

METROPOLITAN WASHINGTON
AIRPORTS AUTHORITY



Construction



Safety



Manual



REVISION 15
JULY 2002

CONSTRUCTION SAFETY MANUAL

CONSTRUCTION SAFETY POLICY

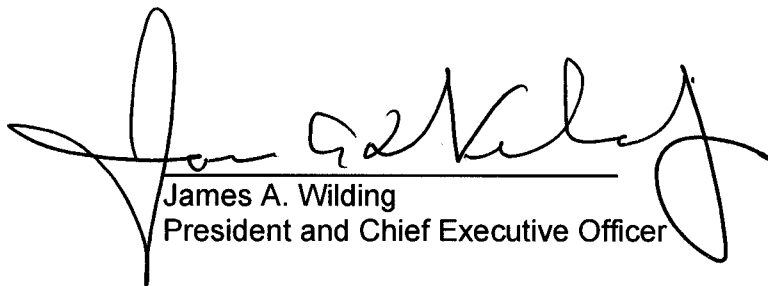
FOR

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

This manual provides general information to Contractors on the requirements and procedures for accident prevention, safety, and loss control for the Metropolitan Washington Airports Authority's (Authority) implementation of the Capital Construction Program, Capital Maintenance Investment Program, and other related construction, repair, or services required by the Authority and its tenants. The Authority's safety objective is to foster a safety environment so that the Authority's contractors strive to achieve accident-free construction projects.

Contractors are charged with the responsibility for conducting safe operations providing protection for all employees, the public, and all others who may come in contact with, or be exposed to, this project. Nothing contained in this manual is intended to relieve any Contractor or supplier of the obligations assumed by the Contractor under their contract with the Authority or required by law.

Safety must be an integral part of each job. Full participation, cooperation, and support are necessary and required to ensure the safety and health of all persons and property involved in the project.



James A. Wilding
President and Chief Executive Officer

7/16/02

Date

CONSTRUCTION SAFETY MANUAL

CHAPTER 1. DEFINITIONS	1
CHAPTER 2. CONSTRUCTION SAFETY PROGRAM	6
2.1 PROGRAM OBJECTIVES	6
2.2 ACCIDENT PREVENTION	6
2.2.1 Prevent Job Site Accidents	6
2.2.2 Protection of the Public and Property	7
2.2.3 Work Preparation.....	8
2.3 PERSONNEL REQUIREMENTS AND NONCOMPLIANCE	9
2.3.1 Cooperation and Involvement	9
2.3.2 Noncompliance	9
2.3.3 Grounds for Removal	9
2.3.4 Re-Hire	9
2.4 CONSTRUCTION SAFETY ADVISORY COMMITTEE	9
2.5 CONSTRUCTION SAFETY RESPONSIBILITIES	10
2.5.1 Contracting Officer's Technical Representative	10
2.5.2 Contractor's Project Manager	11
2.5.3 Contractor's Safety Engineer	12
2.5.4 Contractor's Safety Manager	13
2.5.5 Insurance Safety Consultant	13
2.5.6 Job Foreman	14
2.5.7 Program Safety Manager	14
2.5.8 Risk Manager	15
2.5.9 Subcontractor's On-Site Manager.....	16
2.6 SAFETY AWARD PROGRAMS	17
2.6.1 Quarterly OCWIP Safety Awards.....	17
2.6.2 Monthly OCWIP Safety Awards	17
2.6.3 Pizza Award.....	18
CHAPTER 3. SAFETY REQUIREMENTS	19
3.1 BASIC SAFETY PROVISIONS	19
3.1.1 Airport Procedures	19
3.2 AIR OPERATIONS AREA (AOA) CONSTRUCTION	22
3.2.1 Airport Procedures	22
3.3 BLASTING/EXPLOSIVES PROCEDURES	23
3.3.1 Basic Procedures	23
3.4 CRANES	23
3.4.1 Basic Procedures	23
3.4.2 Outrigger Cranes	24
3.5 ELECTRICAL SAFE CLEARANCE PROCEDURES	24
3.5.1 Guidelines and Purpose	24
3.5.2 Responsibilities	25
3.5.3 Approval Procedure	25
3.5.4 Locking.....	25
3.5.5 Re-energizing.....	26
3.6 PERSONAL PROTECTIVE EQUIPMENT	26
3.6.1 Basic Protective Equipment	26
3.7 STEEL ERECTION PROCEDURES	27
3.8 TOUR AND VISITOR GUIDELINES	27

3.9 TRENCHES, EXCAVATIONS AND STOCKPILES	27
3.10 TUNNELING AND UNDERGROUND CONSTRUCTION	28
3.10.1 General Requirements	28
3.10.2 Safety	29
3.10.3 Compressed Air	29
3.10.4 Emergency Rescue	30
3.11 FIRE SAFETY	30
3.11.1 Safety Codes	30
3.11.2 Permits	30
3.11.3 Fuel Line Hot Work	30
3.11.4 Material Safety Data Sheets	31
CHAPTER 4. MOTOR VEHICLE OPERATIONS	32
4.1 BASIC VEHICLE PROCEDURES	32
4.2 SPECIAL REQUIREMENTS FOR AOA	32
CHAPTER 5. REPORTING PROCEDURES	34
5.1 CONSTRUCTION SAFETY/SECURITY INSPECTION REPORT	34
5.1.1 Inspection Report	34
5.2 REPORTING ACCIDENTS AND OTHER HAZARDS	35
5.2.1 Reporting Accidents	35
5.2.2 Occupational Exposures	35
5.3 ON-SITE FIRST AID	36
CHAPTER 6. OTHER GENERAL REQUIREMENTS	37
6.1 ORDER OF PRECEDENCE	37
APPENDIX A	38
Construction Safety Program Organization Chart	39
APPENDIX B	40
Applicable Governmental Agencies and Industry Safety Standards	41
APPENDIX C	42
Construction Safety/Security Inspection Report Form	43
APPENDIX D	44
Contractor's Safety Plan	45
APPENDIX E	51
O&I: Fire System Shutdown Procedures	52
APPENDIX F	55
O&I: Welding, Cutting, and Other Open Flamework	56
APPENDIX G	60
Electrical Safe Clearance Forms	61
APPENDIX H	63
CCP/CMIP/Tenant Monthly Safety Report	64

APPENDIX I	65
Confined Space Entry Permit	66
APPENDIX J	68
FAA Advisory Circular – Operational Safety on Airports During Construction	69

CHAPTER 1. DEFINITIONS

1.1 PUBLIC AREA

Any area of the airport accessible to the general public without requiring the issuance of a badge or escorting.

1.2 STERILE AREA

An area accessible to the public only after processing through a security checkpoint.

1.3 AIR OPERATIONS AREA (AOA)

Areas of the airport used or intended for landing, taking off, surface maneuvering, loading, unloading, or servicing of aircraft, operational vehicular traffic and cargo operations. This is a high security area requiring badging and compliance with security regulations.

1.4 AIRPORT OPERATIONS OFFICER

A representative from the airport's Operations Department with the authority to intervene if the Contractor's actions on the airport are detrimental to the airport's operational safety or security.

1.5 ARFF

Authority designation for Airport Rescue and Fire Fighting stations and equipment.

1.6 CAPITAL CONSTRUCTION PROGRAM (CCP)

A major portion of the Authority's construction program to upgrade the facilities of Ronald Reagan Washington National Airport (National) and to expand the facilities at Washington Dulles International Airport (Dulles).

1.7 CAPITAL MAINTENANCE INVESTMENT PROGRAM (CMIP)

The Authority program, which is coordinated with the CCP, to provide major restoration or replacement of utilities or facilities at Ronald Reagan Washington National and Washington Dulles International Airports.

1.8 OPERATION AND MAINTENANCE PROGRAM (O&M)

The Authority program which provides for the daily operation of both airports and those functions performed centrally, including minor facility projects.

1.9 COMPETENT PERSON

One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate these conditions.

1.10 CONFINED SPACE

Any space not intended for continuous employee occupancy, having a limited means of egress, which is subject to a potentially hazardous atmosphere. These spaces include, but are not limited to, manholes, vaults, sewers, storage tanks, boilers, and other new construction structures that have been in the ground more than 24 hours.

1.11 CONSTRUCTION SAFETY ADVISORY COMMITTEE

The committee, comprised of Authority and Program Management Consultant personnel, responsible for coordination, direction, and management of the CCP, CMIP, and O&M Construction Safety Programs.

1.12 CONSTRUCTION SAFETY PROGRAM

The safety and loss prevention program established by the Authority to monitor the hazards and risks associated with construction projects.

1.13 CONSULTANTS

Any individual, partnership, corporation or other business entity utilized by the Authority as an independent contractor to provide engineering, design, construction management, technical support, testing, or other related services.

1.14 CONTRACT

The written agreement by and between the Authority and a Contractor.

1.15 CONTRACTING OFFICER (CO)

An individual with formally delegated written authorization to commit the Authority by entering into contracts and other contractual instruments such as modifications, task orders, delivery orders, purchase orders, and blanket purchase orders.

1.16 CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE (COTR)

An individual possessing technical expertise with respect to the contractual work being performed who has been delegated limited responsibility for monitoring technical performance and compliance with contract requirements. The COTR also provides administrative support for the contracting officer. Resident Engineers are also designated as COTRs for assigned construction contracts.

1.17 CONTRACTOR

An individual, firm, partnership, or corporation undertaking a project through one or more contracts with the Authority, program manager or a tenant, performing work at a job site located on either airport.

1.18 CONTRACTOR'S PROJECT MANAGER

The Contractor's senior management employee for a given project or task who has the overall responsibility to see that the work or job is satisfactorily completed.

1.19 CONTRACTOR'S SAFETY ENGINEER

A full time on-site safety professional with a minimum of five years experience hired by the Contractor to manage only the safety efforts. This person must be familiar with the type of work to be performed under the contract and have no other duties. The requirements contained herein are in addition to any other requirements contained in the contract documents.

1.20 CONTRACTOR'S SAFETY MANAGER

A full time on-site safety professional with a minimum of ten years experience in managing safety programs on large construction projects comparable to this Contract in scope and complexity (a CSP or CSM preferred). This person will monitor efforts of Safety Engineers assigned to the project and perform administrative duties assigned in the *Construction Safety Manual* and the *OCWIP Insurance Manual*. The requirements contained herein are in addition to any other requirements contained in the contract documents.

1.21 DE-ENERGIZING REQUESTOR

Requestors for system de-energizing may include competent persons from Authority and airport Contractors, airport tenants and concessionaires, airport tenant and concessionaire Contractors, and airport Engineering and Maintenance Departments.

1.22 OFFICE OF ENGINEERING

The Authority office responsible for the implementation of the planning, design, overall program construction, and safety programs related to the Capital Construction Program. Also responsible for budgeting for Capital Maintenance Investment Programs, for planning and design of individual CMIP projects, and construction of certain CMIP projects where assigned

1.23 ENGINEERING AND MAINTENANCE DEPARTMENT

A department reporting to the manager of an airport responsible for the construction and safety programs related to CMIP major and O&M minor facility projects.

1.24 FIRE MARSHAL

The Authority official within the Office of Public Safety responsible for the fire safety of all facilities and operations at both airports.

1.25 INCURSION

An incursion occurs when any area, under air traffic control, authorized for use by aircraft is compromised by an unauthorized aircraft, vehicle or person.

1.26 INSURANCE ADMINISTRATORS

Representatives from insurance brokerage firms responsible for the Authority's OCWIP program.

1.27 INSURANCE SAFETY CONSULTANT

On-site representative of the OCWIP insurance companies who advises and provides safety related recommendations to the Authority and enrolled Contractors performing work at Ronald Reagan Washington National and Washington Dulles International Airports and may be the PSM for designated projects. Advises job site personnel of safety training and compliance issues to control losses.

1.28 INSURED

The Authority, Program Management Consultant, Contractors, consultants, architects, engineers, subcontractors, and any other party listed as an insured on the certificates of insurance signed by a duly authorized representative of the insurance carriers.

1.29 INSURER

The companies providing insurance for either workers' compensation, builder's risk, or general liability coverage for the Owner-Controlled Wrap-Up Insurance Program (OCWIP).

1.30 JOB SITE

The site of contract work on Authority property at Ronald Reagan Washington National Airport or Washington Dulles International Airport.

1.31 LIVE LOAD

Any load of material (i.e., steel, building materials) attached to a crane by means of a cable or sling shall be referred to as a "live load" until the materials have been disconnected.

1.32 LOCKING

Locking is a method of preventing a switch or other electrical circuit opening device from becoming accidentally altered.

1.33 METROPOLITAN WASHINGTON AIRPORTS AUTHORITY (Authority)

The public body responsible for the operation and management of both Ronald Reagan Washington National Airport and Washington Dulles International Airport.

1.34 OBSTACLE FREE ZONE (OFZ)

An area clear of vehicles and fixed objects that is in proximity to a runway or taxiway.

1.35 OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

The Federal agency responsible for providing the rules and regulations on safety and health requirements in the work place.

1.36 OFFICE OF PUBLIC SAFETY

The Authority's office responsible for Fire and Police Department activities, and the overall public safety at both National and Dulles.

1.37 OWNER CONTROLLED WRAP-UP INSURANCE PROGRAM (OCWIP)

The package of insurance coverages provided under the Authority's program, generally addressing on-site exposures related to property, liability, workers' compensation, and AOA approved vehicles.

1.38 PROGRAM MANAGEMENT CONSULTANT

The consultant employed by the Authority under contractual agreement to provide program management support services for the CCP and selected CMIP projects, including planning, design, construction and related services.

1.39 PROGRAM SAFETY MANAGER (PSM)

An employee of the Authority, Program Management Consultant, or designated consultant who is responsible for the day-to-day management of a Construction Safety Program.

1.40 PROJECT

The term used to describe the specific construction work packages under the CCP and the CMIP programs and defined by contracts at both National and Dulles.

1.41 RESIDENT ENGINEER

The person responsible for the supervision and coordination of individual construction contracts, referred to in the contract documents as the Contracting Officer's Technical Representative (COTR).

1.42 RISK MANAGER

The Authority manager responsible for the administration of insurance programs and the review of insurance claims for payment authorization or other purposes.

1.43 RUNWAY/TAXIWAY SAFETY AREA

The surface adjacent to a runway or taxiway that is free of holes, trenches, bumps or other surface variations which is capable of supporting an aircraft under normal dry conditions.

1.44 CONSTRUCTION MANAGER

The Authority manager responsible for the overall management of the construction phase of the Capital Construction Program and other projects as designated.

1.45 SITE MANAGER

A Program Management Consultant or tenant manager who is responsible for the coordination / management of the construction phase of the program management support services contract, or all program management of the contract at an airport site.

1.46 TAGGING

Tagging is the placement of a red "Danger-Hold" tag (MWAA Form RM-21) directly on a circuit opening and/or locking device.

1.47 TENANT

An airline, concessionaire, or an entity that has a lease agreement with the Authority and undertakes renovations or new construction on airport premises.

1.48 VIRGINIA OCCUPATIONAL SAFETY AND HEALTH (VOSH)

The Department of Labor and Industry shall be responsible for administering and enforcing occupational safety and occupational health activities as required by the Federal Occupational and Health act of 1970 in accordance with

the state plan for enforcement of that act. (See VA Code Title 40.1, including but not limited to Section 40.1-22(5).)
VOSH is a division of the Department of Labor and Industry of the Commonwealth of Virginia.

CHAPTER 2. CONSTRUCTION SAFETY PROGRAM

2.1 PROGRAM OBJECTIVES

The Construction Safety Program has been established by the Metropolitan Washington Airports Authority (Authority) to promote safety and to limit, reduce, and control hazards and risks associated with the CCP, CMIP, and other programs and other construction, repair, maintenance, and related services required by the Authority and its tenants. Refer to Appendix A for a chart of the offices involved in the program. The specific Construction Safety Program goals are to foster a safety conscious environment to encourage contractors to actively manage safety in order to limit losses from personal injuries and property damage. The ultimate objective is to achieve greater efficiency and reduce direct and indirect costs associated with losses and loss control.

The effectiveness of the Construction Safety Program depends upon the active participation and cooperation of the Contractor's project managers, supervisors, and employees and the coordination of their efforts with the Authority in carrying out the following basic procedures:

- (1) **Detection.** Maintain a system of prompt detection and correction of unsafe practices and conditions.
- (2) **Education.** Establish and conduct an educational program to stimulate and maintain interest and cooperation of all employees. Education will be conducted through safety meetings, safety training programs, and the use of personal protective equipment and mechanical guards.
- (3) **Investigation.** All accidents, incidents and claims will be investigated to determine their causes and take reasonable corrective action when possible.
- (4) **Planning.** Plan all work to minimize the potential for personal injury, property damage, and loss of productive time.
- (5) **Regulations.** Comply with Federal, state and local laws, ordinances, regulations, industry standards, and Authority regulations and requirements. Refer to Appendix B for a list of applicable agencies.

2.2 ACCIDENT PREVENTION

2.2.1 Prevent Job Site Accidents. The *Construction Safety Manual* identifies general safety requirements that relate to the activities of the Authority, Program Management Consultant, Contractors, tenants, consultants, and others located on all Authority construction work sites. All Contractors have the responsibility to correct hazardous conditions and practices. When more than one Contractor is working within a given job site, any job Foreman shall have the authority to take action to prevent physical harm or significant property damage. If it is determined there is imminent danger, the job Foreman or Safety Engineer shall:

- (1) **Take immediate action** to remove workers from the hazard and stabilize or stop work until corrective actions can be implemented to eliminate the hazard.
- (2) **Immediately notify the COTR/RE, PSM**, Contractor's Safety Engineer, and others as identified in the Contractor's Safety Plan of the condition.
- (3) **Identify and implement** corrective action to eliminate the hazard. Notify the proper emergency service personnel if the danger cannot be promptly corrected and could develop into an emergency condition. When the job Foreman or Safety Engineer is made aware of an unsafe condition or act that cannot be corrected, he/she shall develop and submit an abatement plan to the COTR/RE for transmission to the PSM.

- (4) **Employees shall immediately report** any condition suspected to be unsafe or unhealthy to their job Foreman, Safety Manager, or Safety Engineer. If there is no resolution of the concern at that level, the employee shall report the concern to the PSM or Insurance Safety Consultant.
- (5) **When any condition has been determined to constitute a safety hazard, work will not continue until the danger is corrected, guarded, or removed from the job site.**

2.2.2 Protection of the Public and Property. For this manual, "public" shall be construed as including all persons not employed by the Contractor or Subcontractor, Program Management Consultant, tenants, other Authority contractors, or Authority involved in the project. This will include Authority employees not directly involved with the project, facilities or other construction-related contracts. The Contractor shall take all necessary action to eliminate hazards which might reasonably be expected to cause injury to the public or property damage. In addition to the regulations identified within the specific contract documents, the following precautions are required:

- (1) **Barriers/Barricades.** All barriers used on the project must comply with VDOT and other applicable regulations (see Appendix B). The Contractor shall provide adequate visibility and protection when public use of work areas must be maintained on sidewalks, entrances to buildings, lobbies, corridors, aisles, stairways, and vehicular roadways. Appropriate barriers (i.e., guardrails, barricades, temporary fences or partitions, overhead protection, shields) shall be secured against accidental displacement and maintained in place except where temporary removal is necessary to perform the work. When a barricade is temporarily removed, a guard shall be placed at all openings.

Barricades must be used where sidewalk sheds, fences, or guardrails are not required. Such barricades must guard against harmful radioactive rays or particles, flying materials, falling or moving materials and equipment, hot or poisonous materials, explosives and explosive atmospheres, flammable or toxic liquids and gases, open flame, energized electric circuits, or other harmful exposures.

- (2) **Caution Tape.** The use of caution tape for marking unsafe conditions or open hazards is prohibited. Only plastic orange safety fences or other devices of similar construction shall be used.
- (3) **Egress.** Sidewalks, building entrances, lobbies, corridors, aisles, doors, or exits in use by the public shall be clear of obstructions to permit safe ingress and egress of the public at all times.
- (4) **Guardrails.** Guardrails shall be provided on both sides of vehicular and pedestrian bridges, ramps, runways, and platforms. Their height shall be approximately 42 inches.

Guardrails shall be made of rigid materials able to withstand a force of at least 200 pounds applied in any direction at any point in their structure. Pedestrian walkways elevated above adjoining surfaces, or walkways within 6 feet of the top of excavated slopes or vertical banks shall be protected with guardrails, except where sidewalk sheds or fences are required in 2.2.2 (5). Top rails and posts may be 2 inches by 4 inches dressed wood or equal material. Posts shall not be more than 8 feet apart.

- (5) **Overhead Protection.** Sidewalk sheds, canopies, catch platforms, and appropriate fencing shall be provided when it is necessary to safely maintain public pedestrian traffic adjacent to the erection, demolition, or structural alteration of outside walls on any structure.
- (6) **Perimeter Fencing.** Temporary fencing shall be provided around the perimeter of aboveground operations adjacent to public areas except where a sidewalk shed or fencing is provided by the contract or as required by subparagraphs (3) and (5). Perimeter fencing shall be at least 6 feet high. Fencing shall be constructed of wood or metal frame and sheathing, wire mesh or a combination of both, as provided in contract documents and shall be adequately anchored.

When fencing is adjacent to a sidewalk and near a street intersection, the upper fence section shall be composed of open wire mesh from a point not more than four feet above the sidewalk. The fencing must extend at least 25 feet in both directions from the corner of the fence.

- (7) **Public Areas.** Work shall not be performed in any area occupied or in public use unless specifically permitted by the contract or in writing from the Authority, Program Management Consultant, or other designated party.

All workers in the sterile area of the airport may utilize tools in their work area provided: 1) The tools are essential and necessary to their work. 2) Tools must be kept controlled at all times, and may not be left unattended. Knives are prohibited and may not be carried. 3) Tool boxes must be guarded and locked when not in use.

No cartridge style nail guns, nor any tool that uses a cartridge or any explosive charge, shall be permitted on the job, unless authorized by Airport Operations / Security.

- (8) **Signage.** Appropriate warnings, signs and instructional safety signs shall be conspicuously posted where necessary. In addition, a properly certified flagger shall control the moving of motorized equipment in areas where the public might be endangered.
- (9) **Temporary Sidewalks.** Temporary sidewalks with guardrails shall be provided when a permanent sidewalk is obstructed by the Contractor's operations. These sidewalks shall be built according to the local ordinances.
- (10) **Warning Lights.** Signs and lighting shall be placed at both ends of any public protection or obstructions and not over 20 feet apart alongside such protection or obstructions. Warning signs and lights, including lanterns, torches, flares, and electric lights, meeting Authority and FAA requirements, shall be maintained from dusk to sunrise along the guardrails, barricades, temporary sidewalks, and at every obstruction to the public.

2.2.3 **Work Preparation.** Before commencing work, CCP, CMIP, O&M and tenant Contractors shall follow these rules:

- (1) **OCWIP Enrollment.** The Contractors of any tier MUST BE ENROLLED in the OCWIP to perform on-site work. General Contractors are responsible to ensure their Subcontractors are enrolled in the OCWIP.
- (2) **Safety Equipment.** The Contractor shall provide personal protective equipment and other safety items which have been identified as required by the Construction Safety Program, Authority contracts, Office of Public Safety, and all applicable laws, regulations, and orders. The Contractor shall not receive additional payment or reimbursement for safety items.
- (3) **Safety Plan.** Meet with the PSM and representatives of the Authority's Office of Engineering, the CO, and the COTR/RE to discuss and develop a written safety plan. See Appendix D for a sample plan. Safety plans must be site specific and submitted and approved prior to the start of any work.
- (4) **Safety Professionals.** Submit resumes for the proposed Safety Managers / Safety Engineers as required in the Construction Safety Program indicating their work experience and qualifications. Resumes for the Safety Engineers will be reviewed and satisfactorily approved by the PSM and OCWIP Safety Consultant. On-site work may not be performed until the Safety Engineer is approved and present.

2.3 PERSONNEL REQUIREMENTS AND NONCOMPLIANCE

2.3.1 Cooperation and Involvement. It is the Authority's intention to maintain a healthy and safe workplace. To succeed, all parties must be actively involved and maintain cooperation between all Contractors, Subcontractors, and their employees. Contractors and Subcontractors are responsible for orienting employees on the specific safety rules that must be followed by all persons working on the project.

2.3.2 Noncompliance. If the CO is aware of any noncompliance with these safety requirements, or is advised of such noncompliance by the COTR/RE, by the PSM, or by a governmental agency with the authority to enforce safety regulations, the following shall occur:

- (1) **Claim.** The CO shall deny any claim or request from the Contractor for equitable adjustment for additional time or money on any suspend-work order issued under these circumstances.
- (2) **Notification.** The CO shall notify the Contractor of the noncompliance and of the corrective action required. This notice, when delivered to the Contractor or their representative at the job site, shall be deemed sufficient notice of noncompliance to implement corrective action immediately.
- (3) **Removal.** The Contractor will be required to remove any employee or piece of equipment deemed to be unsafe from airport property. Given the concurrence from the CO, the PSM or Site Manager shall replace the Contractor's Safety Engineer or other contract personnel for nonperformance of his or her safety/security duties at no additional cost to the Authority.
- (4) **Work Suspension.** If the Contractor fails or refuses to take corrective action within the specified time, the CO shall exercise the right to suspend work, stopping all or part of the work. The order will remain in effect until satisfactorily corrected.

2.3.3 Grounds for Removal. Any employee of the Contractor or Subcontractor found to be violating the following safety rules, or other Authority policies or procedures as defined in the Construction Safety Manual, is subject to immediate removal from the job site. Disciplinary policies must be included in the Contractor's Safety Plan to address violations.

- (1) **Continued Violations.** Any employee who has been documented as having repeatedly violated the Federal, State or Authority safety regulations on any Authority project, can be removed for cause.
- (2) **Drugs and Alcohol.** No employee shall possess, use, or be under the influence of drugs or alcohol while on the project.
- (3) **Fighting, Gambling, or Horseplay.** Unprofessional behavior will not be tolerated. Violators will be removed from the job site.
- (4) **Weapons.** Carrying or possession of firearms, knives, clubs, or other weapons is strictly prohibited.

2.3.4 Re-Hire. Any employee removed from an Authority construction project for safety violations or unsafe work practices cannot be hired to work on any other Authority project for a minimum of one year from the date of removal without the specific approval of the CO.

2.4 CONSTRUCTION SAFETY ADVISORY COMMITTEE

The Committee shall meet as required by the Chair. Members may request the Chair to call a meeting when the need arises. The Committee membership includes: Vice President, Office of Engineering (Chair); Assistant VP of Engineering; National/Dulles Airport Operations Managers; National/Dulles Engineering and Maintenance

Managers; Construction Manager, Office of Engineering; Program Management Consultant Project Manager; Program Management Consultant Site Managers; Program Safety Manager; Risk Manager and Insurance Safety Consultant. The Authority's Construction Safety Advisory Committee shall have three primary functions:

- (1) **Leadership.** Provide coordination, leadership, and direction for the Construction Safety Program.
- (2) **Enforcement.** Monitor the management of the Construction Safety Program to ensure the program is maintained and enforced.
- (3) **Recommendations.** Recommend resolutions to safety problems not routinely resolvable by the PSM, Insurance Safety Consultant, or Contractor's safety staff.

2.5 CONSTRUCTION SAFETY RESPONSIBILITIES

2.5.1 **Contracting Officer's Technical Representative (COTR/RE).** The COTR/RE will observe the Contractor's safety and accident prevention procedures for all activities and personnel working at the construction sites, including the Authority, consultant, Subcontractors, visitors, and materials or equipment suppliers. The COTR/RE on the project has the responsibility to:

- (1) **Corrective Actions.** Initiate measures to promptly notify entity in control of construction activities to address unsafe working conditions, including taking corrective action when unsafe working conditions are detected (i.e., lack of good housekeeping practices, use of equipment in obviously poor condition, failure to adhere to any of the regulations and standards listed in Appendix B, or issued by any of the agencies listed in Appendix B which pertain to safety.

First-time infringements should be corrected by prompt referral of the incident to the Contractor's Safety Engineer or Safety Manager. If neither person is present, the Contractor's Project Manager must address the incident.

- (2) **Documentation.** Maintain written documentation of communications with the Contractor's Safety Engineer concerning accident prevention to preclude any misunderstandings even though it may be expected that a hazardous condition might be corrected by an oral communication.
- (3) **Imminent Danger.** Inform the Contractor of any construction activity which, in the COTR/RE's judgment, constitutes an immediate threat of imminent danger and, if necessary, stop such action.
- (4) **Monitor Contractor Enforcement.** Monitor to see that Contractors provide effective safety enforcement on the project.
- (5) **Noncompliance.** Promptly notify the Contractor and the PSM in writing of noncompliance with any of the safety requirements contained in the contract documents including the *Construction Safety Manual*. Use the Authority's *Construction Safety/Security Inspection Report* (see Appendix C).
- (6) **Report Unsafe Conditions.** Report directly, or assign another person to report, any unsafe working condition to the Contractor and the Authority's PSM.
- (7) **Safety Compliance.** Receive and review copies of the Contractor's Daily Reports, Equipment Maintenance Log, Accident Report forms, and other forms as they apply. These reports are to be continually monitored to ensure that the Contractor takes prompt action to correct safety deficiencies.

For all CCP Task Order Contracts, CMIP and O&M projects, the COTR/RE or project engineer is responsible to ensure the requirements listed under Section 2.5.3. are performed by a specifically

dedicated person on the project. A full-time Safety Engineer shall be required for all contracts over \$250,000 or any project directly exposed to aircraft operations.

2.5.2 Contractor's Project Manager. The Contractor is responsible for accident prevention and job site safety. This responsibility cannot be delegated to Subcontractors, suppliers, the Authority, Program Management Consultant, or other persons. The COTR/RE must be informed in advance if the Contractor's safety personnel will not be on duty when work will be undertaken.

The Contractor's Project Manager will ensure compliance with all provisions of the contract, including the Authority's *Construction Safety Manual*, OSHA, VOSH, and other agency and industry safety requirements and standards. Additional duties shall include the following:

- (1) **Contractor's Safety Plan.** Upon notification of contract award, submit in writing a Contractor's Safety Plan (see Appendix D) to the COTR/RE, who will forward the documents to the PSM for review and recommendations. The Contractor's Safety Plan must comply with Authority's Construction Safety Program before the COTR/RE will approve the document. Delay in submitting a written safety plan will not constitute grounds for a contract schedule extension or delay claim. Copies of the site layout must be submitted to the Deputy Fire Chief at the appropriate airport.
- (2) **Cooperation.** Cooperate with the Authority, consultants, and safety representatives of the insurance administrators or the insurers.
- (3) **Corrective Action.** Review and direct immediate action to correct all unsafe conditions recognized. This will apply to the work performed by all Subcontractors on the project.
- (4) **Emergency Contact Lists.** Updated phone numbers for Contractor personnel, Police Department, Fire Department, COTR/RE, and other Authority departments listed in the *OCWIP Emergency Phone Number List* must be posted on the project at all times.
- (5) **Enforcement.** Be responsible for providing the PSM with support in carrying out the duties and responsibilities of that position. Take an active part in supervisory safety meetings, including the discussion of observed unsafe work practices or conditions, a review of the accident experience and corrective actions, and encouragement of safety suggestions from employees.
- (6) **Federal/State Citations.** Provide the COTR/RE copies of all OSHA/VOSH citations, immediately upon receipt.
- (7) **Qualifications.** Ensure that all heavy equipment operators (i.e., cranes, loaders, forklifts) are properly qualified and trained on the specific piece of equipment in use.
- (8) **Regulations.** Plan and execute all work to comply with the stated objectives and safety requirements contained in the Authority's *Construction Safety Manual*, contract provisions, Federal, state, local laws and regulations, and industry standards, as listed in Appendix B.
- (9) **Resumes for Safety Professionals.** Submit a resume of the experience and qualifications for the proposed Safety Engineer or Safety Manager to the COTR/RE. The resume will be reviewed by the PSM and OCWIP Safety Consultant, and a personal interview may be required. Only qualified personnel will be approved.
- (10) **Safety Awareness.** Ensure that all of its Subcontractors, suppliers, etc., are provided with a copy of this *Construction Safety Manual* and are informed of their obligations regarding safety.

- (11) **Safety Inspections & Training.** Select either a Safety Engineer, Safety Manager, or both, as required in the contract provisions, to perform safety inspection and training services under the direction of the Project Manager. The safety representative may not be removed from the job by the Contractor without written approval from the contracting officer based on a recommendation from the PSM and Insurance Safety Consultant.
- (12) **Safety Meetings.** Hold weekly safety meetings. These will be bilingual if dictated by the work force. Documentation of topics discussed and attendees shall be maintained with copies of record submitted to COTR/RE.
- (13) **Safety Orientation.** Maintain an orientation program for new employees that includes as a minimum a review of (a) potential hazards in the work areas and (b) required personal protective equipment and apparel as specified under OSHA or VOSH.
- (14) **Safety Performance Goals.** Safety performance goals have been identified by the Authority, Program Management Consultant and the prime Contractor to evaluate Contractor performance. Develop performance measures to evaluate the overall safety of the project. Create and monitor activities to reduce the frequency and severity of unsafe acts and conditions.
- (15) **Safety Compliance.** For all CCP Task Orders, CMIP, O&M and Tenant projects, the Project Manager is responsible to assign and monitor that the requirements listed under Section 2.5.3. are performed by a designated person whose sole duties relate to safety on the project.

2.5.3 Contractor's Safety Engineer. The Contractor's Safety Engineer will perform daily safety inspections of the Contractor's and Subcontractor's job sites to eliminate unsafe acts or conditions. The Safety Engineer must be a full-time position on all CCP contracts with no other duties assigned. For Air Operations Area contracts over \$5,000,000 in value, the Safety Manager or Safety Engineer must have at least one-year experience in an airport or other aviation environment.

2.5.3.1 A Safety Engineer is required to be on the project during every shift with no exceptions, regardless of the number of employees working on site, including projects scheduled to work 24-hours a day or on weekends. A Safety Engineer must remain on the project until contract substantial completion has been achieved or all significant work activities are completed, as determined by the COTR/RE.

2.5.3.2 The Contractor's Safety Engineer will ensure that all employees are made aware of steps to take in case of an accident and the location of first-aid facilities. The position requires this person to perform or complete the following:

- (1) **Accident Investigation.** Investigate all accidents and implement immediate corrective action. Assist in the preparation of all accident investigations and reporting procedures. Submit copies of written reports to COTR/RE, PSM, and Insurance Safety Consultant within 24 hours of the incident.
- (2) **Contractor Safety Meetings.** Provide the job foremen with appropriate training materials to conduct weekly "tool box" safety meetings. Whenever the attendees do not understand English, the training material must be provided in their language. The Safety Engineer shall attend the weekly "tool box" safety meeting to assure that the meetings are held and are meaningful. He shall also review the Foreman's safety meeting reports.
- (3) **Cooperation.** Coordinate safety activities with the Authority, Program Management Consultant, and insurance safety consultant. Take the necessary steps to implement safety recommendations promptly. Coordinate the public relations aspects of the Contractor's safety plan with Authority personnel.

- (4) **Entry Points.** Drawings of all project entry points must be provided to the Fire Department within 30 days of project commencement. When project conditions change, updated drawings must be re-submitted to the Fire Department.
- (5) **First Aid.** Ensure adequate first-aid supplies are available at the work site and personnel are qualified to administer first aid as required in the contract. Post an updated list of current availability of first aid and emergency treatment for injured employees.
- (6) **Injury Reports.** Report all injuries and accidents within 24 hours according to Federal and state laws and Authority orders or regulations.
- (7) **Manhour Report.** Submit a completed *Monthly Project Manhour/Injury Report Log* by the 10th of each month to the Insurance Safety Consultant. Refer to the *OCWIP Manual* for more details.
- (8) **Medical Treatment.** Ensure that injured workers are taken to the OCWIP designated facilities for the first treatment and subsequent follow-ups.
- (9) **Organizational Safety Meetings.** Attend special safety meetings held or sponsored by the Authority, Program Management Consultant, or Contractor. The Contractor's Safety Engineer or Safety Manager is expected to participate in these meetings.
- (10) **Safety Equipment.** Be responsible for the control, availability and use of necessary safety equipment, including personal protective equipment and apparel for the employees.
- (11) **Safety Training.** Implement safety training programs for supervisors and employees applicable to their specific responsibilities.
- (12) **Written Violations.** Provide timely, written reports to COTR/RE citing any observed unsafe conditions or practices, or violations of job security regarding safety issues, and take corrective actions. This includes all "near misses".

2.5.4 Contractor's Safety Manager. For large complex construction projects, or when multiple Safety Engineers are required, the contractor will employ a full-time Safety Manager on the project. This individual will have the responsibility to monitor efforts of Safety Engineers assigned to the project. Additionally, this individual will perform the administrative tasks required by the contractor, the *Construction Safety Manual* and the *OCWIP Manual*, which includes the submission of monthly manhour reports, payroll information, accident reports, medical coordination, and accident investigations. In the absence of a Safety Engineer on the project, the Contractor's Safety Manager will perform the daily safety inspections and other responsibilities as outlined in Section 2.5.3.

2.5.5 Insurance Safety Consultant. The Insurance Safety Consultant is part of the Authority's Risk Management Department. He/she works with the Insurance Administrator who is responsible for the enrollment, re-enrollment, and dis-enrollment of all contractors, including those hired by the Authority's tenants who must be insured under the OCWIP. Refer to the *OCWIP Manual* for more information. The Insurance Safety Consultant shall perform the following tasks:

- (1) **Accident Investigation.** Perform a complete investigation of all accidents and offer recommendations to prevent a recurrence.
- (2) **Communication & Interaction.** Interact with the Risk Management Department, insurers, Program Management Consultant, and others involved in the project as needed, and assist in the explanation and acceptance of the Authority's Construction Safety Program.

- (3) **Construction Planning Meetings.** Attend and participate in safety, pre-proposal, pre-construction, and insurance meetings as requested and/or as practical.
- (4) **Inspections.** Review inspections conducted by the insurers and be available for any discussion of recommendations proposed during the project construction.
- (5) **Manhour Report.** Compiles and distributes the monthly *Monthly Project Manhour/Injury Report*. Refer to the *OCWIP Manual* for more information.
- (6) **Payroll Report.** Submits to the insurer all job site monthly certified payroll reports received from the Contractors.
- (7) **Risk Assessment.** Conduct accident prevention surveys on the needs of the CCP, CMIP, O&M, tenant programs, and other facilities-based programs as provided in an Authority contract.
- (8) **Safety Issues.** Notify the Authority and Program Management Consultant of safety issues or recurring problems that must be resolved.
- (9) **Safety Orientation & Training.** Offer Contractor's Safety Orientation program and other safety training as required.

2.5.6 Job Foreman. The Contractor's job Foreman is an integral part of an effective safety program. The effort put into accident prevention on the job Foreman's daily assignments determines a good accident record. The job Foreman's responsibilities shall include:

- (1) **Accident Investigation.** Performing a complete investigation of all accidents and taking corrective actions to prevent a recurrence.
- (2) **Enforcement.** Ensuring that unsafe practices or conditions are not allowed to exist on the job sites through continuous monitoring. Correct, or report immediately to the job superintendent, any unsafe conditions, practices or violations of job security.
- (3) **First Aid.** Providing that prompt first aid is administered to an injured employee.
- (4) **Instruction.** Instructing personnel under his or her supervision in safe work methods and practices when assigning work.
- (5) **Personal Protective Equipment.** Protecting employees by having and using the proper protective equipment and tools for the job.
- (6) **Safety Attitude.** Setting a good example for personnel.
- (7) **Safety Meetings.** Holding weekly "tool box" safety meetings with work crews to discuss any observed unsafe work practices or conditions; review the accident experience of the crew; discuss corrective action to prevent future accidents; and encourage safety suggestions from the employees. Recommendations from the meeting shall be given to the Safety Engineer.

2.5.7 Program Safety Manager (PSM). The PSM is an Authority, Program Management Consultant, or designated consultant who is responsible for the day-to-day management of the CCP Construction Safety Program. The PSM shall:

- (1) **Audits.** Conduct periodic safety audits of all projects.

- (2) **Contractor's Safety Plans.** Review Contractor's safety plans and programs, descriptions of hazards peculiar to their work, and nominees for the Contractor's Safety Engineer or Contractor's Safety Supervisor position as required by the contract. The PSM will recommend the approval/disapproval of the Contractor's nominees to the CO.
- (3) **Cooperation.** Assist the Authority, Site Managers, consultants, COTRs/REs, and field personnel on safety matters. Organize and conduct safety training as necessary. Act as a technical advisor for safety issues. Perform necessary actions to promote effective safety programs and procedures.
- (4) **Document Review.** Review pertinent contract documents for safety related problems.
- (5) **Emergency Incident.** Work with the Fire Department on construction sites when major incidents have occurred. Act as resource to the Incident Commander or Authority's Public Safety designated officer.
- (6) **Enforcement.** Work diligently with the Authority and consultant field personnel in assisting the Site Managers, COTRs/REs, and inspectors toward strict enforcement of the contract safety provisions. This includes compliance with OSHA (Part 1910 and 1926 of the Code of Federal Regulations), VOSH, FAA, other laws and applicable safety standards, as well as Authority regulations as set forth in the *Construction Safety Manual*.

The PSM reserves the right to enforce, through the contract designated on-site representative, stricter safety procedures than those that might have been issued by OSHA, VOSH, or any other related agency when, in his/her judgment, potential hazards could otherwise exist.

In case of conflict or ambiguity between various statutes, contract documents, or safety provisions, the PSM will recommend to the contracting officer an interpretation as to which provision applies or what is implied in a given provision. The contracting officer's decision will then be final and the contractor shall proceed on that basis.

- (7) **Imminent Danger.** Stop any construction activity or task which, in the PSM's judgment, constitutes an immediate or evolving situation of imminent danger.
- (8) **Meetings.** Participate in meetings with offerors and Contractors (such as pre-proposal, pre-award, and pre-construction conferences) to outline and explain the Construction Safety Program and other safety related aspects of the program as appropriate.
- (9) **Safety Review.** Perform a safety review on all projects identified and scheduled for semi-annual inspections. Present recommendations to the contractor within 30 days after the review.
- (10) **Safety Report.** Provide and distribute the CCP/CMIP/Tenant Monthly Safety Report on certain projects as directed by the Authority.

Program Safety Management functions for the CMIP and tenant construction programs are performed by the insurance safety consultant.

PSM functions for O&M projects are performed by the project manager designated by the Airport's Engineering Division.

2.5.8 Risk Manager. The Authority's Risk Manager shall assist and advise all Authority offices, Program Management Consultant, the insurance administrators, tenants, and the insurers in loss control, safety and insurance. Whether the following items are performed by an Authority employee or Contractor, the Risk Management Department has the responsibility to perform the following:

- (1) **Communication.** Coordinate and maintain regular communication with all parties involved in the safety and loss control efforts provided by the Authority, Program Management Consultant, the insurers, or the insurance administrators involved in the management of projects or other contracts.
- (2) **Industry Awareness.** Obtain and exchange current information on Federal, state, and local safety and environmental regulations.
- (3) **Insurance.** Provide the insurance coverages required under the Owner Controlled Wrap-Up Insurance Program (OCWIP) or indicate other coverages necessary for the selected project.
- (4) **Loss Analysis.** Analyze loss trends, prepare safety and loss control reports, including an analysis of accident frequency, severity, and causes. Provide recommendations to increase the effectiveness of the Authority's *Construction Safety Manual*.
- (5) **Program Evaluation.** Monitor the Authority's Construction Safety Program and make recommendations as required.
- (6) **Risk Evaluation.** Evaluate all exposures of potential loss and monitor the safety performance and enforcement of safety standards of all operations within and under contract to the Authority. Areas of evaluation include personnel safety, liability exposure, public safety, emergency planning, fire protection, and other related areas.

2.5.9 Subcontractor's On-Site Manager. The on-site project manager, or other designated person, for all subcontractors shall be required by the Contractor to perform or complete the following:

- (1) **Accident Investigation.** Complete supervisory investigation reports on all accidents.
- (2) **Cooperation.** Cooperate with the Authority, Program Management Consultant, and the insurers' safety representatives. Assignment of these responsibilities by Contractors to Subcontractors shall not relieve Contractors of their obligations.
- (3) **Enforcement.** Take immediate action to correct unsafe practices or conditions. Immediately report any unsafe conditions, hazardous practices or violations of job security to the Contractor's Safety Engineer/Safety Supervisor or Project Manager.
- (4) **Manhour Report.** Submit a completed *Monthly Project Manhour/Injury Report Log* by the 10th of each month to the General Contractor. Refer to the *OCWIP Manual* for more details.
- (5) **Payroll Report.** Prepare and submit to the General Contractor a job site monthly Certified Payroll Report by the 10th of each month. Refer to the *OCWIP Manual* for more details.
- (6) **Personal Protective Equipment.** Provide and enforce, at all times, the use of required personal protective equipment.
- (7) **Safety Compliance.** Plan and execute all work according to the Authority's Construction Safety Program and incorporate the *Construction Safety Manual* in all subcontracts.
- (8) **Safety Meetings.** Attend supervisory personnel safety meetings scheduled by the Contractor. Schedule and attend weekly "tool box" safety meetings held by job foremen.

2.6 SAFETY AWARD PROGRAMS

The Authority recognizes eligible Contractors who meet or exceed established safety goals. Projects are evaluated and tracked based on contract size and type of program. Awards are given for overall loss performance and to recognize exceptional safety programs. This is a discretionary program. The Authority reserves the right to change or eliminate this program at any time without compensation to contractor. Contractors are currently evaluated on:

- Accident and Injury Records,
- Compliance with Regulations,
- Contractor's Commitment to Safety, and
- Overall Project Appearance.

The Authority uses the *Safety Is No Accident* logo to emphasize the importance of safety on every project. Contractor's must maintain a constant focus on safety. Cooperation, prompt correction of deficiencies, and implementation of safety measures to prevent accidents are required at all times.

2.6.1 Quarterly OCWIP Safety Awards. Projects valued at less than \$10,000,000 with a minimum duration of ninety days on-site are eligible for quarterly safety awards.

- (1) **Performance.** The Authority will reward general contractors who achieve the following established goals over *any three-month interval*. All eligible contractors working on-site must meet the following criteria outlined below:
 - (a.) **Workers' Compensation.** No work-related injuries, excluding first aid. Includes all injuries reported by the general or enrolled Subcontractor of any tier working on-site.
 - (b.) **General Liability.** No accidents involving bodily injury or property damage incurred to any third-party (i.e., slips/falls, auto damage, non-Authority property) as a result of the on-site work.
 - (c.) **Property.** Work performed by any on-site contractor does not cause damage to Authority property (i.e., underground cables or lines, buildings, vehicles, sidewalks and walkways, fence, lights, etc.) in excess of \$1,000.00 per incident.
 - (d.) **Violations.** Receive no more than three serious violations within the three-month interval.
- (2) **Eligibility.** All prime contractors are considered eligible when the following criteria is met:
 - (a.) The contractor and all approved Subcontractors must be enrolled in the Owner Controlled Wrap-Up Insurance Program.
 - (b.) The project must report a minimum of 1,000 manhours per month
- (3) **Award Presentation.** Eligible contractors will receive a certificate to post in their office and a banner to hang on their trailer.

Statistics and project histories will be maintained in the Authority's Risk Management Department.

2.6.2 Monthly OCWIP Safety Awards. Projects valued at \$10,000,000 or more are eligible for monthly safety awards.

- (1) **Performance.** The Authority will reward general contractors who achieve the following established goals over *any thirty-day interval*. All eligible contractors working on-site must meet the following criteria outlined below:
 - (a.) **Workers' Compensation.** No work-related injuries, excluding first aid. Includes all injuries reported by the general or enrolled Subcontractor of any tier working on-site.
 - (b.) **General Liability.** No accidents involving bodily injury or property damage incurred to any third-party (i.e., slips/falls, auto damage, non-Authority property) as a result of the on-site work.
 - (c.) **Property.** No damage to Authority property (i.e., underground cables or lines, buildings, vehicles, sidewalks, and walkways, fence, lights, etc.) in excess of \$5,000.00 per incident as a result of work performed by any on-site contractor.
 - (d.) **Violations.** Receive no more than one serious violation within the thirty-day interval.
- (2) **Eligibility.** All prime contractors are considered eligible when the following criteria are met:
 - (a.) The contractor and all approved Subcontractors must be enrolled in the Owner Controlled Wrap-Up Insurance Program.
 - (b.) The project must report a minimum of 1,000 manhours per month
 - (c.) The contractor must employ a full-time safety professional on-site.
- (3) **Award Presentation.** Eligible contractors will receive a certificate to post in their office and a banner to hang on their trailer.

Statistics and project histories will be maintained in the Authority's Risk Management Branch.

2.6.3 Pizza Award. All general contractors are eligible to receive the Pizza Award, which will be free pizza for all of the general contractors' on-site personnel. These awards will be given to those projects that are recognized for a "job-well-done."

Awards will be given to all eligible general contractors completing sixty-days without any uncorrected deficiencies and exhibiting a positive safety attitude based on the following criteria:

- (1) **Overall Project Appearance.** The project will be evaluated on its daily appearance (i.e., housekeeping, storage, fencing, guarding, etc.) as related to liability and worker safety.
- (2) **Compliance with Regulations.** Regular compliance with the safety (i.e., Federal, state, and Authority) requirements and other airport regulations. The contractor's willingness to correct problems in these areas is considered.
- (3) **Contractor's Commitment to Safety.** The overall attitude and cooperation of the project management team to correct deficiencies. Willingness to institute safety measures to prevent accidents and injuries is evaluated as a part of the award.

The award is limited to general contractors enrolled in the OCWIP, and on-site, for a minimum of ninety days. One project may not receive this award more than twice during a calendar year.

CHAPTER 3. SAFETY REQUIREMENTS

3.1 BASIC SAFETY PROVISIONS

3.1.1 Airport Procedures. The Contractor shall protect the health and safety of employees, the public and any other persons, take all necessary and reasonable actions to prevent damage to property, materials, supplies, and equipment, and avoid interrupting normal airport operation. Nothing contained, herein, alters the requirements to comply with the safety procedures in the contract and otherwise mandated by law or regulation. Examples of items requiring specific Contractor attention include:

- (1) **AOA Operation.** Preventing employees, Subcontractors, suppliers, or equipment from intruding upon the AOA, without the knowledge and concurrence of the Airport Operations Officer (see AOA Construction, Section 3.2).
- (2) **Barricades.** Provide adequate and proper fencing, barricading, marking, and lighting of construction, maintenance or other areas that are temporarily closed to normal airport use.
- (3) **Communication.** A telephone or other means of two-way communication shall be available at the site before construction begins. Maintain radio communication between the construction and maintenance vehicles and air traffic control tower or other on-field communications facility as required in the AOA.
- (4) **Compressors.** Provide ANSI or OSHA approved valve on all air compressors with hoses exceeding ½ inch inside diameter at the source of supply or branch line.
- (5) **Confined Space.** Ensure all confined space entries are made only under the supervision of a qualified person. Each entry must have a permit signed by the qualified person and be kept in visual sight at the entry points. Confined space entries will be made according to the VOSH Confined Space Program, utilizing the Confined Space Entry Permit (Appendix I).
- (6) **Cylinders.** Secure compressed gas cylinders in upright position at all times. Valve caps shall be in place when not in use. They shall be transported and stored according to Federal and state standards. Moving compressed gas cylinders by crane is prohibited, unless cylinders are capped and secured in an approved carrying device.
- (7) **Demolition.** Ensure that material is not dropped outside the exterior wall of the building where the drop distance is more than 20 feet high, unless contained in a chute enclosed on all sides. If the drop distance is less than 20 feet high, the landing area must be barricaded. When material is dropped through openings in the building, the openings must be barricaded at least 42 inches high and 6 feet or more back from the edge of the open area at the landing.
- (8) **Electronic Interference.** The Contractor shall not use any vehicles, equipment, excavations, stockpiles, or other materials that could degrade or otherwise interfere with the electronic signals from radios or electronic navigational aids.
- (9) **Emergency Access.** Prevent construction/maintenance activities or materials from hampering access by any airport rescue and fire-fighting (ARFF) vehicle to all parts of the airport. Contractors will provide and post signage to indicate where emergency access is located (see sample below). Letters must be a minimum of 12 inches high and made of a red reflective material.

EMERGENCY ACCESS

Contractor's
Name

Project
Name

- (10) **Equipment Perimeter Protection.** Heavy equipment with rotating superstructure, such as backhoes and power shovels, shall be guarded in such a manner that rotation and use shall not present a danger to individuals or infringe into any traffic lane.
- (11) **Fire Prevention.** The Contractor shall establish a Fire Prevention Plan referencing OSHA, VOSH, and NFPA standards. OSHA approved safety cans shall be used for flammable and combustible liquids. "NO SMOKING OR OPEN FLAME" signs and fire extinguishers shall be provided where required.

The Contractor's Fire Prevention Plan shall be submitted to the COTR/RE for the Fire Marshal's approval. The Fire Prevention Plan must be updated as job conditions change and include procedures when a fire system is shut down. (See Appendix E, *Fire System Shutdown Procedures*).

- (12) **Flagging.** Provide properly trained and equipped flaggers at designated locations on all Authority roadways including the AOA and for such periods as necessary for the control and protection of vehicular and pedestrian traffic in accordance with the *Manual of Uniform Traffic Control Devices (MUTCD)* and *Virginia Work Area Protection Manual*. Reflective vests must be worn during ALL flagging operations.
- (13) **Foreign Object Damage (FOD).** Debris and other materials can cause serious damage to aircraft. Material or equipment shall not be permitted to obscure pavement markings, pavement edges, or detract from visibility of runway/taxiway markings or lighting. Prevent trash, water, snow, dirt, debris, or other transient materials with foreign object damage potential from entering into or remaining in construction or maintenance areas, whether on runways, taxiways, aprons, or in related safety areas.

Remove all bird attractions, such as edibles (food scraps, etc.) or other miscellaneous garbage, trash, or pooled water while on or near the airports. All materials and equipment, such as lightweight construction materials, must be secured to prevent displacement from wind or jet blast. Dust shall be controlled by using water trucks, sweeping and other acceptable means.

- (14) **Fork Lift Operations.** Operators must be trained and certified as instructed under OSHA regulation 29 CFR 1910.66, 67 & 68, entitled, "*Powered Platforms/Manlifts*". Fork lift operators are required to have a "Fork Lift Trained" decal on their hard hat indicating the person is certified. Fork lifts are to be used for stacking or moving of materials and not to set steel or as a lifting device. Additionally, an AOA driver's license must be annotated to include forklift qualifications (Class B).
- (15) **Ground Fault Circuit Interrupters (GFCI).** Have all construction related electrical services equipped with ground fault circuit interrupters. All power tools must be GFCI protected regardless of power source.
- (16) **Ladders.** Inspect all ladders before use. Defective ladders must be removed from service immediately. All ladders must have firm footing, be secured at the top, and extend 36 inches above the landing level. Provide adequate training for employees and ensure ladders are being used properly. For example, frame ladders may not be used as extension ladders; the upper section of extension ladders may not be dismantled and used as a separate ladder; and aluminum ladders may not be used in conjunction with electric work.
- (17) **Loss Control.** Implement any additional safety measures the CO determines to be necessary to ensure project safety pursuant to a recommendation by the PSM, Insurance Safety Consultant, Contractor's Safety Engineer/Safety Supervisor, or COTR/RE.

- (18) **Manlifts.** Manlift operators shall follow the procedures provided by the manufacturer and OSHA, as well as guidelines specified by either airport, for equipment provided by the Contractor or owned by the Authority.
- (19) **MSDS.** Keep current Material Safety Data Sheets on-site and available to all personnel. Copies may be requested by the Fire Department in connection with their responses for fire, injury or spill incidents.
- (20) **Open Flame Devices.** Prohibit the use of unapproved fuel-burning types of lanterns, torches, flares, or other open-flame devices on Authority property. Permits must be obtained from the Fire Department for any open flame devices used on Authority property.
- (21) **Open Flame Welding.** Ensure that no welding or cutting operations that may provide an open flame or a hot surface are performed until the Authority's Fire Marshal has been notified and a permit obtained to conduct such operations. The Fire Marshal shall inspect the area in which the work is to be performed and determine that adequate fire and safety precautions have been taken before a permit is issued (see Appendix F, *O&I for Welding Cutting and Other Open Flamework*). Have anti-flashback devices installed on the fuel side of all gas and oxygen cutting torches.
- (22) **Regulation Compliance.** Comply with all Federal, state and local safety laws and regulations and industry standards (see Appendix B). All Contractors, Subcontractors and suppliers at every tier shall require compliance of the foregoing, but not limited to, the application of:
- (1) OSHA Construction Safety and Health Regulations, *29 CFR Part 1926* and *29 CFR Part 1910*;
 - (2) FAA Order: (AC 15/5370-2D), *Operational Safety on Airports During Construction*;
 - (3) FAA Order (EA 5210.1C), *Safety Requirements on Airports During Agency Funded Construction and Maintenance Activities*, dated 2/14/85; and
 - (4) The Authority's *Construction Safety Manual*, and *OCWIP Manual*.
- (23) **Piles.** Prohibit cut-off piles to fall free if the top of the pile sticks out of the ground above knee high. Holes shall be kept free of cut-off piles.
- (24) **Scaffolding.** Hollow concrete blocks, in any fashion, shall not be used under scaffold legs to support the scaffold. Appropriate base plates will be utilized at all times. Prior to utilizing any scaffold or fall-protection systems, written documentation must be provided upon request to Program Safety Manager substantiating its compliance with current OSHA regulations.
- Scaffolding will be erected and inspected daily by the Contractor's competent person as described in the OSHA regulations. All scaffold 4 to 10 feet in height, having a minimum platform dimension of less than 45 inches horizontally in any direction, shall be equipped with a guardrail or a fall protection system. This includes a Baker Scaffold.
- (25) **Temporary Lighting.** All outdoor temporary electrical wiring within the construction area will be Type SO Romex (direct burial type), or installed in rigid conduit. If installed outside the limits of the construction area, wiring shall meet the requirements of the *Authority Design Manual*. All indoor temporary electrical lighting shall be a three-wire type system in compliance with OSHA regulations and NEC codes.
- (26) **Tools.** Ensure all tools and equipment used on Authority job sites comply with OSHA standards. Additionally, electrical tools, cords, appliances, etc. must comply with the National Electrical Code standards. Tools in public areas could be a security hazard, and must be closely guarded or locked-up when not in use.

3.2 AIR OPERATIONS AREA (AOA) CONSTRUCTION

3.2.1 **Airport Procedures.** The Airport Operations Division has established procedures to be followed during AOA construction operations. All construction work on the AOA is under the jurisdiction of the Airport Operations Division. They must be notified in advance and give approval prior to the start of any work on the AOA. (See Appendix J for additional guidelines). Activities on or within the vicinity of an active runway, approach or departure may not be distracting, confusing or alarming to pilots during aircraft operations. In addition to the noted attachment, the COTR/RE should be contacted to advise of any current FAA Advisory Circulars or Airport Orders and Instructions that may be in effect. The Contractor shall follow these instructions:

- (1) **Barricades.** Barricades must be properly highlighted for easy visibility by flight crews and airport support personnel. Tape of any type is not acceptable.
- (2) **Clearance.** The Contractor must provide adequate clearances for takeoffs and landing and all other aircraft movements over obstructions or work or storage areas.
- (3) **Drop-offs.** Pavement drop-offs or pavement-turf lips, either permanent or temporary, cannot exceed 3 inches in height.
- (4) **Hazardous Conditions.** In the event of a hazardous condition, the Contractor or Subcontractor shall immediately coordinate the corrective action with an Airport Operations Officer, who will issue proper notices to airport users.
- (5) **Inspections.** Daily inspections of temporary AOA fencing will be conducted. Replacement or repairs shall be given top priority to deter human and animal intrusion into the AOA.
- (6) **Lighting.** Obstruction lights may not be misleading or malfunctioning in the approach to any open runway, approach or departure surface. Night work lighting should be directed in such a manner that it does not interfere with airport operations.
- (7) **Lunch/Break Location.** Lunch and break locations will be approved by the COTR/RE for employees working on the AOA. Adequate trash receptacles shall be provided and emptied on a daily basis.
- (8) **Marking/Lighting.** Temporary runway and taxiway threshold marking and lighting will be provided as required. Elongated or unmarked objects, especially tall cranes, pile drivers or drill rigs, must be properly lit or flagged.
- (9) **Objects.** Mounds or piles of earth, construction materials, temporary structures, or other objects in the vicinity of any operational runway, taxiway, taxi lane, or in a related safety approach or departure area are prohibited. All trench spoil shall be trucked from airside when excavated unless storage is approved by the COTR/RE.
- (10) **Contractor's On-Call Personnel.** An employee, and a back-up individual, must be on 24 hour call when not working on the job site. They must have the capability to maintain construction barricades and lighting on the AOA.
- (11) **Vehicle/Equipment Operations.** Vehicles or equipment, whether operating or idle, may not be used on any open runway, taxiway, taxi lane, or in any related approach, departure, or safety area (see Chapter 4, Motor Vehicle Operations).

- (12) **Work Completion.** Upon completion of work within the AOA, the Contractor shall return all areas to the conditions required by the contract and notify the COTR/RE who will notify Airport Operations to issue the proper notice indicating completion of the construction.

3.3 BLASTING/EXPLOSIVES PROCEDURES

3.3.1 **Basic Procedures.** The Contractor shall exercise the utmost care not to endanger life or property. The following minimum guidelines will be followed in blasting operations:

- (1) **Authority Notification.** Provide written notification to the Fire Marshal and other Authority personnel responsible for the water, sewer, electric, telecommunication, gas, and other airport utility systems prior to blasting. At a minimum, information shall include:
 - (a) Name of the blaster, copy of current license, and work experience,
 - (b) Type of blasting agent and method,
 - (c) Fly rock suppression system, including blasting mats,
 - (d) Lightning detection, and
 - (e) Traffic controls and warning signals.
- (2) **Blasting Plan.** Submit a Blasting Plan to the COTR/RE for comment and approval by the PSM and the Authority's Public Safety, Fire Marshal's Office.
- (3) **Notification.** Notification prior to blasting shall be given to the Authority, tenants, and public utility company, and the Fire Department having structures or facilities in proximity to the work site where the explosives are to be used. Sufficient advance notice shall be given to enable others to take steps as necessary to protect personnel and property.
- (4) **Protection.** All blasting caps shall be a non-electrical type and blasting mats will be used whenever required by the PSM.
- (5) **Shot Plan.** The blaster shall provide the COTR/RE with a shot pattern plan prior to each shot. The plan shall include the number of holes, depth, and size up to three inches maximum diameter. The shot pattern plan shall also include the distance between holes, explosive pounds per delay, number and types of delays, and stemming used.
- (6) **Storage.** Explosives shall NOT be stored on airport property without prior written approval from the COTR/RE and Fire Marshall. Storage must be in compliance with all laws and ordinances and clearly marked to be approved. The storage may not be closer than 1,000 feet from the work, any building, road, aircraft, or other place of human occupancy.
- (7) **Time.** The specific time approved for all surface blasting must be coordinated through the Airport Operations Department. Normally, blasting shall occur between sunrise and sunset. Other limitations may be provided by the Airport Operations Division.
- (8) **Explosives/Blasting Permit.** Obtain an explosives/blasting permit from the Fire Code Enforcement Division.

3.4 CRANES

3.4.1 **Basic Procedures.** The Contractor shall follow the general requirements listed below:

- (1) **FAA Regulations.** Lighting, flagging, raising, and lowering of crane booms shall be done in accordance with FAA rules and airport policies and procedures. See the Airport Bulletins for more information.
- (2) **Inspection.** Provide the COTR/RE and Safety Engineer with a copy of the Crane Safety Inspection Certification for each crane brought on the job site. All cranes must be certified by a master mechanic or certified manufacturer's representative. Daily check lists must be completed and kept on the job site as long as the crane is operating on the project.
- (3) **Multi-Member Lifting.** "Christmas treeing" or multi-member lifting of crane loads is not allowed.
- (4) **Notifications.** Airport Operations must be notified prior to crane operations and FAA Form 7460 must be completed and submitted. All operations must be in compliance with FAR Part 77.
- (5) **Reporting.** Operating times and crane boom heights shall be reported to the Airport Operations Division.
- (6) **Slings and Hooks.** Specialty slings and hooks shall not be used to set steel or move materials over workers. All sling and crane load line hooks shall have safety latches installed or shall be moused, excepted for specialty slings and hooks (i.e., sorting or shake out slings or self adjusting pipe slings.)

3.4.2 **Outrigger Cranes.** Outrigger cranes in use shall be blocked to the following requirements:

- (1) **Board Size.** All blocking boards shall be 8 inch x 8 inch minimum for fixed boom cranes, and 4 inch x 4 inch boards shall be used for hydraulic cranes under 30 tons capacity.
- (2) **Critical Lifts.** A plan must be submitted for all dual lifts, as well as critical lifts. The PSM will determine if the lift is critical and grant approval. All critical lift plans must have a "PE" stamped on the plan with an approved signature.
- (3) **Float Pad.** Float pads are mandatory irrespective of the terrain, conditions, or surfaces located beneath the pads. Size of the float pad blocking shall be determined by the following formula:

<p>Size of blocking in square feet = crane capacity tons ÷ 5</p>
--

<p>For example:</p>

$\frac{30 \text{ ton crane}}{5} = 6 \text{ square feet}$
--

- (4) **Fully Extended.** All outrigger cranes and other vehicles equipped with outriggers shall be operated only with outriggers fully extended and have appropriate blocking, except for a pick and move lift. All pick and move lifts must be approved by the PSM.
- (5) **Suspended Platform.** No crane suspended work platform will be used without the involvement and agreement of the COTR/RE, PSM, Contractor's safety representative, and general superintendent.
- (6) **Weight.** The weight of all lifts must be determined prior to lifting the load.

3.5 ELECTRICAL SAFE CLEARANCE PROCEDURES

3.5.1 **Guidelines and Purpose.** The purpose of this requirement is to establish safe electrical clearance procedures to protect life and property while requiring opening and closing of switches for electrical transmission or

distribution lines. This procedure, which must be followed by all Contractors, will provide for the blocking, tagging, and grounding of electrical switching and controlling devices to clear lines and equipment for the safe accomplishment of work in the de-energized condition.

3.5.2 Responsibilities. Each airport has identified certain individuals with defined responsibilities as described below:

- (1) **De-energizing Requestors.** De-energizing requestors are responsible for the implementation of all safe clearance procedures as defined in the *Construction Safety Manual*, and the training of their representatives assigned to work at or near equipment requiring clearance procedures. The requestor's representatives shall be a competent person with the knowledge to implement these safety procedures.
- (2) **Electrical Safe Clearance Approval Authority.** The Electrical Manager of the Engineering and Maintenance Department at each airport or a safe clearance manager appointed in writing is the approval authority for safe clearances for electrical system energizing and de-energizing.
- (3) **Electrical Outage Approval Authority.** The Airport Engineering and Maintenance Department Manager or designated representative, has the approval authority for all scheduled electrical outage requests which impact airport facilities and services.
- (4) **Lockout/Tagout Procedure.** Contractors are required to create an Electrical Safe Procedure, which will include their own Lockout/Tagout Procedure and submit it to the PSM through the COTR/RE. Contractors must use the Authority's Lockout/Tagout Procedure when indicated in the contract. Contractors may not work on any energized circuits without an approved Electrical Safe Procedure approved by the PSM.

3.5.3 Approval Procedure. The following steps are required under the Electrical Safe Clearance Procedure:

- (1) **MWAA Form EM-27.** De-energizing requestors will complete MWAA Form EM-27 entitled, *Utility Outage Request* (see Appendix G). This form will be used to identify the area(s) required to have electrical circuits and equipment de-energized, the type of work to be performed, the desired start time, and the time required for the outage.
- (2) **Electrical Outage Approval Authority.** Requestors will submit Form EM-27 to the Electrical Outage Approval Authority and provide a copy to the COTR/RE. De-energizing requestors will submit blocking and tagging procedure for each type of device being disconnected. Approved outage requests will be forwarded to the Electrical Safe Clearance Approval Authority for further action. Disapproved requests will be returned to de-energizing requestors with reasons for disapproval annotated.
- (3) **Form RM-21.** Red tags, MWAA Form RM-21 (see Appendix G), will be filled out by the Authority's representative, one tag per work crew.
- (4) **Timeliness.** All activities set forth in the procedure section shall be completed in the scheduled work period so that the initiation and maintenance of regular airport service will not be adversely impacted.

3.5.4 Locking. Locking out will be accomplished by the use of padlocks, or other approved means, which will be controlled by the person receiving the safe clearance. The de-energizing requestor will use his lock and retain the key in his possession. Red tags will be tied to the requestor's lock by the Authority's representative, and the clearance stubs given to the de-energizing requestor. In addition, the requestor will attach his own tag with the name of the person working on the equipment. When possible, a visible line break must be provided at all points of possible feed.

3.5.5 Re-energizing. The de-energizing requestor is responsible to ensure switching operations are performed in reverse order. Beginning with the last detail of switching, blocking and tagging, perform the opposite sequence of events. For example, if the detail of switching, blocking and tagging reads, “open switch no. 27 install lock and attach danger tag,” then the opposite operation should be “remove danger tag, remove lock, and close switch No. 27.”

3.5.5.1 The reverse operation is to be done only after red tag stubs are matched to the upper body of the red tag by the Authority's representative and both copies are signed by the requestor. The requestor will return all Danger Tags to the Safe Clearance Approval Authority.

3.6 PERSONAL PROTECTIVE EQUIPMENT

3.6.1 Basic Protective Equipment. The Contractor is responsible for providing and requiring the use of appropriate personal protective equipment for all employees. The following is a list of the minimum personal protective equipment required:

- (1) **Clothing.** Full length trousers without excessive length or flared bottoms are required. Shirts must cover the entire mid-section and the sleeves must cover the entire shoulder. Sleeveless shirts, tank-tops, net shirts, halter tops, flannel sweat pants and any clothing with derogatory language or offensive photographs shall NOT be worn on the construction site.
- (2) **Fall Protection.** Guardrail systems, safety nets, or personal fall protection must be used during any activity where a worker is exposed to a fall hazard greater than 6 feet. This applies in all cases, unless the PSM grants permission otherwise (ladders are the only exception).

Full body safety harnesses with seat support are the only acceptable fall protection outside of safety rails and nets.

- (3) **Hair.** Long hair shall be contained under a hard hat or net when the individual is working where hair may become entangled.
- (4) **Hard Hats.** Approved hard hats shall be worn at all times while on the construction site. Hard hats shall be worn properly with the bill forward unless the eye protection prevents this, as with welders. The bill is designed to protect the face from falling objects, dust, etc.

Contractors and Subcontractors are required to distinguish their hard hats from other Contractors on the projects. Specially trained operators, such as fork lift, trenching and confined space, are also required to have a decal on their hard hat. This shall be accomplished by using company identification labels, hat color, or colored tape across or around the hat. The tape should be at least one inch wide. Employees' names shall be affixed to the hard hat.

- (5) **Hearing Protection.** Hearing protection shall be worn when required.
- (6) **Reflective Vests.** All personnel working on the AOA, in or around active roadways, or any areas with high vehicular or equipment movement are required to wear a reflective vest at all times. Safety-related personnel will be given a special reflective vest with the word “SAFETY” written on the back to distinguish them from other workers.
- (7) **Respiratory Protection.** Establish and implement a written respiratory protection program when required.

- (8) **Work Shoes.** A serviceable pair of work shoes or boots made of leather or similar material shall be worn. Steel toe shoes or metatarsal covers are required for operating jackhammers, earth compacting equipment, and other activities or areas when designated. Tennis shoes, sandals and other similar shoes are not permitted.

3.7 STEEL ERECTION PROCEDURES

The Authority requires stricter standards than the procedures outlined in OSHA's Steel Erection Standard. All work above 6 feet in height requires 100 percent fall protection. Walking on any live loads and the use of chains is prohibited.

3.8 TOUR AND VISITOR GUIDELINES

It is imperative that the highest degree of protection is afforded to all individuals touring any Authority construction site. Visitors must adhere to the Contractor's rules while on the construction site. ALL tours and visits must be coordinated through the Office of Engineering's Construction Department or the Contractor. The following guidelines have been prepared as general instructions for the organization, direction and safe conduct of tours and visits:

- (1) **Escorted Visitors.** While on the job site, non-construction personnel or groups shall be accompanied at all times by an authorized representative from Program Management Consultant, the Authority, the Contractor, or other designee familiar with the job site.
- (2) **Notification and Tours.** Personnel tours that do not involve technical inspections need to be cleared through the Authority Office of Engineering's Construction Department allowing reasonable advance notice. The site COTR/RE shall be consulted to coordinate the tour plan, identify specific rules, and to ensure necessary safety precautions are taken.
- (3) **Safety Enforcement.** Before entering a job site, all visitors must be informed regarding the need for careful, orderly conduct and notified of any special hazards that may be encountered. All visitors and tour groups must comply with the safety precautions required under the contract for that site, including furnishing and use of personal protective equipment. The number of escorted persons on such tours should be proportionate to the degree of hazard and operating space involved, but may not exceed ten visitors per authorized representative.

3.9 TRENCHES, EXCAVATIONS AND STOCKPILES

An open trench or excavation exceeding 3 inches deep and 3 inches wide will not be permitted within the limits of restricted areas of operational runways, taxiways, or ramps. The following guidelines are required for all trenches, unmarked or unlit holes, and excavations:

- (1) **Barricades.** Barricades around open holes, trenches, drop-offs, or other identified hazards shall be weighted or secured to the ground to prevent displacement by wind or jet blast.
- (2) **Marking.** Open trenches, excavations, and stockpiled material at the job site must be prominently marked as directed by the COTR/RE with red flags and lighted during hours of restricted visibility or darkness.

- (3) **Soil Stability.** In the event of concern by any safety employee including the COTR/RE, on soil stability, the Contractor shall supply specific calculations on the stability of the materials including support calculations (i.e., trench data, angle of repose, and support materials).
- (4) **Stored Materials and Equipment.** Materials and equipment shall be stored in approved areas when not in use and shall not become a hazard to airport operations. The Contractor shall inspect all construction and storage areas as often as necessary to prevent hazardous conditions.
- (5) **Trench Banks.** All trench banks more than 5 feet high shall be sloped to a proper angle. If the angle cannot be achieved, the trench shall be shored unless the trench is in solid rock. All shoring systems must be approved by the PSM. Approved shoring systems shall consist of sheathing, tight planking, or a trenching box.
- (6) **Trench Coverings.** Coverings for open trenches or excavations shall be sufficient to support the weight of the heaviest aircraft or vehicle operating on the runway, taxiway, apron, or roadway.

3.10 TUNNELING AND UNDERGROUND CONSTRUCTION

3.10.1 **General Requirements.** All tunneling and underground construction will be performed in accordance with OSHA Regulation 29 CFR 1926, Subpart S-800-804 entitled, "*Underground Construction, Caissons, Cofferdams, and Compressed Air.*" Additionally, Contractors will adhere to the following Authority requirements:

- (1) **Diesel Powered Equipment.** Any diesel powered equipment used underground will require scrubbers and must be in good operating condition (i.e., no exhaust leaks, no excessive noise or smoking).
- (2) **Lighting.** Underground lighting must be free of defects and kept clean at all times. This includes the equipment lights and all temporary tunnel lighting.
- (3) **Monitoring.** Contractor will be required to provide air quality data to the COTR/RE. Air quality shall be constantly monitored while any personnel are occupying the shafts, tunnels, or headings that are under construction. The monitoring equipment must be capable of detecting four gasses simultaneously and equipment must be calibrated and tested per the manufacturer's specifications.
- (4) **Permits.** Utility vaults require OSHA confined space entry permits. Completed walkback, baggage, tug, and train tunnels do not require confined space entry permits. See Appendix I.
- (5) **Prohibited Items.** The use of the following items is prohibited in any tunnel during underground construction: gasoline or the use of gasoline powered equipment; liquid propane gas; natural gas; PVC piping; and smoking materials.
- (6) **Record Keeping.** All daily air quality results will be recorded and submitted to the COTR/RE within 24 hours.
- (7) **Safety Plan.** Special safety requirements must be identified in the Contractor's Safety Plan to cover all tunnel operations, including a comprehensive evacuation and rescue plan coordinated with the Authority and kept current.
- (8) **Ventilation.** Fan line ventilation must be maintained within 10 feet of the tunnel heading. At a minimum, the system must comply with CFR1926.800. A hard line (steel) system is preferred.

3.10.2 Safety.

- (1) **Job Hazard Analysis.** The contractor shall submit for review a job hazard analysis for each task to be undertaken. This will include the task, its hazards, and corrective measures. These will be submitted five working days prior to initiating the task.
- (2) **Training.** The contractor shall submit for review:
 - Orientation program
 - Frequency of training
 - Types of training
 - Accommodation of ethnic language groups
 - List of qualified competent persons
- (3) **First Aid.** A First Aid / CPR trained individual will be required on each crew.
- (4) **Safety Manager.** The Safety Manager must be a full time on-site position with the following qualifications:
 - (a) Minimum of ten years underground construction safety management experience or;
 - (b) A Certified Safety Professional (CSP) or a Professional Engineer License (PE) with a minimum of five years experience in underground construction safety supervision.
- (5) **Safety Engineer.** The Safety Engineer must have a minimum of five years in underground construction safety supervision. A Safety Engineer will be required per shift regardless of the number of employees working.
- (6) **Whip Checks.** Whip checks for air operated hand tools shall be connected from the hose to the body of the tool only.
- (7) **Walkway.** The contractor will provide a designated walkway for access / egress within the tunnel. It shall be separate and clearly marked.
- (8) **Conveyors.**
 - (a) In addition to the audible requirements for conveyors in CFR 1926.555, both a visual warning system and a minimum of a 30 second delay for conveyor start-up shall be incorporated into the system.
 - (b) No one is allowed to walk on the same side of the tunnel that the conveyor is installed on while it is in operation.
- (9) **Mine Phones.** All phone systems shall be installed in accordance with CFR 1926.800. Additionally, spacing between operating units shall not exceed 200 feet. Each phone location will be provided with a 20 LB chemical fire extinguisher and will be identified by a red light.

3.10.3 Compressed Air.

- (1) **Compressed Air.** The use of compressed air is not allowed as a method to clean or empty any concrete, shotcrete, or grout delivery lines. All delivery lines must have adequate restraining devices which are certified in writing by a registered Professional Engineer (PE).

- (2) **Receiver Tanks.** All air receiver tanks shall comply with CFR 1910.169. Written certification must be provided prior to their use on site.
- (3) **Personnel Underground.** No individual is allowed to be underground alone. Additionally, under no circumstances is any individual allowed to be forward of any excavation in progress.

3.10.4 Emergency Rescue.

- (1) **Work Platform.** If a shaft is the means of access/egress, the contractor will be required to provide a work platform at each shaft location. The platform must be capable of supporting a full rescue team and equipment. It must be designed by a licensed structural engineer and be appropriately tested and conspicuously posted per OSHA 1926.550.
- (2) **Second Means of Retrieval.** A second means of personnel retrieval must be available within fifteen minutes travel time to the shaft.
- (3) **Vertical Conveyors.** If a vertical conveyor system is utilized, it will be equipped with a fire suppression / sprinkler system the full length of the belt.
- (4) **Training Sessions.** Contractors will make arrangements with the MWAA Fire Department "Tunnel Rescue Team" to explain rescue procedures at the sites. This will include three separate semi-annual on-site training sessions. This will be coordinated with the COTR/RE.
- (5) **Water Service.** For fire protection, a water service should be installed and maintained throughout the tunnel. This water service shall require a "T" placed every 200 feet horizontally equipped with an operational shut off valve and a 1 ½" National Standard thread male end with a protective cap.
- (6) **Self-Rescuers.** Self Rescuers will be of the oxygen generating type with a minimum one hour supply.

3.11 FIRE SAFETY

3.11.1 **Safety Codes.** Contractors shall be responsible for compliance with all Fire Prevention / Safety Requirements established in the Virginia Statewide Fire Prevention Code (VSFPC) and other applicable regulatory requirements.

3.11.2 **Permits.** Contractors shall be required to obtain a permit from the Fire Code Enforcement Division for the following:

- Welding/Cutting/Hot Work
- Hazardous Materials Storage, Use, Handling (including flammable/combustible liquids, compressed gases)
- Organic Coating Application
- Explosives/Blasting
- Portable Tank Installation
- Temporary Heating Device Use

3.11.3 Fuel Line Hot Work.

- (1) The following are possible scenarios for welding on fuel lines at the airports.
 - Welding with fuel in the line
 - Welding with no fuel in the line and line has not been purged

- Welding with a purged fuel line
 - Welding on a new fuel line
- (2) The contractor shall notify the Fire & Rescue Department (FRD) of any welding on any existing fuel line.
- (a) Should the contractor weld on a fuel line containing fuel, the contractor shall be required to request a foam unit for standby. This request shall be made to the Deputy Fire Chief or FRD Shift Commander 72 hours prior to welding.
 - (b) Should the contractor weld on a fuel line that does not contain fuel but has not been purged, the contractor shall be required to request a foam unit for standby. This request shall be made to the Deputy Fire Chief or FRD Shift Commander 72 hours prior to welding.
 - (c) Should the contractor weld on a fuel line that does not contain fuel and has been purged, the contractor shall make a courtesy phone call to Fire Dispatch at the beginning and end of the welding operation.
- (3) Should the contractor weld on a new fuel line, no action by the contractor is necessary.
- (4) In all cases, the contractor shall contact the appropriate Fire Marshal's Office for the applicable permits in the prescribed timetables.

3.11.4 Material Safety Data Sheets. Material Safety Data Sheets for all hazardous materials on the jobsite shall be submitted to the Fire Code Enforcement Division prior to the start of construction.

CHAPTER 4. MOTOR VEHICLE OPERATIONS

4.1 BASIC VEHICLE PROCEDURES

The Authority created a series of motor vehicle rules, which was adopted by the Board of Directors and became regulations with the full force of law. A complete copy of the regulations are located on the Authority's web site at <http://www.mwaa.com> Authority publications, Motor Vehicle Rules part 4 chapters 1 through 6. In addition, the following rules are also applicable:

- (1) **Cleaning.** The Contractor shall provide means for cleaning haul vehicles as needed to prevent mud or other potentially hazardous material from accumulating on ramps, taxiways, runways, and airport roads.
- (2) **Flagging.** Furnish, at his/her own expense, flaggers as necessary to control the work traffic, unless otherwise directed by the CO [see Section 3.1.1(12).] Reflective vests must be worn by all personnel.
- (3) **Obstructed View.** All motorized equipment and vehicles with an obstructed rear view shall be equipped with a functioning back-up alarm. A spotter must be used in ALL construction areas where other personnel are working in close proximity to motorized vehicles.
- (4) **Parking.** Employee parking shall be as designated in the contract documents.
- (5) **Site Access.** Access to the construction sites and haul roads shall be as shown and described in contract documents.
- (6) **Spoil Covers.** Spoil covers shall be used whenever trucks are loaded and operating on the Authority property.
- (7) **Unattended Vehicle/Equipment.** No vehicle or equipment operator shall dismount any equipment without first turning off the engine, removing the key, and securing the equipment from movement.
- (8) **Vehicle Inspection.** Construction equipment shall be inspected at the beginning of each shift. Safety equipment such as windshields, side windows, head, tail, brake, and clearance lights, etc., shall be kept clean, tested and unbroken.
- (9) **Vehicle Weight.** No vehicle may be operated on any road within Authority property in excess of approved highway weight limits.

4.2 SPECIAL REQUIREMENTS FOR AOA

After award of the contract, and before commencing vehicle use, the Contractor shall furnish to the COTR/RE a complete vehicle and operators list, including Subcontractors, who will be operating motor vehicles on the AOA. The list shall contain the name of each employee, their address, valid operator's permit (i.e., state driver's license number), and the vehicle registration number for each vehicle that will be used at the airport. The following requirements apply to motor vehicle operations within the AOA:

- (1) **AOA Permit.** All Contractor personnel driving unescorted motor vehicles on airside must obtain and maintain an AOA operator's permit from the Airport Operations Department. The airport has specific Orders and Instructions addressing vehicle and driver's license requirements.
- (2) **AOA Tour.** Prior to beginning construction on the AOA, the Contractor's safety representative shall tour airside with an Air Operations Officer.

- (3) **Communication.** The Airport Operations Department will provide Airside Radio Communication training for contractor personnel before they are permitted to use radios on the AOA. Contractor's traffic will not be permitted to cross active runways, taxiways, and ramps in the AOA, except as specifically approved and controlled by the COTR/RE. It shall be the Contractor's responsibility to ascertain the status of runways, taxiways, and ramps at all times and maintaining continuous communication while on the airside through means identified by the COTR/RE. The clearance should be confirmed by the driver's personal observation that no aircraft is approaching or departing in that area.
- (4) **Escort Procedures.** Operators who do not possess a valid airport drivers license must be escorted. Unlicensed operators or unregistered vehicles entering the AOA must be escorted by a licensed operator into, through, and out of the AOA by a vehicle properly identified to operate in the area. All persons operating vehicles on the AOA must have a valid state drivers license with CDL endorsements as necessary.

Escort of vehicles onto the AOA is permitted only when the vehicle has a demonstrated need, i.e. unloading / loading of tools, equipment, supplies, etc. No personal vehicle parking is permitted on the AOA.

Personnel must be trained by the Airport Operations Department before they can perform escort duties. An individual approved to perform escort duties may only escort three private vehicles or one tractor-trailer at a time.

- (5) **Flagging, Airfield Crossing.** Unless specifically approved, flaggers shall be positioned only to control traffic across an active taxiway. Flaggers shall use the standard red (18 inch) square flag with weighted baton. Contractor's must use the standard signals as defined by the Airport Operations Department for flagging operations through all active runway, taxiway and ramp areas, including the following:
- a. Stop = Hands/flags crossed to represent an X.
 - b. Proceed = Right hand stretched upward, left hand pointed at the ground.
 - c. Wait at hold line = Waving both hands in a crossing motion indicates return to hold line and wait for signal to cross.
- (6) **Vehicle Identification.** Only properly identified vehicles shall be allowed in the project work area (Consult Airport Operations: O&I at each airport for details of vehicle and drivers program). Vehicles must be equipped as follows:
- a. Light. A non-flashing, yellow, dome-type light when operating any vehicle on the AOA at night or during times of low visibility.
 - b. Markings. Company identification, such as insignia or initials, with an identification number adjacent to the markings on each side and on the roof, or on the hood if the vehicle does not have a roof. These markings shall be either painted on or a decal attached to the vehicle. The side markings shall be a minimum of 8 inches tall and clearly visible. The roof or hood markings shall be a minimum of 12 inches tall and be installed to be easily read viewing from front to rear of the vehicle.
 - c. Color. Identification markings must be in sharp contrast to the rest of the vehicle. See the Authority's O&I, Section 3-2-5E, *Air Operations Area Vehicle Registration Program*.

CHAPTER 5. REPORTING PROCEDURES

5.1 CONSTRUCTION SAFETY/SECURITY INSPECTION REPORT

5.1.1 **Inspection Report.** The Authority's *Construction Safety/Security Inspection Report* form is required for recording any unsafe conditions or acts noted (see Appendix C). This form is used by the Contractor's Safety Engineer, the PSM, the COTR/RE, Insurance Safety Consultant, Authority staff, inspectors, or insurer's personnel when inspecting the job sites. The following instructions apply to the use of the form:

- (1) **Classification.** Unsafe conditions or acts having potential to cause bodily injury or property damage, should be classified as either "imminent danger" or "serious." In either case, immediate action should be taken to correct the hazard. The unsafe condition or act must be reported as instructed in the Construction Safety Program, even if it has been corrected.
- (2) **Corrective Action.** The last item in the "Contractor's Correcting Action" column will indicate abatement action and a deadline date. (For example, "Repair or replace rail immediately. Clean up accumulated trash, 9/27. Relocated flammable storage, 9/25.")
- (3) **Detailed Information.** Provide specific information under "Safety Violations." Descriptions such as, "safety rails need repair" are adequate, but a better description would be, "broken top rail in safety rail, 8' long at head of Smith Avenue escalator entrance needs repair." Give exact locations of safety violations.
- (4) **Distribution.** All forms will be distributed in the following manner:

White Original	Project Safety Manager (PSM)
Green Copy	Contractor
Yellow Copy	Contracting Officer's Tech. Rep, (COTR/RE)
Pink Copy	Site Manager
Gold Copy	Contracting Officer (CO)
Xerox Copy	Insurance Safety Consultant

- (5) **Item Number.** Number each item, beginning with #1 on each report.
- (6) **Legible.** Print or write legibly with a ball point pen, so that all copies are readable.
- (7) **Report Signature.** The person conducting the inspection must sign and date the form in the space marked "Report Prepared By:" after the inspection is completed.
- (8) **Review.** The violations or comments marked on the inspection report shall be reviewed with the Project Manager, Contractor's Safety Engineer, COTR/RE, and other persons authorized by the Project Manager to implement the necessary corrective action. The Project Manager, or the authorized representative, will note in the "Contractor's Corrective Action" column the appropriate action that will be taken, such as [*Defective regulator will be removed from service this date*]. That individual will sign and date the report.

The PSM or Safety Engineer will review the report with the COTR/RE. The COTR/RE or a designated inspector will follow-up and ensure that the Contractor's corrective action is completed as stated. If corrective action is not taken, incomplete or is substantially delayed, the COTR/RE will promptly report it to the PSM or Site Manager.

5.2 REPORTING ACCIDENTS AND OTHER HAZARDS

5.2.1 **Reporting Accidents.** Accidents occurring from operations or work performed under the CCP and CMIP programs, tenant projects, or other facilities/construction contracts on the airports must be reported, verified, investigated, and analyzed as prescribed by this manual and the *OCWIP Manual*. All Contractors and other individuals involved in the construction programs shall instruct employees and other personnel to follow these procedures if someone is injured:

- (1) **Accident Notification.** Employees must report all injuries or occupationally-related illnesses, as soon as possible, to their employer or immediate supervisor. Accidents resulting in a fatality, the hospitalization of three or more people, or property damage estimated in excess of \$1,000 must be reported to the Contractor's Safety Engineer, or other designated person, COTR/RE, OCWIP Claims Manager, Insurance Safety Consultant, PSM, and others in charge at the job site. VOSH must be notified immediately in the event of an accident involving the death of an employee or serious injury to three or more workers.
- (2) **Accident Investigation and Reports.** Report all accident exposures and near miss incidents that occur on the job site and conduct an in-depth investigation identifying all causes and recommending hazard control measures. Completed reports shall be sent to the Authority's Risk Management Department within 24 hours by the immediate Contractor supervisor, or other designated person. No supervisor may decline to accept a report of injury from a subordinate. These records are to be maintained and submitted to the CO, PSM, Insurance Safety Consultant, or other designated authority upon request.

Submit by the 10th of each month a *Monthly Project Manhour/ Injury Report Log* (see *OCWIP Manual*), indicating the total number of man-hours worked and recordable injuries for the month. This is separate from the OSHA No. 300 form, which is maintained at the job site.

- (3) **Medical Assistance.** Contact the Fire Department for all emergencies. The injured person's supervisor will see that first-aid is administered. Except in emergencies, the Foreman or immediate supervisor must provide the injured employee with a list of preferred physicians to seek medical treatment.
- (4) **Public Information.** Information concerning the event, shall be given to only authorized personnel (i.e., the Office of Public Safety, Risk Management Department, Airport Operations Officer), and where appropriate, request assistance from the Authority's Office of General Counsel. Questions from the media are to be referred to the Authority's Public Affairs Manager at 703-417-8370.
- (5) **Secure the Incident Area.** Except for rescue and emergency procedures, the accident area must be tightly and quickly secured for all major accidents. The accident scene shall not be disturbed until released by the investigating Authority officials.

5.2.2 **Occupational Exposures.** In the event an employee is exposed to toxic materials or harmful physical agents, the Contractor shall:

- (1) **Notification.** Notify the COTR/RE, Insurance Safety Consultant, and the PSM of the incident. Develop procedures under the Authority's guidance to contact the following Authority offices for the events listed below:

Fire Department	▪ Hazardous Material Event or Incidents
	▪ Fire Related Incidents
	▪ Medical Emergencies
Police Department	▪ Bomb Threats
	▪ Public Demonstrations

Risk Management	<ul style="list-style-type: none"> ▪ Insurance/Claim Issues ▪ Property Damage ▪ Injuries to Employees or the Public
-----------------	--

- (2) **Reports.** Any occupational exposures shall be reported on an *Employer's First Report of Accident* (see *OCWIP Manual*), along with an explanation of the corrective action taken to eliminate further exposures.
- (3) **Review Procedures.** Review the emergency procedures regularly and adjust as necessary to provide maximum effectiveness. All such procedures are to be included in the Contractor's Safety Plan and coordinated with the Contracting Officer and COTR/RE.

5.3 ON-SITE FIRST AID

At least one person shall be available at the work site, at all times, to render first-aid. This person must have a valid certificate in first-aid training from the U.S. Bureau of Mines, the American Red Cross, or equivalent verifiable training program. A minimum ratio of one such qualified person for every 25 employees shall be maintained throughout the project. Additionally, the Contractor shall:

- (1) **Emergency Numbers.** Post emergency telephone numbers and locations of facilities including, but not limited to, hospitals, physicians, police, fire, and emergency medical services, in conspicuous locations at the job site and at all telephone locations.
- (2) **First-aid Supplies.** First-aid supplies must be accessible for immediate use and be of sufficient size and number to handle common first aid incidents. The PSM will specify the number and type of first-aid kits required at each work location.
- (3) **Identification.** Personnel qualified to render first-aid shall affix suitable emblems to the rear of their hard hats for identification.
- (4) **Safety Awareness.** Actions to be taken during emergencies should be discussed regularly with the Contractor's supervisory personnel and at "tool box" safety meetings.

CHAPTER 6. OTHER GENERAL REQUIREMENTS

6.1 ORDER OF PRECEDENCE

In case of conflict between the general provisions of the contract relating to safety and this document, this document shall control.

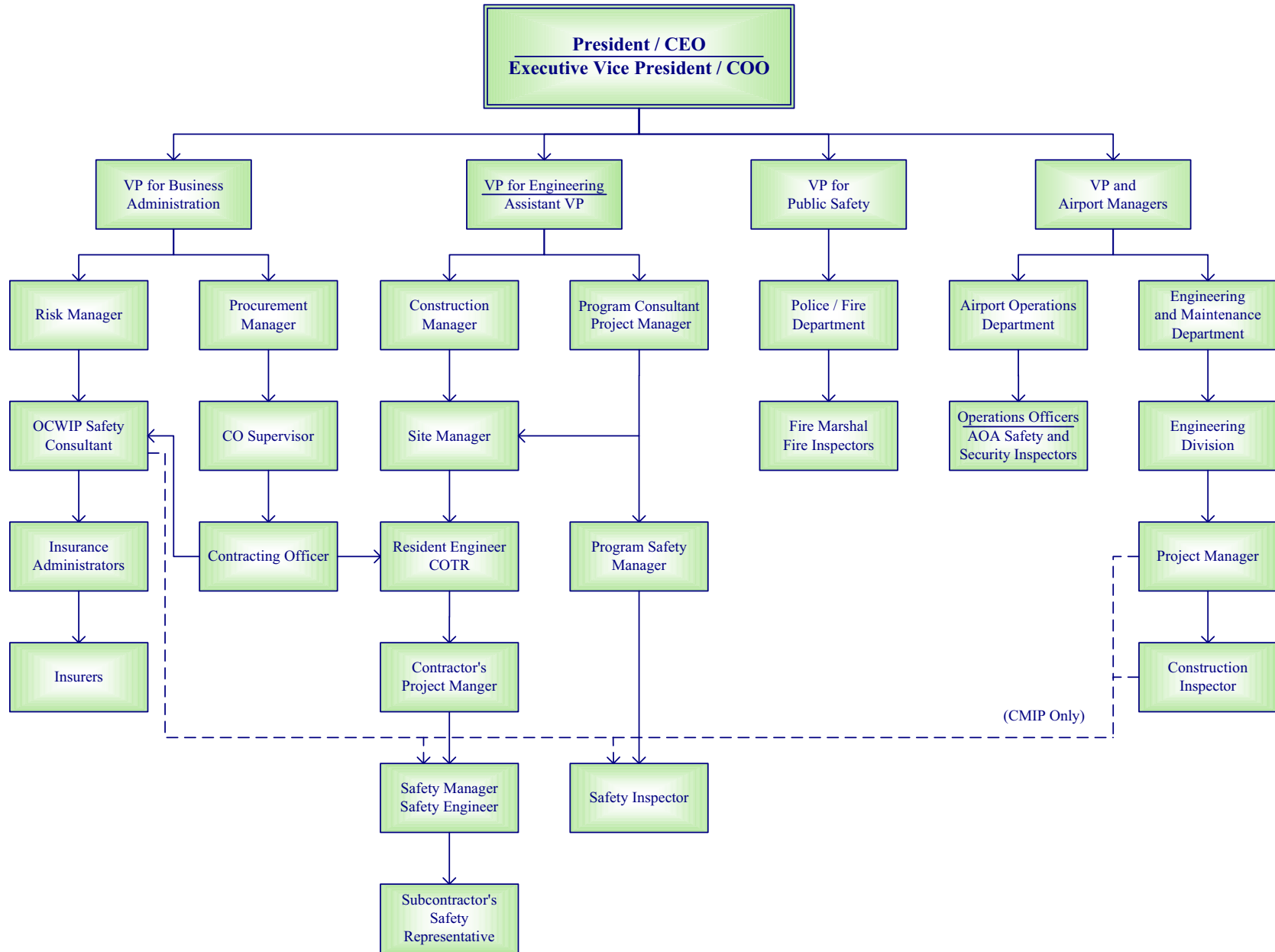
APPENDIX A

CONSTRUCTION SAFETY PROGRAM ORGANIZATION CHART



Metropolitan Washington Airports Authority

Construction Safety Program Organization Chart



APPENDIX B

APPLICABLE GOVERNMENTAL AGENCIES AND INDUSTRY SAFETY STANDARDS



APPENDIX B

APPLICABLE GOVERNMENTAL AGENCIES AND INDUSTRY SAFETY STANDARDS

The Contractor shall comply with the safety requirements and provisions of the following agencies, associations, councils, societies, etc.

- American Concrete Institute
- American National Red Cross
- American National Standards Institute (ANSI)
- American Petroleum Institute (API)
- American Society of Mechanical Engineers (ASME)
- American Society for Testing Materials (ASTM)
- American Welding Society
- Associated General Contractors of America (AGCA)
- Building Officials Conference of America (BOCA)
- Federal Aviation Administration (FAA)
- Federal Fire Council
- Federal Safety Council
- Industrial Hygiene Foundation of America, Inc.
- Institute of Makers of Explosives
- Interstate Commerce Commission (ICC)
- Manual of Uniform Traffic Control Devices (MUTCD)
- National Electrical Code (NEC)
- National Fire Protection Assoc. (NFPA)
- National Institute of Occupational Safety and Health (NIOSH)
- National Institute of Standards & Technology (NIST)
- National Safety Council (NSC)
- Underwriters Laboratories, Inc. (UL)
- U.S. Army, Corp of Engineers
- U.S. Atomic Energy Commission
- U.S. Department of Interior, Bureau of Mines
- U.S. Department of Labor (OSHA)
- U.S. Environmental Protection Agency (EPA)
- U.S. General Services Administration (GSA)
- U.S. Standards Institute
- Virginia Department of Labor (VOSH)
- Virginia Department of Transportation (VDOT)
- Virginia Division of Motor Vehicles and the Motor Vehicle Safety Responsibility Act
- Virginia Statewide Fire Prevention Code (VSFPC)

APPENDIX C

CONSTRUCTION SAFETY/SECURITY INSPECTION REPORT FORM



APPENDIX D

CONTRACTOR'S SAFETY PLAN

(Sample)



APPENDIX D

CONTRACTOR'S SAFETY PLAN

EXAMPLE – Minimum Requirements Provided

The Contractor is responsible to review the specific requirements of the contract, analyze the planned methods of operation, incorporate any additional specific or unique safety requirements in the written plan, and ensure that all applicable safety regulations are addressed. The Contractor's Safety Plan shall include, but is not limited to, the following guidelines:

General Provisions

1. **Policy Statement.** The contractor will state that they are committed to provide a safe and healthy working environment that is free from recognized hazards for all employees. This policy is to be reinforced by upper management and implemented by all project managers.
2. **Compliance.** Contractor's plan to comply with the specific safety requirements identified in the Authority's *Construction Safety Manual*, including the procedures for completing and forwarding to the COTR/RE and Insurance Safety Consultant all on-site accident and incident reports.
3. **Medical Treatment.** Providing medical service in compliance with *OCWIP Manual*. A copy is to be posted at the work site first aid station. The following emergency numbers shall be included for the given work area:

Ronald Reagan Washington National Airport

703-417-8200	Fire or Ambulance
703-417-8210	Police

Washington Dulles International Airport

703-572-2980	Fire or Ambulance
703-572-2951	Police

4. **OSHA Requirements and Personal Protection.** Safety and health provisions for providing adequate lighting, ventilation, noise control, and personal protective equipment, company housekeeping rules, which construction areas shall be designated "Hard Hat Areas," and where warning signs will be posted at all entry points.
5. **Personnel Instruction.** The Contractor must identify the greatest number of employees to be working at any one time during peak construction periods, the company policies for initial safety indoctrination of all employees, and company plans for continued safety education for all employees, including weekly safety meetings. Orientation programs and weekly training meetings should be able to accommodate the various language groups.
6. **Responsibilities.** Acknowledgment that the Contractor is totally responsible for compliance with OSHA and VOSH requirements and relevant FAA, Authority or other applicable rules and orders. Additionally, the plan will require a place of employment that is free of unsanitary or hazardous conditions that would harm an employee's health or safety.

7. **Safety Inspections.** The frequency at which safety inspections will be conducted by the Contractor's Safety Engineer or other assigned safety personnel.
8. **Safety Personnel.** State the name of the Contractor's Safety Engineer and his/her qualifications. Indicate his/her authority to direct work stoppage and expend funds to eliminate imminent hazardous conditions. Submit resume of Contractor's safety staff.
9. **Safety Requirements, Electrical.** Checking and testing of electrical tools, appliances for the required ground, and the installation of electrical circuits in accordance with the National Electric Code.
10. **Safety Requirements, Equipment.** Testing and inspecting of equipment, and the provision for backup alarms for tractors, backhoes, dozers, motor graders, etc.
11. **Safety Requirements, Ladders.** Types of ladders for specific uses and the anchoring to be utilized with each type.
12. **Site Layout.** A layout drawing of the site indicating access roads, fire and ambulance lanes, location of first aid stations, location of required danger alarm systems, location of offices, parking for private vehicles and equipment, and storage of all flammable and/or combustible liquids, gases or other hazardous materials.
13. **Storage.** Requirements for storage of flammable and combustible liquids or gases, including paints.
14. **Toilets.** Provision of toilets, including frequency at which toilet will be cleaned with soap and water, and sterilized.
15. **Traffic Control.** How the traffic will be controlled and marked for hazards, such as haul roads, highways, intersections, utilities, pedestrian walkways, and prohibited areas.
16. **Accident Investigation.** There are four types of incidents or accidents that must be investigated, workman's compensation injury, auto accidents, vehicle liability, and general liability. A detailed report shall be provided in a timely manner explaining what happened, why, who, when, where, etc., and the corrective measures taken to prevent future occurrence.

Special Provisions

Depending on the type of construction, additional items must be incorporated into the Contractor's Safety Plan. When applicable, include the following:

1. **Blasting Plan.** Complete Blasting Plan which includes procedures for blasting, permits, explosives handling, explosive storage, explosive transportation, hole loading, blast signals, and blaster qualifications.
2. **Confined Space Entry.** Procedures for confined space entry and work operations in and around confined spaces, as well as, emergency retrieval measures.
3. **Cranes.** Use of cranes or derricks and the testing and inspection thereof, including hook latches, cables, boom stops, load tables, warning devices, fire extinguishers, and where the illustration of crane operation signals shall be posted on the job site.
4. **Excavations.** Excavation plans must indicate slope angle and protection, shoring, guarding, barricades, excavation access, and excavated material storage.
5. **Fall Protection.** The use of full-body harnesses, life lines, and lanyards when necessary.

6. **Formwork.** Procedure for submitting formwork and falsework drawings for review and approval. This item should also be indicated on the Contractor's progress schedule to prevent submittal delay which could hold up project.
7. **Hazard Communication Program.** Policy for following the hazard communication program, including the location of MSDSs on the job site.
8. **Interruption of Fire/Security Systems.** Plans shall include measures and/or procedures to provide interim fire and security protection to facilities or areas affected by interruptions. These include automatic detection devices and alarms, automatic sprinkler systems, fire pumps, fire hydrants, applicable water supplies and reservoirs.
9. **Lockout/Tagout.** Procedures for lockout/tagout and the control of energy during work operations.
10. **Safety Nets.** Use of safety nets in areas where the use of full-body harnesses and life lines or scaffolds is not practical.
11. **Scaffolding.** Planking size, cleats, guardrails, toeboards, anchor points, putlogs, section pins, fall protection, and access points.
12. **Welding Protection.** How welding protection will be provided, including shields, fire extinguishers, ventilation, hot work permits and fire watches.
13. **Respiratory Program.** How and when respiratory protection will be provided and monitored.
14. **Disciplinary Program.** The Contractor shall provide an outline of disciplinary action regarding safety violations, for example;
 - first offense - written notice
 - second offense - one day off
 - third offense - three days off
 - fourth offense - removal from company
15. **Substance Abuse Policy.** Policy Statement - i.e., pre-employment drug testing, post accident, random testing, etc. (This policy is not required but is preferred.)
16. **Emergency Excavation and Rescue Plan.** The Contractor's plan for steps to take if a crisis/serious injury or incident occurs. This plan should be developed with assistance from Program Management Consultant, Airport Operations, and the Airports Authority's Fire Department. A drawing of the site should be submitted to Authority's Fire, Police, and Operations departments. If site conditions that may affect this plan change during construction, the contractor shall submit a revised plan for approval. This plan should be made available in English as well as other languages as necessary, so that all employees can understand and react accordingly.
17. **Signage.** At all construction sites, the contractor will install signs that are clearly visible from 50 feet that identify any hazardous or dangerous condition. Signs must be red with white lettering.
18. **Job Hazard Analysis Program.** The Contractor shall submit a program that identifies any upcoming work activities which pose a potential safety hazard. This program should be documented into definable and manageable components whenever the risk of personal injury exists as a result of hazardous tasks or activities.

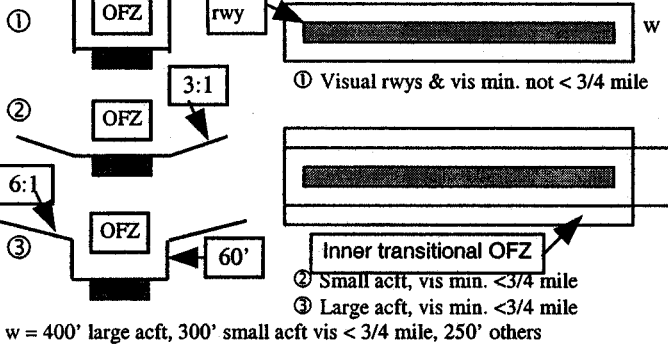
19. **AOA Projects.** For all AOA projects, an attachment to the safety program is required in accordance with FAA Advisory Circular AC 150/5370-2D. A Safety Plan should include, to the extent applicable, provisions for the following:

- (1) Scope of work to be performed, including proposed duration of work.
- (2) Possible safety problems.
- (3) Work control measures.
- (4) Limitations on equipment height.
- (5) Location of airport operational areas.
- (6) Location of and access to stockpiled construction materials and equipment.
- (7) Inspection requirements.
- (8) Trenches and excavations, and cover requirements.
- (9) Threshold marking and lighting.
- (10) Closed runway marking.
- (11) Vehicle operation and pedestrian access in airport movement areas.
- (12) Construction site access and haul roads, includes maintenance of and keeping open ARFF access routes.
- (13) Limitations on construction.
- (14) Radio communications.
- (15) Foreign object debris (FOD) control provisions.
- (16) Hazardous materials (HAZMAT) management.
- (17) Wildlife abatement.
- (18) NOTAM issuance.
- (19) Vehicle identification.
- (20) Vehicle parking.
- (21) Use of temporary visual aids.
- (22) Obstacle-free zones (OFZ).
- (23) Approach clearance to runways.
- (24) Runway and taxiway safety areas.
- (25) Procedures and equipment, such as barricades (identify type) for closing portions of the movement area.
- (26) Required compliance of contractor personnel.
- (27) Procedures for notification of aircraft rescue firefighting (ARFF) if deactivating water lines or fire hydrants, or if emergency access routes are rerouted or blocked.
- (28) Emergency notification for fire, medical, and police response.
- (29) Coordination of plan with an FAA airport certification safety inspector.
- (30) The attached 2-page Pocket Guide for Airport Construction & Maintenance Safety

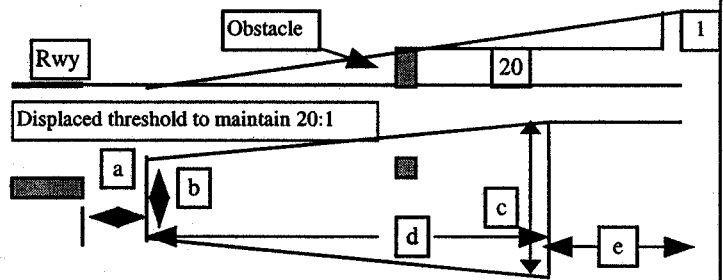
1. Runway Obstacle Free Zone (OFZ)

No construction activity or equipment within OFZ - extends 200 feet beyond runway end and 150' above rwy

Plan View

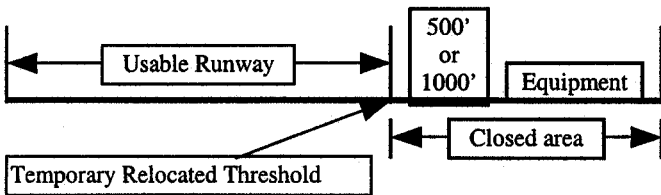


2. Approach Clearance over Object in Runway Approach



Dimension (ft)	Small Aircraft	Large Aircraft
a	0	200
b	250	400
c	700	1000
d	2250	1500
e	2750	8500

3. Equipment on the Runway - Partial Closure



Small Aircraft (12,500# or less) - 500 feet
 Large Aircraft (More than 12,500#) - 1000 feet

Based on equipment height of about 15 feet; higher objects may require special consideration.

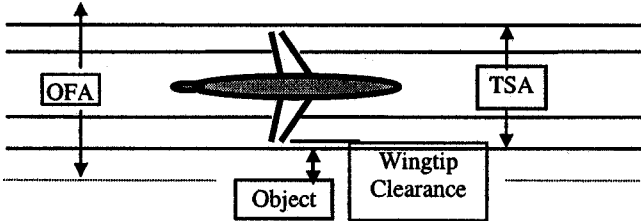
4. Runway Safety Area (Use dimension a or b, whichever results in the greater distance from the runway centerline.)



Acf't Appch Cat.	Runway Safety Area Dimensions(feet)					
	ADG	I	II	III	IV	V
Visual Rwy's and Not Lower than 3/4 Mi Visibility	a	120	150	300	500	
	b	30	40	100	175	
	c	240	300	600	1000	
Lower than 3/4 Mi Visibility	a	300	300	400	500	
	b	100	100	150	175	
	c	600	600	800	1000	
C and D	All: a - 500, b - 150, c - 1000					

5. Taxiway Object Free Area (OFA) and Safety Area

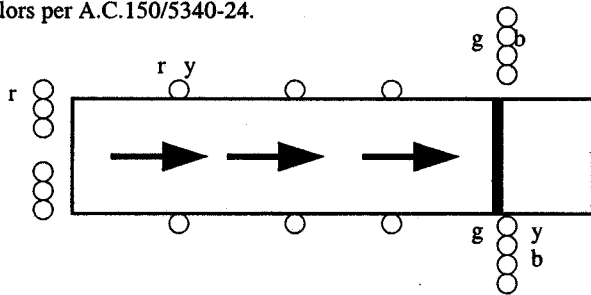
Construction or maintenance activity ok if hazard-marked and lighted and NOTAM is in effect. Check height of barricades & lights for wingtip, prop, and engine clearance.



Airplane Design Gp →	I	II	III	IV	V
Taxiway Safety Area Width (Feet)	49	79	118	171	214
Taxiway Object Free Area Width (Feet)	88	130	186	260	320

6. Marking and Lighting Temporary Displaced Thresholds

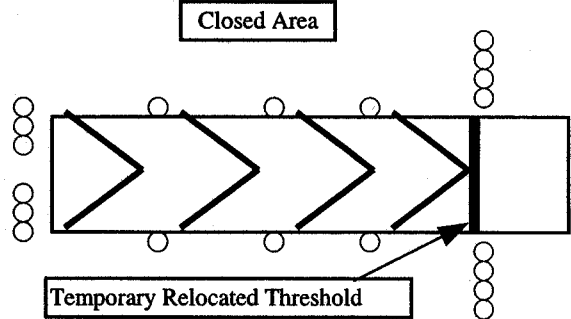
Use white arrows & threshold bar per A.C.150/5340-1, lighting colors per A.C.150/5340-24.



Alternate marking: clearly visible to pilot, not misleading, secured in place, material which will not damage aircraft.

7. Marking and Lighting Temporary Relocated Thresholds

Use yellow chevrons per A.C.150/5340-1, disable lighting in closed area. Alternate marking: same criteria as #6.



8. Notices to Airmen: identify person responsible, issue through AFSS, 1-800-WX-BRIEF, monitor regularly.

Closed Runway Marking: Yellow "X" - 60 feet by 10 feet, closes entire runway, place at both ends

Monitor: Jet blast and propwash near construction areas, ILS critical areas, airport security, vehicle identification and access to aircraft operational areas, cranes or other objects of unusual height, utilities and cables for lighting, NAVAIDS and weather reporting facilities, debris on runways, taxiways, and aprons, pavement lips, access to aircraft firefighting and rescue stations, fencing and gates, vehicle communications.

APPENDIX E

O&I: FIRE SYSTEM SHUTDOWN PROCEDURES



Metropolitan Washington Airports Authority
ORDERS & INSTRUCTIONS

SUBJECT: FIRE SYSTEM SHUTDOWN PROCEDURES

1.0 PURPOSE

This Orders & Instructions (O&I) establishes the procedures to be followed when a fire system is required to be shutdown at Ronald Reagan Washington National Airport and Washington Dulles International Airport.

The purpose of this document is to establish procedures for coordinating fire system shutdowns to prevent unauthorized shutdown of a fire protection system. A shutdown is any situation in which all or part of a fire system is turned off, or otherwise temporarily rendered inoperable. Fire systems shall include automatic fire sprinklers, fire detection and alarm systems, pre-engineered fire systems, under/above ground water supply mains, etc.

2.0 DISTRIBUTION

This O&I is distributed to Metropolitan Washington Airports Authority personnel at branch (department) level and above, tenants, concessionaires, and air carriers.

3.0 AUTHORITY MAINTAINED FIRE SYSTEM SHUTDOWN RESPONSIBILITY

Any person, and his/her organization, who performs fire system installation, maintenance, testing, repair or other operation which requires shutdown of a fire system shall be responsible for compliance with the procedures established in the Virginia Statewide Fire Prevention Code, the BOCA Fire Prevention Code, and this O&I.

4.0 AUTHORITY NOTIFICATION/COORDINATION

4.1 The Fire Department Communications Center and the Fire Marshal's Office shall be notified immediately for all emergency discovered unauthorized shutdowns.

Ronald Reagan Washington National Airport	703-417-8050
Washington Dulles International Airport	703-572-2730
Fire Marshal	703-572-3331

4.2 The person or organization reporting or scheduling a fire system shutdown, hereafter referred to as the requestor, is responsible for coordinating the shutdown. The requestor is typically the airports Engineering and Maintenance Department or the COTR/RE on construction projects. Fire system shutdowns shall be coordinated and scheduled by the requestor to minimize life and property risks and inconveniences to the affected tenants.

4.2.1 Coordination of fire system shutdowns shall start approximately 2 weeks prior to the anticipated shutdown date. A "Utility Outage Request" form shall be completed for all fire system shutdown requests. All coordination and scheduling of shutdowns shall be completed a minimum of 72 hours prior to the shutdown, except for minor and emergency outages which are addressed below.

4.2.2 Minor and emergency fire system shutdowns may be accomplished with less than 72 hours' notice, provided that all notification and coordination is complete. Fire system shutdowns considered to be minor in nature include fire system testing, maintenance and repairs which are of a short duration, of 24 hours or less, do not impact critical operations and do not include substantial risk for life or property loss.

4.2.3 Written notification of fire system shutdowns is required when substantial risk to life or property is involved, critical operations are affected, numerous tenants are affected or the shutdown is for an extended period of time (in excess of 48 hours). The decision whether to require written notification in addition to verbal notification shall be made by the Fire Code Official as part of the approval, coordination and scheduling process.

4.2.4 The requestor shall notify the following Authority sections to coordinate and schedule fire system shutdown:

- a. Fire Code Official
Fire Marshal's Office 703-572-3331

- b. Engineering & Maintenance Department
Dulles Airport, Utilities Division, MA-223 703-572-2830
National Airport, Electrical Division, MA-123 703-417-8080
National Airport, Utilities Division, MA-124 703-417-8090

- c. Authority Construction Engineer. The requestor shall provide advisory notification to the following airports Authority section.
 - (1) Airport Operations Department
Dulles Airport, MA-210 703-572-2730
National Airport, MA-110 703-417-8050

 - (2) Risk Management Department, MA-450 703-417-8654

4.2.5 The requestor shall notify, coordinate and schedule fire system shutdowns with all tenants and organizations that will be affected.

4.2.6 The Engineering and Maintenance Utility Division shall notify the Authority's insurance company of all requests for fire system shutdown.

4.2.7 When a fire system is placed back in service, all personnel who were previously notified of the system shutdown shall be notified that the fire system is back in service. Responsibility for notifying tenants and other agencies when the fire system is placed back in service shall rest with the requestor. This notification may be verbal. In addition, the fire department person shall be notified immediately by radio or telephone or in person when the system is back in service. Responsibility for this notification shall rest with the Engineering and Maintenance Department or the COTR/RE on construction work.

5.0 SYSTEM SHUTDOWN

5.1 Immediately before the scheduled shutdown of any fire system, the Fire Department Communication Center shall be notified.

National Airport 703-417-8250
Dulles Airport 703-572-2980

- 5.2 When a fire sprinkler or standpipe system or any portion is shut down for testing, maintenance, repair or other reason, the personnel working on the system shall attach impairment tags to the exterior fire department connection for that system and to the affected valve(s) at the point of work (or any other location required by applicable procedures) to indicate that the system is inoperative. The exterior fire department connection should not be tagged out if only a portion of the system is shut down and use of the exterior connection would not affect the shutdown portion the system. The personnel performing the work shall remove the impairment tags attached to any connection when the system is placed back in service.
- 5.3 Whenever a fire alarm/detection system is shut down for testing, maintenance, repair, or any other reason, a tag shall be attached to the annunciator panel for that system and at any other location, as required by other applicable procedures, to indicate the inoperative status of the system.
- 5.4 All work on a fire system shall be continuous, when possible, until the system is restored to operational status. All work on a fire system shall be completed as quickly as possible to minimize downtime. In the event of interruptions or lengthy delays in excess of 48 hours, the Fire Code Official shall use discretion to exercise the powers and authority granted under the Virginia Statewide Fire Prevention Code to alleviate a fire hazard.
- 5.5 Upon completion of all fire system work, all affected components of the system shall be inspected and tested by personnel from the Fire Prevention Section or other applicable Metropolitan Washington Airports Authority personnel.
- 5.6 All fire systems shall be mechanically secured when they are placed back in service (fire alarm system panels shall be locked, fire sprinkler system valves shall be locked open, etc.)
- 5.7 The Fire Code Official shall determine the appropriate level of occupancy or activity that may take place in a building or area during fire system shutdown. Buildings requiring fire system shutdown shall be evaluated by Fire Prevention Section personnel to determine if any temporary fire protection measures need to be implemented during the shutdown. At the discretion of the Fire Code Official, any shutdown of fire system may be canceled if the required temporary fire protection measures have not been fully implemented, or at the discretion of the Fire Code official the building may be ordered vacated if fire system shutdown renders a building unsafe for occupancy.
- 5.8 Any discovered unauthorized fire system shutdown shall be reported to the Fire Marshal's Office for immediate follow-up and initiation of legal action, if appropriate.
- 5.9 Fire Department personnel required to perform emergency shutdown of a fire system shall implement the provisions specified in this document.

6.0 **FIRE SYSTEMS NOT MAINTAINED BY THE METROPOLITAN WASHINGTON AIRPORTS AUTHORITY**

- 6.1 Whenever fire systems are required to be shut down for any reason and the maintenance of the system is not the responsibility of the Metropolitan Washington Airports Authority, the Fire Department Communication Center and the Fire Marshal's Office shall be notified before the system is shut down and upon completion of work and restoration of the system to operational status.

National Airport	703-417-8250
Dulles Airport	703-572-2973
Fire Marshal	703-572-3331

- 6.2 Persons performing a shutdown of any fire system shall comply with Sections 5.1, 5.2, 5.3, 5.4, 5.6, 5.7, and 5.8 of this procedure.

APPENDIX F

O&I: WELDING, CUTTING, AND OTHER OPEN FRAMEWORK



Metropolitan Washington Airports Authority
ORDERS & INSTRUCTIONS

SUBJECT: WELDING, CUTTING, AND OTHER OPEN FLAME WORK

ISSUED: 9-12-91

1.0 PURPOSE

This Orders & Instructions (O&I) establishes the procedures to be followed when welding, cutting or other open flame work is conducted at Ronald Reagan Washington National Airport and Washington Dulles International Airport.

2.0 DISTRIBUTION

This O&I is distributed to Metropolitan Washington Airports Authority personnel at Department level and above, tenants, concessionaires, and air carriers.

3.0 CANCELLATION

O&I 5-1-1, Welding and Cutting Operations, dated July 14, 1970.

4.0 WELDING, CUTTING AND OTHER OPEN FLAME WORK

All welding, cutting and other open flame work shall be performed in accordance with the Virginia Statewide (BOCA) Fire Prevention Code, OSHA requirements, NFPA 51B standards, and other requirements established by the Metropolitan Washington Airports Authority.

5.0 DEFINITIONS

Welding/Cutting: Welding or cutting shall include any gas, electric arc or flammable liquid welding or cutting or any combination thereof.

Other Open Flame Work: Any work utilizing a torch or other flame-producing device for removing paint, heating pipes, etc.

6.0 PROCEDURES

6.1 GENERAL REQUIREMENTS

No one shall perform welding, cutting or other open flame work without first obtaining a permit from the Office of Public Safety, Fire Prevention Section. The permit (see attached) shall specify the area in which the cutting, welding or other open flame work will take place. Fire Prevention Section personnel will inspect the area in which

the cutting, welding or other open flame work is to take place before issuing a permit and shall establish fire safety requirements if needed.

6.2 APPROVED WELDING SHOP AREAS

“Open” permits shall be issued for welding, cutting or other open flame work performed in “approved” shop areas. “Approved” is defined as any designated shop area specifically designed for welding, cutting and other flame work and approved by the Metropolitan Washington Airports Authority Fire Code Official (Fire Chief, MA-320, or Fire Marshal, MA-320D) for that purpose.

6.3 CONSTRUCTION SITES

Permits for welding, cutting and other open flame work for construction or renovation projects shall be issued for the duration of the project.

7.0 COMPLIANCE

Compliance with all requirements established in this document shall be the responsibility of all personnel performing welding, cutting and other open flame work at the airports. Informational documents containing requirements and standards for welding, cutting and other open flame work may be obtained from the Metropolitan Washington Airports Authority Fire Marshal’s Office, 703-572-3331, Office of Public Safety, Washington Dulles International Airport.

Metropolitan Washington Airports Authority
Office of Public Safety
Fire Marshal's Office

Welding Permit Requirements

1. All Welding/Cutting work must be in accordance with Virginia Statewide Fire Prevention Code, NFPA 51 and 51B. (F-2203.1)
2. The permit holder must maintain a record of all locations where welding or cutting operations are performed and shall have the record available for inspection by the code official. (F-2203.3)
3. No combustible materials shall be within 35 feet of operations without approved shields and/or covers. (F-2204.2)
4. A FIRE WATCH is required during operations and for 30 mins after completion. Fire watch shall sign an inspection report after completion of the 30 mins. Inspection report shall be available for inspection. (F-2204.2)
5. At least one 2A20BC rated fire extinguisher is required where work is being performed. (F-2204.3)
6. At least one 2A10BC rated fire extinguisher shall be attached to all portable welding carts. (F-2204.3)
7. NO WELDING/CUTTING during outages of the building sprinkler system.
8. NO WELDING/CUTTING within 50 feet of aircraft. (F-803.5)
9. Outages must be done when the possibility exist that an accidental alarm could occur. These outages should be processed in accordance with MWAA Policy.
10. Gas cylinders must be removed from site each day.

APPENDIX G

ELECTRICAL SAFE CLEARANCE FORMS



Metropolitan Washington Airports Authority

UTILITY OUTAGE REQUEST

(Must be submitted and approved 3 business days before requested outage date.)

WASHINGTON DULLES INTERNATIONAL AIRPORT

RONALD REAGAN WASHINGTON NATIONAL AIRPORT

PROJECT NAME (Print or Type)			CONTRACT NO.			
REQUESTER (Print or Type)			COMPANY			
ADDRESS			PHONE NO.		FAX NO.	
REQUEST SYSTEM OUTAGE OF						
<input type="checkbox"/> Electrical <input type="checkbox"/> Gas <input type="checkbox"/> Water <input type="checkbox"/> Fire Alarm <input type="checkbox"/> Sewer <input type="checkbox"/> Sprinkler <input type="checkbox"/> Other (Specify) _____						
START			COMPLETION			
DAY	DATE	TIME (24 HR.)	DAY	DATE	TIME (24 HR.)	
DESCRIPTION						
PURPOSE (Indicate project and describe specific tasks to be performed)						
POSSIBLE AFFECTED BUILDINGS/TENANTS/EQUIPMENT						
CONCURRENCE						
TENANT/OWNER					DATE	
RESIDENT ENGINEER (PMC / MA-224 / MA-121)					CONTROL NO.	DATE
FIRE CODE OFFICIAL (MA-320, If Appropriate)					CONTROL NO.	DATE
ELECTRICAL/UTILITY SUPERVISOR					CONTROL NO.	DATE
OUTAGE REQUEST APPROVED/REJECTED FOR INDICATED DATE/TIME					CONTROL NO.	DATE
APPROVAL/REJECTION COMMENTS						
COPY (As Appropriate)			FOR INTERNAL USE ONLY			
<input type="checkbox"/> Operations, MA-_____ <input type="checkbox"/> Fire & Rescue, MA-321, MA-32 <input type="checkbox"/> Resident Engineer, _____ <input type="checkbox"/> Electrical Supervisor, _____ <input type="checkbox"/> Utility Supervisor, _____ <input type="checkbox"/> Requester, _____ <input type="checkbox"/> Other, _____			MA-_____		TOTAL HOURS	
			AFFECTED EQUIPMENT			

20651

Metropolitan Washington Airports Authority

DANGER-HOLD

Worker on Circuit – Do Not Close

LOCATION		
DISCONNECTING DEVICE		
CIRCUIT OR EQUIPMENT		
TAGGED OUT FOR		
TIME & DATE	AM PM	15
CLEARANCE BY	IN PERSON <input type="checkbox"/>	TELEPHONE <input type="checkbox"/> RADIO <input type="checkbox"/>
REMARKS		
TAG PLACED BY		SWITCH OPERATOR
TIME & DATE	AM PM	15
RELEASED BY	IN PERSON <input type="checkbox"/>	TELEPHONE <input type="checkbox"/> RADIO <input type="checkbox"/>
TAG REMOVED BY		SWITCH OPERATOR

CLEARANCE STUB 20651

LOCATION		
DISCONNECTING DEVICE		
CIRCUIT OR EQUIPMENT		
TAGGED OUT FOR		
TAG PLACED BY		SWITCH OPERATOR
TIME & DATE	AM PM	15
RELEASED BY		

MWSA Form RM-21 Rev. 1/95

Front

Sample Lockout / Tagout

“Danger Hold Tag”

MWAA Form RM-21

A fellow worker's life depends upon the proper use of this tag

DANGER-HOLD

Completed tag and stub shall be forwarded to the Department Head over the person for whom the tag was placed

Worker on Circuit – Do Not Close

This tag shall be used in accordance with the instructions of the latest safety manual issued.

This stub shall be released in accordance with instructions of the latest safety manual.

BE SURE

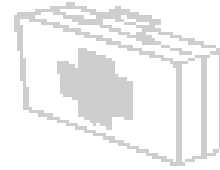
Back

APPENDIX H

CCP/CMIP/TENANT MONTHLY SAFETY REPORT



CCP/CMIP/Tenant



MONTHLY SAFETY REPORT

Contract No. _____ Month/Year: _____

Project Name: _____

Contractor: _____

	REQ'D ENTRY		REMARKS	
	(indicate # of occurrences, unless other instructions given)			
Violations				
Corrected Violations <small>(remarks: attitude toward corrections)</small>				
Safety (Toolbox) Meetings <small>(remarks: evaluate effectiveness)</small>				
Lost Time Injuries <small>(remarks: indicate type of injury)</small>		Monthly:	YTD:	
Recordable Injuries		Monthly:	YTD:	
Lost Time Frequency				
First Aid Injuries				
Special Safety Meetings <small>(see comments)</small>				
Accident / Investigations <small>(see comments)</small>				
On-Site Staffing (# of employees)				
Project Management Support <small>(Indicate: poor/good/excellent)</small>				
Fire Prevention Efforts (When) <small>(Indicate: poor / good / excellent)</small>				

Manhour Reports Submitted

Yes ____ No ____ Date: _____

Contractor's On-Site Safety Presence (Evaluation of Safety Rep. and visit by Corp. safety.)

COMMENTS: (Special meeting, training, event, on-site)

Prepared By/Signature & Date: _____

Phone No. _____ Fax No. _____

APPENDIX I

CONFINED SPACE ENTRY PERMIT



Metropolitan Washington Airports Authority

CONFINED SPACE ENTRY PERMIT

1. LOCATION	START (Hour)	FINISH (Hour)
2. JOB DESCRIPTION		
3. TYPE OF SPACE		
High-temperature manhole	Electrical/phone manhole	Sanitary manhole
		Lift station
		Water meter pit
4. ATMOSPHERIC SAMPLING CONDUCTED BY (Complete 4-6):		
NAME (Print and Signature)	TITLE	DATE
Non-Permit Confined Space Permit Confined Space Other Description of space (Specify): _____		
ATMOSPHERIC SAMPLING REQUIRED		
Prior to ventilation/start of job (always required)	Periodically during occupancy	Continuously during occupancy
ATMOSPHERIC SAMPLING INSTRUMENT MANUFACTUER AND MODEL NO.	SERIAL NUMBER	DATE OF LATEST CALIBRATION
5. VENTILATION*		
No mechanical ventilation required	Continuous mechanical ventilation required	
* For high-temperature spaces and/or if any atmospheric data are outside acceptable ranges or if chemical hazards are present, ventilate at least 15 minutes prior to entry.		
6. EMERGENCY PERSONNEL STANDBY		
Not required	Fire/Rescue Protection Service	Notes/Comments _____
Safety Officer	Other (Specify): _____	
7. PROTECTIVE EQUIPMENT REQUIRED		
Type "C" supplied-air respirator		
SCBA		
Other respiratory protections (Specify): _____	Full body coverings	
Hearing protection	Fire extinguisher	
Coveralls		
Safety harness/lifeline is required if: 1. any sampling data is outside acceptable ranges; 2. type "C" supplied-air respirator is required; 3. moderate/high risk of burns or scalds; or 4. during emergency rescue. Harness/lifeline use requires the fire protection services to be notified.		
8. COMMUNICATION MEDIUM		
Two way radio	Voice to voice	Other Specify _____
9. ISOLATION OF MECHANICAL, ELECTRICAL, PHYSICAL, OR CHEMICAL ENERGY SOURCES REQUIRED (Lockout/Tagout)?		
No	Yes (Specify): _____	
10. NAME OF ATTENDANT (Must maintain visual or voice contact with personnel in space.)		
11. NAME(S) OF EMPLOYEE(S) AUTHORIZED TO ENTER		

APPENDIX J

FAA ADVISORY CIRCULAR – OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION





U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

Subject: OPERATIONAL SAFETY ON AIRPORTS
DURING CONSTRUCTION

Date: 5/31/02

AC No: 150/5370-2D

Initiated by: AAS-300

Change:

1. THE PURPOSE OF THIS ADVISORY CIRCULAR (AC).

Aviation safety is the primary consideration at airports, especially during construction. This AC sets forth guidelines for operational safety on airports during construction.

2. THIS AC CANCELS.

AC 150/5370-2C, *Operational Safety on Airports During Construction*, dated May 31, 1984, is canceled.

3. READING MATERIAL RELATED TO THIS AC.

Appendix 1 contains a listing of supplemental material and instructions for ordering these documents. Many of them, including this AC, are available on the Federal Aviation Administration (FAA) Web site.

4. WHO THIS AC AFFECTS.

It's intent is to help to assist airport operators comply with Title 14, Code of Federal Regulation (CFR), part 139, Certification and Operation: Land Airports Serving Certain Air Carriers, and with the requirements of Federally funded airport construction projects. While the FAA does not require noncertificated airport without grant agreements to adhere to these guidelines, doing so will help these airports maintain a desirable level of operational safety during periods of construction.

5. ADDITIONAL BACKGROUND INFORMATION.

Appendix 1 contains a list of pertinent reading materials on airport construction, design, and potential safety hazards during construction. Appendix 2 contains definitions of terms used in this advisory circular.

DAVID L. BENNETT

Director of Airport Safety and Standards

CONTENTS

<u>Paragraph</u>	<u>Page</u>
Chapter 1. General Safety Requirements and Responsibilities	1
1-1. Overview.....	1
1-2. Who Is Responsible for Safety During Construction.....	1
Chapter 2. Safety Plans	3
Section 1. Basic Safety Plan Considerations	3
2-1. Overview.....	3
2-2. Safety Plan Checklist.....	3
Section 2. Safety and Security Measures	4
2-3. Overview.....	4
2-4. Vehicle Operation Marking and Pedestrian Control.....	4
2-5. Construction Employee Parking Areas.....	5
2-6. Construction Vehicle Equipment Parking.....	5
2-7. Radio Communication Training.....	5
2-8. Fencing and Gates.....	5
Section 3. Notification of Construction Activities.....	5
2-9. General.....	5
2-10. Assuring Prompt Notifications.....	5
2-11. Notices to Airmen (NOTAMs).....	5
2-12. Aircraft Rescue and Fire Fighting (ARFF) Notification.....	6
2-13. Notification to The Faa.....	6
2-14. Work Scheduling and Accomplishment.....	6
CHAPTER 3. SAFETY STANDARDS AND GUIDELINES	7
Section 1. Runway and Taxiway Safety Areas	7
3-1. Overview.....	7
3-2. Runway Safety Area (RSA).....	7
3-3. Taxiway Safety Areas.....	7
Section 2. Temporary Runway Threshold Displacements	8
3-4. Overview.....	8
3-5. Marking Guidelines for Temporary Threshold.....	8
3-6. Lighting Guidelines for Temporary Threshold.....	9
Section 3. Other Construction Marking And Lighting Activities	9
3-7. Overview.....	9
3-8. Closed Runway and Taxiway Marking and Lighting.....	9
3-9. Hazard Marking.....	10
3-10. Construction Near Navigational Aids (NAVAIDS).....	10
3-11. Construction Site Access and Haul Roads.....	11
3-12. Trenches and Excavations.....	11
3-13. Construction Material Stockpiling.....	11
3-14. Other Limitations an Construction.....	11
3-15. Foreign Object Debris (FOD) Management.....	11
Section 4. Safety Hazards and Impacts.....	11
3-16. Overview.....	11

Appendices

Appendix 1. Related Reading Material A-1
Appendix 2. Definitions of Terms Used in the AC A-2
Appendix 3. Airport Construction Safety Planning Guide A-3
Appendix 4. Sample NOTAM..... A-7

CHAPTER 1. GENERAL SAFETY REQUIREMENTS AND RESPONSIBILITIES

1-1. OVERVIEW.

Hazardous practices and marginal conditions created by construction activities can decrease or jeopardize operational safety on airports. To minimize disruption of normal aircraft operations and to avoid situations that compromise the airports operational safety, the airport operator must carefully plan, schedule, and coordinate construction activities. The guidance in this AC does not apply to day-to-day maintenance at airport facilities.

1-2. WHO IS RESPONSIBLE FOR SAFETY DURING CONSTRUCTION.

An airport operator has overall responsibility for construction activities on an airport. This includes the predesign, design, preconstruction, construction, and inspection phases.

a. Airport operator responsibilities—

- (1) Require contractors to submit plans indicating how they intend to comply with the safety requirements of the project.
- (2) Convene a meeting of construction/contractor and airport management to review and discuss project safety prior to construction activity.
- (3) Develop a construction safety plan that complies with the safety guidelines in Chapter 2, "Safety Plans," and Appendix 3, "Airport Construction Safety Planning Guide."
- (4) Ensure contact information is accurate for each representative/point of contact identified in the safety plan.
- (5) Hold weekly, or if necessary daily, safety meetings to coordinate activities.
- (6) Notify users, especially aircraft rescue and fire fighting (ARFF) personnel, of construction activity and conditions that may adversely affect the operational safety of the airport. Convene a meeting for review and discussion if necessary.
- (7) Ensure that construction personnel know of any applicable airport procedures and of changes to those procedures that may affect their work.
- (8) Ensure that construction contractors undergo any training required by the safety plan, as agreed to in the invitation for bid and all subsequent agreements.
- (9) Develop and coordinate a construction vehicle plan with airport tenants, the airport traffic control tower (ATCT) and construction contractors. Include specific requirements in the safety plan or invitation for bid.

(10) Ensure tenants and contractors comply with standards for vehicle lighting, marking, access, and operation.

(11) Ensure that each tenant construction safety plan at certificated airports is consistent with Title 14, Code of Federal Regulations (CFR), part 139, Certification and Operations: Land Airports Serving Certain Air Carriers.

(12) Conduct frequent inspections to assure construction contractors and tenants comply with the safety plan and oversights or altered construction activities do not create potential safety hazards.

(13) Resolve safety deficiencies immediately.

b. Construction contractors responsibilities—

- (1) Posses a copy of the project safety plan.
- (2) Comply with the safety plan associated with the construction project and ensure that construction personnel are familiar with safety procedures and regulations on the airport.
- (3) Provide a point of contact that will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport.
- (4) Provide a safety officer/construction inspector trained in airport safety to monitor construction activities.
- (5) Restrict movement of construction vehicles to construction areas by flagging and barricading, erecting temporary fencing, or providing escorts, as appropriate.
- (6) Ensure that no construction employees, employees of subcontractors or suppliers, or other persons enter any part of the aircraft operations areas from the construction site unless authorized.

c. Tenants planning construction activities on their leased property responsibilities—

- (1) Develop a safety plan and submit it the airport operator for approval prior to issuance of a Notice to Proceed.
- (2) Provide a POC who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport.
- (3) Provide a safety officer/construction inspector trained in airport safety to monitor construction activities.
- (4) Ensure that no tenant or construction employees, employees of subcontractors or suppliers, or

any other persons enter any part of the AOA from the construction site unless authorized.

(5) Restrict movement of construction vehicles to construction areas by flagging and barricading or erecting temporary fencing.

CHAPTER 2. SAFETY PLANS

Section 1. Basic Safety Plan Considerations

2-1. OVERVIEW.

Airport operators should coordinate safety issues with the air carriers and other airport tenants before the design phase of the project. The airport operator should identify project safety concerns, requirements, and impacts before making arrangements with contractors and other personnel to perform work on an airport. These safety concerns will be used as the foundation for the construction safety plan and to maintain a high level of aviation safety during the project. These safety concerns should also be included in the invitation for bid. In addition the invitation for bid, should include provisions for addressing additional concerns that are identified as the project progresses.

The airport operator should determine the complexity of the safety plan that is necessary for each construction project. The contractor working for the airport operator or tenant, in conjunction with the airport operator, should develop the safety plan. However, the airport operator has final approval authority for all safety plans.

The plans and specifications for airport construction should include the construction safety plan. Safety plan costs should be incorporated into the total cost of the project. Coordination will vary from formal predesign conferences to informal contacts throughout the duration of the construction project.

Discussion of all details of the safety plan should take place at the predesign and preconstruction conferences. Items to discuss at these meetings include the following:

- a. Actions necessary before starting construction, including defining and assigning responsibilities.
- b. Basic responsibilities and procedures for disseminating instructions about airport procedures to the contractor's personnel.
- c. Means of separating construction areas from aeronautical-use areas.
- d. Navigational aid (NAVAID) requirements and weather.
- e. Marking and lighting plan illustrations.
- f. Methods of coordinating significant changes in airport operations with all the appropriate parties.

2-2. SAFETY PLAN CHECKLIST.

To the extent applicable, the safety plan should address the following:

- a. Scope of work to be performed, including proposed duration of work.
- b. Runway and taxiway marking and lighting.
- c. Procedures for protecting all runway and taxiway safety areas, object-free zones, obstacle-free zones (OFZs), and other imaginary surfaces defined in 14 CFR part 77, Objects Affecting Navigable Airspace. This includes limitations on equipment height.
- d. Areas and operations affected by the construction activity, including possible safety problems.
- e. NAVAIDS that could be affected.
- f. Methods of separating vehicle and pedestrian construction traffic from the airport movement areas. This may include fencing off construction areas to keep equipment operators in restricted areas in which they are authorized to operate. Fencing (or some other form of restrictive barrier) is an operational necessity in some cases.
- g. Procedures and equipment, such as barricades (identify type), to delineate closed construction areas from the airport operational areas, as necessary.
- h. Limitations on construction.
- i. Required compliance of contractor personnel with all airport safety and security measures.
- j. Construction site parking, access, and haul roads.
- k. Radio communications.
- l. Vehicle identification.
- m. Location of and access to stockpiled construction materials and equipment.
- n. Trenches and excavations and cover requirements.

o. Procedures for notifying of ARFF personnel if water lines or fire hydrants must be deactivated or if emergency access routes must be rerouted or blocked.

p. Emergency notification procedures for medical and police response.

q. Use of temporary visual aids.

r. Wildlife management

s. Foreign object debris (FOD) control provisions.

t. Hazardous materials (HAZMAT) management.

u. Notice to airmen (NOTAM) issuance.

v. Inspection requirements.

w. Procedures for locating and protecting of existing underground utilities, cables, wires, pipelines, and other underground facilities in excavation areas.

x. Procedures for contacting responsible representatives/points of contact for all involved parties. This should include off-duty contact information so an immediate response may be coordinated to correct any construction-related activity that could adversely affect the operational safety of the airport.

y. Vehicle operator training.

z. Penalty provisions for noncompliance with the Safety Plan (e.g., a vehicle involved in a runway incursion).

Section 2. Safety and Security Measures

2-3. OVERVIEW.

Airport operators are responsible for closely monitoring tenant and construction contractor activity during the construction project to ensure continual compliance with all safety and security requirements. Airports subject to 49 CFR part 1542, Airport Security, must meet standards for access control, movement of ground vehicles, and identification of construction contractor and tenant personnel. In addition, airport operators should use safety program standards, as described in Chapter 3 of this AC, to develop specific safety measures to which tenants and construction contractors must adhere throughout the duration of construction activities.

General safety provisions are contained in AC 150/5370-10, *Standards For Specifying Construction on Airports*, paragraphs 40-05, "Maintenance of Traffic"; 70-08, "Barricades, Warning Signs, and Hazard Marking"; and 80-04, "Limitation of Operations." At any time during construction, aircraft operations, weather, security, or local airport rules, may dictate more stringent safety measures. The airport operator should ensure that both general and specific safety requirements are coordinated with airport tenants and the ATCT personnel. These parties should also be included in the coordination of all bid documents, construction plans, and specifications for on-airport construction projects.

2-4. VEHICLE OPERATION MARKING AND PEDESTRIAN CONTROL.

Vehicle and pedestrian access routes for airport construction must be controlled to prevent inadvertent or unauthorized entry of persons, vehicles, or animals onto the Airport Operations Area (AOA). This includes aircraft movement and non-movement areas. The airport operator should develop and coordinate a construction

vehicle plan with airport tenants, contractors, and the ATCT. Specific vehicle and pedestrian requirements should be included in the safety plan or IFB.

The vehicle plan should contain the following items:

a. Airport operator's rules and regulations for vehicle marking, lighting, and operation.

(1) During daylight hours, mark vehicles with orange-and-white-checked flags or flashing yellow beacons.

(2) Mark vehicles used for nighttime or low-visibility operations with flashing yellow beacons.

(3) Affix a flag to construction vehicles requiring escorts.

(4) Mark and identify vehicles in accordance with AC 150/5210-5, *Painting, Marking, and Lighting of Vehicles Used on an Airport*.

b. Vehicle operations.

(1) Describe proper vehicle operations on movement and non-movement areas under normal, lost communications, and emergency conditions.

(2) Describe the penalties for non-compliance with driving rules and regulations.

(3) Describe training for vehicle drivers to ensure compliance with the airport operator's vehicle rules and regulations.

(4) Provide radio communication training for construction contractor personnel engaged in construction activities around aircraft movement areas. This training may not be necessary for all drivers, such as construction drivers under escort.

(5) Establish escort procedures for construction vehicles requiring access to aircraft movement areas. No vehicle must be in the movement area without a working radio unless it is under escort. Vehicles can be in closed areas without a radio if the closed area is properly marked and lighted to prevent incursions and NOTAM regarding the closure is issued.

(6) Provide monitoring procedures to ensure that vehicle drivers are in compliance with the construction vehicle plan.

(7) Provide, if appropriate, personnel to control access through gates and fencing or across aircraft movement areas.

2-5. CONSTRUCTION EMPLOYEE PARKING AREAS.

Designate vehicle parking areas for contractor employees in advance to prevent any unauthorized entry of persons or vehicles onto the airport movement area. They should provide reasonable employee access to the job site.

2-6. CONSTRUCTION VEHICLE EQUIPMENT PARKING.

Contract employees must park and service all construction vehicles in an area designated by the airport operator outside the runway safety areas (RSAs) and obstacle free zones (OFAs) and never on a closed taxiway or runway. Parking areas must not obstruct the clear line of sight by ATCT to any aprons, taxiways, or runways under air traffic control nor obstruct any runway visual aids, signs, or navigational aids or penetrate part 77 surfaces.

2-7. RADIO COMMUNICATION TRAINING.

Ensure that tenant and construction contractor personnel engaged in activities involving unescorted operation on airport movement areas observe the proper procedures for communications, including using appropriate radio

frequencies at airports with and without ATCTs. Systematic training of contractors regardless of whether they are accompanied by an escort is an essential requirement for maintaining airport operational safety. When operating vehicles on or near open runways or taxiways construction personnel must understand the critical importance of maintaining radio contact (or being accompanied by a person who maintains such contact) with the ATCT or the Common Traffic Advisory Frequency, which may include UNICOM, MULTICOM or one of the FAA Flight Service Stations (FSS), as directed by airport management.

Vehicular traffic crossing active movement areas must be controlled either by two-way radio with the ATCT, escort, flagman, signal light, or other means appropriate for the particular airport. Vehicle drivers must confirm by personal observation that no aircraft is approaching their position when given clearance to cross a runway.

Even though radio communication is maintained, vehicle drivers also must be familiar with ATCT light gun signals in the event of radio failure (see FAA safety placard "Ground Vehicle Guide to Airport Signs and Markings"). This safety placard may be ordered through the Runway Safety Program Web site at <http://www.faa.gov/runway/> or obtained from the Regional Airports Division Office.

2-8. FENCING AND GATES.

Airport operators and contractors must take care to maintain a high level of safety and security during construction when access points are created in the security fencing to permit the passage of construction vehicles or personnel. Temporary gates should be equipped so they can be securely closed and locked. Procedures should be in place to ensure that only authorized persons and vehicles have access to the AOA and to prohibit piggybacking behind another person or vehicle. Department of Transportation (DOT) document number DOT/FAA/AR-00/52, Recommended Security Guidelines for Airport Planning and Construction provides more specific information on fencing.

Section 3. Notification of Construction Activities

2-9. GENERAL.

In order to maintain the desired levels of operational safety on airports during construction activities, the safety plan should contain the notification actions described below.

2-10. ASSURING PROMPT NOTIFICATIONS.

The airport operator should establish and follow procedures for the immediate notification of airport users and the FAA of any conditions adversely affecting the operational safety of an airport.

2-11. NOTICES TO AIRMEN (NOTAMS).

The airport operator must provide information on closed or hazardous conditions at the airport to the local air traffic control facility (control tower, approach control, air route traffic control center, or FSS) so they can issue a NOTAM. The airport operator should coordinate the issuance, maintenance, and cancellation of NOTAMs about airport conditions resulting from construction activities. Refer to AC 150/5200-28, *Notices to Airmen (NOTAMS) for Airport Operators*, and Appendix 4 in this AC for a sample NOTAM form. Only the FAA may issue or cancel NOTAMs on shutdown or irregular operation of

FAA-owned facilities. Only the airport operator or an authorized representative may issue or cancel NOTAMs on airport conditions. The airport operator must file and maintain this list of authorized persons with the FSS. Any person having reason to believe that a NOTAM is missing, incomplete, or inaccurate must notify the appropriate POINT OF CONTACT, as defined in the safety plan.

2-12. AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF) NOTIFICATION.

The safety plan must provide procedures for notifying ARFF personnel, mutual aid providers, and other emergency services when construction requires shutting off or otherwise disrupting any water line or fire hydrant on the airport or adjoining areas and if contractors must work with hazardous material on the airfield. Notification procedures must also be developed for notifying ARFF and all other emergency personnel when the work performed will close or affect any emergency routes. Likewise, the procedures must address appropriate notifications required when services are restored.

2-13. NOTIFICATION TO THE FAA.

Regulation requires formal notification to the FAA for certain airport projects. In addition to applications made for Federally funded construction, 14 CFR part 157, Notice of Construction, Alteration, Activation, and Deactivation of Airports, requires that the FAA be notified in writing whenever a non-Federally funded project involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; and the deactivation or abandoning of an entire airport. Formal notification involves by submitting FAA Form 7480-1, Notice of Landing Area Proposal, to the

nearest FAA Airports Regional Office or Airports District Office (ADO).

Also, any person proposing any kind of construction or alteration of objects that affects navigable airspace, as defined in 14 CFR part 77, must notify the FAA. This includes construction equipment and proposed parking areas for this equipment (i.e., cranes, graders, etc.). FAA Form 7460-1, Notice of Proposed Construction or Alteration, is used for this purpose and submitted to the FAA Air Traffic Division in the Regional Office. (See AC 70/7460-2, *Proposed Construction or Alteration of Objects That May Affect the Navigable Airspace.*)

If construction operations require a shutdown of NAVAIDS from service for more than 24 hours or in excess of 4 hours daily on consecutive days, we recommend a 45-day minimum notice prior to facility shutdown.

2-14. WORK SCHEDULING AND ACCOMPLISHMENT.

Airport operators or tenants having construction on their leased properties should use predesign, prebid, and preconstruction conferences to introduce the subject of airport operational safety during construction, see AC 150/5300-9, *Predesign, Prebid, and Preconstruction Conferences for Airport Grant Projects*. The airport operator, tenants and construction contractors should integrate operational safety requirements into their planning and work schedules as early as practical. Operational safety should be a standing agenda item for discussion during progress meetings throughout the project. The contractor and airport operator should carry out on sight inspections throughout the project and immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

CHAPTER 3. SAFETY STANDARDS AND GUIDELINES

Section 1. Runway and Taxiway Safety Areas

3-1. OVERVIEW.

Airport operators must use these safety guidelines when preparing plans and specifications for construction activities in areas that may interfere with aircraft operations. The safety plan must reflect the specific needs of a particular project and for this reason these safety guidelines must not be incorporated verbatim into project specifications. The safety plan should recognize and address these standards for each airport construction project. For additional guidance on meeting safety and security requirements, refer to the planning guide template included in Appendix 3 of this AC.

3-2. RUNWAY SAFETY AREA (RSA).

Construction activities may be permitted within the standard RSA, subject to the following conditions:

a. Runway edges.

(1) No construction may occur closer than 200 feet from the runway centerline unless the runway is closed or restricted to aircraft operations requiring a RSA that is equal to the RSA width available during construction.

(2) Personnel, Material, and/or equipment may not penetrate the OFZ, as defined in AC 150/5300-13 *Airport Design*.

(3) The airport operator must coordinate the construction activity in the RSA with the ATCT and the FAA Regional Airports Division Office and issue a local NOTAM.

b. Runway ends.

(1) A RSA area must be maintained from the runway threshold to a point at least equal to the distance from the runway threshold that existed before construction activity, unless the runway is closed or restricted to aircraft operations requiring a RSA that is equal to the RSA width available during construction in accordance with AC 150/5300-13, *Airport Design*. The temporary use of declared distances and partial runway closures may help achieve this distance. In addition, all personnel, materials, and/or equipment must remain clear of the applicable threshold siting criteria surface, as defined in Appendix 2, "Threshold Siting Requirements" of AC 150/5300-13.¹

(2) Personnel, material, and/or equipment may not penetrate the OFZ, as defined in AC 150/5300-13.

(3) The safety plan must provide procedures for ensuring adequate distance for blast protection, if required by operational considerations.

(4) The airport operator must coordinate construction activity in this portion on the RSA with the ATCT and the FAA Regional Airports Division Office and issue a local NOTAM.

3-3. TAXIWAY SAFETY AREAS.

Construction activity is permissible in taxiway safety areas and taxiway object-free areas (TOFAs) if the activity is hazard-marked and/or lighted and local NOTAMs are issued to that effect. Limit construction activities to the following distance: the TOFAs wingtip clearance is equal to 1.4 times the airplane wingspan plus 20 feet (6m) of the largest aircraft (see the TOFA table in AC 150-5300-13, *Airport Design*). If construction must occur in taxiway safety areas (refer to the taxiway safety area table in AC 150/5300-13), give special consideration to the height of barricades, flashers, and other warning devices to ensure adequate clearance for aircraft wingtips, propellers, engines, etc.

If operating in a taxiway safety area, personnel and equipment must be mobile and be moved out of the area for each passing aircraft. The use of a flagperson to direct construction equipment (not aircraft) along taxiways may be necessary. Construction in restricted areas where the OFA standards cannot be met may require the use of wing walkers. Wing walkers that guide these aircraft through these areas should be airline/aviation personnel rather than construction workers. If wing walkers cannot be provided, close the area.

RSA as long as conditions sited in paragraph 3-2b(2) thru (4) are met. In addition, 14 CFR part 77 surfaces; various transitional surfaces, outlined in AC 150/5300-13; and Terminal En Route Procedures (TERPS) must be protected.

¹ If a full safety area cannot be obtained through declared distances and partial closures, or other methods such as an alternate runway use, construction activity may operate in the

Section 2. Temporary Runway Threshold Displacements

3-4. OVERVIEW.

Construction activity in a runway approach area may result in the need to partially close a runway or displace the existing runway threshold. In either case, locate the threshold at a point where the approach slope for the new landing threshold is not penetrated. Objects that do not penetrate these surfaces may still be obstructions to air navigation and may affect standard instrument approach procedures. These objects must be coordinated with the FAA's Regional Airspace and Procedures Branch and Flight Procedures Branch or their equivalents, as necessary. Refer to the current edition of AC 150/5300-13, *Airport Design*, for guidance on threshold siting requirements. Also coordinate the partial runway closure, the displacement of the runway threshold, as well as complete runway and other portions of the movement area closures with appropriate ATCT personnel and airport users.

Caution regarding partial runway closures: When filing a NOTAM for a partial runway closure verify with FSS, that the portion of pavement located prior to the threshold is not available for landing and departing traffic. Example NOTAM: "North 1,000 feet of Runway 18/36 is closed; 7,000 feet remains available on Runway 18 and Runway 36 for arrivals and departures." There may be situations where the portion of closed runway is available for taxiing only. This condition must also be reflected in the NOTAM.

Caution regarding displaced thresholds: Implementation of a displaced threshold ONLY affects runway length available for aircraft landing over the displacement. Published physical length remains the same for aircraft *departing* in both directions and for aircraft *landing* in the direction opposite the displacement. If project scope includes personnel, equipment, excavation, etc. within the RSA of any usable runway end, we do not recommend a displaced threshold unless arrivals and departures toward the construction activity are prohibited. Instead, implement a partial closure.

3-5. MARKING GUIDELINES FOR TEMPORARY THRESHOLD.

Ensure that markings for temporarily displaced thresholds are clearly visible to pilots approaching the airport to land. When construction personnel and equipment are located close to any threshold, a temporary visual NAVAID, such as runway end identifier lights (REIL), may be required (even on unlighted runways) to define the new beginning of the runway clearly. A visual vertical guidance device, such as a visual approach slope indicator (VASI) or precision approach path indicator (PAPI), may be necessary to assure landing clearance over personnel, vehicles, equipment, and/or above-grade

piled materials. If such devices are installed, ensure an appropriate descriptive NOTAM is issued to inform pilots of these conditions. The current edition of AC 150/5340-1, *Standards for Airport Markings*, describes standard marking colors and layouts. In addition, we recommend that temporary runway thresholds be marked using the following guidelines:

a. Short-term temporary runway threshold markings may deviate from the standards specified in AC 150/5340-1, provided the deviations are coordinated with the FAA Airports Regional or Airports District Office and an appropriate NOTAM is filed. However, the colors and dimensions must meet the existing standards. In addition, these markings must be clearly visible to pilots; not misleading, confusing, or deceptive; secured in place to prevent movement by prop wash, jet blast, wing vortices, or other wind currents; and constructed of materials that would minimize damage to an aircraft in the event of inadvertent contact.

(2) Pavement markings for temporary closed portions of the runway must use yellow chevrons to identify pavement areas that are unsuitable for landing (see AC 150/5340-1).

(3) When threshold markings are needed to identify temporary beginning of the runway that is available for landing, a single white bar of the dimensions specified in AC 150/5340-1 may be used.

(4) If temporary outboard elevated or flush threshold bars are used, locate them outside of the runway pavement surface, one on each side of the runway. They are to be 10 feet (3m) in width and extend outboard from each side of the runway so they are clearly visible to landing and departing aircraft. These threshold bars are white. If the white threshold bars are not discernable on grass, apply a black background in appropriate material over the grass to ensure the markings are clearly visible.

(5) A temporary threshold may also be marked with the use of retroreflective, elevated markers. One side of such markers is green to denote the approach end of the runway; the side that is seen by pilots on rollout is red. See FAA Specification L-853 in AC 150/5345-39, *Runway and Taxiway Retroreflective Markers*.

(6) At 14 CFR part 139 certificated airports, temporary elevated threshold markers must be mounted with a frangible fitting (see 14 CFR part 139.309). However at noncertificated airports, the temporary elevated threshold markings may either be mounted with a frangible fitting or be flexible. See FAA Specification L-853 in AC 150/5345-39.

b. The application rate of the paint to mark a short-term temporary runway threshold may deviate from the

standard (see Revised Item, P-620 Runway and Taxiway Painting in AC 150/5370-10), but the dimensions must meet the existing standards.

c. When a threshold is temporarily displaced, the distance remaining signs for aircraft landing in the opposite direction may need to be covered or removed during the construction.

3-6. LIGHTING GUIDELINES FOR TEMPORARY THRESHOLD.

Temporary runway thresholds must be lighted if the runway is lighted and it is the intended threshold for night landings or instrument meteorological conditions. We recommend that temporary threshold lights and related visual NAVAIDs be installed outboard of the edges of the full-strength pavement with bases at grade level or as low as possible, but not to exceed 3 inches (7.6cm) above ground. When any portion of a base is above grade, place properly compacted fill around the base to minimize the rate of gradient change so aircraft can, in an emergency, cross at normal landing or takeoff speeds without incurring significant damage (see AC 150/5370-10, *Standards for Specifying Construction of Airports*). We recommend that the following be observed when using temporary runway threshold lighting:

a. Maintain threshold and edge lighting color and spacing standards as described in AC 150/5340-24, *Runway and Taxiway Edge Lighting System*. Battery-powered or portable lights, that meet the criteria in AC 150/5345-50, *Specification for Portable Runway Lights*, may be used. These systems are intended primarily for visual flight rules (VFR) aircraft operation but may be used for instrument flight rules (IFR) aircraft operations, upon individual approval from the Flight

Standards Division of the applicable FAA Regional Office.

b. When the threshold has been displaced due to a partial runway closure, disconnect edge and threshold lights with associated isolation transformers on that part of the runway at and behind the threshold (i.e., the portion of the runway that is closed). Alternately, cover the light fixture in such a way as to prevent light leakage. Avoid removing the lamp from energized fixtures because an excessive number of isolation transformers with open secondaries may damage the regulators and/or increase the current above its normal value.

c. Secure, identify, and place any temporary exposed wiring in conduit to prevent electrocution and fire ignition sources.

d. Reconfigure amber lenses (caution zone), as necessary. If the runway has centerline lights, reconfigure the red lenses, as necessary.

e. Relocate the visual glide slope indicator (VGI) such as VASI, PAPI, REIL, and approach lights to identify the temporary threshold. Also, disable VGI or any equipment that would give misleading indications to pilots as to the new threshold location. Installation of temporary visual aids may be necessary to provide adequate guidance to pilots on approach to the affected runway. If the temporary runway threshold is not already served by a VGI, we recommend the installation of a PAPI. If the FAA owns and operates the VGI, coordinate their installation with the Airways Facility Systems Management Office.

f. Issue a NOTAM to inform pilots of temporary lighting conditions.

Section 3. Other Construction Marking and Lighting Activities

3-7. OVERVIEW.

Ensure that construction areas, including closed runways, are clearly and visibly separated from movement areas and hazards, facilities, cables, and power lines are identified prominently for construction contractors. Throughout the duration of the construction project, verify that these areas remain clearly marked and visible at all times and that marking and lighting aids remain in place and operational. Routine inspections must be made of temporary construction lighting, especially battery-powered lighting, since weather conditions can limit battery life.

3-8. CLOSED RUNWAY AND TAXIWAY MARKING AND LIGHTING.

Closed runway markings consist of a yellow "X" in compliance with the standards of AC 150/5340-1,

Standards for Airport Markings. A very effective and preferable visual aid to depict temporary closure is the lighted "X" signal placed on or near the runway designation numbers. This device is much more discernible to approaching aircraft than the other materials described. If the lighted "X" is not available, construct the marking of any of the following materials: double-layered painted snow fence, colored plastic, painted sheets of plywood, or similar materials. They must be properly configured and secured to prevent movement by prop wash, jet blast, or other wind currents. In addition, install barricades, or activate stop bars, at major entrances to the runways to prevent aircraft from entering a closed portion of runway. The placement of even a single reflective barricade with a "do not enter" sign on a taxiway centerline can prevent an aircraft from continuing onto a closed runway.

For runways and taxiways that have been permanently closed, the lighting circuits should be disconnected. With runways, the threshold marking, runway designation marking, and touchdown zone markings should be obliterated and "Xs" placed at each end and at 1,000 feet (300m) intervals. With taxiways, a cross should be placed at each entrance of the closed taxiway.

When all runways are closed temporarily, the runways are marked as temporarily closed runways and the airport beacon is turned off. When the runways are closed permanently, the runways are marked as permanently closed, the airport beacon is disconnected, and an "X" is placed in the segmented circle or at a central location if no segmented circle exists.

3-9. HAZARD MARKING.

Provide prominent, comprehensible warning measures for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles. Using appropriate hazard markings may prevent damage, injury, traffic delays, and/or facility closures. Hazard markings must restrict access and make specific hazards obvious to aircraft, personnel, and vehicles. Barricades, traffic cones (weighted or sturdily attached to the surface), or flashers are acceptable methods used to identify and define the limits of construction and hazardous areas on airports.

Provide temporary hazard marking to prevent aircraft from taxiing onto a closed runway for takeoff and to identify open manholes, small areas under repair, stockpiled material, and waste areas. Also consider less obvious construction-related hazards, including markings to identify FAA, airport, and National Weather Service facilities cables and power lines; instrument landing system (ILS) critical areas; and other sensitive areas.

a. Nonmovement areas.

Indicate construction locations on nonmovement areas in which no part of an aircraft may enter by the using barricades that are marked with diagonal, alternating orange and white stripes. Supplement these barricades with alternating orange and white flags at least 20 by 20 inches (50 by 50cm) square and made and installed so they are always in an extended position, properly oriented, and securely fastened to eliminate jet engine ingestion. Such barricades may be many different shapes and made from various materials, including railroad ties, sawhorse, jersey barriers, or barrels. During reduced visibility or night hours, supplement the barricades with yellow or red lights, either flashing or steady burning. If an aircraft would normally have access to these areas use red lights. The intensity of the lights and spacing for barricade flags and lights must adequately and without ambiguity delineate the hazardous area.

The construction specification must include a provision requiring the contractor to have a person on call 24 hours a day for emergency maintenance of airport hazard

lighting and barricades. The contractor must file this information with the airport.

b. Movement areas.

Use alternating orange and white flaglines, traffic cones, omnidirectional red flashers, and/or signs to separate all construction/maintenance areas from the movement area. All barricades, temporary markers, flagline supports, and other objects placed and left in safety areas associated with any open runway, taxiway, or taxilane must be as low as possible to the ground; of low mass; easily collapsible upon contact with an aircraft or any of its components; weighted or sturdily attached to the surface to prevent displacement from prop wash, jet blast, wing vortex, or other surface wind currents; and, if affixed to the surface, frangible at grade level or as low as possible, but not to exceed 3 inches (7.6cm) above the ground. Do not use nonfrangible hazard markings, such as railroad ties, jersey barricades, and/or metal-drum-type barricades in aircraft movement areas.

Barricade taxiways leading to closed runways with highly reflective barriers with flashing or solid red lights. Evaluate all operating factors when dealing with temporary closures that can last from 10 to 15 minutes to a much longer period of time. However, we strongly recommend that, even for closures of relatively short duration, major taxiway/runway intersections be marked. Mark the with barricades with a flashing red light spaced at 20 feet (6m) intervals. At a minimum, use a single barricade placed on the taxiway centerline.

3-10. CONSTRUCTION NEAR NAVIGATIONAL AIDS (NAVAIDS).

Construction, activities, materials/equipment storage, and vehicle parking near electronic NAVAIDS require special consideration since they may interfere with signals essential to air navigation. Evaluate the effect of construction activity and the required distance and direction from the NAVAID for each construction project. Pay particular attention to stockpiling material, as well as to movement and parking of equipment that may interfere with line-of-sight from the ATCT or electronic emissions. Interference from construction may require NAVAID shutdown or adjustment of instrument approach minimums for IFR. This condition requires that a NOTAM be filed. Construction activities and materials/equipment storage near NAVAIDS may also obstruct access to the equipment and instruments for maintenance. Before commencing construction activity, parking vehicles, or storing construction equipment and materials near NAVAIDS, consult with the nearest FAA Airways Facilities Office.

3-11. CONSTRUCTION SITE ACCESS AND HAUL ROADS.

Determine the construction contractor's access to the construction sites and use of haul roads. Do not permit the construction contractor to use any access or haul roads other than those approved.. Construction contractors must submit specific proposed routes associated with construction activities to the airport operator for evaluation and approval before beginning construction activities. These proposed routes must also provide specifications to prevent inadvertent entry to operational runways. Pay special attention to ensure that ARFF right of way on access and haul roads are not impeded at any time and that construction traffic on haul roads does not interfere with NAVAIDS or penetrate part 77 surfaces of operational runways.

3-12. TRENCHES AND EXCAVATIONS.

Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red or yellow lights, depending on accessibility by aircraft, during hours of restricted visibility or darkness.

a. RSAs.

Open trenches or excavations are not permitted within 200 feet (60m) of the runway centerline and at least the existing RSA distance from the runway threshold while the runway is open. If the runway must be opened before excavations are backfilled, cover the excavations appropriately. Coverings for open trenches or excavations must be of sufficient strength to support the weight of the heaviest aircraft operating on the runway (see paragraph 3-2, "Runway Safety Area," for additional guidance.)

b. Taxiways and Aprons.

Excavations and open trenches may be permitted up to the edge of a structural taxiway and apron pavement provided the dropoff is marked and lighted per paragraph 3-10.

3-13. CONSTRUCTION MATERIAL STOCKPILING.

Stockpiled materials and equipment storage is not permitted within the RSA, OFA, or OFZ of an operational runway. The airport operator must ensure that stockpiled materials and equipment adjacent to these areas are prominently marked with red flags and lighted during hours of restricted visibility or darkness. This includes determining and verifying that materials are stored at an approved location to prevent foreign object damage and attraction by wildlife.

3-14. OTHER LIMITATIONS ON CONSTRUCTION.

Contractor may not use open-flame welding or torch unless adequate fire safety precautions are provided and the airport operator has approved their use. Under no circumstances should flare pots be used within the AOA at any time. The use of electrical blasting caps shall not be permitted on or within 1,000 feet (300m) of the airport property, (see AC 150/5370-10A, *Standards for Specifying Construction of Airports.*)

3-15. FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT.

Waste and loose materials, commonly referred to as FOD, are capable of causing damage to aircraft landing gears, propellers, and jet engines. Construction contractors must not leave or place FOD on or near active aircraft movement areas. Materials tracked onto these areas must be continuously removed during the construction project. We also recommend that airport operators and construction contractors carefully control and remove waste or loose materials that might attract wildlife on a continual basis.

Section 4. Safety Hazards and Impacts

3-16. OVERVIEW.

The situations identified below are potentially hazardous conditions and may occur during airport construction. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the three most prevalent threats to airport operational safety during airport construction. Airport operators and contractors should consider the following when performing inspections of construction activity:

a. Excavation adjacent to runways, taxiways, and aprons.

b. Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxilane or in the related object-free and aircraft approach or departure areas/zones.

c. Runway resurfacing projects resulting in lips exceeding 3 inches (7.62cm) from pavement edges and ends.

d. Heavy equipment, stationary or mobile, operating or idle near AOA, in runway approaches and departures areas, or in object-free areas.

e. Equipment or material near NAVAIDS that may degrade or impair radiated signals and/or the monitoring of navigational and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.

f. Tall and especially relatively low-visibility units (i.e., equipment with slim profiles)—cranes, drills, and similar objects— located in critical areas such as OFZs and approach zones.

g. Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway, or open taxilane or in a related safety, approach, or departure areas.

h. Obstacles, loose pavement, trash, and other debris on or near AOA. Construction debris (gravel, sand, mud, paving materials, etc.) on airport pavements, resulting in aircraft prop, turbine engine, or tire damage. Also loose materials that may be subject to being blown about, potentially causing personal injury or equipment damage.

i. Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate construction areas from open aircraft operating areas create aviation hazards.

j. Improper or inadequate marking or lighting of runways (especially thresholds that have been displaced) and taxiways. Inadequate or improper methods of marking, barricading, and lighting temporarily closed portions of airport operating areas create aviation hazards.

k. Wildlife Attractants, such as trash (food scraps not collected from construction personnel activity), grass seeding, or ponded water on or near airports.

l. Obliterated or faded markings on active operational areas.

m. Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.

n. Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction-related airport conditions.

o. Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway/taxiway lighting; loss of navigational, visual, or approach aids; disruption of weather reporting services; and/or loss of communications.

p. Restrictions on ARFF access from fire stations to the runway-taxiway system or airport buildings.

q. Lack of radio communications with construction vehicles in airport movement areas.

r. Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircraft operations.

s. Water, snow, dirt, debris, or other contaminants, which temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that obscures or diminishes the visibility of areas under construction.

t. Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, ramps, and airport roadways.

u. Failure to maintain drainage system integrity during construction (e.g. no temporary drainage provided when working on a drainage system).

v. Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/workers, construction contractors should make provisions for coordinating work on circuits.

w. Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.

x. Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring and place it in conduit or bury it.

y. Site burning, which can cause possible obscuration.

APPENDIX 1. RELATED READING MATERIAL

- 1.** Obtain the latest version of the following free publications from the U.S. Department of Transportation, Subsequent Distribution Office, SVC-121.23, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD, 20785. The most recent edition of AC 00-2, *Advisory Circular Checklist*, lists all current issues and changes. In addition, the FAA makes many of these ACs available on its Web Site at <http://www.faa.gov/ARP/>.
 - a.** AC 150/5200-28, *Notices to Airman (NOTAMS) for Airport Operators*. Provides guidance for the use of the NOTAM System in airport reporting.
 - b.** AC 150/5200-30, *Airport Winter Safety and Operations*. Provides guidance to airport owners/operators on the development of an acceptable airport snow and ice control program and on appropriate field condition reporting procedures.
 - c.** AC 150/5200-33, *Hazardous Wildlife Attractants on or Near Airports*. Provides guidance on locating certain land uses having the potential to attract hazardous wildlife to near public-use airports.
 - d.** AC 150/5210-5, *Painting, Marking, and Lighting of Vehicles Used on an Airport*. Provides guidance, specifications, and standards, for painting, marking, and lighting vehicles operating in the airport air operations areas.
 - e.** AC 150/5220-4, *Water Supply Systems for Aircraft Fire and Rescue Protection*. Provides guidance for the selection of a water source and standards for the design of a distribution system to support aircraft rescue and fire fighting service operations on airports.
 - f.** AC150/5340-1, *Standards for Airport Markings*. Contains FAA standards for markings used on airport runways, taxiways, and aprons.
 - g.** AC 150/5340-18, *Standard for Airport Sign Systems*. Contains FAA standards for the siting and installation of signs on airport runways and taxiways.
 - h.** AC 150/5345-28, *Precision Approach Path Indicator (PAPI) Systems*. Contains the FAA standards for PAPI systems, which provide pilots with visual glide slope guidance during approach for landing.
 - i.** AC 150/5380-5, *Debris Hazards at Civil Airports*. Discusses problems at airports, gives information on foreign objects and explains how to eliminate such objects from operational areas.
 - j.** AC 70/7060-2, *Proposed Construction or Alteration of Objects That May Affect the Navigable Airspace*. Provides information to persons proposing to erect or alter an object that may affect navigable airspace and explains the need to notify the FAA before construction begins and the FAA's response to those notices as required by 14 CFR part 77.
- 2.** Obtain copies of the following publications from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Send check or money order with your request made payable to the Superintendent of Documents in the amount stated. The Government Printing Office does not accept C.O.D. orders. In addition, the FAA makes these ACs available on our Web Site at <http://www.faa.gov/ARP/>.
 - a.** AC 150/5300-13, *Airport Design*. Contains FAA standards and recommendations for airport design, establishes approach visibility minimums as an airport design parameter, and contains the object-free area and the obstacle free zone criteria. (\$26. Supt. Docs.) SN050-007-01208-0.
 - b.** AC 150/5370-10, *Standards for Specifying Construction of Airports*. Provides standards for construction of airports. Items covered include earthwork, drainage, paving, turfing, lighting, and incidental construction. (\$18. Supt. Docs) SN050-007-0821-0.

APPENDIX 2. DEFINITIONS OF TERMS USED IN THE AC

1. AIRPORT OPERATIONS AREA (AOA). Any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operations area includes such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runways, taxiways, or aprons.

2. CERTIFICATED AIRPORT. An airport that has been issued an Airport Operating Certificate by the FAA under the authority of 14 CFR part 139, Certification and Operation: Land Airports Serving Certain Air Carriers.

3. FAA FORM 7460-1, NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION. The form submitted to the FAA Regional Air Traffic Division as formal written notification of any kind of construction or alteration of objects that affect navigable airspace, as defined in 14 CFR part 77, Objects Affecting Navigable Airspace (see AC 70/7460-2, *Proposed Construction or Alteration of Objects That May Affect the Navigable Airspace*).

4. FAA FORM 7480-1, NOTICE OF LANDING AREA PROPOSAL. Form submitted to the FAA Airports Regional Office or Airports District Office as formal written notification whenever a project without an airport layout plan on file with the FAA involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; and the deactivation or abandoning of an entire airport.

5. MOVEMENT AREA. The runways, taxiways, and other areas of an airport that are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and aircraft parking areas (reference 14 CFR part 139).

6. OBSTRUCTION. A structure, natural growth, vehicle, or construction material that penetrates any airport imaginary surface defined by 14 CFR part 77, including primary, transitional, approach, horizontal, and conical surfaces.

7. OBJECT-FREE AREA (OFA). An area on the ground centered on the runway, taxiway, or taxilane

centerline provided to enhance safety of aircraft operations by having the area free of objects except for those objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes (see AC 150/5300-13, *Airport Design*, for additional guidance on OFA standards and wingtip clearance criteria).

8. OBSTACLE-FREE ZONE (OFZ). A design standard involving imaginary surfaces near a runway. Included are the runway OFZ, inner-transitional surface OFZ, and inner-approach OFZ. The OFZ is a three-dimensional volume of airspace that supports the transition of ground to airborne aircraft operations (and vice versa). The OFZ clearing standard precludes penetrations by taxiing and parked airplanes and other objects, except for frangible visual navigational aids (NAVAIDS) that need to be located in the OFZ because of their function (refer to AC 150/5300-13 for guidance on OFZs).

9. RUNWAY SAFETY AREA (RSA). A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway, in accordance with AC 150/5300-13.

10. TAXIWAY SAFETY AREA. A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway, in accordance with AC 150/5300-13.

11. THRESHOLD. The beginning of that portion of the runway available for landing. In some instances, the landing threshold may be displaced.

12. DISPLACED THRESHOLD. The portion of pavement behind a displaced threshold that may be available for takeoffs in either direction or landing from the opposite direction.

13. VISUAL GLIDE SLOPE INDICATOR (VGI). This device provides a visual glide slope indicator to landing pilots. These systems include precision approach path indicator (PAPI) and visual Approach slope indicator (VASI).

APPENDIX 3. AIRPORT CONSTRUCTION SAFETY PLANNING GUIDE

Aviation Safety Requirements During Construction

PURPOSE. This appendix provides airport operators with boilerplate format and language for developing a safety plan for an airport construction project. Adapt this appendix, as applicable, to specific conditions found on the airport for which the plan is being developed. Plans should contain the following:

1. GENERAL SAFETY REQUIREMENTS.

Throughout the construction project, the following safety and operational practices should be observed:

- Operational safety should be a standing agenda item during progress meetings throughout the construction project.
- The contractor and airport operator shall perform onsite inspections throughout the project, with immediate remedy of any deficiencies, whether caused by negligence, oversight, or project scope change.
- Airport runways and taxiways remain in use by aircraft to the maximum extent possible.
- Aircraft use of areas near the contractor's work will be controlled to minimize disturbance to the contractor's operation.
- Contractor, sub-contractor, and supplier employees or any other unauthorized persons must be restricted from entering or remaining in an airport area that would be hazardous.
- Construction that is within the safety area of an active runway, taxiway, or apron that is performed under normal operational conditions must be performed when the runway, taxiway, or apron is closed or use restricted and initiated only with prior permission from the airport operator.
- The contracting officer, airport operator, or other designated airport representative may order the contractor to suspend operations; move personnel, equipment, and materials to a safe location; and stand by until aircraft use is completed.

2. CONSTRUCTION MAINTENANCE AND FACILITIES MAINTENANCE.

Before beginning any construction activity, the contractor must, through the airport operator, give notice (using the Notice to Airmen (NOTAM) System) of proposed location, time, and date of commencement of

construction. Upon completion of work and return of all such areas to standard conditions, the contractor must, through the airport operator, verify the cancellation of all notices issued via the NOTAM System. Throughout the duration of the construction project, the contractor must—

- a. Be aware of and understand the safety problems and hazards described in AC 150/5370-2, *Operational Safety on Airports During Construction*.
- b. Conduct activities so as not to violate any safety standards contained in AC 150/5370-2 or any of the references therein.
- c. Inspect all construction and storage areas as often as necessary to be aware of conditions.
- d. Promptly take all actions necessary to prevent or remedy any unsafe or potentially unsafe conditions as soon as they are discovered.

3. APPROACH CLEARANCE TO RUNWAYS.

Runway thresholds must provide an unobstructed approach surface ratio over equipment and materials. (Refer to Appendix 2 in AC 150/5300-13, *Airport Design*, for guidance in this area.)

4. RUNWAY AND TAXIWAY SAFETY AREA (RSA and TSA).

A runway must be closed/partially closed if construction activity will occur within the RSA (see AC 150/5370-2 for exceptions). Construction activity within the TSA/obstacle-free zone is permissible when the taxiway is open to aircraft traffic if adequate wingtip clearance exists between the aircraft and equipment/material; evacuations, trenches, or other conditions are conspicuously marked and lighted; and local NOTAMs are in effect for the activity (see AC 150/5300-13 for wingtip clearance requirements.) The NOTAM should state that, "personnel and equipment are working adjacent to Taxiway_____."

a. Procedures for protecting runway edges.

- Limit construction to no closer than 200 feet (60M) from the runway centerline, unless the runway is closed or restricted to aircraft operations requiring a lesser standard RSA that is equal to the RSA available during construction.

- Prevent personnel, material, and/or equipment, as defined in AC 150/5300-13, Paragraph-306, from penetrating the OFZ.
- Coordinate construction activity with the Airport Traffic Control Tower (ATCT),

FAA Regional Airports Office or Airports District Office and through the airport operator issue an appropriate NOTAM.

Complete the following chart to determine the area that must be protected along the runway edges:

RUNWAY	Aircraft Approach Category *	Airplane Design Group*	RSA WIDTH IN FEET Divided by 2*
	A, B, C, or D	I, II, III, or IV	
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

*See AC 150/5300-13, *Airport Design*, to complete the chart for specific runway.

b. Runway Ends.

- Maintain the RSA from the runway threshold to a point at least the distance from the runway threshold as existed before construction activity, unless the runway is closed or restricted to aircraft operations requiring a RSA that is equal to the RSA width available during construction in accordance with AC 150/5300-13. This may involve the use of declared distances and partial runway closures (see AC 150/5370-2 for exceptions).
- Ensure all personnel, materials, and/or equipment are clear of the applicable threshold siting criteria surface as defined in Appendix, "Threshold Siting Requirements," of AC 150/5370-2.
- Prevent personnel, material, and/or equipment, as defined in AC 150/5300-13, from penetrating the OFZ.
- Ensure adequate distance for blast protection is provided, as needed.
- Coordinate construction activity with the ATCT, FAA Regional Division Office, or Airport District Office, and, through the airport operator, issue an appropriate NOTAM.
- Provide a drawing showing the profile of the appropriate surfaces of each runway end where construction will take place. Where operations by turbojet aircraft are anticipated, review takeoff procedures and jet blast characteristics of aircraft, and incorporate safety measures for construction workers in the contract documents.

Complete the following chart to determine the area that must be protected prior to the runway threshold:

RUNWAY END NUMBER	Airplane Design Group* I, II, III, or IV	Aircraft Approach Category * A, B, C, or D	MINIMUM SAFETY AREA BEHIND THRESHOLD*	MINIMUM UNOBSTRUCTED APPROACH SLOPE
_____	_____	_____	_____ : FEET	_____ : 1 to (threshold)
_____	_____	_____	_____ : FEET	_____ : 1 to (threshold)
_____	_____	_____	_____ : FEET	_____ : 1 to (threshold)
_____	_____	_____	_____ : FEET	_____ : 1 to (threshold)

*See AC 150/5300-13, *Airport Design*, to complete the chart for specific runway.

5. MARKING AND LIGHTING FOR TEMPORARY THRESHOLDS.

Marking and lighting for a temporary threshold is ___/is not ___ required. The airport owner or contractor, as specified in the contract will furnish and maintain markings for temporary thresholds. Precision approach path indicator (PAPI) or runway end identification lights (REIL) are ___/are not ___ required. The airport owner or contractor, as specified in the contract will furnish and install all temporary lighting. Include appropriate items per Chapter 3 of this AC. If marking and lighting for the temporary threshold is not required, delete this section of the safety plan. If visual aids and/or markings are necessary, provide details. (Include applicable 14 CFR part 77 surfaces in the contract documents.)

6. CLOSED RUNWAY MARKINGS AND LIGHTING.

The following must be specified for closed runways. Closed runway marking are ___/are not ___ required. Closed runway markings will be as shown on the plans ___/ as furnished by the airport owner ___/other ___ (specify). Barricades, flagging, and flashers are ___/are not ___ required at Taxiway ___ and Runway ___ and will be supplied by the airport ___/other ___ (specify).

7. HAZARDOUS AREA MARKING AND LIGHTING.

Hazardous areas on the movement area will be marked with barricades, traffic cones, flags, or flashers (specify). These markings restrict access and make hazards obvious to aircraft, personnel, and vehicles. During periods of low visibility and at night, identify hazardous areas with red or yellow omnidirectional flashing lights (specify). The hazardous area marking and lighting will be supplied by

the airport operator/contractor, as specified in the contract and will be depicted on the plans.

8. TEMPORARY LIGHTING AND MARKING.

Airport markings, lighting, and/or signs will be altered in the following manner (specify) during the period from ___ to ___. The alterations are depicted on the plans.

9. VEHICLE OPERATION MARKING AND CONTROL.

Include the following provisions in the construction contract, and address them in the safety plans:

a. When any vehicle, other than one that has prior approval from the airport operator, must travel over any portion of an aircraft movement area, it shall be escorted and properly identified. To operate in those areas during daylight hours, the vehicle must have a flag or beacon attached to it. Any vehicle operating on the movement areas during hours of darkness or reduced visibility should be equipped with a flashing dome type light, the color of which is in accordance with local or state codes.

b. It may be desirable to clearly identify the vehicles for control purposes by either assigned initials or numbers that are prominently displayed on each side of the vehicle. The identification symbols should be at minimum 8-inch (20cm), block-type characters of a contrasting color, and easy to read. They may be applied either by using tape or a water-soluble paint to facilitate removal. Magnetic signs are also acceptable. In addition, all vehicles must display identification media as specified in the approved security plan. (This section should be revised to conform to the airport operator's requirements.)

c. Employee parking shall be _____ (specify)

location), as designated by: airport manager _____/project engineer _____ other _____ (specify).

d. Access to the job site shall be via _____ (specify route) as shown on the plans _____/designated by the engineer _____/ designated by the superintendent _____/designated by the airport manager _____/other _____ (specify).

e. At 14 CFR part 139 certificated airports, all vehicle operators having access to the movement area shall be familiar with airport procedures for the operation of ground vehicles and the consequences of non-compliance.

f. If the airport is certificated and/or has a security plan, the airport operator should check for guidance on the additional identification and control of construction equipment.

10. NAVIGATIONAL AIDS.

The contractor must not conduct any construction activity within navigational aids' restricted areas without prior approval from the local FAA Airway Facilities sector representative. Navigational aids include instrument landing system components and very high-frequency omnidirectional range, airport surveillance radar. Such restricted areas are depicted on construction plans.

11. LIMITATIONS ON CONSTRUCTION.

Additional limitations on construction shall include—

a. Prohibit open-flame welding or torch cutting operations unless adequate fire safety precautions are provided and these operations have been authorized by the engineer (as tailored to conform to local requirements and restrictions).

b. Prominently mark open trenches, excavations, and stockpiled materials at the construction site with alternating orange and white flags and light these obstacles during hours of restricted visibility and darkness.

c. Marking and lighting of closed, deceptive, and hazardous areas on airports, as appropriate.

d. Constrain stockpiled material to prevent its movement as a result of the maximum anticipated aircraft blast and forecast wind conditions.

12. RADIO COMMUNICATIONS.

Vehicular traffic located in or crossing an active movement area must have a working two-way radio in contact with the control tower or be escorted by a flag person (in radio contact with the tower). The driver, through personal observation, should confirm that no aircraft is approaching the vehicle position. Construction personnel may operate in a movement area without two-way radio communication provided a NOTAM is issued closing the area and that the area is properly marked to prevent incursions. Two-way radio communications are _____/are not _____ required between contractors and the Airport Traffic Control Tower _____/FAA Flight Service Station _____/Airport Aeronautical Advisory Stations (UNICOM/CTAF) _____. Radio contact is _____/is not _____ required between the hours of _____ and _____. Continuous monitoring is required _____/or is required only when equipment movement is necessary in certain areas. (This section may be tailored to suit the specific vehicle and safety requirements of the airport sponsor.)

13. DEBRIS.

Waste and loose material must not be placed in active movement areas. Materials tracked onto these areas must be removed continuously during the work project.

APPENDIX 4. SAMPLE NOTAM

_____ AIRPORT

FAA NOTAM # _____ **DATE:** _____

AIRPORT I.D. # _____ **TIME:** _____

NOTAM TEXT:

NOTIFICATON:

#### TOWER	_____	_____	_____	_____
	PHONE #	INITIALS	TIME	CALLED IN BY

#### AFSS	_____	_____	_____	_____
	PHONE #	INITIALS	TIME	CALLED IN BY

AIRLINES

CANCELLED:

NOTIFICATON:

#### TOWER	_____	_____	_____	_____
	PHONE #	INITIALS	TIME	CALLED IN BY

#### AFSS	_____	_____	_____	_____
	PHONE #	INITIALS	TIME	CALLED IN BY

AIRLINES
