

FIRE ENGINEERDEFINITION:

Under general supervision performs skilled technical work in the maintenance and operation of firefighting apparatus and equipment.

ESSENTIAL FUNCTIONS INCLUDE BUT ARE NOT LIMITED TO

## House Duties:

Attends roll call and receives and follows orders, instructions, regarding the work to be done. Reports equipment and apparatus missing or needing repair or replacement. Reports results of alarm, radio, apparatus and equipment tests. Locks doors and windows, and secures valuable items from theft, vandalism, and damage at the station. Interacts informally with other members of shift for prolonged periods, under conditions of monotony or extreme stress. Prepares meals for fire fighters at station, washes dishes, cooking utensils and dining area following meals at station. Cuts grass, cleans sidewalks, maintains flower beds. Straightens up quarters and cleans floor, walls. Tests and records results of tests for alarm, radio apparatus and equipment. Conducts fire station tours and explains functions of apparatus and equipment. Demonstrates and explains fire equipment use, operating technique and fire fighting duties. Explains fire prevention methods and common fire hazards to the public. Operates weather-monitoring equipment (at Station 5 only). Inspects and maintains station auxiliary power source and emergency generators.

## Apparatus and Equipment Maintenance:

Cleans, dries, inspects, and properly secures rescue equipment such as K-12 saws, spreaders, pneumatic air chisel, hurst tool, resuscitator. Cleans, dries, inspects and properly secures fire fighting and salvage equipment assigned to apparatus (ladders, hand tools, portable breathing equipment, ropes and tackle, ventilation fans, salvage covers and runners; hose appliances, nozzles and extra hose couplings; leather straps and belts, coat, hat, boots). Maintains motorized apparatus by checking tires, lubricating, cleaning, waxing and making minor repairs. Performs annual performance test for fire apparatus. Inventories equipment carried on fire apparatus.

## Training:

Plans company training in conformance with department requirements. Prepares training material and obtains training aids. Prepares written lesson plans. Conducts single company drills and participates in multi-company drills. Evaluates and documents training results for compliance with established performance standards. Critiques company training and provides for additional training to correct performance deficiencies. Participates in in-service drill and simulated fire fighting exercises. Participates in daily training sessions in station. Reads and studies fire fighting training materials. Attends formal fire science technology courses outside the department. Informally supervises and oversees activities of less experienced fire fighters. Plans and makes training presentations within the department on first aid, CPR (Cardio-Pulmonary Resuscitation) and other fire-related subjects. Oversees and informally trains new recruits and fire fighters on the job. Maintains records and forms pertinent to training. Reads and works with district maps to locate calls. Uses a Thomas Brothers map book to respond to calls. Completes State Fire reports on fill-in basis.

#### Inspections:

Prepares pre-fire fighting plans and access maps for properties that might lead to greater alarm fires and natural disasters, by upgrading existing maps and surveying new construction in response districts. Maintains familiarity with building fire equipment and water supplies in response area through pre-fire planning and routine inspections. Conducts hydrant inspections, home inspections, commercial building inspections and pre-fire surveys for hazards and compliance with fire codes, informing the public through public information and education details. Maintains awareness of hazardous material stored, transferred or manufactured in response area through pre-fire planning and routine inspections. Prepares records and reports of all building inspections and hazards found. Coordinates inspection frequency to assure timely and thorough coverage of response area as directed. Drives apparatus through district and communicates with city maintenance department and utility companies to obtain information regarding street construction or temporary traffic restrictions. Inspects standpipes and sprinkler systems, fire extinguishers and preconnected fire hose, fire escapes, ladders and stairways, and detection and fire alarm systems in commercial buildings and recommends correction of identified hazards to occupant of building or property owner. Inspects heating, cooling, ventilating and electrical systems in commercial buildings and notifies building inspectors of unsafe equipment and practices. Inspects hazardous and flammable material storage sites and recommends correction of hazardous practices to occupant of building or property owner. Inspects wiring and heating systems, basements and attics of residence and makes recommendations for eliminating fire safety hazards or notifies building inspectors of hazards. Prepares pre-planning reports and draws pre-planning maps and diagrams. Prepares inspection reports. Enforces public smoking regulations. Inspects fire exits to ensure that they are clearly marked, that doors operate properly and that exits and aisles are kept clear of building occupants and obstructions. Inspects and lubricates hydrant threads. Tests hydrant pressure. Pre-plans for fires in industrial and commercial buildings to obtain information regarding location of hydrants and standpipes, building layout, hazardous material storage, occupancy patterns and structural information, and relays information to other members of crew.

#### Driving and Positioning Apparatus:

Selects shortest available route to emergency site using knowledge of streets and information regarding temporary obstructions, repairs. Drives apparatus according to state and local regulations governing operation of emergency vehicles. Operates siren, lights, and other warning devices. Maneuvers apparatus at scene of emergency to occupy best fire fighting position and to avoid interfering with other companies. Speaks or signals to driver of apparatus to assist in maneuvering apparatus in confined spaces. Stabilizes apparatus using wheel chocks, stabilizing pads and stabilizing jacks or outriggers. Positions vehicle at fire scene to prevent damage to vehicle. Operates vehicle in and around fires to ensure safety of crew. Operates mobile radio equipment. Guards apparatus against pilferage.

#### Rescue and First Aid:

Locates emergency site and uses shovels and picks to free victims trapped or unconscious in tunnels, pipes, sewers, excavations. Cuts or pries open vehicles and machinery to free persons trapped or pinned inside, using extricator, K-12 saw, pry bar, come-alongs, pneumatic cutting tool, portopower, hurst tool. Carries or assists conscious, unconscious or deceased victims down ladder or stairs using drags, slings, cots, scoops, chairs, stretcher or improvised equipment. Removes victims from cars. Hoists or lowers victims using rope and tying knots, e.g., to

complete cliff rescues. Removes trapped victims using aerial ladder or elevating platform apparatus. Removes energized electrical wire from contact with victim using hot line cutters, pig tail, and protective clothing, e.g., gloves. Carries victims to ambulance, coronary unit or other emergency vehicles to assist emergency medical personnel. Provides first aid treatment to victims in emergency vehicle while enroute to hospital. Checks pulse and respiration of victims to determine status of circulatory and respiratory systems. Inspects victim for evidence of arterial bleeding or poisoning. Administers closed chest cardiac compression to heart failure victims. Makes non-emergency public service calls (free child locked in room, clean up water from burst pipes, assist invalids who have fallen from beds or wheelchairs). Gives first aid demonstrations. Moves heavy objects or material to gain access to free trapped victims or bodies. Inspects scene of poisoning or drug overdose to determine nature of poisoning and proper antidote and treatment procedure. Calms distraught victims, relatives and spectators at emergency scenes. Operates and maintains resuscitator. Makes rescues with airpack on in smoky, toxic atmosphere. Performs emergency water rescues.

#### Hose Lays and Pumping:

Primes pump. Computes necessary engine pressure, given hose lay, using established procedures, printed charts and mathematics under stress conditions. Operates throttle and relief valve or pressure regulator, and monitors temperature, pressure vacuum and tachometer gauges to provide necessary pump pressure. Operates engine booster tank and pump. Places hose bridge. Operates hose clamp. Prepares single or multiple lays using appliances such as wyes, siamese adaptors, and four-way connections. Makes rapid hose connection to hydrant. Operates portable fire extinguishers/pumps. Drafts water from a static water source. Supplies master stream appliances. Rolls fire hose using manual methods as well as mechanical devices. Relay-pumps on extended hose lays. Makes simple and progressive hose lays on wildland fires, utilizing wyes, tees, clamps and various thread adapters and reducers.

#### Laddering:

Maneuvers, raises, spots, foots, bridges and lowers straight, extension, bangor, and folding ladders. Climbs, works from, descends ladders carrying fire victims or equipment using appropriate safety equipment and procedures. Elevates, rotates and extends aerial ladder and fly sections for supported or unsupported operation. Mounts and/or operates master stream appliances and aerial ladder, snorkel or elevated platform. Operates elevating master stream device.

#### Ventilation and Forcible Entry:

Makes forced entries into grounds or buildings by climbing walls and fences; cuts locks, chain hasps, and bolts to gain entry to locked areas; and breaks or cuts doors, windows, walls, or roofs using manual and power tools. Uses cutting tools (pickhead and flat head axe, roof cutter, wire and bolt cutters, auger, cutting torch, K-12) to make forced entries into grounds or buildings. Creates ventilation openings by opening or forcing doors and windows using minimum necessary force and by cutting or breaking walls and roofs. Places ventilation fans to exhaust dangerous gases from work area.

#### Extinguishing Fire:

Locates hidden fires by seeing, feeling or smelling fire and exposes fires by opening walls, ceiling, floors, furniture. Observes fire and smoke conditions and locates fire sources. Operates proper class of fire extinguisher for particular type of ignited material. Dons and operates portable breathing equipment. Operates aerial ladder or elevating platform from ground controls or platform controls. Uses cutting, prying or drilling tools (pike pole, plaster hook, wrecking bar) for extricating victims and getting at fire source. Uses striking tools (sledge, hammerhead pick, battering ram) for extricating victims and getting at fire source. Operates portable generator to produce electrical power for illumination and running equipment. Locates and operates shut-off valves for gas, electricity, oil and water to remove fuel or source of ignition for fire. Positions ventilation fans to safely inject fresh air and exhaust heat, smoke and gases. Restores sprinkler system to service. Carries and operates heavy tools and equipment such as hoses, ropes, extinguishers. Operates in contaminated atmosphere and maneuvers in confined spaces. Uses hand tools such as McCleod tool, shovel, pulaski, chain saw to construct fire line. Operates multiple gallonage, combination nozzles.

#### Salvage and Overhaul:

Removes water from floors, cellar or basements using brooms, squeegee, mop and bucket, water vacuum, siphon or pump. Wedges or clamps sprinkler heads after fire is extinguished. Observes bystanders to protect salvaged property from theft and gives any personal property found to officer. Identifies and removes or protects flammable or hazardous materials at fire scene. Recognizes and preserves evidence of arson. Carries burning mattresses and furniture from buildings to reduce fire and smoke damage to building and contents. Tears down or shores up weak and dangerous structural components (floors, roofs, overhangs, cornices). Removes fire debris after fire is extinguished using shovel, mop and bucket, broom and squeegee. Carries undamaged furniture from burning buildings to prevent smoke, fire and water damage to furniture. Piles furniture, clothing and other valuables and covers piled property, walls, floors and stairways with salvage covers, tarps and floor runners. Guards premises where arson is suspected, pending investigation. Secures windows and doors with nails, hasps and locks, and covers openings with wood or reinforced plastic sheeting to protect building and contents from weather and to prevent theft and vandalism. Gathers evidence at scene of fire under supervision of officer or investigator. Observes spectators for suspicious behavior. Cuts or bores holes in ceiling or walls and makes stair and ladder chutes to drain water from floors.

#### Emergency Operations as a Company Commander:

Upon the approval and direction of the duty Battalion Chief the Engineer may serve as an Acting Company Commander. Responds to all emergencies in assigned area. Evaluates severity of emergency upon arrival at emergency scene. Places greater alarm and/or calls for additional equipment as needs dictate. Directs and participates in rescue and first aid efforts at scene of emergency. Directs amount, size and placement of ladders and hoses of support companies at scene of emergency. Participates in hose and ladder evolutions at fire scene. Directs and participates in ventilation and forcible entry at fire scene. Directs and participates in salvage and overhaul operations at fire scene. Investigates for possible arson and preserves evidence of fire origin. Deals with public at emergencies. Performs all emergency work expected of a Fire Fighter, per entire Fire Fighter Job-Related Job Description.

#### Fire Company Supervision:

Apportions duties to subordinate company members according to company policy. Monitors activities for compliance with company policy as set by department standards and level of competency established by company commander. Monitors company work in relation to company work schedule to insure that all daily work is performed as assigned. Monitors administrative work of other Fire Engineers and Fire Fighters. Checks necessary reports for accuracy and detail. Takes disciplinary action as needs dictate within limitations imposed by General Orders and Civil Service rules. Counsels employees concerning desirable performance. Inventories company supplies (including janitorial, office, fuel and equipment), determines inventory needs, requisitions new supplies, checks, certifies and dispenses new supplies. Insures proper display, maintenance and storage of the U.S. flag. Receives, disseminates, and interprets Fire Department General Orders, letters of instructions, Rules and Regulations, memorandums. Examines and approves completed forms covering such items as attendance, sickness, overtime, vacation, hose, supply, inventory.

#### DISTINGUISHING FEATURES OF THE CLASS

This is the advanced journey classification in the sworn firefighting occupational series. This classification differs from Firefighter in that Fire Engineers are primarily responsible for the technical aspects of firefighting operations, including driving and positioning the apparatus, supplying water and maintaining apparatus and equipment. Fire Engineer differs from Fire Captain in that they do not have supervisory responsibility, but may serve as acting or temporary supervisors.

#### MINIMUM QUALIFICATIONS

Three years of experience under civil service appointment as a firefighter with the City of Santa Ana.

#### DESIRABLE KNOWLEDGE, SKILLS AND ABILITIES

Knowledge of: Tool and equipment usage and maintenance; hose care and maintenance; forcible entry practices and techniques; mechanical knowledge sufficient to identify abnormalities and malfunctions in fire apparatus and equipment; fire service hydraulics related to pump and nozzle pressure, hose function, hose elevation and other factors which affect the flow of water through the hose; fire prevention techniques; building design, construction and material characteristics; basic principles of electricity; basic mathematics to add, subtract, multiply, divide whole numbers; principles of fire behavior; weather and its effect on fire; wildland fire control practices and principles; radio codes; effective teamwork techniques, including skills to accept, understand and follow orders, to work and live harmoniously with co-workers and to consistently follow through on assigned or implied duties; organization operations and procedures; geographic location of stations; characteristics, uses, limitations and location of equipment and apparatus; laws, codes and ordinances relating to fire prevention; rescue and first aid techniques; traffic laws and ordinances; extraordinary hazards in response area; water distribution system; sprinkler system characteristics and location in response area; Fire Department rules, regulations, general orders; fire alarm systems; Fire Department hose evolution procedures; Fire Department ladder evolution procedures; Fire Department ventilation and forcible entry procedures; Fire

Department salvage and overhaul practices; training techniques; Fire Department emergency mobilization plan at company level; radio procedures as established by Federal Communications Commission rules and regulations governing public safety radio service; determining fire cause and recognizing acts of arson.

Skill in: Emergency related techniques such as rescuing victims and handling difficult or unexpected fire fighting problems at the scene; reading maps and mapped information; making immediate, sound decisions under stress; preparation and/or analysis of statistical information; operation of motor vehicles.

Ability to: Write legibly, concisely and with technical accuracy in English to record and convey information; show patience, tact, courtesy when dealing with crew members and the public; read and interpret complex technical documents in English including blueprints, diagrams, and fire fighting manuals; verbally communicate in English to explain fire fighting techniques, procedures and orders clearly and concisely to others; organize and maintain technical filing system.

### SPECIAL REQUIREMENTS

Possession of CPR (Cardio-Pulmonary Resuscitation) certificate, E.M.T. 1 (emergency medical technician) certificate, and a valid California driver's license, Class "B-restricted".

### WILLINGNESS TO:

Work 24-hour shift, irregular days, overtime, irregular hours, on call, variable shifts, holidays, weekends; work any station in city on short notice; perform routine, repetitive work to completion; attend meetings and classes both on and off duty; work under adverse or hazardous conditions such as: fumes, smoke, gases, crowds, heat, noise, dampness, confined space, dust, alone for long periods of time, odors, darkness, heights, high altitude, extreme stress, decomposed, burnt or severely dismembered bodies; wear a uniform (uniform allowance paid by employer); train other employees; maintain a clean, neat appearance; travel locally, out of state for up to 7 days.

### PHYSICAL CHARACTERISTICS DOMAIN

The following physical characteristics affect work behavior and are necessary or important for successful job performance.

Visual acuity to distinguish objects and read warning labels and signs in dark and smoky environment for extended periods of time; hearing to hear radio transmissions, command, and cries for assistance when obscured by background noise; voice quality to speak in a clear, well modulated, readily understood voice, to be heard over background noise; arm pushing strength to push heavy objects away from the body repeatedly; arm pulling strength to pull heavy objects toward the body; wrist and grip strength to operate heavy handheld tools and machinery with arms extended for brief periods of time; general arm and upper torso strength to carry or drag heavy, limp bodies extended distances; general leg and lower torso strength to carry heavy objects up flights of stairs and up ladders rapidly and repeatedly; dexterity to make complex body movements involving balance and coordination while moving through restricted spaces; reach - must have sufficient reach to remove an extension ladder mounted on fire truck. (Total

minimum reach - 5'10"); smell sufficient to detect smoke/fires, toxic gases, dangerous chemicals; physical capability to work under adverse/hazardous conditions such as: fumes, odors, noise, gases, dark, confined space, heat, high altitude, alone for long periods of time, dampness, smoke, dust, crowds, heights, extreme stress; general body strength to raise 35' extension ladder; general body strength to raise a 55' extension ladder; swim to rescue victims.

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