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[▶ Engineering](#)[▶ Career Info](#)[▶ Health Info](#)[▶ Job Title](#)CODE: **13017A**Buy ONET/DOT: [Download or CD-ROM](#)**TITLE: Engineering Managers**

**DEFINITION:** Plan, direct, and coordinate work in engineering fields, spending a majority of time performing managerial work for which a background consistent with that described for engineers is required.

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**TASKS:**

1. Establishes procedures, and directs testing, operation, maintenance, and repair of transmitter equipment.
2. Evaluates contract proposals, directs negotiation of research contracts, and prepares bids and contracts.
3. Plans and directs installation, maintenance, testing, and repair of facilities and equipment.
4. Directs, reviews, and approves product design and changes, and directs testing.
5. Plans, coordinates, and directs engineering project, organizes and assigns staff, and directs integration of technical activities with products.
6. Plans and directs oil field development, gas and oil production, and geothermal drilling.
7. Analyzes technology, resource needs, and market demand, and confers with management, production, and marketing staff to plan and assess feasibility of project.
8. Plans, directs, and coordinates survey work with activities of other staff, certifies survey work, and writes land legal descriptions.
9. Administers highway planning, construction, and maintenance, and reviews and recommends or approves contracts and cost estimates.
10. Directs engineering of water control, treatment, and distribution projects.
11. Confers with and prepares reports for officials and speaks to public to solicit support.

**KNOWLEDGE:**

Knowledge elements are ranked by *importance*.

100 Engineering and Technology  
 Knowledge of equipment, tools, mechanical devices, and their uses to produce motion, light, power, technology, and other applications

96 Administration and Management  
 Knowledge of principles and processes involved in business and organizational planning, coordination, and execution. This includes strategic planning, resource allocation, manpower modeling, leadership techniques, and production methods

79 Design  
 Knowledge of design techniques, principles, tools and instruments involved in the production and use of precision technical plans, blueprints, drawings, and models

75 Physics  
 Knowledge and prediction of physical principles, laws, and applications including air, water, material dynamics, light, atomic principles, heat, electric theory, earth formations, and meteorological and

A	B	C
D	E	F
G	H	I
J	K	L
M	N	O
P	Q	R
S	T	U
V	W	X
Y	Z	?

related natural phenomena

#### 75 Mathematics

Knowledge of numbers, their operations, and interrelationships including arithmetic, algebra, geometry, calculus, statistics, and their applications

#### 71 English Language

Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar

#### 67 Economics and Accounting

Knowledge of economic and accounting principles and practices, the financial markets, banking, and the analysis and reporting of financial data

#### 58 Mechanical

Knowledge of machines and tools, including their designs, uses, benefits, repair, and maintenance

#### 54 Telecommunications

Knowledge of transmission, broadcasting, switching, control, and operation of telecommunications systems

#### 50 Law, Government and Jurisprudence

Knowledge of laws, legal codes, court procedures, precedents, government regulations, executive orders, agency rules, and the democratic political process

#### 46 Sales and Marketing

Knowledge of principles and methods involved in showing, promoting, and selling products or services. This includes marketing strategies and tactics, product demonstration and sales techniques, and sales control systems

#### 46 Chemistry

Knowledge of the composition, structure, and properties of substances and of the chemical processes and transformations that they undergo. This includes uses of chemicals and their interactions, danger signs, production techniques, and disposal methods

#### 46 Public Safety and Security

Knowledge of weaponry, public safety, and security operations, rules, regulations, precautions, prevention, and the protection of people, data, and property

#### 46 Building and Construction

Knowledge of materials, methods, and the appropriate tools to construct objects, structures, and buildings

#### 46 Geography

Knowledge of various methods for describing the location and distribution of land, sea, and air masses including their physical locations, relationships, and characteristics

#### 46 Communications and Media

Knowledge of media production, communication, and dissemination techniques and methods including alternative ways to inform and entertain via written, oral, and visual media

#### 42 Personnel and Human Resources

Knowledge of policies and practices involved in personnel/human resource functions. This includes recruitment, selection, training, and promotion regulations and procedures; compensation and benefits packages; labor relations and negotiation strategies; and personnel information systems

#### 38 Psychology

Knowledge of human behavior and performance, mental processes, psychological research methods, and the assessment and treatment of behavioral and affective disorders

#### 33 Education and Training

Knowledge of instructional methods and training techniques including curriculum design principles, learning theory, group and individual teaching techniques, design of individual development plans, and test design principles

#### 29 Computers and Electronics

Knowledge of electric circuit boards, processors, chips, and computer hardware and software, including applications and programming

#### 29 Production and Processing

Knowledge of inputs, outputs, raw materials, waste, quality control, costs, and techniques for maximizing the manufacture and distribution of goods

#### 17 Customer and Personal Service

Knowledge of principles and processes for providing customer and personal services including needs assessment techniques, quality service standards, alternative delivery systems, and customer satisfaction evaluation techniques

#### 13 Transportation

Knowledge of principles and methods for moving people or goods by air, rail, sea, or road, including their relative costs, advantages, and limitations

**13 History and Archeology**

Knowledge of past historical events and their causes, indicators, and impact on particular civilizations and cultures

**8 Biology**

Knowledge of plant and animal living tissue, cells, organisms, and entities, including their functions, interdependencies, and interactions with each other and the environment

**8 Clerical**

Knowledge of administrative and clerical procedures and systems such as word processing systems, filing and records management systems, stenography and transcription, forms design principles, and other office procedures and terminology

**4 Therapy and Counseling**

Knowledge of information and techniques needed to rehabilitate physical and mental ailments and to provide career guidance including alternative treatments, rehabilitation equipment and its proper use, and methods to evaluate treatment effects

**4 Medicine and Dentistry**

Knowledge of the information and techniques needed to diagnose and treat injuries, diseases, and deformities. This includes symptoms, treatment alternatives, [drug](#) properties and interactions, and preventive health-care measures

**4 Foreign Language**

Knowledge of the structure and content of a foreign (non-English) language including the meaning and spelling of words, rules of composition and grammar, and pronunciation

**4 Sociology and Anthropology**

Knowledge of group behavior and dynamics, societal trends and influences, cultures, their history, migrations, ethnicity, and origins

**SKILLS:**

Skills elements are ranked by **importance**.

**96 Coordination**

Adjusting actions in relation to others' actions

**96 Implementation Planning**

Developing approaches for implementing an idea

**83 Reading Comprehension**

Understanding written sentences and paragraphs in work related documents

**83 Speaking**

Talking to others to effectively convey information

**83 Operations Analysis**

Analyzing needs and product requirements to create a design

**79 Problem Identification**

Identifying the nature of problems

**79 Management of Material Resources**

Obtaining and seeing to the appropriate use of equipment, facilities, and materials needed to do certain work

**79 Visioning**

Developing an image of how a system should work under ideal conditions

**79 Science**

Using scientific methods to solve problems

**79 Critical Thinking**

Using logic and analysis to identify the strengths and weaknesses of different approaches

**79 Judgment and Decision Making**

Weighing the relative costs and benefits of a potential action

**79 Idea Generation**

Generating a number of different approaches to problems

**75 Writing**

Communicating effectively with others in writing as indicated by the needs of the audience

**75 Information Gathering**

Knowing how to find information and identifying essential information

**75 Idea Evaluation**

Evaluating the likely success of an idea in relation to the demands of the situation

**75 Identification of Key Causes**

Identifying the things that must be changed to achieve a goal

**71 Monitoring**

Assessing how well one is doing when learning or doing something

**71 Time Management**

Managing one's own time and the time of others

**71 Management of Personnel Resources**

Motivating, developing, and directing people as they work, identifying the best people for the job

**71 Identifying Downstream Consequences**

Determining the long-term outcomes of a change in operations

**71 Systems Perception**

Determining when important changes have occurred in a system or are likely to occur

**71 Systems Evaluation**

Looking at many indicators of system performance, taking into account their accuracy

**71 Mathematics**

Using mathematics to solve problems

**71 Technology Design**

Generating or adapting equipment and technology to serve user needs

**67 Solution Appraisal**

Observing and evaluating the outcomes of a problem solution to identify lessons learned or redirect efforts

**67 Active Learning**

Working with new material or information to grasp its implications

**67 Information Organization**

Finding ways to structure or classify multiple pieces of information

**63 Testing**

Conducting tests to determine whether equipment, software, or procedures are operating as expected

**63 Synthesis/Reorganization**

Reorganizing information to get a better approach to problems or tasks

**58 Troubleshooting**

Determining what is causing an operating error and deciding what to do about it

**58 Negotiation**

Bringing others together and trying to reconcile differences

**58 Equipment Selection**

Determining the kind of tools and equipment needed to do a job

**58 Product Inspection**

Inspecting and evaluating the quality of products

**58 Social Perceptiveness**

Being aware of others' reactions and understanding why they react the way they do

**54 Active Listening**

Listening to what other people are saying and asking questions as appropriate

**54 Management of Financial Resources**

Determining how money will be spent to get the work done, and accounting for these expenditures

**46 Installation**

Installing equipment, machines, wiring, or programs to meet specifications

**38 Persuasion**

Persuading others to approach things differently

**33 Learning Strategies**

Using multiple approaches when learning or teaching new things

**33 Instructing**

Teaching others how to do something

**25 Operation and Control**

Controlling operations of equipment or systems

**21 Service Orientation**

Actively looking for ways to help people

**17 Operation Monitoring**

Watching gauges, dials, or other indicators to make sure a machine is working properly

**17 Equipment Maintenance**

Performing routine maintenance and determining when and what kind of maintenance is needed

**17 Repairing**

Repairing machines or systems using the needed tools

**13 Programming**

Writing computer programs for various purposes .

**ABILITIES:**

Abilities elements are ranked by *importance*.

**100 Oral Comprehension**

The ability to listen to and understand information and ideas presented through spoken words and sentences

**96 Written Expression**

The ability to communicate information and ideas in writing so others will understand

**96 Written Comprehension**

The ability to read and understand information and ideas presented in writing

**96 Oral Expression**

The ability to communicate information and ideas in speaking so others will understand

**88 Deductive Reasoning**

The ability to apply general rules to specific problems to come up with logical answers. It involves deciding if an answer makes sense.

**83 Speech Clarity**

The ability to speak clearly so that it is understandable to a listener

**83 Inductive Reasoning**

The ability to combine separate pieces of information, or specific answers to problems, to form general rules or conclusions. It includes coming up with a logical explanation for why a series of seemingly unrelated events occur together.

**79 Near Vision**

The ability to see details of objects at a close range (within a few feet of the observer)

**79 Mathematical Reasoning**

The ability to understand and organize a problem and then to select a mathematical method or formula to solve the problem

**71 Visualization**

The ability to imagine how something will look after it is moved around or when its parts are moved or rearranged

**71 Originality**

The ability to come up with unusual or clever ideas about a given topic or situation, or to develop creative ways to solve a problem

**67 Fluency of Ideas**

The ability to come up with a number of ideas about a given topic. It concerns the number of ideas produced and not the quality, correctness, or creativity of the ideas.

**67 Number Facility**

The ability to add, subtract, multiply, or divide quickly and correctly

**63 Speech Recognition**

The ability to identify and understand the speech of another person

**58 Problem Sensitivity**

The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.

**54 Category Flexibility**

The ability to produce many rules so that each rule tells how to group (or combine) a set of things in a different way.

**54 Information Ordering**

The ability to correctly follow a given rule or set of rules in order to arrange things or actions in a certain order. The things or actions can include numbers, letters, words, pictures, procedures, sentences, and mathematical or logical operations.

**54 Visual Color Discrimination**

The ability to match or detect differences between colors, including shades of color and brightness

**50 Time Sharing**

The ability to efficiently shift back and forth between two or more activities or sources of information (such as speech, sounds, touch, or other sources)

**50 Speed of Closure**

The ability to quickly make sense of information that seems to be without meaning or organization. It involves quickly combining and organizing different pieces of information into a meaningful pattern

**50 Memorization**

The ability to remember information such as words, numbers, pictures, and procedures

**46 Selective Attention**

The ability to concentrate and not be distracted while performing a task over a period of time

**42 Far Vision**

The ability to see details at a distance

**33 Trunk Strength**

The ability to use one's abdominal and lower back muscles to support part of the body repeatedly or continuously over time without "giving out" or fatiguing

**33 Spatial Orientation**

The ability to know one's location in relation to the environment, or to know where other objects are in relation to one's self

**33 Perceptual Speed**

The ability to quickly and accurately compare letters, numbers, objects, pictures, or patterns. The things to be compared may be presented at the same time or one after the other. This ability also includes comparing a presented object with a remembered object

**29 Wrist-Finger Speed**

The ability to make fast, simple, repeated movements of the fingers, hands, and wrists

**25 Auditory Attention**

The ability to focus on a single source of auditory (hearing) information in the presence of other distracting sounds

**25 Peripheral Vision**

The ability to see objects or movement of objects to one's side when the eyes are focused forward

**25 Flexibility of Closure**

The ability to identify or detect a known pattern (a figure, object, word, or sound) that is hidden in other distracting material

**21 Extent Flexibility**

The ability to bend, stretch, twist, or reach out with the body, arms, and/or legs

**21 Arm-Hand Steadiness**

The ability to keep the hand and arm steady while making an arm movement or while holding the arm and hand in one position

**21 Depth Perception**

The ability to judge which of several objects is closer or farther away from the observer, or to judge the distance between an object and the observer

**17 Manual Dexterity**

The ability to quickly make coordinated movements of one hand, a hand together with its arm, or two hands to grasp, manipulate, or assemble objects

**17 Static Strength**

The ability to exert maximum muscle force to lift, push, pull, or carry objects

**17 Hearing Sensitivity**

The ability to detect or tell the difference between sounds that vary over broad ranges of pitch and loudness

**17 Control Precision**

The ability to quickly and repeatedly make precise adjustments in moving the controls of a machine or vehicle to exact positions

**17 Finger Dexterity**

The ability to make precisely coordinated movements of the fingers of one or both hands to grasp, manipulate, or assemble very small objects

**8 Response Orientation**

The ability to choose quickly and correctly between two or more movements in response to two or more signals (lights, sounds, pictures, etc.). It includes the speed with which the correct response is started with the hand, foot, or other body parts

**8 Gross Body Equilibrium**

The ability to keep or regain one's body balance or stay upright when in an unstable position

#### 8 Night Vision

The ability to see under low light conditions

#### 8 Sound Localization

The ability to tell the direction from which a sound originated

#### 4 Rate Control

The ability to time the adjustments of a movement or equipment control in anticipation of changes in the speed and/or direction of a continuously moving object or scene

#### 4 Reaction Time

The ability to quickly respond (with the hand, finger, or foot) to one signal (sound, light, picture, etc.) when it appears

#### 4 Speed of Limb Movement

The ability to quickly move the arms or legs

#### 4 Dynamic Strength

The ability to exert muscle force repeatedly or continuously over time. This involves muscular endurance and resistance to muscle fatigue

#### 4 Stamina

The ability to exert one's self physically over long periods of time without getting winded or out of breath

#### 4 Dynamic Flexibility

The ability to quickly and repeatedly bend, stretch, twist, or reach out with the body, arms, and/or legs

#### 4 Gross Body Coordination

The ability to coordinate the movement of the arms, legs, and torso together in activities where the whole body is in motion

#### 4 Multilimb Coordination

The ability to coordinate movements of two or more limbs together (for example, two arms, two legs, or one leg and one arm) while sitting, standing, or lying down. It does not involve performing the activities while the body is in motion

### **WORK ACTIVITIES:**

Work activities elements are ranked by **importance**.

#### 92 Guiding, Directing and Motivating Subordinates

Providing guidance and direction to subordinates, including setting performance standards and monitoring subordinates.

#### 92 Getting Information Needed to Do the Job

Observing, receiving, and otherwise obtaining information from all relevant sources.

#### 88 Organizing, Planning, and Prioritizing

Developing plans to accomplish work, and prioritizing and organizing one's own work.

#### 88 Providing Consultation and Advice to Others

Providing consultation and expert advice to management or other groups on technical, systems-related, or process related topics.

#### 88 Coordinating Work and Activities of Others

Coordinating members of a work group to accomplish tasks.

#### 83 Analyzing Data or Information

Identifying underlying principles, reasons, or facts by breaking down information or data into separate parts.

#### 83 Communicating With Other Workers

Providing information to supervisors, fellow workers, and subordinates. This information can be exchanged face-to-face, in writing, or via telephone/electronic transfer.

#### 83 Developing and Building Teams

Encouraging and building mutual trust, respect, and cooperation among team members.

#### 83 Establishing and Maintaining Relationships

Developing constructive and cooperative working relationships with others.

#### 79 Monitoring and Controlling Resources

Monitoring and controlling resources and overseeing the spending of money.

#### 79 Communicating With Persons Outside Organization

Communicating with persons outside the organization, representing the organization to customers, the public, government, and other external sources. This information can be exchanged face-to-face, in writing, or via telephone/electronic transfer.

**79 Making Decisions and Solving Problems**

Combining, evaluating, and reasoning with information and data to make decisions and solve problems. These processes involve making decisions about the relative importance of information and choosing the best solution.

**79 Implementing Ideas or Programs**

Conducting or carrying out work procedures and activities in accord with one's own ideas or information provided through directions/instructions for purposes of installing, modifying, preparing, delivering, constructing, integrating, finishing, or completing programs, systems, structures, or products.

**79 Identifying Objects, Actions, and Events**

Identifying information received by making estimates or categorizations, recognizing differences or similarities, or sensing changes in circumstances or events.

**75 Processing Information**

Compiling, coding, categorizing, calculating, tabulating, auditing, verifying, or processing information or data.

**75 Judging Qualities of Things, Services, or People**

Making judgments about or assessing the value, importance, or quality of things or people.

**75 Estimating Needed Characteristics**

Estimating the Characteristics of Materials, Products, Events, or Information: Estimating sizes, distances, and quantities, or determining time, costs, resources, or materials needed to perform a work activity.

**75 Interpreting Meaning of Information to Others**

Translating or explaining what information means and how it can be understood or used to support responses or feedback to others.

**75 Developing Objectives and Strategies**

Establishing long range objectives and specifying the strategies and actions to achieve these objectives.

**75 Scheduling Work and Activities**

Scheduling events, programs, activities, as well as the work of others.

**75 Monitor Processes, Material, or Surroundings**

Monitoring and reviewing information from materials, events, or the environment, often to detect problems or to find out when things are finished.

**75 Updating and Using Job-Relevant Knowledge**

Keeping up-to-date technically and knowing one's own jobs' and related jobs' functions.

**71 Interacting With Computers**

Controlling computer functions by using programs, setting up functions, writing software, or otherwise communicating with computer systems.

**71 Performing Administrative Activities**

Approving requests, handling paperwork, and performing day-to-day administrative tasks.

**71 Drafting and Specifying Technical Devices**

Providing documentation, detailed instructions, drawings, or specifications to inform others about how devices, parts, equipment, or structures are to be fabricated, constructed, assembled, modified, maintained, or used.

**67 Thinking Creatively**

Originating, inventing, designing, or creating new applications, ideas, relationships, systems, or products, including artistic contributions.

**67 Coaching and Developing Others**

Identifying developmental needs of others and coaching or otherwise helping others to improve their knowledge or skills.

**67 Evaluating Information Against Standards**

Evaluating information against a set of standards and verifying that it is correct.

**67 Resolving Conflict or Negotiating with Others**

Handling complaints, arbitrating disputes, and resolving grievances, or otherwise negotiating with others.

**67 Documenting or Recording Information**

Entering, transcribing, recording, storing, or maintaining information in either written form or by electronic/magnetic recording.

**63 Staffing Organizational Units**

Recruiting, interviewing, selecting, hiring, and promoting persons for the organization.

**58 Selling or Influencing Others**

Convincing others to buy merchandise/goods, or otherwise changing their minds or actions.

#### 50 Teaching Others

Identifying educational needs, developing formal training programs or classes, and teaching or instructing others.

#### 46 Handling and Moving Objects

Using one's own hands and arms in handling, installing, forming, positioning, and moving materials, or in manipulating things, including the use of keyboards.

#### 46 Inspecting Equipment, Structures, or Material

Inspecting or diagnosing equipment, structures, or materials to identify the causes of errors or other problems or defects.

#### 38 Performing General Physical Activities

Performing physical activities that require moving one's whole body, such as in climbing, lifting, balancing, walking, stooping, where the activities often also require considerable use of the arms and legs, such as in the physical handling of materials.

#### 33 Repairing and Maintaining Electrical Equipment

Fixing, servicing, adjusting, regulating, calibrating, fine-tuning, or testing machines, devices, and equipment that operate primarily on the basis of electrical or electronic (not mechanical) principles.

#### 25 Repairing and Maintaining Mechanical Equipment

Fixing, servicing, aligning, setting up, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.

#### 25 Performing For or Working With Public

Performing for people or dealing directly with the public, including serving persons in restaurants and stores, and receiving clients or guests.

#### 21 Assisting and Caring for Others

Providing assistance or personal care to others.

#### 21 Controlling Machines and Processes

Using either control mechanisms or direct physical activity to operate machines or processes (not including computers or vehicles).

#### 8 Operating Vehicles or Equipment

Running, maneuvering, navigating, or driving vehicles or mechanized equipment, such as forklifts, passenger vehicles, aircraft, or water craft.

#### **WORK CONTEXT:**

Work context elements are ranked by **frequency (F), importance (I), responsibility (R), amount of contact (C), how serious (S), objective vs. subjective (O), automation (A), extent of frustration (E), responsible for health and safety (H), likelihood of injury (L), degree of injury (D)**.

#### 90 (I) Importance of Being Exact or Accurate

How important is being very exact or highly accurate in performing this job?

#### 87 (I) Coordinate or Lead Others

How important are interactions requiring the worker to: Coordinate or lead others in accomplishing work activities (not supervision)?

#### 80 (I) Importance of Being Sure All Is Done

How important is it to be sure that all the details of this job are performed and everything is done completely?

#### 72 (S) Consequence of Error

How serious would the result usually be if the worker made a mistake that was not readily correctable?

#### 71 (F) Indoors

How frequently does this job require the worker to work: Indoors

#### 69 (R) Responsibility for Outcomes and Results

How responsible is the worker for work outcomes and results of other workers?

#### 67 (F) Sitting

How much time in a usual work period does the worker spend: Sitting?

#### 63 (I) Supervise, Coach, Train Others

How important are interactions requiring the worker to: Supervise, coach, train, or develop other employees?

#### 61 (C) Job-Required Social Interaction

How much does this job require the worker to be in contact (face-to-face, by telephone, or otherwise) with others in order to perform it?

#### 56 (O) Objective or Subjective Information

How objective or subjective is the information communicated in this job?

53 (I) Deal With External Customers

How important are interactions requiring the worker to: Deal with external customers (e.g., retail sales) or the public in general (e.g., police work)?

50 (F) Walking or Running

How much time in a usual work period does the worker spend: Walking or running?

50 (F) Outdoors

How frequently does this job require the worker to work: Outdoors

50 (F) Frequency in Conflict Situations

How frequently do the job requirements place the worker in conflict situations?

50 (F) Standing

How much time in a usual work period does the worker spend: Standing?

50 (E) Frustrating Circumstances

To what extent do frustrating circumstances ("road blocks" to work that are beyond the worker's control) hinder the accomplishment of this job?

47 (I) Importance of Being Aware of New Events

How important is being constantly aware of either frequently changing events (e.g. security guard watching for shoplifters) or infrequent events (e.g. radar operator watching for tornadoes) to performing this job?

46 (F) Using Hands on Objects, Tools, Controls

How much time in a usual work period does the worker spend: Using hands to handle, control, or feel objects, tools or controls?

46 (F) Common Protective or Safety Attire

How often does the worker wear: Common protective or safety attire, such as safety shoes, glasses, gloves, hearing protection, hard-hat, or personal flotation device?

42 (A) Degree of Automation

Indicate the level of automation of this job.

40 (I) Take a Position Opposed to Others

How important are interactions requiring the worker to: Take a position opposed to coworkers or others?

40 (H) Responsible for Health and Safety of Others

How responsible is the worker for others' health and safety on this job?

40 (I) Persuade Someone to a Course of Action

How important are interactions requiring the worker to: Persuade someone to a course of action (informally) or influence others to buy something (to sell)?

38 (F) Contaminants

How often during a usual work period is the worker exposed to the following conditions: Contaminants (pollutants, gases, dust, odors, etc.)?

38 (F) Very Hot

How often during a usual work period is the worker exposed to the following conditions: Very hot (above 90 F) or very cold (under 32 F) temperatures?

33 (F) Hazardous Conditions

How often does this job require the worker to be exposed to hazardous conditions? Hazardous Conditions (e.g., high voltage electricity, combustibles, explosives, chemicals; do not include hazardous equipment or situations)

33 (F) Hazardous Equipment

How often does this job require the worker to be exposed to hazardous equipment? Hazardous Equipment (e.g., saws, machinery/mechanical parts include exposure to vehicular traffic, but not driving a vehicle)

33 (F) Sounds or Noise Levels Are Distracting

How often during a usual work period is the worker exposed to the following conditions: Sounds and noise levels that are distracting and uncomfortable?

29 (F) Bending or Twisting the Body

How much time in a usual work period does the worker spend: Bending or twisting the body?

29 (F) Deal With Unpleasant or Angry People

How frequently does the worker have to deal with unpleasant, angry, or discourteous individuals as part of the job requirements?

29 (F) Kneeling, Crouching or Crawling

How much time in a usual work period does the worker spend: Kneeling, stooping, crouching or crawling?

**27 (I) Provide a Service to Others**

How important are interactions requiring the worker to: Provide a service to others (e.g., customers)?

**27 (D) Hazardous Conditions**

If injury, due to exposure to hazardous conditions, were to occur while performing this job, how serious would be the likely outcome? Hazardous Conditions (e.g., high voltage electricity, combustibles, explosives, chemicals; do not include hazardous equipment or situations)

**27 (I) Pace Determined by Speed of Equipment**

How important is it to this job that the pace is determined by the speed of equipment or machinery? (This does not refer to keeping busy at all times on this job.)

**27 (D) Hazardous Equipment**

If injury, due to exposure to hazardous equipment, were to occur while performing this job, how serious would be the likely outcome? Hazardous Equipment (e.g., saws, machinery/mechanical parts include exposure to vehicular traffic, but not driving a vehicle)

**25 (F) Climbing Ladders, Scaffolds, Poles, etc.**

How much time in a usual work period does the worker spend: Climbing ladders, scaffolds, poles, etc?

**25 (F) Extremely Bright or Inadequate Lighting**

How often during a usual work period is the worker exposed to the following conditions: Extremely bright or inadequate lighting conditions?

**25 (F) High Places**

How often does this job require the worker to be exposed to high places? High Places (e.g., heights above 8 feet on ladders, poles, scaffolding, catwalks, etc.)

**25 (F) Hazardous Situations**

How often does this job require the worker to be exposed to hazardous situations? Hazardous Situations involving likely cuts, bites, stings, or minor burns

**21 (F) Special Uniform**

How often does the worker wear: A special uniform, such as that of a commercial pilot, nurse, police officer, or military personnel?

**21 (F) Making Repetitive Motions**

How much time in a usual work period does the worker spend: Making repetitive motions?

**21 (F) Keeping or Regaining Balance**

How much time in a usual work period does the worker spend: Keeping or regaining balance?

**20 (I) Importance of Repeating Same Tasks**

How important is repeating the same physical activities (e.g., key entry) or mental activities (e.g., checking entries in a ledger) over and over, without stopping, to performing this job?

**17 (D) Hazardous Situations**

If injury, due to exposure to hazardous situations, were to occur while performing this job, how serious would be the likely outcome? Hazardous Situations involving likely cuts, bites, stings, or minor burns

**17 (D) High Places**

If injury, due to exposure to high places, were to occur while performing this job, how serious would be the likely outcome? High Places (e.g., heights above 8 feet on ladders, poles, scaffolding, catwalks, etc.)

**17 (F) Cramped Work Space, Awkward Positions**

How often during a usual work period is the worker exposed to the following conditions: Cramped work space that requires getting into awkward positions?

**17 (L) Hazardous Situations**

What is the likelihood that the worker would be injured as a result of being exposed to hazardous situations while performing this job? Hazardous Situations involving likely cuts, bites, stings, or minor burns

**14 (L) Hazardous Conditions**

What is the likelihood that the worker would be injured as a result of being exposed to hazardous conditions while performing this job? Hazardous Conditions (e.g., high voltage electricity, combustibles, explosives, chemicals; do not include hazardous equipment or situations)

**14 (L) Hazardous Equipment**

What is the likelihood that the worker would be injured as a result of being exposed to hazardous equipment while performing this job? Hazardous Equipment (e.g., saws, machinery/mechanical parts include exposure to vehicular traffic, but not driving a vehicle)

**13 (F) Whole Body Vibration**

How often during a usual work period is the worker exposed to the following conditions: Whole body vibration (e.g., operating a jackhammer or earthmoving equipment)?

## 13 (F) Radiation

How often does this job require the worker to be exposed to radiation?

## 13 (F) Specialized Protective or Safety Attire

How often does the worker wear: Specialized protective or safety attire, such as breathing apparatus, safety harness, full protection suit, or radiation protection?

## 12 (L) High Places

What is the likelihood that the worker would be injured as a result of being exposed to high places while performing this job? High Places (e.g., heights above 8 feet on ladders, poles, scaffolding, catwalks, etc.)

## 10 (D) Radiation

If injury, due to exposure to radiation, were to occur while performing this job, how serious would be the likely outcome?

## 7 (L) Radiation

What is the likelihood that the worker would be injured as a result of being exposed to radiation while performing this job?

## 4 (F) Deal With Physically Aggressive People

How frequently does this job require the worker to deal with physical aggression of violent individuals?

## 4 (F) Diseases or Infections

How often does this job require the worker to be exposed to diseases/infection? Diseases/Infections (e.g., patient care, some laboratory work, sanitation control, etc.)

## 3 (D) Diseases or Infections

If injury, due to exposure to diseases/infection, were to occur while performing this job, how serious would be the likely outcome? Diseases/Infections (e.g., patient care, some laboratory work, sanitation control, etc.)

## 2 (L) Diseases or Infections

What is the likelihood that the worker would be injured as a result of being exposed to diseases/infections while performing this job? Diseases/Infections (e.g., patient care, some laboratory work, sanitation control, etc.)

**INTERESTS:**

Interest elements are ranked by **occupational interest**.

## 89 Enterprising

Enterprising occupations frequently involve starting up and carrying out projects. These occupations can involve leading people and making many decisions. Sometimes they require risk taking and often deal with business.

## 67 Investigative

Investigative occupations frequently involve working with ideas, and require an extensive amount of thinking. These occupations can involve searching for facts and figuring out problems mentally.

## 67 Realistic

Realistic occupations frequently involve work activities that include practical, hands-on problems and solutions. They often deal with plants, animals, and real-world materials like wood, tools, and machinery. Many of the occupations require working outside, and do not involve a lot of paperwork or working closely with others.

## 61 Conventional

Conventional occupations frequently involve following set procedures and routines. These occupations can include working with data and details more than with ideas. Usually there is a clear line of authority to follow.

## 28 Social

Social occupations frequently involve working with, communicating with, and teaching people. These occupations often involve helping or providing service to others.

## 22 Artistic

Artistic occupations frequently involve working with forms, designs and patterns. They often require self-expression and the work can be done without following a clear set of rules.

**WORK VALUES:**

Work values elements are ranked by **extent**.

## 74 Independence-Mean Extent

Occupations that satisfy this work value allow employs to work on their own and make decisions. Corresponding needs are Creativity, Responsibility and Autonomy.

## 73 Achievement-Mean Extent

Occupations that satisfy this work value are results oriented and allow employees to use their strongest abilities, giving them a feeling of accomplishment. Corresponding needs are Ability Utilization and Achievement.

**68 Working Conditions-Mean Extent**

Occupations that satisfy this work value offer job security and good working conditions. Corresponding needs are Activity, Compensation, Independence, Security, Variety and Working Conditions.

**66 Recognition-Mean Extent**

Occupations that satisfy this work value offer advancement, potential for leadership, and are often considered prestigious. Corresponding needs are Advancement, Authority, Recognition and Social Status.

**54 Relationships-Mean Extent**

Occupations that satisfy this work value allow employees to provide service to others and work with co-workers in a friendly non-competitive environment. Corresponding needs are Co-workers, Moral Values and Social Service.

**48 Support-Mean Extent**

Occupations that satisfy this work value offer supportive management that stands behind employees. Corresponding needs are Company Policies, Supervision: Human Relations and Supervision: Technical.

**81 Autonomy**

Workers on this job plan their work with little supervision

**81 Compensation**

Workers on this job are paid well in comparison with other workers

**78 Authority**

Workers on this job give directions and instructions to others

**75 Working Conditions**

Workers on this job have good working conditions

**75 Company Policies and Practices**

Workers on this job are treated fairly by the company

**75 Ability Utilization**

Workers on this job make use of their individual abilities

**72 Security**

Workers on this job have steady employment

**72 Achievement**

Workers on this job get a feeling of accomplishment

**72 Activity**

Workers on this job are busy all the time

**72 Responsibility**

Workers on this job make decisions on their own

**69 Creativity**

Workers on this job try out their own ideas

**66 Co-workers**

Workers on this job have co-workers who are easy to get along with

**66 Social Status**

Workers on this job are looked up to by others in their company and their community

**63 Recognition**

Workers on this job receive recognition for the work they do

**63 Moral Values**

Workers on this job are never pressured to do things that go against their sense of right and wrong

**63 Variety**

Workers on this job have something different to do every day

**59 Advancement**

Workers on this job have opportunities for advancement

**44 Independence**

Workers on this job do their work alone

**44 Supervision, Human Relations**

Workers on this job have supervisors who back up their workers with management

**34 Social Service**

Workers on this job have work where they do things for other people

**25 Supervision, Technical**

Workers on this job have supervisors who train their workers well

**CROSSWALKS:**

<b><u>DOT91 (Dictionary of Occupational Titles):</u></b>	<a href="#">018167022 Manager, Land Surveying</a> <a href="#">019167014 Project Engineer</a> <a href="#">010161014 Chief Petroleum Engineer</a> <a href="#">010167018 Superintendent, Oil-Well Services</a> <a href="#">005167022 Highway-Administrative Engineer</a> <a href="#">003167070 Engineering Manager, Electronics</a> <a href="#">162117030 Research-Contracts Supervisor</a> <a href="#">007167014 Plant Engineer</a> <a href="#">003167034 Engineer-in-Charge, Transmitter</a> <a href="#">005167010 Chief Engineer, Waterworks</a>
AIM97 (Apprenticeship Information Management):	No crosswalks
CEN90 (1990 Census Occupations):	053 Civil Engineers 005 Administrators and Officials, Public Administration 047 Petroleum Engineers 057 Mechanical Engineers 022 Managers and Administrators, N.E.C. 055 Electrical and Electronic Engineers 059 Engineers, N.E.C.
CIP90 (Classification of Instructional Programs):	143001 Engineering/Industrial Management 140805 Water Resources Engineering 151102 Surveying 140801 Civil Engineering, General
GOE93 (Guide for Occupational Exploration):	050201 Managerial Work: Mechanical: Systems 050206 Managerial Work: Mechanical: Services 110503 Business Administration: Management Services: Government 050103 Engineering: Systems Design 050108 Engineering: General Engineering 111204 Contracts and Claims: Procurement Negotiations
MOC97 (Military Occupational Codes):	5980 Electronics Research Administrator 5961 Aircraft Electronics Director 5970 Electronic Equipment Military Characteristics Officer 2170 Designated Project Support Officer 4240 Petroleum Production Engineering Officer 2166 Designated Project Engineering Coordinator 2167 Designated Project Test & Evaluation Coordinator 2181 Operational Test and Evaluation Officer 2180 Prperational Test and Evaluation Officer 8035 Aircraft/Guided Missile Engine Project Officer 51A Research and Development 23 Research and Development 51B Test and Evaluation 62E1G Developmental Engineer 62E4 Developmental Engineer 32E3C Civil Engineer 32E3K Civil Engineer 32E3H Civil Engineer 62E3G Developmental Engineer 32E1C Civil Engineer
OES98 (Occupational Employment Statistics):	13017 Engineering, Mathematical, and Natural Sciences Managers
OPM97 (Office of Personnel Management Occupations):	0807 Landscape Architecture 1301 General Physical Science 0880 Mining Engineering 0881 Petroleum Engineering 0890 Agricultural Engineering 0892 Ceramic Engineering 0893 Chemical Engineering 0803 Safety Engineering 0896 Industrial Engineering 0861 Aerospace Engineering 1306 Health Physics 1370 Cartography 1372 Geodesy 1373 Land Surveying 1380 Forest Products Technology

1384 Textile Technology  
 0894 Welding Engineering  
 0840 Nuclear Engineering  
 0801 General Engineering  
 0804 Fire Protection Engineering  
 0806 Materials Engineering  
 0808 Architecture  
 0810 Civil Engineering  
 0818 Engineering Drafting  
 0873 Ship Surveying  
 0830 Mechanical Engineering  
 0871 Naval Architecture  
 0850 Electrical Engineering  
 0854 Computer Engineering  
 0855 Electronics Engineering  
 0856 Electronics Technician  
 0858 Biomedical Engineering  
 0688 Sanitarian  
 0819 Environmental Engineering  
 0028 Environmental Protection Specialist  
 0018 Safety and Occupational Health Management

SOC98 (Standard Occupational Classification): 11-9041 Engineering Managers

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 Revised 11-Aug-06

006299CTR060810