling projects. The meeting attendees were subject matter experts (SMEs) and, as such, were asked to review and adjust a list of potential work behaviors (tasks) that CCLs should be able to perform when hired by a contractor to perform Tunneling work. The list was developed from a literature review conducted by PMG and in consultation with SMEs. The tasks to be performed by the CCLs must be generically applicable to most work sites and regions across North America. As a result, the scope of the course arising from and/or informed by this report must be generic in nature to be useful in teaching CCLs to perform work that is useful across the various work sites and regions. The SMEs were also asked to review/revise/create a list of potential knowledges, skills and abilities (KSAs) that would be useful to CCLs when performing the common Tunneling tasks. The user of this document should keep in mind that other and more specific tasks may be performed by CCLs working on specific sites or in specific regions that require the performance of tasks not covered in this study. Those unique tasks and KSAs must be taught by instructional providers for those regions and/or specific sites.

In addition to developing the course content useful to train CCLs on how to perform basic Tunneling tasks, this report also provides the information necessary for the development of a test plan for the purpose of creating assessments used to certify CCLs for tunneling work. In this effort, the study of the CCLs job at work sites conformed, where possible, to the 29 CFR 1607 - Uniform Guidelines for Employee Selection (1978) and related US federal law and other professional guidelines including American National Standards Institute (ANSI) 17024 accreditation program.

Skills Standards Development

The skills standards described in this report arose from an Internet-based survey of SMEs and multiple virtual focus group meetings conducted by PMG. In each focus group, multiple SMEs met to provide expertise on the work performed by CCLs at work sites where Tunneling work occurs.

In the first of these meetings, a social scientist at PMG led seven SMEs during a virtual meeting to review, revise and in some cases, help create a list of potential work behaviors/tasks and KSAs needed by CCLs at work sites where Tunneling work occurs, that would enable the CCLs to perform their jobs. SMEs are listed in the Appendix for each step of this process.

After the first review meeting, an Internet-based survey was distributed to SMEs to evaluate the work behaviors/ tasks and KSAs. SMEs were asked to participate in this survey through LIUNA's contact network. On this survey, a sample of 28 SMEs from across North America rated the work behaviors/tasks on Importance to performance of the job and Difficulty to Perform. These SMEs also

rated the KSAs on Importance to performance of the job. Thorough data cleaning was performed and 23 completed survey responses (i.e., all questions were answered in the survey) were included in PMG's analysis. This analysis will be described later in this report. A copy of the Internet-based survey is provided in the Appendix.

In the second and final virtual meeting, a social scientist at PMG captured six SMEs' evaluation of the tasks and KSAs on a variety of topics using the results from the survey as the starting point. For the tasks, the SMEs were asked to individually rate each task on Necessity at Exit from Training and Certification (post certification class) and Frequency of Performance. For the KSAs, the SMEs were asked to rate each KSA on Necessity at Exit (post certification class), Consequence of Error, and Relative Contribution to Performance. Finally, the SMEs "linked" those KSAs that were at least helpful to performance of one or more tasks in the list. Because one SME did not provide Relative Contribution and Task-KSA "Linkage" ratings, only five SMEs' data were included in analyses of these topics. Full data results for the Internet-based survey and the second virtual meeting are on file at PMG and available upon request.

Decision rules were applied to the tasks and KSAs after the Internet-based survey and after the second virtual meeting, which resulted in the tasks either being dropped from the list or retained. First, the task had to be considered both important and necessary at exit (post certification class). Next, PMG used a modified Lawshe (1975) approach using the significance levels identified by Lawshe. For the Internet-based survey, approximately 70% of the SMEs had to agree the task or the KSA was important in order to be retained. For the second virtual meeting, all six SMEs had to agree that the task or the KSA was necessary at exit from training. Tasks and KSAs not meeting these decision rules were dropped from the list. All rating scales are provided in the Appendix.

For the tasks, SMEs' ratings for Difficulty and Frequency were averaged and the averages were summed to create a "consideration value." The consideration value was used to "band" the tasks by first calculating the mean and standard deviation of the consideration value across all tasks and then by placing the tasks in ranked bands as follows: Highest – Greater than one standard deviation above the mean, Moderately High – Greater than the mean but one standard deviation or less above the mean, Moderate – Mean to one standard deviation below the mean, Low – more than one standard deviation below the mean. PMG subsequently wrote draft performance measures for all tasks that were evaluated to be in the Moderate, Moderately High, or Highest bands.

For the KSAs, PMG calculated the total tasks linked to each KSA. PMG then "banded" the KSAs on their average contribution value and total linkages in a fashion very similar to that described above for

Lawshe, C.H. (1975). A quantitative approach to content validity. *Personnel Psychology*, 28, 563-575.

tasks. For the draft performance functions, PMG included all retained KSAs that fell within all bands due to their importance to the performance of certain critical tasks. For example, although the KSA Reading Comprehension fell in the "Low" band, it was included due to need to read in order to perform certain, critical tasks.

After the data analysis, SMEs reviewed and evaluated the draft performance measures that were created by PMG. PMG used the decision rules and task ratings described above to create the performance measures using the Instructional System Design (ISD) approach for creation of terminal

objectives. Although not necessary, PMG used the Audience, Behavior, Condition, Degree (ABCD) method when creating the performance measure statements. SMEs made adjustments by changing the wording of the statements to improve understanding, changing the condition and/or the degree to which the performance measures must be performed. Additionally, SMEs reviewed all tasks and KSAs and made minor wording changes to some of these. Finally, the SMEs at LIUNA confirmed that all retained KSAs should be included in the skills standards. These KSAs are considered enabling objectives for the performance measures to which they are linked.

Definition of Terms Used to Describe and Define Skills Standards

The definitions of the following terms are in commonly recognized job analysis literature (Gael, 1983).

Function – A Function is a broad subdivision of a job composed of a group of tasks that are related based on some defined common factor. Tasks are grouped into functions based on their similarity of purpose (e.g., safety tasks, assembly tasks) or based on some other relevant categorization (e.g., chronology – beginning/end of shift, work activity – clean up). Generally, functions represent broad job goals. For the purposes of this report, a job is a collection of job functions performed by one employee.

Task – A Task is a discrete organized unit of work performed by an individual to achieve an organizationally desired outcome. According to the USAF *Handbook for Designers of Instructional Systems* defines a task as a group of related, manual, goal-directed activities that have a definite beginning and end; it involves interaction with equipment, other people, and/or media; and when performed, it results in a meaningful product. A task includes a mixture of decisions, perceptions, and/or physical activities required of one person.

Performance Measure - A Performance Measure is a statement of expectations of desired employee performance expressed in the ABCD format (Audience, Behavior, Condition, Degree). Performance measures are designed to inform curriculum and certification assessment development. They identify the critical work functions, key tasks, performance measures, and knowledges, skills, and abilities required to successfully perform in a given occupation or field.

It is understood that all of the information contained in the performance measures may or may not be included in course development or assessment development for a variety of logical and pragmatic

Gael, S. (1983). Job Analysis – A guide to assessing work activities.

reasons. From a logic perspective, CCLs that can perform all of the performance measures as described are demonstrating 100% performance; far beyond what is required at a mastery level (the training is designed to meet the journey level). Also, from a pragmatic standpoint, not all performance measures can be addressed in training given the varied resource constraints of the different regions and training facilities.

Instructional designers use this information as the basis for the development of training objectives from which to create standards-based industry curriculum. Attainment of training objectives provides reasonable evidence that an individual has the knowledge and ability to perform the job to expectations in the field.

Certification assessment developers also use the performance measures as input into the

development of certification assessments. This information is used to create assessments that, where feasible, can measure the degree to which an individual possesses the knowledges, skills and abilities to carry out key aspects of the job as measured against the performance level specified in the performance measure.

Knowledges, Skills, and Abilities – According to the US Office of Personnel Management, Knowledges, Skills, and Abilities (KSAs) are the attributes required to perform a job.

- Knowledge - Is a body of information applied directly to the performance of a function.
- Skill - Is an observable competence to perform a learned psychomotor act.
- Ability - Is competence to perform an observable behavior or a behavior that results in an observable product.

Skills Standards

Safety Function¹

While working in enclosed environments, such as those found underground, Tunnel Laborers must always be thinking of safety. Basic tasks that lead to a safe environment include using proper lighting in tunnels and checking in and out of tunnels as required. Tunnel Laborers often encounter materials that are extremely hazardous to the health of everyone on the worksite. These can include, but are not limited to, flammable and toxic gases which may be extremely hazardous in enclosed environments. In these situations, it is essential that Tunnel Laborers constantly ventilate the workspace and strictly monitor the air quality. These measures help to prevent workers in the tunnel from experiencing immediate and/or long-term health issues, such as issues that may occur from inhaling silica-containing dust. It is also important that Tunnel Laborers work in a manner that mitigates the production of hazardous atmospheres, in order to maintain a safe atmosphere in the tunnel. Finally, it is vital that Tunnel Laborers comply with all safety instructions on Safety Data Sheets (SDS) for chemicals used, and on warning signs that they may encounter during their work. The Safety Function consists of:

- Using and maintaining different types of PPE;
- Paying attention to equipment that monitors the air in tunnels, e.g., gas monitors;
- Ventilating the tunnel on a regular basis;
- Warning others before commencing hazardous activities, e.g., blasting;
- Continuously observing the work environment for potential safety hazards;
- Safely storing hazardous materials.

Critical Tasks

The following tasks provide a more detailed understanding of this function and are in descending order of a combination of difficulty and frequency.

1. Ventilates tunnels constantly with proper equipment (e.g., ventilation fan) to ensure fresh air flow.
2. Monitors overall air quality of underground work environment (e.g., by observing/listening to gas monitors).
3. Rides in “man-trips” and/or operates and/or signals locomotives or other vehicles securely, without risking injuries to self and others.
4. Follows directions listed on safety labels and warning signs, to include SDS and safety/warning labels, before using chemicals, tools, and other materials.
5. Cleans and maintains PPE to ensure its proper functionality.
6. Visually inspects tunnel and work area for safety hazards.
7. Obtains new PPE when needed.
8. Takes proper safety precautions, to include wearing applicable PPE when needed (e.g., safety glasses, gloves, etc.) to prevent accidents and exposure to contaminants.
9. Warns others to evacuate the scene prior to blasting/use of explosives through methods appropriate for the area (e.g., verbal warnings, air horns).

¹This function is a combination of two task categories that were similar in nature. The tasks and performance measures were combined where appropriate, and may not reflect the exact content that was initially reviewed by SMEs. These changes were made based on input from SMEs in the final review process.

10. Safely stores and appropriately marks explosives and gas cylinders (e.g., oxygen/acetylene).
11. Checks in and out of tunnel to ensure an accurate headcount.²

Performance Measures

These Measures are not intended to address every critical task. Further, in some cases the Measure covers more than one task. Finally, some tasks did not meet the decision criteria for inclusion as a Performance Measure.

1. The Tunnel Laborer will, given a photograph/video/description of a tunnel environment containing a gas detection monitor, describe the correct sequence of steps to take when a monitor alarms, with 100% accuracy within the specified time frame.
2. The Tunnel Laborer will demonstrate (or describe) the proper methods to safely operate a tunnel transport vehicle (i.e., locomotive, truck) with 100% accuracy within the specified time frame.
3. The Tunnel Laborer will describe the critical tasks of a brakemen on a tunnel locomotive with 100% accuracy within the specified time frame. This includes an explanation of signals commonly used by brakemen, e.g., light signals.
4. The Tunnel Laborer will, given appropriate safety labels and/or SDS, describe how to maintain a safe work environment while the relevant material or compound is in use with 100% accuracy within the specified time frame. This will include the safe use of explosives and compressed gas cylinders.
5. The Tunnel Laborer will describe the proper methods of inspecting and maintaining specific PPE with 100% accuracy within the specified time frame. This will include a description of the point at which PPE becomes unusable.
6. The Tunnel Laborer will, when provided with visual evidence of an unsafe situation in the construction of a tunnel, identify the dangers of the situation and the proper actions to correct it while ensuring worksite safety with 100% accuracy within the specified time frame.

²This task did not meet the data threshold for critical tasks due to its low level of difficulty, but is included because SMEs indicated its high level of importance and frequency.

Critical Knowledges, Skills and Abilities (KSAs)

The following critical KSAs are linked to the critical tasks and are provided in descending order of importance and the number of linkages to tasks listed for the “Safety” function.

1. **Knowledge of Worksite Safety Practices** - Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
2. **Skill and Ability in Working Safely** - Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
3. **Following Directions or Instructions** - Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
4. **Attention To Detail** - Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
5. **Work Environment** - Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
6. **Autonomy/Initiative** - Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
7. **Learning** - Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
8. **Communication** - Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
9. **Use of Senses** - Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
10. **Knowledge of Hazardous Material Safety** - Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
11. **Reading Comprehension** - Ability to read and understand written materials required by the job.
12. **Hand-eye Coordination** - Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
13. **Knowledge of Ventilation** - Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
14. **Interpersonal Skills/Teamwork** - Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different

situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.

15. **Skill and Ability in Soft Ground Tunneling** - Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
16. **Knowledge of Soft Ground Tunneling Equipment** - Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., backhoe loaders, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to use these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
17. **Knowledge of Jumbo Drills** - Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
18. **Knowledge of Rock Drilling Equipment** - Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
19. **Knowledge of Soft Ground Tunneling Principles** - Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
20. **Skill and Ability in Scaling** - Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.
21. **Skill and Ability in Hard Rock Drilling** - Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
22. **Knowledge of Geological Drilling Principles** - Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
23. **Knowledge of Shielding** - Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
24. **Physical Strength** - Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
25. **Physical Agility** - Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
26. **Stamina** - Ability to exert oneself physically over a long period of time.
27. **Coping With Stress** - Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.

General Worksite Maintenance Function

During a typical day's work, a Tunnel Laborer will perform tasks that keep a worksite safe and functional, so that Laborers and others may perform required work. This work includes cleaning, testing, and inspecting tunneling equipment. Dirt or grime often accumulates in many pieces of tunneling equipment. It is a Tunnel Laborer's job to clean this dirt off of the equipment as needed. In some cases, equipment cleaning requires special cleaning solutions and must be cleaned above ground in an open space to prevent the creation of a hazardous atmosphere. Tunnel Laborers must also load, unload, and secure vehicles and equipment and set up barricades around specific areas of a worksite, as required. The General Worksite Maintenance Function entails:

- Removing dirt and grime on tools and equipment, including vehicles components;
- Loading and unloading vehicles with construction materials;
- Inspecting and testing equipment before use and repairing any defects, as necessary;
- Setting up barricades around underground work sections, as required.

Critical Tasks

The following tasks provide a more detailed understanding of this function and are in descending order of a combination of difficulty and frequency.

1. Removes accumulated dirt/grime from equipment used for operations (e.g., brakes, accelerators).
2. Cleans all equipment, as needed, using appropriate cleaning solutions and safety procedures; includes cleaning certain equipment above ground.
3. Loads and unloads building/construction materials from vehicles.
4. Rolls and unrolls cables as needed.
5. Changes and charges batteries as required in a safe environment.
6. Inspects and tests equipment (e.g., hand held power tools) before operation to ensure proper functioning.
7. Places appropriate barriers around high-risk and/or hot work within tunnels.
8. Sets up barricades for inactive and/or completed underground work sections.
9. Inspects the entire tunnel/worksite for cleanliness.

Performance Measures

These Measures are not intended to address every critical task. Further, in some cases the Measure covers more than one task. Finally, some tasks did not meet the decision criteria for inclusion as a Performance Measure.

1. The Tunnel Laborer will, when given tools or equipment that require cleaning, fully clean them while observing all safety procedures and according to equipment specifications within the specified time frame.
2. The Tunnel Laborer will assist another person in loading a specified amount of construction materials (e.g., concrete segments) onto a tunnel transport vehicle, and then properly secure the load such that the vehicle can safely move to its destination, with 100% accuracy and using safe practices within the specified time frame.
3. The Tunnel Laborer will, given a provided set of hand held power tools, inspect, set up, and test the proper functioning, correct any deficiencies if possible, and use in a specified construction scenario with 100% accuracy within the specified time frame. This includes

checking batteries, hoses, and safety features, rolling and unrolling power cords and air and water hoses, and changing bits/blades.

4. The Tunnel Laborer will, given photographs/videos of a tunnel scenario where barricades are required, select the proper type of barricade and set it up using proper techniques with 100% accuracy within the specified time frame.

Critical Knowledges, Skills and Abilities (KSAs)

The following critical KSAs are linked to the critical tasks and are provided in descending order of importance and the number of linkages to tasks listed for the “General Worksite Maintenance” function.

1. **Knowledge of Worksite Safety Practices** - Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
2. **Skill and Ability in Working Safely** - Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
3. **Following Directions or Instructions** - Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
4. **Attention To Detail** - Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
5. **Work Environment** - Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
6. **Communication** - Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
7. **Autonomy/Initiative** - Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
8. **Use of Senses** - Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
9. **Learning** - Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
10. **Hand-eye Coordination** - Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
11. **Interpersonal Skills/Teamwork** - Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
12. **Reading Comprehension** - Ability to read and understand written materials required by the job.

13. **Physical Strength** - Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
14. **Stamina** - Ability to exert oneself physically over a long period of time.
15. **Knowledge of Soft Ground Tunneling Equipment** - Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., backhoe loaders, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to use these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
16. **Physical Agility** - Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
17. **Knowledge of Shielding** - Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
18. **Knowledge of Hazardous Material Safety** - Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
19. **Knowledge of Jumbo Drills** - Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
20. **Skill and Ability in Soft Ground Tunneling** - Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
21. **Knowledge of Rock Drilling Equipment** - Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
22. **Knowledge of Ventilation** - Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
23. **Skill and Ability in Hard Rock Drilling** - Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
24. **Knowledge of Geological Drilling Principles** - Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
25. **Knowledge of Soft Ground Tunneling Principles** - Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
26. **Skill and Ability in Scaling** - Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.

Drill Maintenance Function

Drills are one of the most essential tools for Tunnel Laborers. Therefore, it is important that Tunnel Laborers regularly clean and maintain drills and their components. Drills require the regular addition and changing of fluids, the removal of dust from their component parts, and regular maintenance of any air or water hoses. Larger drills, such as jumbo drills, also require regular engine maintenance. Tunnel Laborers must assemble and attach components of certain types of drills frequently used in tunneling jobs. The Drill Maintenance function entails:

- Inspecting drill motors and attachments before use for any deficiencies;
- Cleaning and connecting air or water hoses, as needed;
- Checking a drill's fluids and refilling them, as necessary;
- Lubricating a drills components, as needed;
- Ensuring drills that use air or water maintain proper air or water pressure.

Critical Tasks

The following tasks provide a more detailed understanding of this function and are in descending order of a combination of difficulty and frequency.

1. Maintains, as needed, engine and attachments to jumbo drills (e.g., adds fluids).
2. Installs, assembles/disassembles, and replaces drill bits as appropriate.
3. Blows accumulated dirt out of air and water hoses.
4. Maintains appropriate water and air pressure in drills.
5. Lubricates drill and associated components as needed.
6. Checks lubricator and other fluids in drill and/or machines regularly.
7. Inspects threads and clamps on drills before use.
8. Connects and disconnects air and water hoses to drill pipelines.
9. Fills drills with oil as necessary.
10. Places dust caps on air and water connections of drills.

Performance Measures

These Measures are not intended to address every critical task. Further, in some cases the Measure covers more than one task. Finally, some tasks did not meet the decision criteria for inclusion as a Performance Measure.

1. The Tunnel Laborer will perform a maintenance check on a jumbo drill and its attachments, noting and correcting any deficiencies (e.g., adds oil if necessary), with 100% accuracy within the specified time frame.
2. The Tunnel Laborer will, when provided with a specific type of hand held drill typically used in a tunneling job, demonstrate the proper assembly and installation of a specified number of drill bits with 100% accuracy within the specified time frame.
3. The Tunnel Laborer will demonstrate the proper method of set up, use, and break down of a drill equipped with power cords and air and/or water hoses, and use the drill to drill a hole of specified depth with 100% accuracy within the specified time frame. This will include maintaining proper air or water pressure while drilling the hole.
4. The Tunnel Laborer will perform a maintenance check on a specified handheld drill and its components, noting and correcting any deficiencies (e.g., lubricates components if necessary), with 100% accuracy within the specified time frame.

Critical Knowledges, Skills and Abilities (KSAs)

The following critical KSAs are linked to the critical tasks and are provided in descending order of importance and the number of linkages to tasks listed for the “Drill Maintenance” function.

1. **Knowledge of Worksite Safety Practices** - Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
2. **Skill and Ability in Working Safely** - Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
3. **Following Directions or Instructions** - Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
4. **Knowledge of Rock Drilling Equipment** - Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
5. **Autonomy/Initiative** - Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
6. **Knowledge of Jumbo Drills** - Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
7. **Attention To Detail** - Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
8. **Skill and Ability in Hard Rock Drilling** - Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
9. **Communication** - Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
10. **Hand-eye Coordination** - Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
11. **Use of Senses** - Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
12. **Work Environment** - Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
13. **Interpersonal Skills/Teamwork** - Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.

14. **Stamina** - Ability to exert oneself physically over a long period of time.
15. **Learning** - Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
16. **Physical Agility** - Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
17. **Physical Strength** - Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
18. **Knowledge of Soft Ground Tunneling Equipment** - Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., backhoe loaders, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to use these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
19. **Reading Comprehension** - Ability to read and understand written materials required by the job.
20. **Knowledge of Geological Drilling Principles** - Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
21. **Coping With Stress** - Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
22. **Knowledge of Soft Ground Tunneling Principles** - Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
23. **Knowledge of Hazardous Material Safety** - Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
24. **Skill and Ability in Soft Ground Tunneling** - Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.

Scaling Function

Scaling is the manual removal of loose rock, soil, or other fractured materials from the top and sides of tunnels that are under construction. Tunnel Laborers must scale drilled or recently blasted areas (a muck pile) in a tunnel to ensure the safety of everyone on the worksite. Scaling helps stabilize a blasted area and helps prevent rock or soil from falling on individuals working in tunnels. Tunnel Laborers generally wet down areas before scaling, and then scale these areas using a scaling bar while continuing to wet them down, as necessary. The Scaling Function entails:

- Inspecting a scaling bar for any defects;
- Examining terrain before scaling begins to determine its stability;
- Continuous vigilance while scaling rock or soil.

Critical Tasks

The following tasks provide a more detailed understanding of this function and are in descending order of a combination of difficulty and frequency.

1. Raises or pulls scaling bar as needed to perform scaling work.
2. "Sounds" the rock (i.e., strikes bar against rock) before scaling to inspect terrain.
3. Continuously observes area that he/she is scaling.
4. Inspects scaling bar for defects/safety issues before and after use.

Performance Measures

These Measures are not intended to address every critical task. Further, in some cases the Measure covers more than one task. Finally, some tasks did not meet the decision criteria for inclusion as a Performance Measure.

1. The Tunnel Laborer will inspect a scaling bar for defects and safety issues noting 100% of the defects and safety issues within the specified time frame.
2. The Tunnel Laborer will examine a photograph of a tunnel to be scaled and describe how to use a scaling bar to scale this tunnel with 100% accuracy within the specified time frame.
3. The Tunnel Laborer will demonstrate the proper and safe use of a scaling bar on an overhead concrete ceiling or mockup of a tunnel ceiling to "sound" the ceiling with 100% accuracy within the specified time frame.

Critical Knowledges, Skills and Abilities (KSAs)

The following critical KSAs are linked to the critical tasks and are provided in descending order of importance and the number of linkages to tasks listed for the "Scaling" function.

1. **Knowledge of Worksite Safety Practices** - Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
2. **Skill and Ability in Scaling** - Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.

3. **Skill and Ability in Working Safely** - Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
4. **Following Directions or Instructions** - Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
5. **Attention To Detail** - Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
6. **Autonomy/Initiative** - Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
7. **Work Environment** - Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
8. **Interpersonal Skills/Teamwork** - Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
9. **Hand-eye Coordination** - Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
10. **Communication** - Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
11. **Physical Agility** - Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
12. **Physical Strength** - Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
13. **Stamina** - Ability to exert oneself physically over a long period of time.
14. **Use of Senses** - Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
15. **Learning** - Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
16. **Coping With Stress** - Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.

Hard Rock Drilling Function

On many tunneling projects, Tunnel Laborers will need to drill into the tunnel face with provided equipment. During the actual drilling process, Tunnel Laborers will change drill bits as needed. Once the initial hole has been drilled, Tunnel Laborers will ensure rocks or dirt do not enter the hole, as needed. Tunnel Laborers must secure holes that have been drilled; however, they should not use metal pipes to secure holes which may contain portions of undetonated explosives. In these situations, PVC blow pipes must be used to secure holes. Tunnel Laborers will never drill into an existing/previously drilled hole. During the whole process, Tunnel Laborers must constantly use proper techniques to drill holes and observe their environment to ensure safety. The Hard Rock Drilling Function entails:

- Using the proper tools and attachments to drill through hard rock;
- Removing rock and dirt fragments from drilled holes, as needed;
- Modifying drilling techniques as required by the hardness of the rock;
- Ensuring adequate spacing exists between drilled holes;
- Securing a drilled hole once initial drilling has completed.

Critical Tasks

The following tasks provide a more detailed understanding of this function and are in descending order of a combination of difficulty and frequency.

1. Collars initially drilled hole sufficiently in order to allow continued drilling.
2. Maintains proper alignment between drill rod and drill while drilling.
3. Selects drilling technique that is appropriate and safe for current work and rock conditions.
4. Operates various drills, using levers and valves, by using proper techniques.
5. Utilizes a jackleg drill, as required.
6. Ensures proper spacing of holes for ground type, such as by reading and following a drilling pattern.
7. Changes drill bits as dictated by rock conditions at the worksite.
8. Removes rock fragments from holes drilled straight down (e.g., blows out holes, washes holes out with water if explosives misfire).
9. Selects the proper drill for the job from among various options.
10. Ensures drill has appropriate penetration tools and attachments (e.g., drill bits) for intended job.

Performance Measures

These Measures are not intended to address every critical task. Further, in some cases the Measure covers more than one task. Finally, some tasks did not meet the decision criteria for inclusion as a Performance Measure.

1. The Tunnel Laborer will place a sufficient amount of provided reinforcement materials (e.g., PVC piping, plugs) in a recently drilled hole in order to prevent the hole from filling with dirt and/or collapsing with 100% accuracy within the specified time frame.
2. The Tunnel Laborer will, given a specific job and the type and hardness of the rock to be drilled, select the proper drilling equipment to use to drill the hole with 100% accuracy within the specified time frame.
3. The Tunnel Laborer will, given a specific job that requires drilling, drill a specified number of holes into a hard rock formation at a specified depth within the specified time frame. This will

include use of the proper techniques to drill the specified hole, the changing of drill bits as needed, and following a drilling pattern. This should include drilling holes straight down.

4. The Tunnel Laborer will drill a hole of specified depth safely and properly using a jackleg drill, with 100% accuracy within the specified time frame.

Critical Knowledges, Skills and Abilities (KSAs)

The following critical KSAs are linked to the critical tasks and are provided in descending order of the importance and number of linkages to tasks listed for the “Hard Rock Drilling” function.

1. **Knowledge of Rock Drilling Equipment** - Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
2. **Skill and Ability in Hard Rock Drilling** - Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area; skill in troubleshooting all equipment used.
3. **Following Directions or Instructions** - Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
4. **Autonomy/Initiative** - Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
5. **Work Environment** - Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
6. **Knowledge of Jumbo Drills** - Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
7. **Skill and Ability in Working Safely** - Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
8. **Attention To Detail** - Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
9. **Use of Senses** - Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
10. **Knowledge of Geological Drilling Principles** - Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
11. **Knowledge of Worksite Safety Practices** - Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock

splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

12. **Interpersonal Skills/Teamwork** - Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
13. **Hand-eye Coordination** - Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
14. **Learning** - Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
15. **Communication** - Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
16. **Stamina** - Ability to exert oneself physically over a long period of time.
17. **Physical Agility** - Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
18. **Physical Strength** - Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
19. **Coping With Stress** - Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
20. **Reading Comprehension** - Ability to read and understand written materials required by the job.

Soft Ground Tunneling Function

In addition to harder rock formations, tunneling also frequently occurs in softer ground including loose soil and gravel. When tunneling into this type of ground, Tunnel Laborers move away from reliance on drills and instead rely more on earth-moving/excavation and shielding equipment and machinery. Tunnel Laborers must assist in ensuring that this machinery operates properly at all times; this includes monitoring the machinery's components while in use. Once the earth-moving/excavation and shielding equipment has completed its job, Tunnel Laborers are responsible for ensuring that the moved terrain is stable and secure. This can be done in multiple ways by using the proper supports behind the shield. In rare cases, compressed air is also used to aid Tunnel Laborers when stabilizing an excavated area. The Soft Ground Tunneling Function entails:

- Assisting fellow Tunnel Laborers in the operation of excavation/earth-moving machinery, such as the Tunnel Boring Machine (TBM);
- Moving earth and soil manually;
- Securing ground behind an excavated area using a variety of methods, including erecting ground support;
- Continuously observing ground and stabilization devices to ensure secured ground remains stable and devices are functioning properly.

Critical Tasks*

The following tasks provide a more detailed understanding of this function and are in descending order of a combination of difficulty and frequency.

1. Places ground support made of concrete segments, liner plates, or steel sets to support tunnel walls.
2. Secures ground behind completed work using necessary equipment.
3. Pushes iron or steel sets into tunneled area, using jacks, to act as a temporary shield and/or support.
4. Pumps proper amount of compressed air into tunnel, as necessary, to aid stabilization activities.
5. Pumps grout into holes in rocks made by a TBM.
6. Assists in the operation of excavating machinery (e.g., TBMs) using proper and safe techniques.
7. Utilizes digger shield attached to excavating machinery.
8. Observes worksite to ensure that shield/support device is working satisfactorily.
9. Selects and uses appropriate manual digging equipment (e.g., shovels) to move earth.
10. Monitors operational components of excavating machinery continuously (e.g., muck removal system, push rams).

*The task 'Removes loose soil, gravel, and other debris to clear space for shield installation' met the critical task threshold, but was omitted from this list because SMEs indicated that this operation completely overlaps with other critical tasks.

Performance Measures

These Measures are not intended to address every critical task. Further, in some cases the Measure covers more than one task. Finally, some tasks did not meet the decision criteria for inclusion as a Performance Measure.

1. The Tunnel Laborer will describe common types of ground support used on tunneling jobs, to include their specific features and the pros and cons of each, with 100% accuracy within the specified time frame.
2. The Tunnel Laborer will demonstrate the safe and proper performance of a specified number of commonly performed tasks done to support the operation of a TBM with 100% accuracy within the specified time frame, e.g., filling muck cars, assembling utility lines. This includes monitoring the TBM's operational components, such as muck removal systems (by loading and monitoring conveyor belts).
3. The Tunnel Laborer will, given a specific set of environmental conditions inside of a hypothetical tunnel, describe the steps that must be taken install ground support (e.g., support made of concrete segments, liner plates, or steel sets) immediately after excavation has been completed, with 100% accuracy within the specified time frame.
4. The Tunnel Laborer will, given a photograph or video recording of a tunneling worksite with improperly secured tunnel supports, note all safety concerns and describe accurate corrective actions to take within the specified time frame.
5. The Tunnel Laborer will, given a task that requires the use of manual digging equipment, select and use the proper piece of equipment to manually move a set amount of soil or debris from one location to another with 100% completion within the specified time frame.

Critical Knowledges, Skills and Abilities (KSAs)

The following critical KSAs are linked to the critical tasks and are provided in descending order of the importance and number of linkages to tasks listed for the "Soft Ground Tunneling" function.

1. **Knowledge of Worksite Safety Practices** - Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
2. **Skill and Ability in Working Safely** - Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
3. **Autonomy/Initiative** - Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
4. **Work Environment** - Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
5. **Following Directions or Instructions** - Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
6. **Hand-eye Coordination** - Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
7. **Interpersonal Skills/Teamwork** - Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different

situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.

8. **Communication** - Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
9. **Attention To Detail** - Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
10. **Use of Senses** - Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
11. **Skill and Ability in Soft Ground Tunneling** - Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
12. **Knowledge of Soft Ground Tunneling Principles** - Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
13. **Learning** - Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
14. **Knowledge of Shielding** - Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
15. **Physical Agility** - Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
16. **Stamina** - Ability to exert oneself physically over a long period of time.
17. **Physical Strength** - Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
18. **Knowledge of Soft Ground Tunneling Equipment** - Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., backhoe loaders, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to use these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
19. **Coping With Stress** - Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
20. **Knowledge of Geological Drilling Principles** - Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
21. **Knowledge of Ventilation** - Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
22. **Reading Comprehension** - Ability to read and understand written materials required by the job.

Physical Labor Function

Tunnel Laborers must often use their physical strength, agility, flexibility, and endurance in order to perform tasks required on a certain project. These tasks all involve movements of the body, ranging from repetitive movements to operating tools to exerting considerable physical strength to lift heavy construction materials. Performance of tasks in this function is highly dependent on the physical condition of a Tunnel Laborer. It is essential that a Tunnel Laborer keep his or her body in top physical condition. As such, the physical labor function entails:

- Lifting and carrying construction materials that may weigh in excess of 50 pounds for extended distances;
- Bending or contorting his or her body to perform tasks in tight, enclosed spaces
- Performing a multitude of tasks using repetitive bodily motions (e.g., mixing epoxies);

Critical Tasks

The following tasks provide a more detailed understanding of this function and are in descending order of a combination of difficulty and frequency.

1. Uses proper bodily movements to accomplish intended work tasks (e.g., contorts body at different angles, fits body into tight spaces).
2. Carries materials and tools (e.g., pipes, drills), for varying distances, to and from work locations.
3. Uses proper lifting procedures to move construction materials and tools safely (e.g., lifts 50 lbs to waist height repeatedly).
4. Uses physical strength to mix compounds needed to perform intended work (e.g., grout, two-part epoxies).

Performance Measures

These Measures are not intended to address every critical task. Further, in some cases the Measure covers more than one task. Finally, some tasks did not meet the decision criteria for inclusion as a Performance Measure.

1. The Tunnel Laborer will perform a specified number of construction tasks common to Tunnel Laborers (e.g., reaching into a narrow, confined space while laying on back or side to grasp an object in order to remove or reposition it) in an enclosed space of specified dimensions with 100% completion within the specified time frame.
2. The Tunnel Laborer will carry 50 pounds of construction materials for a specified distance in one attempt within the specified time frame, e.g., 50 pounds of piping material for 50 feet within 1 minute.
3. The Tunnel Laborer will manually mix a given compound according to specifications within the specified time frame, e.g., mixes grout in 5 minutes.

Critical Knowledges, Skills and Abilities (KSAs)

The following critical KSAs are linked to the critical tasks and are provided in descending order of the importance and number of linkages to tasks listed for the “Physical Labor” function.

1. **Knowledge of Worksite Safety Practices** - Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
2. **Skill and Ability in Working Safely** - Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
3. **Following Directions or Instructions** - Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
4. **Autonomy/Initiative** - Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
5. **Physical Strength** - Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
6. **Stamina** - Ability to exert oneself physically over a long period of time.
7. **Hand-eye Coordination** - Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
8. **Physical Agility** - Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
9. **Work Environment** - Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
10. **Use of Senses** - Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
11. **Attention To Detail** - Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
12. **Interpersonal Skills/Teamwork** - Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
13. **Communication** - Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
14. **Learning** - Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
15. **Coping With Stress** - Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
16. **Skill and Ability in Scaling** - Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.

17. **Knowledge of Ventilation** - Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
18. **Knowledge of Hazardous Material Safety** - Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.

Communications/Communicating Function

During the course of daily work, it is important that Tunnel Laborers communicate with one another, with their supervisors, and comprehend written materials and hand signals in order to convey this information to others. These communications will entail:

- Asking for clarification/confirmation regarding directions from others;
- Understanding and following instructions from supervisors;
- Using commonly understood hand signals to communicate in environments where verbal communication may not be possible, such as to a locomotive operator while the locomotive is in operation;
- Reading and comprehending written materials relevant to job performance.

Critical Tasks

The following tasks provide a more detailed understanding of this function and are in descending order of a combination of difficulty and frequency.

1. Communicates with other coworkers and supervisors while performing tasks.
2. Asks for clarification/confirmation of directions received from others.
3. Reads and comprehends various documents, directions, warning labels, and other written materials related to performance of job.
4. Comprehends and accurately follows instructions provided by management and coworkers.
5. Uses and comprehends various hand signals to communicate with others.

Performance Measures

These Measures are not intended to address every critical task. Further, in some cases the Measure covers more than one task. Finally, some tasks did not meet the decision criteria for inclusion as a Performance Measure.

1. The Tunnel Laborer will be able to read and explain written materials, including safety instructions, manuals, warning labels, and other materials with 100% accuracy within a specified time frame.
2. The Tunnel Laborer will follow a list of verbal instructions provided by an instructor with 100% accuracy within the specified time frame.
3. The Tunnel Laborer will demonstrate frequently-used hand signals in a variety of situations, upon command, with 100% accuracy within the specified time frame.

Critical Knowledges, Skills and Abilities (KSAs)

The following critical KSAs are linked to the critical tasks and are provided in descending order of the importance and number of linkages to tasks listed for the “Communications/Communicating” function.

1. **Knowledge of Worksite Safety Practices** - Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
2. **Skill and Ability in Working Safely** - Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
3. **Following Directions or Instructions** - Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
4. **Communication** - Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
5. **Autonomy/Initiative** - Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
6. **Learning** - Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
7. **Interpersonal Skills/Teamwork** - Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
8. **Attention To Detail** - Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
9. **Work Environment** - Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
10. **Use of Senses** - Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
11. **Reading Comprehension** - Ability to read and understand written materials required by the job.
12. **Hand-eye Coordination** - Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
13. **Knowledge of Hazardous Material Safety** - Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
14. **Skill and Ability in Hard Rock Drilling** - Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill

bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.

15. **Knowledge of Geological Drilling Principles** - Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
16. **Knowledge of Soft Ground Tunneling Principles** - Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
17. **Knowledge of Rock Drilling Equipment** - Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
18. **Knowledge of Soft Ground Tunneling Equipment** - Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., backhoe loaders, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to use these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
19. **Knowledge of Shielding** - Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
20. **Knowledge of Jumbo Drills** - Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
21. **Skill and Ability in Scaling** - Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.
22. **Skill and Ability in Soft Ground Tunneling** - Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
23. **Stamina** - Ability to exert oneself physically over a long period of time.
24. **Physical Agility** - Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.

Appendix

Subject Matter Experts

Subject Matter Experts (SMEs) were identified and asked to participate in any or all of the steps including the Internet-based survey and/or both virtual meetings to offer their opinions and insight on the role of construction craft workers in environments where Tunneling work occurs. The table below provides the information on those SMEs and the project review phase(s) in which they participated.

Name	Job Title	Location	Employer	Phase(s) Participated In
Anita Johnson	Safety Professional	Snohomish, WA	Sound Transit	Meeting 1 – Task/KSA Review; Internet-based Survey
Bobby Vigel	Tunnel Laborer	Las Vegas, NV	Southern Nevada Laborers Local #872	Meeting 1 – Task/KSA Review
Brian Pfeiffer	Tunnel Laborer	New York City, NY	LIUNA	Internet-based Survey
Carlos Reyes	Tunnel Laborer	Fresno, CA	Laborers Union Local #295	Internet-based Survey
Charles Chatten	Supervisor	Nelson/ Vancouver, BC, Canada	CSWA Local 1611	Internet-based Survey
Christopher Fitzsimmons	Instructor	New York City, NY	Local #147	Internet-based Survey
Dan Mahoney	Supervisor	New York City, NY	Kiewit Infrastructure	Internet-based Survey
Eddie Ramirez	Tunnel Laborer	Las Vegas, NV	Southern Nevada Laborers Local #872	Meeting 1 – Task/KSA Review
Eugene Boyd	Tunnel Laborer	Quincy, MA	Skanska/Underpinning	Internet-based Survey
Gerald Fulghum	Instructor	Sacramento, CA	Retired State - Consultant	Internet-based Survey
James Wood, Jr.	Miner / Union Rep.	Modesto, CA	Atkinson/Dillingham/ Tudor/LIUNA	Internet-based Survey; Meeting 2 – Final Task/KSA Ratings; Final Performance Measure Review
John Hart	Tunnel Laborer	New York City, NY	Dragadso	Internet-based Survey
John Phillips	Instructor	Massachusetts	New England Laborers Association (LIUNA)	Meeting 2 – Final Task/KSA Ratings
John Ryan	Walking boss	New York City, NY	Dragados	Internet-based Survey
Kenneth Newell	Tunnel Laborer	Quincy, MA	Michals	Internet-based Survey
Larry Byrns	Supervisor	Oroville, CA	Semi-Retired	Internet-based Survey
Mark Delaney	Instructor	Massachusetts	New England Laborers Association (LIUNA)	Meeting 2 – Final Task/KSA Ratings
Merik Edgel	Instructor	Las Vegas, NV	Southern Nevada Laborers Local #872	Meeting 1 – Task/KSA Review; Internet-based Survey; Meeting 2 – Final Task/KSA Ratings
Raymond Mendoza	Tunnel Laborer	San Bernardino, CA	Shea/Kenny	Internet-based Survey

Name	Job Title	Location	Employer	Phase(s) Participated In
Richard McLane	Supervisor	Bellevue, WA	Traylor Brothers., Inc.	Meeting 1 – Task/KSA Review; Internet-based Survey
Rick Gohl	Other - Unknown	Las Vegas, NV	Parsons	Internet-based Survey
Rick Roath	Supervisor	Oakdale, CA	Semi-Retired	Internet-based Survey
Robert McDonald	Tunnel Laborer	Vancouver, BC, Canada	Kumigi, Northern	Internet-based Survey; Meeting 2 – Final Task/KSA Ratings
Robert McGrath	Tunnel Laborer	Quincy, MA	Dragados/JudlawAJV	Internet-based Survey
Ron Myers	Tunnel Laborer	Las Vegas, NV	Southern Nevada Laborers Local #872	Meeting 1 – Task/KSA Review
Russell Clough	Supervisor	California	Contractor – As needed	Internet-based Survey
Shawn Burnes	Tunnel Laborer	Quincy, MA	Tunnel Workers Union Local #88	Internet-based Survey
Thomas Smith	Instructor	New York City, NY	LIUNA Local #147 Training	Meeting 1 – Task/KSA Review; Meeting 2 – Final Task/KSA Ratings; Final Performance Measure Review
Zachary MacDonald	Tunnel Laborer	Northborough, MA	Shank	Internet-based Survey

Rating Scales Used to Evaluate Tasks and Knowledges, Skills and Abilities

SMEs were asked to consider the task and Knowledge, Skill and Ability (KSA) statements and then rate them using the following scales. Analysts later evaluated the SMEs' ratings for agreement using Lawshe (1975) determined significance levels. SMEs had to agree that a task was important or critical to performance and necessary at exit in order to be retained for further consideration in development of the skills standards. KSAs had to meet the same criteria for further consideration in development of the skills standards.

Lawshe, C.H. (1975). A quantitative approach to content validity. *Personnel Psychology*, 28, 563-575.

Task Rating Scales

- **Importance**

How important is this task to successfully performing the overall job?

- (0) Not Relevant
- (1) Of Little or No Importance
- (2) Important
- (3) Critical

- **Necessary at Exit from Training and for Certification**

Is it necessary for a Construction Worker to be able to perform this task in order to be certified for work as a tunnel worker?

- (0) Not Necessary
- (1) Desired
- (2) Required

- **Difficulty**

How difficult is it to perform this task in its typical setting or location?

- (1) Very Easy
- (2) Easy
- (3) Difficult
- (4) Very Difficult

- **Frequency**

Regardless of the importance of this task, how often does this task get done on a project?

- (1) Infrequently (as needed)
- (2) Monthly
- (3) Weekly
- (4) Daily or more often

KSA Rating Scales

- **Importance**

How important is this KSA to the overall job?

- (0) Not Related
- (1) Of Little or No Importance
- (2) Important
- (3) Critical

- **Necessary at Exit from Training for Certification**

Is it necessary for a Construction Worker to have this knowledge, skill or ability in order to be certified to perform tasks as a tunnel worker?

- (0) Not Necessary
- (1) Desired
- (2) Required

- **Consequence of Error**

What is the consequence of error if a tunneling worker does not have this KSA or his/her skill level is insufficient for this specific KSA?

- (0) Low – Consequence is low having minimal effect on success as a tunnel worker. Little or no consequence would result.
- (1) Medium – Consequence is moderate having a moderate effect on success as a tunnel worker. May create some minor impacts.
- (2) High – Consequence is high/extreme having a severe effect on success as a tunnel worker. Could result in serious and/or intolerable consequences.

Relative Contribution

To what degree does this KSA contribute to successful performance of these tasks, relative to other KSAs? (1 to 10)

Some KSAs contribute more to successful job performance than others. Write in a number that reflects the degree to which this KSA contributes to successful job performance, relative to the other KSAs on the list. Starting with those that contribute the most, assign a value of 10. Then consider those that contribute the least and assign a value of 1. Next, consider the remaining KSAs and assign values somewhere in between.

Tunnel Worker Job Analysis Questionnaire

First Name:	Middle Initial:	Last Name:

Job Title:
☐ Tunnel Worker ☐ Trainer ☐ Supervisor ☐ Other

How many years of experience do you have in the field of tunneling (ex. 0.5 years, 1 years, 1.5 years, 2 years, 2.5 years, etc.)?

Employer:	Union Local # (ex.1, 45, 507):

City:	State/Province:

Tasks

Category 1000: General Safety

	<u>Importance</u>				<u>Difficulty</u>			
	How important is this task to successfully performing the overall job?				How difficult is it to perform this task in its typical setting or location?			
	Not Relevant	Little or no importance	Important	Critical	Very Easy	Easy	Difficult	Very Difficult
1000. Takes proper safety precautions, to include wearing applicable PPE (e.g., safety glasses, gloves, etc.), to prevent accidents and exposure to contaminants.	☒	☒	☒	☒	☒	☒	☒	☒
1001. Checks in and out of tunnel to ensure an accurate headcount.	☒	☒	☒	☒	☒	☒	☒	☒
1002. Sits in and/or operates "man-trips" (e.g., trolleys) securely, without risking injuries to self and others.	☒	☒	☒	☒	☒	☒	☒	☒
1003. Visually inspects tunnel and work area for safety hazards.	☒	☒	☒	☒	☒	☒	☒	☒
1004. Wets down work area prior to beginning the day's work in order to accurately examine safety conditions.	☒	☒	☒	☒	☒	☒	☒	☒
1005. Reports unsafe conditions and/or equipment.	☒	☒	☒	☒	☒	☒	☒	☒
1006. Ventilates tunnels constantly with proper equipment (e.g., ventilation fan) to ensure fresh air flow.	☒	☒	☒	☒	☒	☒	☒	☒

Tasks

Category 1000: General Safety

	<u>Importance</u>				<u>Difficulty</u>			
	How important is this task to successfully performing the overall job?				How difficult is it to perform this task in its typical setting or location?			
	Not Relevant	Little or no importance	Important	Critical	Very Easy	Easy	Difficult	Very Difficult
1007. Is aware of overall air quality of underground work environment (e.g., by observing/listening for gas monitors).	☒	☒	☒	☒	☒	☒	☒	☒
1008. Uses necessary approved lighting (e.g., cap light, flashlight) when entering and working in tunnels.	☒	☒	☒	☒	☒	☒	☒	☒
1009. Follows directions listed on safety labels and warning signs.	☒	☒	☒	☒	☒	☒	☒	☒
1010. Cleans and maintains PPE to ensure its proper functionality.	☒	☒	☒	☒	☒	☒	☒	☒
1011. Obtains new PPE when needed.	☒	☒	☒	☒	☒	☒	☒	☒
1012. Properly disposes of or returns PPE when no longer functional.	☒	☒	☒	☒	☒	☒	☒	☒

Tasks

Category 2000: Hazardous Material Safety

	<u>Importance</u>				<u>Difficulty</u>			
	How important is this task to successfully performing the overall job?				How difficult is it to perform this task in its typical setting or location?			
	Not Relevant	Little or no importance	Important	Critical	Very Easy	Easy	Difficult	Very Difficult
2000. Is aware of atmospheric monitoring devices in tunnels (e.g., gas monitors) to gauge level of hazardous materials in work environment.	☒	☒	☒	☒	☒	☒	☒	☒
2001. Reviews relevant safety data sheets (SDS) and safety/warning labels before using chemicals, tools, and other materials on worksite.	☒	☒	☒	☒	☒	☒	☒	☒
2002. Uses proper PPE when entering and working in areas that contain hazardous materials (e.g., stored gases, explosives).	☒	☒	☒	☒	☒	☒	☒	☒
2003. Warns others to evacuate the scene prior to blasting/use of explosives through methods appropriate for the area (e.g., verbal warnings, air horns).	☒	☒	☒	☒	☒	☒	☒	☒
2004. Safely stores and appropriately marks compressed gas cylinders (e.g., oxygen/acetylene).	☒	☒	☒	☒	☒	☒	☒	☒
2005. Stores flammable materials and compounds in separate locations from explosives.	☒	☒	☒	☒	☒	☒	☒	☒

Tasks

Category 3000: General Maintenance

	<u>Importance</u>				<u>Difficulty</u>			
	How important is this task to successfully performing the overall job?				How difficult is it to perform this task in its typical setting or location?			
	Not Relevant	Little or no importance	Important	Critical	Very Easy	Easy	Difficult	Very Difficult
3000. Cleans all equipment above ground, as needed, using appropriate cleaning solutions and safety procedures.	☒	☒	☒	☒	☒	☒	☒	☒
3001. Removes accumulated dirt/grime from equipment used for operations (e.g., brakes, accelerators).	☒	☒	☒	☒	☒	☒	☒	☒
3002. Changes and charges batteries as required in a safe environment.	☒	☒	☒	☒	☒	☒	☒	☒
3003. Tests and inspects equipment (e.g., drills, power tools) before operation to ensure proper functioning.	☒	☒	☒	☒	☒	☒	☒	☒
3004. Disconnects power tools when finished with their use.	☒	☒	☒	☒	☒	☒	☒	☒
3005. Rolls and unrolls cables as needed.	☒	☒	☒	☒	☒	☒	☒	☒
3006. Loads and unloads building/construction materials from vehicles.	☒	☒	☒	☒	☒	☒	☒	☒
3007. Sets up barricades for inactive and/or completed underground work sections.	☒	☒	☒	☒	☒	☒	☒	☒
3008. Maintains barricades for inactive and/or completed underground work sections.	☒	☒	☒	☒	☒	☒	☒	☒
3009. Inspects the entire tunnel/worksite for cleanliness.	☒	☒	☒	☒	☒	☒	☒	☒
3010. Places appropriate barriers around high-risk, hot work within tunnels.	☒	☒	☒	☒	☒	☒	☒	☒

Tasks

Category 4000: Drill Maintenance

	<u>Importance</u>				<u>Difficulty</u>			
	How important is this task to successfully performing the overall job?				How difficult is it to perform this task in its typical setting or location?			
	Not Relevant	Little or no importance	Important	Critical	Very Easy	Easy	Difficult	Very Difficult
4000. Maintains, as needed, engine and attachments to wheeled jumbo drill (e.g., adds fluids).	☒	☒	☒	☒	☒	☒	☒	☒
4001. Inspects threads and clamps on drills before use.	☒	☒	☒	☒	☒	☒	☒	☒
4002. Connects and disconnects air and water hoses to drill pipelines.	☒	☒	☒	☒	☒	☒	☒	☒
4003. Blows accumulated dirt out of air and water hoses.	☒	☒	☒	☒	☒	☒	☒	☒
4004. Fills drills with oil as necessary.	☒	☒	☒	☒	☒	☒	☒	☒
4005. Installs, assembles/disassembles, and replaces drill bits as appropriate.	☒	☒	☒	☒	☒	☒	☒	☒
4006. Checks lubricator and other fluids in drill and/or machines regularly.	☒	☒	☒	☒	☒	☒	☒	☒
4007. Maintains appropriate water and air pressure in drills.	☒	☒	☒	☒	☒	☒	☒	☒
4008. Lubricates drill and associated components as needed.	☒	☒	☒	☒	☒	☒	☒	☒
4009. Places dust caps on air and water connections of drills.	☒	☒	☒	☒	☒	☒	☒	☒

Tasks

Category 5000: Scaling

	<u>Importance</u>				<u>Difficulty</u>			
	How important is this task to successfully performing the overall job?				How difficult is it to perform this task in its typical setting or location?			
	Not Relevant	Little or no importance	Important	Critical	Very Easy	Easy	Difficult	Very Difficult
5000. Inspects scaling bar for defects/safety issues before and after use.	☒	☒	☒	☒	☒	☒	☒	☒
5001. "Sounds" the rock (i.e., strikes bar against rock) before scaling to inspect terrain.	☒	☒	☒	☒	☒	☒	☒	☒
5002. Raises or pulls scaling bar as needed to perform scaling work.	☒	☒	☒	☒	☒	☒	☒	☒
5003. Continuously observes area that he/she is scaling.	☒	☒	☒	☒	☒	☒	☒	☒

Tasks

Category 6000: Hard Rock Drilling

	<u>Importance</u>				<u>Difficulty</u>			
	How important is this task to successfully performing the overall job?				How difficult is it to perform this task in its typical setting or location?			
	Not Relevant	Little or no importance	Important	Critical	Very Easy	Easy	Difficult	Very Difficult
6000. Ensures drill has appropriate penetration tools and attachments for intended job.	☒	☒	☒	☒	☒	☒	☒	☒
6001. Selects the proper drill for the job from among various options.	☒	☒	☒	☒	☒	☒	☒	☒
6002. Changes drill bits as dictated by rock conditions at the worksite.	☒	☒	☒	☒	☒	☒	☒	☒
6003. Uses water or air pressure to remove rock fragments from drill holes.	☒	☒	☒	☒	☒	☒	☒	☒
6004. Operates various drills by using proper techniques.	☒	☒	☒	☒	☒	☒	☒	☒
6005. Selects drilling technique that is appropriate and safe for current job and rock conditions.	☒	☒	☒	☒	☒	☒	☒	☒
6006. Utilizes drill(s) as a hand-held jackhammer tool as required.	☒	☒	☒	☒	☒	☒	☒	☒
6007. Collars initially drilled hole sufficiently in order to allow continued drilling.	☒	☒	☒	☒	☒	☒	☒	☒
6008. Maintains proper alignment between drill rod and drill while drilling.	☒	☒	☒	☒	☒	☒	☒	☒
6009. Measures distances between drill cuts and holes to ensure spacing is appropriate for the job.	☒	☒	☒	☒	☒	☒	☒	☒

Tasks

Category 7000: Soft Ground Tunneling

	<u>Importance</u>				<u>Difficulty</u>			
	How important is this task to successfully performing the overall job?				How difficult is it to perform this task in its typical setting or location?			
	Not Relevant	Little or no importance	Important	Critical	Very Easy	Easy	Difficult	Very Difficult
7000. Assists in the operation of excavating machinery, e.g., tunnel boring machines (TBM), using proper and safe techniques.	☒	☒	☒	☒	☒	☒	☒	☒
7001. Monitors operational components of excavating machinery continuously (e.g., muck removal system, push rams).	☒	☒	☒	☒	☒	☒	☒	☒
7002. Pumps grout into holes in rocks made by tunnel boring machine (TBM).	☒	☒	☒	☒	☒	☒	☒	☒
7003. Selects and uses appropriate manual digging equipment (e.g., shovels) to move earth.	☒	☒	☒	☒	☒	☒	☒	☒
7004. Pushes iron or steel cylinder into tunneled area, using jacks, to act as a temporary shield and/or support.	☒	☒	☒	☒	☒	☒	☒	☒
7005. Removes loose soil, gravel, and other debris to clear space for shield installation.	☒	☒	☒	☒	☒	☒	☒	☒
7006. Places a lining made of cast iron or precast concrete to act as a tunnel shield.	☒	☒	☒	☒	☒	☒	☒	☒
7007. Secures shield to top of tunneled area using necessary equipment.	☒	☒	☒	☒	☒	☒	☒	☒
7008. Observes tunneled worksite to ensure that shield/support device is working satisfactorily.	☒	☒	☒	☒	☒	☒	☒	☒
7009. Utilizes digger shield on excavating machinery as appropriate.	☒	☒	☒	☒	☒	☒	☒	☒
7010. Pumps proper amount of compressed air into tunnel, as necessary, to aid stabilization activities.	☒	☒	☒	☒	☒	☒	☒	☒

Tasks

Category 8000: Physical Tasks

	<u>Importance</u>				<u>Difficulty</u>			
	How important is this task to successfully performing the overall job?				How difficult is it to perform this task in its typical setting or location?			
	Not Relevant	Little or no importance	Important	Critical	Very Easy	Easy	Difficult	Very Difficult
8000. Uses proper lifting procedures to move construction materials and tools safely (e.g., lifts 50 lbs to waist height repeatedly).	☒	☒	☒	☒	☒	☒	☒	☒
8001. Uses proper body movements to accomplish intended work tasks (e.g., contorts body at different angles, fits body into tight spaces).	☒	☒	☒	☒	☒	☒	☒	☒
8002. Uses physical strength to mix compounds needed to perform intended work (e.g., grout, two-part epoxies).	☒	☒	☒	☒	☒	☒	☒	☒
8003. Carries materials and tools (e.g., pipes, drills), for varying distances, to and from work locations.	☒	☒	☒	☒	☒	☒	☒	☒

Tasks

Category 9000: Communication

	<u>Importance</u>				<u>Difficulty</u>			
	How important is this task to successfully performing the overall job?				How difficult is it to perform this task in its typical setting or location?			
	Not Relevant	Little or no importance	Important	Critical	Very Easy	Easy	Difficult	Very Difficult
9000. Comprehends and accurately follows instructions provided by management and coworkers.	☒	☒	☒	☒	☒	☒	☒	☒
9001. Asks for clarification/confirmation of directions received from others.	☒	☒	☒	☒	☒	☒	☒	☒
9002. Communicates with other coworkers and supervisors while performing tasks.	☒	☒	☒	☒	☒	☒	☒	☒
9003. Uses and comprehends various hand signals to communicate with others.	☒	☒	☒	☒	☒	☒	☒	☒
9004. Reads and comprehends various documents, directions, warning labels, and other written materials related to performance of job.	☒	☒	☒	☒	☒	☒	☒	☒

Competencies

	<u>Importance</u>			
	How important is this KSA to the overall job?			
	Not Relevant	Little or no importance	Important	Critical
Knowledge of Ventilation - Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.	☒	☒	☒	☒
Knowledge of Worksite Safety Practices - Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and trolleys, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use compressed air in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer), and when equipment is safe to use; knowledge of fire safety and prevention in workspace.	☒	☒	☒	☒
Knowledge of Hazardous Material Safety - Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to control gas leaks and when to monitor gas detectors, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.	☒	☒	☒	☒
Knowledge of Rock Drilling Equipment - Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper usage and safety devices, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.	☒	☒	☒	☒
Knowledge of Soft Ground Tunneling Equipment - Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.	☒	☒	☒	☒

Competencies

	<u>Importance</u>			
	How important is this KSA to the overall job?			
	Not Relevant	Little or no importance	Important	Critical
Knowledge of Shielding - Knowledge of different types of shielding equipment and methods used in soft ground tunneling (e.g., blind shield, digger shield, etc.) and how to install them when needed; knowledge of the appropriate ground type in which to install each shielding method, to include knowing when to use compressed air for stability; knowledge of how to maintain shielding.	☒	☒	☒	☒
Knowledge of Relevant Laws and Regulations - Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.	☒	☒	☒	☒
Knowledge of Geological Drilling Principles - Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper rock bits to use with differing rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations, to include methods and pressure (water and air) to reduce stress on rocks while drilling.	☒	☒	☒	☒
Knowledge of Soft Ground Tunneling Principles - Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water contents (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating and supporting tunnels under and through each ground type.	☒	☒	☒	☒
Knowledge of Wheeled Jumbo Drill - Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with the wheeled jumbo drill within tunnels; knowledge of the occasions when it is necessary to use a wheeled jumbo drill.	☒	☒	☒	☒

Competencies

	<u>Importance</u>			
	How important is this KSA to the overall job?			
	Not Relevant	Little or no importance	Important	Critical
Skill and Ability in Scaling - Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.	☒	☒	☒	☒
Skill and Ability in Hard Rock Drilling - Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area; skill in troubleshooting all equipment used.	☒	☒	☒	☒
Skill and Ability in Soft Ground Tunneling - Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using various types of digging shields; skill in cleaning recently drilled area; skill in troubleshooting all equipment used.	☒	☒	☒	☒
Skill and Ability in Working Safely - Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).	☒	☒	☒	☒
Following Directions or Instructions - Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.	☒	☒	☒	☒
Learning - Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.	☒	☒	☒	☒
Reading Comprehension - Ability to read and understand written materials required by the job.	☒	☒	☒	☒
Interpersonal Skills/Teamwork - Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.	☒	☒	☒	☒
Communication - Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.	☒	☒	☒	☒

Competencies

	<u>Importance</u>			
	How important is this KSA to the overall job?			
	Not Relevant	Little or no importance	Important	Critical
Attention To Detail - Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.	☒	☒	☒	☒
Autonomy/Initiative - Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.	☒	☒	☒	☒
Coping With Stress - Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.	☒	☒	☒	☒
Physical Agility - Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.	☒	☒	☒	☒
Physical Strength - Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).	☒	☒	☒	☒
Stamina - Ability to exert oneself physically over a long period of time.	☒	☒	☒	☒
Hand-eye Coordination - Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.	☒	☒	☒	☒
Use of Senses - Ability to use senses to include one or more of the following based on job demands: feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.	☒	☒	☒	☒
Work Environment - Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, contaminated air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).	☒	☒	☒	☒

Additional Comments:

Description of Key Terms and Data

Each skills standard statement has been carefully crafted after several layers of SME evaluation and analyses by social scientists at PMG. In order to assist the course developer, this section will discuss the four main areas of information provided surrounding each skills statement as well as the various rating numbers and their potential uses. The list and potential usefulness follows:

Column Name	How is it Useful?	Other Considerations
Task No.	This is a library number assigned by PMG. It is used during the evaluation process and does not signify anything of importance.	
Performance Measure	This is the Performance Measure Statement. It is written in the ISD – ABCD format. It describes what the CCL should learn/be able to do upon completion of the course.	
Task Definition	This is the task statement upon which the skills standard statement was based.	Tasks retained for this purpose must be important to performance, necessary at exit from the training program (post training), and were rated higher than other tasks.
Function	This is a brief label describing what part of the job the task is associated with. Frequently this is seen as a task category or grouping of associated tasks.	It should be remembered that tasks can and will be repeated throughout the CCL's day and throughout the Tunnel Laborer project. The context statement is intended to help the course developer understand the when and for what purpose the task is being undertaken by the CCL.
Consid. Value (Consideration Value)	This numerical value is the sum of the average frequency and average difficulty ratings provided by the SMEs for the task statement. Higher values mean that both the difficulty is high and the task is frequently performed.	In general, in task performance more time should be spent learning tasks that are difficult to do <i>and</i> are frequently performed.
KSA No.	This is a library number assigned by PMG. It is used during the evaluation process and does not signify anything of importance.	

Error	This numerical value is the average of the Consequence of Error ratings provided by the SMEs for the KSA statement. Higher values mean that the KSA represents a higher consequence of error. Consequence of error includes both worker safety and cost escalation although a high rating does not need to imply both are present.	In general, in learning KSAs more time should be spent learning those that have high consequence of error when all other things are taken into consideration.
Contrib. Value (Contribution Value)	This numerical value is the average of the relative Contribution to Performance provided by the SMEs for the KSA statement. Higher values mean that the KSA contributes more to performance of the overall job (not necessarily the associated task) than lesser rated KSAs.	In general, in learning KSAs more time should be spent learning those that contribute more to the job when all other things are taken into consideration.
Links (linkages to tasks)	This numerical value represents the total number of times the KSA was linked to the tasks in the list by the SMEs.	This is a similar value to that of contribution value above. Instead of relative contribution to the job, this value may be thought of as “usefulness”. Another way of thinking about it is that once this KSA is learned it will speed the learner in learning other tasks to which the KSA was linked.
KSA Definitions and Linkages	These are the KSAs linked to (useful in) performing the task associated with the performance measure.	The degree to which (depth) this KSA is taught is described by the performance measure. In other words, learning everything about this KSA may not be necessary to perform the performance measure successfully.

Skills Standards Development and Analysis Data

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
Function: Safety								
1000	Takes proper safety precautions, to include wearing applicable PPE (e.g., safety glasses, gloves, etc.), to prevent accidents and exposure to contaminants.		5.91	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					11	3.72%	100	Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
1001	Checks in and out of tunnel to ensure an accurate headcount.		5.48	Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
1002	Rides in "man-trips" and/or operates and/or signals locomotives or other vehicles securely, without risking injuries to self and others.	The Tunnel Laborer will demonstrate (or describe) the proper methods to safely operate a tunnel transport vehicle (i.e., locomotive, truck) with 100% accuracy within the specified time frame.	6.00	Mod. - Low	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
		The Tunnel Laborer will describe the critical tasks of a brakemen on a tunnel locomotive with 100% accuracy within the specified time frame. This includes an explanation of signals commonly used by brakemen, e.g., light signals.			2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
								blueprints.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
1003	Visually inspects tunnel and work area for safety hazards.	The Tunnel Laborer will, when provided with visual evidence of an unsafe situation in the construction of a tunnel, identify the dangers of the situation and the proper actions to correct it while ensuring worksite safety with 100% accuracy within the specified time frame.	5.96	Mod. - Low	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					11	3.72%	100	Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
								gear).
1004	Wets down work area prior to beginning the day's work in order to accurately examine safety conditions.		5.83	Low	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					11	3.72%	100	Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
1005	Reports unsafe conditions and/or equipment.		5.74	Low	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					11	3.72%	100	Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain

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								gear).
1006	Ventilates tunnels constantly with proper equipment (e.g., ventilation fan) to ensure fresh air flow.	The Tunnel Laborer will, given a photograph/video/description of a tunnel environment containing a gas detection monitor, describe the correct sequence of steps to take when a monitor alarms, with 100% accuracy within the specified time frame.	6.22	Mod. - High	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
1007	Monitors overall air quality of underground work environment (e.g., by observing/listening for gas monitors).	The Tunnel Laborer will, given a photograph/video/description of a tunnel environment containing a gas detection monitor, describe the correct sequence of steps to take when a monitor alarms, with 100% accuracy within the specified time frame.	6.13	Mod. - Low	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
1008	Uses necessary approved lighting (e.g., cap light, flashlight) when entering and working in tunnels.		5.78	Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
						2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
						2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
						3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
						3.72%	100	Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.
						3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
						4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
						4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
						3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
						3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
						3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
						3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
						3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
						3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
1009	Follows directions listed on safety labels and warning signs.	The Tunnel Laborer will, given appropriate safety labels and/or SDS, describe how to maintain a safe work environment while the relevant material or compound is in use with 100% accuracy within the specified time frame. This will include the safe use of explosives and compressed gas cylinders.	6.00	Mod. - Low	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
1010	Cleans and maintains PPE to ensure its proper functionality.	The Tunnel Laborer will describe the proper methods of inspecting and maintaining specific PPE with 100% accuracy within the specified time frame. This will include a description of the point at which PPE becomes unusable.	6.00	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
1011	Obtains new PPE when needed.	The Tunnel Laborer will describe the proper methods of inspecting and maintaining specific PPE with 100% accuracy within the specified time frame. This will include a description of the point at which PPE becomes unusable.	5.96	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
1012	Properly disposes of or returns PPE when no longer functional.		5.74	Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
2000	Periodically observes and listens for atmospheric monitoring devices in tunnels (e.g., gas monitors) to gauge level of hazardous materials in work environment.	The Tunnel Laborer will, given a photograph/video/description of a tunnel environment containing a gas detection monitor, describe the correct sequence of steps to take when a monitor alarms, with 100% accuracy within the specified time frame.	6.09	Mod. - Low	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
2001	Reviews relevant safety data sheets (SDS) and safety/warning labels before using chemicals, tools, and other materials on worksite.	The Tunnel Laborer will, given appropriate safety labels and/or SDS, describe how to maintain a safe work environment while the relevant material or compound is in use with 100% accuracy within the specified time frame. This will include the safe use of explosives and compressed gas cylinders.	6.22	Mod. - High	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
2002	Uses proper PPE when entering and working in areas that contain hazardous materials (e.g., stored gases, explosives).		5.96	Mod. - Low	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
2003	Warns others to evacuate the scene prior to blasting/use of explosives through methods appropriate for the area (e.g., verbal warnings, air horns).	The Tunnel Laborer will, given appropriate safety labels and/or SDS, describe how to maintain a safe work environment while the relevant material or compound is in use with 100% accuracy within the specified time frame. This will include the safe use of explosives and compressed gas cylinders.	5.91	Mod. - Low	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
2004	Safely stores and appropriately marks gas cylinders (e.g., oxygen/acetylene).		5.91	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
2005	Stores flammable materials and compounds in separate locations from explosives.		5.73	Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
Function: General Worksite Maintenance								

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
3000	Cleans all equipment, as needed, using appropriate cleaning solutions and safety procedures; includes cleaning certain equipment above ground.	The Tunnel Laborer will, when given tools or equipment that require cleaning, fully clean them while observing all safety procedures and according to equipment specifications within the specified time frame.	6.17	Mod. - Low	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
								necessary to use a jumbo drill.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
3001	Removes accumulated dirt/grime from equipment used for operations (e.g., brakes, accelerators).	The Tunnel Laborer will, when given tools or equipment that require cleaning, fully clean them while observing all safety procedures and according to equipment specifications within the specified time frame.	6.30	Mod. - High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
								necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
3002	Changes and charges batteries as required in a safe environment.	The Tunnel Laborer will, given a provided set of hand held power tools, inspect, set up, and test the proper functioning, correct any deficiencies if possible, and use in a specified construction scenario with 100% accuracy within the specified time frame. This includes checking batteries, hoses, and safety features, rolling and unrolling power cords and air and water hoses, and changing bits/blades.	6.00	Mod. - Low	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
3003	Inspects and tests equipment (e.g., hand held power tools) before operation to ensure proper functioning.	The Tunnel Laborer will, given a provided set of hand held power tools, inspect, set up, and test the proper functioning, correct any deficiencies if possible, and use in a specified construction scenario with 100% accuracy within the specified time frame. This includes checking batteries, hoses, and safety features, rolling and unrolling power cords and air and water hoses, and changing bits/blades.	6.00	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					11	3.72%	100	Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
3004	Disconnects power tools when finished with their use.		5.61	Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
3005	Rolls and unrolls cables as needed.		6.04	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
3006	Loads and unloads building/construction materials from vehicles.	The Tunnel Laborer will assist another person in loading a specified amount of construction materials (e.g., concrete segments) onto a tunnel transport vehicle, and then properly secure the load such that the vehicle can safely move to its destination, with 100% accuracy and using safe practices within the specified time frame.	6.13	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
3007	Sets up barricades for inactive and/or completed underground work sections.	The Tunnel Laborer will, given photographs/videos of a tunnel scenario where barricades are required, select the proper type of barricade and set it up using proper techniques with 100% accuracy within the specified time frame.	5.96	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
3008	Maintains barricades for inactive and/or completed underground work sections.		5.83	Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
3009	Inspects the entire tunnel/worksite for cleanliness.		5.91	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
3010	Places appropriate barriers around high-risk, hot work within tunnels.	The Tunnel Laborer will, given photographs/videos of a tunnel scenario where barricades are required, select the proper type of barricade and set it up using proper techniques with 100% accuracy within the specified time frame.	6.00	Mod. - Low	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
Function: Drill Maintenance								

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
4000	Maintains, as needed, engine and attachments to jumbo drills (e.g., adds fluids).	The Tunnel Laborer will perform a maintenance check on a jumbo drill and its attachments, noting and correcting any deficiencies (e.g., adds oil if necessary), with 100% accuracy within the specified time frame.	6.26	Mod. - High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
4001	Inspects threads and clamps on drills before use.	The Tunnel Laborer will demonstrate the proper method of set up, use, and break down of a drill equipped with power cords and air and/or water hoses, and use the drill to drill a hole of specified depth with 100% accuracy within the specified time frame. This will include maintaining proper air or water pressure while drilling the hole.	5.96	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
4002	Connects and disconnects air and water hoses to drill pipelines.	The Tunnel Laborer will demonstrate the proper method of set up, use, and break down of a drill equipped with power cords and air and/or water hoses, and use the drill to drill a hole of specified depth with 100% accuracy within the specified time frame. This will include maintaining proper air or water pressure while drilling the hole.	5.96	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
4003	Blows accumulated dirt out of air and water hoses.	The Tunnel Laborer will perform a maintenance check on a specified handheld drill and its components, noting and correcting any deficiencies (e.g., lubricates components if necessary), with 100% accuracy within the specified time frame.	6.04	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
4004	Fills drills with oil as necessary.	The Tunnel Laborer will perform a maintenance check on a specified handheld drill and its components, noting and correcting any deficiencies (e.g., lubricates components if necessary), with 100% accuracy within the specified time frame.	5.96	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
4005	Installs, assembles/disassembles, and replaces drill bits as appropriate.	The Tunnel Laborer will, when provided with a specific type of hand held drill typically used in a tunneling job, demonstrate the proper assembly and installation of a specified number of drill bits with 100% accuracy within the specified time frame.	6.17	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
4006	Checks lubricator and other fluids in drill and/or machines regularly.	The Tunnel Laborer will perform a maintenance check on a specified handheld drill and its components, noting and correcting any deficiencies (e.g., lubricates components if necessary), with 100% accuracy within the specified time frame.	6.00	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
4007	Maintains appropriate water and air pressure in drills.	The Tunnel Laborer will demonstrate the proper method of set up, use, and break down of a drill equipped with power cords and air and/or water hoses, and use the drill to drill a hole of specified depth with 100% accuracy within the specified time frame. This will include maintaining proper air or water pressure while drilling the hole.	6.04	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
4008	Lubricates drill and associated components as needed.	The Tunnel Laborer will demonstrate the proper method of set up, use, and break down of a drill equipped with power cords and air and/or water hoses, and use the drill to drill a hole of specified depth with 100% accuracy within the specified time frame. This will include maintaining proper air or water pressure while drilling the hole.	6.04	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
4009	Places dust caps on air and water connections of drills.		5.91	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
Function: Scaling								

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
5000	Inspects scaling bar for defects/safety issues before and after use.	The Tunnel Laborer will inspect a scaling bar for defects and safety issues noting 100% of the defects and safety issues within the specified time frame.	5.91	Mod. - High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					11	3.72%	100	Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
5001	"Sounds" the rock (i.e., strikes bar against rock) before scaling to inspect terrain.	The Tunnel Laborer will demonstrate the proper and safe use of a scaling bar on an overhead concrete ceiling or mockup of a tunnel ceiling to "sound" the ceiling with 100% accuracy within the specified time frame.	6.45	Mod. - High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					11	3.72%	100	Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
5002	Raises or pulls scaling bar as needed to perform scaling work.	The Tunnel Laborer will examine a photograph of a tunnel to be scaled and describe how to use a scaling bar to scale this tunnel with 100% accuracy within the specified time frame.	6.50	Mod. - High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					11	3.72%	100	Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
								scale rock.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
5003	Continuously observes area that he/she is scaling.		6.32	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					11	3.72%	100	Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
Function: Hard Rock Drilling								
6000	Ensures drill has appropriate penetration tools and attachments for intended job.	The Tunnel Laborer will, given a specific job and the type and hardness of the rock to be drilled, select the proper drilling equipment to use to drill the hole with 100% accuracy within the specified time frame.	6.09	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
6001	Selects the proper drill for the job from among various options.	The Tunnel Laborer will, given a specific job and the type and hardness of the rock to be drilled, select the proper drilling equipment to use to drill the hole with 100% accuracy within the specified time frame.	6.18	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
6002	Changes drill bits as dictated by rock conditions at the worksite.	The Tunnel Laborer will, given a specific job that requires drilling, drill a specified number of holes into a hard rock formation at a specified depth within the specified time frame. This will include use of the proper techniques to drill the specified hole, the changing of drill bits as needed, and following a drilling pattern. This should include drilling holes straight down.	6.30	Mod. - High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
			6.30	Mod. - High	4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
6003	Removes rock fragments from holes drilled straight down (e.g., blows out holes, washes holes out with water if explosives misfire).	The Tunnel Laborer will, given a specific job that requires drilling, drill a specified number of holes into a hard rock formation at a specified depth within the specified time frame. This will include use of the proper techniques to drill the specified hole, the changing of drill bits as needed, and following a drilling pattern. This should include drilling holes straight down.	6.23	Mod. - High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
6004	Operates various drills, using levers and valves, by using proper techniques.	The Tunnel Laborer will, given a specific job that requires drilling, drill a specified number of holes into a hard rock formation at a specified depth within the specified time frame. This will include use of the proper techniques to drill the specified hole, the changing of drill bits as needed, and following a drilling pattern. This should include drilling holes straight down.	6.48	Mod. - High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
								necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
								gear).
6005	Selects drilling technique that is appropriate and safe for current job and rock conditions.	The Tunnel Laborer will, given a specific job that requires drilling, drill a specified number of holes into a hard rock formation at a specified depth within the specified time frame. This will include use of the proper techniques to drill the specified hole, the changing of drill bits as needed, and following a drilling pattern. This should include drilling holes straight down.	6.52	High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
6006	Utilizes a jackleg drill, as required.	The Tunnel Laborer will drill a hole of specified depth safely and properly using a jackleg drill, with 100% accuracy within the specified time frame.	6.39	Mod. - High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
6007	Collars initially drilled hole sufficiently in order to allow continued drilling.	The Tunnel Laborer will place a sufficient amount of provided reinforcement materials (e.g., PVC piping, plugs) in a recently drilled hole in order to prevent the hole from filling with dirt and/or collapsing with 100% accuracy within the specified time frame.	6.70	High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stoppers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
6008	Maintains proper alignment between drill rod and drill while drilling.	The Tunnel Laborer will, given a specific job that requires drilling, drill a specified number of holes into a hard rock formation at a specified depth within the specified time frame. This will include use of the proper techniques to drill the specified hole, the changing of drill bits as needed, and following a drilling pattern. This should include drilling holes straight down.	6.57	High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
6009	Measures distances between drill cuts and holes to ensure spacing is appropriate for the job.	The Tunnel Laborer will, given a specific job that requires drilling, drill a specified number of holes into a hard rock formation at a specified depth within the specified time frame. This will include use of the proper techniques to drill the specified hole, the changing of drill bits as needed, and following a drilling pattern. This should include drilling holes straight down.	6.39	Mod. - High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
Function: Soft Ground Tunneling								
7000	Assists in the operation of excavating machinery, e.g., tunnel boring machines (TBM), using proper and safe techniques.	The Tunnel Laborer will demonstrate the safe and proper performance of a specified number of commonly performed tasks done to support the operation of a TBM with 100% accuracy within the specified time frame, e.g., filling muck cars, assembling utility lines. This includes monitoring the TBM's operational components, such as muck removal systems (by loading and monitoring conveyer belts).	6.59	High	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
7001	Monitors operational components of excavating machinery continuously (e.g., muck removal system, push rams).	The Tunnel Laborer will demonstrate the safe and proper performance of a specified number of commonly performed tasks done to support the operation of a TBM with 100% accuracy within the specified time frame, e.g., filling muck cars, assembling utility lines. This includes monitoring the TBM's operational components, such as muck removal systems (by loading and monitoring conveyer belts).	6.32	Mod. - High	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
								flexibility.
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
7002	Pumps grout into holes in rocks made by tunnel boring machine (TBM).		6.64	High	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
7003	Selects and uses appropriate manual digging equipment (e.g., shovels) to move earth.	The Tunnel Laborer will, given a task that requires the use of manual digging equipment, select and use the proper piece of equipment to manually move a set amount of soil or debris from one location to another with 100% completion within the specified time frame.	6.36	Mod. - High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
7004	Pushes iron or steel sets into tunneled area, using jacks, to act as a temporary shield and/or support.	The Tunnel Laborer will, given a specific set of environmental conditions inside of a hypothetical tunnel, describe the steps that must be taken install ground support (e.g., support made of concrete segments, liner plates, or steel sets) immediately after excavation has been completed, with 100% accuracy within the specified time frame.	6.77	High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
7005	Removes loose soil, gravel, and other debris to clear space for shield installation.		6.73	High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
7006	Places ground support made of concrete segments, liner plates, or steel sets to support tunnel walls.	The Tunnel Laborer will, given a specific set of environmental conditions inside of a hypothetical tunnel, describe the steps that must be taken install ground support (e.g., support made of concrete segments, liner plates, or steel sets) immediately after excavation has been completed, with 100% accuracy within the specified time frame.	6.86	High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
7007	Secures ground behind completed work using necessary equipment.	The Tunnel Laborer will describe common types of ground support used on tunneling jobs, to include their specific features and the pros and cons of each, with 100% accuracy within the specified time frame.	6.86	High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
7008	Observes tunneled worksite to ensure that shield/support device is working satisfactorily.	The Tunnel Laborer will, given a photograph or video recording of a tunneling worksite with improperly secured tunnel supports, note all safety concerns and describe accurate corrective actions to take within the specified time frame.	6.45	Mod. - High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
7009	Utilizes digger shield on excavating machinery as appropriate.		6.59	High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
7010	Pumps proper amount of compressed air into tunnel, as necessary, to aid stabilization activities.		6.68	High	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
Function: Physical Labor								
8000	Uses proper lifting procedures to move construction materials and tools safely (e.g., lifts 50 lbs to waist height repeatedly).	The Tunnel Laborer will carry 50 pounds of construction materials for a specified distance in one attempt within the specified time frame, e.g., 50 pounds of piping material for 50 feet within 1 minute.	6.57	High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
8001	Uses proper bodily movements to accomplish intended work tasks (e.g., contorts body at different angles, fits body into tight spaces).	The Tunnel Laborer will perform a specified number of construction tasks common to Tunnel Laborers (e.g., reaching into a narrow, confined space while laying on back or side to grasp an object in order to remove or reposition it) in an enclosed space of specified dimensions with 100% completion within the specified time frame.	6.70	High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					11	3.72%	100	Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
8002	Uses physical strength to mix compounds needed to perform intended work (e.g., grout, two-part epoxies).	The Tunnel Laborer will manually mix a given compound according to specifications within the specified time frame, e.g., mixes grout in 5 minutes.	6.48	Mod. - High	1	3.58%	125	Knowledge of proper procedures to ventilate and circulate clean air within a tunnel, including how to ventilate a tunnel when encountering various gases (e.g., methane, nitrogen, carbon monoxide, etc.) and how to keep harmful dust and fumes out of tunneling areas.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					22	3.32%	141	Ability and willingness to produce quality work under time pressure, hazardous work conditions, or other stressors.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
8003	Carries materials and tools (e.g., pipes, drills), for varying distances, to and from work locations.	The Tunnel Laborer will carry 50 pounds of construction materials for a specified distance in one attempt within the specified time frame, e.g., 50 pounds of piping material for 50 feet within 1 minute.	6.65	High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					24	3.67%	198	Ability to lift, carry, push or pull heavy objects (e.g., lifting drills in tight spaces, operating heavy digging equipment).
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
Function: Communications/Communicating								
9000	Comprehends and accurately follows instructions provided by management and coworkers.	The Tunnel Laborer will follow a list of verbal instructions provided by an instructor with 100% accuracy within the specified time frame.	6.17	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					11	3.72%	100	Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
9001	Asks for clarification/confirmation of directions received from others.		6.22	Mod. - High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					4	3.84%	189	Knowledge of different types of rock drills (e.g., jack leg, stopers, compressed air drills) and attachments (e.g., rock drill bits such as the diamond bit and the roller bit, drill steel), their proper use, safety features, and the energy outputs and applied thrust of different drills; knowledge of the proper maintenance, including lubrication, of drilling tools to ensure continued safe functioning, and troubleshooting methods for assigned tools/equipment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					5	3.84%	159	Knowledge of the different types of digging/excavating tools (e.g., compressed air tools and blowers) and machines (e.g., shovels, tunnel boring machine) and the safety devices accompanying these machines, to include their proper and safe usage, e.g., how to handle unwanted ground movement; how to handle these tools and machines in various ground conditions; how to properly maintain these tools and machines; how to troubleshoot problems/malfunctions.
					6	3.93%	118	Knowledge of different types of shielding operations and methods; knowledge of the features of different types of ground support (e.g., concrete segments, liner plates, steel sets) and how to properly install them behind a working shield.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					10	3.76%	173	Knowledge of the multiple components (e.g., rock drills, hydraulic booms, four-wheel drive) and operating procedures (e.g., driving) associated with jumbo drills (e.g., wheeled jumbo drill) within tunnels; knowledge of the occasions when it is necessary to use a jumbo drill.
					11	3.72%	100	Skill and ability in the practice of scaling rock, to include skill in the use of scaling bars (e.g., proper holding of bar); skill in locating proper/safe areas to scale rock.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					13	3.39%	148	Skill and ability in the safe and effective use of tunneling and earth moving equipment and machinery in varying ground/earth conditions and through different layers and types of soil, to include proper equipment/machinery selection and use; skill in securing soft ground tunneling worksites by using proper and safe support mechanisms; skill in cleaning muck and other dirt from a recently drilled area; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
9002	Communicates with other coworkers and supervisors while performing tasks.		6.30	Mod. - High	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					8	2.60%	162	Knowledge of characteristics/properties of various types of rock (e.g., the strength/fragility of rocks, voids, inclusions, elasticity, grain boundaries), the mechanics of penetration, and major factors influencing the penetration of different rock types; knowledge of the proper angles and spacing, measurement of holes, proper size of bits to use when drilling into various rock types, various drilling techniques (e.g., percussive, hydraulic) and their effects on rock formations.
					9	3.10%	144	Knowledge of characteristics/properties of various ground types, their behavior when moved/tunneled into, their stability, and their water content (e.g., influence of groundwater); knowledge of the methods/mechanics of safely penetrating ground and supporting tunnels under and through different ground types.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					23	3.67%	204	Ability to bend, stretch, twist, balance body, or reach out with the body, arms, or legs; to move the limbs quickly and easily; to demonstrate physical flexibility.
					25	3.93%	213	Ability to exert oneself physically over a long period of time.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
9003	Uses and comprehends various hand signals to communicate with others.	The Tunnel Laborer will demonstrate frequently-used hand signals in a variety of situations, upon command, with 100% accuracy within the specified time frame.	6.13	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					12	3.45%	174	Skill and ability in the safe and effective use of drilling equipment in varying environments and through different types and layers of rock, to include proper equipment and drill bit selection; skill in cleaning recently drilled area sufficient enough to eliminate hazards; skill in troubleshooting all equipment used.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).
9004	Reads and comprehends various documents, directions, warning labels, and other written materials related to performance of job.	The Tunnel Laborer will be able to read and explain written materials, including safety instructions, manuals, warning labels, and other materials with 100% accuracy within a specified time frame.	6.18	Mod. - Low	2	4.02%	362	Knowledge of proper safety practices to follow on worksite (e.g., tunnels, other enclosed spaces), including the proper PPE to use in various work environments, proper lifting and moving techniques that ensure the safety of self and others, proper locations to perform certain types of high-risk work, safe use of cables and tunnel transportation, proper treatment for self and others when injured or overheated (e.g., basic first aid), how to safely use air tools in underground environment, how to safely attach, secure, and detach all pneumatic tools used (e.g., air ratchet, jackhammer, rock splitter), and when equipment is safe to use; knowledge of how to prevent fires and the actions to take when a fire occurs on the worksite.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					3	3.58%	128	Knowledge of the proper handling and storage methods for hazardous materials; knowledge of the proper actions to take when working around hazardous chemicals and materials (e.g., explosives), including the proper PPE to use, how to monitor gas detectors and control gas leaks, proper treatment required for self and others when exposed to unsafe levels of hazardous materials, and proper safety practices and precautions to take in environments where blasting/explosive equipment will be used or has been used.
					7	2.96%	226	Knowledge of relevant laws, regulations and procedures that govern all aspects of work to be performed (e.g., rock drilling, tunneling), to include the use of associated equipment (e.g., drills, shielding) and safety laws (e.g., government laws and regulations); knowledge to include how laws and regulations affect daily performance of job, such as the required atmospheric conditions in enclosed workspaces and safety regulations for ladders and stairways.
					14	4.02%	365	Skill and ability in performing work in a safe manner, regardless of the surroundings or hazards found on a worksite; skill in using all equipment safely and taking proper precautions when working around hazardous materials (e.g., explosives).
					15	4.02%	361	Ability to follow directions, instructions, rules, policies and/or procedures correctly and in order.
					16	3.41%	293	Ability to comprehend new or unfamiliar material in the expected amount of time; to grasp or learn the implication of new information relevant to tunnel and shaft work, such as safety instructions and blueprints.
					17	2.30%	164	Ability to read and understand written materials required by the job.

Task No.	Performance Measure	Task Definition	Consid. Value	Task Band Rank	KSA No.	Rel. Contrib. Value	Links	KSA Definitions
					18	3.28%	273	Ability to be tactful; to develop and maintain effective relationships; to consider and respond appropriately to the needs, feelings and capabilities of different people in different situations; to treat others with respect; to contribute to group efforts; to dedicate effort to team success, helping others in the process.
					19	3.61%	313	Ability and willingness to listen to what other people are saying and ask questions to ensure understanding; ability and willingness to speak to others in a clear and understandable manner to convey information effectively.
					20	3.85%	342	Ability to keep track of details without losing focus on the big picture; to check and visually inspect work to ensure that it is completed to specifications; to record information accurately.
					21	3.93%	342	Ability to work effectively and carry out job tasks and procedures faithfully without close supervision; to make decisions independently, as necessary and appropriate; to be self-motivated.
					26	3.85%	287	Skill in manipulating objects with hands; to make coordinated eye and hand movements with precision and speed; to use fine motor skills in the daily performance of work.
					27	3.84%	306	Ability to use senses to include one or more of the following based on job demands: to feel heat and cold; to feel vibrations; to perceive colors; to have a sense of smell; to have visual acuity; to recognize changes in pitch or sounds; to recognize a potentially hazardous or dangerous situation or environment.
					28	3.50%	345	Ability to work in one or more of the following environments based on job demands: at height, below grade, enclosed space, inclement weather, air that may be contaminated, compressed air, in the field and/or other types of conditions; includes the ability to select and use proper PPE for various work environments (e.g., respiratory protection, rain gear).

