TECHNICAL MANUAL

WORK PACKAGE

OPERATION AND MAINTENANCE INSTRUCTIONS

AIRCRAFT FIRE TRAINING FACILITY

BASIC AND ALL CHANGES HAVE BEEN MERGED TO MAKE THIS A COMPLETE PUBLICATION.

Published Under Authority of the Secretary of the Air Force

25 JUNE 2013 **CHANGE 2 - 6 FEBRUARY 2015**

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGED PAGES. DESTROY SUPERSEDED PAGES.

NOTE The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by shaded or screened areas, or by miniature pointing hands.

Dates of issue for original and changed pages are:

Original. . . . . .0. . . . . .25 June 2013 Change . . . . . .2. . . . .6 February 2015

Change . . . . . .1. . . . . .9 August 2014

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 256, CONSISTING OF THE FOLLOWING:

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NUMERICAL INDEX OF EFFECTIVE WORK PACKAGES

NOTE

Only those work packages and subordinate work packages assigned to this manual are listed in this index, therefore WP/SWP numbers may not be sequential. Insert Change No. 2, work packages and subordinate work packages, dated 6 February 2015. Dispose of superseded work packages and subordinate work packages. If change pages are issued to a work package or subordinate work package, insert the changed pages in the applicable work package or subordinate work package. The portion of the text affected in a change or revised WP or SWP is indicated by change bars in the outer margin of each column of text. Changes to illustrations and diagrams are indicated by pointing hands or shaded areas.

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010 01	0		Thule AB Greenland Winterization Procedures
011 00	1		AFTF Certification Performance Test

SAFETY SUMMARY

1 GENERAL SAFETY INSTRUCTIONS.

This manual describes physical and/or chemical processes which may cause injury or death to personnel, or damage to equipment, if not properly followed. This safety summary includes general safety precautions and instructions that must be understood and applied during operation and maintenance to ensure personnel safety and protection of equipment. Prior to performing any specific task, the WARNINGs, CAUTIONs, and NOTEs included in that task shall be reviewed and understood.

2 WARNINGS, CAUTIONS, AND NOTES.

WARNINGs and CAUTIONs are used in this manual to highlight operating or maintenance procedures, practices, conditions, or statements which are considered essential to protection of personnel (WARNING) or equipment (CAUTION). WARNINGs and CAUTIONs immediately precede the step or procedure to which they apply. WARNINGs and CAUTIONs consist of four parts: heading (WARNING, CAUTION, or icon), a statement of the hazard, minimum precautions, and possible results if disregarded. NOTEs are used in this manual to highlight operating or maintenance procedures, practices, conditions, or statements which are not essential to protection of personnel or equipment. NOTEs may precede or follow the step or procedure, depending upon the information to be highlighted. The headings used and their definitions are as follows:

WARNING

Highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which if not strictly observed, could result in injury to, or death of, personnel or long term health hazards.

CAUTION

Highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which if not strictly observed, could result in damage to, or destruction of, equipment or loss of mission effectiveness.

NOTE

Highlights an essential operating or maintenance procedure, condition, or statement.

3 REGULATIONS.

These systems were developed in accordance with NFPA 1402-1992 and have been revalidated under NFPA 1402-1997 as meeting all requirements for outside activities. This system has been revalidated by the Air Force based on the requirements of NFPA 1402-2002, and NFPA 1402-2007. All NFPA 1402-2007 Chapter 13 Outside Activities recommendations related to system and controls certification and labeling by nationally recognized testing laboratories has been accomplished by the Air Force internal operational test and evaluation process (OT&E) conducted under the auspices of the independent Air Force Operational Test and Evaluation Center (AFOTEC). Compliance with this Technical Order is required to retain the certification identified in NFPA 1402.

3.1 Systems. Systems approved by AFCEC as complying with the requirements of this Technical Order are in compliance with NFPA 1403-2007 Live Fire Training Evolutions, Chapter 7 Exterior Props and Chapter 8 Exterior Class-B Fires. All NFPA 1403 elements related to system and controls certification by nationally recognized testing laboratories has been accomplished by the Air Force internal operational test and evaluation process (OT& E) conducted under the auspices of the independent Air Force Operational Test and Evaluation Center (AFOTEC). Compliance with this technical order is required to conduct live fire training evolutions in accordance with NFPA 1403.

3.2 Certification. All fire department personnel who inspect and operate the AFTF are required to be certified. To become certified, personnel are required to study the multimedia course material, entitled AFTF Inspection, Operation and Maintenance and pass the 50-question final exam with a minimum score of 80%. The test is called Liquid Propane Aircraft Fire Training Facility and is located in the most current version of CerTest. Upon completion of the academic portion personnel are required to pass the Performance Test and submit the Performance Test Record (see WP 011 00), the CerTest results and a cover letter signed by the Fire Chief requesting the training certificate.

4 PROTECTIVE CLOTHING.

Wear Personal Protective Equipment (PPE); such as bunker gear, helmet, gloves, boots, Self Contained Breathing Apparatus (SCBA), etc. approved for use in actual firefighting incidents and the training exercises mentioned in this manual.

5 ELECTRICAL CIRCUITS.

Operating personnel must think safety at all times. Do not replace components or make adjustments inside of equipment with the electrical power supply turned on. To avoid injuries, always remove power from, discharge and ground a circuit before touching it. If a test connection to energized equipment is required, make the test connection ground connection before probing the voltage or signal to be tested. Do not attempt internal service or adjustment of equipment unless another person capable of rendering aid and resuscitation is present.

6 LIVE FIREFIGHTER TRAINING.

NOTE

The information in Paragraph 6 through Paragraph 6.5 is taken from USFA-TR-100 May 2003 Trends and Hazards in Firefighter Training - Special Report which is available on-line at: http://www.usfa.fema.gov/downloads/txt/publications/tr-100.txt

The need for safe firefighter training must be balanced with sufficient challenge to prepare firefighters for the unpredictable nature of the fire ground. Training must not be so controlled as to give firefighters a false sense of security, nor can it disregard established safety procedures for the sake of increased realism. To maintain an effective cadre of firefighters and officers, the fire service must find new and dynamic ways to train personnel to act in a safe, decisive manner that best supports the fire service's mission to protect lives, property, and the environment.

NOTE

This system is a live fire trainer intended to expose the firefighter/trainee to the same thermal and direct fire exposure experience in an actual uncontrolled fire emergency. The system is not a fire simulator; there is nothing simulated about the fires in the system. The potential for the training system fires to cause thermal injury is no less than that in an actual uncontrolled fire emergency.

6.1 Safety. Although generally considered an essential part of firefighter training, practical evolutions utilizing live fire or smoke pose a significant risk to both trainees and instructors. The potential for injury is very real during this type of training and prudent instructors take numerous precautions to ensure the safety of the participants.

6.2 Life-Threatening Fire Conditions. Modern protective clothing may make life-threatening fire conditions less obvious; fire fighters and instructors must be constantly alert to recognize the visual and physical clues to impending danger.

6.3 Firefighter Activities. Firefighting is, without question, a highly physical and demanding activity. The intensity and prolonged duration of firefighter training evolutions place substantial physical stress on trainees and instructors. Injuries that commonly occur during training evolutions involve knees, lower back, strains, and sprains. The best means for preventing these potential injuries is by promoting physical fitness and proper lifting techniques. Although it is impossible to completely prevent these types of injuries, increased fitness and conditioning helps to reduce the incidence of injury and enable firefighters to cope with the intense physical demands of practical training and tactical operations. Simple techniques, such as warm-up exercises to prevent muscle injuries, although not routinely employed, should be done prior to any training.

NOTE

During training, firefighters physical stress level should be monitored continuously to reduce training- related heart attacks, strokes and heat stress emergencies.

6.4 Safety Discipline. The discipline and supervision applied during training can rarely be matched in actual firefighting operations. In many ways, training can and should constitute one of the safest aspects of a firefighter's job. However, training is sometimes compromised by complacency or by the diminished sense of danger suggested in a controlled training environment.

6.5 Building Construction and Detection/Suppression Systems. The decrease in the incidence of fires, coupled with improvements in building construction and detection/suppression systems, has led to a shortage of instructors with extensive experience under actual fire conditions. As experienced instructors retire, especially those in career fire departments serving urban areas, they are being replaced with younger, less seasoned instructors. New instructors are often well educated and have usually achieved instructor certifications through organizations that meet or exceed NFPA standards for teaching and training. However, many of these instructors do not have the same level of fireground experience as more seasoned fire instructors. While well-trained and competent leaders, they may not have the fire combat experience of many of their predecessors that can help them to

quickly recognize dangerously changing fire conditions. Limited experience makes it even more imperative that firefighting instruction adheres strictly to established policies and standards.

NOTE

Fire service instructors should ensure that training standards and procedures be followed closely, especially when challenging tasks are assigned to recruits. To prevent injuries, instructors must know their material well, maintain a high ratio of instructors to students and be vigilant about ensuring strict adherence to safety procedures. Instructors should familiarize themselves with the backgrounds and experience of their students, and care should be taken to avoid situations for which the students are not yet prepared.

6.6 Attitude and Training. Attitude and the Training Academy Way. One of the cornerstones of fire service training is to impart the correct attitude towards firefighting from instructor to student. Failure to pass on the appropriate attitudes and force unit discipline in fire training can have a lasting effect on students. One problem consistently voiced by experienced fire service personnel is the attitude that there is a training academy way of doing things, and the real way of doing things (outside of training). The training academy way should be synonymous with the right way.

7 STRUCTURAL FAILURE REPORTING.

Any structural failure, collapse, damage, or significant deformation in the physical shape of the trainer mock-up, control/safety tower, or propane storage facility shall be reported within 24 hours of occurrence to AFCEC/COS/CXF, 139 Barnes Drive, Tyndall AFB, FL, 32403-5319 or the AFCEC Reach Back Center. General warping of decks and panels which do not result in the deformation or shifting of the trainer's general shape are considered normal in the course of use of the trainer.

8 COMPONENT FAILURE REPORTING.

Any component failure or malfunction which occurs in other than a safe mode shall be reported within 24 hours of occurrence to AFCEC/COS/CXF, 139 Barnes Drive, Tyndall AFB, FL, 32403-5319 or the AFCEC Reach Back Center at www.afcec.af.mil. All the components are designed to fail or not function in a safe mode - off, shut-down or not operate - any other failure condition must be reported.

9 CASUALTY REPORTING.

Any injury or death occurring during or following a training exercise using the an Air Force Fire Training Facility shall be reported within 6 hours using the Fire Incident Notification reporting process in AFI 32-2001. Copies of the final incident report shall be provided to AFCEC/COS/CXF, 139 Barnes Drive, Tyndall AFB, FL, 32403-5319 or the AFCEC Reach Back Center. As with any live training event, there is a potential for personnel injury. The following procedure shall be applied to all fire trainer systems regardless whether the system is COTS, Air Force Standard Design or unique design any time a firefighter suffers a reportable injury.

- The fire events in use at the time of the injury shall be locked and tagged out. Other events may continue in use with the approval of the installation Fire Chief. Locked/tagged out fire events shall not be used until approved by AFCEC.

- All personal protective clothing and equipment used by the injured party shall be collected and secured for evaluation. Items shall remain secured by the installation Fire Chief until both MAJCOM and AFCEC have determined there is no further need for the items.

- The fire hose and nozzle being used in the training event shall be collected and secured. Items shall remain secured by the installation Fire Chief until both MAJCOM and AFCEC have determined there is no further need for the items.

WORK PACKAGE

ALPHABETICAL INDEX

OPERATION AND MAINTENANCE INSTRUCTIONS

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE WP PAGES

Total Number of Pages in this WP is 2 consisting of the following:

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ALPHABETICAL INDEX OF EFFECTIVE WORK PACKAGES

NOTE

Only those work packages and subordinate work packages assigned to this manual are listed in this index.

WORK PACKAGE

FOREWORD

OPERATION AND MAINTENANCE INSTRUCTION

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE WP PAGES

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FOREWORD

1 ABBREVIATIONS.

All abbreviations used in this manual are in accordance with ASME Y14.38, Abbreviations and Acronyms for Use on Drawings and Related Documents.

AF	Air Force
AFCEC	Air Force Civil Engineer Center (FOA)
AFOSH	Air Force Occupational Safety and Health
AFTF	Aircraft Fire Training Facility
AFTO	Air Force Technical Order
AP	Attaching Parts
APU	Auxiliary Power Unit
AR	As Required
ARFF	Aircraft Rescue Firefighting (vehicle)
ASME	American Society of Mechanical Engineers
ASSY	Assembly
BTU	British Thermal Unit
CAGE	Commercial and Government Entity
CFE	Contractor Furnished Equipment
COTS	Commercial-Off-the-Site
DoD	Department of Defense
GFE	Government Furnished Equipment
HDPE	High Density Polyethylene
I&S	Interchangeability and Substitution
IPB	Illustrated Parts Breakdown
Kvac	Kilovolts Alternating Current
LPG	Liquid Propane Gas
MPL	Maintenance Parts List
N_2	Nitrogen
NFPA	National Fire Protection Association
NHA	Next Higher Assembly
NI	Numerical Index
NPGA	National Propane Gas Association
OS&Y (valve)	Outside Screw and Yoke
PPE	Personal Protective Equipment
PN	Part Number
Psi	Pound Per Square Inch
RDI	Reference Designator Index
REF	Reference
SCBA	Self Contained Breathing Apparatus
SMR	Source, Maintenance, and Recoverability
STANAG	Standardization Agreement (NATO)
SWP	Subordinate Work Package
UOC	Usable on Code
Vac	Volts Alternating Current
WP	Work Package

2 RELATED PUBLICATIONS.

The following publications contain information in support of this technical manual.

List of Related Publications

Number	Title
AFM 91-201	Explosive Safety Standards
ASME Y14.38	Abbreviations and Acronyms for Use on Drawings and Related Documents
DODI 5330.03_AFI 33-395	Document Automation and Production Service (DAPS)
NFPA	Standard on Fire Department Occupational Safety and Health Program
TO 00-5-1-WA-1	Air Force Technical Order System
TO 00-25-195-WA-1	Source, Maintenance, and Recoverability Coding of Air Force Weapons, Systems, and Equipment
TO 00-25-234-WA-1	General Shop Practice Requirements for the Repair, Maintenance, and Test of Electrical Equipment
TO 00-105E-9/STANAG 3896	Aerospace Emergency Rescue and Mishap Response Information (Emergency Services)

3 PURPOSE.

This manual contains a series of Work Packages (WP) and Subordinate Work Packages (SWP) which provide operating instructions and instructions for intermediate and field level maintenance of the Aircraft Fire Training Facility. The intent of this system is to create a safe live fire training environment for fire fighters.

4 SCOPE.

The complete set of work packages covers all approved operations, inspection, and fault isolation.

5 DESIGN, MODEL, AND DATE.

The AFTF design was originally referred to as the Crash Fire Rescue Training Facility (CFRTF). The original Technical Order was published under this title dated 19 November 1996 and changed to the AFTF on 1 June 2002 when this TO went to digital media. The following is the Design Modification Effective Dates:

Design Number	Model Number	Date
CFRTF-3	Original	1991
CFRTF-3	Mod-1	14 June 1995
CFRTF-3	Mod-2	21 September 1995
CFRTF-3	Mod-3	22 December 1995
CFRTF-3	Mod-4	26 July 1996
CFRTF-3	Mod-5	9 August 1996
CFTRF-3-P	N/A	1 October 1997
AFTF-P-4.0	N/A	1 December 2009
AFTF-P-4.1	N/A	2013

6 MANUAL STRUCTURE.

This manual is divided into WPs and SWPs. Each WP is an independent, task-oriented unit. Only essential information is provided. WPs cover the subjects of alphabetical indexes, foreword, theory of operation, operating instructions, troubleshooting, inspection, and repair. A WP is subdivided into SWPs when one division by WP is not sufficient to maintain a logical sequence of data, for clarity, or to isolate specific maintenance level requirements.

7 WP BREAKOUT.

The Alphabetical Index (WP 001 00) provides a complete list of all WPs and SWPs.

8 LOCATING INFORMATION.

The Numerical Index of Effective Work Packages lists, in numerical order, all WPs and SWPs contained in this manual and provides the model application for each WP/SWP. The Alphabetical Index WP lists, in alphabetical order, all WPs and SWPs contained in this manual. Each WP/SWP contains a table of contents which lists all procedures contained in that WP/SWP. Reference to paragraphs, tables, or figures within a WP are made by number, e.g. “paragraph 7, table 2, or figure 3.” A reference to another WP merely includes the WP or SWP number, e.g., “WP 004 00 or SWP 004 01.” To find a particular procedure or topic, it is necessary to refer to that WP or SWP.

9 LEADING PARTICULARS.

Due to the nature and geographic diversity of each site, it would be impractical to list all leading particulars in this manual. Wherever possible, those items with a high probability of site specific installation will be identified by the words, “if applicable”.

10 MAINTENANCE CONCEPT.

Civil Engineering or contractor personnel will maintain this facility. The replacement of valves, piping, etc., and cleaning, painting, lubricating and corrosion control will be accomplished utilizing established Civil Engineering procedures and per the manufacturer’s instruction. WP 007 00 contains excavation procedures for gaining access to and subsequent back fill of underground components. Inspection criteria for specific components will be as per this manual and manufacturer’s instruction.

11 USE OF SHALL, WILL, SHOULD AND MAY.

Use of the word “shall” indicates a mandatory provision that is binding. Use of the words “should” and “may” express non-mandatory provisions. The word “will” is used to express a declaration of purpose. “Will” may also be used to show simple futurity, e.g., “Power for the meter will be provided by the ship”.

12 TIME COMPLIANCE TECHNICAL ORDERS (TCTO).

The following TCTOs are applicable to the Aircraft Fire Training Facility.

List of Time Compliance Technical Orders

None

13 PRINCIPLES OF OPERATION.

13.1 Description. The Air Force Aircraft Fire Training Facility is a generic site adaptable design. The design incorporates a lined burn area and conservation pond for water conservation and recycling, a pneumatic emergency shutdown system, an ignition system, and a liquid propane fuel system. A view of a generic facility is shown in Figure 1. The design provides quality training to maintain firefighting proficiency while meeting all necessary operational and safety standards.

13.2 Configuration. A 100-foot (30-meter) lined burn area with an aircraft mock-up and 10,000 water gallon (38,000 liters) liquid propane fuel tank provide the live fires necessary to simulate multi-aircraft type fires. A typical training scenario includes filling the burn area with water to one inch (2.54 cm) above the aggregate level, supplying propane to the burn area through underground pipes, and igniting the fuel by activating 10,000 volt, 23 milliampere, ignitors located in 15 burners. Various switches and valves located on the control stand are used to control fire(s) during training. The fully lined facility completely protects the environment from ground water contamination.

14 TOLERANCES, CLEARANCES AND WEAR LIMITS.

14.1 Wear Limits. Two kinds of limits are identified, serviceable and repairable. A limit is the condition beyond which deterioration of a part necessitates repair or replacement. The SERVICEABLE LIMITS column defines the maximum departure from manufacturer's established standard that will not materially reduce the usability of the part. If a part is within serviceable limits, no corrective action is required. The REPAIRABLE LIMITS column defines the maximum deterioration of a part from manufacturer's established standard that is repairable. If a part is within repairable limits but exceeds serviceable limits, it must be repaired in accordance with the CORRECTIVE ACTION column. If a part exceeds repairable limits, it is not repairable and must be replaced. If a part is not serviceable and not repairable, it must be replaced.

15 PART IDENTIFICATION.

All training facility parts must be identified at disassembly. Identification may include part number, serial number (when applicable), or physical description.

16 ONE TIME USE ITEMS.

The following listed items shall be considered as consumable and shall be discarded upon disassembly to prevent reuse unless manufacturer authorized rebuild/repair kits and are available: Solenoids, regulators, valves, switches, and ignitors.

17 IMPROVEMENT REPORTS.

Recommendations proposing changes to this manual should be submitted on AFTO Form 22 in accordance with TO 00-5-1 and forwarded to AFCEC/CXF, 139 Barnes Drive Suite 1, Tyndall AFB, Florida 32403-5319.

18 THEORY OF OPERATION - GENERAL.

This updated theory of operation is based on the current, generic US Air Force design. Individual sites' configurations may vary depending on component use and on-site location. The Aircraft Fire Training Facility (AFTF) consists of an aircraft mock-up, burn area, control stand, compressor shelter, and the following integrated systems: liquid propane fuel, Cathodic (anti-corrosion) protection, pneumatic system, electrical system, and water conservation system with a holding pond incorporating submerged and aeration pumps with an associated sprinkler, water jackets, drain and wash down systems. Refer to Figure 1 for specific site configurations. General maintenance procedures are described in WP 007 00. The aircraft mock-up, located in the burn area which has an underground liner to prevent ground pollution, is constructed of uncoated/unpainted carbon steel. It is approximately 72 feet long, 25 feet high at tip of tail, with a wingspan of 72 feet. The mock-up is configured with four simulated aircraft engines, two on the right high wing, one located on the vertical stabilizer, and one forward of the left wing known as the Engine Debris trainer. Each engine contains a burner assembly and two ignitors. The wiring to all mock-up ignitors is enclosed in water jackets to protect them from extreme heat generated by ground burner fires. Water injection is located in both wing engines and at some sites in the tail engine. The wing engines also have dams and plumbing installed to simulate running fuel fires. Wheel well and auxiliary power unit fires are simulated on the high wing side of the fuselage adjacent to the inboard engine. The outboard engine has plumbing installed to simulate a large running fuel fire with ground pool and spill fires below. In the interior of the mock-up, ignitors and burners are installed to simulate cockpit, passenger compartment, and cargo fires. A water sprinkler system is installed along the top of the fuselage to cool and wash down the mock-up. Water is circulated from the burn area to the environmental pond and back to the mock-up through a series of drains and pumps. This circulation system is emptied during the Winterization process to prevent damage during this period. An expansion joint is located midway on the fuselage to allow for expansion and contraction during live fire training. Cutout panels are located on the left and right sides of the fuselage. These replaceable panels are constructed of 0.031 inch sheet metal. The panels are used to simulate emergency entrance into an aircraft. Two steel hinged doors are located at the left side of the fuselage and one hinged steel door is located on the right side of the fuselage. The troop door on the rear left side of the fuselage has been configured as the Pyrolance trainer where concrete blocks and steel plating are mounted in the

door area for penetration training. The re-routing of burner systems from the high tail and left forward ground accommodate the Pyrolance and Engine Debris fire trainers that are now incorporated in the latest design changes. Therefore, the high tail engine is no longer functional. (See Figure 2, Figure 3, Figure 4, and Figure 5.)

18.1 Burn Area. The burn area is 100 feet in diameter. It is recessed and lined with either one or two 80 mil thick high-density polyethylene (HDPE) liner(s). The liner(s) is sandwiched between 6 inch thick layers of sand and covered by an 18 inch thick layer of 2 inch to 5 inch crushed low moisture content stone with no fines. There are six ignitors and burners installed in the burn area to simulate exterior ground fires. The energy output, British Thermal Unit (BTU), of these six burners operated simultaneously is equal to or greater than a 100 ft. diameter JP-type fuel spill fire. The burner positioning is based on actual suitable aircraft fire events (military and civil) where the fire was found to be linear and close to the fuselage, not a circular spill. No documented evidence was found to support a circular spill fire in any survivable aircraft fire event. They are located on the left and right sides of the front fuselage, under the right and left wings, and on the left and right sides of the rear fuselage. A weir is used to maintain the proper water level in the burn area. Opening the burn area drain valve allows all the water in the burn area to drain to the water conservation pond.

18.2 Control Stand. Valves, regulators, solenoids, and switches used to control water, propane and ignitors during training events are located on the control stand. Pushing the emergency shutdown switch IN will deactivate all ignitors, close all coaxial and solenoid valves in propane lines to burners, and close the internal valve located on the propane tank via a pneumatic control system, if applicable. Propane and water piping, and electrical conduits from the control stand to the burn area are located in an underground HDPE lined trench. Regulators in propane lines to mock-up burners are adjusted to increase or decrease flame size and set maximum fire size for each burner. There are no regulators in lines to ground burners. All burners are equipped with pneumatically operated high-speed emergency shut off coaxial valves.

18.3 Liquid Propane System. The liquid propane system supplies fuel for training exercises. Propane is supplied from a 10,000 water gallon or larger tank to the various burners in the burn area through a series of pipes and valves. It is recommended to reservice the tank when 25% of its capacity remains. (Liquid flow from the tank will stop when the tank capacity drops below 10% to 20% because the excess flow valve extends 6 to 10 inches (depending on manufacturer) up inside the tank.) A vapor return line is required to properly/ completely fill the tank to 80% to 85% to avoid pumping against unnecessary vapor pressure in the tank. The tank should be reserviced to a level of 80% to 85% to provide vapor space above the liquid and prevent over-pressurizing the tank. Vapor pressure (Table 1) will vary with ambient temperature. Liquid propane has a boiling point of -44° Fahrenheit. A propane pump may be installed, in parallel to the main supply line, to obtain adequate pressure, if applicable. Safety features of the propane system are provided to stop the flow of fuel to the burners, and include a pneumatic emergency shutdown system, a manual shutdown system, and a seismic sensor shutdown system (if applicable). Pressure relief valves are installed as required by National Fire Protection Association (NFPA) Standard 58. Cathodic protection is used to protect below ground piping from corrosion.

Table 1. Temperature and Pressure Relation

Ambient Temperature	Vapor Pressure Pounds Per Square Inch (PSIG)
100° Fahrenheit	196
70° Fahrenheit	127
0° Fahrenheit	30
-40° Fahrenheit	2

18.3.1 The purpose of the Liquid Propane Gas (LPG) AFTFs is to prepare and train firefighters to experience and extinguish simulated liquid fuel fires and, as an added value, different engine, landing gear, APU and four different internal aircraft fires not available with the older fossil fuel training facilities. It is the responsibility of the Training Officer and the Ignition Officer to make sure the LPG fire reacts to agent application similar to how liquid fuel fire would react under the same circumstances. This requires the manipulation of the fuel valves for the desired effect. Emphasis on the appropriate training methods of these facilities is essential for a successful training session. Trainers must make sure trainees use the appropriate agent application techniques for liquid fuel fires and not LPG fires when these scenarios are specifically selected.

19 WATER CONSERVATION POND.

A typical water conservation pond is a 72 feet x 72 feet square area, 9 feet deep. The pond is lined with either one or two layers of 80 mil thick HDPE. Unlike the burn area, the

pond liner is not covered. A pump located in the pond is used to supply water to the training area. Pump design and location may vary.

20 AFTF MODIFICATION.

WARNING

No modification of any aircraft fire training facility shall be made without prior coordination and approval of the respective MAJCOM fire emergency services offices, AFCEC/COS (Fire Engineering), and AFCEC/CXF (Fire Operations) Division offices.

21 COMERCIAL-OFF-THE-SHELF (COTS) TRAINING SYSTEMS.

This Technical Order does not cover the operations and maintenance of COTS products built by manufacturing firms such as ProSafe, Inc. Kidde Fire Trainers, Kirila Fire Training Facilities, WRG Training Systems, and FireBlast 451. (AAI, IFTE, International Code Services, Symtron Systems, Inc. are now Kidde Fire Trainers products). Such COTS training systems shall be operated and maintained in strict accordance with the manufacturer's operations and maintenance instructions. Modification of a COTS training system shall be coordinated with and approved by the manufacturer. COTS still require approval by AFCEC before being placed in service.

a. The establishment of formal requirements for COTS is based on two reasons: (1) Propane fire training device manufacturers do not have an established means to provide updates to past customers and (2) Propane fire training device maintainers are not required to demonstrate competency in maintaining a specific manufacturer's product.

b. The formal requirements are as follows:

- Obtain documentation from the manufacturer of any safety modifications required or recommended to the specific unit and recommended upgrades or other modifications.
- Documentation must be obtained annually. Units without documentation in the past 18 months shall be shut down until documentation is received.
- Contract maintainers must provide documentation from the manufacturer that they are authorized to service the manufacturer's products.

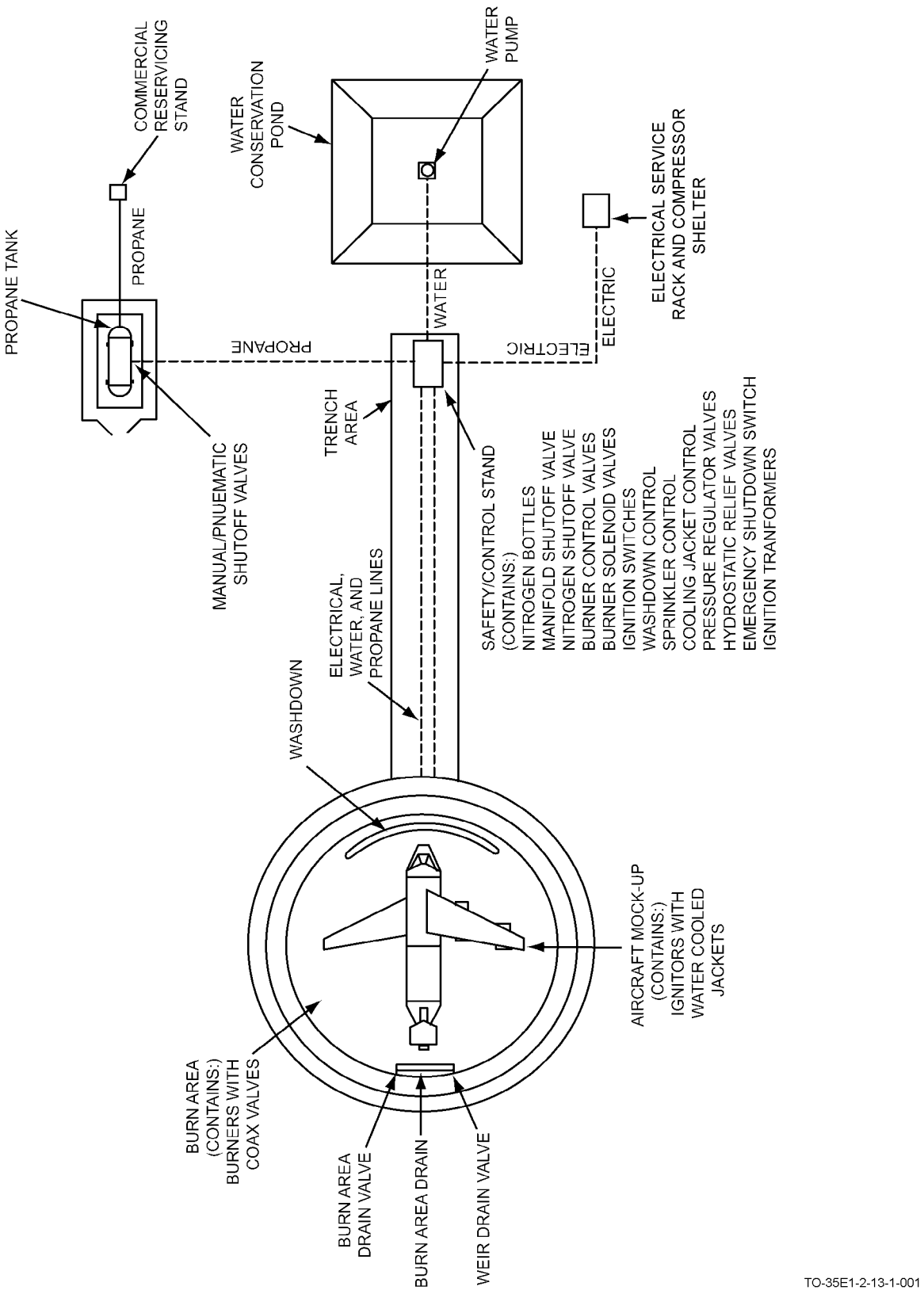
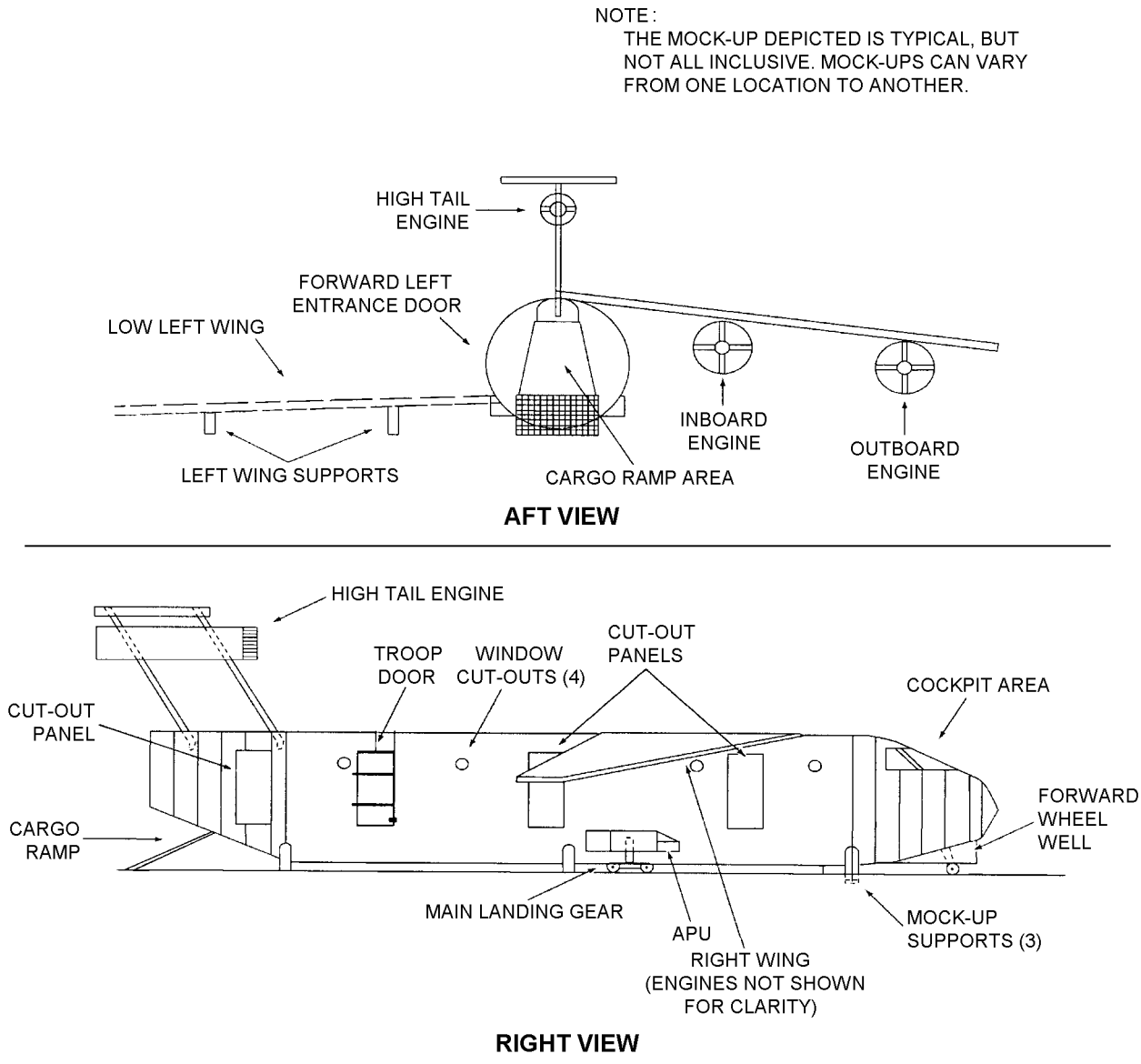


Figure 1. Generic AFTF



TO-35E1-2-13-1-002

Figure 2. Mock-up Right Side and Aft View

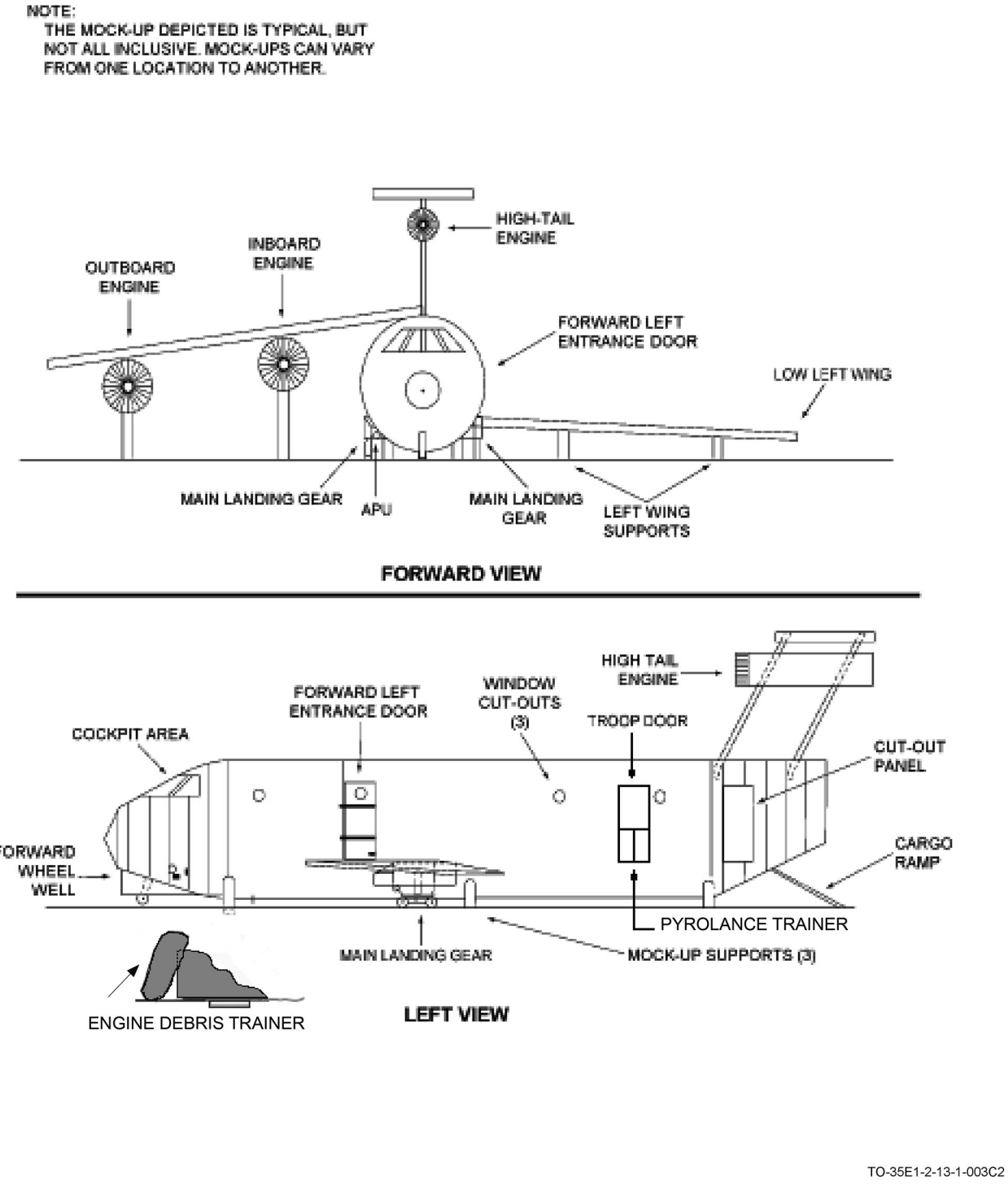


Figure 3. Mock-up Left Side and Forward View

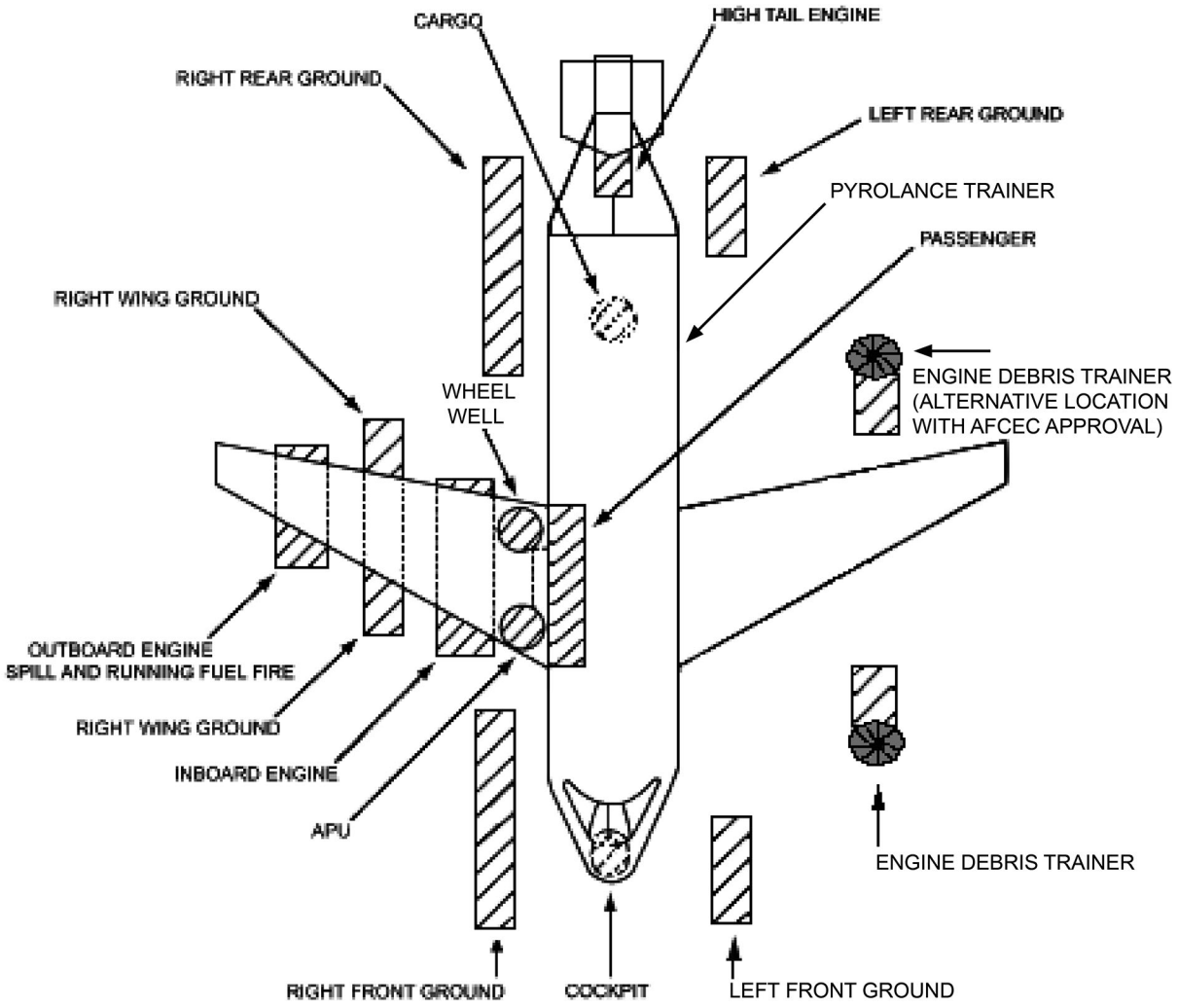


Figure 4. LPG Burner Locations

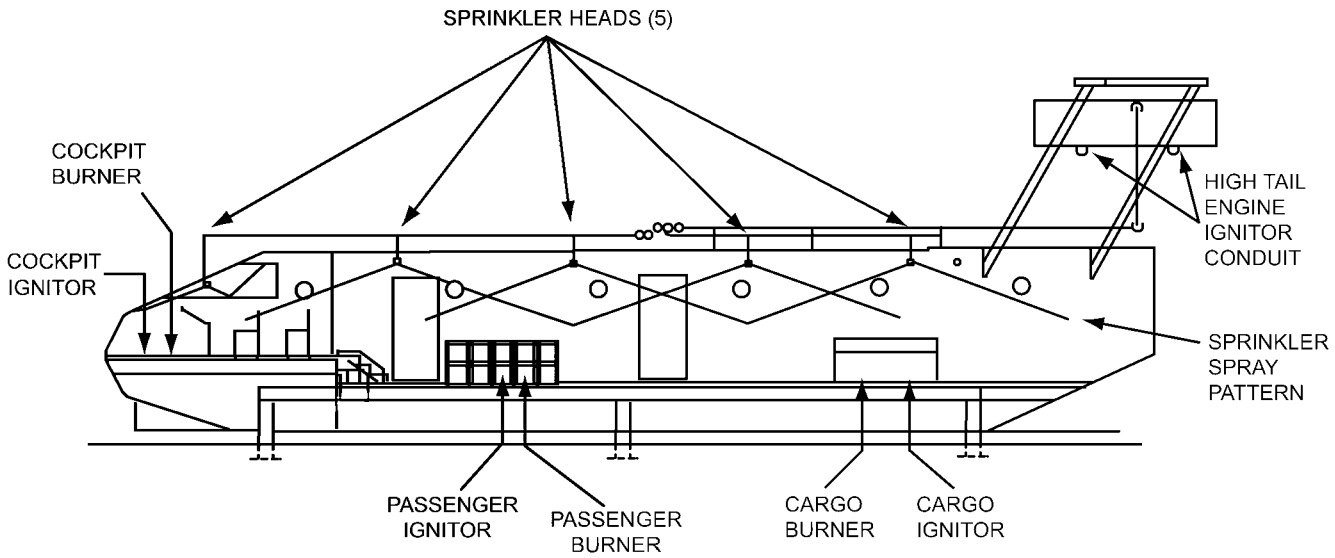


Figure 5. LPG Burner, Ignitor and Sprinkler Locations

WORK PACKAGE

MASTER LIST OF SPECIAL TOOLS, TEST EQUIPMENT, AND CONSUMABLES

OPERATION AND MAINTENANCE INSTRUCTIONS

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE WP PAGES

Total Number of Pages in this WP is 20 consisting of the following:

* Zero in this column indicates an original page.

LIST OF TABLES

Table 1. Master List of Special Tools

Part No./Specification No./NSN	CAGE Code	Figure/ Index No.	Nomenclature	Use
GSE PN 3668 (GSE Lining Technology, Inc. 19103 Gundle Road Houston, Texas 77073)	N/A	N/A	GSE Extrusion Welder, 120V	Repair tears, holes in liner
GSE PN 0128 (GSE Lining Technology, Inc. 19103 Gundle Road Houston, Texas 77073)	N/A	N/A	Grinder, Black and Decker, 4 1/2 inch, 120V	Repair tears, holes in liner
GSE PN 0127 (GSE Lining Technology, Inc. 19103 Gundle Road Houston, Texas 77073)	N/A	N/A	Hot Air Blower, 120V	Repair tears, holes in liner
MTS Mass Transfer Systems (www.mtsjets.com)	N/A	N/A	Multi-Aspirator	Aeriation of Water Conservation Pond, algae control

Table 2. Master List of Test Equipment

Part No./Specification No./NSN	CAGE Code	Figure/ Index No.	Nomenclature	Use
Any manufactured gas detector capable of detecting flammable atmospheres	N/A	N/A	Flammable Gas Detector	Inspect LPG Plumbing
GSE PN 2999 (GSE Lining Technology, Inc. 19103 Gundle Road Houston, Texas 77073)	N/A	N/A	Vacuum Box, small	Used to Quality Check liner repairs
GSE PN 2938 (GSE Lining Technology, Inc. 19103 Gundle Road Houston, Texas 77073)	N/A	N/A	Portable Electric Vacuum Pump with Hose	Used to Quality Check liner repairs
Heron Instruments Groundwater Monitoring, Inc. (www.heroninstruments.com)	N/A	N/A	Little Dipper (portable, tape length of 75ft/ 22m)	Measure water level in leak detection points

Table 3. Master List of Consumable Materials

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
Door Panels 36 inch x 84 inch 26 gauge (sheet metal cutout panels on mock up)	N/A	N/A	Practice cut-in and skin penetration with appropriate tools	N/A
Lock out tags	N/A	N/A	Lock out inoperable components	WP 004 00: Paragraph 7, step g, WP 005 00: Paragraph 4, Caution
Propane Liquid Propane Gas	BB-G-110A Type II NSN 6830-00-261-7445	81348	Fuel	WP 002 00: Paragraph 13.1, Paragraph 13.2, Paragraph 18 WP 010 00: Paragraph 3
Pneumatic System	BB-N411C Type 1, Grade A, Class 1, NSN 6830-00-656-1596 (231 SCF)	81348	Powers emergency shutdown system	WP 002 00: Paragraph 18.3 WP 005 00: Paragraph 3, steps c, l, and q, Paragraph 4, steps e and f, Paragraph 6, step h, WP 006 00: Paragraph 3, steps i and o WP 009 00: Paragraph 4, steps m and v, Paragraph 6, step f
N_2 Bottle Cylinder, Compressed Gas	RR-C-901 and 901/1 NSN 8120-00-985-7275 or 8120-00-286-8592 (200 cu ft.)	81348	Powers emergency shutdown system	WP 005 00: Paragraph 3, step q

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
Jet Fuel (JP-8) (JET A-1 ASTMD 1655)	MIL-T-83133D NSN 9130-01-031-5816	81349	Turbine Fuel (Thule only)	WP 009 00: Paragraph 4, steps c and j, Paragraph 5, step i Paragraph 5.1, step c WP 010 00: Paragraph 10, Paragraph 10.2, Paragraph 10.3, Paragraph 10.4
Ignition Cable	NSN 6145-00-197-8166 or 6145-00-845-1861 MIL-C-3702-U5MC and MIL-C-3702-U7MC	81349 1EAY2	Connects ignition transformer to ignitor. No substitution permitted.	SWP 007 01: Paragraph 3, Note
Ignitor (1 Electrode)	NSN: 2920-00-104-4461 Champion CH31615 Honeywell 3699642	11583	Ignites fuel	WP 007 00: Figure 5
Ignitor (3 Electrodes)	NSN: None Assigned Champion CH31917	0AFL4	Ignites fuel	WP 007 00: Figure 5
Ignitor (Mushroom Tip Electrode)	NSN None Assigned ICS Int'l Code Services 7860030	4T0W4	Ignites fuel	WP 007 00: Figure 3 and Figure 4
Pigtail	Champion 204085	0AFL4	Connects ignition cable to ignitor. (Unique to AF Fire Trainers)	WP 007 00: Paragraph 3, step c, Table 2, Figure 2, Figure 6 SWP 007 01: Paragraph 3, step j
Ignition Transformer	NSN 5950-00-962-9875 Illinois Capacitor Inc. 638-171 NSN 5950-00-243-1603 Dongan Elec. Manf. Co. A10-LA2	N/A	Step up transformer secondary power for ignitors 10 KV 23 MAmp. (Secondary can not exceed 23 MAmp)	WP 007 00: Table 2 SWP 007 01: Paragraph 3, Note, Paragraph 3, steps h and i SWP 010 01: Paragraph 3, step u, Paragraph 4, step c
Water Pump-submersible operating supply *	ITT-Goulds	3N150	300 gallon per minute or greater. Supplies water to sprinkler system, washout system, water jackets and cooling system. TDH (PT): 75, HP: 15	WP 005 00: Paragraph 4, step b WP 007 00: Paragraph 10 WP 010 00: Paragraph 6, step f and j, Paragraph 8, step d and g SWP 010 01: Paragraph 3, steps a, i, l, p, and t

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
Coaxial Valve 3/4 inch Brass Steel 316 Stainless	"co-ax" (Company name is Co-Ax Valve, Inc.) [1], [2], [3]	1U180	Normally closed coaxial valves. High speed emergency propane shutoff. (no substitution permitted)	WP 006 00: Table 1 WP 007 00: Table 2
Coaxial Valve 1 inch NPT Brass Steel 316 Stainless	"co-ax" (Company name is Co-Ax Valve, Inc.) [4] [5] [6]	1U180	Normally closed coaxial valves. High speed emergency propane shutoff. (no substitution permitted)	WP 006 00: Table 1 WP 007 00: Table 2
Coaxial Valve 3/4 inch Flanged Steel 316 Stainless	"co-ax" (Company name is Co-Ax Valve, Inc.) [7] [8]	1U180	Normally closed coaxial valves. High speed emergency propane shutoff. (no substitution permitted)	WP 006 00: Table 1 WP 007 00: Table 2
Coaxial Valve 1 inch Flanged Steel 316 Stainless	"co-ax" (Company name is Co-Ax Valve, Inc.) [9] [10]	1U180	Normally closed coaxial valves. High speed emergency propane shutoff. (no substitution permitted)	WP 006 00: Table 1 WP 007 00: Table 2
Pilot Valves	Norgren PVAF 1024C ASCO 8344G74 (or equal)	1NGM3 1HAR9 3ZZN5	4 way valve. High speed emergency propane shutoff. Control Coaxial valves.	WP 007 00: Table 2 SWP 007 01: Paragraph 3, Note, Paragraph 4, step d
Solenoid Valves	ASCO 8210G3B ICS 6301559 (or equal) Valcor Industries SV321GF0N1EGS	1HAR9 3ZZN5 16554	2 way valve switch. Interlock with ignitor	WP 002 00: Paragraph 18.2 WP 007 00: Table 2 SWP 007 01: Paragraph 4, step c WP 009 00: Paragraph 5, step i and j WP 010 00: Paragraph 10.3
Liquid Propane Regulators	Fisher Controls 627 Series Engineered Controls RegO 1586Y (or equal)	26819 86120	Liquid propane pressure/flow control. Controls flame height.	WP 002 00: Paragraph 16, Paragraph 18.2 WP 005 00: Paragraph 3, steps c and l WP 006 00: Paragraph 3, steps i and j WP 009 00: Paragraph 4, steps m, Paragraph 7 WP 010 00: Paragraph 5, steps c and e
Heat Shrink Tubing	Mil-1-23053/S Class 1	N/A	Plastic protective tubing. Protects ignitor pigtail.	WP 007 00: Table 2, Figure 6

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
Teflon Tubing	Mil-1-22129	N/A	Teflon protective tubing. Protects ignitor cable.	WP 007 00: Table 2, Figure 6
Solder	Sn63	N/A	Joins ignitor cable splice	WP 007 00: Table 2, Figure 6
Sprinkler Heads**	Spraying Systems Co, FullJet ® Nozzle Model: 1 1/4 HI 190WSQ		Mockup Cool-down	WP 002 00: Figure 5 item (5)
Sprinkler Heads**	BETE Fog Nozzle, Inc. Whirl Nozzle Model: SCSQ12- spray angle 120°		Mockup Cool-down	WP 002 00: Figure 5 item (5)
RTV Adhesive	G.E. #122, 6702 (or equal)	N/A	Pasty adhesive. Covers ignitor pigtail splice, Teflon tubing, cable, and solder splice	WP 007 00: Table 2, Figure 6
Ball Valves 3/4 inch and 1 inch	Conbraco Industries- Apollo valve series 83 or 86 [-100 threaded or -500 welded] (or equal)	72219 57661	3-Piece high pressure full port ball valve. Propane flow control valve	WP 004 00: See Warning WP 004 00 Paragraph 8 Procedures, WP 005 00: Paragraph 5, steps d(2) and d(3)(a) WP 007 00: Paragraph 12, Paragraph 12 Note 1, and steps a, b, and c, Figure 10 SWP 007 01: Paragraph 4 WP 009 00: Paragraph 5, steps c and g WP 010 00: Paragraph 10.2, steps c
Ball Valve 2 inch, 2 1/2 inch and 3 inch	Smith-Cooper International- Sharpe valve series 84 (or equal)	06LW3	3-Piece high pressure full port ball valve. Propane flow control valve	WP 004 00: See Warning WP 004 00 Paragraph 8 Procedures, Paragraph 5, steps d(2) and d(3)(a) WP 007 00: Paragraph 12, Paragraph 12 Note 1, and steps a, b, and c, Figure 10 SWP 007 01: Paragraph 4 WP 009 00: Paragraph 5, steps c and g WP 010 00: Paragraph 10.2

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
Radio Remote Control Safe-T-Stop System Transmitter	NSN Non Assigned Laird Controls North America Inc. 24T09A-1 MHz radio remote control transmitter	0TK66 1RF45	Activate shutdown/stop fuel flow	WP 007 00: Figure 24
Radio Remote Control Safe-T-Stop System Receiver/Relay	NSN Non Assigned Laird Controls North America Inc. 25R11A or Laird Controls North America Inc. 21R14A MHz radio remote control receiver and relay	0TK66 1RF45	Activate shutdown/stop fuel flow	WP 007 00: Figure 24
Automatic Submersible Sump Pump	Model No. ES33D1-10, Grainger Item No. 4NY84, 1/3 HP, 1-1/2 inch NPT, 115 VAC, Manf: Franklin Electric Co.	23452	de-water the mock-up containment berm area (alternative in the absence of Weir Drain)	WP 007 00: Figure 46
Water Pump- non-submersible operating supply- water conservation pond bank placement with floating suction/strainer	Any manufacturer self-priming centrifugal pump.	N/A	Pump water from the Water Conservation Pond	WP 007 00: Paragraph 13
Water Conservation Pond Aerator	Any manufacturer pond aerator.	N/A	Aeration of water in the conservation pond to enhance bio-processes and reduce algae growth.	WP 007 00: Paragraph 17

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
Air Compressor	Any manufactured air compressor. Not less than free air flow @ 175 psi of 34 cubic feet per minute. Recommendations are on air pressure 140 psi. Off air pressure 175 psi. Splash-lubricated, cast-iron compressor. 3 phase electric driver for compressor, if three phase power is available at the power panel	N/A	Replace the pneumatic system (optional). Provide appropriate protection from environmental elements.	WP 007 00: Paragraph 22

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
Air Reservoir/Accumulator Tank	Any manufactured air reservoir/accumulator tank: A single unit or may be a separate stand-alone feature. Not less than 80 gallons suitable for 250 psi pressure. Appropriate relief valve for 250 psi maximum pressure. Where high pressure or high volume compressors are used, ensure the tank relief valve is rated based on the compressor output. 3/4 inch NPT female outlet. An automatic moisture drain is recommended.	N/A	May be integrated with air compressor	WP 007 00: Paragraph 22
Filter-Regulator-Lubricator Assembly	Any manufactured filter-regulator-lubricator assembly: [a]	N/A	Integrated with air reservoir/ accumulator tank	WP 007 00: Paragraph 22

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
Conduit Wire Seal and Strain Relief	Sealcon LLC, CD12DA-BK Nylon 6/6 flame resistant with self extinguishing Buna-n compression seal, 12mm base thread size, thread length not less than 0.55 inch (15mm), cable size up 6.5 mm, fitting suitable for exposure to salt water, acids, alkalis, alcohol, oils, and considered non-corrosive use in the marine environment, good underwater for down to 300feet/91.4m (150 psig) provided there is a liquid tight seal between the thread body and the housing, seals listed to UL 94. Provides an NEMA 4X or 6 (submersible) (US), IP68 (EU) rating. Operating temperature exposure – short term 248 °F (120 °C) & continuous -40° to 212 °F (-40° to 100 °C).	0UE11	Used as seal at ends of the polyethylene conduit/conduit inner-liner.	WP 007 00

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
Conduit Wire Seal and Strain Relief (Acceptable Alternative)	Sealcon LLC, CF12DA-BK Nylon 6/6 flame resistant with self extinguishing Buna-n compression seal, 12 mm base thread size, thread length not less than 0.55 inch (15 mm), cable size up 6.5 mm, fitting suitable for exposure to salt water, acids, alkalis, alcohol, oils, and considered non-corrosive use in the marine environment, good underwater for down to 300 feet/91.4 m (150 psig) provided there is a liquid tight seal between the thread body and the housing, seals listed to UL 94. Provides an NEMA 4X or 6 (submersible) (US), IP68 (EU) rating. Operating temperature exposure – short term 248 °F (120 °C) & continuous -40 ° to 212 °F (-40° to 100 °C).	0UE11	Used as seal at ends of the polyethylene conduit/conduit inner-liner.	WP 007 00

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
Conduit/Conduit Innerliner	Dura-Line Corporation Micro-duct 7599-23021-0000000, conduit color: black with stripe color code: Red (electric), 16 mm (OD)/ 11.76 mm (ID) micro polyethylene duct and innerduct, extruded coilable tubing for use as a single or multiple raceway, conduit may be direct buried, encased in concrete or used as innerduct. Duct is formed from a thermoplastic polymer conforming to the minimum standard of PE334420E/C as defined in ASTM D3350 with smooth exterior and ribbed silicone interior. Preinstalled 200 lb. polyester woven pull tape.	1UKE3	May be used as innerliner in existing metal raceways to facilitate installation of replacement ignition wire or may be used as a direct burial duct to replace damaged or overfilled existing metal ducts.	WP 007 00

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
	Dura-Line Corporation Micro-duct 7599-23021-1010100, conduit color: black, stripe color code: Red (electric), 16/11.76 mm (ID) micro polyethylene duct and innerduct, extruded coilable tubing for use as a single or multiple raceway, conduit may be direct buried, encased in concrete or used as innerduct. Duct is formed from a thermoplastic polymer conforming to the minimum standard of PE334420E/C as defined in ASTM D3350 with smooth exterior and ribbed silicone interior. Preinstalled 200 lb polyester woven pull tape.	1UKE3	May be used as innerliner in existing metal raceways to facilitate installation of replacement ignition wire or may be used as a direct burial duct to replace damaged or overfilled existing metal ducts.	WP 007 00

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
Pneumatic Control Piping (pneumatic system or compressed air)	Dura-Line Corporation PolyPipe® PolyStripe™ , pipe color: black, stripe color code: white, 0.5 to 2 inch polyethylene pipe, extruded coilable tubing for use as pipe, may be direct buried, encased in concrete or used as innerduct. Pipe is formed from a thermo-plastic polymer conforming to the minimum standard of PE4710 DR7 as defined in ASTM D3035/ AWWA C901 with smooth exterior and smooth interior.	1UKE3	May be used as replacement pipe to supply pneumatic pressure distribution to the coaxial valves (propane emergency valves).	WP 007 00

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
	Oil Creek Plastics – Black with Yellow Stripes Gas Pipe, pipe color: black, striped color code: white, 0.5 to 2 inch polyethylene pipe, extruded coilable tubing for use as pipe, may be direct buried, encased in concrete. Pipe is formed from a thermoplastic polymer conforming to the minimum standard of PE3608/3408 with smooth exterior and smooth interior.	06JY7	May be used as replacement pipe to supply pneumatic pressure distribution to the coaxial valves (propane emergency valves).	WP 007 00

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
Water Distribution System	Dura-Line Corporation PolyPipe® PolyStripe™ , pipe color: black, stripe color code: purple (reclaimed water), 0.5 to 2 inch polyethylene pipe, extruded coilable tubing for use as pipe, may be direct buried, encased in concrete or used as innerduct. Pipe is formed from a thermo-plastic polymer conforming to the minimum standard of PE4710 DR7 as defined in ASTM D3035/ AWWA C901 with smooth exterior and smooth interior.	1UKE3	May be used a replacement pipe to supply water to the wash down header and to the water jackets. Must be used only below the rock surface and transition to black steel or stainless steel before rising above the rock surface.	WP 007 00

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
	Oil Creek Plastics – Aqua-Jet Pipe: black, striped color code: gold, 0.75 to 2 inch polyethylene pipe, extruded coilable tubing for use as pipe, may be direct buried, encased in concrete. Pipe is formed from a thermoplastic polymer conforming to the minimum standard of PE3608/3408 DR7 AWWA C901 with smooth exterior and smooth interior.	06JY7	May be used a replacement pipe to supply water to the wash down header and to the water jackets. Must be used only below the rock surface and transition to black steel or stainless steel before rising above the rock surface.	WP 007 00
Radio Remote Control System Keypad	Laird Technologies – Cattron-Theimeg, Inc. Safe-T-Stop. 24T09A-1 Part 15 Frequency Band Operation 900 Mhz. 120 VAC Non Standard Power Supply. Receiver/Decoder in a NEMA 4 steel enclosure. Engineering # 1227080.	1RF45	Activate emergency shutdown/ stop fuel flow.	WP 007 00: Figure 22

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
Radio Remote Control System Receiver/ Decoder	Laird Technologies – Cattron-Theimeg, Inc. Safe-T-Stop. 22R08A Part 15 Frequency Band Operation 900 Mhz. 120 VAC Non Standard Power Supply. Receiver/Decoder in a NEMA 4 steel enclosure.	1RF45	Activate emergency shutdown/ stop fuel flow.	WP 007 00: Figure 22
Water Conservation Pond Aerator	Kasco, Marine, Inc. and any other manufacturer (with identical specifications). Provides ½HP, 120 volt, single phase floating industrial pond aerator including SJTOW (underwater rated power cable, not smaller than 12/3 AWG).	N/A	Aeration of water in the conservation pond to enhance bio-processes and reduce algae growth.	WP 007 00: Figure 15
Air Dryer	Great Lakes Air Products, Inc. Non-cycling refrigerated air dryer. Provides 40 CSFM at 100 PSI gage and 35 °F, Pressure Dew Point (PDP), and 48 SCFM at 100 PSI gage and 50 °F PDP. PN: GRF-40A-116	0KG65	Removes moisture from air of the pneumatic control system.	WP 007 00: Figure 15

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
Caulking/Furnace Cement	NSN not assigned - Hercules Chemical Company, Furnace/Stove Cement, regular body, tan color, manufacturer's part number 35515	84794	Sealing water leaks around pipe entrances and support structure in the inboard and outboard engines.	WP 007 00, where applicable
Caulking/Furnace Cement	NSN not assigned - Hercules Chemical Company, Furnace/Stove Cement, heavy body, dark grey / black color, manufacturer's part number 35521	84794	Sealing water leaks around pipe entrances and support structure in the inboard and outboard engines.	WP 007 00, where applicable
Fire Block Sealant	NSN not assigned - 3M Specified Construction Products Department, Fire Block Sealant FB 136	N/A	Sealing water leaks around pipe entrances and support structure in the inboard and outboard engines.	WP 007 00, where applicable

Table 3. Master List of Consumable Materials - Continued

Nomenclature	Specifications/ Part No./NSN	CAGE Code	Use	Reference
				[b] [c]

[*] The water pump shall be equipped with a seal leak detection probe and warning control system.

[1] VMK202C140VTN3/4ZX7G1A

[2] VMK202C240VTN3/4ZX7G1A

[3] VMK202C640VTN3/4ZX7G1A

[4] VMK252C140VTN1ZX7G1A

[5] VMK252C240VTN1ZX7G1A

[6] VMK252C640VTN1ZX7G1A

[7] VFK202C240VTA3/4ZX7G1A

[8] VFK202C640VTA3/4ZX7G1A

[9] VFK252C240VTA1ZX7G1A

[10] VFK252C640VTA1ZX7G1A

[**] Both nozzles have a square pattern which must be aligned with the fuselage. Where these nozzles were originally installed, no special changes will be required. Where standard fire suppression sprinklers were installed, increasing bushings will be required between the current pipe and the new nozzle.

[a] This will be installed downstream of the reservoir/accumulator. Suitable for 250 psi inlet pressure. Operating Temperature 32 to 150 degrees F (0 to 65.5 degrees C). Suggested lubricant is Airline Oil F442001. Filter- Appropriate for 250 psi maximum pressure, 3/4 inch ports capable of high flow capacity not less than 165 SCFM, size 5 micron. Capacity not less than 2.80 ounces with an automatic drain feature. Regulator- Appropriate for 300 psi maximum supply pressure, 3/4 inch ports capable of high flow capacity not less than 175 SCFM. Adjusting range 0 to 250 PSIG, with 0 to 300 PSIG pressure gauge. Lubricator- Appropriate for 250 psi maximum pressure, 3/4 inch ports capable of high flow capacity not less than 200 SCFM, minimum flow for lubrication not more than 1.5 SCFM. Capacity not less than 6.0 ounces of lubricant, manual drain. Recommended: The filter-regulator- lubricator should be a single assembly of one manufacturer.

[b] NOTE: Use only until replaced under WP 007 00, Paragraph 11, REGULATOR REPLACEMENT.

[c] NOTE: All items in this Technical Order addressing the Pneumatic Control System shall meet the same requirements for sites equipped with either a Pneumatic System or an Air Compressor.

WORK PACKAGE

TECHNICAL PROCEDURES

OPERATION AND MAINTENANCE INSTRUCTIONS SAFETY AND ACCIDENT PREVENTION

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE WP PAGES

Total Number of Pages in this WP is 4 consisting of the following:

* Zero in this column indicates an original page.

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REFERENCE MATERIAL REQUIRED

Publication Number	Publication Title
TO 00-105E-9	Aerospace Emergency Rescue and Mishap Response Information (Emergency Services)
AFM 91-201	Explosive Safety Standards
NFPA 1500	Standard on Fire Department Occupational Safety and Health Program

APPLICABLE TCTOs
NONE

CONSUMABLE MATERIALS
NONE

APPLICABLE SUPPORT EQUIPMENT
NONE

1 FOREWORD.

This work package contains setup and operating procedures for the Aircraft Fire Training Facility (AFTF) in all climatic conditions and the AFTF is not winterized. These procedures include pre-exercise inspection, pre-exercise setup, training exercise, and system shutdown and clean up.

2 GENERAL.

Safety requirements will be complied with during all operations. All personnel engaged in operations involving hazardous material shall be thoroughly trained in safety. They shall be capable of recognizing hazardous situations and conditions. Thinking safety and working safely must become a habit when working with or near items that can create a hazard because of their explosive, thermal, flammable, or toxic characteristics.

2.1 Hazardous Materials. When an abnormal condition is noted and procedures are not available in this manual, training shall be stopped and authorized personnel shall be called for help in eliminating the hazard. Operations shall not be resumed until the hazard has been eliminated. Hazardous material information can be found in TO 00-105E-9, Chapter 3 and hazardous material publications used to determine relative toxicity, flammability, thermal stability, permissible extinguishing agents and other pertinent data for a given substance.

2.2 Protective Clothing. Once firefighters enter the burn area, no additional fires shall be ignited. Protective clothing in accordance with National Fire Protection Association (NFPA) 1971, 1972, 1973, 1974, and 1976 shall be used to prevent burns from extensive heat and hot surfaces. Self Contained Breathing Apparatus (SCBA) shall be worn for all fires.

3 REQUIREMENTS.

The explosive safety standards of AFM 91-201, Air Force Occupational Safety and Health (AFOSH) and NFPA 1500 Fire Department Occupational Safety and Health Program standards will be followed. Lack of a safety requirement in this TO or the above references does not indicate that no safeguards are needed. If a dangerous situation is encountered, other than expected dangers addressed during the exercise pre-brief, all operations shall be terminated. Personnel shall evacuate the training area. Authorized personnel shall be notified to correct hazard. Operations shall not be resumed until the hazard has been eliminated.

4 ABNORMAL CONDITIONS.

When an abnormal condition is noted and correction procedures are not available in this manual, training shall be terminated. Personnel will be evacuated from the training area. Authorized personnel shall be notified to eliminate the hazard. Operations shall not be resumed until the hazard has been eliminated.

5 EXPLOSIVE HAZARDS.

Liquid propane used in the facility is a potential explosive. If hazardous conditions are encountered all operations shall be terminated. Personnel will be evacuated to a safe site. Authorized personnel shall be called to eliminate the hazard. Operations shall not resume until the hazard has been eliminated.

6 RESUSCITATION.

Personnel working with or near high voltage equipment should be familiar with modern methods of resuscitation. Such information can be obtained from the base medical facility.

7 EMERGENCY PROCEDURES.

The procedures under this heading shall be used in case of an emergency. Personnel directly and indirectly related to any training exercise using the Aircraft Fire Training Facility shall be thoroughly familiar with the procedures contained herein. During any phase of training, if an unsafe or emergency condition is observed, any member of the training evolution can declare an emergency. Upon declaration of an emergency, the Ignition Officer on the control stand shall perform the following:

a. PUSH emergency shutdown switch or handheld Safe-T-Stop IN. (Off position)

b. CLOSE all burner control ball valves.

c. Position all ignitor switches to OFF.

d. Verify that all personnel have evacuated the burn area.

e. Notify appropriate agency for correction of problem.

f. Tag inoperable components out of service, if applicable.

g. If emergency shutdown was initiated while burners are operating, LPG will be trapped in lines from the control stand ball valves to individual burner emergency shutdown coaxial valves. These lines shall be purged prior to troubleshooting/maintenance actions. Under these conditions, the Ignition Officer on the control stand shall perform the following:

(1) Position appropriate ignitor switch to the ON position.

(2) PULL emergency shutdown switch OUT.

(3) Allow trapped LPG to burn off.

(4) Position appropriate ignitor switch to the OFF position.

(5) PUSH emergency shutdown switch or handheld Safe-T-Stop.

NOTE

Tag and lock out valves and switches to any inoperable burners or ignitors.

8 PROCEDURES.

WARNING

- Extremely high temperatures and hot surfaces will be encountered during training exercises. It is imperative to wear appropriate protective clothing. Failure to comply may cause serious injury or death to personnel. SCBA shall be utilized for all exercises.

- While attempting to ignite fires, flames should be present within a reasonable time (5-10 seconds), if not, close manual propane valve(s), shut off appropriate ignitors, and allow LPG in burn area to dissipate before attempting re-ignition. Failure to comply could pose a serious risk of explosive gas build-up.

- If firefighters extinguish any fires while LPG is flowing to burner(s), push emergency shutdown switch or handheld Safe-T-Stop IN, close all burner control ball valves, and turn all ignitor switches to OFF.

- Make sure ignitor-cooling water jackets are properly operating.

- All distractions during all training exercises are strictly prohibited. Any type of distraction can cause inattention to detail with personnel engaged in the training exercise. With LP-gas flowing and fire present, personnel may inadvertently be injured, burned, or both, resulting in extreme burns or death.

8.1 Training Instructor. Training Instructor responsibilities include:

a. Shall be in control of the training exercise and have sole responsibility for the training exercise, to include all students, instructors and equipment. Dedicated radio communication shall be established between Training Instructor in Charge, Safety Officer, and Ignition Officer.

b. Shall confirm all Pre-Exercise Inspection and Set Up procedures have been completed.

c. Shall pre-brief, assign personnel duties, initiate, oversee, evaluate, terminate, and debrief the training exercise.

8.2 Safety Officer. Safety Officer responsibilities include:

a. Shall make sure the Ignition Officer has properly configured the control stand for emergency shutdown and normal operation.

b. Shall report to the Training Officer in Charge that the training exercise may commence.

NOTE

Pre-burn time will not exceed 3 minutes (180 seconds) during warm or cold weather and with the beginning of fire suppression operations. If these times are exceeded, execute normal shut down, wait at least 5 minutes and resume training. Actual exercise burn time will be determined by the Training Instructor in Charge. After manual control valves are closed, fire will burn an additional 15 to 25 seconds.

8.3 Ignition Officer. The responsibilities of the Ignition Officer include:

a. Slowly open the propane manifold shutoff valve.

b. Ignite selected burners by activating the appropriate ignitor switch and slowly opening the corresponding burner control ball valve until flame is present. Repeat steps until all required burners are ignited.

c. Exercise Shut Down Procedures:

(1) Close burner control ball valve(s).

(2) Position all ignitor switches to OFF.

WARNING

All distractions during all training exercises are strictly prohibited. Any type of distraction can cause inattention to detail with personnel engaged in the training exercise. With LP-gas flowing and fire present, personnel may inadvertently be injured, burned, or both, resulting in extreme burns or death.

d. Ensuring all distractions are eliminated.

e. Termination of the training exercise if a distraction presents itself.

8.4 Training Disciplines. All Officers and Instructors responsibilities include:

WARNING

- No one other than the Ignition Officer and Ignition Officers in training are permitted on the Control Stand during the training exercise in order to maintain proper discipline and be wholly dedicated to the training exercise. Inattention to this warning can cause injury or death to personnel participating in the training event.

- Distractions that are strictly prohibited are: cell phones of any type; pagers; radios turned to frequencies other than the training exercise; and any other devices that may distract the attention of the Ignition Officer.

a. Ensuring only qualified operators or escorted operator trainees are allowed on/in the control stand. The Control Stand can also be defined as the ‘stand’, ‘room’, ‘tower room’ or ‘ground location’. Post the “Qualified“ operator sign when facility is in use.

b. Terminating the training exercise if incorrect personnel are present on the Control Stand and/or a distraction presents itself.

9 AFTF MODIFICATION.

CAUTION

No modification of any AFTF shall be made without prior coordination and approval of the respective MAJCOM fire emergency services offices, AFCEC/COS (Fire Engineering), and AFCEC/CXF (Fire Operations) Division offices.

10 COMMERCIAL-OFF-THE-SHELF (COTS) TRAINING SYSTEMS.

This Technical Order does not cover the operations and maintenance of COTS products built by manufacturing firms such as ProSafe, Inc. Kidde Fire Trainers, Kirila Fire Training Facilities, WRG Training Systems, and FireBlast 451. (AAI, IFTE, International Code Services, Symtron Systems, Inc. are now Kidde Fire Trainers products.) Such COTS training systems shall be operated and maintained in strict accordance with the manufacturer’s operations and maintenance instructions. Modification of a COTS training system shall be coordinated with and approved by the manufacturer. COTS still require approval by AFCEC before being placed in service and that the requirements of WP 004 00 apply to COTS systems in addition to manufacturing requirements, as well as the USAF standards.

WORK PACKAGE

TECHNICAL PROCEDURES

OPERATION AND MAINTENANCE INSTRUCTIONS STANDARD OPERATING PROCEDURES

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE WP PAGES

Total Number of Pages in this WP is 10 consisting of the following:

* Zero in this column indicates an original page.

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4	0	7 - 9	0		

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LIST OF TABLES

REFERENCE MATERIAL REQUIRED

Publication Number	Publication Title
WP 004 00	(Paragraph 7-Paragraph 8) Emergency Procedures

APPLICABLE TCTOs

NONE

CONSUMABLE MATERIALS

NONE

APPLICABLE SUPPORT EQUIPMENT
NONE

1 FOREWORD.

This work package contains setup and operating procedures for the Aircraft Fire Training Facility (AFTF) in all climatic conditions and the AFTF is not winterized. These procedures include pre-exercise inspection, pre-exercise setup, training exercise, and system shutdown and clean up.

2 SAFETY SUMMARY.

Various steps in this work package may require personnel to be exposed to extremely high temperatures, open flames, liquid propane vapor and fumes, and hot surfaces. It is imperative to wear appropriate protective clothing and to be aware of the EMERGENCY PROCEDURES in Work Package 004 00, Paragraph 7 and Paragraph 8. High voltage will be present at burn area ignitors. All personnel shall remain clear of ignitors while in use. Failure to comply may cause serious injury. Use of Self Contained Breathing Apparatus (SCBA) is required for all fires. Exposed skin areas may result in burns by heat/steam.

3 PRE-EXERCISE INSPECTION.

WARNING

If an obvious unsafe or unserviceable condition is noted, halt operations and rectify condition prior to proceeding. Failure to halt and correct conditions may cause injury or death to personnel.

CAUTION

- The entire training facility is a no smoking area.
- Make sure propane tank level is sufficient for scheduled training exercise. Re-service tank, as required.

Pre-exercise procedures shall be performed by the following authorized personnel immediately prior to commencement of training exercise: Training Instructor In Charge, Safety Officer, and Ignition Officer.

a. Inspect the propane storage tanks, associated gauges, piping and valves.

WARNING

Gloves and face shield shall be worn during Roto Gauge operation.

b. Take tank level reading. Accurate tank level readings can be obtained using the tank Roto Gauge. To read the gauge:

(1) Rotate the lever to the 12 o'clock position.

(2) Open the petcock valve on the end of the gauge, cold propane vapor will escape.

(3) Turn the lever to the left or right slowly until liquid propane escapes through the open petcock. The corresponding reading on the gauge under the lever is the percentage of LPG in the storage tank.

(4) Close the petcock valve.

(5) Return the lever to the 12 o'clock position.

c. Inspect the control stand/mock-up to include electrical and mechanical components, piping, valves, regulators, and pneumatic system.

d. Inspect burn area. Make sure rock is level.

e. Make sure rock level is no higher than top of weir.

f. Make sure burn area drain valve inside weir is closed and weir drain valve outside of weir is open.

NOTE

This is the normal position for the valve during warm weather operations.

g. Inspect exterior and interior burners and ignitors, and make sure that burner grates are not excessively corroded or warped and ignitor protective covers and burner baffles are in place.

h. Inspect mock-up. Make sure expansion joint bolts are finger tight. Inspect mock-up doors for freedom of operation and excessive corrosion.

i. Inspect water piping and water jackets.

j. Inspect drive around burn area for ruts. Level all ruts before proceeding.

k. Inspect exterior lighting for proper operation, if applicable.

l. Inspect propane system to include tank, gauges, valves, piping, pneumatic system, and regulators. Notify appropriate personnel to repair leaks before proceeding with any training exercise.

m. Inspect control stand electrical, piping, valves, and regulators. Examine for corrosion, wear, and serviceable limits. Make sure that all valves are closed and all switches are off.

n. Inspect water conservation pond area. Check visible portion of liner for damage. Make sure pump is completely submerged and sufficient water is available to complete training exercise. Remove debris that may cause damage to pump.

o. On electrical service rack, position all main circuit breakers to ON.

p. Open the appropriate water valves and apply power to water conservation pond pump and test for adequate water pressure. Close valves when testing is complete. Low water pressure may indicate pump malfunction or unseated pump housing.

q. Inspect pneumatic system bottle(s), gauge(s), valve(s) and line(s) for serviceability. Make sure adequate pneumatic system pressure is available before operating facility.

r. Inspect air compressor, gauges, valves, and lines. Make sure adequate air pressure is available before operating facility.

4 PRE-EXERCISE SETUP.

CAUTION

The entire training facility is a no smoking area.

These procedures shall be performed by the following authorized personnel immediately prior to commencement of training exercise: Training Instructor in Charge, Safety Officer, and Ignition Officer.

a. Configure mock-up for exercise scenario.

b. Check water pump circuit breaker at water conservation pond is in the ON position.

c. Check fire department connection is closed (if provided).

d. Position master power switch to ON.

e. Open valves on pneumatic system cylinder(s). Make sure system vent valve is closed. A minimum of 500 psi is required to make sure emergency shutdown valves work properly.

f. Pre-charge pneumatic system to 60 to 120 psi.

g. Check all water drain valves are closed.

h. Position water conservation pond pump switch to ON.

i. Open wash-down system and bring water level to top of weir drain. Make sure water level covers ground burner grates but is 1 to 2 inches below ground burner ignitor tips. Turn wash-down off when water level begins to flow into weir drain.

j. Open ignitor cooling water jacket control valve on the control stand. Make sure water continuously flows to all water jackets on the mock-up.

k. Slowly open globe valve in LPG line from propane tank to control stand.

NOTE

Rapidly opening the globe valve may cause the excess flow valve inside the tank to operate and shut off all propane flow.

l. Power up the Safe-T-Stop receiver and keypad (press the On button). Pull emergency shutdown switch OUT.

CAUTION

Tag and lock out valves and switches to any inoperable burners or ignitors.

m. Check for proper ignitor operation by firing each ignitor in turn.

n. Slowly open LPG manifold shutoff valve on control stand.

o. Test Safe-T-Stop keypad from the remote side of the burn area and reset system.

p. Test E-stop system and reset system.

5 TRAINING EXERCISE.

WARNING

- Extremely high temperatures and hot surfaces will be encountered during training exercise. It is imperative to wear appropriate protective clothing. Failure to comply may cause serious injury or death to personnel. SCBA shall be utilized for all exercises.

- While attempting to ignite fires, flames should be present within a reasonable amount of time (5-10 seconds), if not, close manual propane valve(s), shut off appropriate ignitors, and allow LPG in burn area to dissipate before attempting re-ignition. Failure to comply could pose a serious risk of explosive gas build-up.

- Make sure ignitor cooling water jackets are properly operating prior to igniting ground fires. Failure to comply will result in damage to equipment and pose a hazard to personnel.

- The following are considered abnormal conditions and/or emergency situations requiring activation of the system E-Stop switch for emergency shutdown anytime a firefighter: appears (1) to have blown out or extinguished the fire, (2) fails to follow any direction of the Instructor-in-Charge or the Safety Officer, (3) falls down inside the AFTF, (4) or enters inside the AFTF standing completely upright with fire operating.

- Since the fires are intended to simulate a solid object fire event, the following actions are inappropriate and constitute an emergency condition requiring activation of the system E-Stop switch for emergency shutdown anytime the nozzle or any firefighter including his PPE: (1) breaks the vertical plane of the cargo box, (2) breaks the plane of the control surfaces in the cockpit, (3) breaks the plane of any passenger fire burner shield or the area above the burner itself, (4) breaks either end plane of an engine, (5) enters the area under the cockpit stairs, (6) enters the area under the passenger seats or breaks the plane of the front surface of the passenger seat backs, (7) enters an area above an operating burner, (8) or enters the area directly below the APU or Wheel fire when the burner is operating.

a. The Training Instructor in Charge shall be in control of the training exercise. Dedicated radio communication shall be established between Ignition Officer, Training Instructor in Charge, and Safety Officer.

b. The Training Instructor in Charge shall confirm all Pre-Exercise Inspection and Set Up procedures have been completed.

c. The Training Instructor in Charge initiates, oversees, and terminates the training exercise.

NOTE

Pre-burn time will not exceed 3 minutes (180 seconds). Actual exercise burn time will be determined by the Training Instructor in Charge. After manual control valves are closed fire will burn an additional 15 to 25 seconds.

d. At the prompt of the Training Instructor in Charge, the Ignition Officer shall:

(1) Ignite selected burners by activating the appropriate ignitor switch and slowly opening the corresponding burner control ball valve until flame is present. Repeat steps until all required burners are ignited.

(2) Exercise Shut Down Procedures (At prompt of the Training Instructor in Charge):

(a) Close individual burner control ball valve(s).

(b) Visually confirm all flames are extinguished.

(c) Position all ignitor switches to OFF when all burner control valves have been closed.

6 SYSTEM SHUTDOWN AND CLEAN UP.

When training is complete, the Training Instructor in Charge shall direct the Ignition Officer to:

a. Close manifold shutoff valve.

b. Burn off all gas in the propane manifold by activating selected ignitors and opening corresponding burner control ball valves.

c. Once fire has burned out, close all LPG burner control ball valves.

d. Position all ignitor switches to OFF.

e. Determine the area is safe.

f. Push emergency shutdown switch or handheld Safe-T-Stop into the OFF position.

g. Activate sprinkler and make sure ignitor cooling water jackets remain ON while mock-up cools for a minimum of 15 minutes.

NOTE

The sprinkler system shall run for a minimum of 15 minutes after the last fire event. Wash-down and flushing the AFTF for a minimum of 1 hour clears unburned hydrocarbons and residue from the burn area and assists in maintaining suitable water quality. Facilities experiencing algae growth or blooms will need additional flushing time. Stagnant water promotes the growth of algae.

h. Close globe valve in line from propane tank to control stand.

i. Close valves on pneumatic system cylinders.

j. Activate wash-down system to flush burn area for a minimum of 1 hour.

k. On the electrical services rack (1), position the master ignition system power switch to OFF and (2), ensure the main disconnect switch and essential systems stays ON. These systems include cathodic protection, obstruction lighting, lift station pumps, algae control pumps and any security control lighting.

l. Level drive around area.

Table 1. Aircraft Fire Training Facility Pre-Exercise Inspection/Set-Up/Operation/Shutdown Checklist

Pre-Exercise Inspection	Item	Yes or No with Comments
	1. Inspect propane storage tanks, associated gauges, piping and valves.	
WARNING If an obvious unsafe or unserviceable condition is noted, halt operation and rectify condition prior to proceeding.	2. Take propane tank level reading, compare roto gauge to float gauge.	
	3. Inspect control stand to include electrical and mechanical components, piping, valves and pneumatic system.	
	4. Inspect mock-up to include electrical and mechanical components, piping, valves, pneumatic system and fuselage drain holes.	
CAUTION The entire training facility is a no smoking area.	5. Inspect burn area. Make sure rock is level and no higher than top of weir.	
	6. Make sure burn area drain valve is closed and weir drain valve is open.	
	7. Inspect all interior and exterior burners for corrosion/warped.	
CAUTION Ensure propane tank level is sufficient for scheduled training.	8. Inspect all interior and exterior ignitors.	
	9. Inspect all ignitor covers and burner baffles.	
	10. Inspect mock-up expansion joint bolts, (hand tight).	
CAUTION Pre-Exercise procedures shall be performed by ONLY Training Instructor in Charge, Safety Officer and Ignition Officer.	11. Inspect mock-up doors for freedom of operation and excessive corrosion.	
	12. Inspect water piping, water jackets and sprinkler system.	
	13. Inspect drive around area for ruts and debris.	
	14. Inspect exterior lighting for proper operation, if applicable.	

Table 1. Aircraft Fire Training Facility Pre-Exercise Inspection/Set-Up/Operation/Shutdown Checklist - Continued

WARNING Proper PPE shall be worn during Roto Gauge operation.	15. Inspect pneumatic system tanks, gauges, valves and piping.	
	16. Inspect water conservation pond liner, sufficient water and debris.	
Pre-Exercise Setup	Item	Yes or No with Comments
	1. On electric service rack position all main circuit breakers to ON.	
	2. Make sure all water drain valves are closed.	
	3. Open appropriate water valves and apply power to water conservation pond pump and test for adequate pressure. Open wash-down system and bring water level to top of weir drain, turn wash-down off when water begins to flow into weir drain.	
	4. Open ignitor cooling control valve and make sure water continuously flows to all water jackets on the mock-up.	
	5. Turn on pneumatic system. Ensure the operating pressure is set to 60-120 psi.	
NOTE Rapidly opening the globe valve may cause the excess flow valve to shut-off all propane flow.	6. Slowly open globe valve in LPG line from propane tank to control stand.	
	7. Power up the Safe-T-Stop receiver and keypad.	
	8. Pull Emergency Shutdown switch UP, (activates power to control stand).	
	9. Check for proper ignitor operation by firing each ignitor in turn.	
CAUTION Tag and lock out valves and switches to any inoperable burners or ignitors.	10. Slowly open LPG manifold shutoff valve on control stand.	
	11. Test each fire scenario for proper ignition and normal shutdown.	
	12. Test Safe-T-Stop keypad from remote side of burn area, then reset.	
	13. Test Emergency Shutdown switch on control stand, then reset.	
Training Operation	Item	Yes or No with Comments
	1. The Training Instructor in Charge shall be in control of the training exercise.	
	2. Dedicated radio communication shall be established between Training Instructor in Charge, Ignition Officer and Safety Officer.	

Table 1. Aircraft Fire Training Facility Pre-Exercise Inspection/Set-Up/Operation/Shutdown Checklist - Continued

WARNING Proper PPE including SCBA shall be utilized for all exercises.	3. The Training Instructor in Charge shall confirm all Pre-Exercise Inspection and Set-Up procedures have been completed.	
	4. The Training Instructor in Charge initiates, oversees and terminates the training exercise.	
WARNING Make sure ignitor cooling jackets are properly operating prior to igniting any fires.	5. Actual exercise burn time will be determined by the Training Instructor in Charge. After manual control valves are closed fire will burn an additional 15 to 25 seconds.	
	6. Pre-burn time will not exceed three minutes. After manual control valves are closed fire will burn an additional 15 to 25 seconds.	
WARNING Activate Emergency Shutdown or Safe-T-Stop in case of any abnormal condition or emergency situation.	7. Initiate training exercise: At the prompt of the Training Instructor in Charge, the Ignition Officer shall: Ignite selected burners by activating the appropriate ignitor switch and slowly opening the corresponding burner control valve until flame is present. Repeat steps until all required burners are ignited.	
	8. Shut down training exercise: At the prompt of the Training Instructor in Charge, the Ignition Officer shall: Close individual burner control valves, visually confirm all flames are extinguished and position all ignitor switches to OFF when all burner control valves have been closed.	
System Shutdown/Clean Up	Item	Yes or No with Comments
	1. Close propane manifold shutoff valve.	

Table 1. Aircraft Fire Training Facility Pre-Exercise Inspection/Set-Up/Operation/Shutdown Checklist - Continued

	2. Burn off all gas in the propane manifold by activating selected ignitors and opening corresponding LPG burner control ball valves.		
	3. Once fire has burned out, close all LPG burner control ball valves.		
	4. Position all ignitor switches to the OFF position.		
	5. Determine training area is fire safe.		
	6. Push emergency shutdown switch or handheld Safe-T-Stop to the OFF position.		
	7. Activate sprinkler system and make sure ignitor cooling jackets remain ON while mock-up cools for a minimum of 15 minutes.		
	8. Open wash-down and flush area for a minimum of 1 hour. Facilities experiencing algae growth will need additional flushing.		
	9. Close globe valve in line from propane tank to control stand.		
	10. Turn off air compressor/pneumatic system cylinders and close appropriate valves for the pneumatic system.		
	11. Position the master ignition system power switch to OFF and ensure the main disconnect switch and essential systems (cathodic protection etc.) stay ON.		
	12. Level drive around and training area of any holes or ruts made during training.		
Tank Level Readings	Before Training:	After Training:	Inspection/Set-up Date/Time:
Instructor Performing Inspection/Set-Up/Shutdown	Name:		Shutdown/Clean up Date/Time:

SUBORDINATE WORK PACKAGE

TECHNICAL PROCEDURES

OPERATION AND MAINTENANCE INSTRUCTIONS WINTERIZATION PROCEDURES

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE SWP PAGES

Total Number of Pages in this SWP is 4 consisting of the following:

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LIST OF ILLUSTRATIONS

REFERENCE MATERIAL REQUIRED

Publication Number	Publication Title
WP 004 00	(Paragraph 7-Paragraph 8) Emergency Procedures
WP 005 00	(Table 1) Semi-Annual System Safety Inspections and Operational checks

APPLICABLE TCTOs
NONE

CONSUMABLE MATERIALS
NONE

APPLICABLE SUPPORT EQUIPMENT
NONE

1 FOREWORD.

This work package contains winterization procedures for the Aircraft Fire Training Facility (AFTF).

2 SAFETY SUMMARY.

Various steps in this work package may require personnel to be exposed to liquid propane vapor and fumes. It is imperative to be aware of the EMERGENCY PROCEDURES in Work Package 004 00, Paragraph 7 and Paragraph 8. Failure to comply may cause serious injury.

3 WINTERIZE.

WARNING

If an obvious unsafe condition is noted, halt operations and rectify condition prior to proceeding. Failure to halt and correct conditions may cause injury.

CAUTION

The entire training facility is a no smoking area.

NOTE

- Winterization procedures shall be performed by authorized personnel.
- No vehicles are allowed in burn area.
- Perform semi-annual inspection in accordance with WP 006 00 prior to performing these procedures.

a. Flush burn area for not less than one hour.

b. Exercise, service and lubricate all valves for the water system.

c. Open the burn area drain valve (Figure 1), weir drain valve, water manifold drain valve, trench drain valve and fire department connection. These valves must remain open to drain for not less than 72 hours.

d. Introduce a minimum of 90 CFM of compressed air into the water system to blow out all water lines. Maintain air until all moisture is out of lines to keep from freezing for the winter.

e. Verify that the water conservation pond pump has a minimum of three feet of water for cover or remove water pump from the water conservation pond and place in storage as directed by owner.

f. Remove pond aerator and place in storage as directed by owner.

g. Remove other existing water pumps, if applicable, and place in storage as directed by owner.

h. Install a temporary sump pump if practicable to prevent freezing of electric, propane and pneumatic system.

i. Tag and lock out all ignitor switches and propane valves used to control all burner locations. Tag and lockout the wash-down, ignitor cooling, engine water and sprinkler controls/switches.

j. Visually verify all water has drained from burn area and close the burn area drain valve and weir drain valve.

k. Verify that the rectifier for the impressed current cathodic protection system is operational.

l. Winterize each ignitor by cleaning with compressed air and applying non-freezing liquid to dissipate any moisture that may be collected by the ignitor throughout the winter.

m. Cover and securely seal each individual ignitor.

n. Lubricate and service all switches, cabinet hinges, latches, etc.

o. Verify that all automatic pumping systems are functional for winter.

p. Introduce a minimum of 90 CFM compressed air into the propane system and remove all water from propane lines and co-ax valves. Maintain air until all moisture is out of lines to keep from freezing for the winter.

q. Drain air accumulator, air compressor tank and the air dryer of all water/moisture.

r. Service all pneumatic system/air pilot valves.

s. Identify all minor and major repairs needed for Spring start up.

4 DE-WINTERIZE.

WARNING

If an obvious unsafe condition is noted, halt operations and rectify condition prior to proceeding. Failure to halt and correct conditions may cause injury.

CAUTION

The entire training facility is a no smoking area.

NOTE

- De-winterization procedures shall be performed by authorized personnel.
- No vehicles are allowed in burn area.
- Perform Semi-Annual Inspection in accordance with WP 006 00 prior to performing these procedures.

a. Install water pump and pond aerator if applicable.

b. Close fire department connection, water manifold drain, trench drain and burn area drain valves.

c. Turn on main circuit and appropriate breakers for water pump.

d. Remove all lockout tags.

e. Open weir drain.

f. Open ignitor cooling, engine, wash-down and sprinkler system valves and adjust to assure that all functions are operating at the proper pressures.

g. Operate ignitor cooling, engine, sprinkler and wash-down systems for one hour.

h. Verify that the rectifier is in service for the cathodic protection service.

i. Lubricate and service all switches, cabinet hinges, latches, etc.

j. De-winterize all ignitors and assure good solid (functional) ignition.

k. Check that all applicable pumps and/or lift stations are fully operational.

l. Check and verify that all identification and warning labels are installed, clear and legible.

m. Fill burn area to operating level and assure that ignitor coolers are adjusted properly.

n. Treat the water in the water conservation pond to help prevent algae growth if necessary.

o. Verify that the mechanical emergency shutdown valves associated with filling the propane tank are functioning properly and serviced.

p. Check that the propane tank float gauge is operational.

q. Check that the propane tank roto-gauge is operational.

r. Check that the propane tank pressure gauge is functioning.

s. Cycle all of the propane system valves to include excess flow valve and perform leak test at all connections.

t. Perform common maintenance on all the propane parts and equipment as recommended by the manufacturer.

u. Perform a pressure test on the pneumatic system/air system. ▌

v. Service and cycle all of the pneumatic system/air pilot valves. ▌

w. Operate the entire propane system assuring that all burners are functioning properly and that all emergency shutdown times are achieved.

x. Have a fire truck and crew stand by while testing live fire scenarios and making any burner adjustments, minor repairs, etc.

y. Identify all minor and major repairs needed.

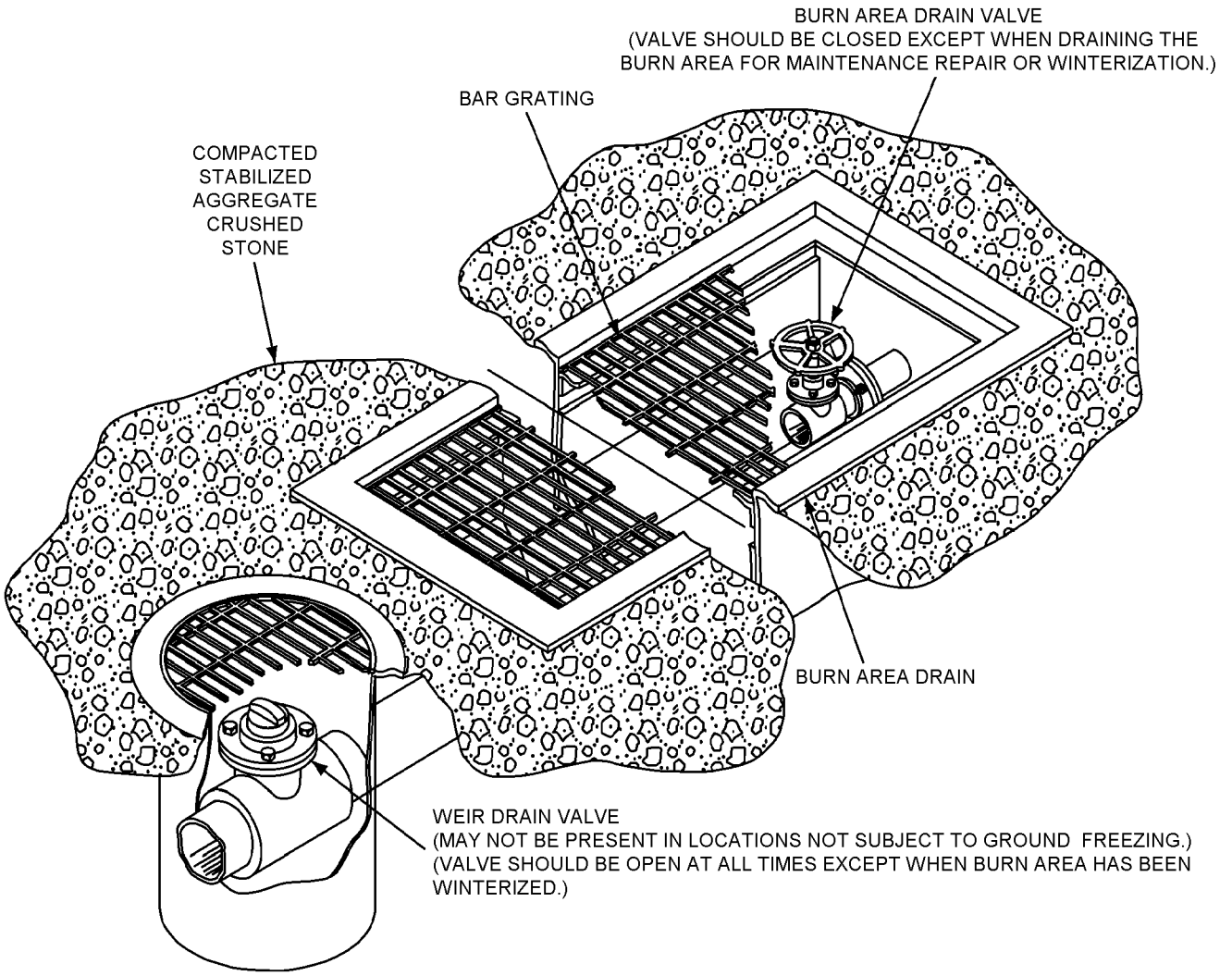

Figure 1. Burn Area Drain

WORK PACKAGE

TECHNICAL PROCEDURES

OPERATION AND MAINTENANCE INSTRUCTIONS SEMI-ANNUAL SYSTEM SAFETY INSPECTION AND OPERATIONAL CHECKS

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE WP PAGES

Total Number of Pages in this WP is 12 consisting of the following:

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REFERENCE MATERIAL REQUIRED

Publication Number	Publication Title
WP 004 00	(Paragraph 7-Paragraph 8) Emergency Procedures

APPLICABLE TCTOs
NONE

CONSUMABLE MATERIALS
NONE

APPLICABLE SUPPORT EQUIPMENT
NONE

1 FOREWORD.

This work package contains semi-annual system safety inspection and operational checks for the Aircraft Fire Training Facility (AFTF).

2 SAFETY SUMMARY.

Various steps in this work package may require personnel to be exposed to liquid propane vapor and fumes. It is imperative to be aware of the EMERGENCY PROCEDURES in Work Package 004 00, Paragraph 7 and Paragraph 8. Failure to comply may cause serious injury. In the interest of safety and to maintain AFTFs in a manner that will ensure its serviceability and prevent deterioration in operational effectiveness, installations will make sure all maintenance and repair work shall comply with AFTO 35E1-2-13-1 Operation and Maintenance Instructions for AFTFs, manufacturer's recommendations and procedures, and local, state, and federal guidelines as applicable to the work involved. Installation, testing and replacement of gas piping, gas utilization equipment or accessories, repair and servicing equipment, shall be performed only by qualified agencies. After major repair or a major problem is discovered, the owner must contact AFCEC/CXF to determine the need to re-commission the AFTF. AFCEC/CXF will determine if the AFTF will remain out-of-service and if a site visit is necessary. Installations shall have the option to have prime vendors, in-house, or other means to perform required inspection and maintenance. Periodic reviews of the AFTFs will be conducted by AFCEC/CXF to determine the effectiveness of the semi-annual inspection procedures. If the semi-annual inspection is not conducted, within 240 days, then the AFTF will be put out of service until the inspection is completed and documented.

3 SEMI-ANNUAL SYSTEM SAFETY INSPECTION AND OPERATIONAL CHECKS.

WARNING

If an obvious unsafe or unserviceable condition is noted, halt operations and rectify condition prior to proceeding. Failure to comply may cause injury or death to personnel.

CAUTION

The entire training facility is a no smoking area.

NOTE

The Semi-Annual System Safety Inspection and Operational Checks procedures shall be performed by qualified personnel.

a. Inspect burn area. Make sure rock is level so when flooded a continuous film of water covers area from side to side. Make sure rock level is no higher than top of weir.

b. Inspect burn area drain valve and weir drain valve for freedom of operation and absence of obstructions.

c. Inspect exterior and interior burners and ignitors, and make sure that burner grates are not excessively corroded or warped and that ignitor protective covers and burner baffles are in place.

d. Inspect ignitors and make sure electrode is clean and ceramic insulator is not cracked or damaged.

e. Inspect mock-up. Make sure expansion joint bolts are finger tight.

f. Inspect mock-up doors for freedom of operation and excessive corrosion.

g. Inspect dual liner leak detection point, if applicable, for evidence of liner leaks. Some accumulation of liquid may be present due to normal rate of condensation.

h. Inspect exterior lighting for proper operation.

i. Inspect propane system to include tank, gauges, valves, piping, pneumatic system or manual safety system, and regulators for corrosion, wear, or serviceable limits.

j. Inspect control stand to include electrical and mechanical components, piping, valves, and regulators. Check for corrosion, wear, or serviceable limits. Inspect markings on valves and switches for legibility.

k. Inspect water conservation pond area. Examine visible portion of liner for damage.

l. Inspect transformer enclosure, transformers, and ignition cable for corrosion, wear, or serviceability limits.

m. Inspect electrical service rack for corrosion, wear, or serviceability limits.

n. Open the wash-down, ignitor cooling, sprinkler, and engine water valves and apply power to water conservation pond pump. Test for adequate operation and water pressure. Turn pump off and close all valves when testing is complete.

o. Charge applicable pneumatic system for operation and examine for leaks.

p. Function ignition and emergency shutdown systems to ensure proper operation. Flame extinguishment for internal burners should result within five seconds while external burners should result within ten seconds.

q. Pressurize propane piping for one (1) hour and examine for leaks with flammable gas detector. Depressurize propane piping.

r. Inspect cathodic system, if applicable.

s. Inspect drive around burn area for ruts. Level all ruts before proceeding.

t. Obtain water sample for environmental testing, if applicable.

4 CONTRACTOR INSTRUCTIONS.

The contractor shall maintain the AFTF by scheduling and conducting two semi-annual inspections (not to exceed 240 days) in conjunction with winterization/de-winterization activities where applicable. The contractor shall perform all inspections, testing and maintenance IAW TO 35E1-2-13-1, dated 9 June 2013, Table 1, Semi-Annual System Safety Inspection and Operational Checks and Table 3, Maintenance Inspection and Test Schedule (SEE ATTACHMENT 2 and 3 for inspection checklists to be used). The contractor shall provide a written summary of the conditions found during the inspection. The contractor shall identify all discrepancies needing immediate repair/replacement. See Table 2. The contractor will also identify any foreseeable problems which may require future budgeting. The contractor shall provide a cost estimate to repair/replace all items identified as discrepancies. See Table 2.

5 DOCUMENTATION.

The Maintenance Inspection and Test Schedule on pages 5 through 12 will be documented and filed. Records will be maintained for a minimum of 3 years.

Table 1. Semi-Annual System Safety Inspection and Operational Checks

Subsystem	Item	Inspect Ops Check	Ops Check How	Required Action	Action Taken
Propane Storage	ASME Tank	Corrosion Cracks Leakage	N/A	Repair/ replace	
	Foundation, Cradle, and Saddle Pads	Corrosion Cracks	N/A	Repair/ replace	
	Area Inside Fence	Free of debris and vegetation	N/A	Remove debris	
	Welded, Flanged, Threaded Connections	Corrosion Cracks Leakage	N/A	Repair/ replace	
	Float Gauge	Corrosion Cracks Leakage Readable	Compare to Roto Gauge reading	Replace	
	Roto Gauge	Corrosion Cracks Leakage Readable	Function in accordance with tech order. Compare to float gauge	Repair/ replace	
	Pressure Gauge (250 psig service)	Corrosion Cracks Leakage Readable	Compare with vapor pressure data	Replace	
	Temperature Gauge	Corrosion Cracks Leakage Readable	Compare with vapor pressure data	Replace	
	Relief Valves in Tank	Corrosion Cracks Leakage Clean and Clear	N/A	Repair/ replace	
	Manual Valves in LPG Lines (250 psig service)	Corrosion Cracks Leakage	Freely Opens, Closes, and Seals	Repair/ replace	

Table 1. Semi-Annual System Safety Inspection and Operational Checks - Continued

Subsystem	Item	Inspect Ops Check	Ops Check How	Required Action	Action Taken
	Excess Flow Valves LPG Lines	Corrosion Cracks Leakage	N/A	Replace	
	3 inch Propane Fill Line from Truck Station (Bollards)	Corrosion Cracks Leakage Labeled	N/A	Repair/ replace	
	2 inch Vapor Return Line to Truck Station (Bollards)	Corrosion Cracks Leakage Labeled	N/A	Repair/ replace	
	Emergency Shutoff Valves (250 psig service)	Corrosion Cracks Leakage	Freely Opens, Closes, and Seals	Replace	
	Pneumatic Shutoff Valves (250 psig service)	Corrosion Cracks Leakage	Freely Opens, Closes, and Seals	Repair/ replace	
	Hydrostatic Relief Valves in Lines	Corrosion Cracks Leakage Clean and Clear	N/A	Replace	
	Propane Line to Stand	Corrosion Cracks Leakage Labeled	N/A	Repair/ replace	
	Fence	Corrosion Condition Free of Debris	N/A	Repair Clear Debris	
	Paint	Cracks Pealing Flaking	N/A	Repair	
	Stenciling, Labeling and Marking (Plate Data)	Clean Readable	N/A	Repair/ replace	
	Exterior Lighting	Visual Verify All	Freely Turns On and Off	Repair/ replace	

Table 1. Semi-Annual System Safety Inspection and Operational Checks - Continued

Subsystem	Item	Inspect Ops Check	Ops Check How	Required Action	Action Taken
Water Conservation Pond	Inflow to Pond from Burn Area	Corrosion Leakage Free of Debris	Free Flowing	Repair	
	Outflow from Pond to Burn Area	Corrosion Leakage Free of Debris	Free Flowing	Repair	
	Outflow Pump	Corrosion Cracks Leakage Clean and Clear	Free Flowing Smooth and Quiet Running	Repair/ replace	
	80 mil Liners <80 mil Liners	Cracks Tears	N/A	Repair in Accordance with Tech Order	
	Liner Notice Sign	Clean Readable	N/A	Replace	
	Fence	Corrosion Condition Free of Debris	N/A	Repair Clear Debris	
	Strainer	Visual Verify Free Flow	Debris Free	Remove Debris and Clean	
	Aeration System	Running Free Flow	Check Visually and Repair Replace	Clean of Debris	
	Algae Prevention	Free of Algae	Check Visually and Water Treatment	Remove Algae	
Safety/Control Stand	LPG Manifold Shutoff Valve	Corrosion Cracks Leakage	Freely Opens, Closes, and Seals	Repair/ replace	
	LPG Manifold	Corrosion Cracks Leakage	N/A	Repair/ replace	
	LP Lines to Burn Area	Corrosion Cracks Leakage	N/A	Repair/ replace	

Table 1. Semi-Annual System Safety Inspection and Operational Checks - Continued

Subsystem	Item	Inspect Ops Check	Ops Check How	Required Action	Action Taken
	Burner Control Ball Valves	Corrosion Cracks Leakage	Freely Opens, Closes, and Seals	Repair/ replace	
	Solenoid Valves in LPG Lines	Corrosion Cracks Leakage	Opens Closes Seals No Chatter	Repair/ replace	
	Momentary Ignitor Switches	Corrosion Clearly Labeled Readable	Freely Opens and Closes	Replace	
	Continuous Ignitor Switches	Corrosion Clearly Labeled Readable	Freely Opens and closes	Replace	
	Emergency Shutdown Switch	Corrosion Clearly Labeled Readable	Freely Opens and Closes	Replace	
	Hydrostatic Relief Valves	Corrosion Cracks Leakage Clean and Clear	N/A	Replace	
	Template	Clean Readable	N/A	Replace	
	Valve Labeling	Clean Readable	N/A	Replace	
	Switch Labeling	Clean Readable	N/A	Replace	
	LPG Line Regulator	Corrosion Cracks Leakage	Freely Opens and Closes	Replace	
	Sprinkler Control	Corrosion Cracks Leakage	Freely Opens and Closes	Repair/ replace	
	Wash-down Control	Corrosion Cracks Leakage	Freely Opens, Closes, and Seals	Repair/ replace	

Table 1. Semi-Annual System Safety Inspection and Operational Checks - Continued

Subsystem	Item	Inspect Ops Check	Ops Check How	Required Action	Action Taken
	Cooling Water Control	Corrosion Cracks Leakage	Freely Opens, Closes, and Seals	Repair/ replace	
	244 SCF N2 Bottles	Secure in Place	Pressure Available 500-2200 psi	Repair/ replace	
	Pneumatic System Pilot Valves	Corrosion cracks leakage after cracks	Freely Opens, Closes and Seals	Repair/replace	
	N2 Accumulator	Corrosion Cracks Leakage	N/A	Repair/ replace	
	Pneumatic Relief Valve	Corrosion Cracks Leakage Clean and Clear	N/A	Replace	
	Warner Sign	Clear Readable	N/A	Replace	
	Control Stand Lights	Visual Verify All	Freely Turns On and Off	Repair/ replace	
	Accumulator Tank	Visual Verify No Leaks	Free Flow Air	Drain Moisture	
	Air Compressor	Visual Verify No Leaks	Free Flow Air	Drain Moisture	
Electric Control Stand	Switches/Breakers	Corrosion/Cracks/In Place	Switch Functionality	Remove/replace	
	Cabinets/Hinges/Latches	Freely Opens, Closes And Seals	Lubricate	Repair/replace	
	22R08A Receiver Assembly	Corrosion Clean And Readable	Switch Functionality	Repair/replace	
	24T09A-01 Hand Held Transmitter	Corrosion Clean And Readable Check Battery	Switch Functionality	Repair/replace	
Burn Area	Wash-down Header	Corrosion Cracks Leakage Clean and Clear	N/A	Repair/ replace	

Table 1. Semi-Annual System Safety Inspection and Operational Checks - Continued

Subsystem	Item	Inspect Ops Check	Ops Check How	Required Action	Action Taken
	Weir	Corrosion Cracks Leakage Clean and Clear	N/A	Repair/ replace	
	Aggregate 80 mil Liner <80 mil Liner	Level Cracks Tears	N/A N/A	Level Repair in Accordance with Tech Orders	
	Liner Signs	Clean Readable	N/A	Replace	
	6 inch Weir Drain Valve	Corrosion Cracks Leakage	Freely Opens, Closes and Seals	Repair/ replace	
	2 inch Burn Area Drain Valve	Corrosion Cracks Leakage	Freely Opens, Closes and Seals	Repair/ replace	
	Ground Burners and Grates	Corrosion Cracks Warped Holes Open	Full Flame	Repair/ replace	
	Coax Valves in Propane Lines	N/A	Freely Opens, Closes and Seals	Repair/ replace	
	Drive Around	Level Rut-Free Debris-Free	N/A	Level	
	Leak Detection Dual Liner	Cracks Leakage Clean and Clear	Dry	Repair	
Aircraft Mock-up	Engine Burners	Corrosion Cracks Warped Holes Open	Full Flame	Repair/ replace	
	Wing Engine Running Fuel Plumbing	Corrosion Cracks Leakage	N/A	Repair	

Table 1. Semi-Annual System Safety Inspection and Operational Checks - Continued

Subsystem	Item	Inspect Ops Check	Ops Check How	Required Action	Action Taken
		Clean and Clear			
	Ignitor Cooling Jackets	Corrosion Cracks Leakage Clean and Clear	Check Water Flow	Repair	
	Wheel Well Burner	Corrosion Cracks Warped Holes Open	Full Flame	Repair/ replace	
	Interior (Bottom Under Decking)	Visual Verify All Drain Holes Open	N/A	Clean if Blocked	
	APU Burner	Corrosion Cracks Warped Holes Open	Full Flame	Repair/ replace	
	Flight Deck Burner	Corrosion Cracks Warped Holes Open	Full Flame	Repair/ replace	
	Battery Burner	Corrosion Cracks Warped Holes Open	Full Flame	Repair/ replace	
	Passenger Burner	Corrosion Cracks Warped Holes Open	Full Flame	Repair/ replace	
	Cargo Burner	Corrosion Cracks Warped Holes Open	Full Flame	Repair/ replace	
	Sprinkler System	Corrosion Cracks Warped Heads Clean and Clear	All Heads Full Flow	Repair/ replace	

Table 1. Semi-Annual System Safety Inspection and Operational Checks - Continued

Subsystem	Item	Inspect Ops Check	Ops Check How	Required Action	Action Taken
	Expansion Joint Bolts	Corrosion	Make Sure Finger Tight	Repair/ replace	
	Mock-up Welds and Surfaces	Corrosion Cracks Warped	N/A	Repair/ replace	
	Spill Fire	Corrosion Cracks Warped	Full Flame	Repair/replace	
	Fire/Pool Fire	Drain Holes Open			
Pneumatic Control System	Air Compressor	Proper Operation	Functions in accordance with Manufacturer Installation	Repair/replace	
	Pneumatic System	Proper Operation	Functions in accordance with Manufacturer Installation	Repair/replace	
Ignition	CH31723/CH31615/CH31917 Ignitors	Cracks Clean Air Gap	Crisp Spark	Replace	
	CH20485 Pigtails	N/A	Crisp Spark	Replace	
	Champion Splices	N/A	Crisp Spark	Replace	
	M3702-U5MC/U7MC Ignition Cables	N/A	Crisp Spark	Replace	
	110V Primary; 10kV, 23 MA Secondary Transformers	Corrosion Cable Connection	Crisp Spark	Repair/ replace	
Inspected By			Date		

Table 2. Identified Discrepancies and Future Budget

Discrepancies	Future Budget

WORK PACKAGE

TECHNICAL PROCEDURES

OPERATION AND MAINTENANCE INSTRUCTIONS GENERAL MAINTENANCE

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE WP PAGES

Total Number of Pages in this WP is 54 consisting of the following:

* Zero in this column indicates an original page.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
1 - 2	2	10 - 12	0	27 - 28	1
2.1 Added	1	13 - 14	1	29 - 44	0
2.2 Blank	1	14.1	2	45 - 46	1
3 - 8	0	14.2 Blank	1	46.1 - 46.2 Added	2
9	1	15 - 26	0	47 - 48	1

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LIST OF ILLUSTRATIONS

LIST OF TABLES

REFERENCE MATERIAL REQUIRED

Publication Number	Publication Title
WP 003 00	(Table 3) Master List of Consumable Items and Expendable Materials
WP 004 00	(Paragraph 7 - Paragraph 8) Emergency Procedures
WP 005 00	Standard Operating Procedures
WP 006 00	(Table 1) Semi-Annual System Safety Inspections and Operational Checks
WP 007 01	Fault Isolation

APPLICABLE TCTOs
NONE

CONSUMABLE MATERIALS

Nomenclature	Specification/Part Number	CAGE Code
Ball Valves 3/4 Inch and 1 Inch	Conbraco 83-500 and 86-500 (or equal)	72219
Door Panels	N/A	N/A
Ignitor	Champion CH31615	11583
Ignitor	Champion CH31917	0AFL4
Ignitor	NSN Non Assigned ICS Int'l Code Services 7860030	4T0W4
Water Pump- Submersible operating supply*	ITT Goulds	3N150

* Both nozzles have a square pattern which must be aligned with the fuselage. Where these nozzles were originally installed, no special changes will be required. Where standard fire suppression sprinklers were installed, increasing bushings will be required between the current pipe and the new nozzle.

APPLICABLE SUPPORT EQUIPMENT
NONE

1 FOREWORD.

This work package contains maintenance procedures for the Aircraft Fire Training Facility (AFTF). These procedures include liner maintenance, locating liner leak, cutout panel replacement, ignitor replacement, excavation procedures, regulator adjustment (Table 1), water pump replacement, and inspection criteria table (Schedule 1).

1.1 Record Maintenance. Each installation shall maintain a record of all maintenance and inspection actions conducted on the AFTF. AFTF documented records will consist of actions over the past three years. Any significant action over three years may be retained as historical data in a separate file as determined by the facility manager.

1.2 Semi-Annual System Safety Inspection and Operational Checks. The Semi-Annual System Safety Inspection and Operational Checks (WP 006 00) is an integral element of the general maintenance procedures of the AFTF. In the interest of safety and to maintain AFTFs in a manner that will ensure its serviceability and prevent deterioration in operational effectiveness, installations will make sure all maintenance and repair work shall comply with Air Force Technical Order 35E1-2-13-1 Operation and Maintenance Instructions for AFTFs, manufacturer's recommendations and procedures, and local, state, and federal guidelines as applicable to the work involved. Installation, testing and replacement of gas piping, gas utilization equipment or accessories, repair and servicing equipment, shall be performed only by qualified agencies. After major repair or a major problem is discovered, the owner must contact AFCEC/CXF to determine the need to re-commission the AFTF. AFCEC/CXF will determine if the AFTF will remain out-of-service and if a site visit is necessary. Installations shall have the option to have prime vendors, in-house, or other means to perform required inspection and maintenance. Periodic reviews of the AFTFs will be conducted by AFCEC/CXF to determine the effectiveness of the semi-annual inspection procedures.

1.3 Schedule Maintenance. It is advantageous to schedule maintenance action at one time to eliminate duplication of efforts. For example, the Semi-Annual System Safety Inspection, Operational Checks, and the general maintenance requirements should be conducted at the same time as Winterization or De-Winterization actions. This is especially true if a contractor is used to winterize or de-winterize the facility. Also, bases may elect to have a contractor annually or semi-annually do the Semi-Annual System Safety Inspection, Operational Checks and general maintenance independent of cold weather issues while doing the remainder of the Semi-Annual System Safety Inspection and Operational Checks using in-house resources.

2 SAFETY SUMMARY.

Various steps in this work package may require personnel to be exposed to liquid propane vapor and fumes, and high voltage - low current electricity. It is imperative to wear appropriate protective clothing and to be aware of the EMERGENCY PROCEDURES in Work Package 004 00, Paragraph 7 and Paragraph 8. Failure to comply may cause serious injury. Use of Self Contained Breathing Apparatus (SCBA) is required for all fires. Exposure to any skin areas may result in burns by heat and/or steam. Installation, testing, and replacement of gas piping, gas utilization equipment or accessories, and repair and servicing of equipment, shall be performed only by qualified agency. In the interest of safety, all persons employed in handling LP Gases shall be trained in proper handling and operating procedures, which the employer shall document. After major repair or a major

problem is discovered, the owner is obligated to contact Air Force Civil Engineer Center (AFCEC), the commissioning authority to determine what actions will be taken. AFCEC will determine if the AFTF will remain out-of-service, and if a site visit is necessary. Examples of major problems include any safety related condition that could lead to an imminent hazard such as:

- LPG piping or tank corrosion that has reduced the wall thickness to less than that required for the maximum allowable operating pressure.
- Any crack or other material defect that impairs the structural integrity or reliability of a LPG tank or piping.
- Any abnormal movement by environmental causes, such as earthquakes, landslides, or floods that may impair the serviceability of a pipeline, tank, or controls.
- Any malfunction or operating error that causes the pressure of a LPG pipeline or tank to rise above its maximum allowable working pressure.
- A leak in the LPG pipeline or tank that constitutes an emergency.

3 IGNITOR REPLACEMENT - CH31917.

WARNING

Make sure all electrical power to ignitors is off. Serious injury to personnel may result.

CAUTION

The entire training facility is a no smoking area.

NOTE

- Ignitor replacement procedures shall be performed by qualified personnel only.
- No vehicles are allowed in burn area.

There are 6 ignitors located in ground burners and 12 ignitors located in mock-up burners (Figure 6).

a. Remove ignitor cover bolts (Figure 1).

b. Remove ignitor cover.

c. Disconnect ignitor pigtail.

d. Remove ignitor mounting bolts (Figure 1).

e. Remove ignitor.

f. Reverse procedures to replace ignitor.

g. Once ignitor is replaced, functionally verify its operation by energizing the ignitor without applying propane. If spark is still not present, refer to Fault Isolation, WP 007 01.

4 IGNITOR REPLACEMENT - ICS 7860030.

WARNING

Make sure all electrical power to ignitors is off. Serious injury to personnel may result.

CAUTION

The entire training facility is a no smoking area.

NOTE

- Ignitor replacement procedures shall be performed by qualified personnel only.
- No vehicles are allowed in burn area.

There are 6 ignitors located in ground burners and 12 ignitors located in mock-up burners (Figure 3 and Figure 4).

a. Remove ignitor cover bolts (Figure 1).

b. Remove ignitor cover.

c. Disconnect ignitor pigtail and cut off pigtail.

d. Mount ignitor to cabinet or housing. Seal around all cabinet penetrations as appropriate. Ensure that ignitor body is well grounded to cabinet or housing (Figure 2).

e. Connect high voltage lead to terminal at base of ignitor using a high-tension Rajah connector or equivalent.

f. Apply shrink tube over connection from ceramic insulator over the terminal and onto the high voltage lead by ~2 inches, using high voltage shrink tube.

g. Apply second layer of shrink tube over the first layer extending ~1/2 inch beyond the first layer.

h. Connect ground lead to housing or cabinet in closest proximity to ignitor mounting point as possible.

i. Set air gap to 0.100 inches by adjusting insulator position up or down. Once gap is set, tighten gland nut in position. Ensure electrode tip is centered in relation to body prior to setting gland nut.

j. Once ignitor is replaced, functionally verify its operation by energizing the ignitor without applying propane. If spark is still not present, refer to Fault Isolation, WP 007 01.

5 CUTOUT PANEL REPLACEMENT.

Cutout panels may be located on the left and right sides of the mock-up. The panels are 36 inches wide x 84 inches high and constructed of 0.031 inch sheet metal. If training scenario includes forced entry extrication through cutout panels, panels should be installed prior to training exercise.

6 LINER MAINTENANCE.

The 80-mil thick high-density polyethylene (HDPE) liners are located in the water conservation pond, burn area, and trench. Sites may incorporate either a single liner or a dual liner. Instructions in this manual refer to a dual lined facility. The liners in the trench and burn area are buried, see EXCAVATION PROCEDURES for excavation details.

7 LOCATING LINER LEAK - BURN AREA.

WARNING

If an obvious unsafe or unserviceable condition is noted, halt operations and rectify condition prior to proceeding. Failure to halt and correct conditions may cause injury.

CAUTION

The entire training facility is a no smoking area.

NOTE

- Liner maintenance procedures shall be performed by qualified personnel only.
- No vehicles are allowed in burn area.

a. Fill burn area and mark water level.

b. After 72 hours, water will leak down to level where leak is located.

c. Repair liner in accordance with manufacturer's specifications.

8 LOCATING LINER LEAK - WATER CONSERVATION POND.

WARNING

If an obvious unsafe or unserviceable condition is noted, halt operations and rectify condition prior to proceeding. Failure to halt and correct conditions may cause injury or death to personnel.

CAUTION

The entire training facility is a no smoking area.

NOTE

Liner leak location procedures shall be performed by qualified personnel only.

a. Fill water conservation pond and mark water level.

b. After 72 hours, water will leak down to level where leak is located.

c. Repair liner in accordance with manufacturer's specifications.

9 EXCAVATION PROCEDURES.

CAUTION

The entire training facility is a no smoking area. Be observant for yellow plastic warning tape buried 12 inches below surface. This warning tape indicates underground wiring, anodes, grounding cells, or reference electrodes. Prior to backfill make sure warning tape is properly replaced.

NOTE

- Excavation procedures shall be performed by qualified personnel only.
- No vehicles are allowed in burn area.

Excavation may be required to repair buried items in the trench or burn area (Figure 9 and Figure 10).

a. Remove required amount of fill to expose item to be repaired, make sure to keep different fill types separated (Figure 11).

b. After repair is complete, backfill materials in appropriate order.

10 REGULATOR ADJUSTMENT.

WARNING

It is the responsibility of the Ignition Officer, Training Instructor, and the Safety Officer to immediately terminate any training exercise where personnel are placed at risk of injury.

a. Regulator pressure shall be adjusted in accordance with Table 1.

b. Loosen lock nut, adjust to proper flame height for appropriate burner, tighten lock nut.

Table 1. Burner Regulator Settings

Burner Location	Optimal Flame Height
Ground Burners	Not Regulated
Engine Burners	Fully Engulfed
Internal Burners	4-6 Feet

11 REGULATOR REPLACEMENT.

Regulator replacement will be with stainless steel braid reinforced hose (Figure 8).

11.1 LP-Gas Regulators. The existing LP-Gas regulators for the engines, cockpit, engine spill (battery), passenger, cargo, APU and wheel fires will be replaced with a flexible section of stainless steel braid reinforced hose or a section of Schedule 80 pipe. This will eliminate the problem experienced at some locations with leaking regulators and reduce the number of potential component failures affecting system reliability. This will function as a fixed orifice and limit the maximum liquid propane flow to each burner.

11.2 Orifice Section. The fixed orifice section(s) shall not be less than 18 inches (457 mm) nor more than 24 inches (609 mm) in length. The cockpit, engine spill (battery), passenger, cargo, APU, and wheel fire event regulators will be replaced with fixed orifice sections with an 1/8 inch (3 mm nominal) inside diameter. The engine fire events regulators will be replaced with fixed orifice section with a 1/4 inch (6 mm nominal) inside diameter.

11.3 Connectors. In reference to NFPA 58, the hose, quick connectors, hose connections, and flexible connectors shall be approved and fabricated of materials that are resistant to the action of LP-Gas both as liquid and vapor. If wire braid is used for reinforcement, it shall be of corrosion-resistant material such as stainless steel. Hose, hose connections and flexible connectors used for conveying LP-Gas liquid or vapor at pressures in excess of 5 psig (34 Kpag), shall comply with the following: hose shall be designed for a working pressure of 350 psig (2.4 Mpag) with a safety factor of 5 to 1 and shall be continuously marked with LP-GAS, PROPANE, 350 PSI WORKING PRESSURE and with the manufacturer's name or trademark. Hose assemblies, after the application of connections, shall have a design capability of not less than 700 psig (4.8 Mpag). If a bench field test is performed, such assemblies shall be leak tested at pressures between the operating pressure and 120% of the maximum working pressure [350 psig (24 Mpag) minimum] of the hose. It is essential that burners meet the size, length, hole position and diameter according to burner specifications in WP 007 00 (see pages 22 through 29). If the fire/flame are too big, this will be considered excessive and will exceed the safety limits. If the fire/flame is too small, this will be considered a limiting factor for emergency shutdown which will cause the duration of shutdown to exceed the five second standard.

12 REPLACEMENT OF GROUND BURNER GRATING.

Any ground burner with expanded metal tops shall be replaced. Original design grating corrodes at a high rate depreciation due to water submergence. Open bar grating will last longer and provide better stability around ground burner location. Second generation grating included the top while third generation (Change 3) provides grating on the bottom. **Only** replace the second generation grating when needed and then upgrade to the latest design. Refer to Figure 13 and

Figure 14 for latest designs. The two previous illustrated designs have been removed in favor of the latest design.

13 WATER PUMP REPLACEMENT.

a. Gain access to water pump.

b. Disconnect applicable piping and wiring.

c. Remove pump.

d. As an option during replacement of the water pump, a bank placement may be more suitable. See WP 003 00, Table 3, Master List of Consumable Items and Expendable Materials for specifications.

14 SPARE PARTS STOCK.

The following spares should be maintained in stock to support ready replacement of nonfunctional items. Specific information on parts is in WP 003 00.

Table 2. Spare Parts Stock

Spare	Quantity
Heat Shrink Tubing	2 feet
Teflon Tubing	4 feet
RTV Adhesive	1 tube
Sn63 Solder	1 spool
Ignitor	6 each
Ignitor Pigtail	6 each
Ignitor Transformer	1 each
COAX Valve	1 each
Pilot Valve	1 each
Solenoid Valve	2 each
3 Position Ignition* (off-on-momentary)	2 each
2 Position Ignition Switch* (off-on)	2 each
Burner Control Ball Valves	2 each

* each site has different switches

15 BALL VALVE REPLACEMENT.

WARNING

- Make sure all propane down steam of the propane storage tank has been burned off.
- Make sure all electric power to the safety/control stand is de-energized.

NOTE

- Ball valve replacement procedure shall be performed by qualified personnel only.
- All replacement ball valves shall be three part fire-safe ball valves as listed in Work Package 003 00 Master List of Consumable Items and Expendable Materials. Existing noncompliant ball valves shall be replaced on an attrition basis.

There are 15 propane burner control ball valves located in the safety/control tower (Figure 12).

a. Remove the existing ball valve(s).

b. Install the replacement ball valve(s).

c. Remove any locking devices from ball valve handles.

d. Once the ball valve(s) is replaced, functionally verify its operation by following the procedures in Work Package 005 00 Standard Operating Procedures.

16 CORROSION PREVENTION SYSTEM.

There are two types of Cathodic Systems: (1) Sacrificial zinc anode bed and (2) Impressed current. Both systems are required to stay OPERATIVE or ON at all times, not just during training and operations, to be effective against corrosion of the mock-up and its components. The sacrificial system is serviceable for 3 years before replacement. A sign will be affixed to the control stand to serve as a reminder to change out the anode bed(s) when due. Whichever system is em-

ployed will be added to the Civil Engineer's Corrosion Prevention Program.

NOTE

If a sign is not physically affixed to the control stand, then one must be manufactured, installed and included in the above notice. See sample sign and test below.

TO-35E1-2-13-1-007

17 ALGAE GROWTH CONTROL.

Most facilities will have some algae growth in the burn area and the water conservation pond under normal conditions. Limited algae on the water conservation pond liner and in the burn area should not be considered a problem and no corrective action is required. Excessive growth beginning to fill the water or float on the water does require action. Excessive growth may clog pumps, sprinkler heads, water jackets, and/or the wash-down header. When excessive algae growth is observed, the following actions should be initiated at least weekly:

a. Activate the wash-down system.

b. Using the wash-down control valve on the safety/control stand, balance the water flowing into the burn area with the water leaving the burn area through the weir.

c. Observe the system operations not less than once every 4 hours.

d. Operate the system for a minimum of 24 hours.

NOTE

It may take more than 24 hours operation to achieve initial control of an algae bloom in the water conservation pond. In some climatic locations, use of the wash-down system even with extended operating times may not be sufficient to control the algae. In these cases, a floating pond aeration pump will need to be added to the water conservation pond. The use of chemical algaecides is not recommended.

e. One recommendation is a product called AquaShade® which is an aquatic blue dye colorant that can be added to the water conservation pond to reduce the amount of light available to aquatic plants and algae. This product is a blend of noncorrosive, nontoxic blue and yellow dyes. Expect oxidation in chlorinated water systems. When poured into the water conservation pond, it will naturally disperse over a few hours, imparting a blue color to water. The dye reduces light penetration, particularly in the blue range (blue and red wavelengths of light are most efficient for driving photosynthesis). The dye is quite long lasting and is expected to slow the growth of submersed plants where water is more than 60 cm (approx. 2 feet) deep. If elected to use, apply at the rate of one gallon per four acre-feet of water (an acrefoot is a volume equivalent to one acre of water one foot deep or 1/2 acre two feet deep, etc.). Where rubber gloves when handling the product. Solid product when unpackaged can simply be placed in the water unwrapped. Wrapper will dissolve in water. If the liquid product is used, pour container out at water's edge. AquaShade® is available at Sales@Great-Fountains.com.

f. When using a Multi-Aspirator, ensure an additional sheet of 80 mil liner material is placed under the aerator to prevent puncture of the Water Conservation Pond primary liner. The aerator can operate 24/7, but not less than during all hours of day light. Remove the aerator when winterized.

18 RADIO REMOTE CONTROL SAFE-T-STOP SYSTEM.

The Safe-T-Stop System is a license free, 900MHz Radio Remote Control System. The 24T09A-01Keypad or Handheld Transmitter with a large Safe-T-Stop control ABORT/STOP pushbutton mounted in a rugged, reinforced poly case. It includes a self-test and battery status LED, custom faceplate, built-in internal antenna, AA alkaline batteries, shoulder strap and a leather holster. The 22R08A Receiver Assembly with eight (8) user definable control output relay includes a receiver RF/Microprocessor/Relay board, 12/24 VDC power supply and external "rubber duck" antenna in a NEMA 4 steel enclosure.

a. During a training exercise, if a situation occurs that places personnel at risk, the designated officer to carry the Safe-T-Stop will use the Safe-T-Stop to remotely

shut down the flow of LP gas to the mock-up. This can be accomplished by pressing the "STOP/ABORT" pushbutton on the transmitter (Figure 24). The remote does not timeout after being idle for any length of time.

b. Before proceeding with the training exercise, the risk in the training exercise must be eliminated whether the problem is with personnel or the facility and its systems.

c. The emergency stop button on the control stand will require reset as well as the Safe-T-Stop pushbutton in order to allow the flow of LP gas to resume.

19 PIPE THREAD SEALANTS FOR PROPANE PIPING.

Only pipe thread sealing compound or PFTE (Teflon) tape approved for use on LPG piping systems shall be used to make repairs on propane piping.

19.1 PFTE Tape. PFTE tape shall be of the full density type, normally yellow in color. The tape shall be of a brand approved for usage with LPG. One such known type is Mill-Rose 3-Wrap Yellow Gas Thread Seal Tape however any product designed for LPG gas piping is acceptable.

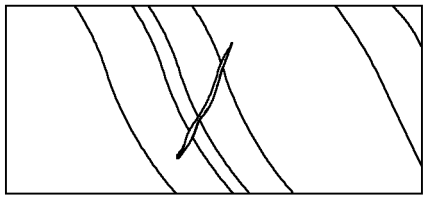
19.2 Teflon Tape. The use of standard white Teflon tape is not acceptable for propane piping but may be used on pneumatic system or air lines.

19.3 Threading Compound. Any pipe thread compound must be checked to assure that it is compatible with LPG piping systems. One such known compound is Rectorseal No. 5 however any product designed for LPG gas piping is acceptable.

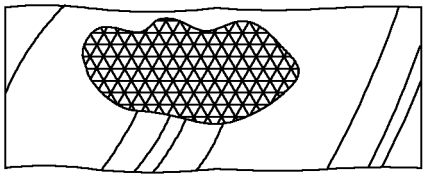
20 GUIDE TO HOSE INSPECTION.

Hose should be given a brief examination every time it is used and a complete examination according to the following procedure should be made at least once every month.

a. The hose should be depressurized and laid out as straight as possible to avoid kinking during the examination. The hose should be examined closely for cuts, abrasion, soft spots, bulges, and similar defects. If the hose is not depressurized, soft spots will not be evident.



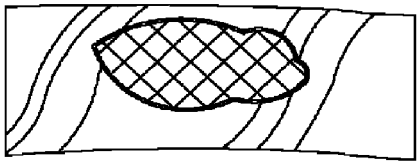
A CUT IN THE HOSE COVER.



WEAR AND ABRASION OF THE HOSE COVER EXPOSING THE TEXTILE BRAID.

TO-35E1-2-13-1-008

b. Cuts or abraded areas in the hose covering which have damaged or exposed the reinforcement fabric, with the exception of fabric exposure in a stainless steel reinforced hose, would be sufficient cause to remove the hose from service. Damage to stainless steel braids requires removal from service.



EXTREME WEAR AND ABRASION OF THE HOSE COVER THROUGH THE TEXTILE BRAID AND EXPOSING THE WIRE BRAID.

TO-35E1-2-13-1-009

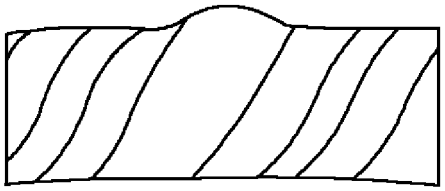
c. Small cuts and nicks in the outer cover should generally not be cause for hose replacement unless the rubber involved is loose or the reinforcement is exposed.

NOTE

Pricking the cover in the manufacture of this type of hose is common and good practice. Obviously, uniform pricking in the cover should not be considered as cuts or nicks in the covering.

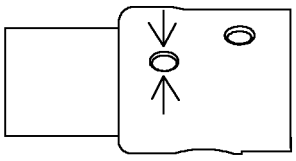
d. The area adjacent to the fitting for at least 18 inch back from the fitting should be carefully examined by pressing the hose with the thumb to detect any soft spots or bulges. Hoses having such weak sections should be removed from service immediately. This hose may be returned to service provided the requirements of Section 7 are satisfied.

e. Blisters or loose outer cover should be examined to see if it is a superficial condition or indicates structural weakness.



A BLISTER IN THE HOSE COVER.
TO-35E1-2-13-1-010

f. Each coupling should be inspected for slippage, which will be evidenced by misalignment of the coupling on the hose end and/or scored or exposed area where slippage has occurred. Any evidence of slippage shall require a new end on that section of the hose and reinstallation of the coupling. Examine the inside of the hose for blisters or bulges prior to replacing the coupling. If the condition of the hose is such that this is not practical, then the hose shall be removed from service and replaced.



SLIPPAGE OF THE COUPLING INDICATED BY END OF HOSE VISIBLE THROUGH HOSE IN FERRULE. WHEN INITIALLY COUPLED, THE END OF THE HOSE WAS ALL THE WAY TO THE BOTTOM OF THE FERRULE.
TO-35E1-2-13-1-011

g. Localized defects may be cut out and the good portions of the hose put back in service where possible.

h. Hose subjected to unusual abuse, such as stretching, kinking or flattening by a vehicle, shall be removed from service immediately and inspected by the above procedures.

i. If the hose passes all of the above preliminary inspection, it shall then be subjected to product pressure for its service and inspected again for defects. Hose, or sections of hose, passing this inspection may be returned to service.

NOTE

While this guide does not include a procedure for hydrostatic pressure test, it should be noted that some members of industry have found such a test to be of great benefit. When an operator elects to use such a test, the test pressure should not exceed the working pressure to which the hose is subjected. Such testing may be done in addition to this recommended visual inspection procedure. Please refer to NFPA No. 58 and Compressed Gas Association Pamphlet #P-7.

21 LPG-GAS BULK STORAGE SAFETY INSPECTION CHECKLIST.

The inspector should be thoroughly familiar with the detailed requirements of NFPA #58 and applicable state regulations, and should refer to the current editions for the exact criteria. This suggested list can be used as a guide for areas to be checked. (OSHA inspections may cover additional areas.) New or newly revised systems should be checked to see that they comply with codes and have adequate, safe designs. In addition to the initial inspection for system design, items which affect the safe maintenance condition of the system should receive periodic safety inspections. The item on this list which should be periodically checked for maintenance are identified by the letter ‘M’ in the adjacent margin.

LP Gas Storage Inspection Check List for Storage Containers

	Yes	No and Comments
I. Construction - Code Compliance		

LP Gas Storage Inspection Check List for Storage Containers

		Yes	No and Comments
M	a) Check for manufacturer's data plate. Is it securely attached and legible?		
	b) Is the data plate free of corrosion?		
	c) Is the pressure rating proper for the product in service?		
II. Condition of Container and Paint			
M	a) Are above-ground containers properly painted?		
M	b) Are container free of corrosion damage, dents, gouges, or other damage?		
	c) Is the stored product identified?		
III. Foundations			
M	a) Are foundations in good condition?		
M	b) Are footings free of settling which might cause misalignment or piping strain?		
M	c) Are containers free of corrosion at masonry contact areas?		
M	d) Are saddle pads in good condition?		
	e) Are multiple container elevations controlled to avoid unintentional overfilling?		
IV. Container Connections			
	a) Are excess flow valves properly sized for downstream piping? (Refer to NPGA Safety Bulletin #113 for information on excess flow valves.)		
	b) Are all container openings (except relief valve connections) equipped with proper fixed restriction, back check, excess flow, or internal valves and shut-off valves?		
M	c) Have excess flow and back flow check valves been recently checked for proper operation		
	d) Are connections marked "vapor" or "liquid"?		
V. Tank Fittings			
	a) Are all fittings subjected to container pressure rated for a least 250 psig working pressure?		
	b) Are containers of 2000 gallons water capacity or less limited to two plugged openings or less?		
M	c) Are all ACME (or other type) connectors in good condition with good gaskets and are they plugged or capped? (See NPGA Bulletin #134 "Care and Inspection of ACME Threaded Hose Couplings.")		
M	d) Are all unused opening plugged or capped?		
M	e) Are all fittings leak free?		
VI. Gauges			
M	a) Are pressure gauges in good condition and are they suitable for 250 psig service (such as 0-400 psig)?		
	b) Are pressure gauge opening protected by excess flow valves or a #54 drill restriction?		
M	c) Are thermometers in good condition and checked for accuracy?		
M	d) Are liquid level gauging devices approved for the service involved and in good condition?		
	e) Are level gauges arranged and installed so the liquid level can be properly determined?		
VII. Pressure Relief Valves			
M	a) Is relief valve data legible?		
	b) Are safety relief valves approved for the service involved?		
	c) Is the relief capacity sufficient as listed in NFPA #58?		
	d) Do relief valves communicate with the container vapor space and discharge vertically, unobstructed to the open air?		
	e) Do relief valves on containers over 2000 GWC have unrestricted size vent stacks of proper length?		

LP Gas Storage Inspection Check List for Storage Containers

		Yes	No and Comments
M	f) Do relief valves or vent stacks have protective caps or closures to prevent entry of foreign matter?		
M	g) Are weep holes for moisture drain open and is as impingement on the container prevented?		
M	h) Are relief valves less than 10 years old?		
M	i) Does external visual inspection look free of corrosion or obstruction?		
VIII. Shut-Off Valves			
	a) Are valves located so they may be easily reached during normal operations and in an emergency?		
M	b) Are valves in good condition and do they shutoff tight?		
IX. Catwalks and Stairways			
	a) Are stairways well anchored, supported and of slip-proofed construction?		
	b) Are railings provided and in good condition?		
	c) Does decking design offer drainage and prevent accumulation?		
	d) Are catwalks provided so personnel need not walk on any portion of the container?		
X. Locations and Spacing of Containers			
	a) Are storage containers located and spaced in accordance with NFPA #58?		
XI. Presence of Combustibles			
M	a) Is the area within 10 ft. of the container(s) free of weeds, long grass, rags, paper, wood or other combustible debris?		

Checked by _____ Date_____

LP Gas Bulk Storage Inspection Check List for Plan and Transfer Piping

		Yes	No and Comments
I. Pipe			
	a) Do all piping and fittings conform to NFPA #58? (See individual paragraphs of NFPA #58.)		
M	b) Are all connections leak tight?		
	c) Are there sufficient lines for all purposed, without improper dual use or are make-shift connections being used for some operations?		
	d) Are pressure gauges located so they will not be exposed to physical damage?		
	e) Are connections designated “liquid” or “vapor”?		
	f) Are all above ground lines securely fastened to structural members of adequate strength and supported at proper intervals?		
	g) Do flexible connectors conform to NFPA #58 and other applicable codes?		
II. Valves			
M	a) Are valves in good working order?		
M	b) Do seats shut off tight?		
M	c) Is packing free of leaks?		
	d) Are valves located for easy access?		
	e) Are emergency controls accessible under emergency conditions?		
M	f) Are necessary valve handlers available at the valve location?		
	g) Are there sufficient valves for all operations and emergency conditions?		
	h) Are they approved for that type of use?		
III. Hydrostatic Relief Valves			
	a) Are hydrostatic relief valves installed wherever liquid can be trapped between valves in liquid lines?		
	b) Are they 400 or 500 psig setting?		
M	c) Are they fitted with protective caps?		

LP Gas Bulk Storage Inspection Check List for Plan and Transfer Piping

		Yes	No and Comments
	d) Is the location or direction of valve discharge safe?		
IV. Transfer Areas			
	a) Are hoses the correct type for each use? Are hoses in good condition and free of deterioration, wear, and blisters? (See NPGA Bulletin #114 "Guide to Hose Inspection".)		
	b) Are hoses capped or plugged when not in use?		
	c) Are hose couplings of the correct type and properly attached (fully seated on the hose)?		
	d) Are ACME or other type couplings worn or damaged?		
	e) Are coupling gaskets in good condition?		
	f) Are the correct coupling wrenches available (if required)?		
	g) Are excess flow valves, where used, appropriately sized and in operable condition?		
	h) Are transfer connections equipped with emergency shutoff valves or back checks as required by NFPA #58?		
	i) Are the emergency valves in good operating condition?		
	j) Are these transfer valves protected from pullaway damage per NFPA #58 (i.e. stanchions)?		
	k) Are remote shutoff controls installed in an accessible area away from the transfer area?		
	l) Does the control system operate properly?		
	m) Are the shutoff controls clearly identified?		
	n) Are loading and unloading risers protected from traffic?		
	o) Are chock blocks provided for railcars?		
	p) Are "No Smoking" signs properly located and in good condition, and are "Tank Car Connected" signs properly used?		
	q) Are fire extinguishers of proper type, size, and rating provided at convenient locations?		
	r) Have extinguishers been tested and/or serviced?		
	s) Are rail car unloading hoses protected by individual back flow check valves?		
	t) Is adequate transfer hose storage provided?		
M	u) Are any necessary transfer instructions available?		
V. Pumps and Compressors			
M	a) Are shaft seals free of leaks?		
	b) Are pumps equipped with a spring loaded by-pass valve where required?		
M	c) Is the by-pass properly set and functional?		
M	d) Are drive belts or couplings protected by suitable guards?		
M	e) Is compressor crank case oil at proper level?		
VI. Electrical Equipment			
	a) Is all electrical equipment installed per NFPA #58?		
M	b) Do all switches, etc. function properly?		
M	c) Are all housings properly assembled to maintain seal?		

Checked by_____ Date_____

22 PNEUMATIC CONTROL SYSTEM.

This system is used to operate the pneumatic valves and coaxial valves within the facility for proper opening pressure required for LP flow or emergency shutdown. The pneumatic pressure source may be a High Pressure Pneumatic System or be a medium pressure Air Compressor. Systems may optionally be configured to use either source or just a single source. A pneumatic Reservoir/Accumulator Tank is required and maybe integrated with the Air Compressor. A Filter-Regulator-Lubricator Assembly, used in conjunction with the Air Compressor and installed downstream of the Air Tank, eliminates accumulated dirt and moisture within the system. Automatic and manual drains on the Filter-Regulator-Lubri-

cator Assembly must be monitored and purged when accumulation occurs to ensure proper operation of this system. The specifications for these components are located in WP 003 00, Table 3, Master List of Consumable Items and Expendable Materials. Inspection criteria for these components will be based on the manufacturer's manual, which is provided with purchase, and its recommendations.

23 PNEUMATIC CONTROL LINES REPLACEMENT.

When repairing (by replacement) or otherwise replacing pneumatic control lines in the burn area and service trench, the use of high density polyethylene (HDPE) piping is approved in additional to the original construction materials. Only approved HDPE products (WP 003 00, Table 3) may be used.

NOTE

HDPE products may not be exposed to sunlight or heat.

24 WATER DISTRIBUTION SYSTEM.

Above ground water distribution piping and controls shall be metal consistent with originally installed materials.

24.1 Buried Water Distribution Piping. Buried water distribution piping when being repaired by replacement may be high density polyethylene (HDPE) piping in additional to the original construction materials. Only approved HDPE products (WP 003 00, Table 3) may be used. There is no schedule on the HDPE.

NOTE

HDPE products may not be exposed to sunlight or heat.

25 IGNITOR CIRCUIT WIRING.

Standard design circuit is two ignition cables (WP 003 00, Table 3) one from the energized terminal on the ignition transformer (continuous un-spliced conductor) to the ignitor and one from the ground side of the ignitor/ignitor housing back to the ground buss in the transformer cabinet. This allows the cables to be switched if a leakage fault develops in the energized conductor. Cables are considered consumable items and replacement during the service life of the system is expected.

25.1 Cable and Cable Conduits. Over time, cables and cable conduits have become damaged or overfilled preventing use of the existing conduit for replacement cables. The following alternative repair replacement process is authorized. If individual conduits are replaced, all existing conduits and any associated junction/pull boxes sealed to prevent damage to other conduits and ignition cables will be removed.

25.1.1 A replacement high density polyethylene (HDPE) conduit (WP 003 00, Table 3) may be installed between the ignition transformer cabinet and the conduit entrance into the water jacket. A single new ignition cable (WP 003 00, Table 3) is pulled or blown through the conduit. Ends of the conduit are sealed around each ignition cable and a thread sealant suitable for continuous submersion. This is applied to the wire seal threads before being screwed into the conduit. The existing conduit entrance into the water jacket will be used. A liquid tight seal will be installed on the existing conduit; then the new HDPE conduit will be passed in the water jacket up to the ignitor housing. The liquid tight seal will provide a tight fitting closure around the HDPE conduit as it enters the water jacket.

NOTE

HDPE products may not be exposed to sunlight or heat.

25.1.2 A continuous solid or stranded copper 12 gage wire with green thermoplastic insulation shall be run from the individual ignitor housing and ignitor pigtail back to a buss in the transformer cabinet.

26 ENGINE SPILL FIRE.

All AFTF's will be retrofitted with a 3 Dimensional (3D) running fuel fire associated with the existing ground pool fire. The Battery fire function will be discontinued allowing the relocation of materials and equipment providing the new spill fire function. The project will consist of tying into the existing outboard engine's one inch propane fuel piping and install a 3D running fuel fire and 150 square foot ground pool fire. The outboard engine will require the installation of front and back cowlings and an access door for future maintenance. Front and rear engine cowlings will be made of 3/8 inch steel to distort water from high pressure handlines and vehicle turrets. This retrofit will create a realistic running fuel fire at the outboard engine by connecting to the existing battery fire fuel piping and extending it to a "foot equivalent ground" encompassing a semi-circular area of 150 +/- square foot pool fire. Extend the battery ignitor circuit and ignitor to the center of the ground fire area. Configure the ignitors such that when the running/ground fire is activated both the ground fire and engine fire ignitors operate. When just the engine fire is used, only the engine ignitors operate.

27 REAR CARGO RAMP REPLACEMENT.

Cargo ramp when replaced should be constructed at a safe angle range of 10 to 18 degrees. The ramp angle of a C-130 is 13 degrees.

NOTE

- Configuration duplicates the cargo/vehicle loading ramp found on the C-130/L-1000 aircraft; hand rails/side rails must not be installed. The cargo/vehicle ramp on any aircraft fire trainer, regardless of location, installation of support rails will compromise the development of appropriate techniques and operational safety procedure.

- Manufactured steps or ladders for the expressed purpose to access either wing are permitted, but not required, as they compromise the development of appropriate techniques and operational safety procedures necessary to support actual aircraft emergencies. Development of appropriate means or techniques to access and safely operate on a low wing aircraft are an integral part of the trainer design. “Train like you fight”.

28 PYROLANCE TRAINER.

Based on the recent modification to the Air Force design, an auxiliary trainer has been added to the AFTF site. The Pyrolance trainer has been added to the aft left side fuselage containing two penetrable materials: metal and concrete. These materials are considered perishable and replaceable. The Pyrolance tool is used for penetration training.

29 ENGINE DEBRIS TRAINER.

Based on the recent modification to the Air Force design, an auxiliary trainer has been added to the AFTF site. The Engine Debris trainer has been added to the forward area of the left wing equipped with its own burner and LPG. This trainer simulates a separated burning engine near an aircraft. An alternative location is the aft area of the left wing if there is not enough space forward of the left wing.

30 DOCUMENTATION.

The Maintenance Inspection and Test Schedule on page 31 will be documented and filed. Records will be maintained for a minimum of 3 years.

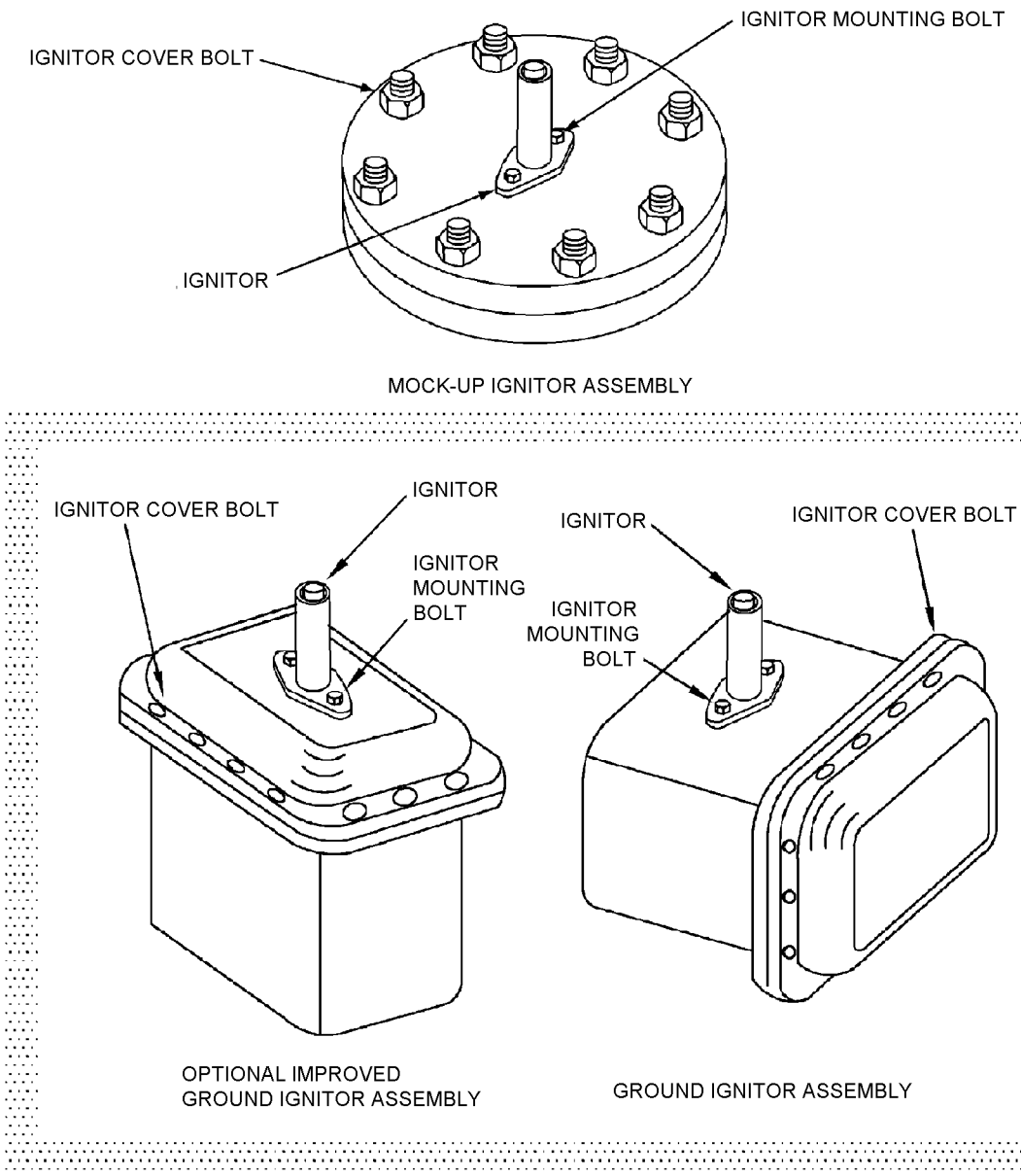


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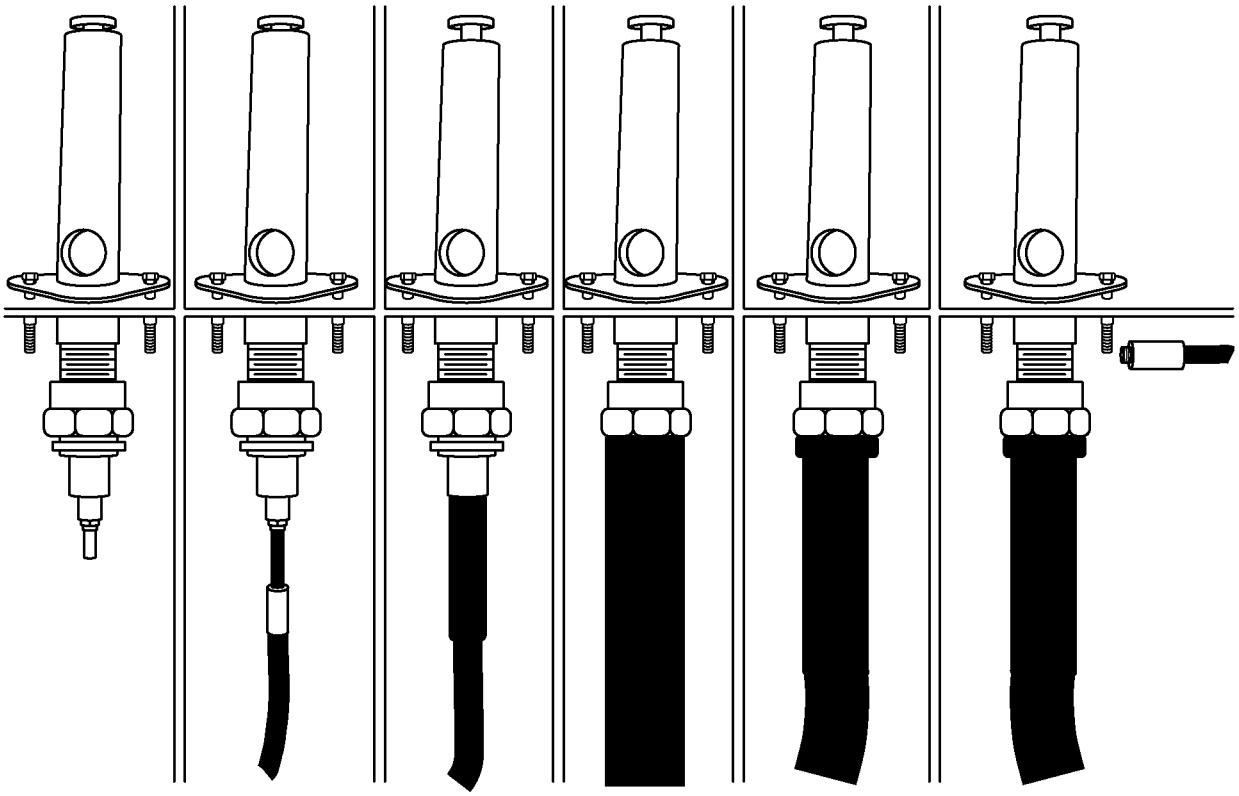
Figure 1. Ignitor Assemblies



NOTE:
REFER TO WP 007 00 PARAGRAPH 2 FOR IGNITOR REPLACEMENT - ICS 7860030.

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Figure 2. ICS 7860030 Ignitor Assembly Installation Steps

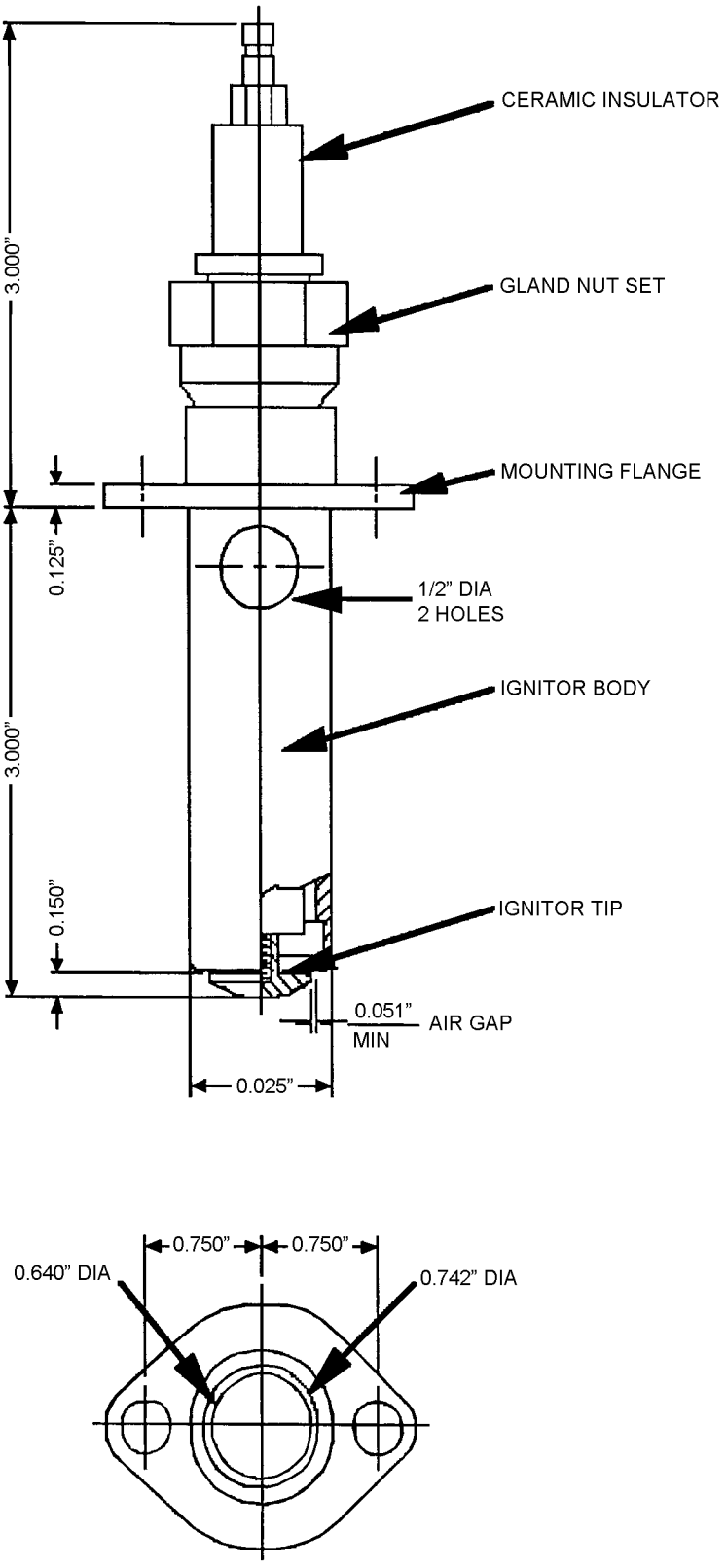


Figure 3. ICS 7860030 Ignitor Dimensions

NOTE:
THE DESIGN FEATURES OF THE ICS IGNITOR NO. 3860030 ARE DESIGNED FOR DIRECT SPARK IGNITION OF MAIN FLAME APPLICATIONS FOR OUTDOOR APPLICATIONS. CONSTRUCTED FROM STAINLESS STEEL, THIS UNIT IS SUITABLE FOR HARSH ENVIRONMENTS AND WORKING CONDITIONS. THIS UNIT IS DESIGNED FOR USE WITH VARIABLE IGNITION LEAD LENGTHS OF UP TO 400 DEGREES. TO BE USED IN CONJUNCTION WITH HIGH OUTPUT IGNITION TRANSFORMER (10KV, 23 mA). THIS IGNITOR HAS AN ADJUSTABLE AIR GAP SETTING. IN ORDER TO COMPENSATE FOR VARYING LINE VOLTAGE DROPS DUE TO CABLE LENGTH AND CONDITION. WITH VARIABLE SETTINGS FROM 0.050" TO 0.200" OPTIMUM PERFORMANCE CAN BE EASILY ACHIEVED.

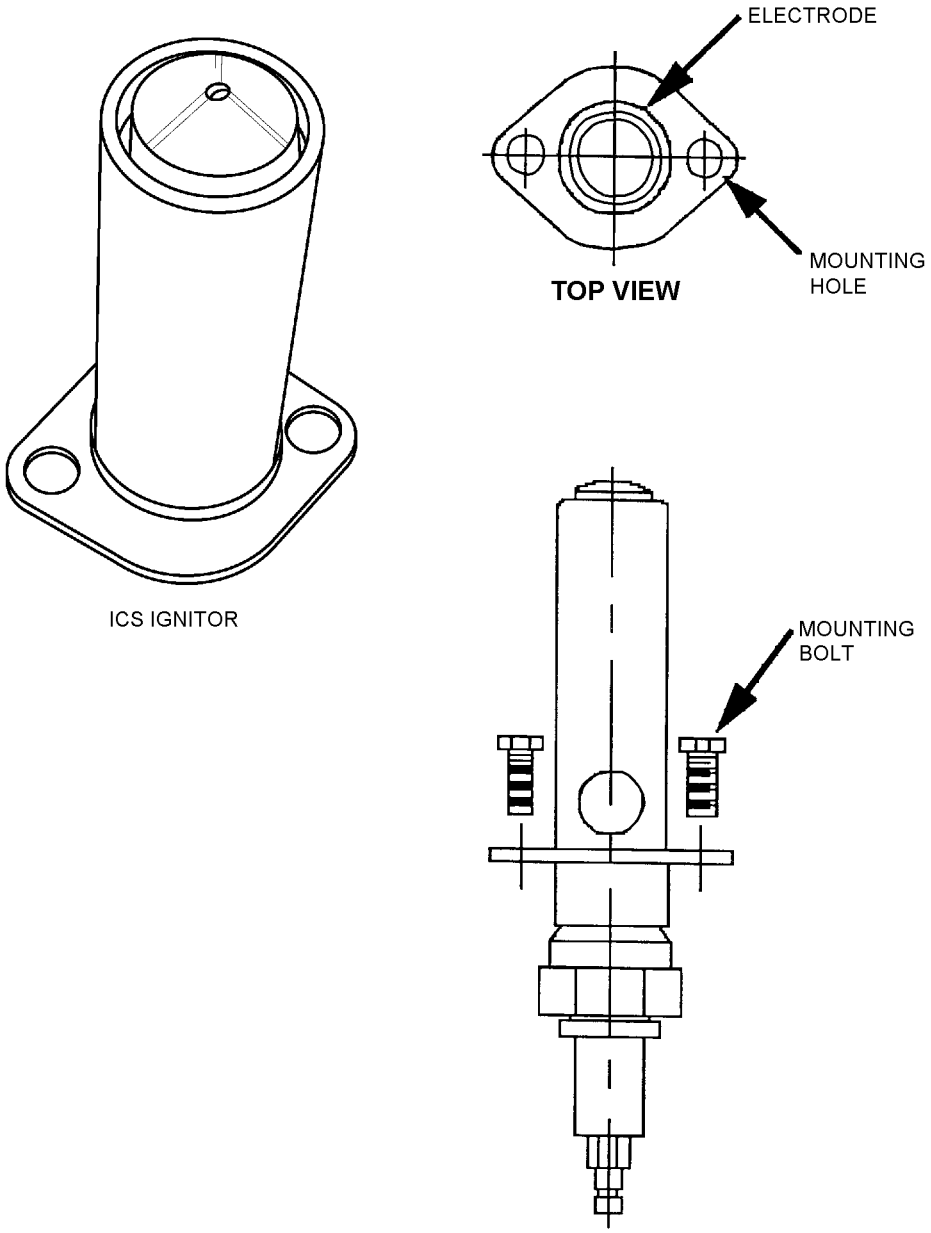


Figure 4. ICS 7860030 Ignitor

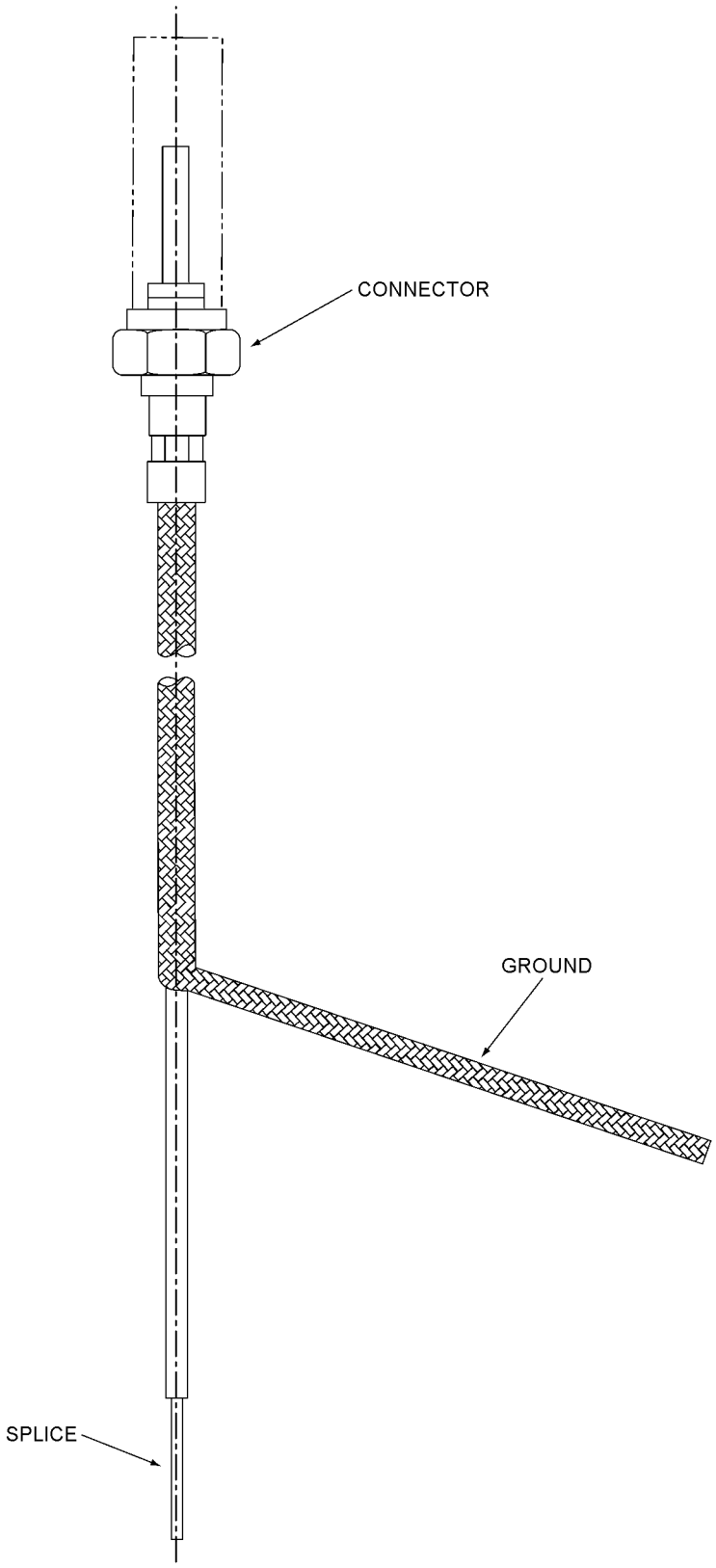


Figure 5. Champion 31917 Ignitor Connector and Pigtail

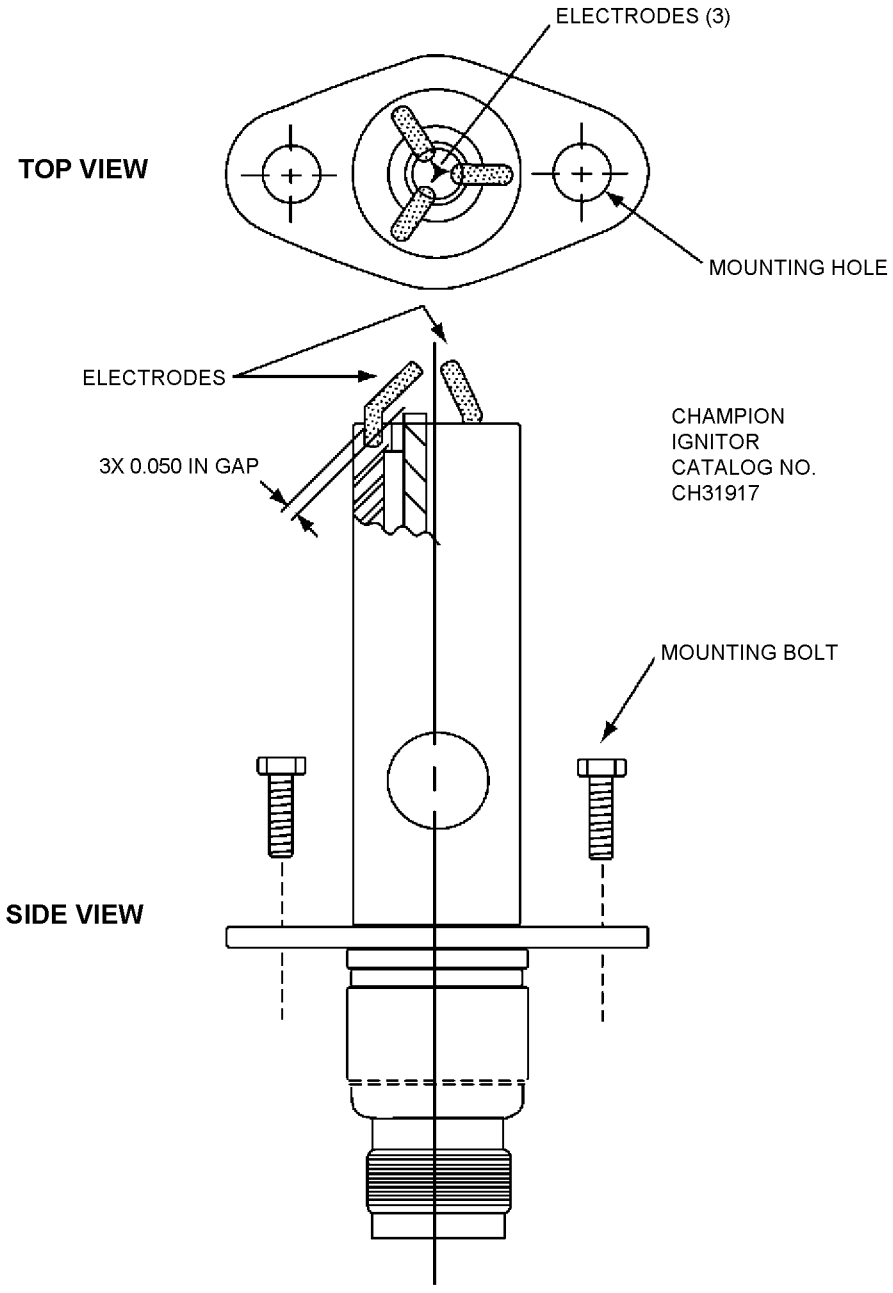
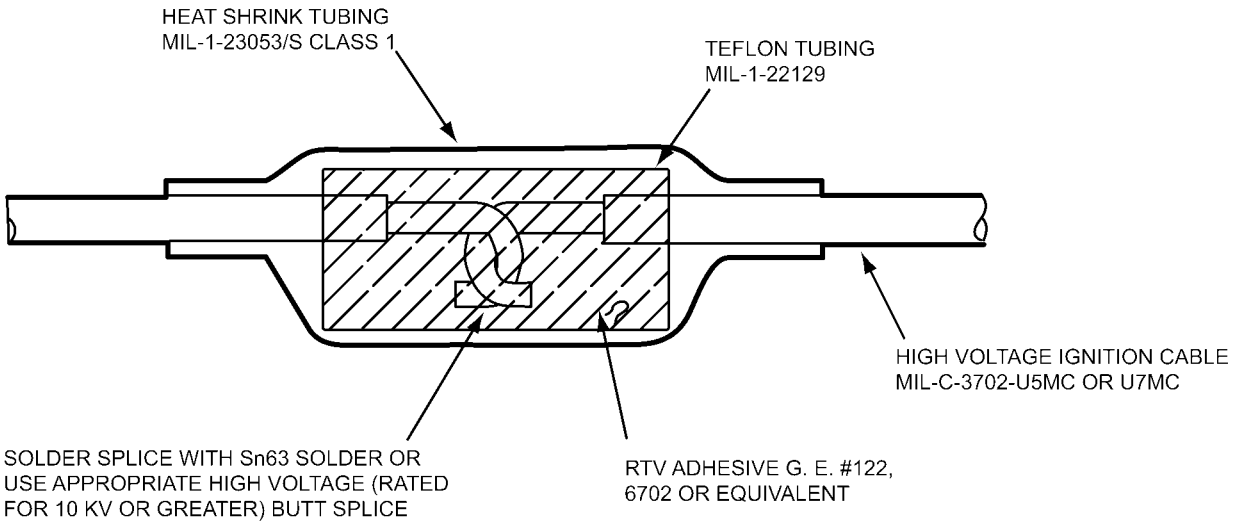


Figure 6. Champion 31917 Ignitor



NOTE:
THIS IS A WATERPROOF CONNECTION. THE CONNECTION CONTAINS (1) SPLICE, (2) RTV COATING, (3) TEFLON TUBING COVERING AND RTV COATING AND (4) HEAT SHRINK COVERING THE WHOLE CONNECTION. REFER TO MANUFACTURER SPECIFICATIONS FOR RTV CURE TIME.

TO-35E1-2-13-1-018

Figure 7. Champion Ignitor Pigtail Splice Detail

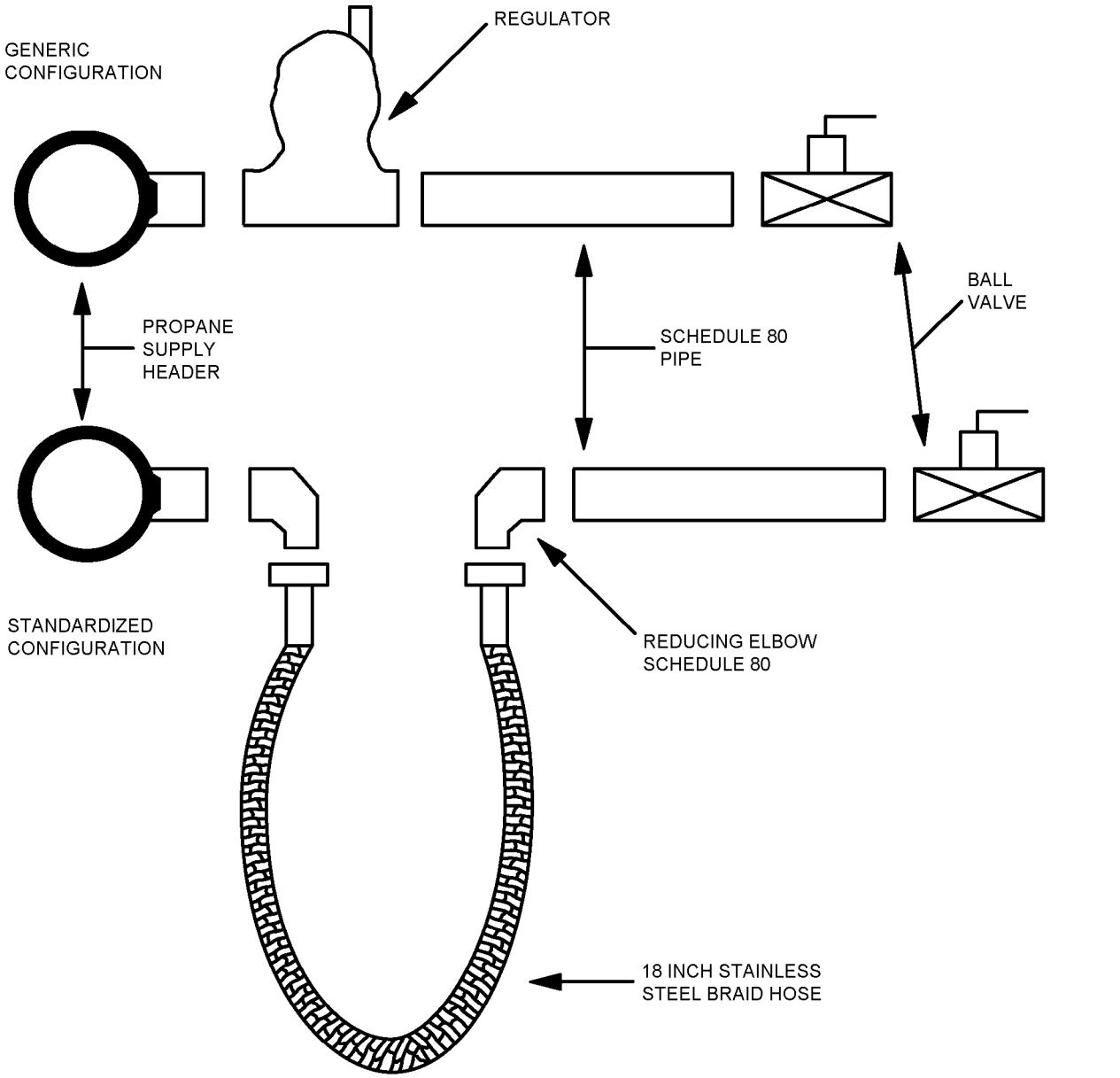
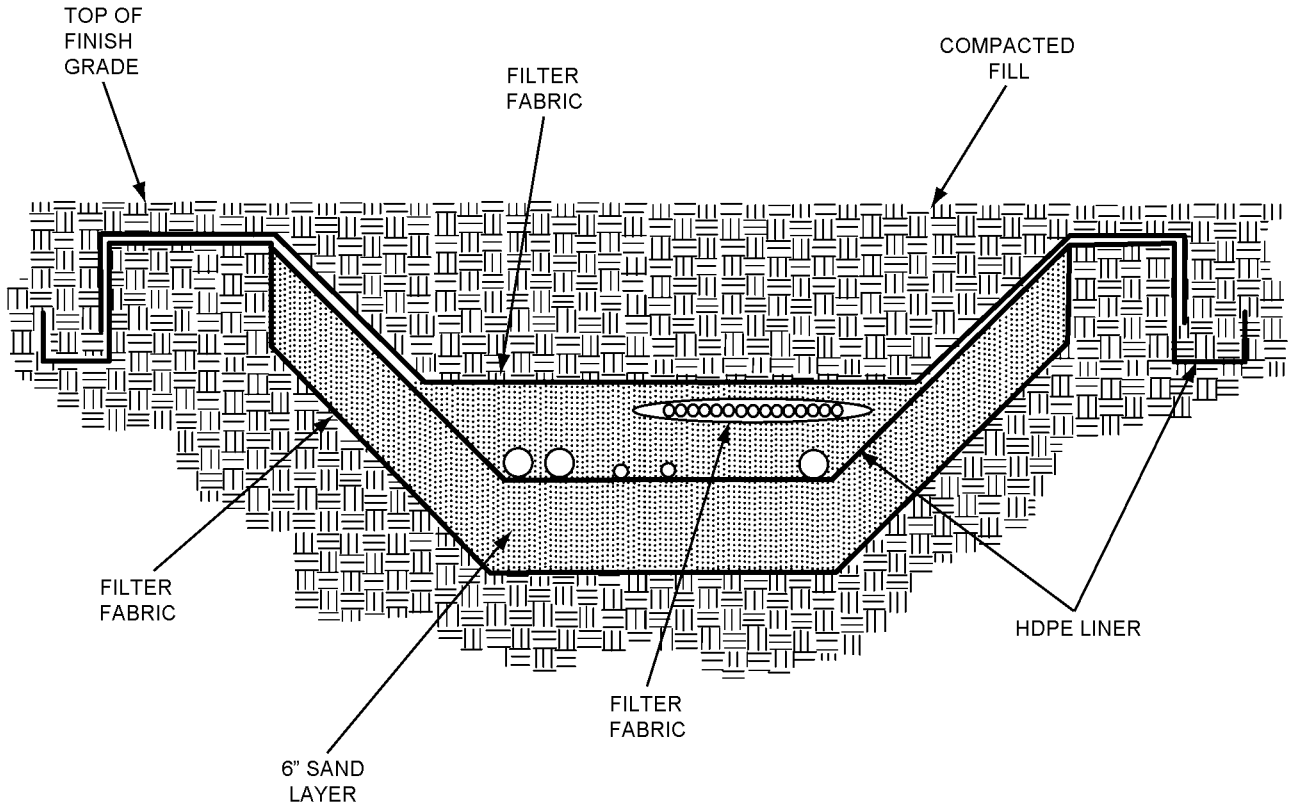


Figure 8. Stainless Steel Braid Replacement Hose



TO-35E1-2-13-1-020

Figure 9. Trench Area Detail

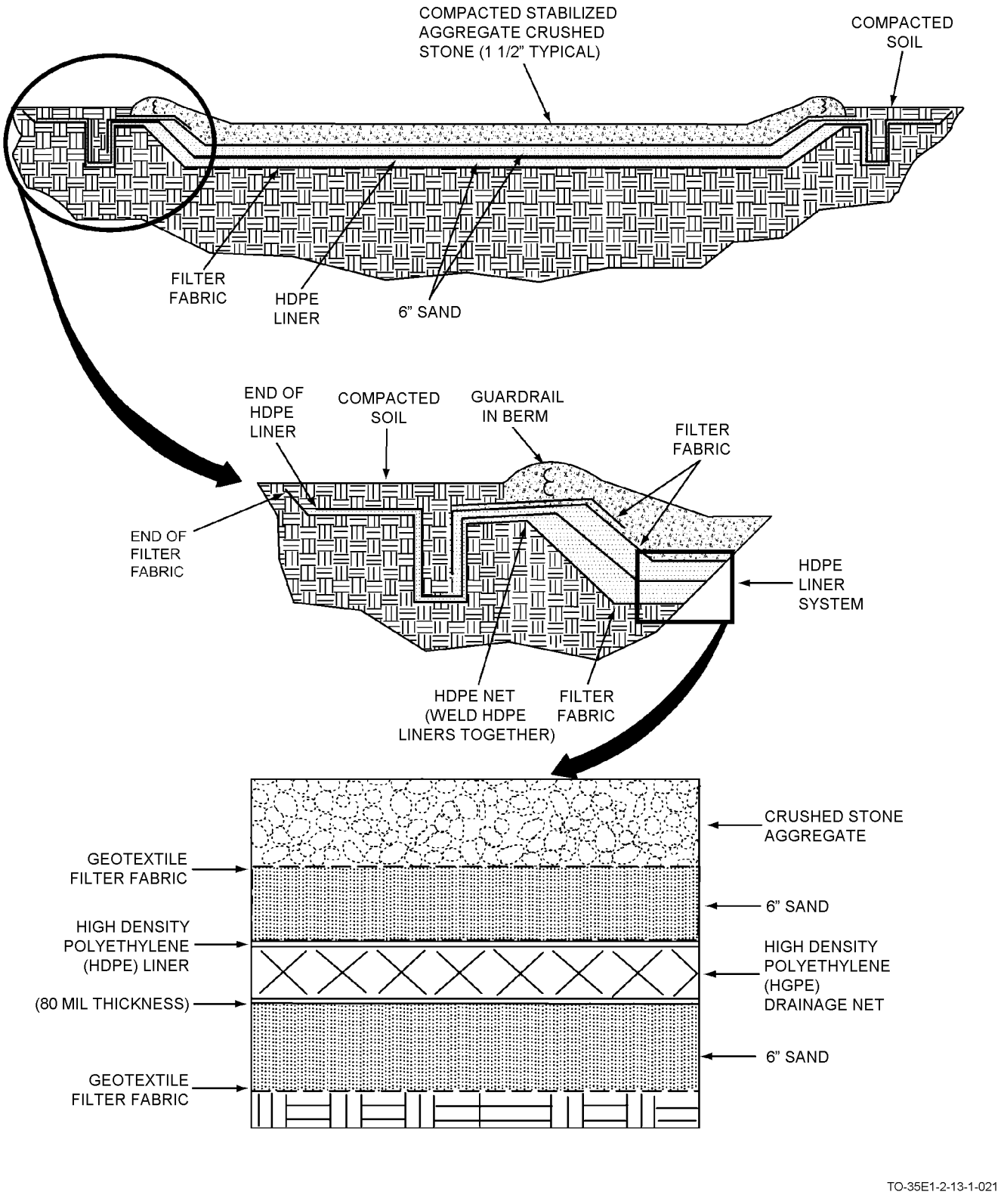


Figure 10. Burn Area Detail

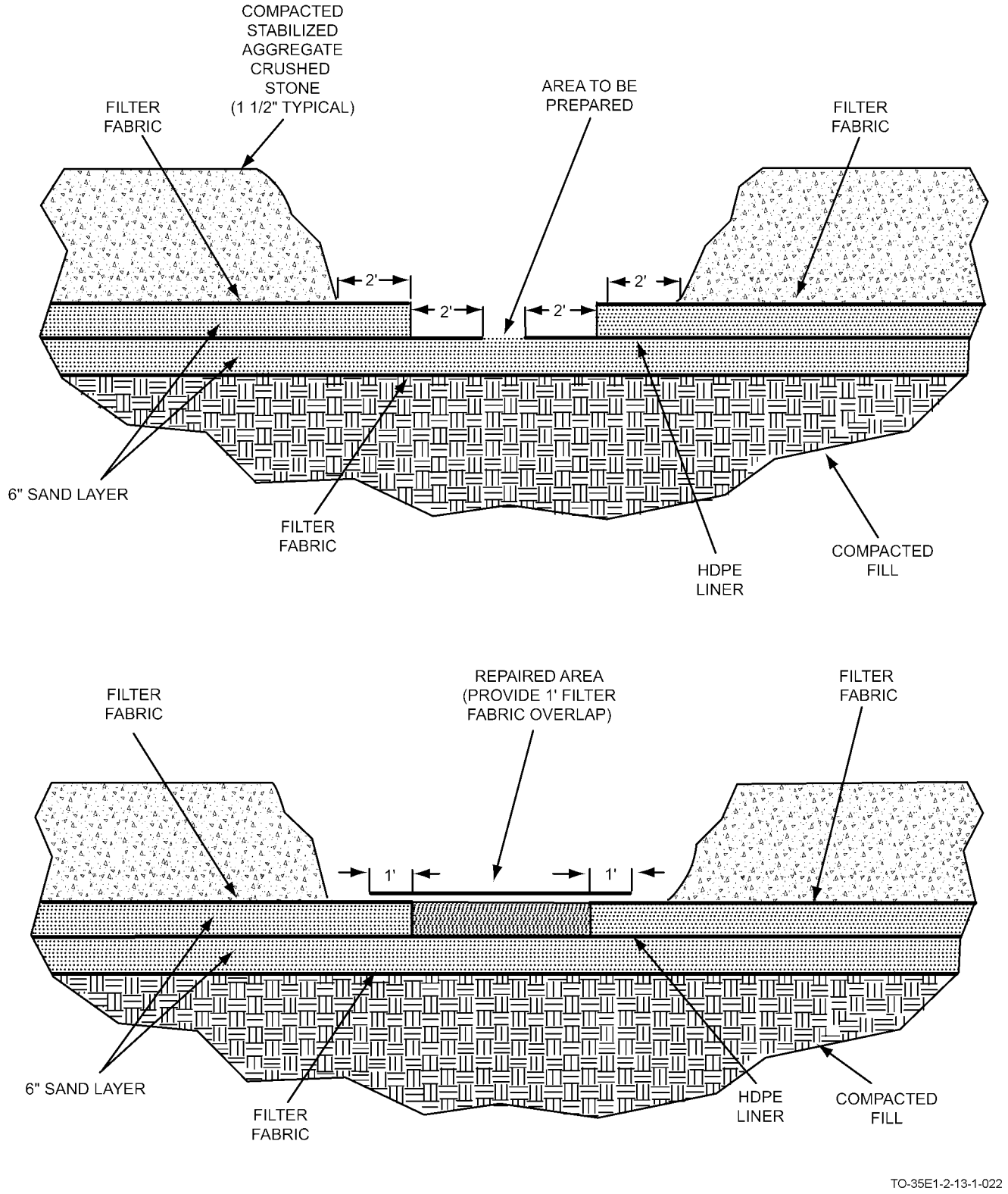
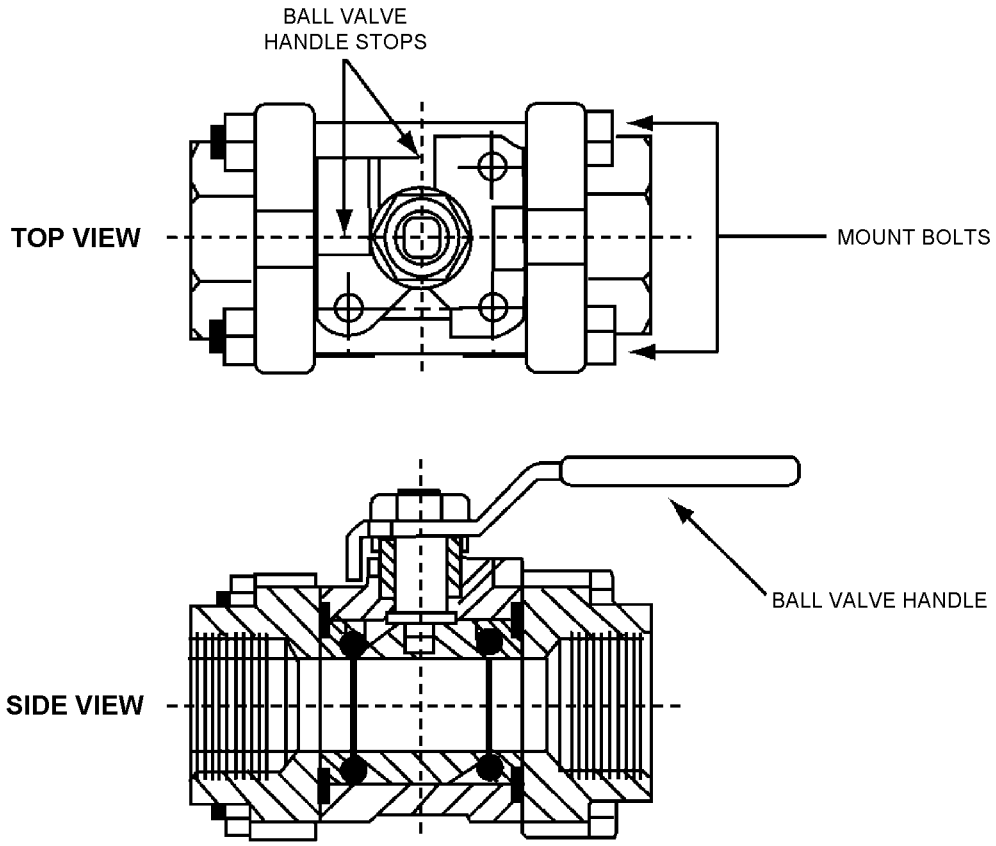


Figure 11. Excavation Detail

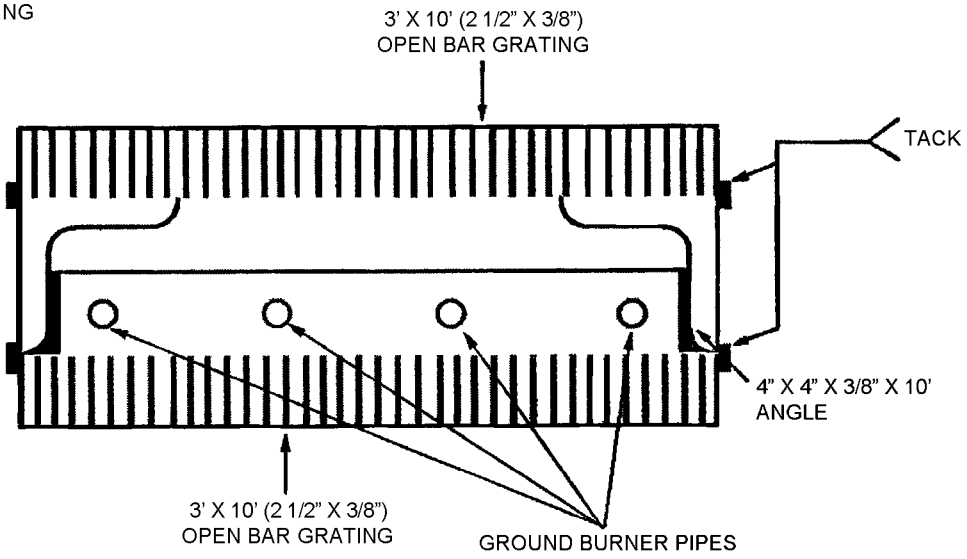


TO-35E1-2-13-1-023

Figure 12. Burner Control Ball Valve

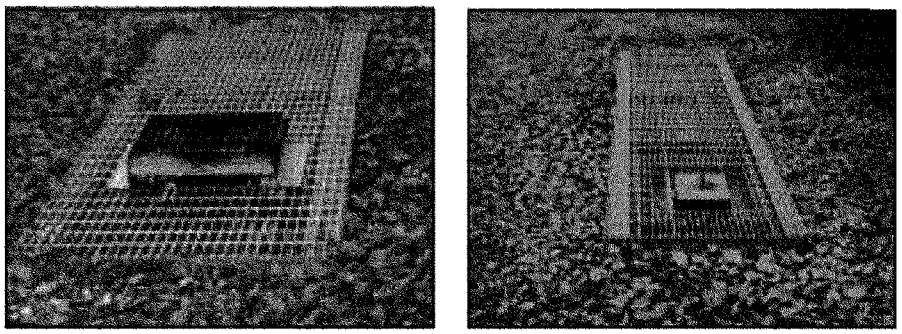
NOTE:
ALL GRATING IS TYPE W-19-4.
REF: ANSI/NAAMMBG 532-00,
HEAVY DUTY METAL BAR GRATING MANUAL

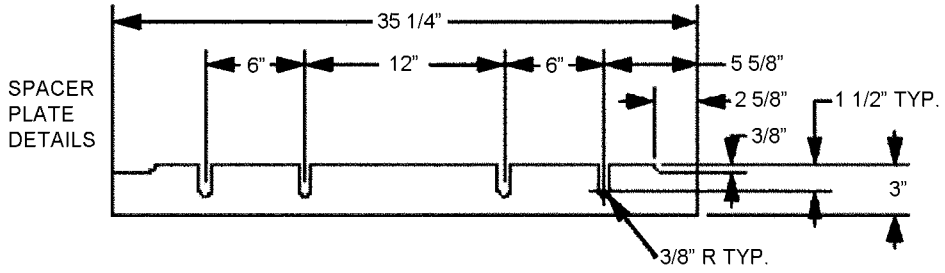
OPTIONAL LOWER BAR GRATING:
4.27 LB CATWALK GRATING

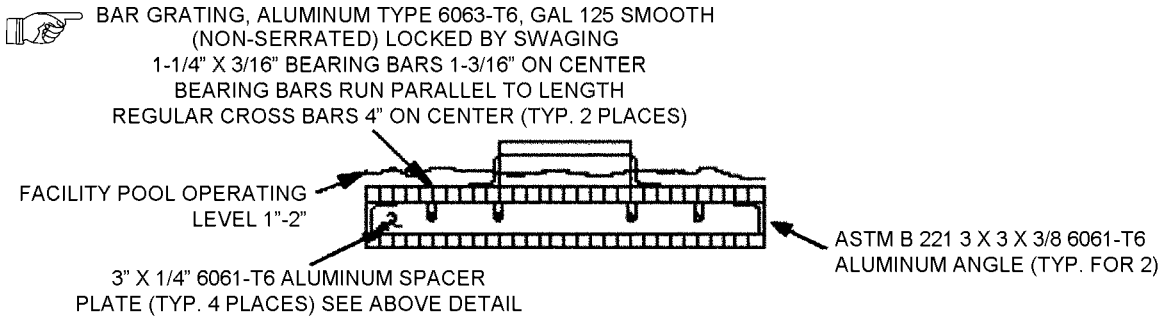


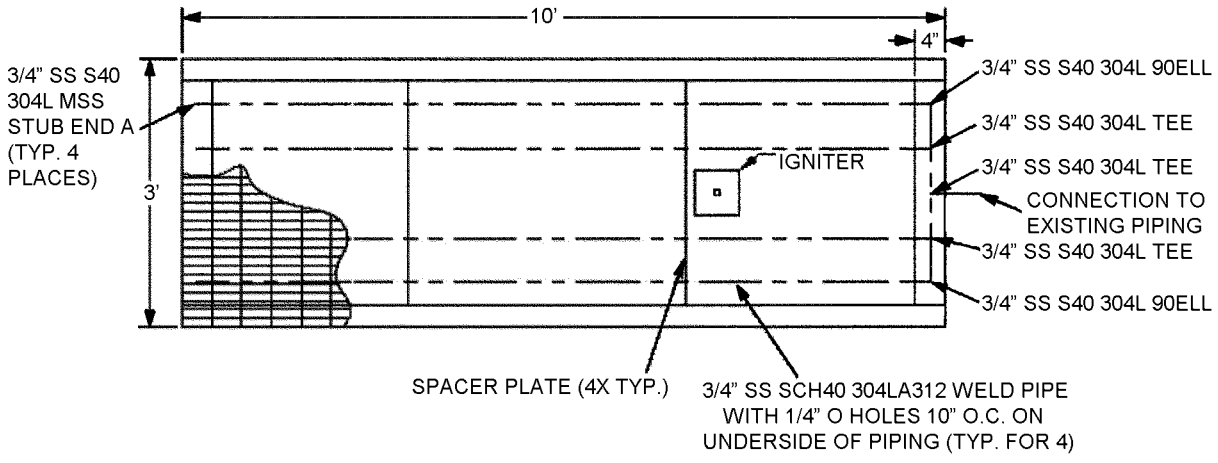
TO-35E1-2-13-1-024C1

Figure 13. Ground Burner/Ground Burner Grating Replacement - Standard Configuration End View with Grating



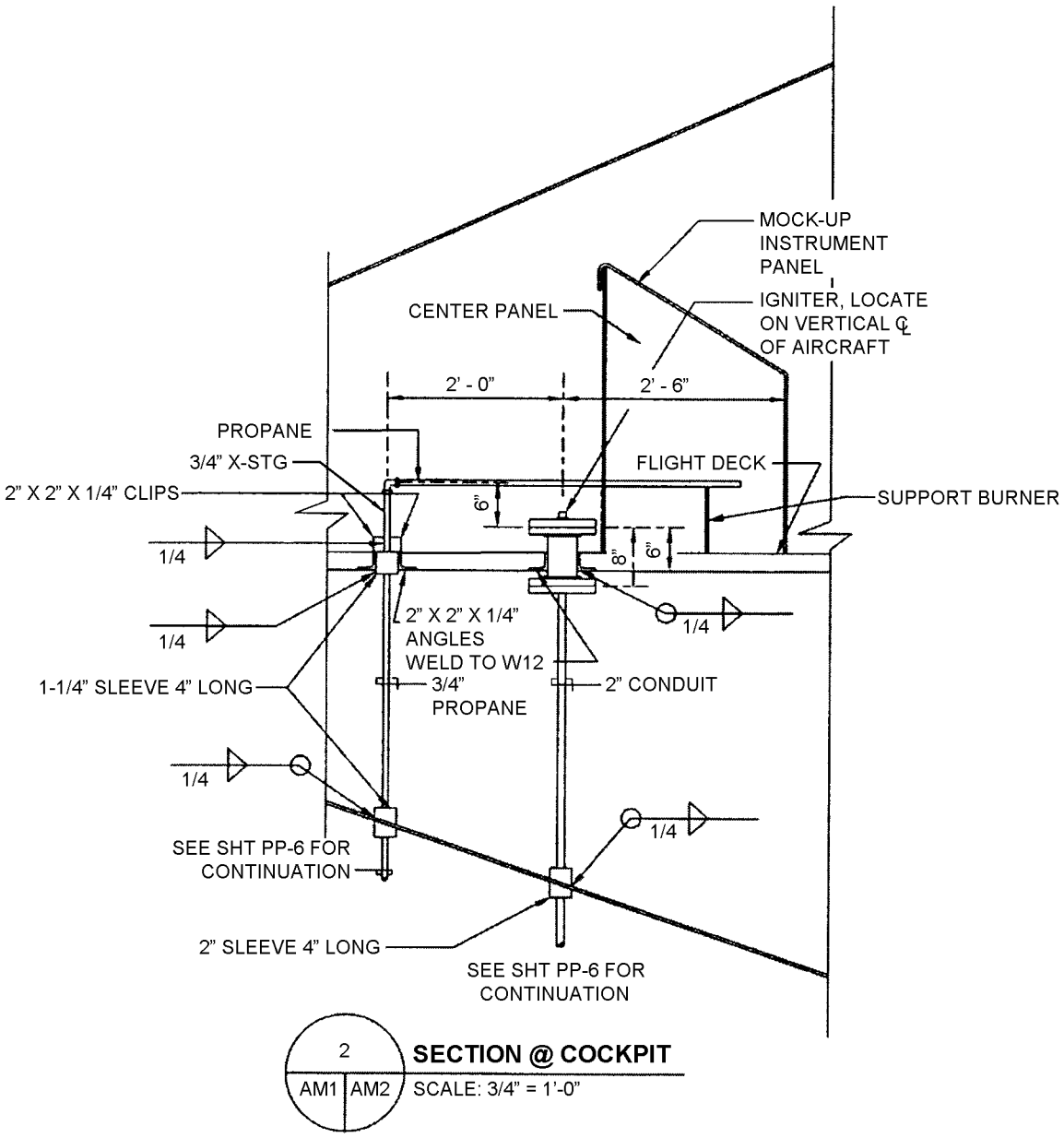






TO-35E1-2-13-1-025C1

Figure 14. Ground Burner/Ground Burner Grating Replacement - Standard - Optional Configuration with Approval from AFCEC System Engineer



NOTE:
THIS GRAPHIC IS FROM THE CFRT FACILITY BASIC COMPONENT DESIGN DRAWING PAGE AM-2.

TO-35E1-2-13-1-026

Figure 15. Cockpit Burner Specifications - LH Side View

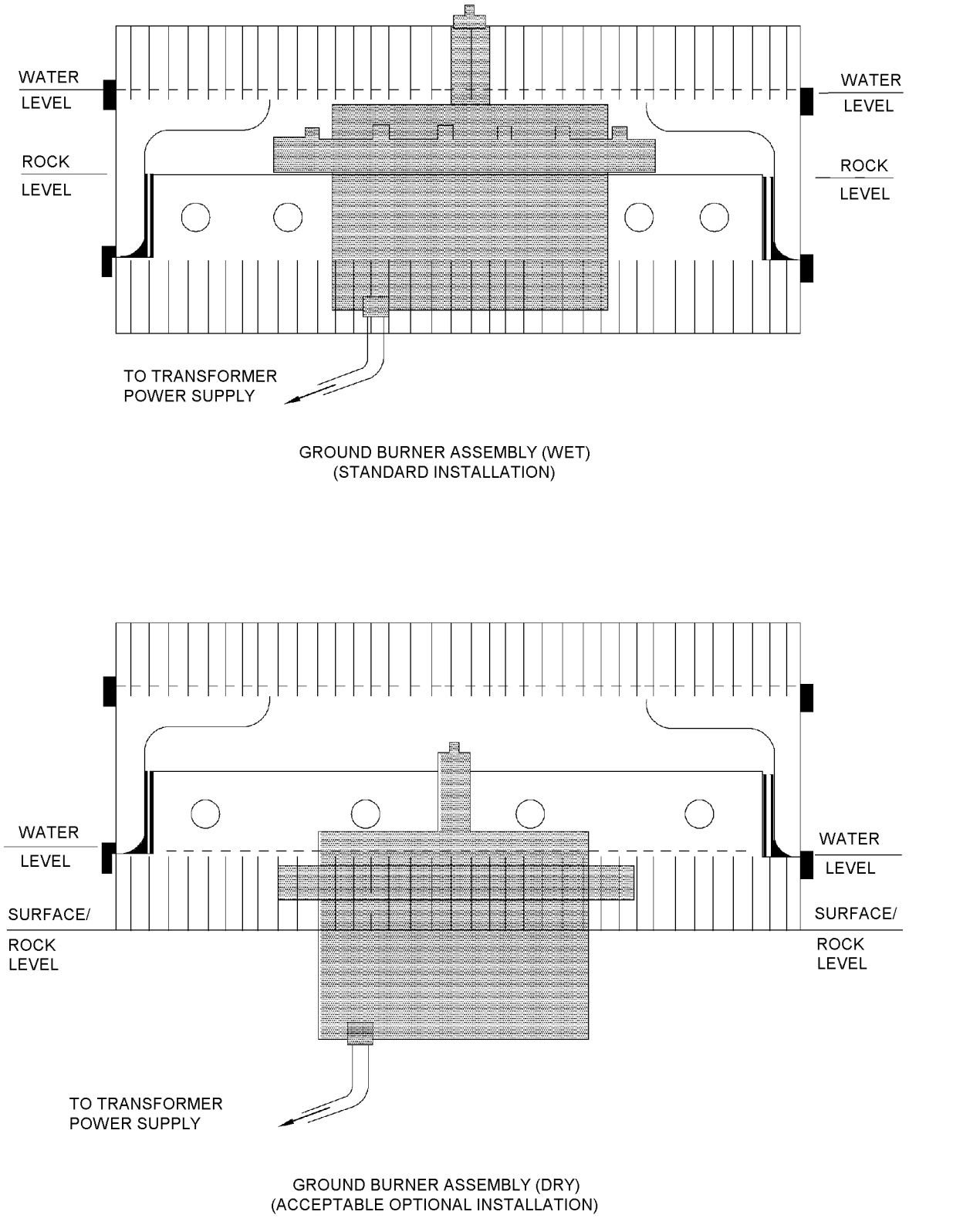
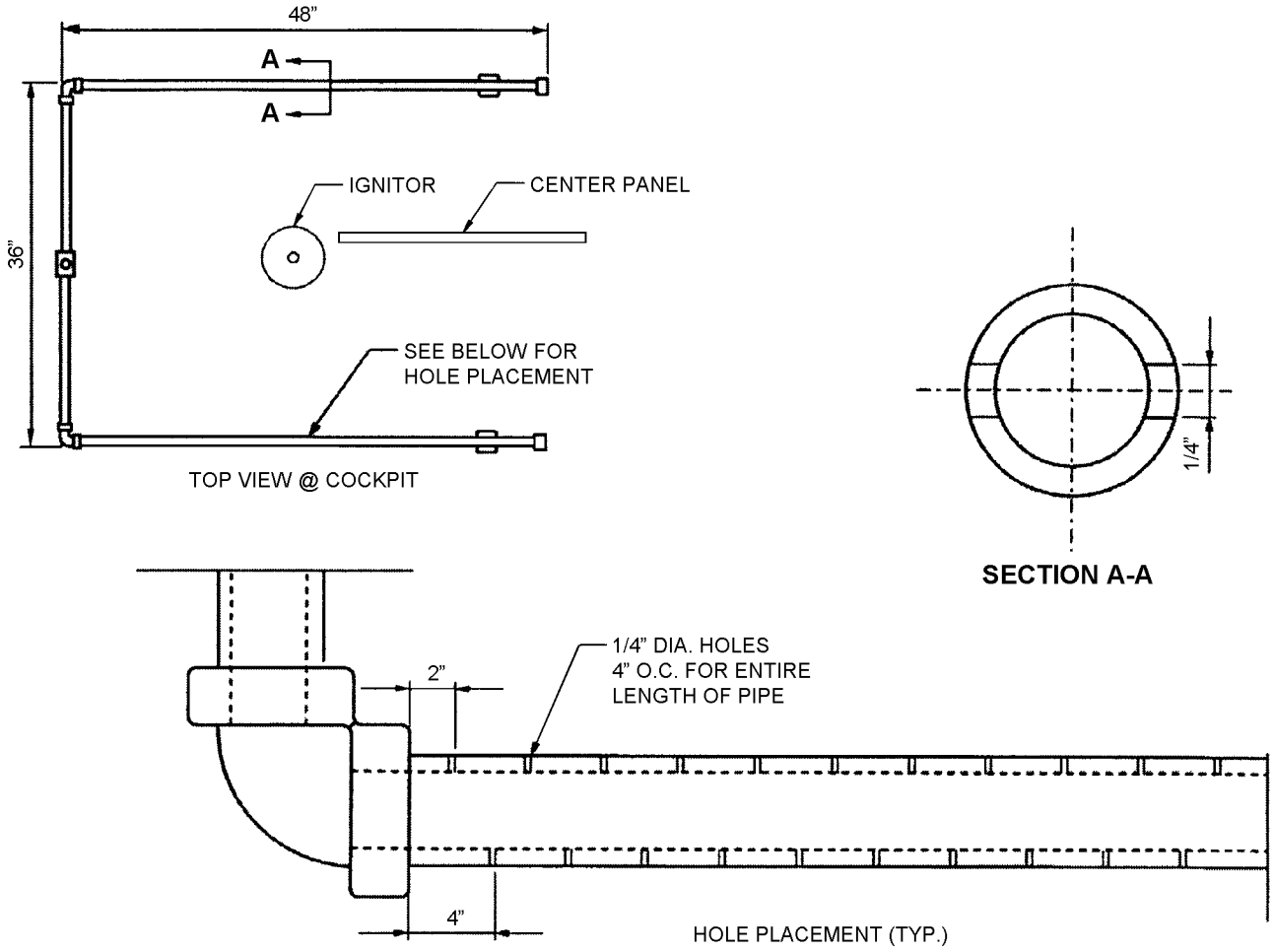


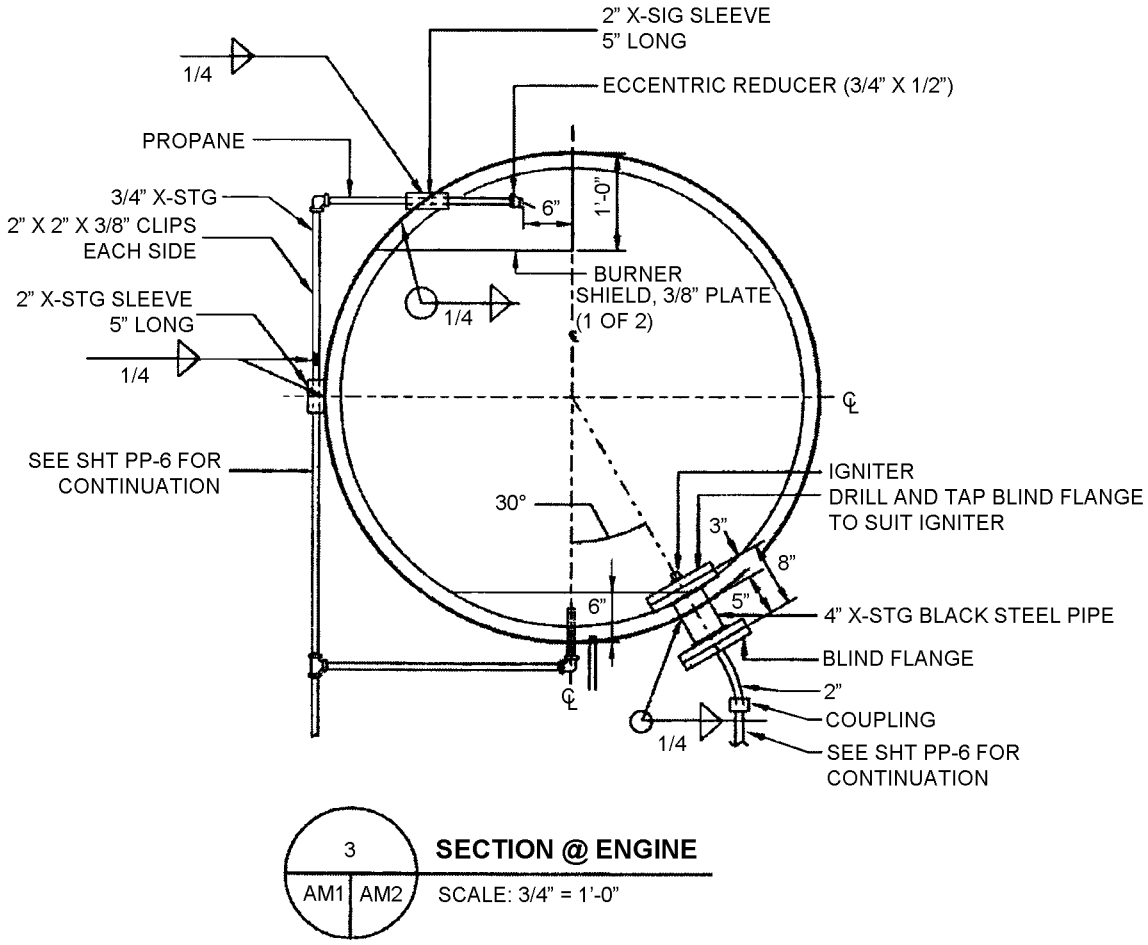
Figure 16. Ground Burner Assemblies (Wet and Dry)



NOTE:
THIS GRAPHIC IS FROM THE CFRT FACILITY BASIC COMPONENT DESIGN DRAWING PAGE AM-2.

TO-35E1-2-13-1-028

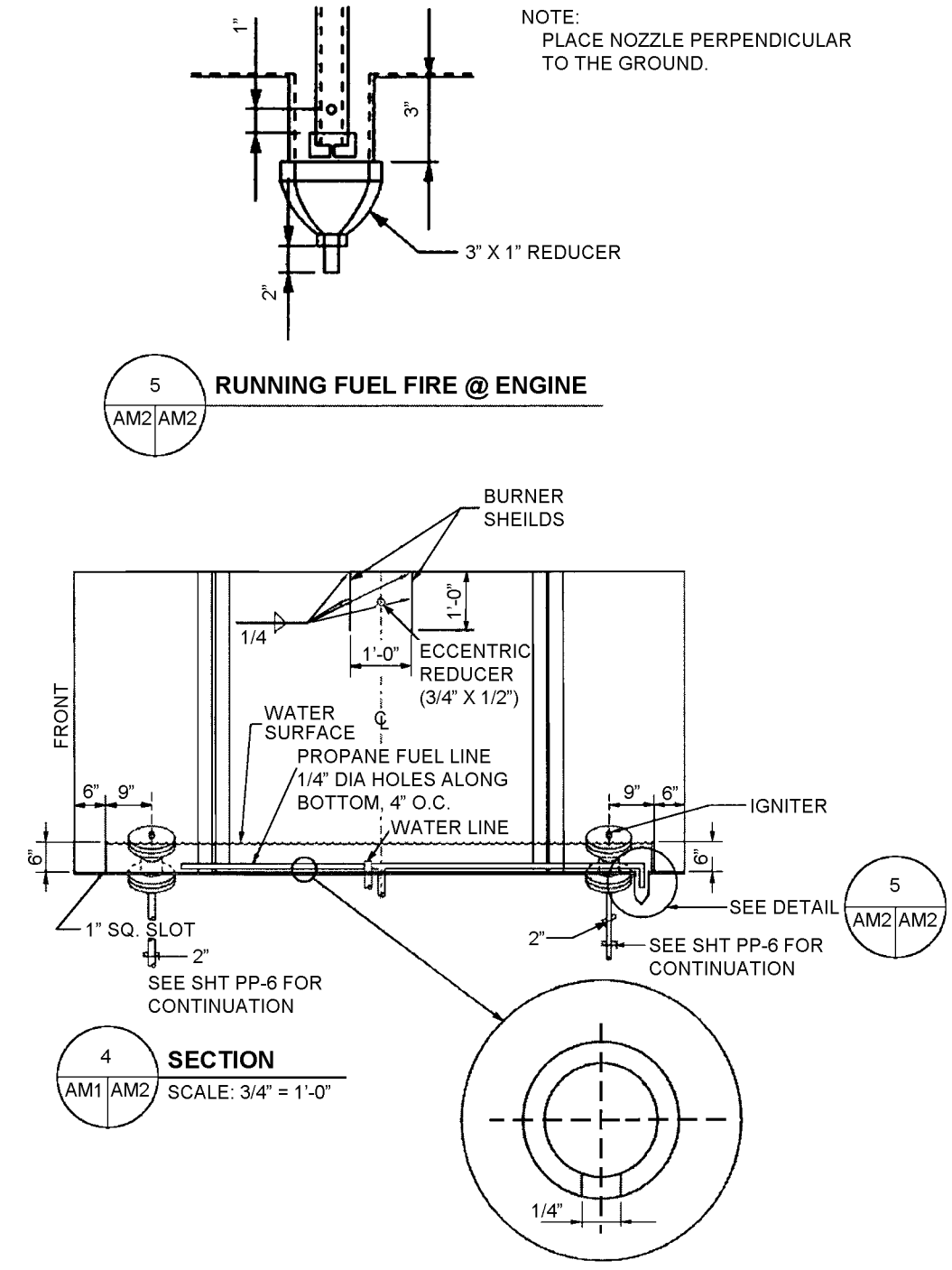
Figure 17. Cockpit Burner Specifications - Top View



NOTE:
THIS GRAPHIC IS FROM THE CFRT FACILITY BASIC COMPONENT DESIGN DRAWING PAGE AM-2.

TO-35E1-2-13-1-029

Figure 18. Engine Burner Specifications - Front View



NOTE:
THIS GRAPHIC IS FROM THE CFRT FACILITY BASIC COMPONENT DESIGN DRAWING PAGE AM-2.

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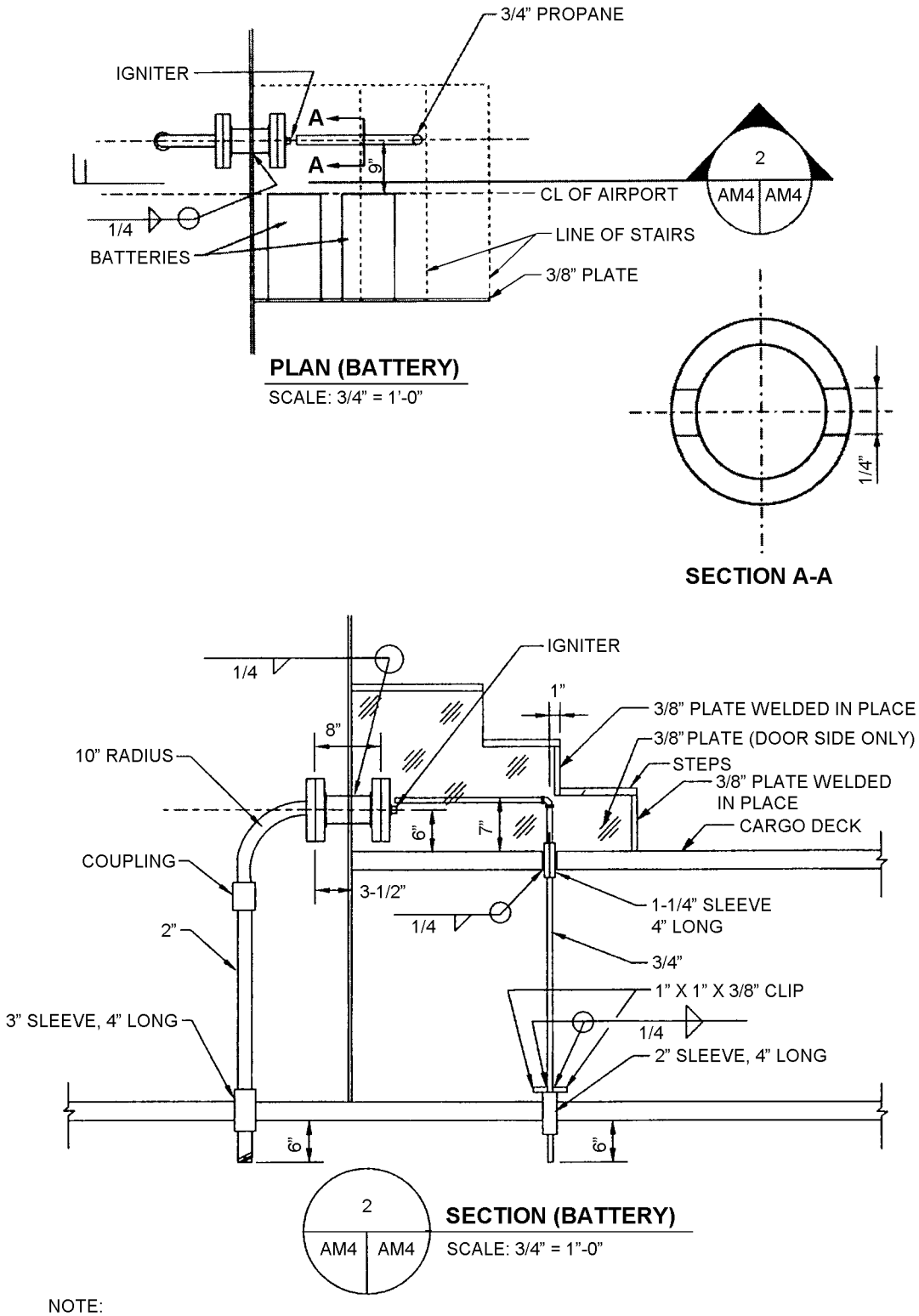
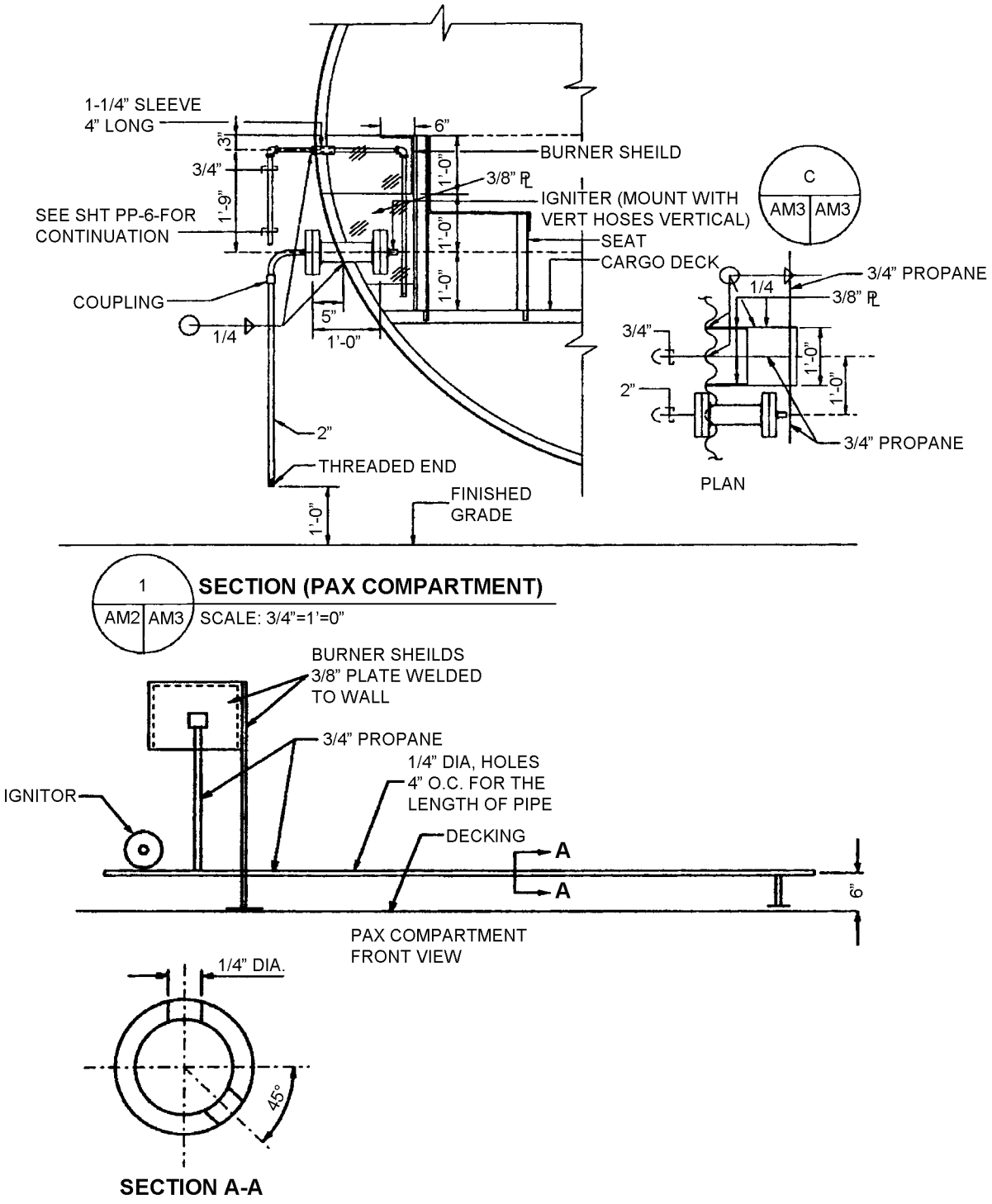
Figure 19. Engine Burner Specifications - Running Fuel Fire



NOTE:
THIS GRAPHIC IS FROM THE CFRT FACILITY BASIC COMPONENT DESIGN DRAWING PAGE AM-4.

TO-35E1-2-13-1-031

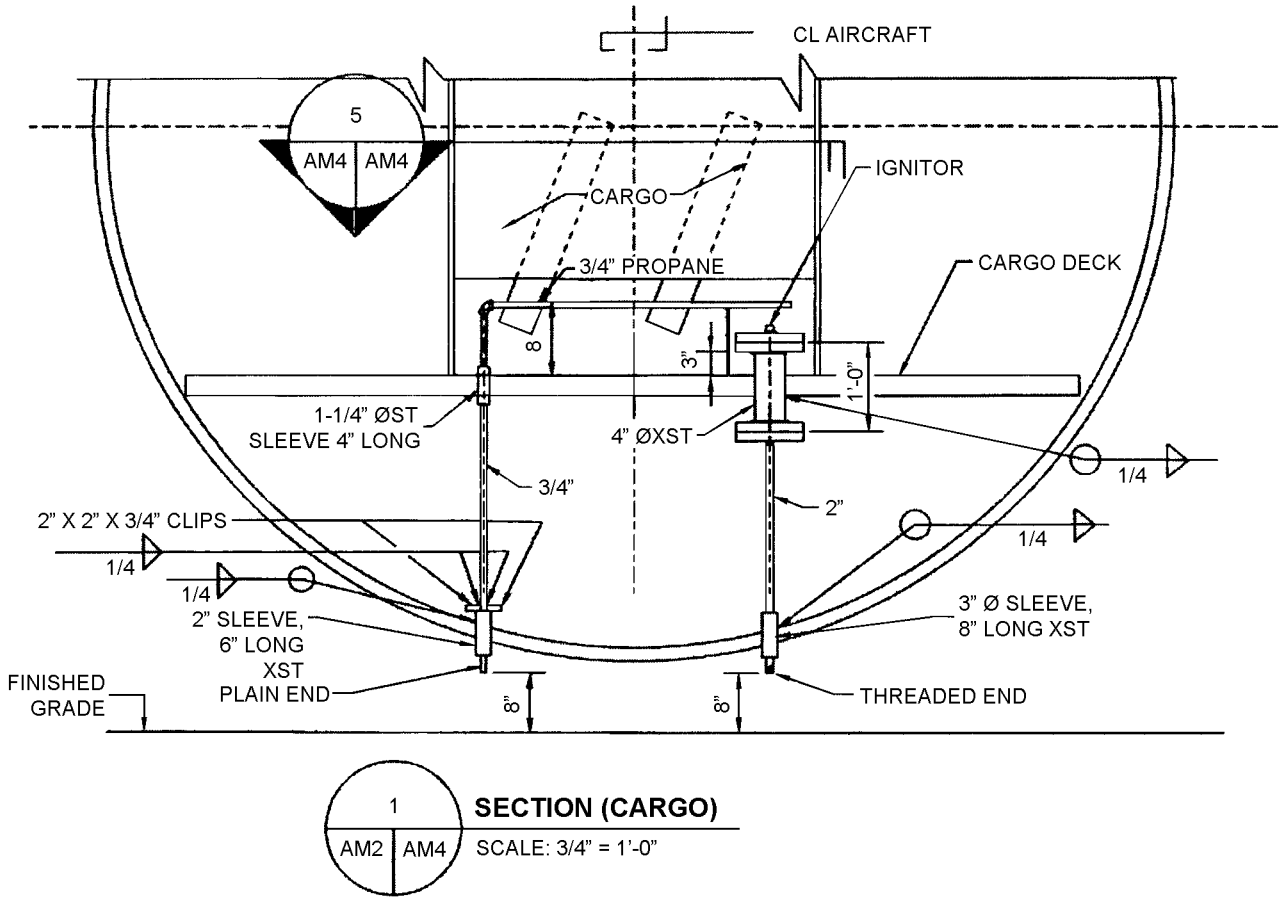
Figure 20. Battery Burner Specifications



NOTE:
THIS GRAPHIC IS FROM THE CFRT FACILITY BASIC COMPONENT DESIGN DRAWING PAGE AM-3.

TO-35E1-2-13-1-032

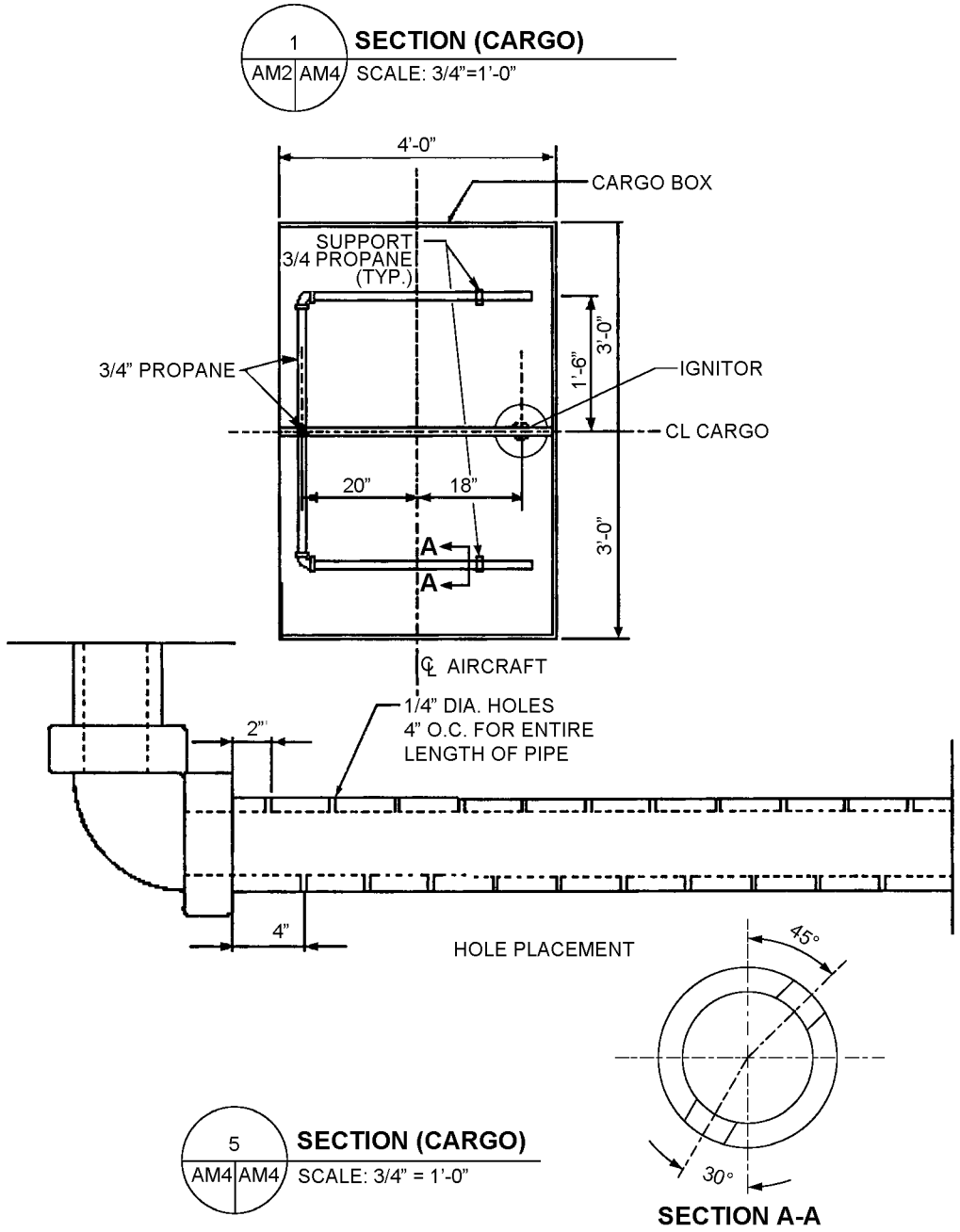
Figure 21. Passenger Burner Specifications



NOTE:
THIS GRAPHIC IS FROM THE CFRT FACILITY BASIC COMPONENT DESIGN DRAWING PAGE AM-4.

TO-35E1-2-13-1-033

Figure 22. Cargo Burner Specifications - Front View



NOTE:
THIS GRAPHIC IS FROM THE CFRT FACILITY BASIC COMPONENT DESIGN DRAWING PAGE AM-4.

TO-35E1-2-13-1-034

Figure 23. Cargo Burner Specification - Top View

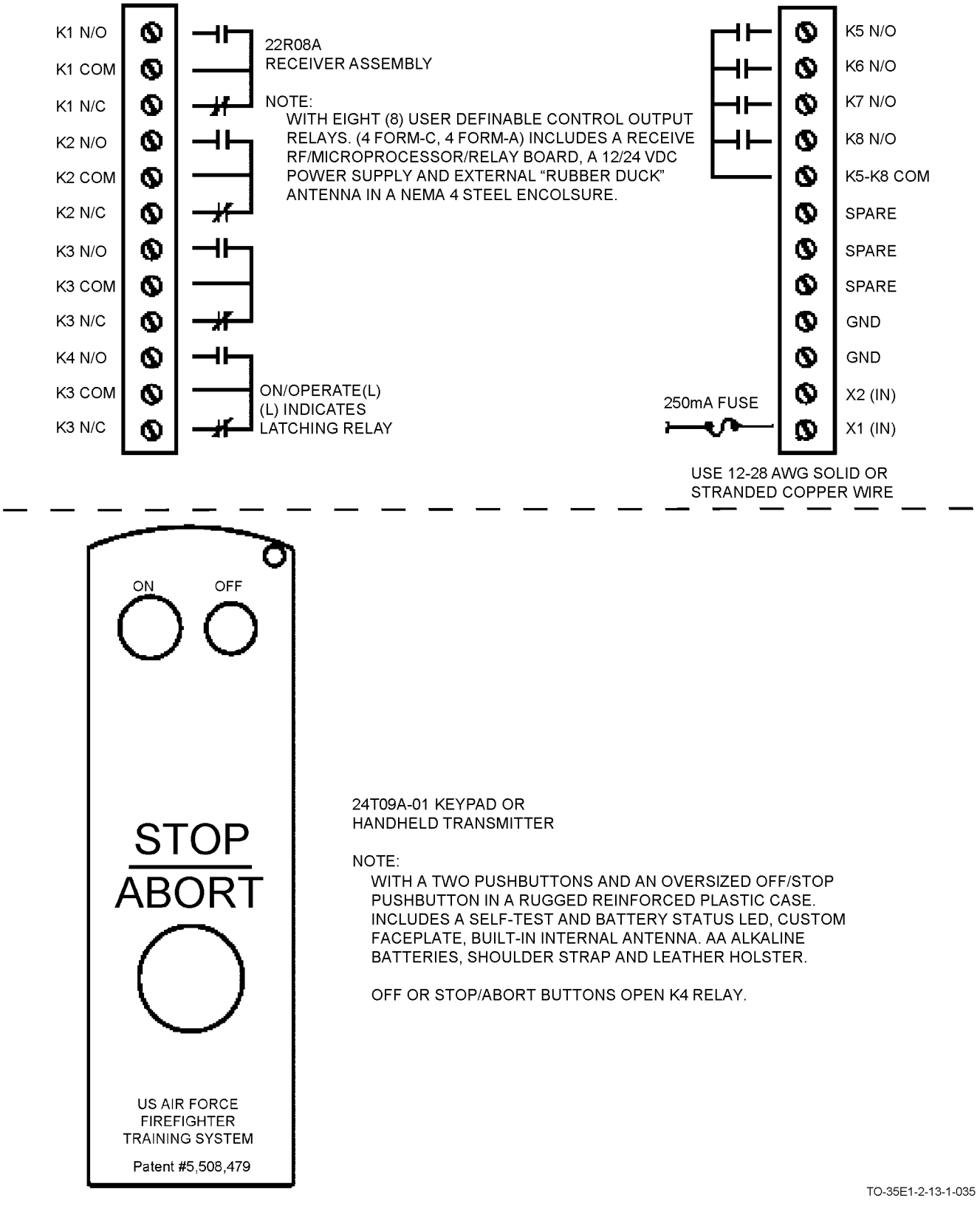


Figure 24. Radio Remote Control Safe-T-Stop System

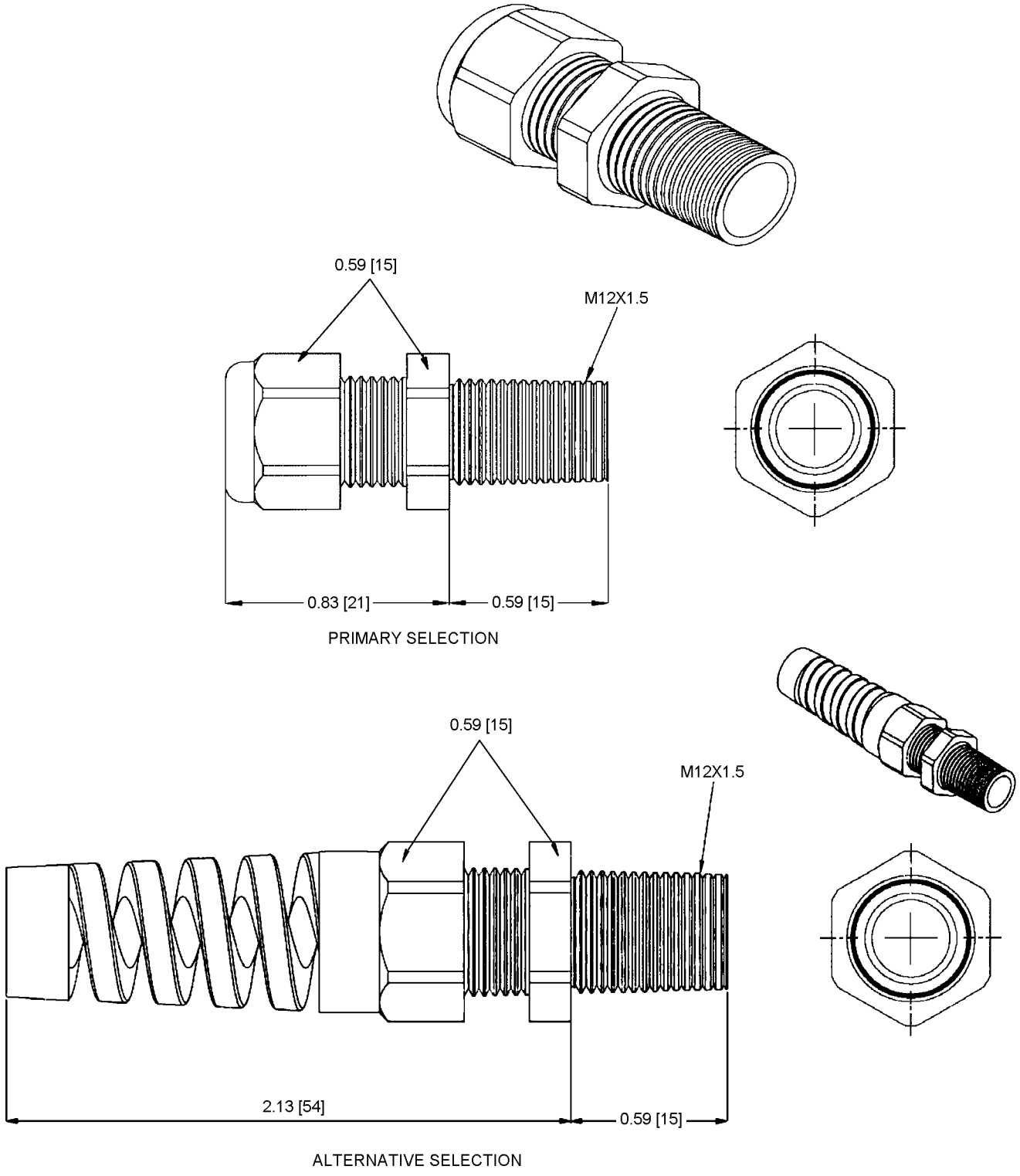
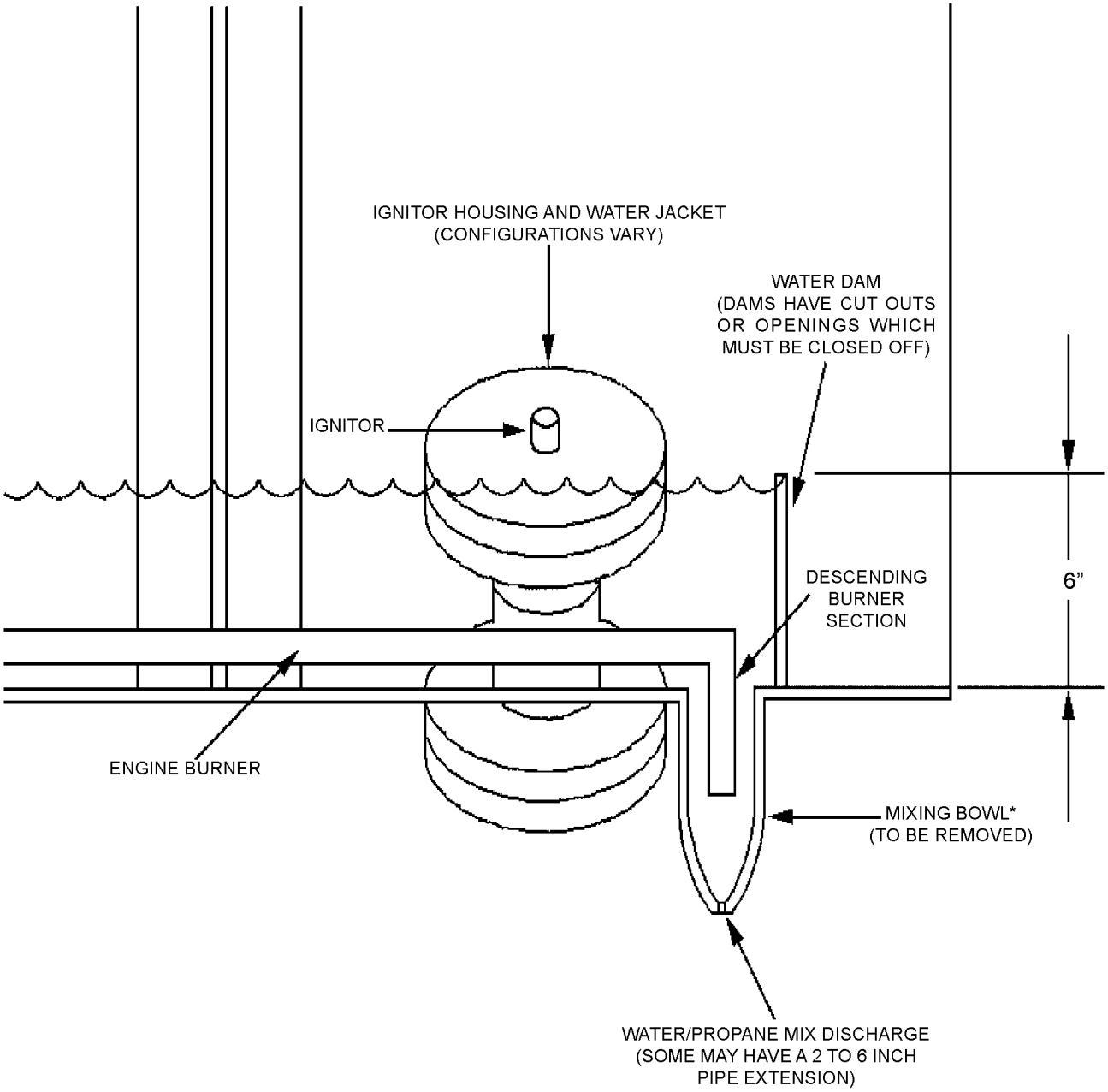


Figure 25. Nylon Liquid Tight Strain Relief Fittings



*NOTE:
ENGINES WITH A REAR MIXING BOWL - REMOVE THE REAR MIXING BOWL, CUT OFF AND CAP THE DESCENDING BURNER SECTION, AND WELD A COVER OVER THE HOLE WHERE THE REAR MIXING BOWL WAS REMOVED.

TO-35E1-2-13-1-037

Figure 26. Generic Existing Engine Fire With Front Running Fuel Fire Mixing Bowl

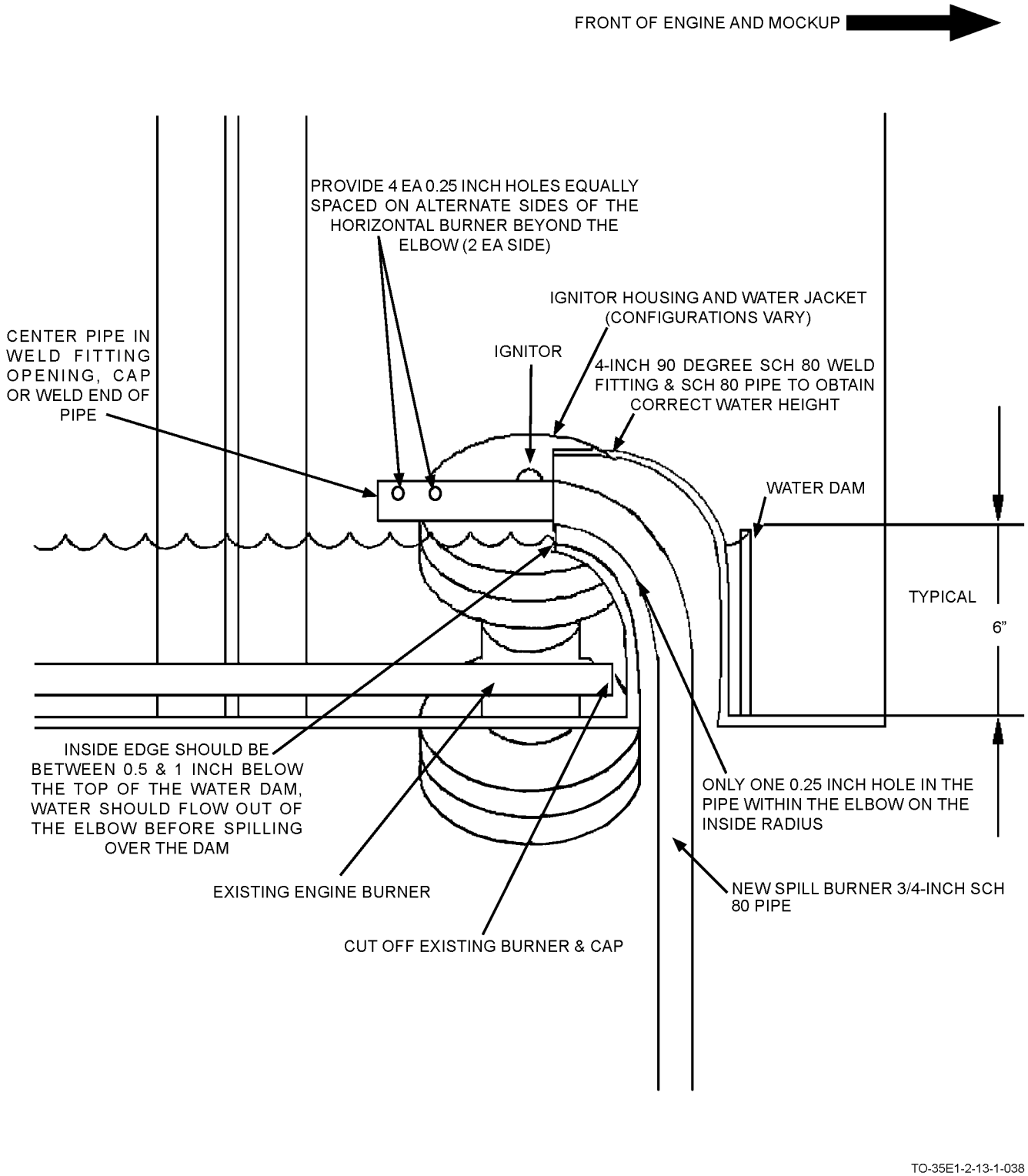
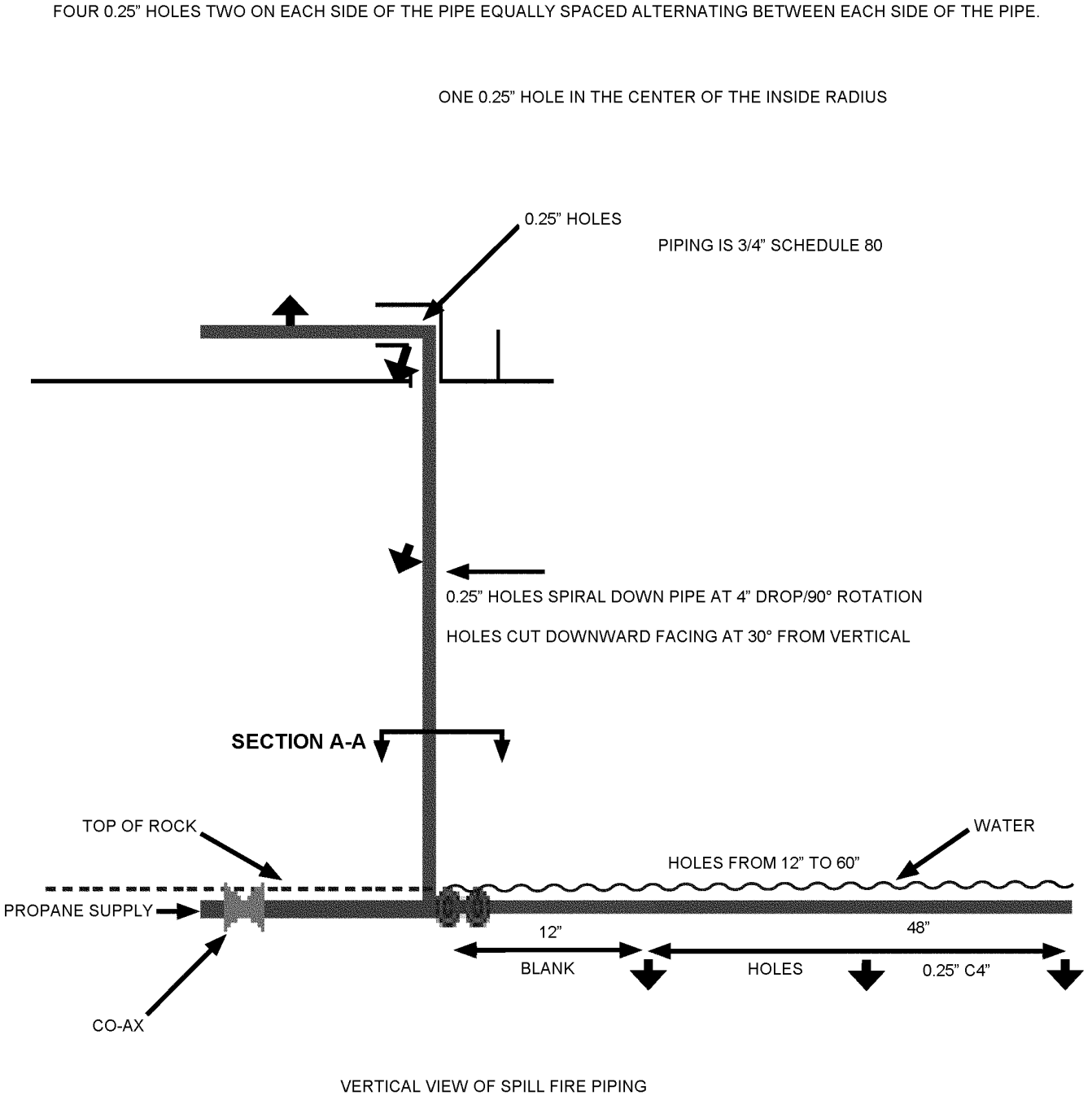


Figure 27. Generic New Engine Fire With Spill Fire/Ignitor Interface

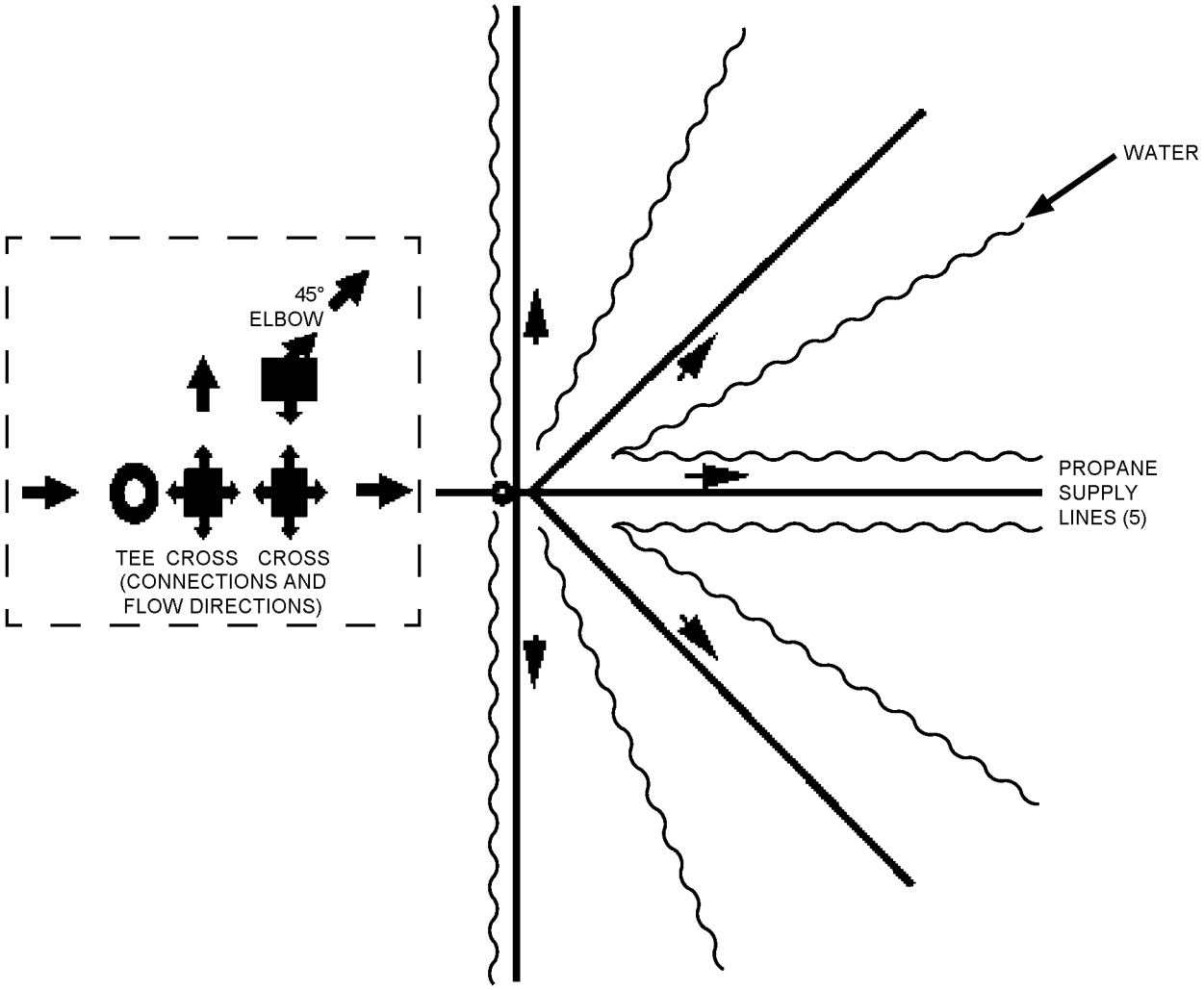


VERTICAL VIEW OF SPILL FIRE PIPING

NOTE:
PROPANE SUPPLY RE-ROUTED FROM EXISTING BATTERY FIRE EVENT CO-AX VALVE RELOCATED TO WITHIN 5 FEET OF THE NEW SPILL FIRE BURNER.

TO-35E1-2-13-1-039

Figure 28. Elevation View Of Spill Fire Burner

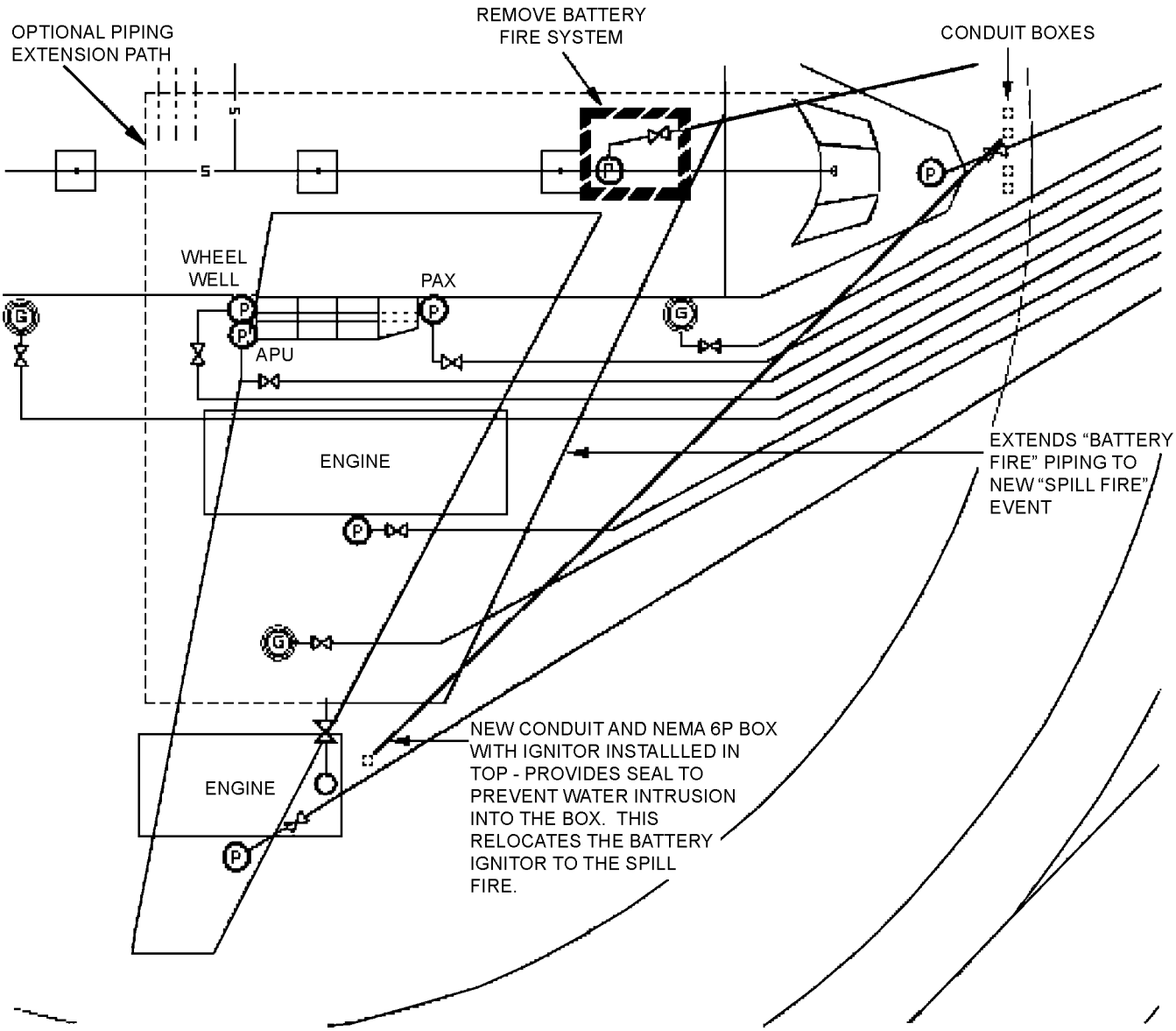


SECTION A-A VIEW

LOOKING DOWN VIEW OF SPILL FIRE PIPING
(UNDER WATER)

TO-35E1-2-13-1-040

Figure 29. Plan View Of Spill Fire Burner



NOTE:
THE "BATTERY FIRE" PIPING INCLUDES 3/4 INCH SCHEDULE 80 GAS PIPE AND TWO (2) PNEUMATIC CONTROL LINES FOR THE CO-AX VALVES.

TO-35E1-2-13-1-041

Figure 30. Relocation Of Battery Piping To Engine And Modified Electrical Ignition Plan

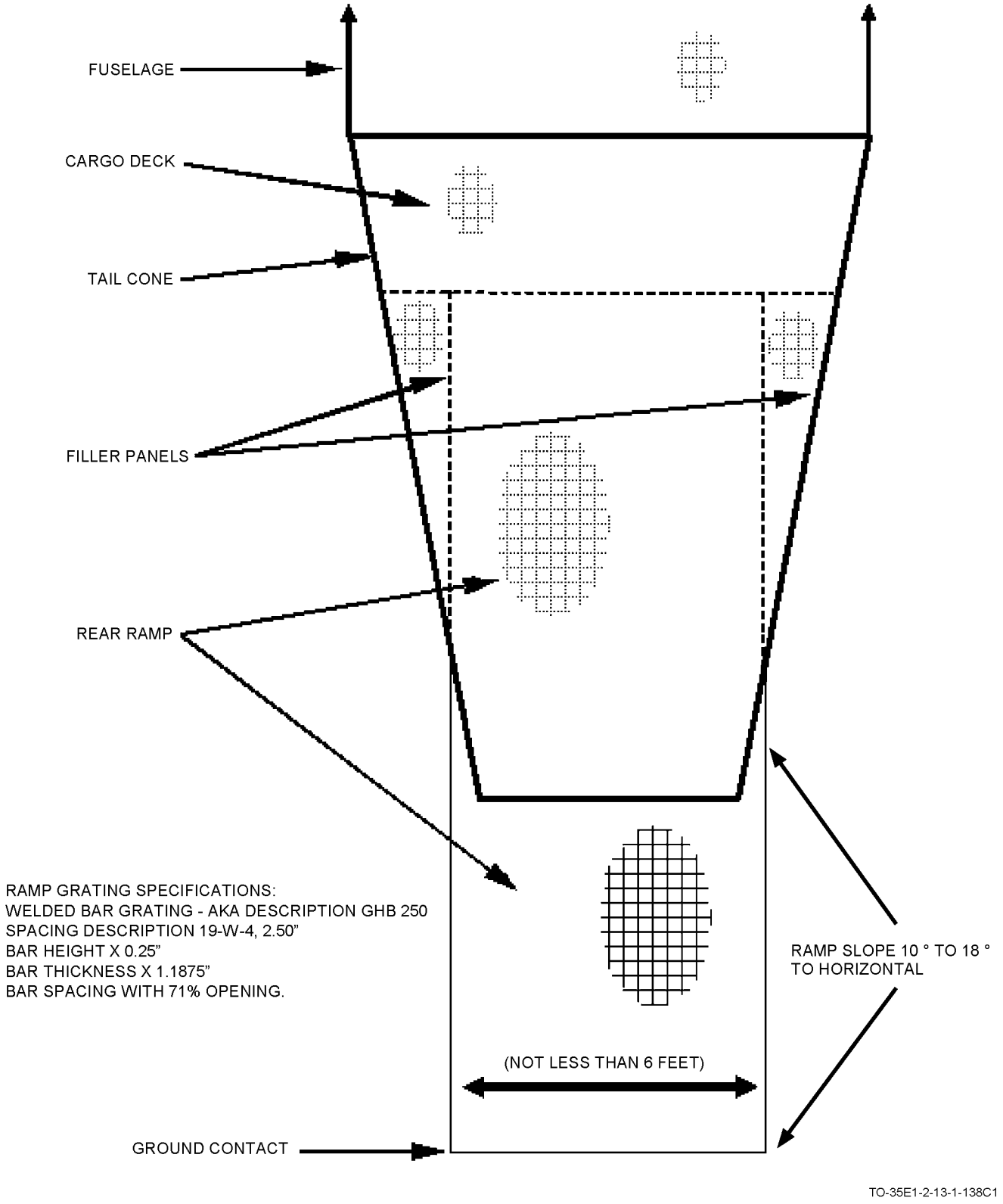
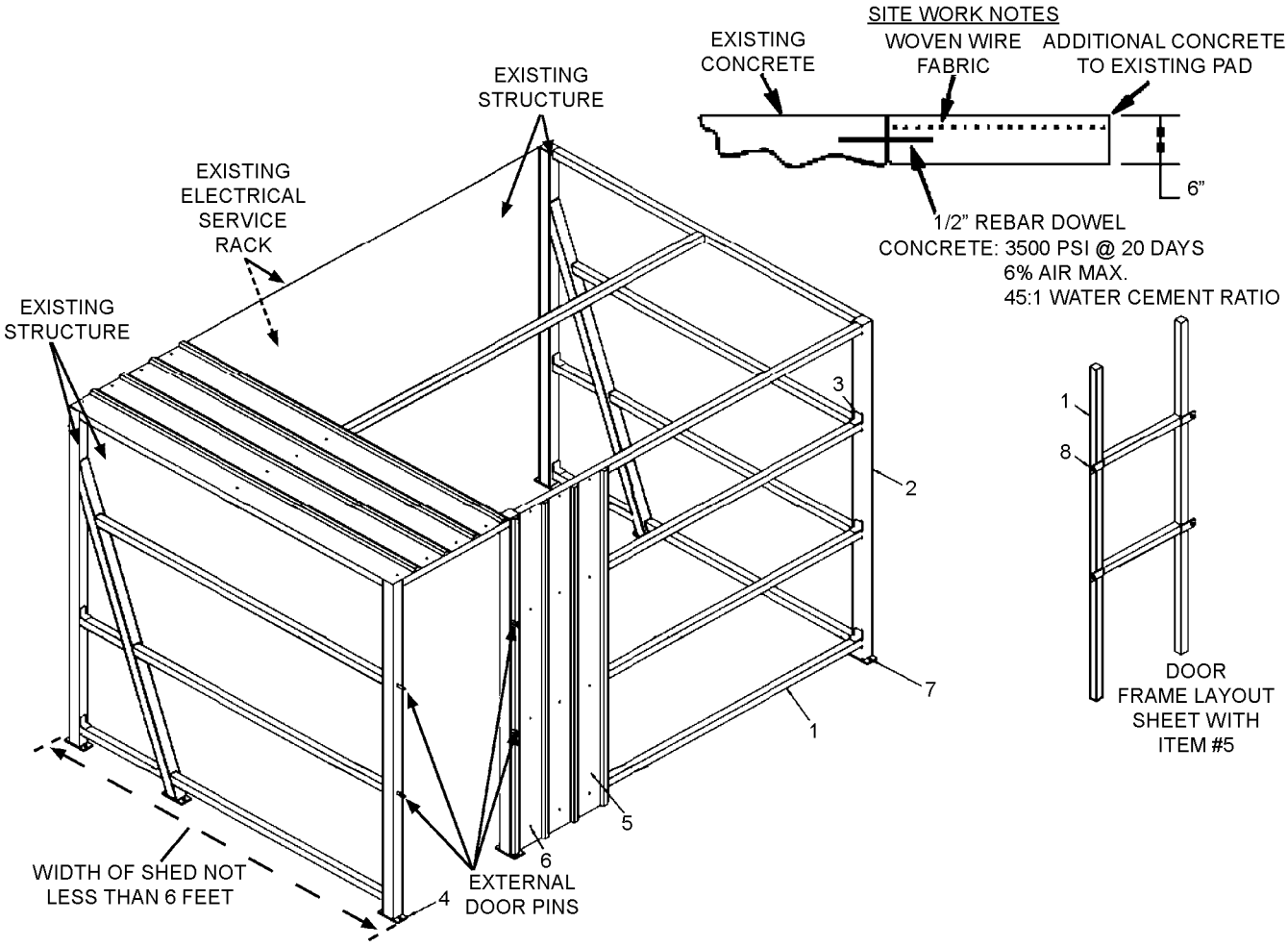


Figure 31. Aircraft Fire Trainer Cargo/Vehicle Ramp Plan View

AIR COMPRESSER SHELTER PARTS LIST			
ITEM	QTY	P/N	DESCRIPTION
1	-	-	GIRT TUBE - 2" X 2" SPLIT SEAM 16 GA. GALVANIZED TUBING
2	-	-	CORNER POST - 3" X 3" X 1/4" GALVANIZED BOX TUBING
3	-	-	MOUNTING TAB - 2" X 2" X 1/4" GALVANIZED ANGLE X 2"
4	-	-	BASE PLATE - 3" X 6" X 36" A36 GALVANIZED PLATE
5	-	-	R-PANEL GALVANIZED 26 GA. STEEL SIDING
6	-	-	#12 X 1" ROOFING SCREWS
7	-	-	RED HEAD TRUBOLT WEDGE 1/2" X 2 3/4"
8	-	-	DOOR MOUNT TABS - 2" X 4" X 1/4" A36 GALVANIZED PLATE

NOTE:
QUANTITY AND SIZE MAY VARY ACCORDING TO EXISTING ELECTRICAL SERVICE RACK/PANEL SIZE. EXTERIOR WALL OF SHELTER ACCOMODATES EXISTING ELECTRICAL SERVICE RACK WHILE THE SHELTER WILL HOUSE THE AIR COMPRESSOR AND ITS WIRING FROM THE ELECTRICAL SERVICE RACK.

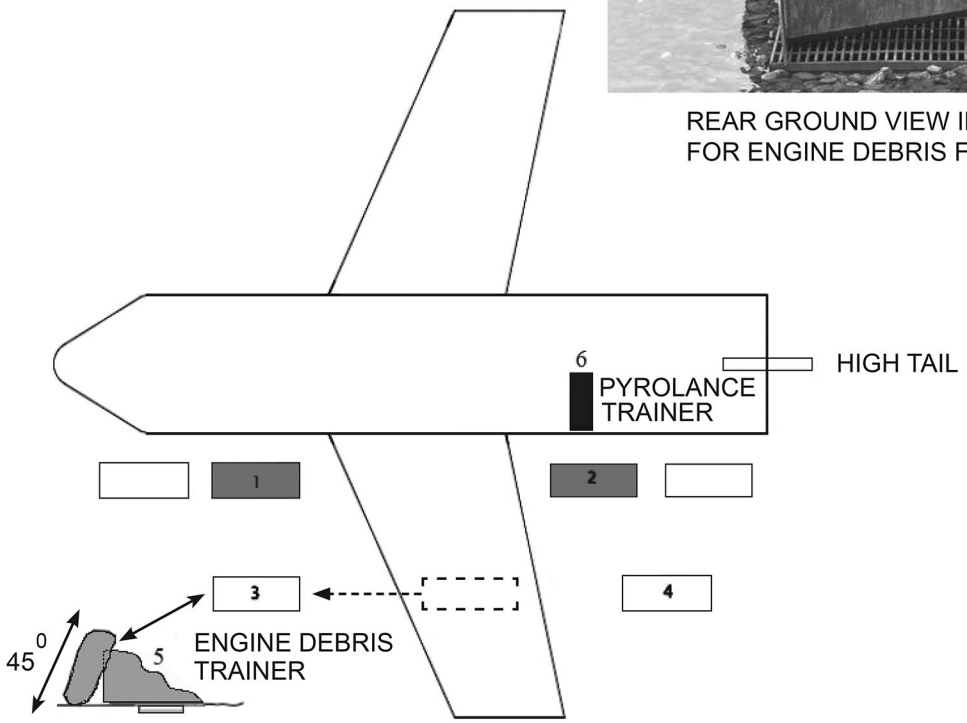


NOTE:
DIMENSIONS OF SHELTER TO BE DETERMINED IN THE FIELD; HEIGHT AND LENGTH NOT LESS THAN HEIGHT AND LENGTH OF EXISTING ELECTRICAL SERVICE RACK (TYPICALLY SHELTER SHOULD PROVIDE 72 SQ FT OF PROTECTED SPACE). CONCRETE PAD IS THEN EXTENDED TO AFFIX THE SHELTER. THE SHELTER DOOR IS DETACHABLE, NOT HINGED. WHEN SECURING SHELTER DOOR, PLACEMENT IS MOUNTED TO EXTERNAL PINS ON DOOR FRAME AND SECURED WITH COTTER PINS OR SUITABLE SUBSTITUTE. DURING USE, THE SHELTER DOOR IS STOWED ON INSIDE OF SHELTER IN THE APPROXIMATE LOCATION AS DEPICTED.

TO-35E1-2-13-1-042

Figure 32. Air Compressor Shelter Layout

REAR GROUND VIEW INSTALLATION
FOR ENGINE DEBRIS FIRE TRAINER



MODIFICATION DIRECTIONS/NEW SPECIFICATIONS:

1. LEFT WING BURNER - REMOVED
2. LEFT REAR GROUND FRONT BURNER - REMOVED
3. RELOCATE LEFT WING GROUND BURNER AND ALL SERVICES FOR ENGINE DEBRIS FIRE TRAINER USE
4. RELOCATE LEFT REAR GROUND FRONT BURNER WITH SERVICES FROM HIGH TAIL FOR PYROLANCE USE
5. SEPARATED ENGINE COWLING FIRE WITH DEBRIS AT 45 DEGREE ANGLE LOCATED ON BURNER
6. EXISTING DOOR (SEE PYROLANCE TRAINER MODIFICATION DETAILS)

TO-35E1-2-13-1-139C2

Figure 33. Engine Debris Trainer

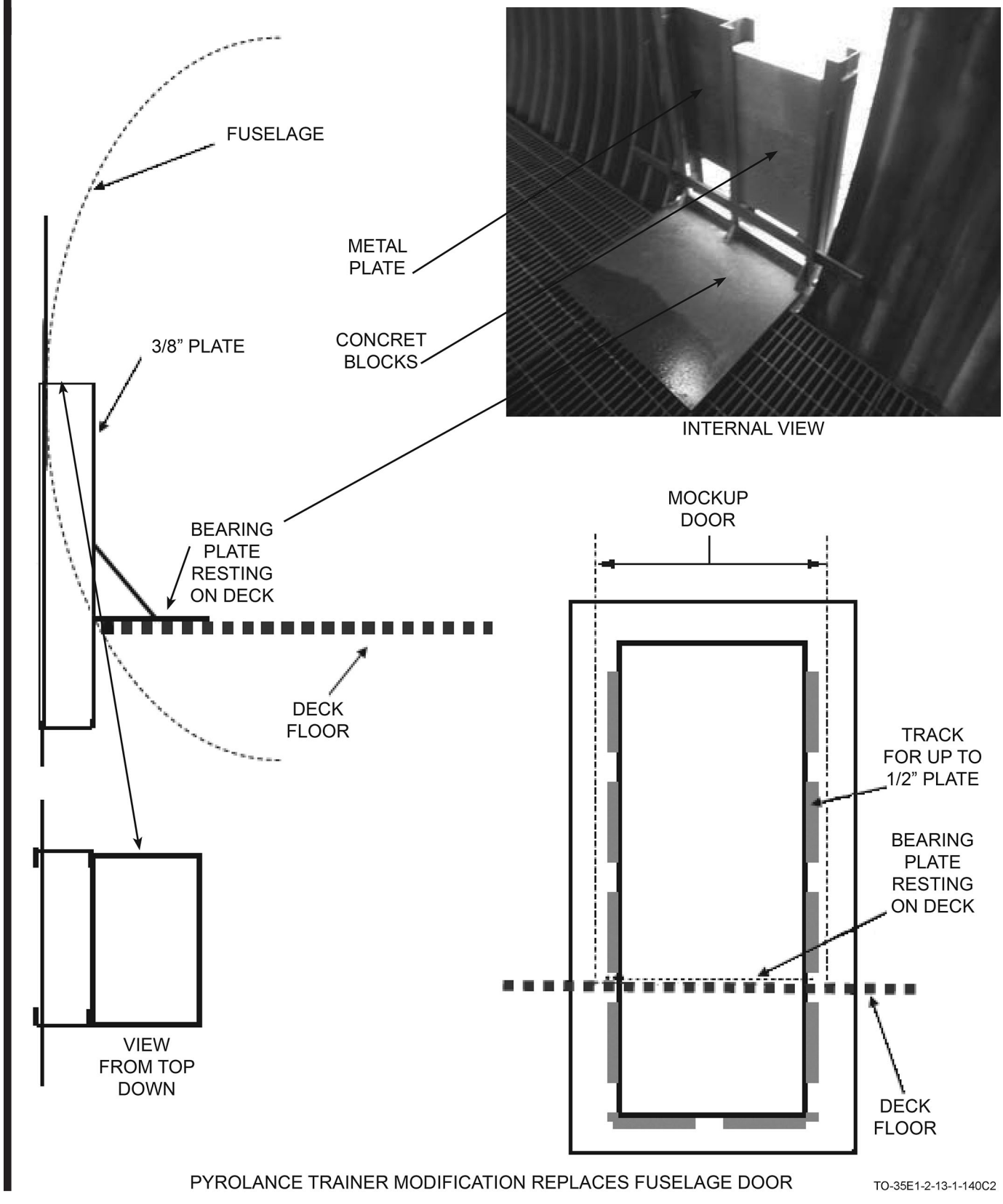


Figure 34. Pyrolance Trainer

Table 3. Maintenance Inspection and Test Schedule

Subsystem	Item	Inspection Interval	Inspect Test	Test Interval	Test How	Required Action	Action Taken
Propane Storage (Modified version of NPGA* Bulletin # 106-83)	ASME Tank	Every 3 Years by Inspector	Corrosion Cracks Leakage	N/A	N/A	Repair Replace	
	Excess Flow Valves LPG Lines	N/A	N/A	Once a year	Make sure valve cycles	Replace	
	Relief valves in tank	N/A	N/A	Every 10 years	Bench test to manufacturer's specification	Replace	
	Seismic sensor, if applicable	Semiannual	Corrosion Cracks Leakage	Semiannual	Actuates and closes pneumatic shutoff	Replace	
Safety Control Stand	N2 Accumulator	Every 3 years by inspector	Corrosion Cracks Leakage	N/A	N/A	Repair Replace	
Burner Area	Leak detection single liner	Semiannual	Corrosion Cracks Leakage	Semiannual	Sample- if detection wells	Cease ops determine source	
Ignition	Cable Sleeve/2000 Braided Ceramic	N/A	N/A	Every 5 years	N/A	Replace with new cable sleeve	
Water Conservation Pond	Pumps (3)**	Manufacturer's requirements	Proper Operation	Manufacturer's Requirements	Manufacturer's Requirements	Repair Rebuild Replace	
	Pond Water	Monthly	Check water test PH level is algae present	N/A	N/A	Circulate water	
		N/A	N/A	Semi-Annual	Test PH	Rebalance PH	
Corrosion Control	Impress current system	60 Days UFC 3-570-06 Manufacturer's requirements	Check voltage check amperage clean rectifier	Annual UFC 3-570-06 AFH 32-1290(I)	Over the line survey	Repair Rebuild Replace	
	Sacrificial anode bed	N/A	N/A	Annual	Voltage Test	Replace	
		Annual	Expiration date	None	None	Replace if expired	

Table 3. Maintenance Inspection and Test Schedule - Continued

Subsystem	Item	Inspection Interval	Inspect Test	Test Interval	Test How	Required Action	Action Taken
	Trainer Mockup	Semi-Annual	Visual verify all drain holes open	N/A	N/A	Clean if blocked	
		Annual	Visual verify no debris, scale, loose rust in bottom of mockup	N/A	N/A	Clean bottom of mockup	
Inspected By				Date			

* National Propane Gas Association

** No commonality among numerous pumps

SUBORDINATE WORK PACKAGE

TECHNICAL PROCEDURES

OPERATION AND MAINTENANCE INSTRUCTIONS FAULT ISOLATION

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE SWP PAGES

Total Number of Pages in this SWP is 4 consisting of the following:

* Zero in this column indicates an original page.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
1 - 3	0	4 Blank	0		

TABLE OF CONTENTS

REFERENCE MATERIAL REQUIRED
NONE

APPLICABLE TCTOs
NONE

CONSUMABLE MATERIALS
NONE

APPLICABLE SUPPORT EQUIPMENT
NONE

1 FOREWORD.

This work package contains fault isolation procedures for Aircraft Fire Training Facility (AFTF). These procedures include electrical system, propane system, and water system fault isolation.

2 SAFETY SUMMARY.

Various steps in this work package may require personnel to be exposed to extremely high temperatures and open flames. It is imperative to wear appropriate protective clothing and to locate and be familiar with the operation of the auxiliary lockout switch. Failure to comply may cause serious injury or death to personnel.

3 NO SPARK AT IGNITOR WHEN IGNITOR SWITCH IS ON.

NOTE

- Make sure ignitor switches are wired to correct ignitors, solenoids, or pilot valves, if applicable.
- Ignition cable which is not MIL-3702, improper cable splices, transformer connections that are not made with lug/spade connectors, and ignitor connections which are not made with proper pigtails, will cause ignitor failures.

a. Check power available to Services Rack. Have power provided if not.

b. At Services Rack, position main disconnect and all other switches ON. Also position all applicable circuit breakers ON.

c. Check if power is available from Services Rack to Transformer Cabinet and Control Stand. Repair either, or both, if necessary.

d. Position auxiliary lockout switch on Control Stand to ON, if applicable.

e. Position Main Ignition Switch on Control Stand to ON, if applicable.

f. Pull Emergency Shutdown Switch OUT.

g. Turn and hold appropriate ignitor switch ON.

h. Record voltage available to the primary side of appropriate transformer. Repair if not 120 vac.

i. Check and record voltage available on secondary side of appropriate transformer. Repair if not 10 kvac.

j. Check and record voltage available to appropriate ignitor pigtail. Will be lower than 10 kvac, but higher than zero. Repair if zero.

k. Check and record voltage available at appropriate ignitor. Will be lower than 10 kvac, but higher than zero. Repair if zero.

l. Check physical condition of ignitor. Replace if damaged.

4 NO PROPANE AT BURNER WHEN APPROPRIATE IGNITOR SWITCH IS ON AND APPROPRIATE BURNER CONTROL BALL VALVE IS OPEN.

NOTE

Make sure storage tank contains a minimum of 2500 gals of propane. Liquid flow from the tank will stop when the tank capacity drops below 10% to 20% because the excess flow valve extends 6 to 10 inches (depends on manufacturer) up inside the tank.

a. Check globe and excess flow valve in propane line from tank to control stand are open. Slowly OPEN globe valve if closed. If excess flow valve is closed, observe frost downstream, CLOSE globe valve and listen for excess flow valve to “clunk” open. Slowly REOPEN globe valve.

b. Check manifold shutoff valve is OPEN. Slowly OPEN manifold shutoff valve if closed.

c. Check solenoid valve in propane line to burner is opening. Cycle ignitor switch and listen for solenoid

valve clicks. Look for frost downstream of solenoid valve and listen for solenoid valve humming or chattering. Replace solenoid if necessary.

d. Check pilot valve for COAX valve in propane line to burner is functioning. Cycle emergency shutdown switch IN and OUT, or ignitor switch ON and OFF, listen for pilot valve clicking and N_2 gas venting. Make sure 60-120 psig N_2 is available for COAX functioning. Replace pilot if necessary or replace N_2 bottles if empty.

5 NO WATER IN BURN AREA WITH CONSERVATION POND PUMP SWITCH ON AND APPROPRIATE VALVES ON CONTROL STAND OPEN.

NOTE

Make sure conservation pond water level is at design freeboard.

a. Check power available to pump switch and pump. Provide power to switch, from switch, and to pump if required.

b. Check pump is running. If not, repair/replace pump.

c. Check pump suction and discharge lines are clear. Remove obstructions if necessary.

d. Check bypass valve is CLOSED. Close bypass valve, if open.

e. Cycle each water control valve in turn to make sure valves are OPENING/CLOSING as required. Make note of change in water flow, if any. Repair/replace valve(s) controls if necessary.

6 SOLENOID NOT OPERATING PROPERLY.

a. Check solenoid function.

b. If solenoid does not open fully, the result will be too small of a fire/flame to train with.

c. Remove and replace solenoid.

7 EMERGENCY SHUTDOWN NOT OPERATING.

a. Check to hear no air being released.

b. Check to hear no air upon reset.

c. Check voltage at pilot valve.

(1) If under constant voltage, when switch is cycled, and the electrical relay has failed to de-energize. Remove and replace relay.

(2) If under no voltage, the electrical relay has failed to energize. Remove and replace relay.

(3) If voltage changes, relay is operating, then pilot valve has failed. Remove and replace pilot valve.

SUBORDINATE WORK PACKAGE

TECHNICAL PROCEDURES

OPERATION AND MAINTENANCE INSTRUCTION REPLACEMENT SCHEDULE

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE SWP PAGES

Total Number of Pages in this SWP is 2 consisting of the following:

* Zero in this column indicates an original page.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
1 - 2	0				

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LIST OF ILLUSTRATIONS

Number	Title	Page	Number	Title	Page

LIST OF TABLES

REFERENCE MATERIAL REQUIRED
NONE

APPLICABLE TCTOs
NONE

CONSUMABLE MATERIALS
NONE

APPLICABLE SUPPORT EQUIPMENT
NONE

1 FOREWORD.

This work package contains a time dependant replacement schedule for the Aircraft Fire Training Facility (AFTF). This schedule identifies those components needing replacement at a specific time the item is considered non-usable.

2 SAFETY SUMMARY.

This work package contains components that may require personnel to be exposed to high pressures and liquid propane gas. It is imperative to wear appropriate protective clothing while removing and replacing identified replacement components. Failure to comply may cause serious injury or death to personnel.

Table 1. Time Dependant Replacement Schedule

Item	Replacement Age	Operating Window
LPG tank relief valves	replace or rebuild/ recertify every 10 years	maximum allowed operating window 11 years
LPG liquid piping hydrostatic relief valves	replace every 10 years	maximum allowed operating window 11 years

Table 1. Time Dependant Replacement Schedule - Continued

Item	Replacement Age	Operating Window
LPG liquid piping hydrostatic relief valves	replace every 10 years	maximum allowed operating window 11 years
Pneumatic system Pilot Valves (WP 003 00 Table 3)	replace or rebuild every 10 years	maximum allowed operating window 11 years
LPG Flexible hoses (NFPA 58-2011 9.4.3.7)	replace every 10 years	maximum allowed operating window 11 years

NOTE

Schedule starts at time of component replacement. Original components will remain in service until replacement or malfunction causes replacement. Replacement schedule will stagger existing facilities making components readily available.

WORK PACKAGE

TECHNICAL PROCEDURES

OPERATION AND MAINTENANCE INSTRUCTIONS FACILITY OVERVIEWS

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE WP PAGES

Total Number of Pages in this WP is 92 consisting of the following:

* Zero in this column indicates an original page.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
1 - 2	2	50	2		
3 - 49	0	51 - 92	0		

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LIST OF ILLUSTRATIONS - CONTINUED

LIST OF TABLES

REFERENCE MATERIAL REQUIRED

Publication Number	Publication Title
WP 009 00	Goodfellow AFB Texas Operating Procedures
WP 010 00	Thule AFB Greenland Operating Procedures

APPLICABLE TCTOs
NONE

CONSUMABLE MATERIALS
NONE

APPLICABLE SUPPORT EQUIPMENT
NONE

1 FOREWORD.

This work package contains the site drawings and their locations for the Aircraft Fire Training Facility (AFTF). This work package does not include Goodfellow AFB TX and Thule AB Greenland due to their distinct engineering differences and operations. Those site drawings are located elsewhere in WP 009 00 and WP 010 00 respectively.

2 SITE CONSTRUCTION.

Missing site drawings are attributed to various reasons such as site under construction, site construction not started, site under modification, or site under engineering review.

Table 1. Permanent Deviation Table

Installation	Facility Type	Approved Deviation
Alpena ANGB	Pro-Safe	Pro-Safe commercial fire trainer system. New PLC system and running fuel fire added in 2012.
Avaino AB	Non-standard	Controls similar to CFRTF-3-P, mockup unique to Avaino, no effluent controls.
Barksdale AFB	CFRTF-3-P Mod 5	Effluent discharge to sanitary waste stream. Discharges to swamp.
Charlotte ANGB	Symtron Systems	Symtron Systems commercial fire trainer system.
Dobbins ARB	CFRTF-3-P Mod 5	Effluent discharge to spray field.
Dyess AFB	CFRTF-2 & AFTF-P-4.0	AFTF-P-4.0 Mockup and AFTF-P-4.0 interior and engine burners, effluent discharge to sanitary waste stream.
Edwards AFB	Non-Standard	Local mockup, effluent discharge to tank with overflow to storm.
Eielson AFB	CRFTF-3-P Mod 5	HDPE Conduit for ignition cable.
Elmendorf AFB	CRFTF-3-P Mod 5	HDPE Conduit for ignition cable.
Fargo ANGB	Pro-Safe	Pro-Safe commercial fire trainer system.
General Mitchell AFRB	CFRTF-3-P Mod 5	Effluent discharge to sanitary waste stream.
Gulfport ANGB	Pro-Safe	Pro-Safe commercial fire trainer system. New PLC system and running fuel fire added in 2012.
Lakenheath AFB	Non-Standard	Fighter mockup, effluent waste to storm waste stream.

Table 1. Permanent Deviation Table - Continued

Installation	Facility Type	Approved Deviation
Langley AFB	CRFTF-3-P Mod 5	Effluent waste stream to sanitary waste stream. Overflows to ground surface.
Little Rock AFB	Non-Standard	Non-standard mockup, effluent discharge to storm.
McGuire	CRFTF-3-P Mod 5	Light weight concrete fill inside mock-up; special burner configurations.
Maxwell AFB	CRFTF-3-P Mod 5	Buried LPG storage tank.
Mildenhall AB	Non-Standard	Non-standard mockup, effluent discharge to storm.
Misawa AB	CRFTF-3-P Mod 5	Electrical features to Japanese standards, LPG storage to Japanese standards, Japanese materials and parts used.
Palmdale AF Plant 42	CRFTF-3-P Mod 5	Two separate mockups CFRTF-3 for exterior spill fires and unique mockup for interior fires, effluent waste to sanitary waste stream.
Peterson AFB	CRFTF-3-P Mod 5	Unique mockup (full size C-130).
Robins AFB	CRFTF-3-P Mod 5	Effluent waste to industrial waste stream.
Savannah ANGB	Pro-Safe	Pro-Safe commercial fire trainer system.
Scott AFB	CRFTF-3-P Mod 5	Light weight concrete fill inside mock-up; concrete burn area, Cellular Raceway™ (HDPE conduit, Tuf-Hide® wire, Maxon ignitor) (for test and evaluation), special burner configurations.
Travis AFB	CRFTF-3-P Mod 5	Effluent waste underground storage with overflow to sanitary waste stream.
Tyndall AFB Silver Flag	CFRTF-2 prototype	Multiple research modifications.
Volk Field ANGB	Pro-Safe	Pro-Safe commercial fire trainer system.
Yokota AB	CRFTF-3-P Mod 5	Electrical features to Japanese standards, LPG storage to Japanese standards, Japanese materials and parts used.
Youngstown ARS	CRFTF-3-P Mod 5	Effluent waste to sanitary waste stream.

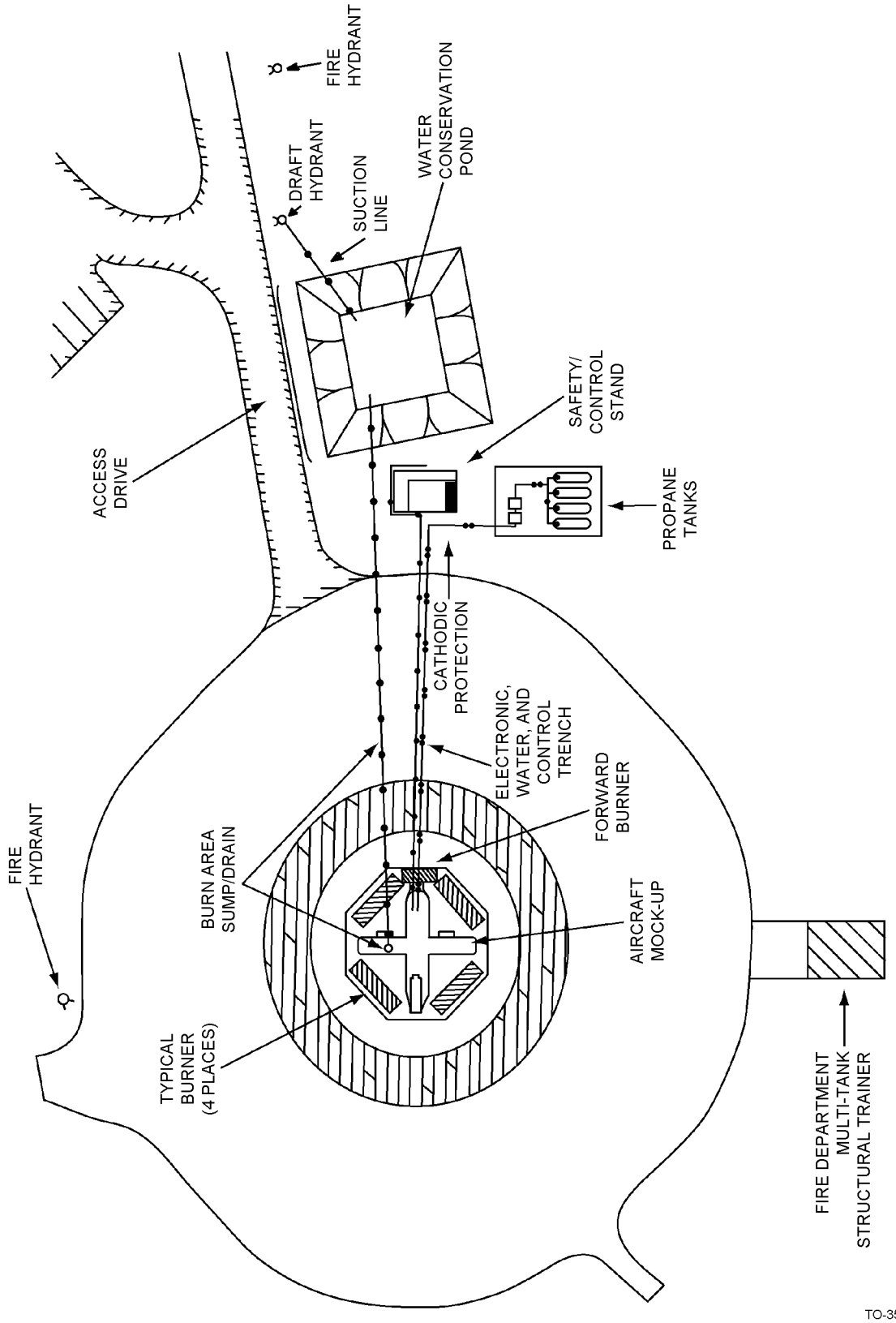

Figure 1. Alpena ANG Alpena CRTC, Michigan

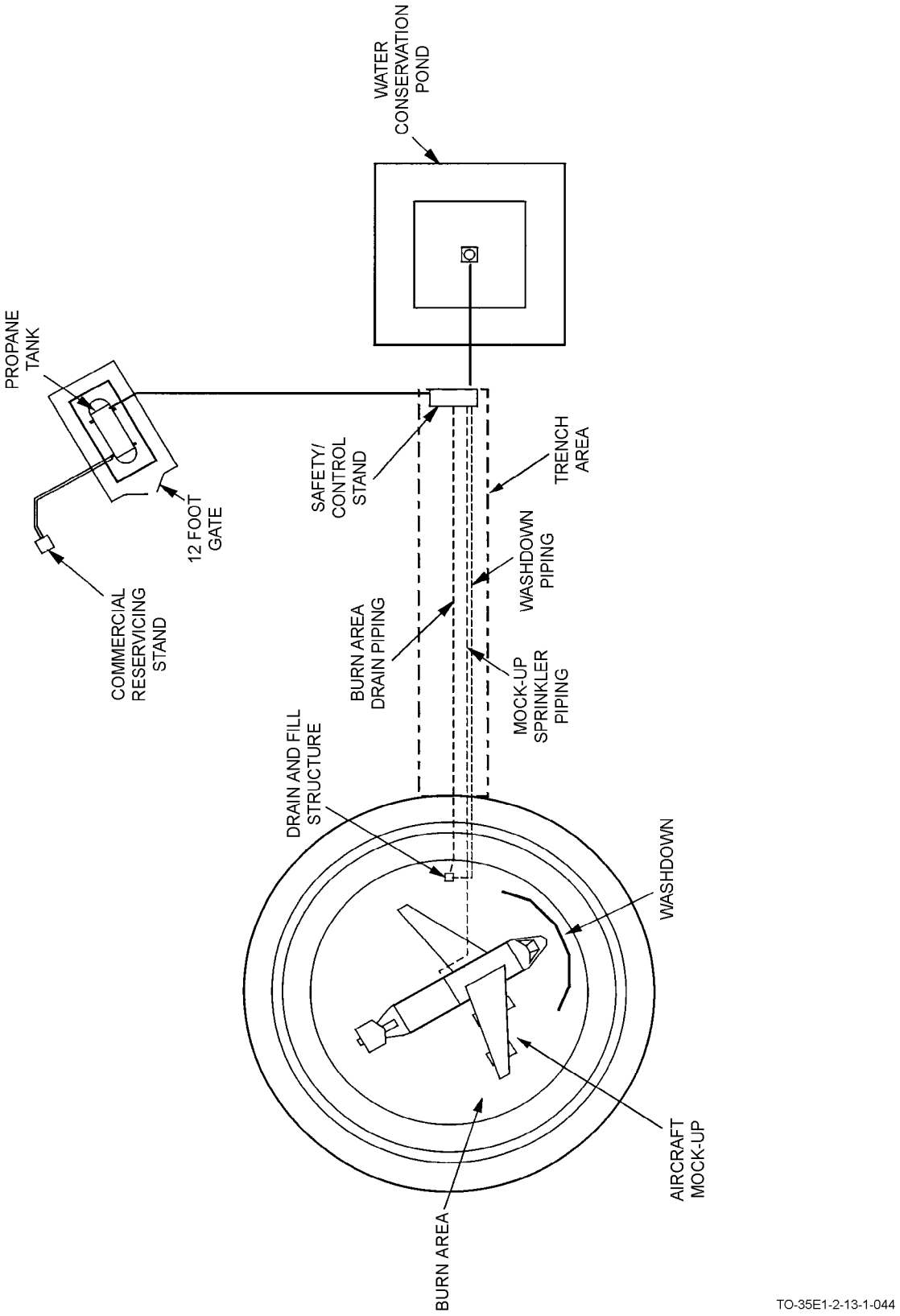

Figure 2. Altus AFB Altus, Oklahoma

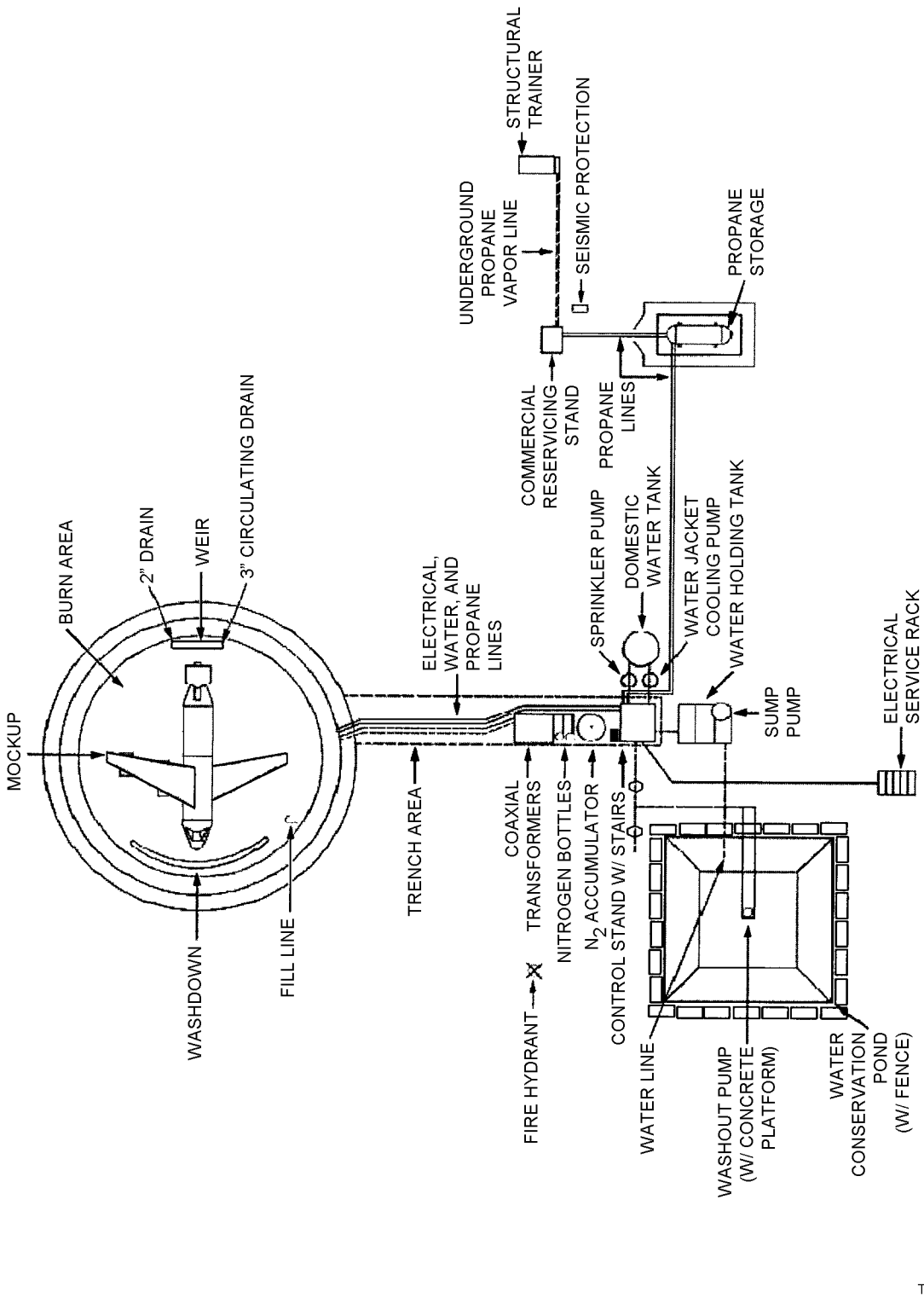

Figure 3. Andersen AFB Guam

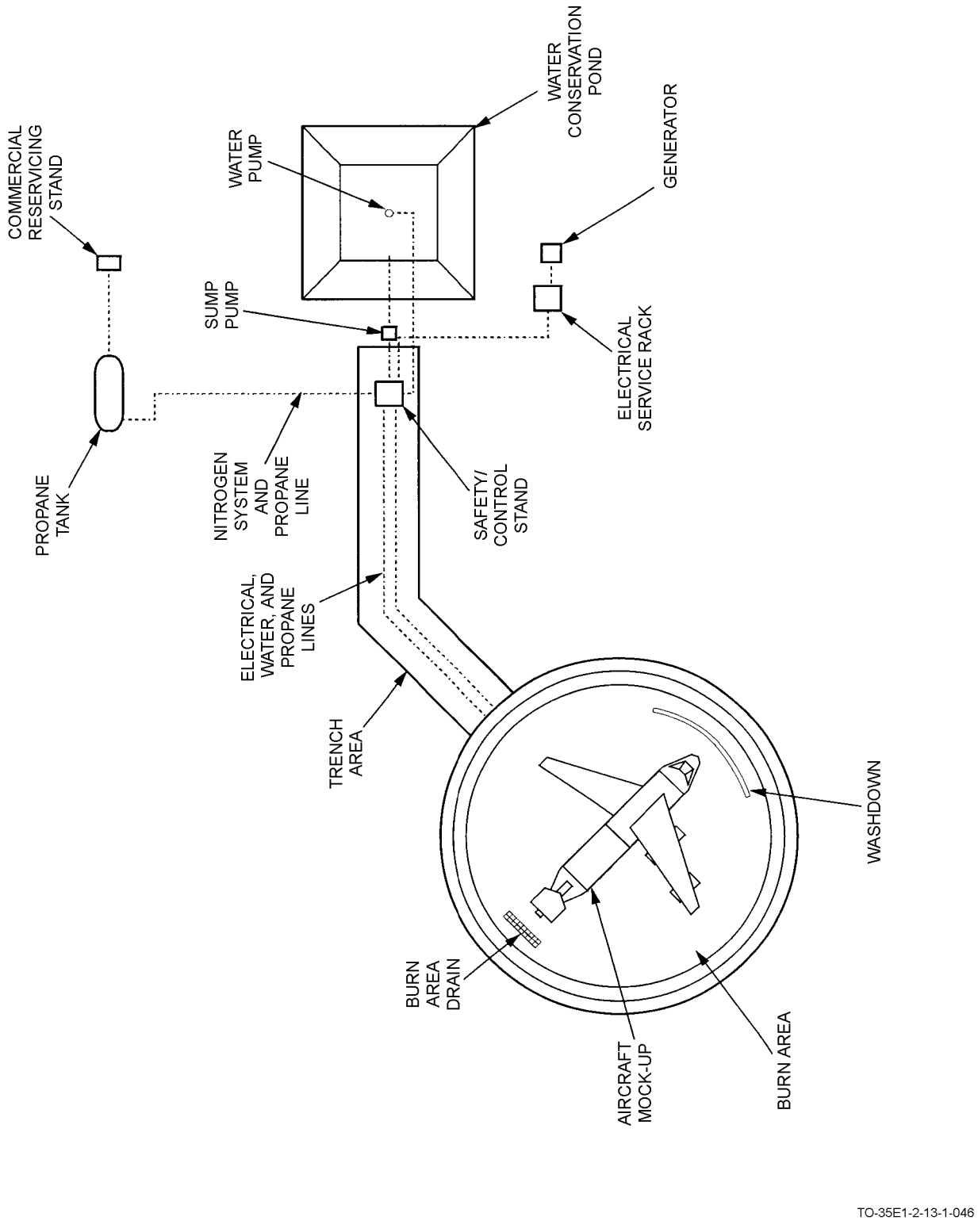

Figure 4. Andrews AFB Camp Spring, Maryland

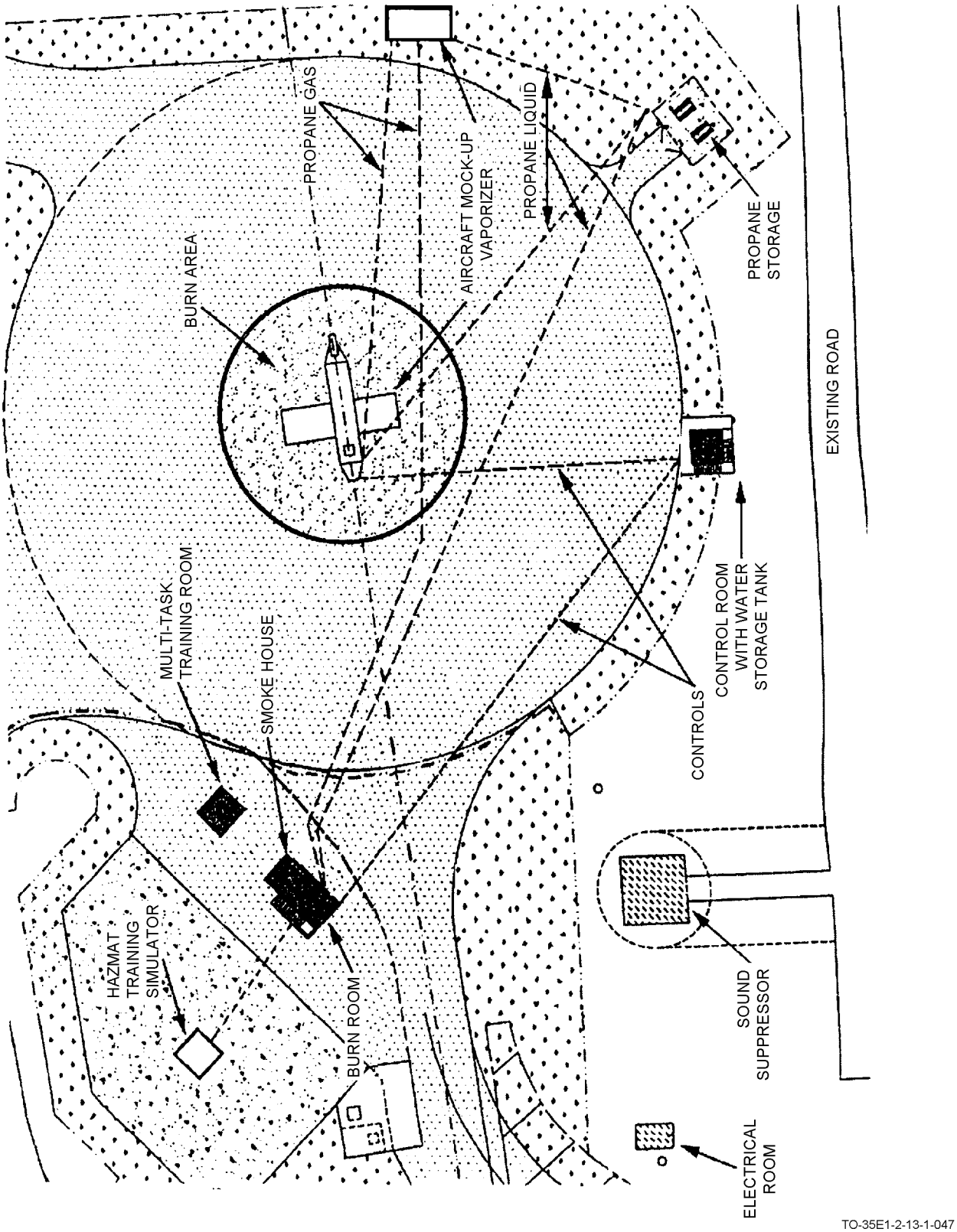

Figure 5. Aviano AB Aviano, Italy

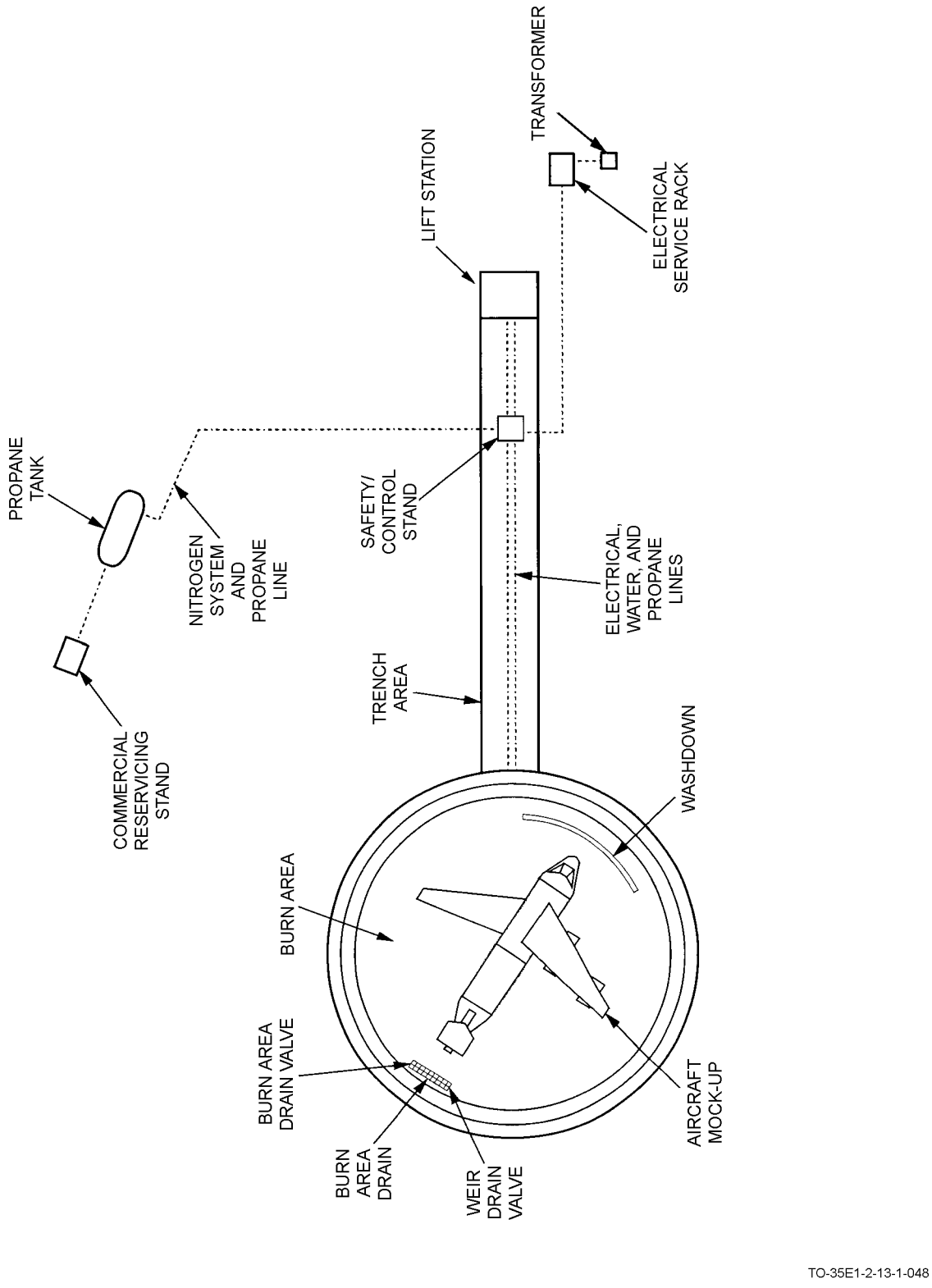

Figure 6. Barksdale AFB Shreveport, Louisiana

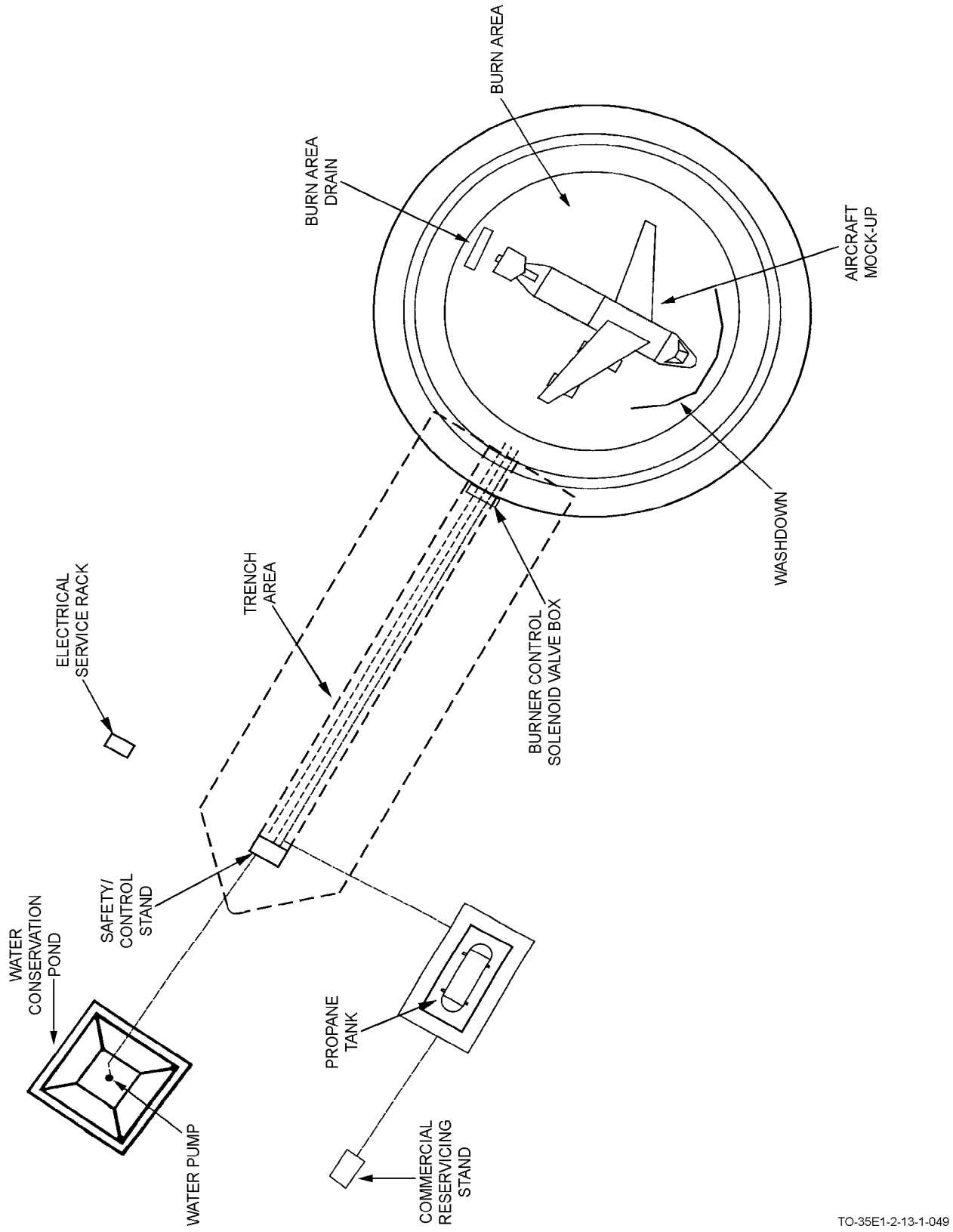

Figure 7. Beale AFB Marysville, California

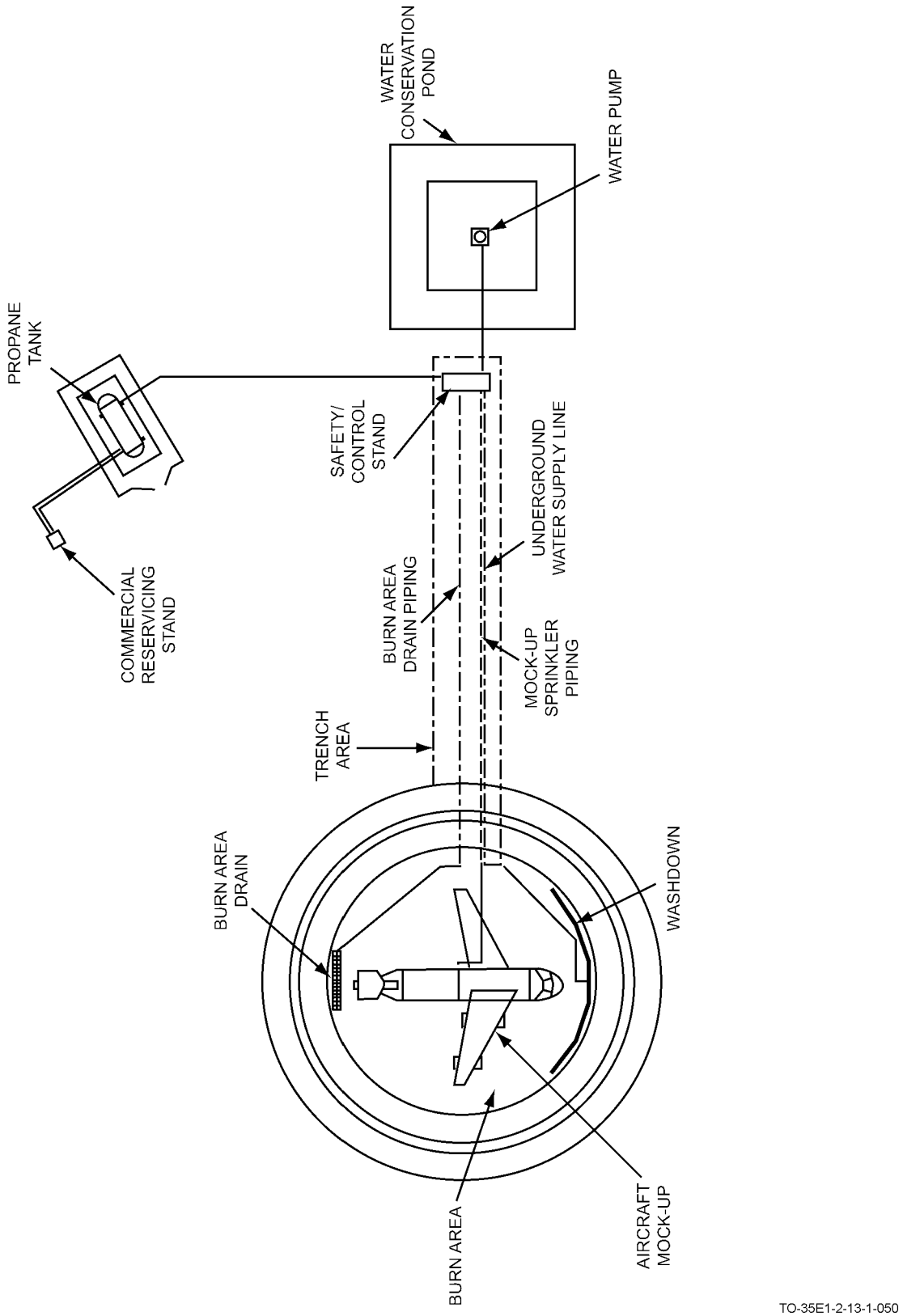

Figure 8. Cape Canaveral AS Cape Canaveral, Florida

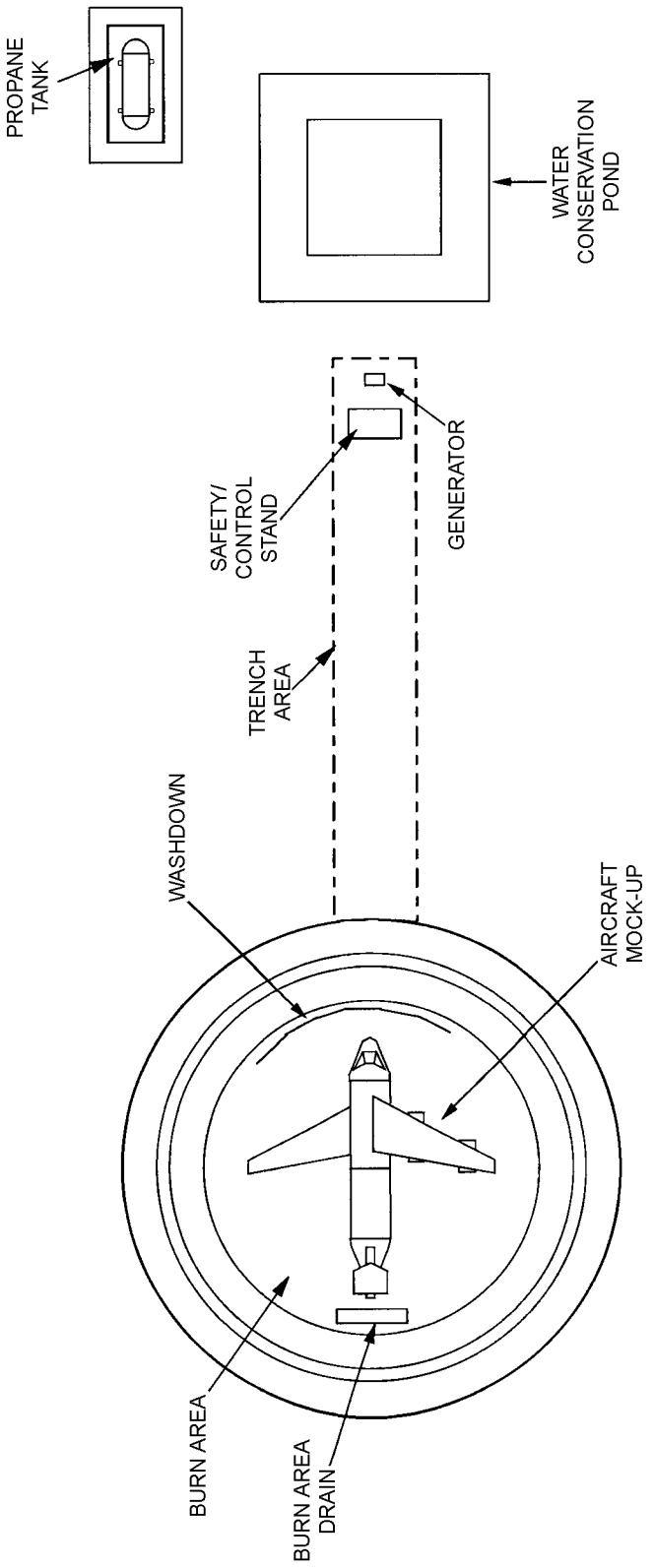

Figure 9. Cannon AFB Clovis, New Mexico

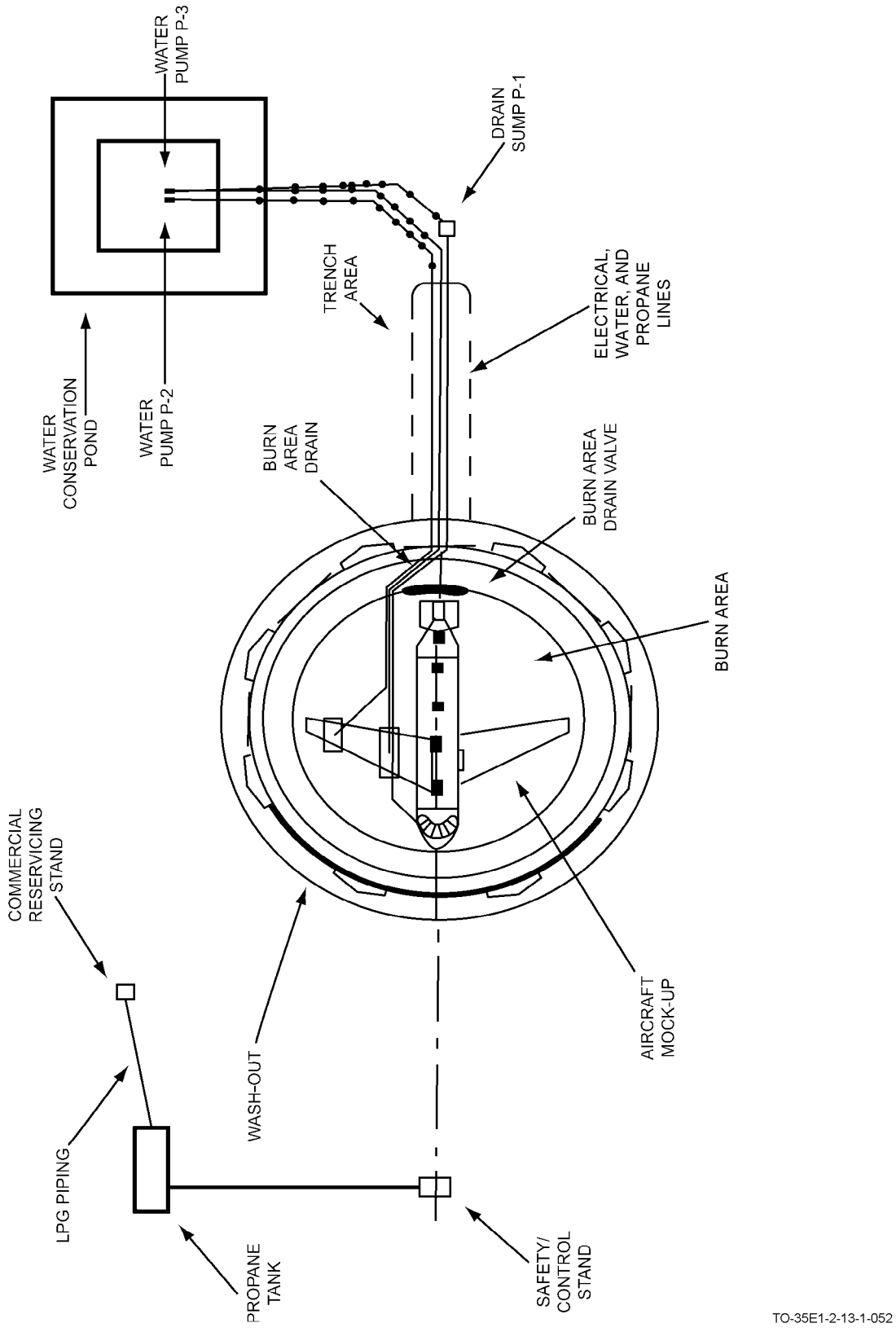

Figure 10. Charleston AFB Charleston, South Carolina

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Figure 11. Charlotte ANGB Charlotte, North Carolina

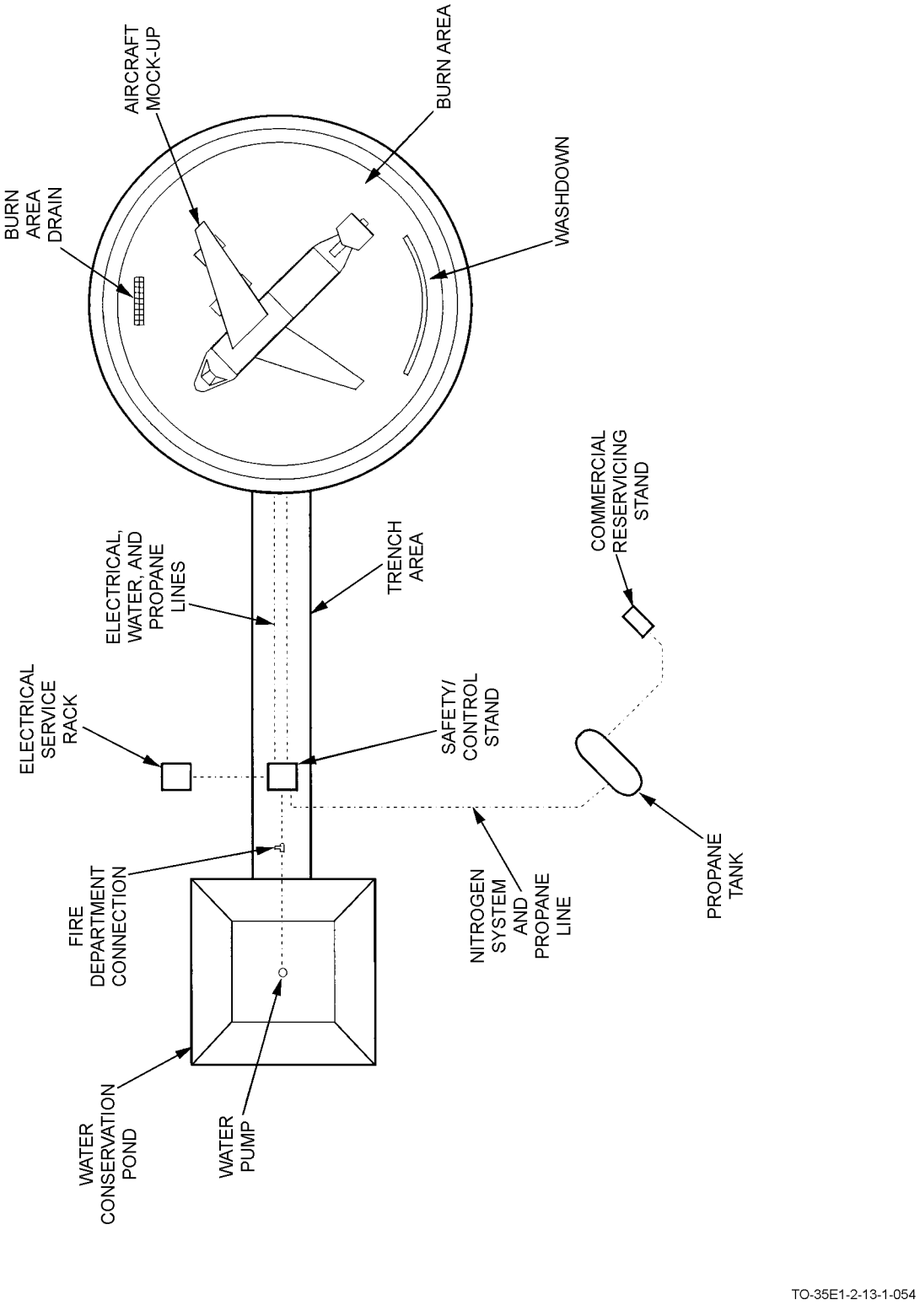

Figure 12. Columbus AFB Columbus, Mississippi

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Figure 13. Davis-Monthan AFB Tucson, Arizona

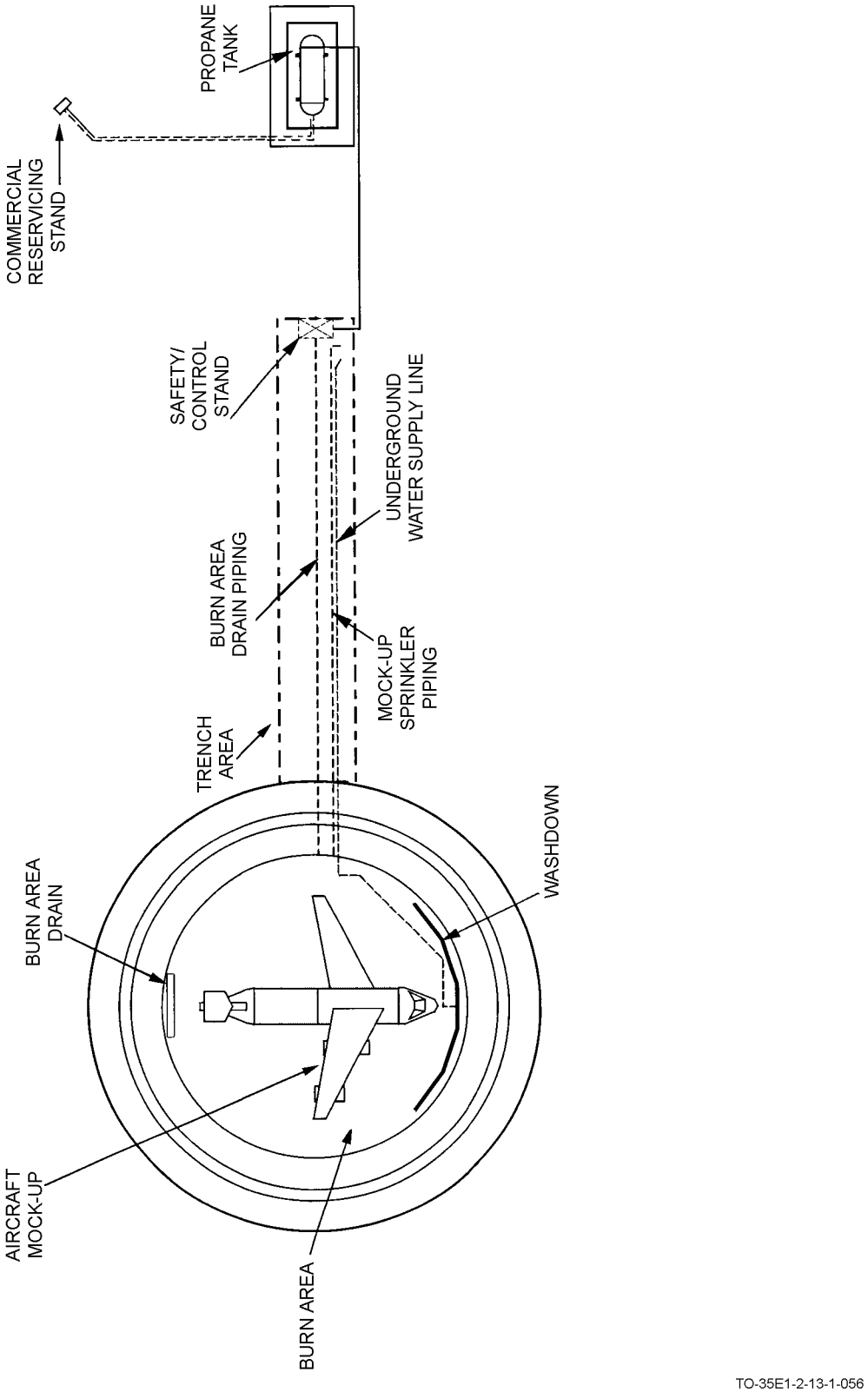

Figure 14. Dobbins AFB Marietta, Georgia

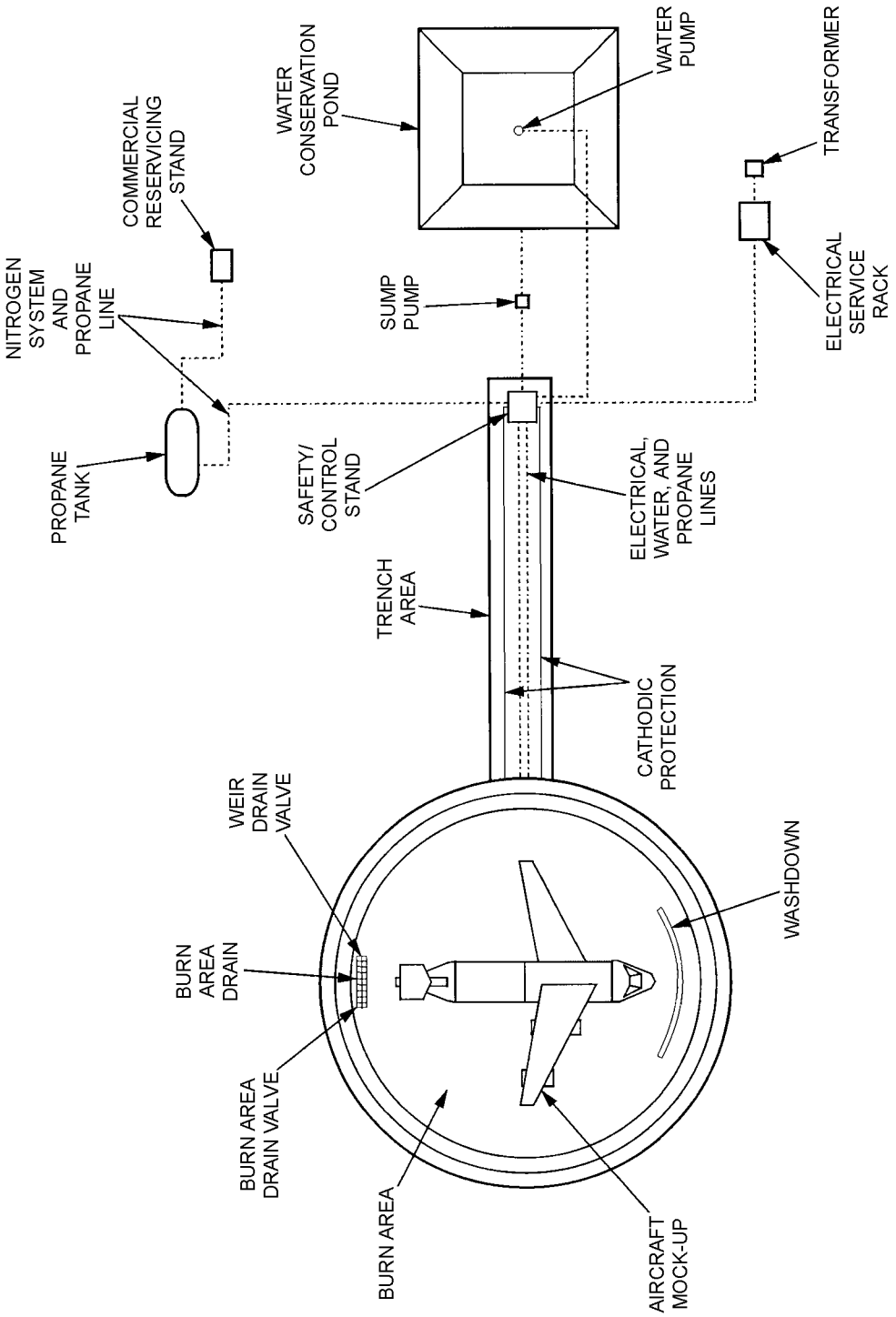

Figure 15. Dover AFB Dover, Delaware

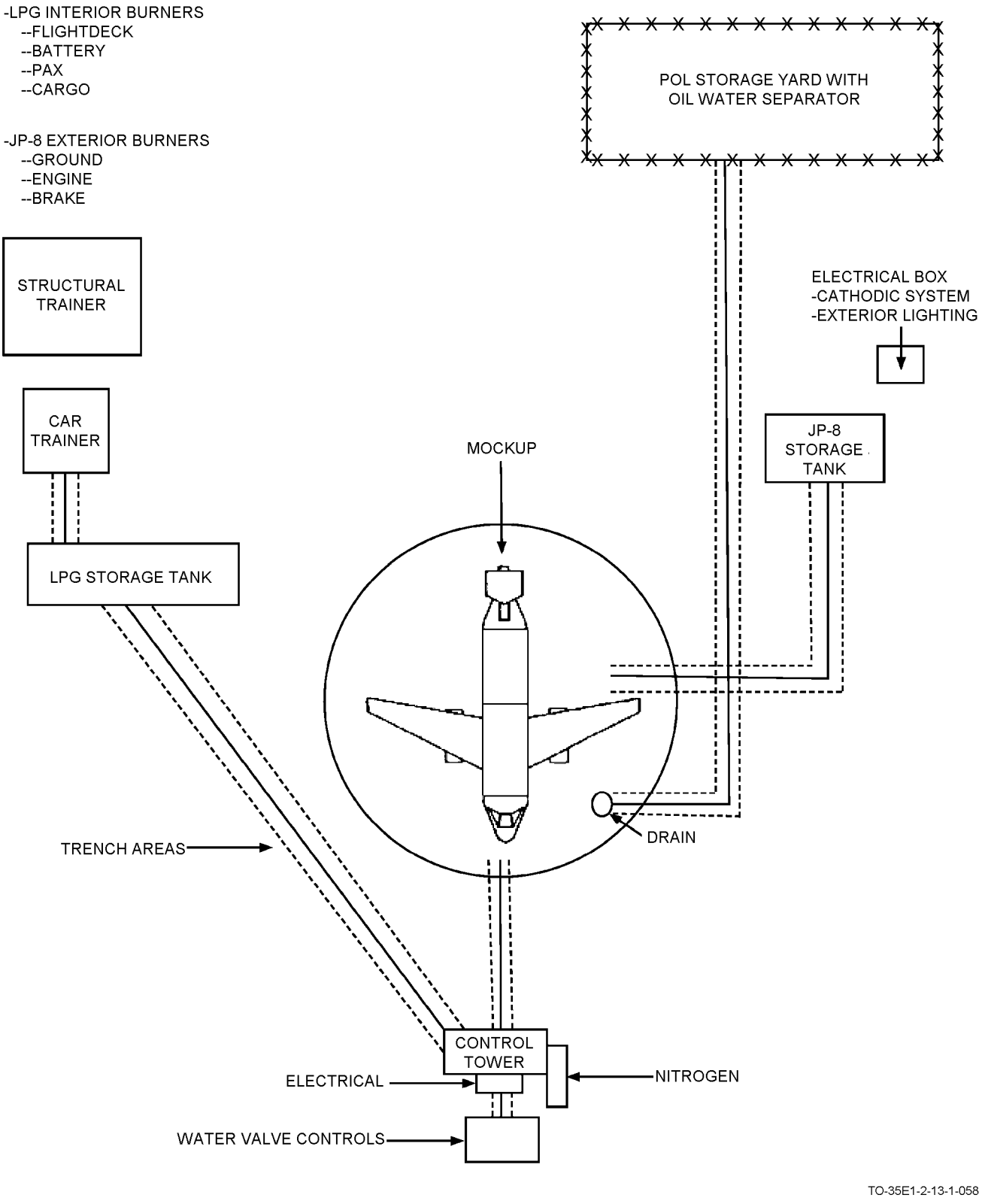

Figure 16. Dyess AFB Abilene, Texas

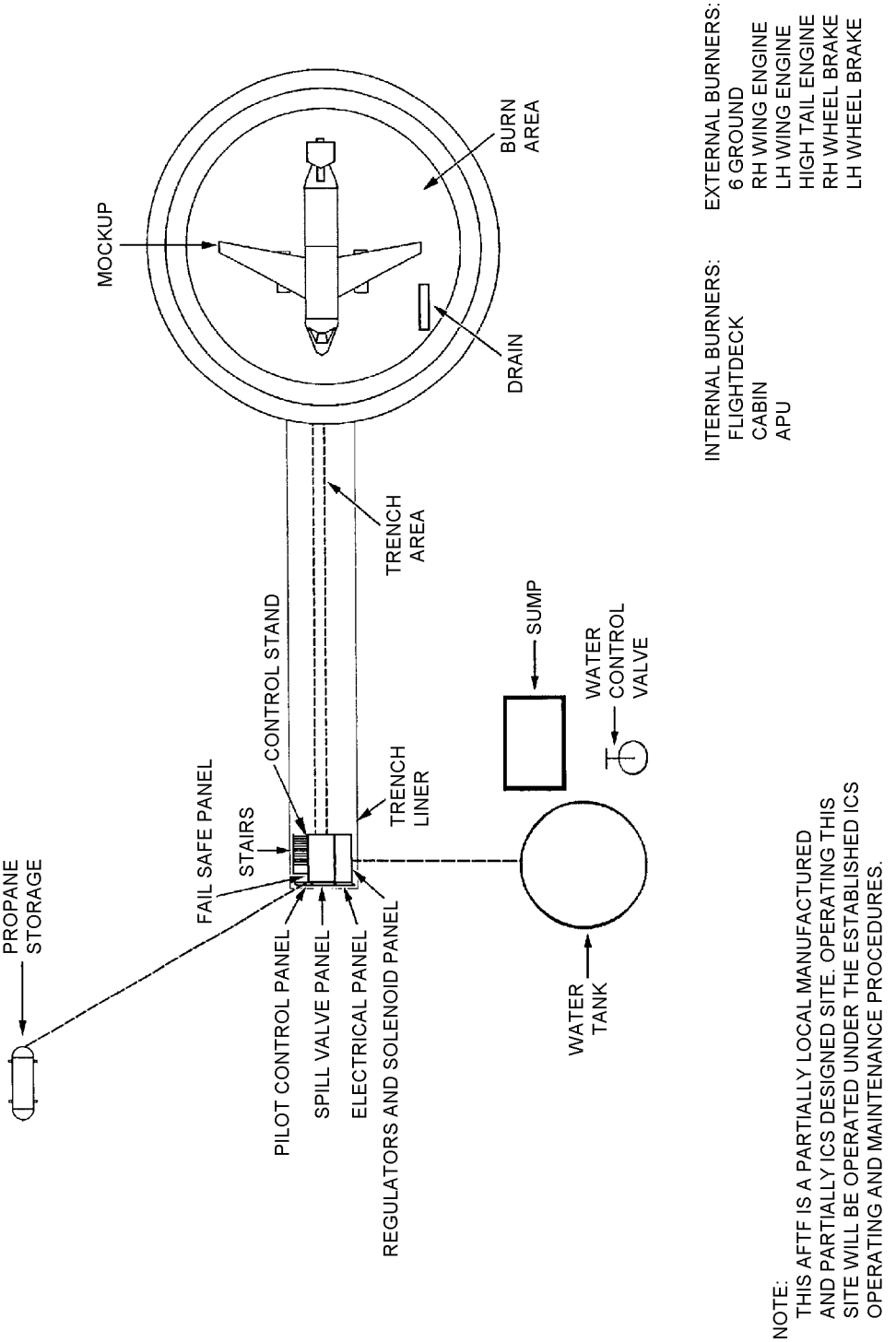

Figure 17. Edwards AFB Rosamond, California

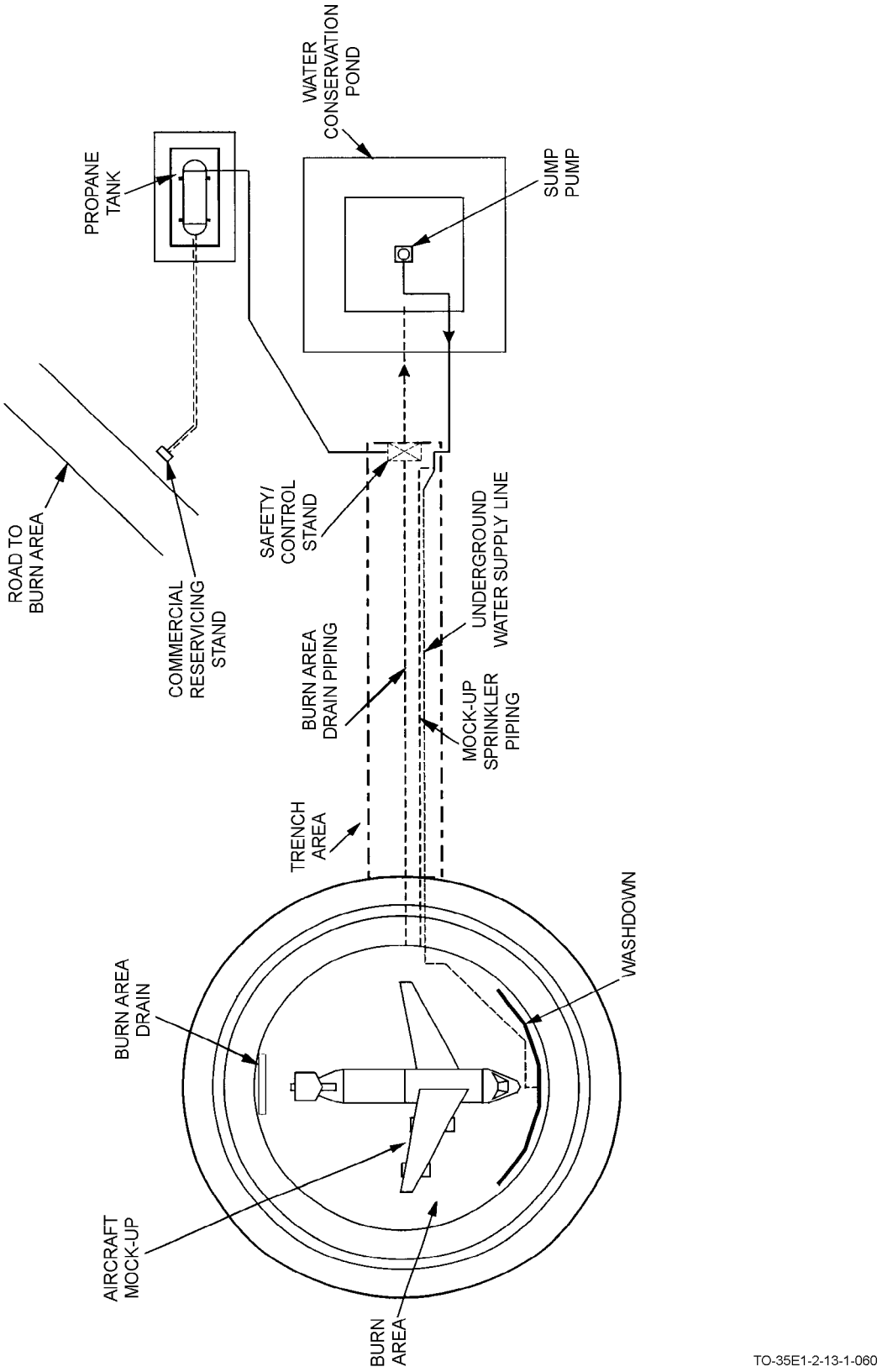

Figure 18. Eglin AFB Fort Walton Beach, Florida

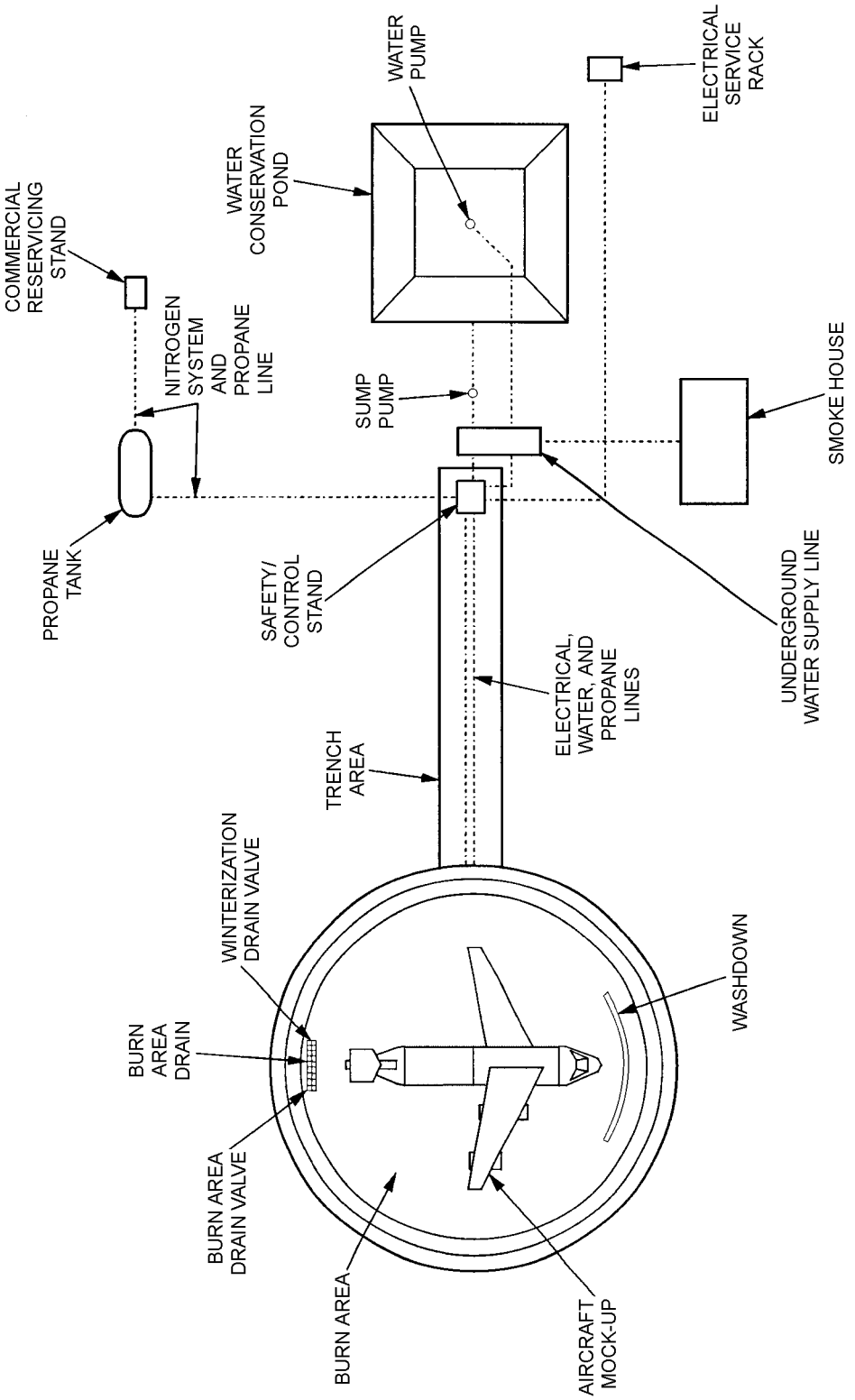

Figure 19. Eielson AFB Fairbanks, Alaska

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Figure 20. Ellsworth AFB Rapid City, South Dakota

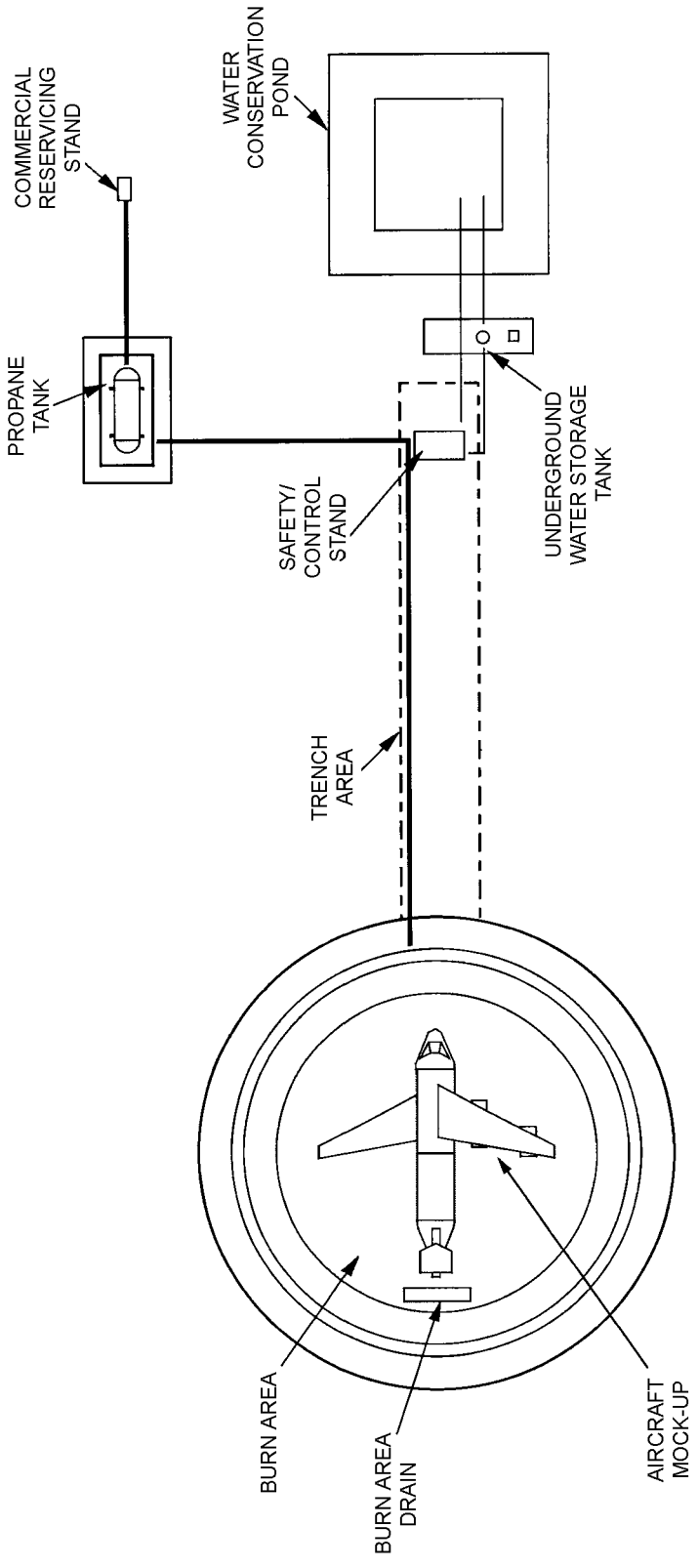

Figure 21. Elmendorf AFB Anchorage, Alaska

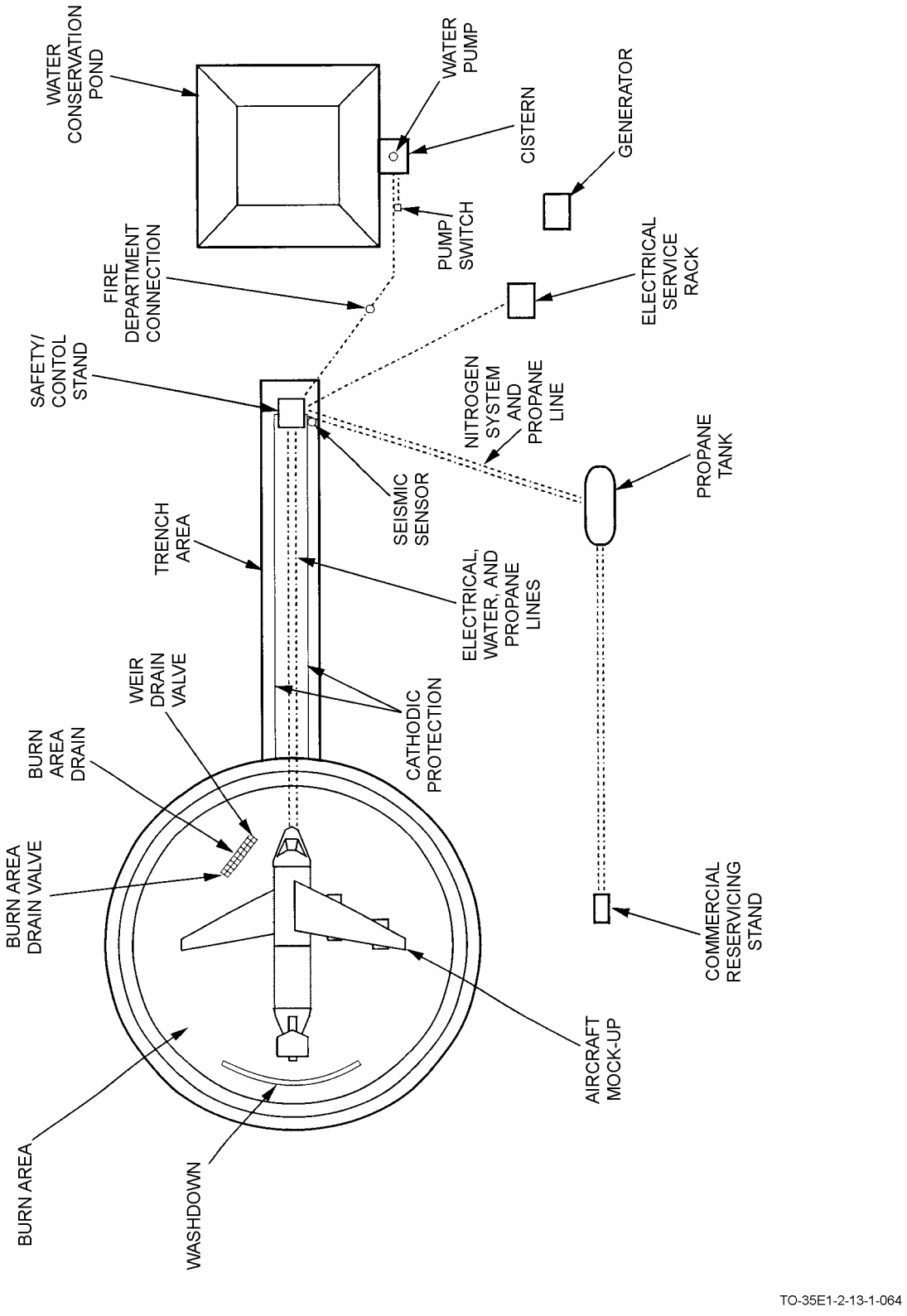

Figure 22. Fairchild AFB Spokane, Washington

THIS SITE USES AN ICS MOBILE TRAINER
NO DRAWING REQUIRED

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Figure 23. Fairford AB United Kingdom

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TO-35E1-2-13-1-066

Figure 24. Fargo ANGB Fargo, North Dakota

DRAWING NOT SUBMITTED

TO-35E1-2-13-1-067

Figure 25. F.E. Warren AFB Cheyenne, Wyoming

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TO-35E1-2-13-1-068

Figure 26. Fort Smith ANGB Van Buren, Arkansas

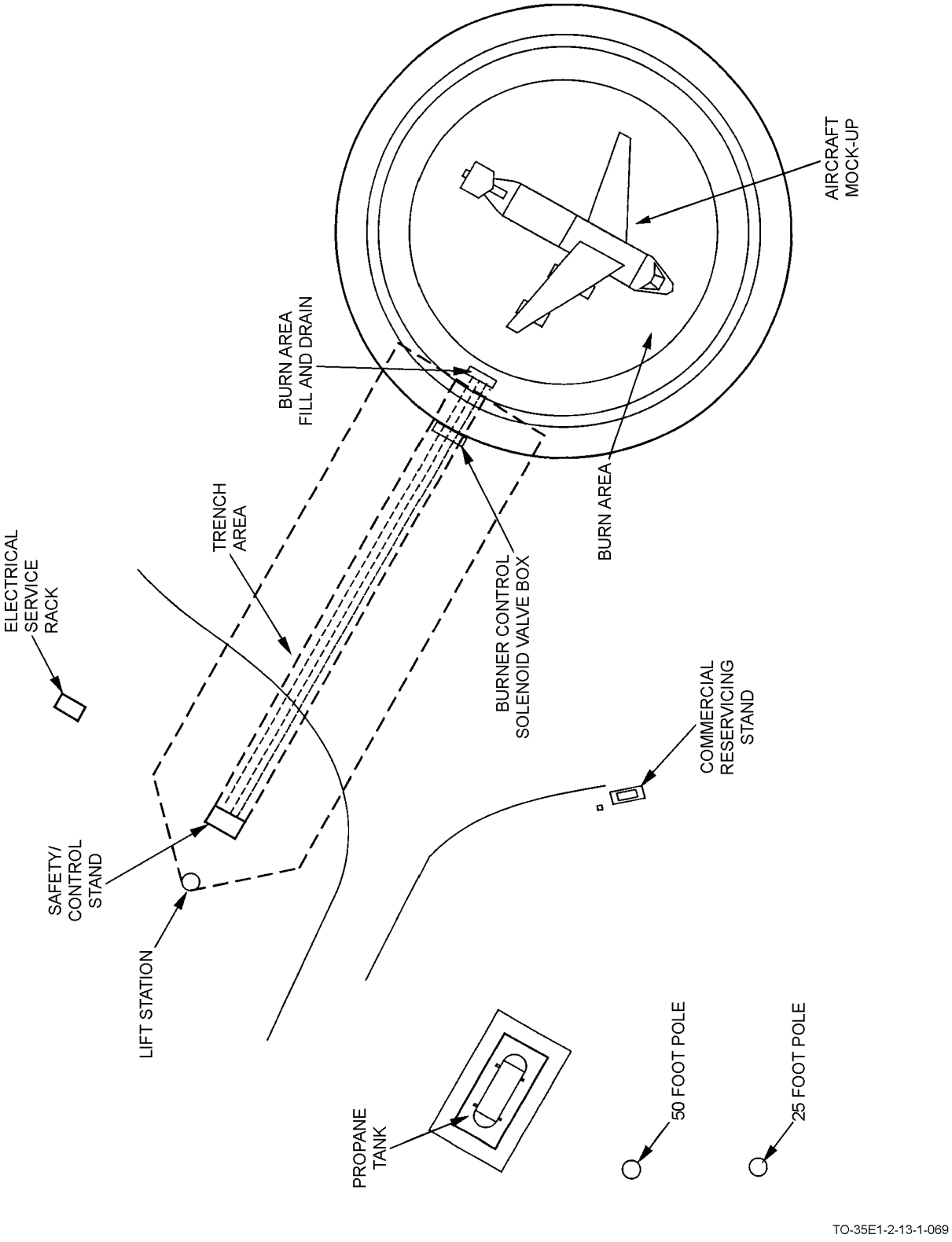

Figure 27. General Mitchell AFRB Milwaukee, Wisconsin

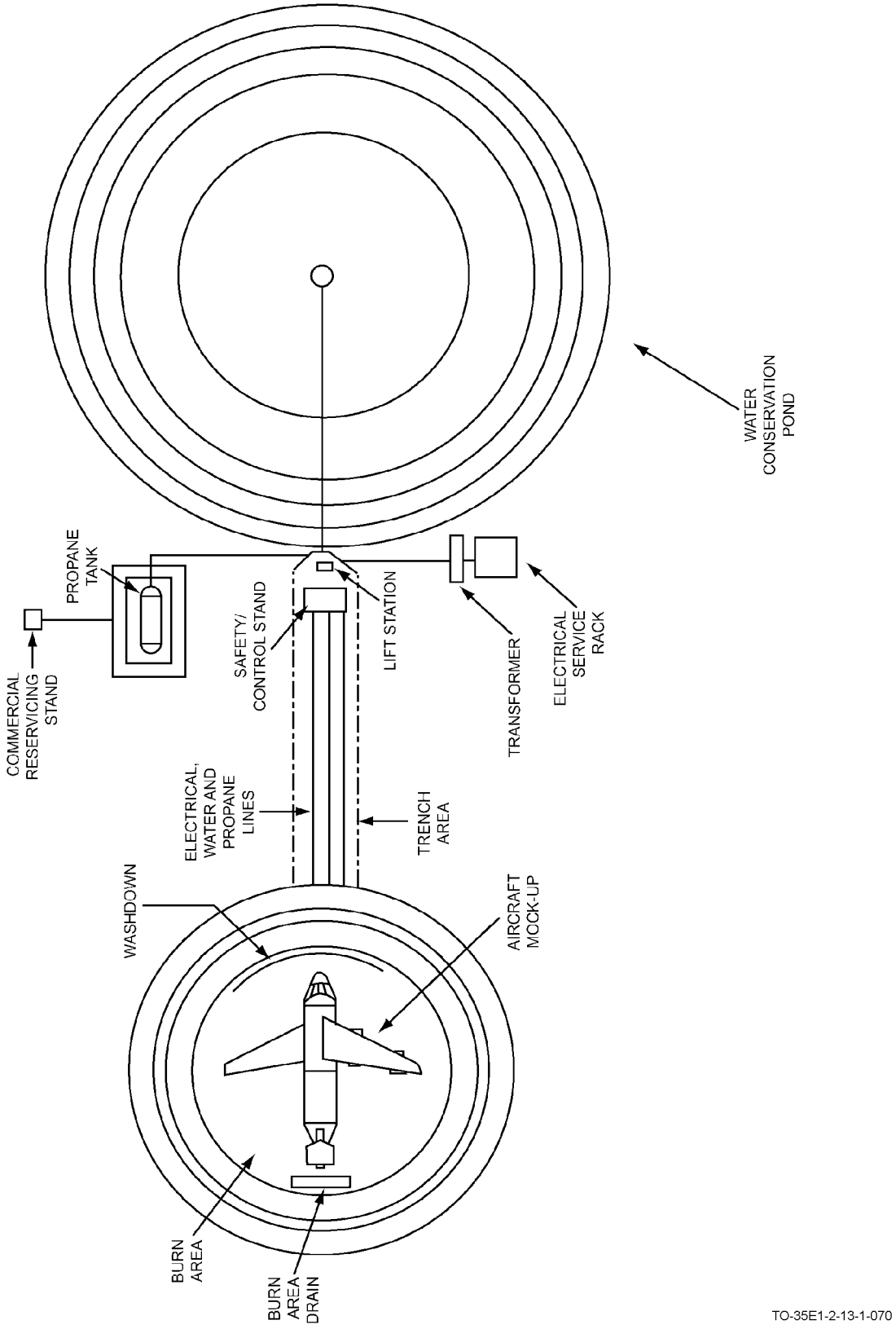

Figure 28. Grand Forks AFB Grand Forks, North Dakota

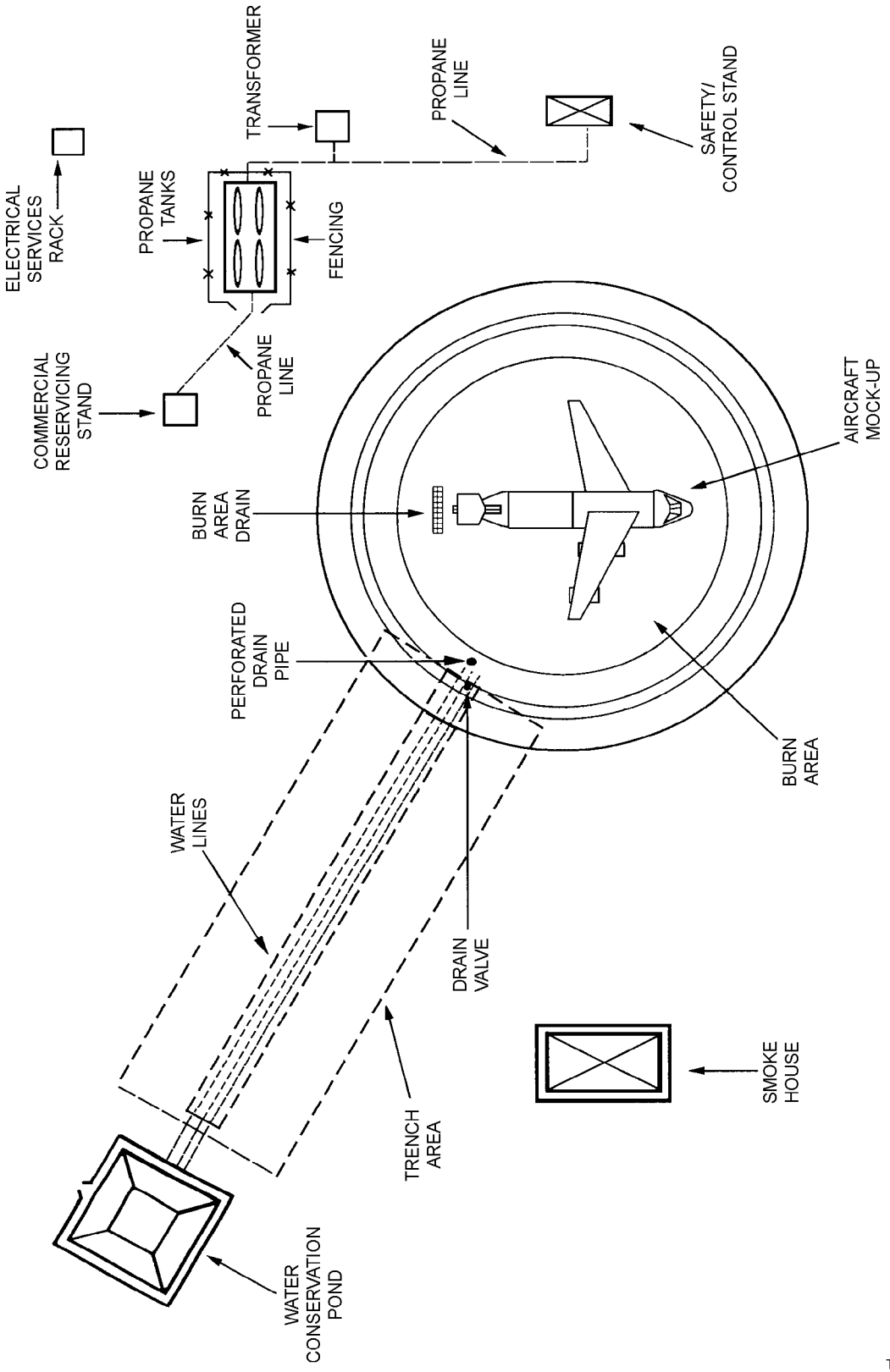

Figure 29. Grissom AFRB Kokomo, Indiana

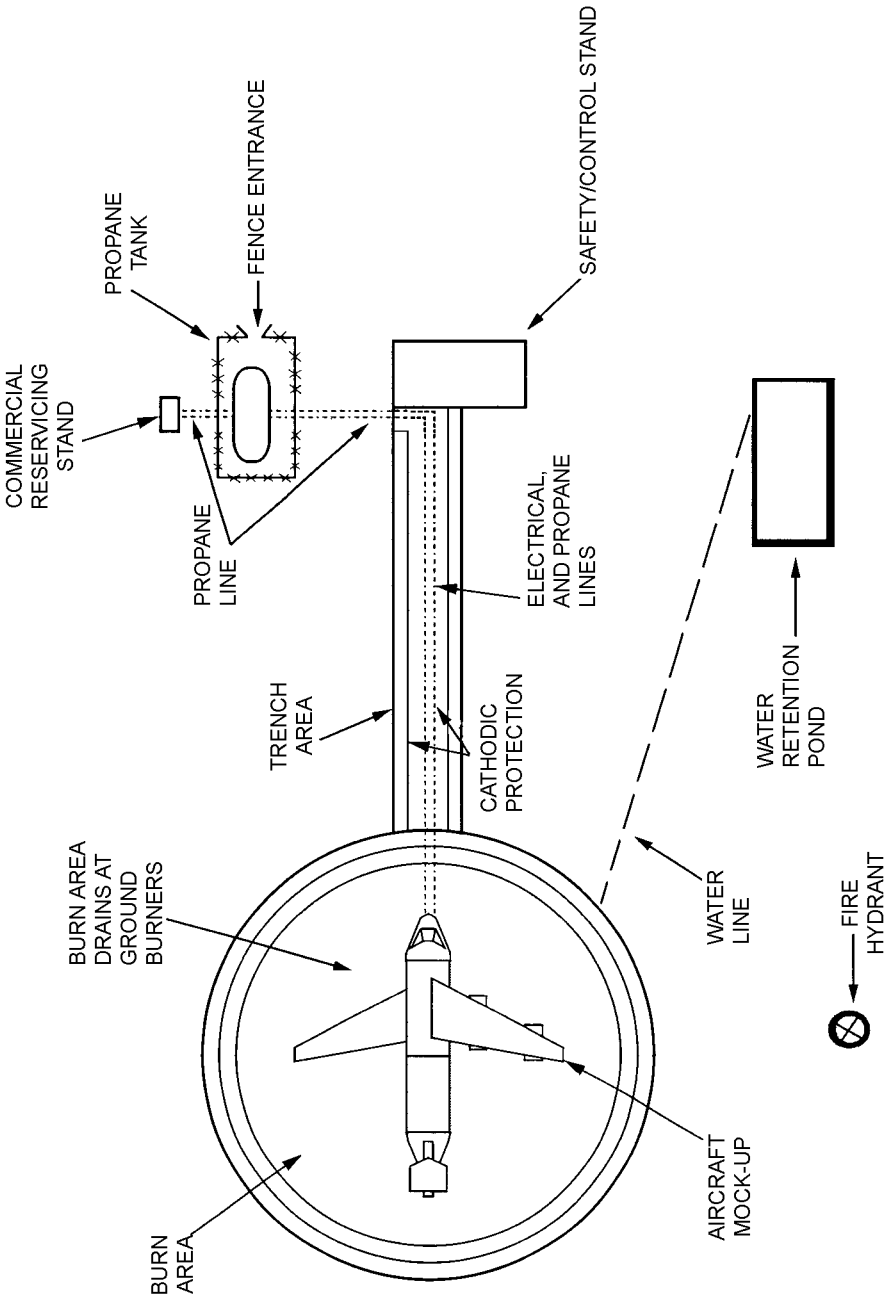

Figure 30. Gulfport ANGB Gulfport, Mississippi

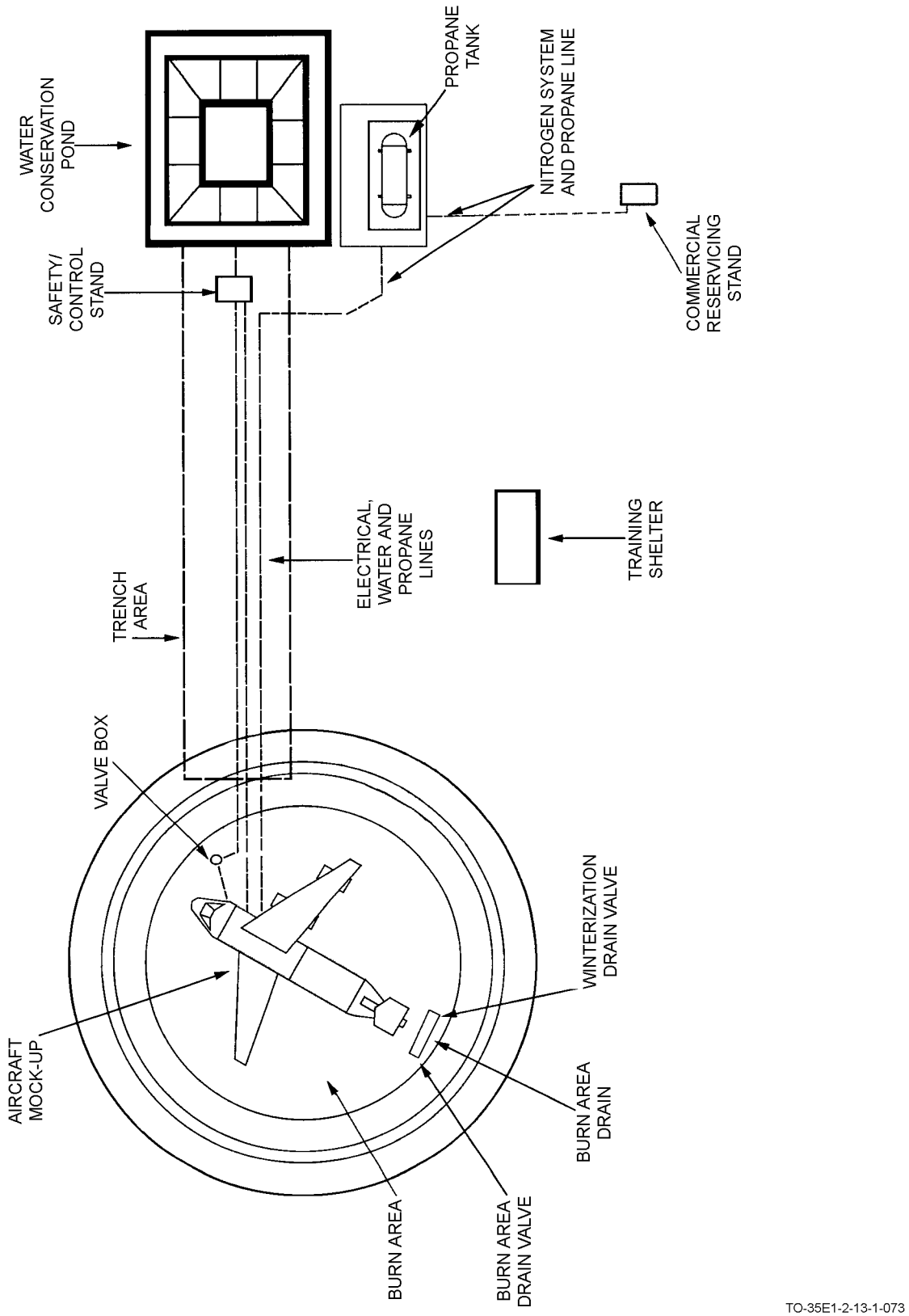

Figure 31. Hickam AFB Honolulu, Hawaii

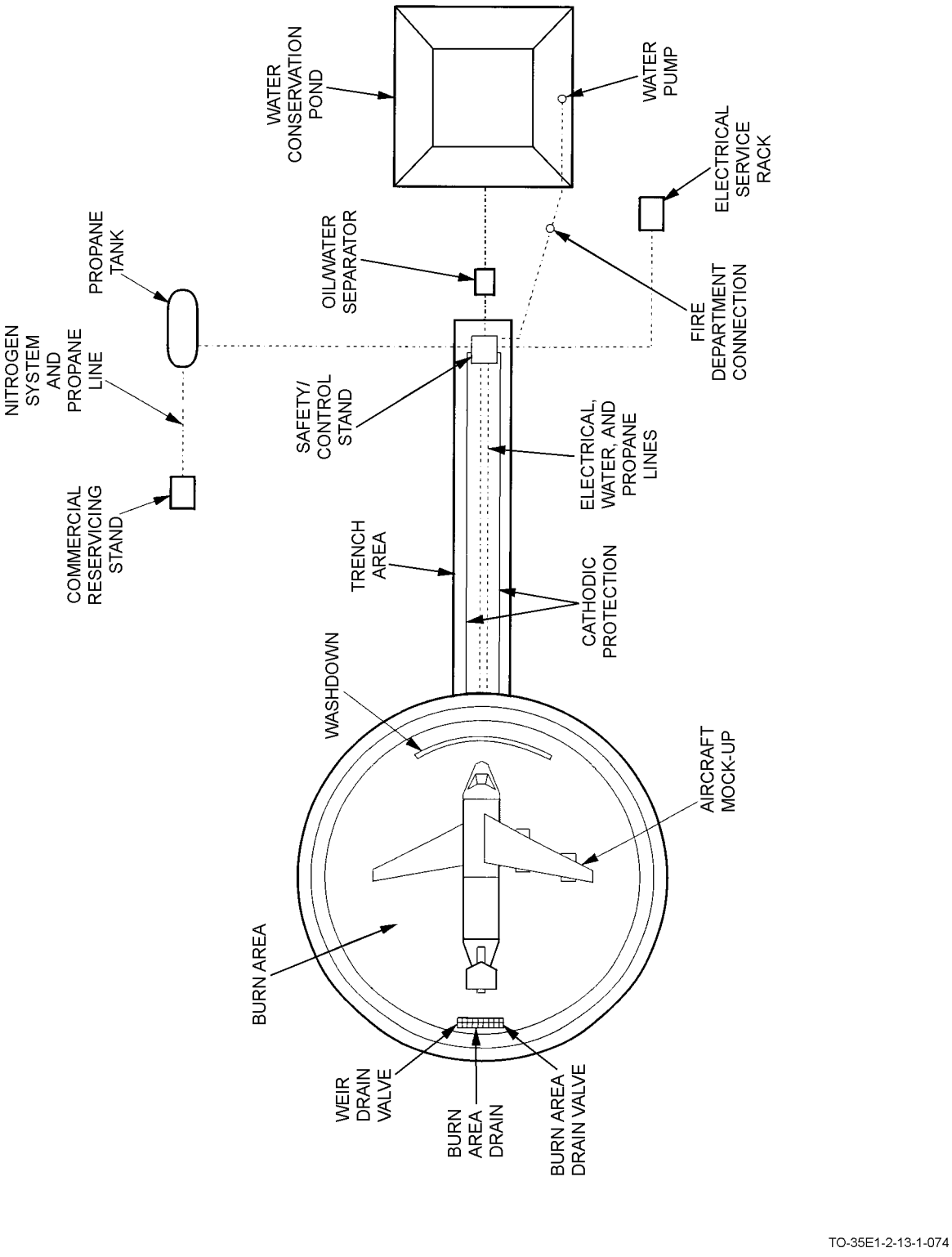

Figure 32. Hill AFB Ogden, Utah

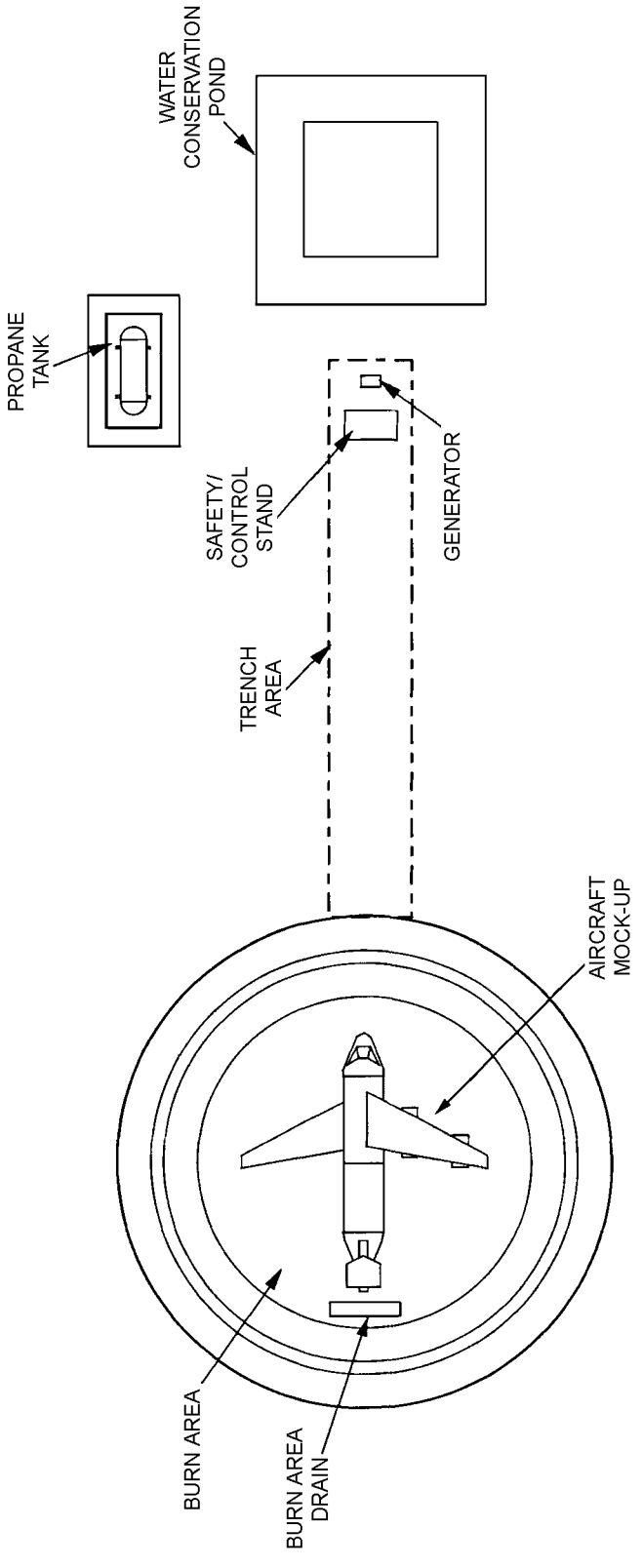

Figure 33. Holloman AFB Alamagordo, New Mexico

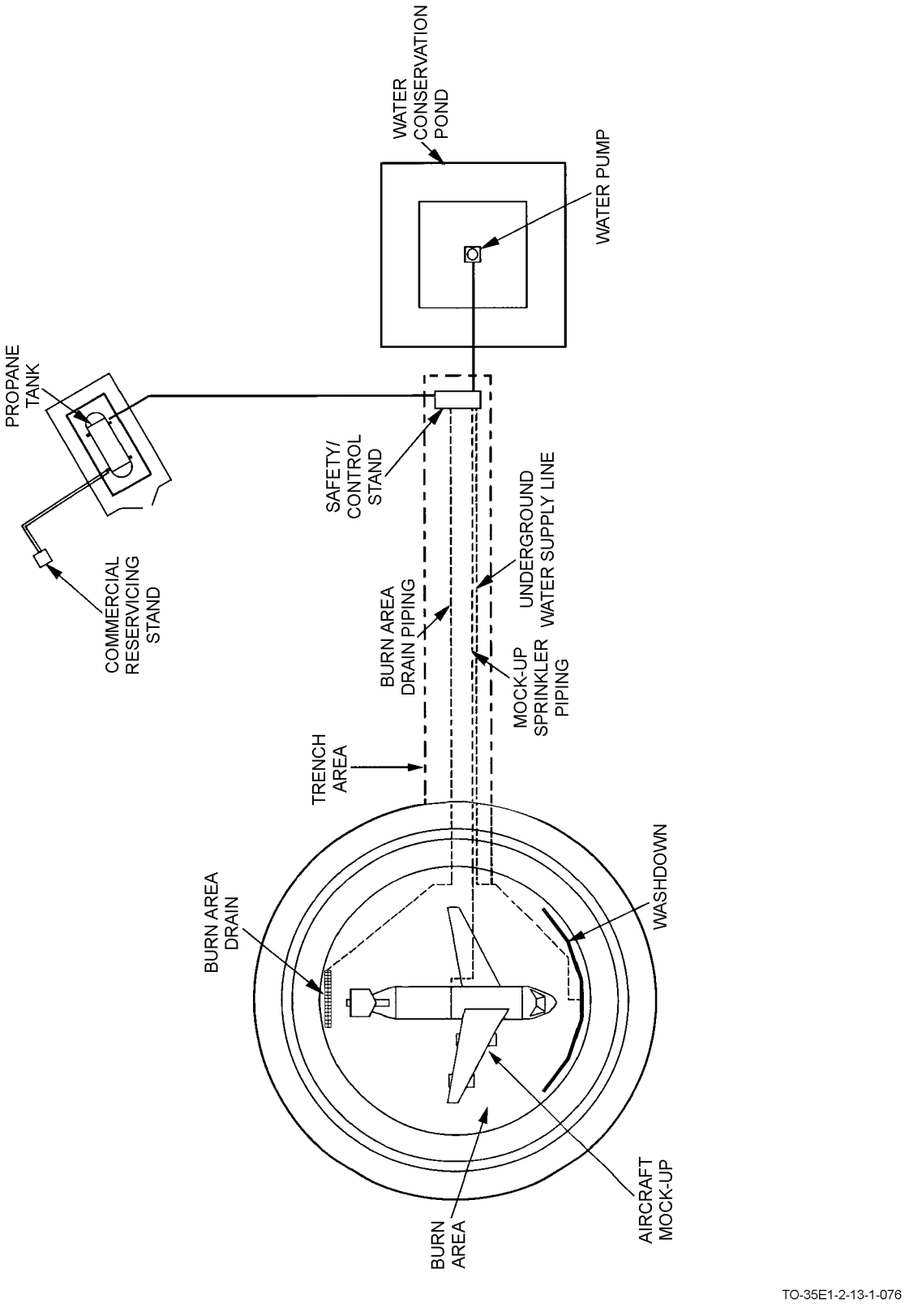

Figure 34. Homestead AFRB Homestead, Florida

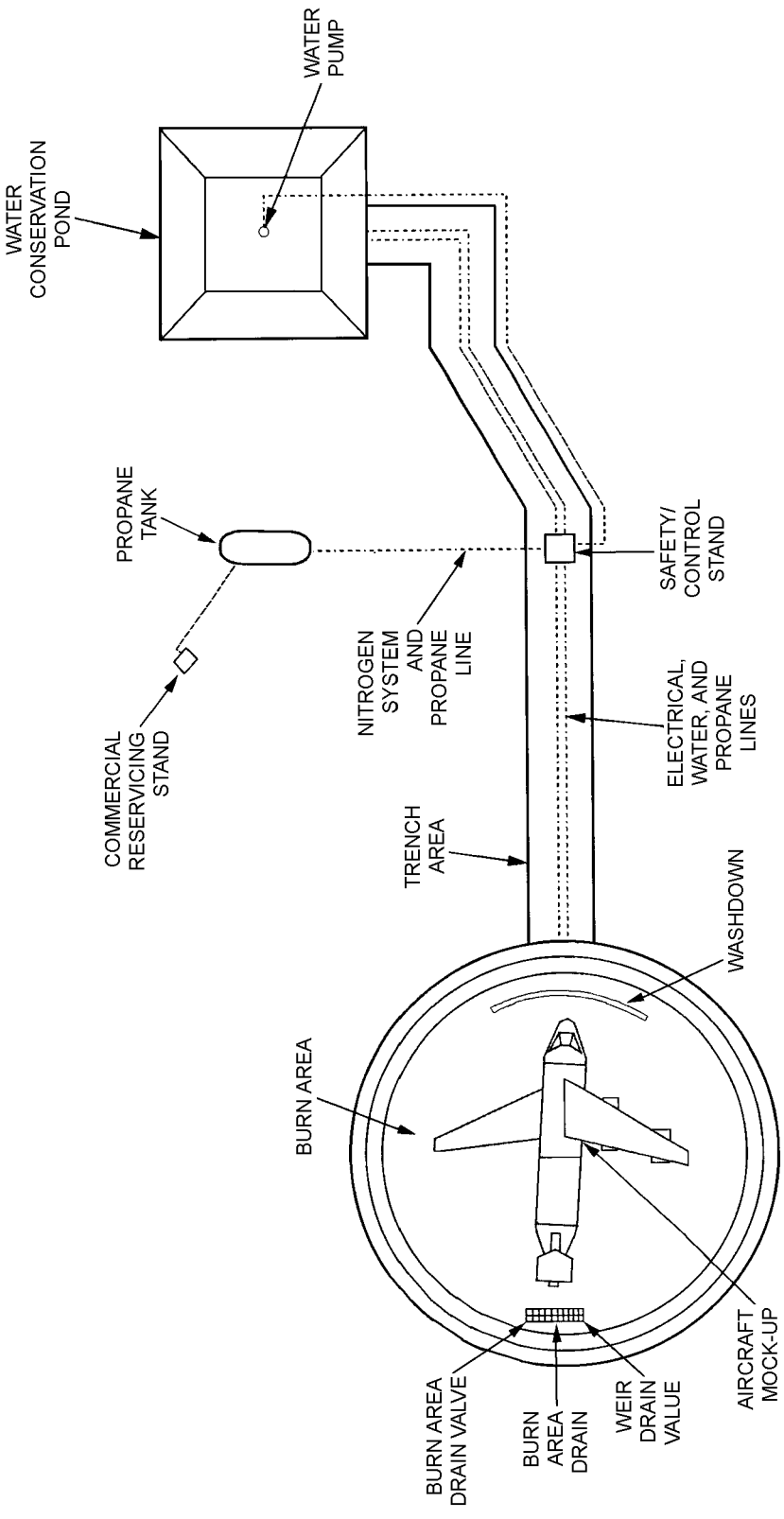

Figure 35. Hurlburt Field AFB Fort Walton, Florida

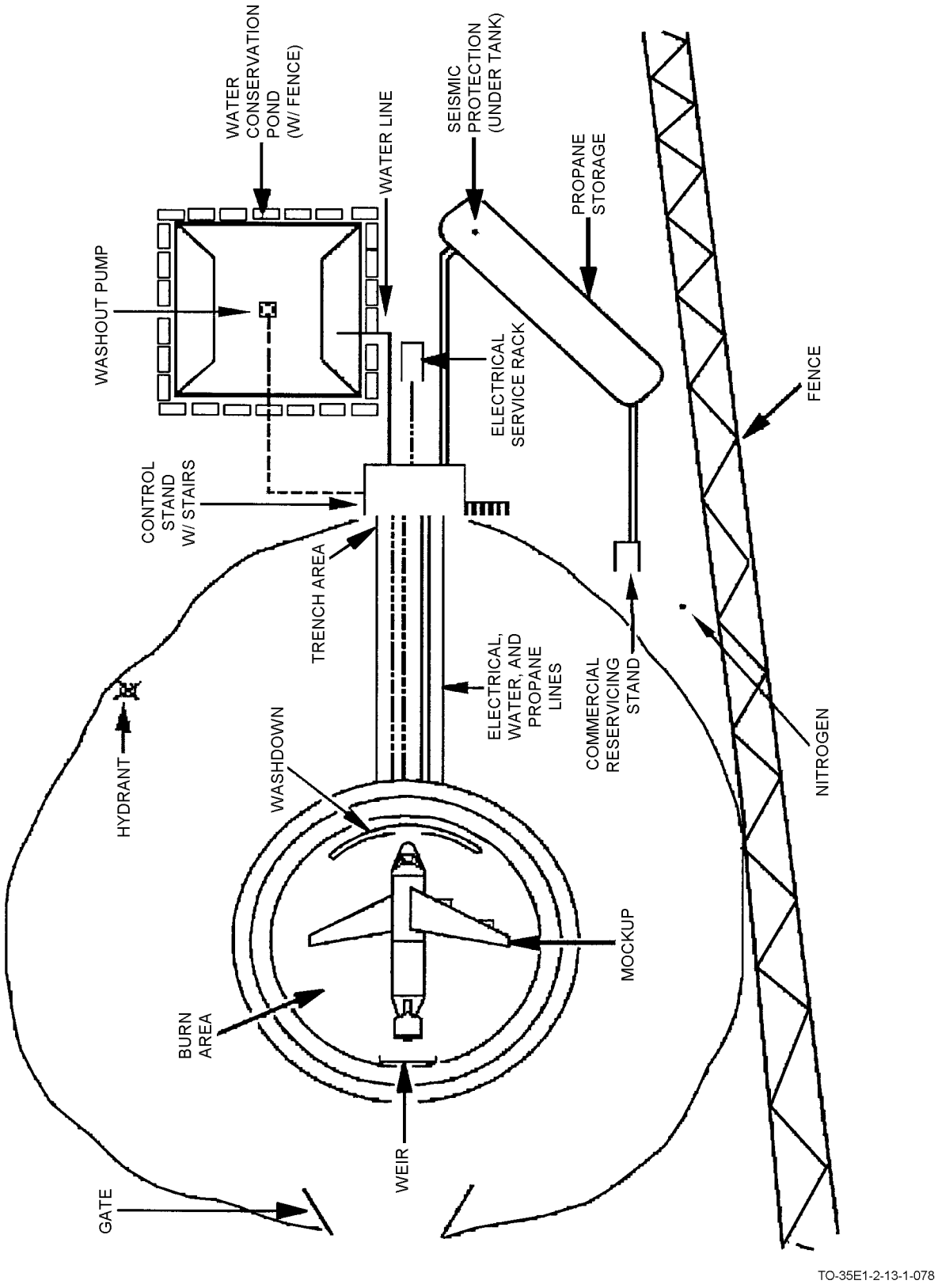

Figure 36. Incirlik AB Turkey

THIS SITE USES A PROSAFE MOBILE TRAINER
NO DRAWING REQUIRED

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Figure 37. Kadena AB Okinawa, Japan

SITE NOT PROJECTED
GULFPORT, MS AFTF IS USED

TO-35E1-2-13-1-080

Figure 38. Keesler AFB Biloxi, Mississippi

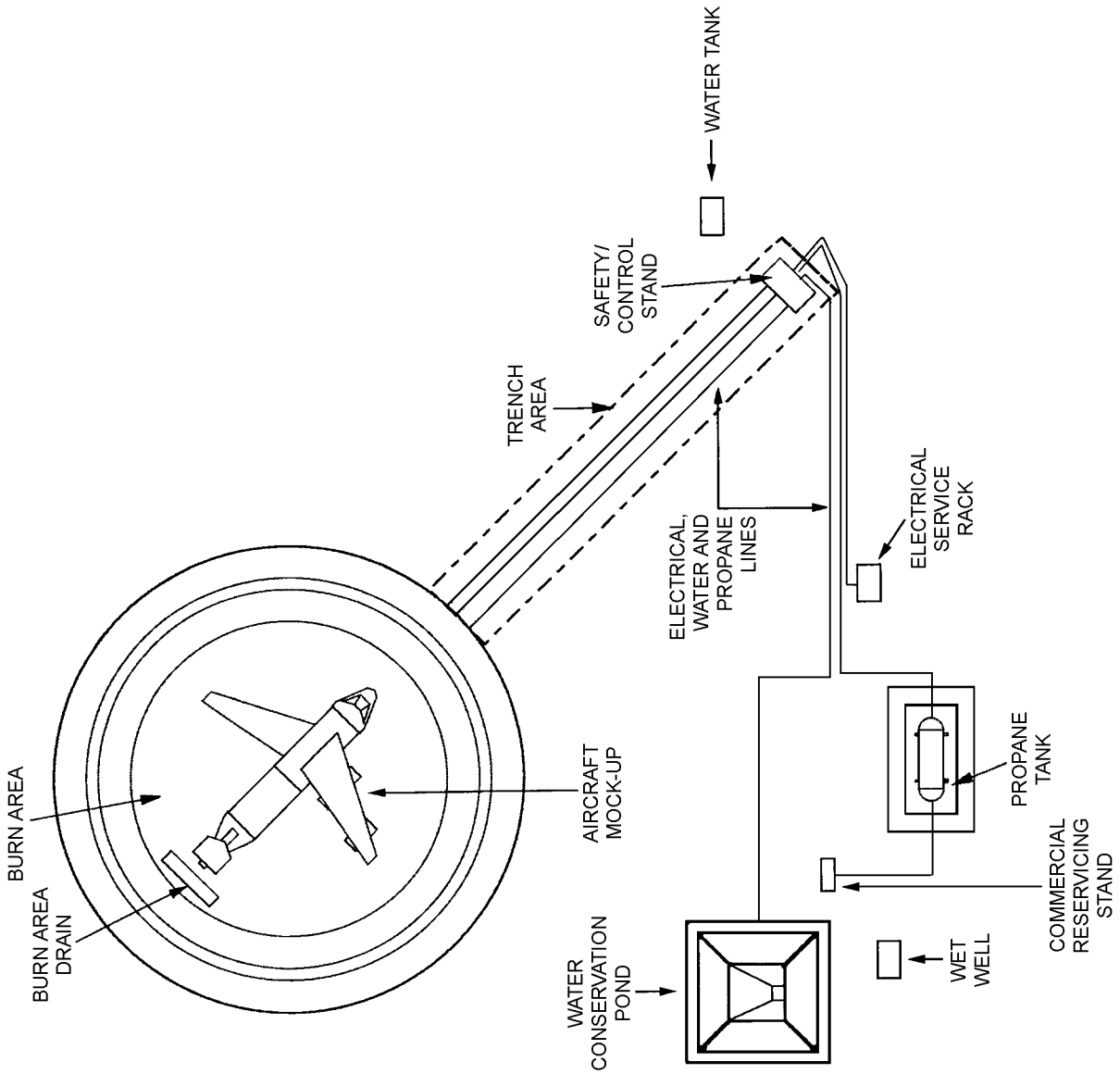

Figure 39. Kelly AFB San Antonio, Texas

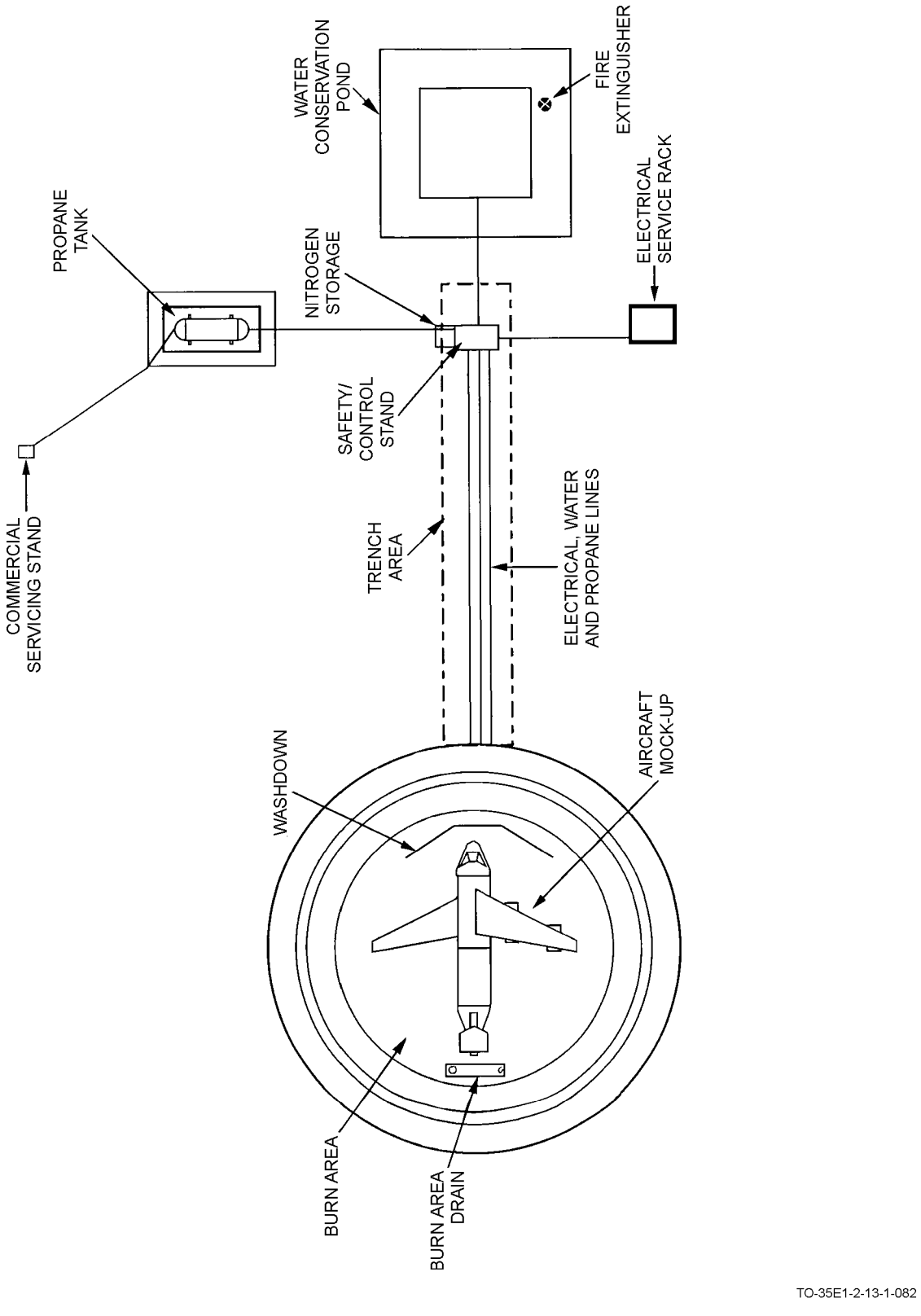

Figure 40. Kirtland AFB Albuquerque, New Mexico

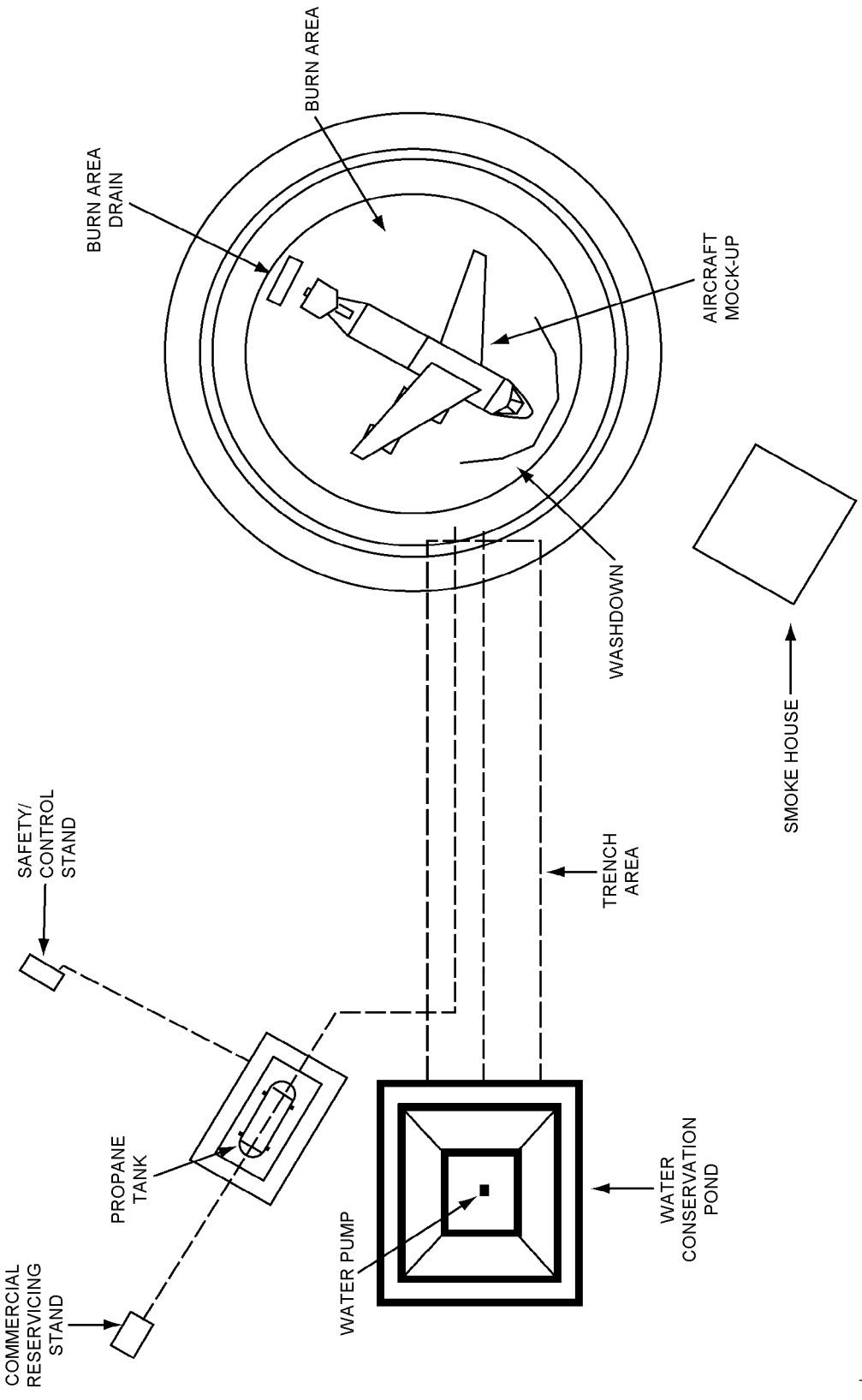

Figure 41. Kunsan AB Kunsan, Korea

THIS SITE USES A PROSAFE MOBILE TRAINER
NO DRAWING REQUIRED

TO-35E1-2-13-1-084

Figure 42. Lajes Field AFB Azores, Portugal

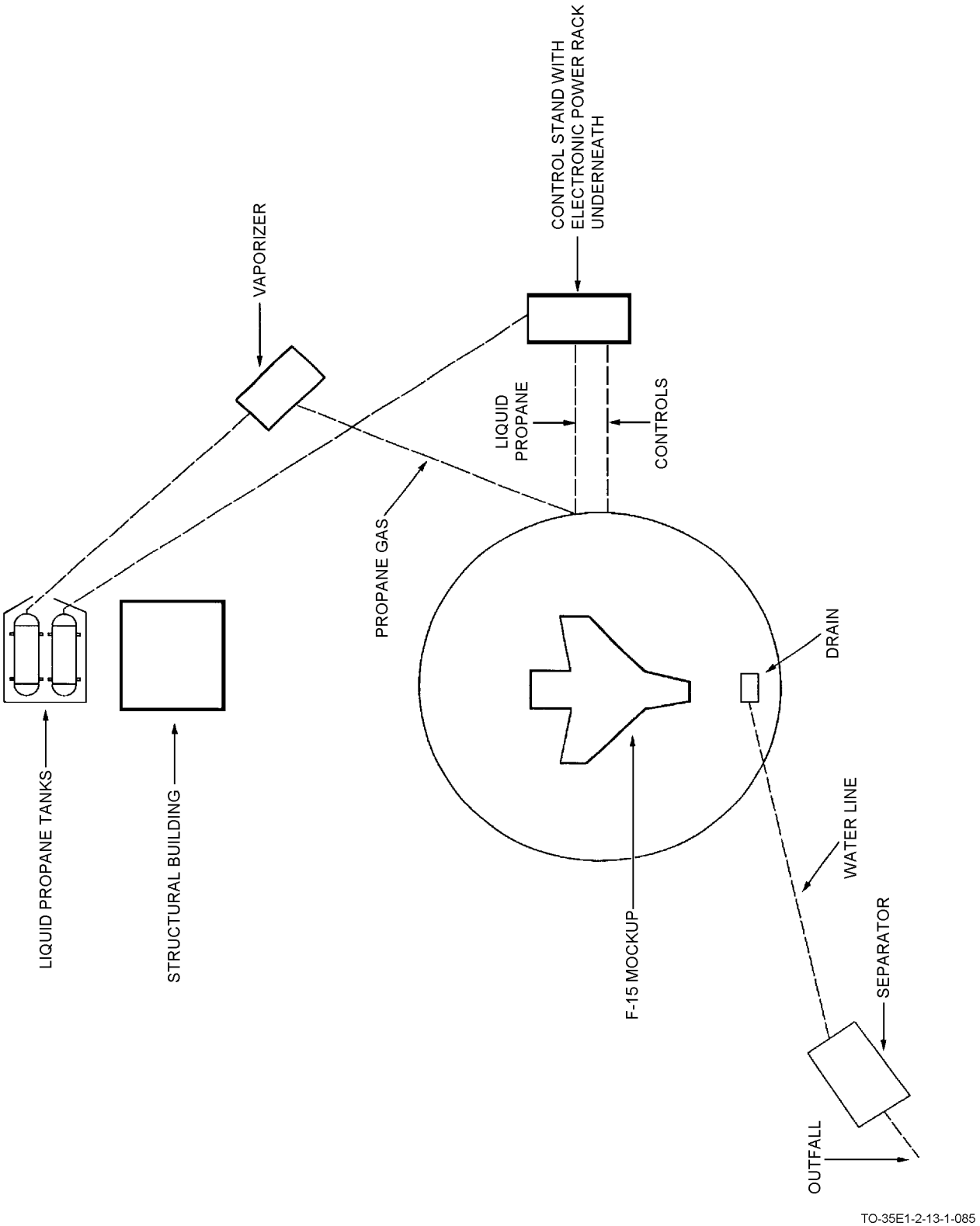

Figure 43. Lakenheath AB United Kingdom

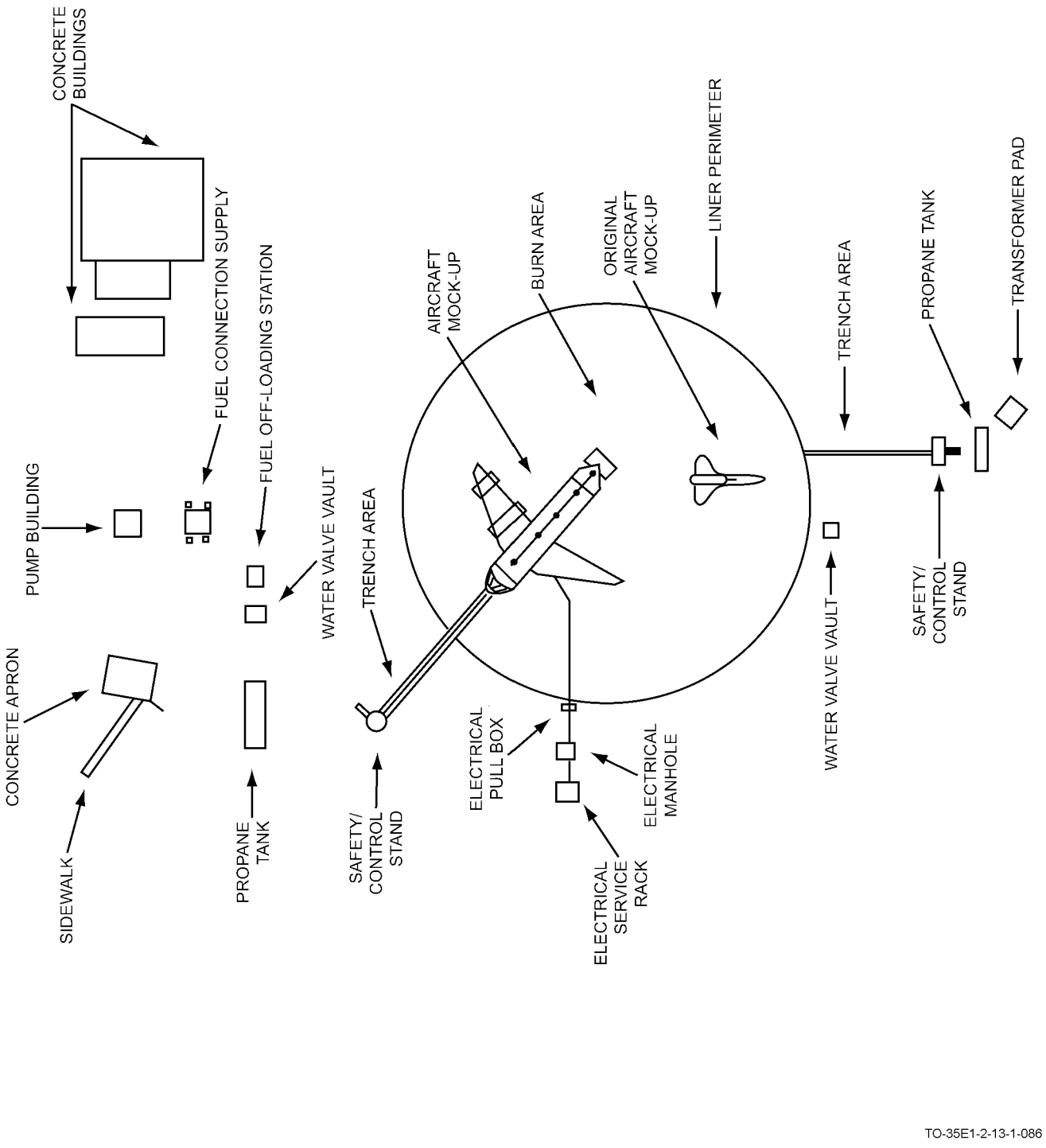

Figure 44. Langley AFB Norfolk, Virginia

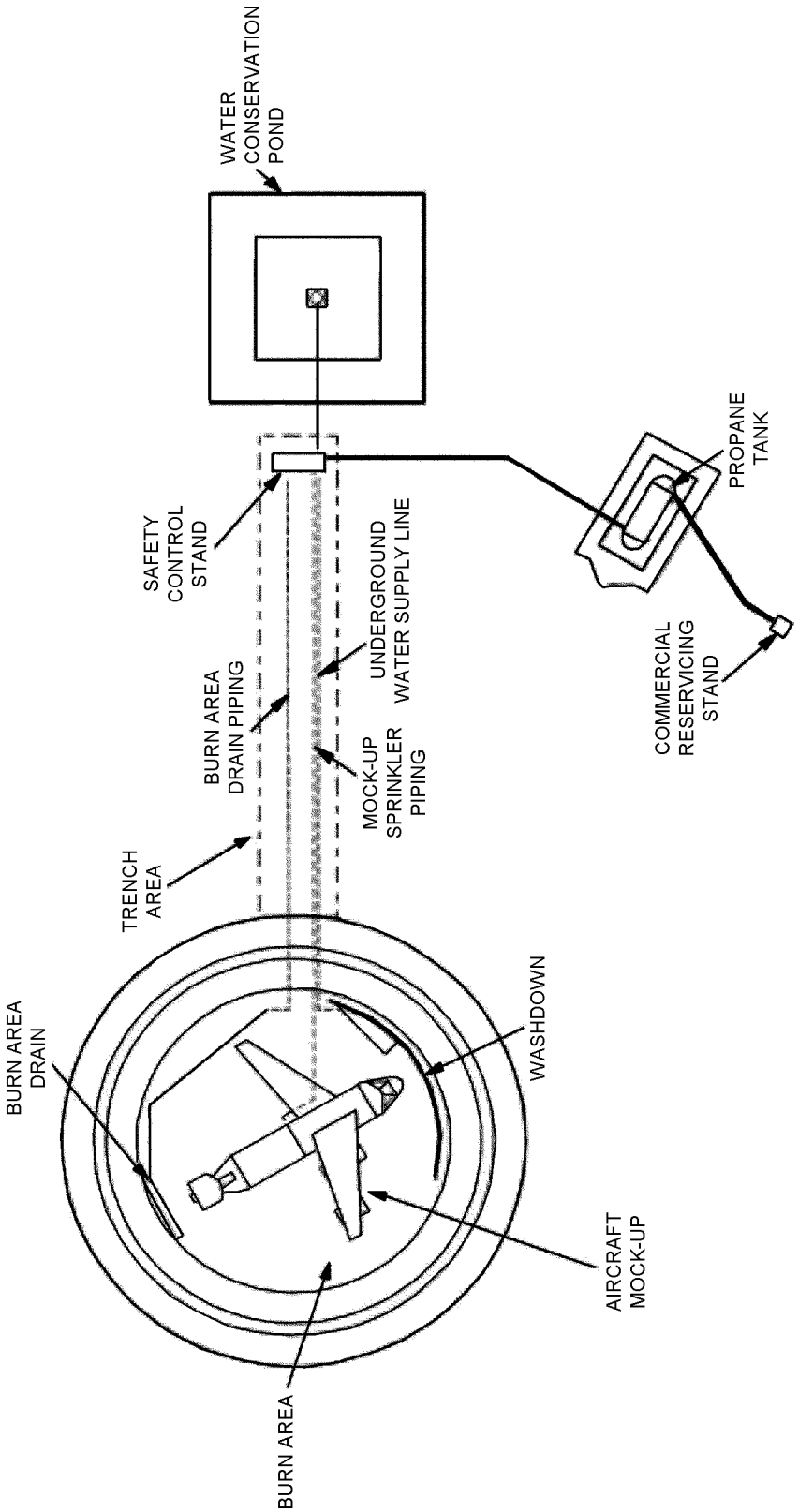

Figure 45. Laughlin AFB Del Rio, Texas

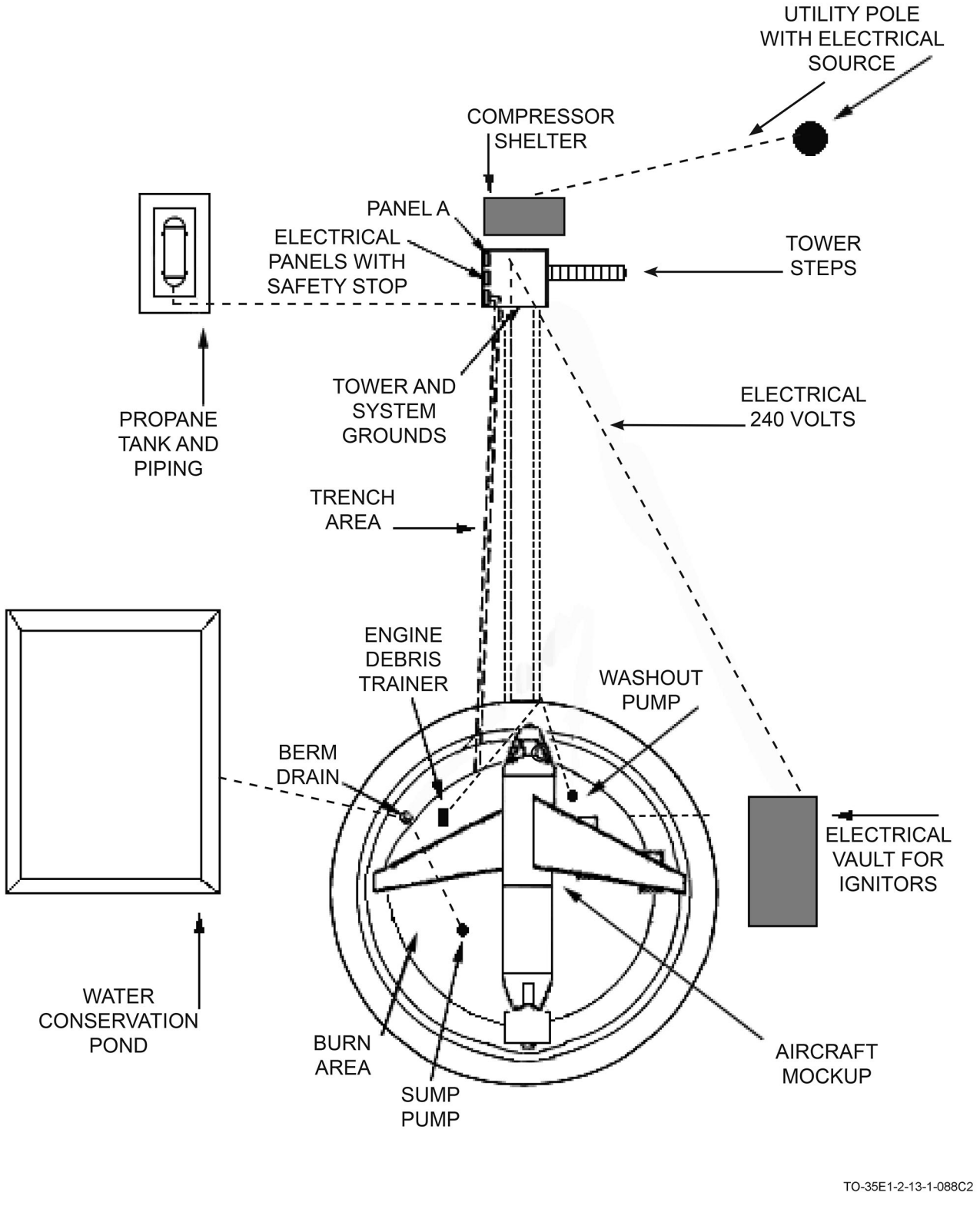

Figure 46. Little Rock AFB Jacksonville, Arkansas

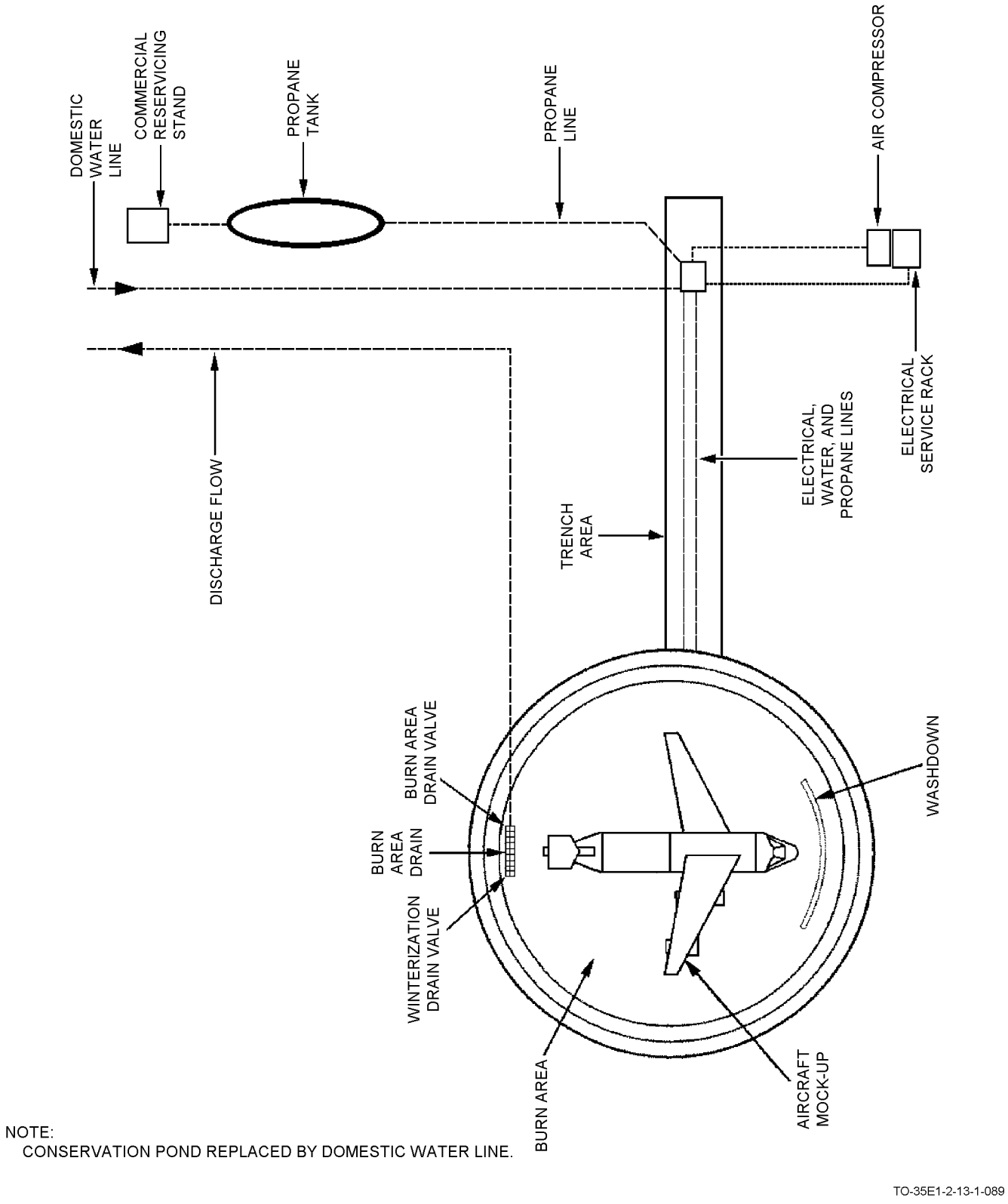

Figure 47. Luke AFB Phoenix, Arizona

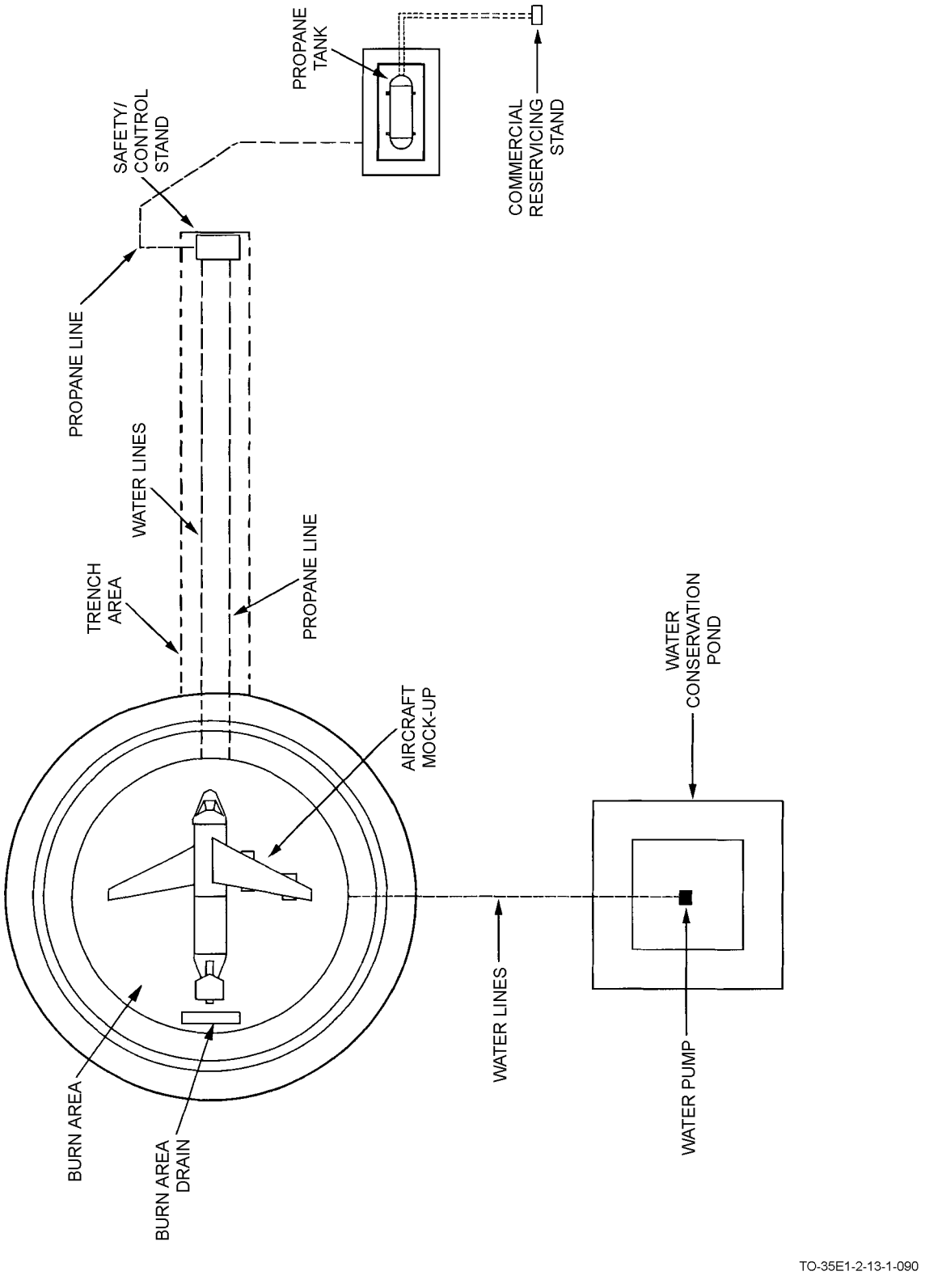

Figure 48. MacDill AFB Tampa Bay, Florida

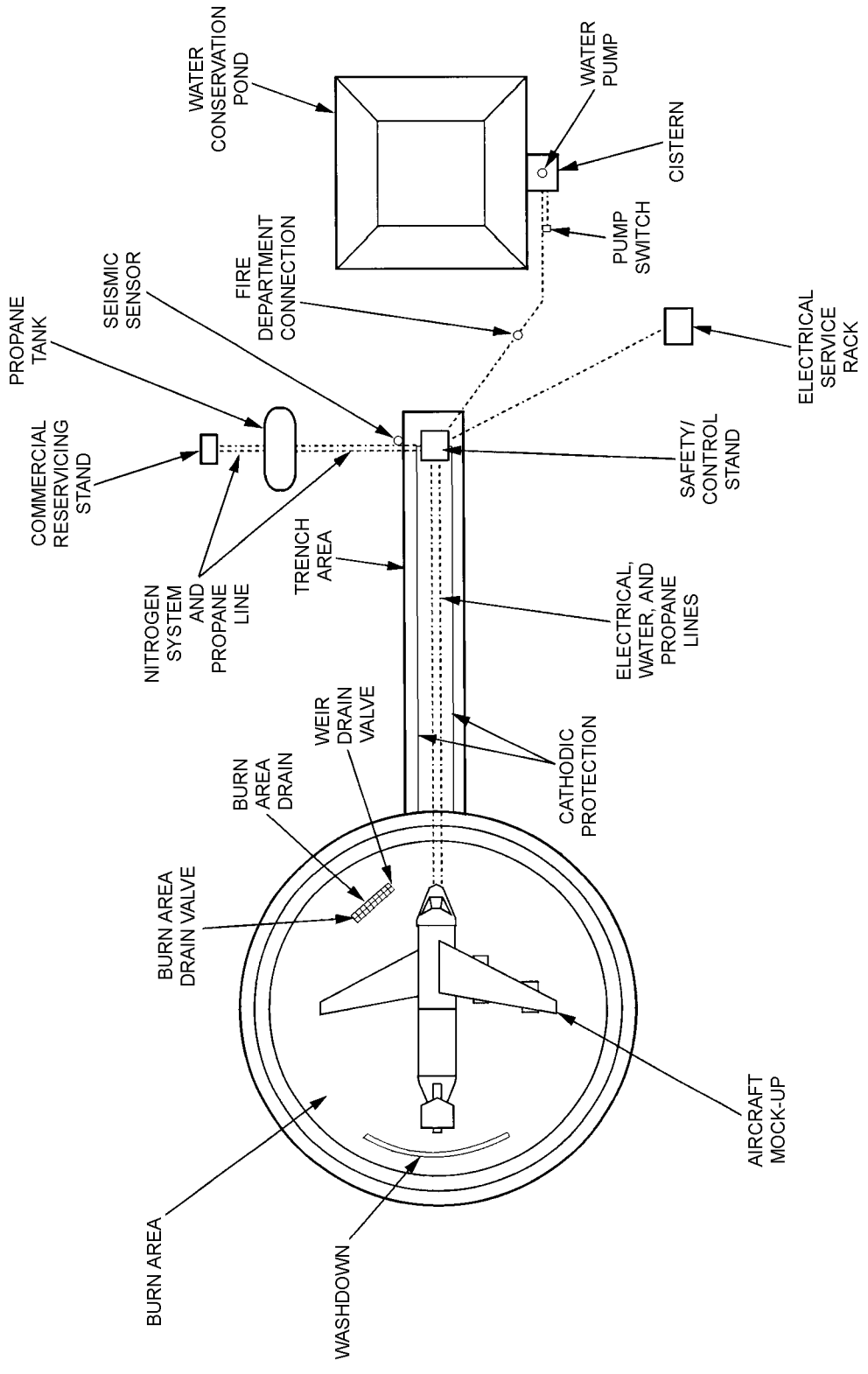

Figure 49. Malmstrom AFB Great Falls, Montana

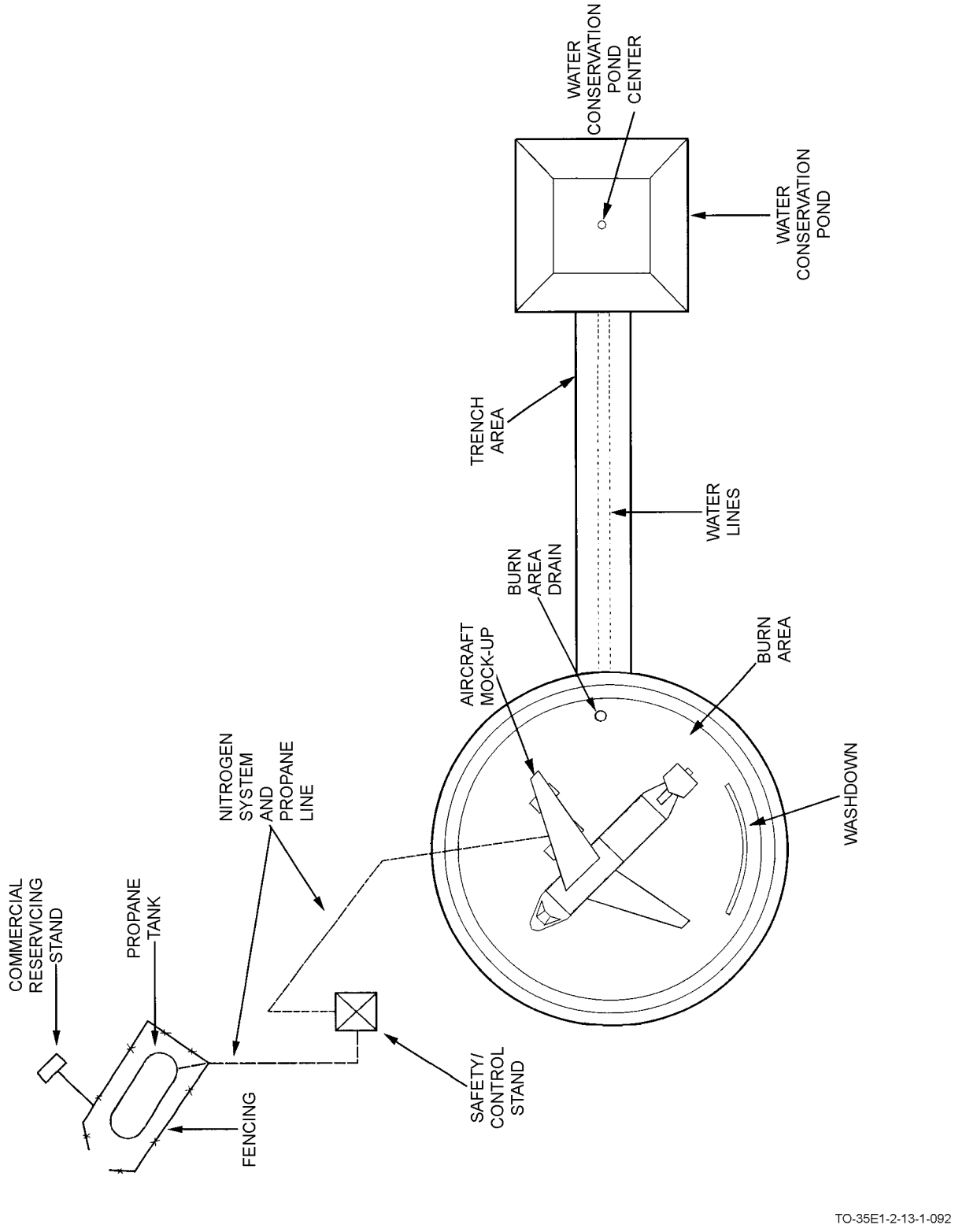

Figure 50. March AFB San Bernadino, California

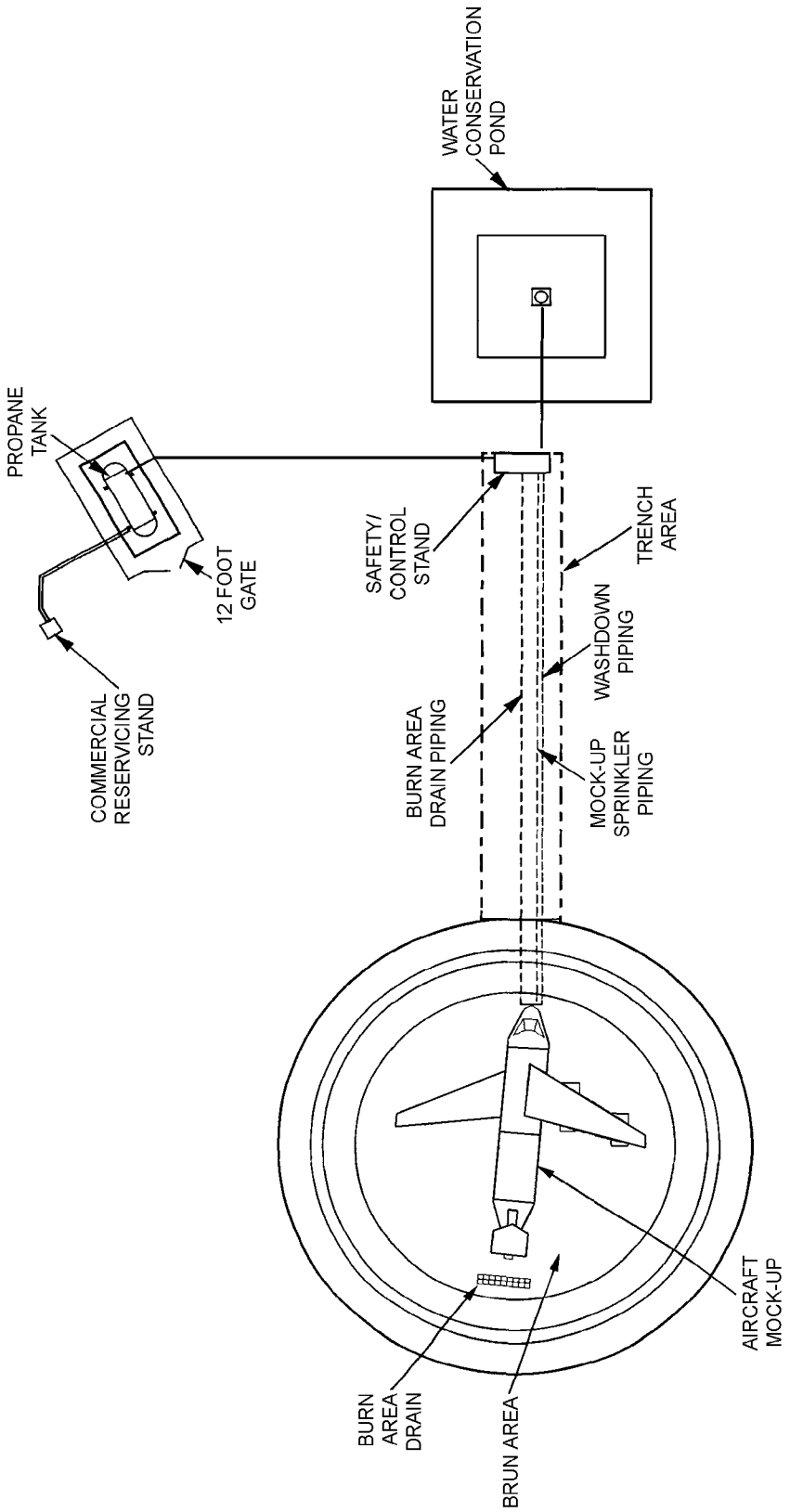

Figure 51. Maxwell AFB Montgomery, Alabama

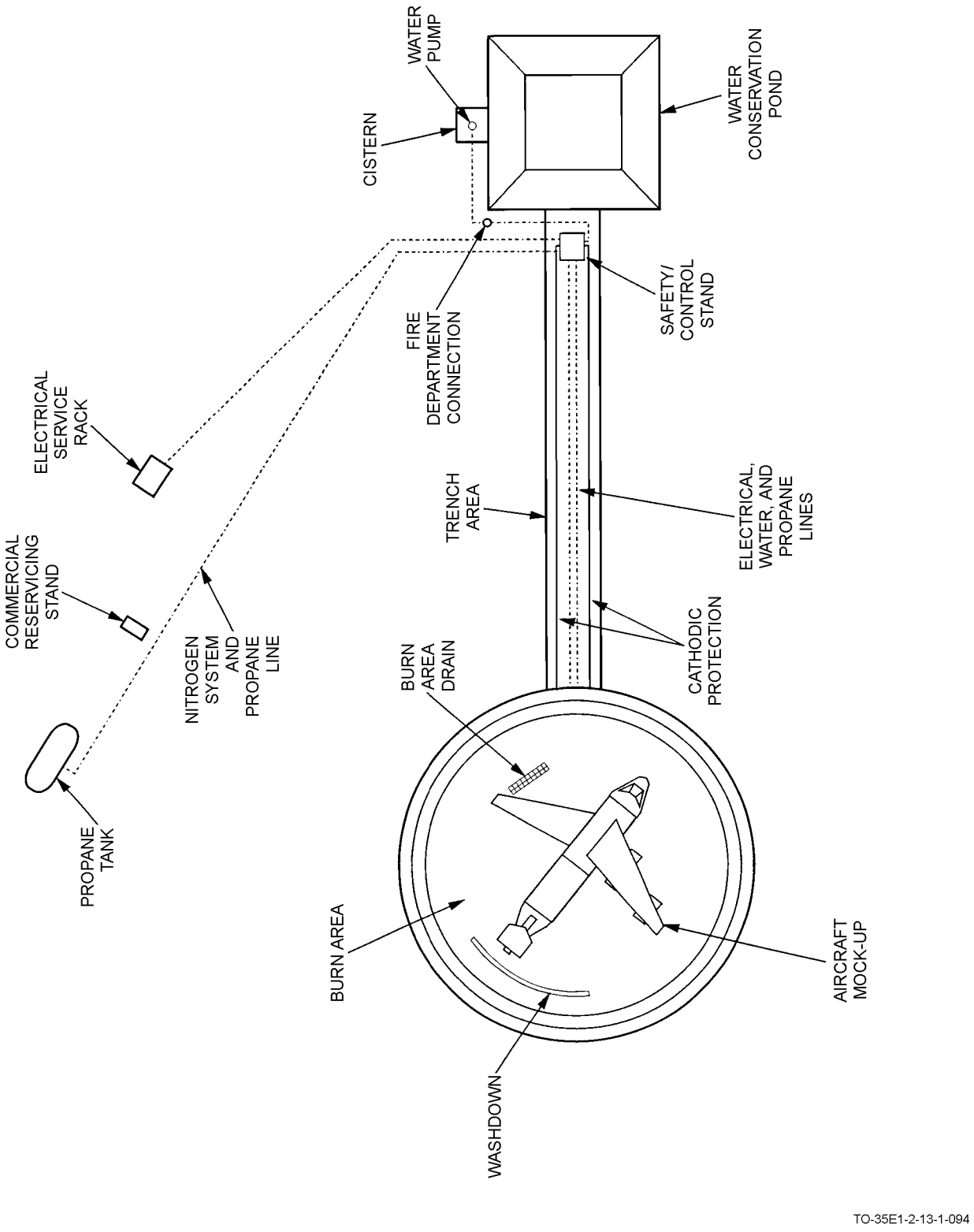

Figure 52. McChord AFB Tacoma, Washington

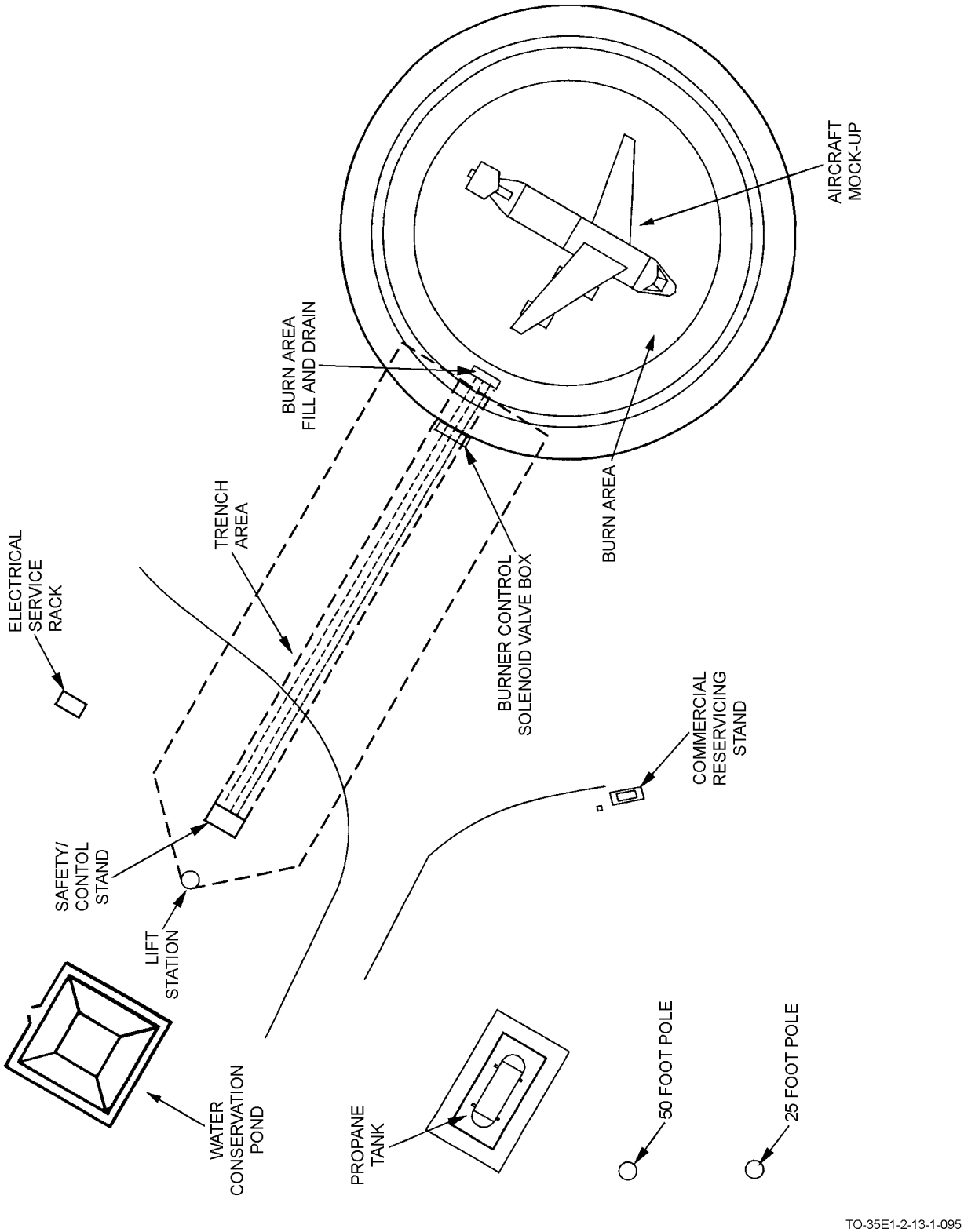

Figure 53. McConnell AFB Wichita, Kansas

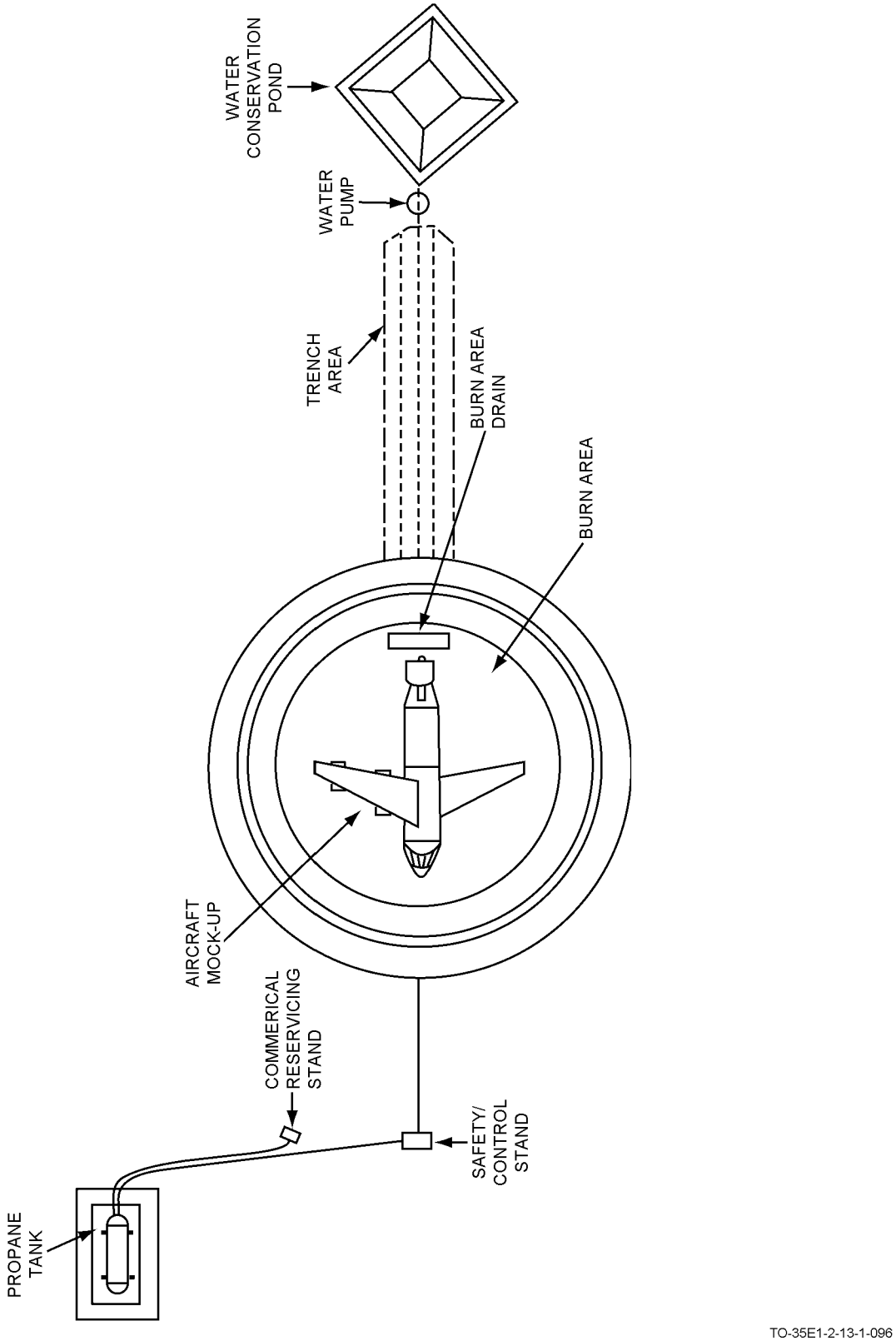

Figure 54. McGuire AFB Wrightstown, New Jersey

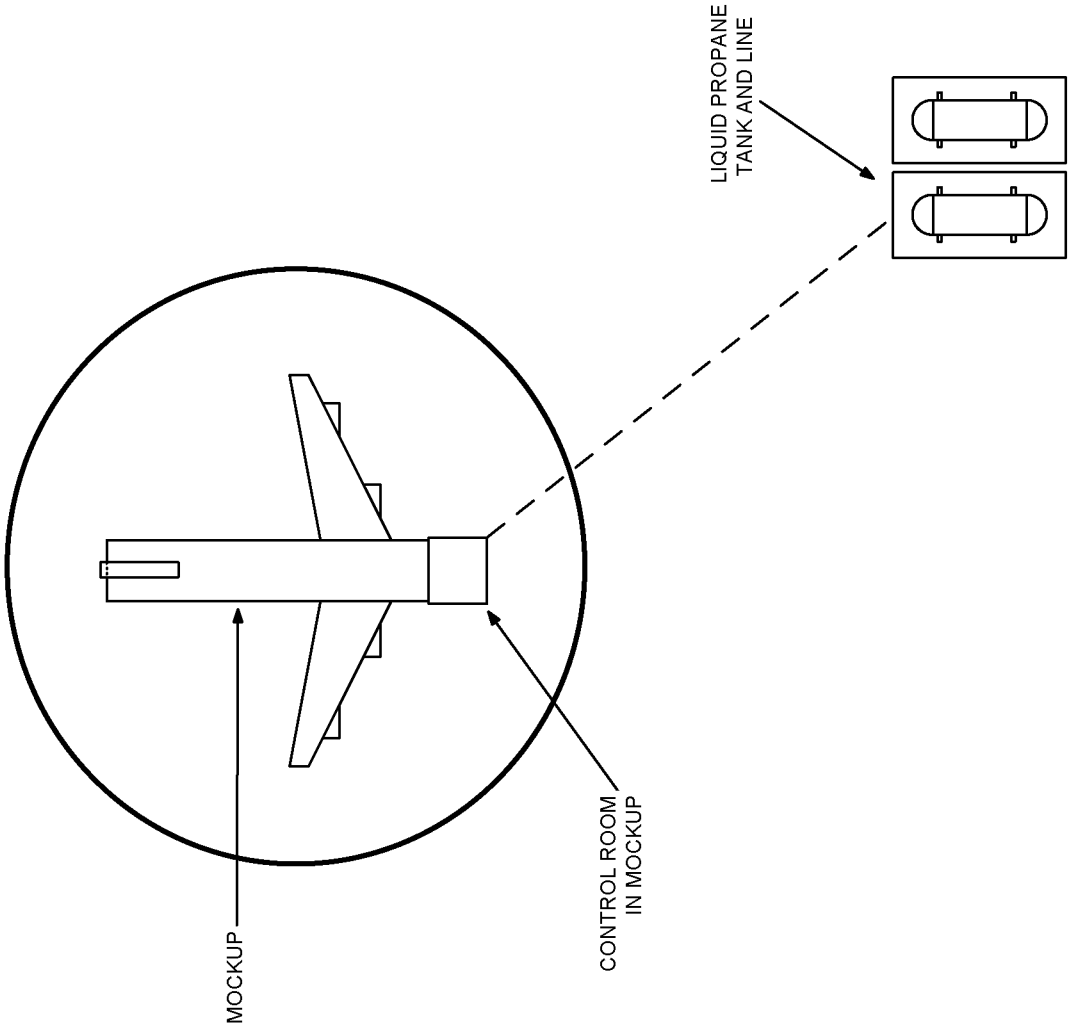

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Figure 55. Mildenhall AB United Kingdom

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NO DRAWING REQUIRED

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Figure 56. Minot AFB Minot, North Dakota

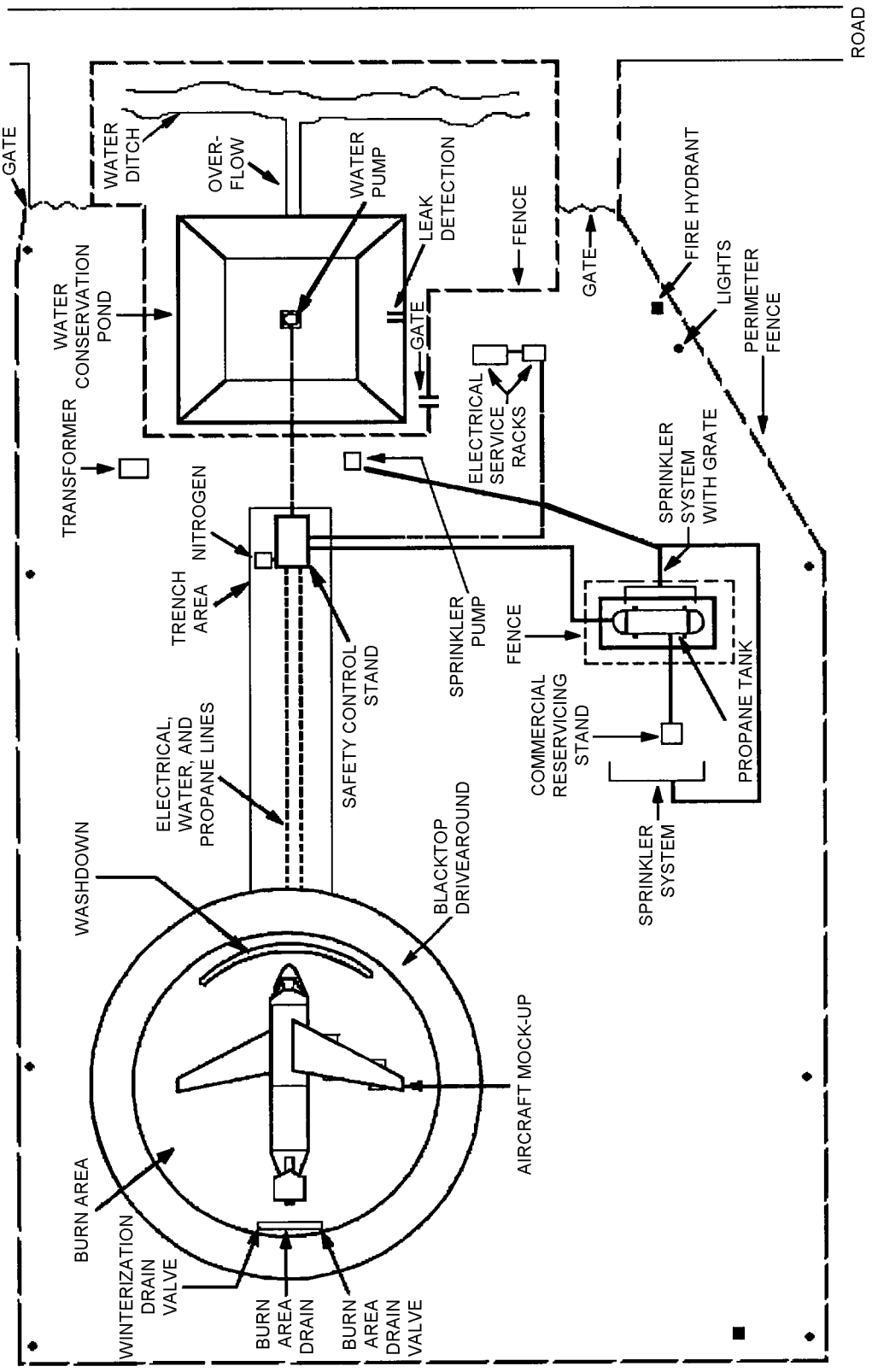

Figure 57. Misawa AB Misawa, Japan

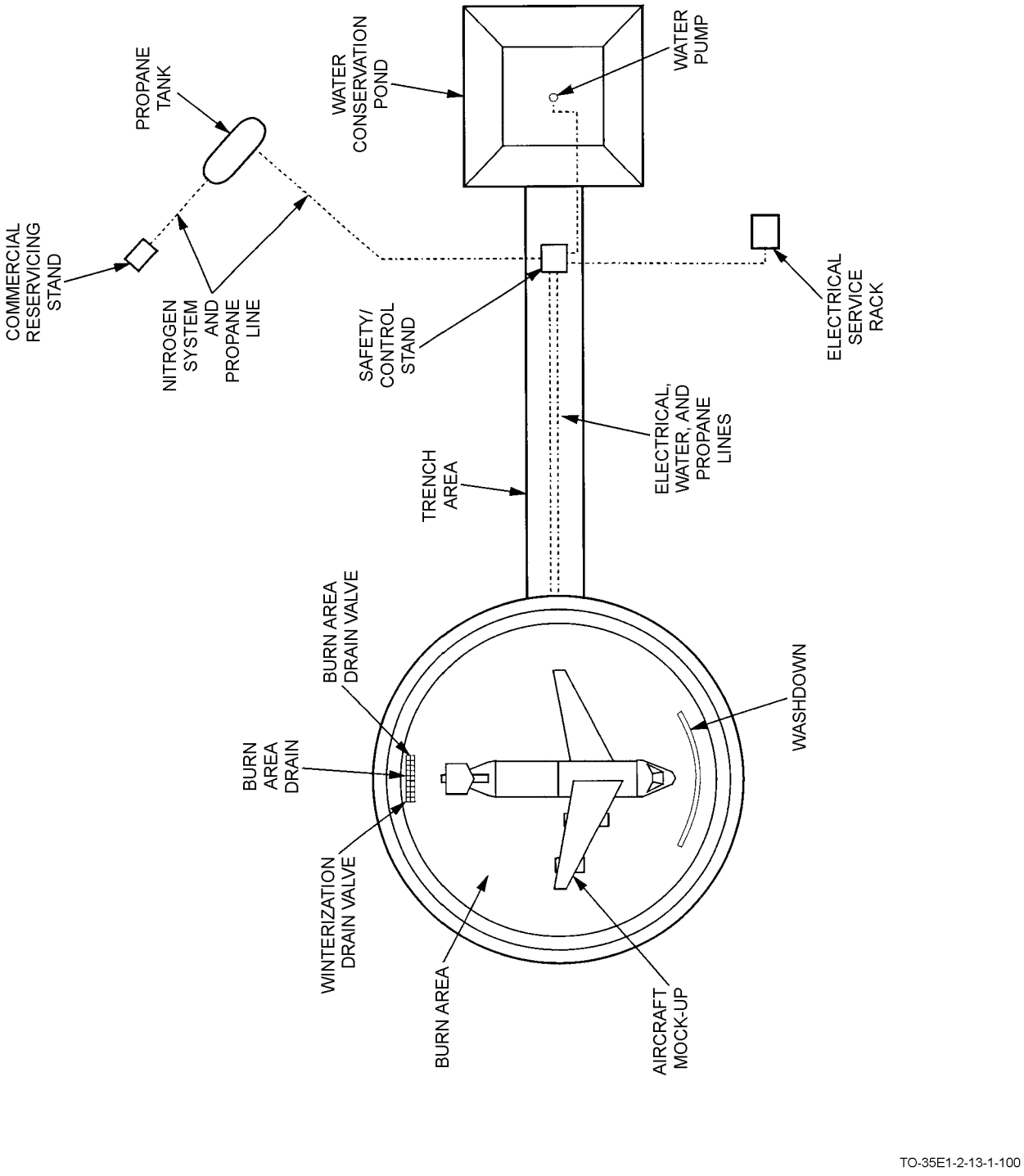

Figure 58. Moody AFB Valdosta, Georgia

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NO DRAWING REQUIRED

TO-35E1-2-13-1-101

Figure 59. Moron AB Spain

DRAWING NOT SUBMITTED

TO-35E1-2-13-1-102

Figure 60. Mt. Home AFB Mt. Home, Idaho

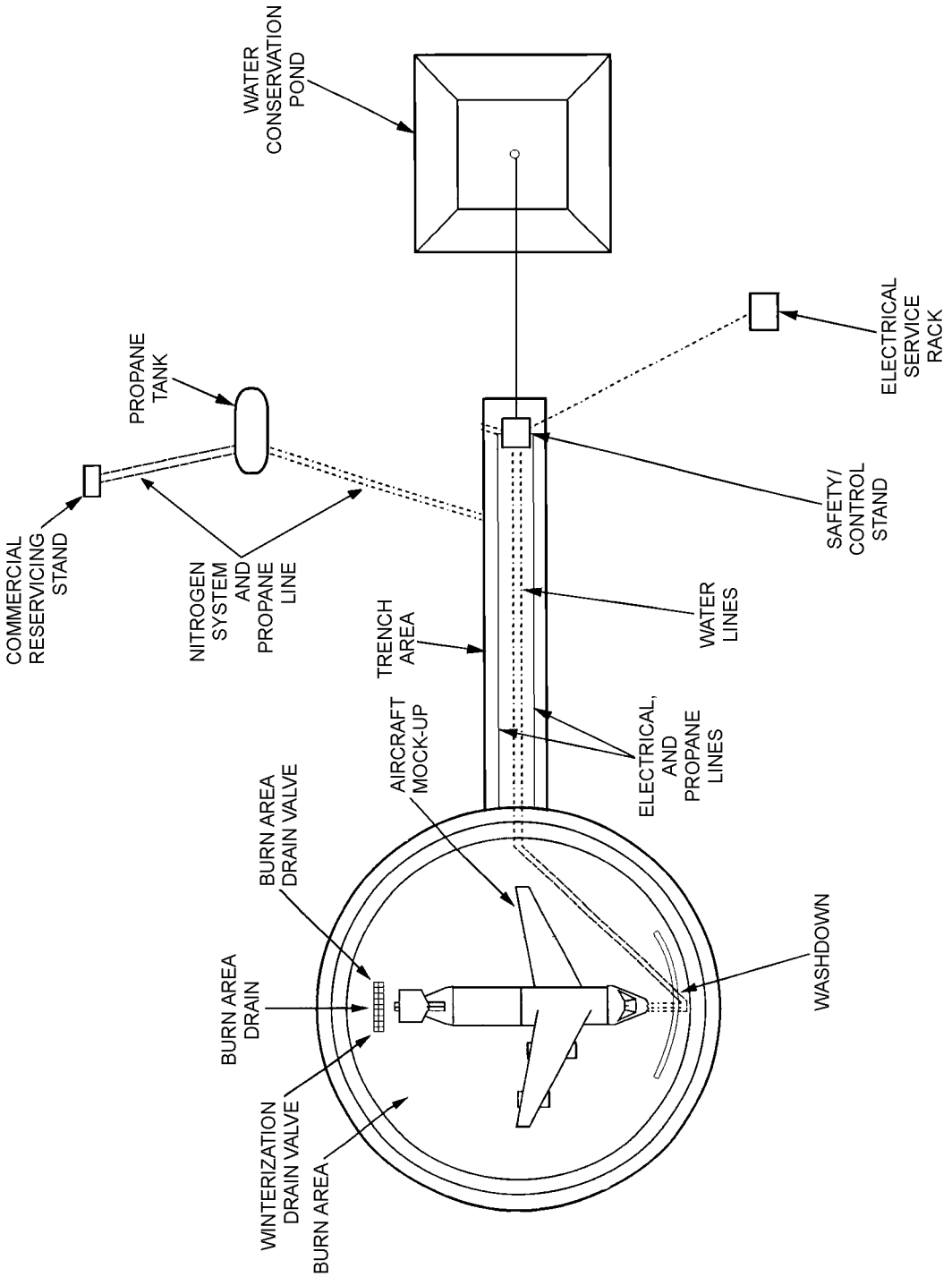

Figure 61. Nellis AFB Las Vegas, Nevada

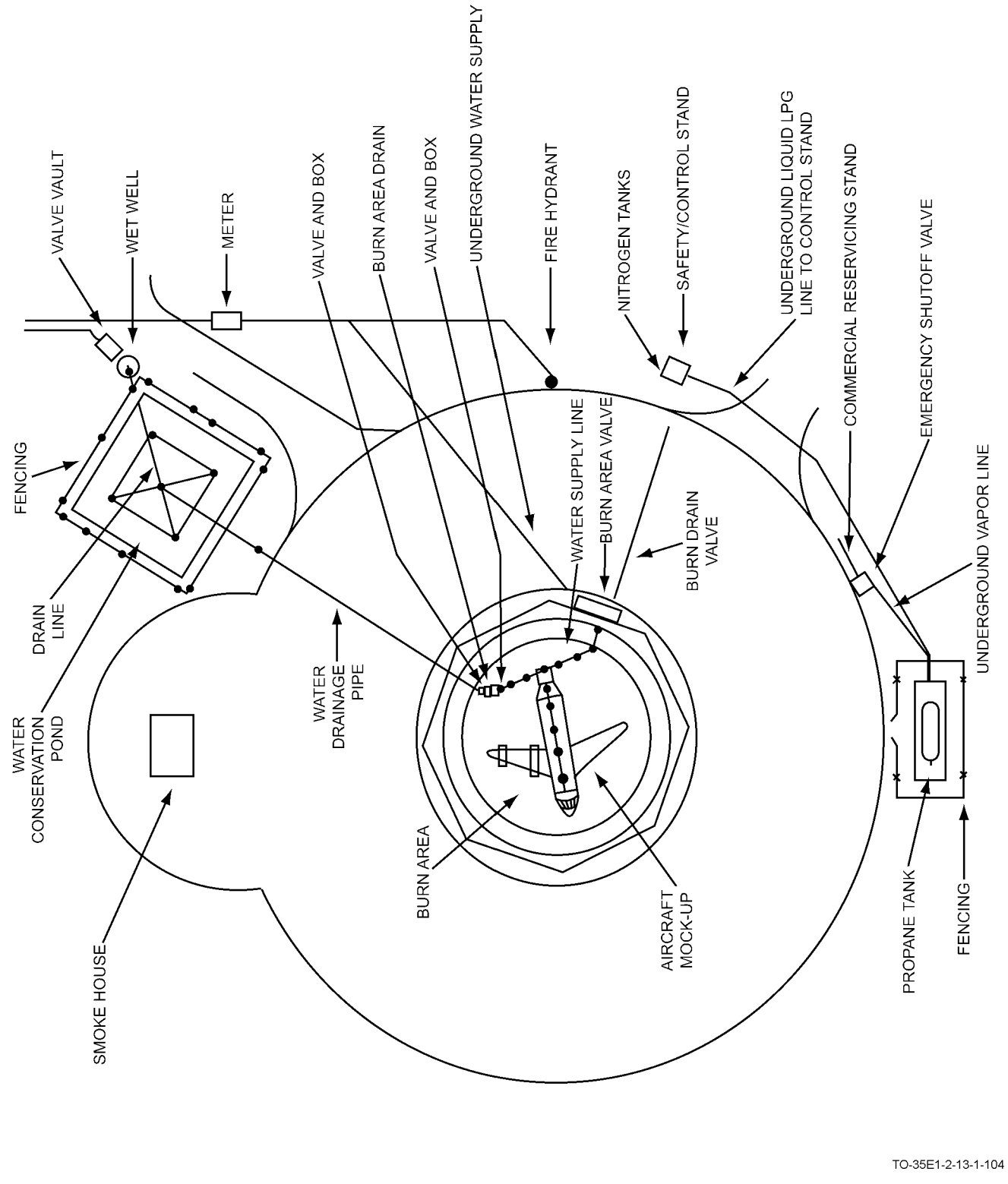

Figure 62. Niagara Falls AFRS Niagara Falls, New York

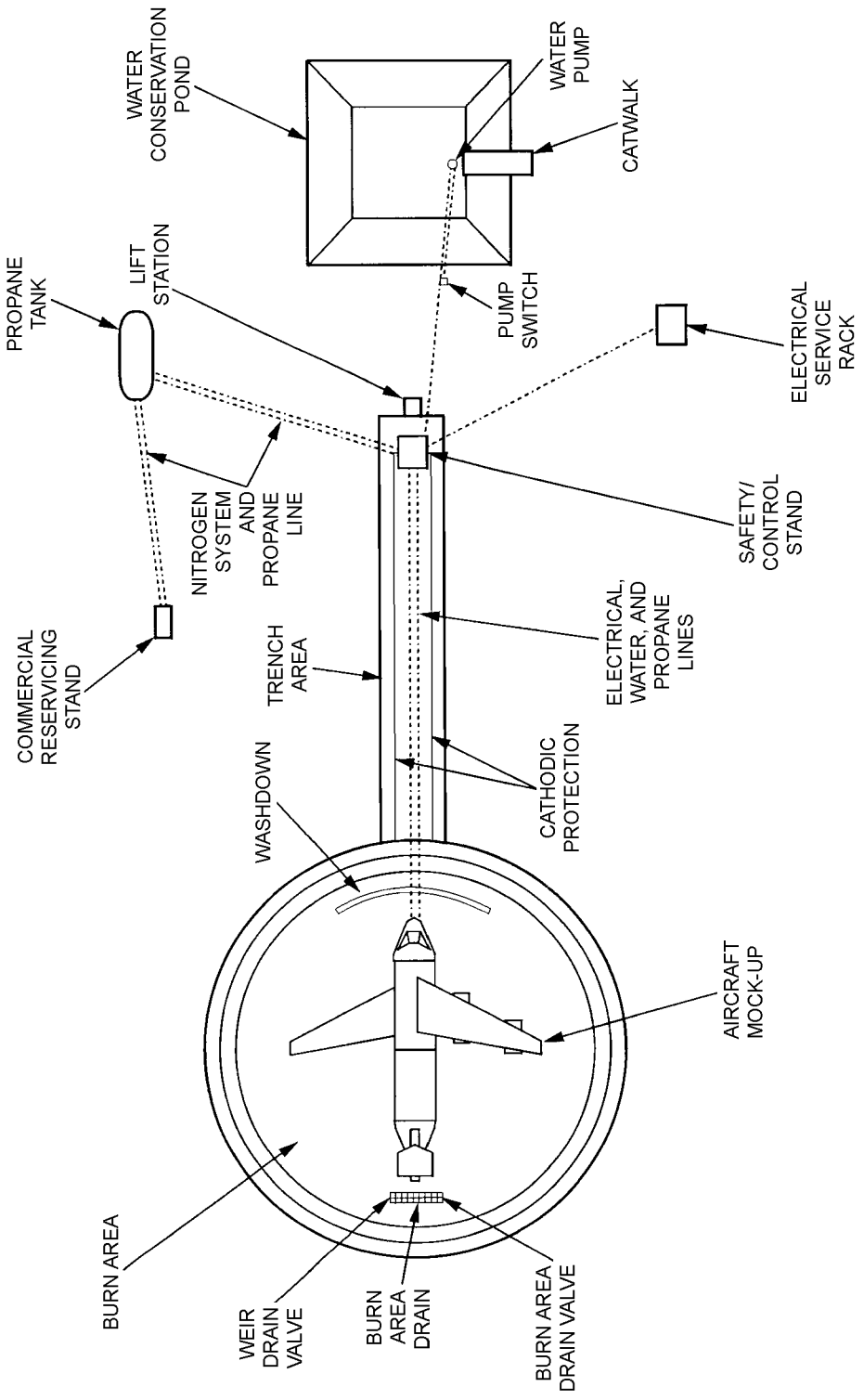

Figure 63. Offutt AFB Omaha, Nebraska

THIS SITE USES A PROSAFE MOBILE TRAINER
NO DRAWING REQUIRED

TO-35E1-2-13-1-106

Figure 64. Osan AB Osan, Korea

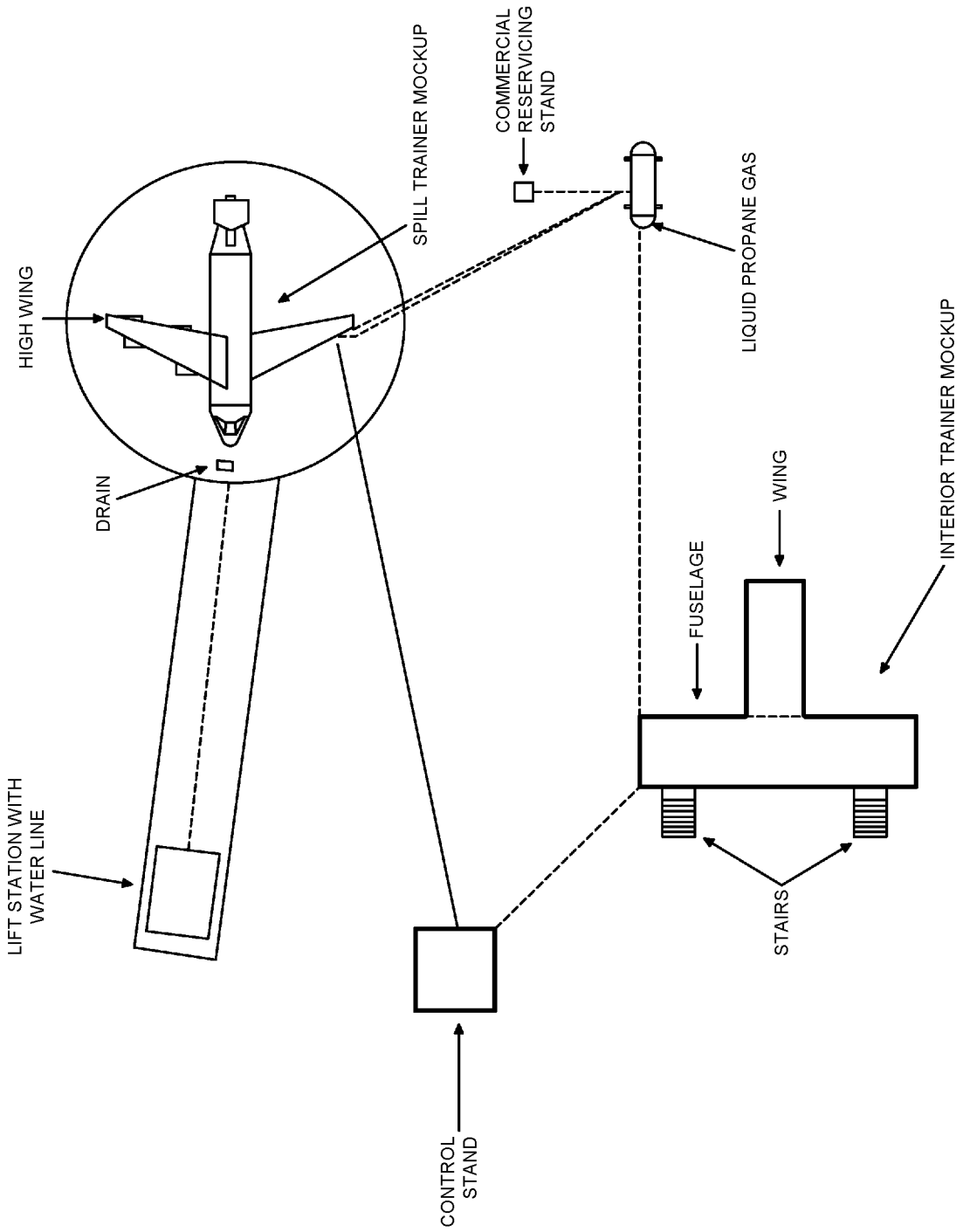

Figure 65. Palmdale AFB Palmdale, California

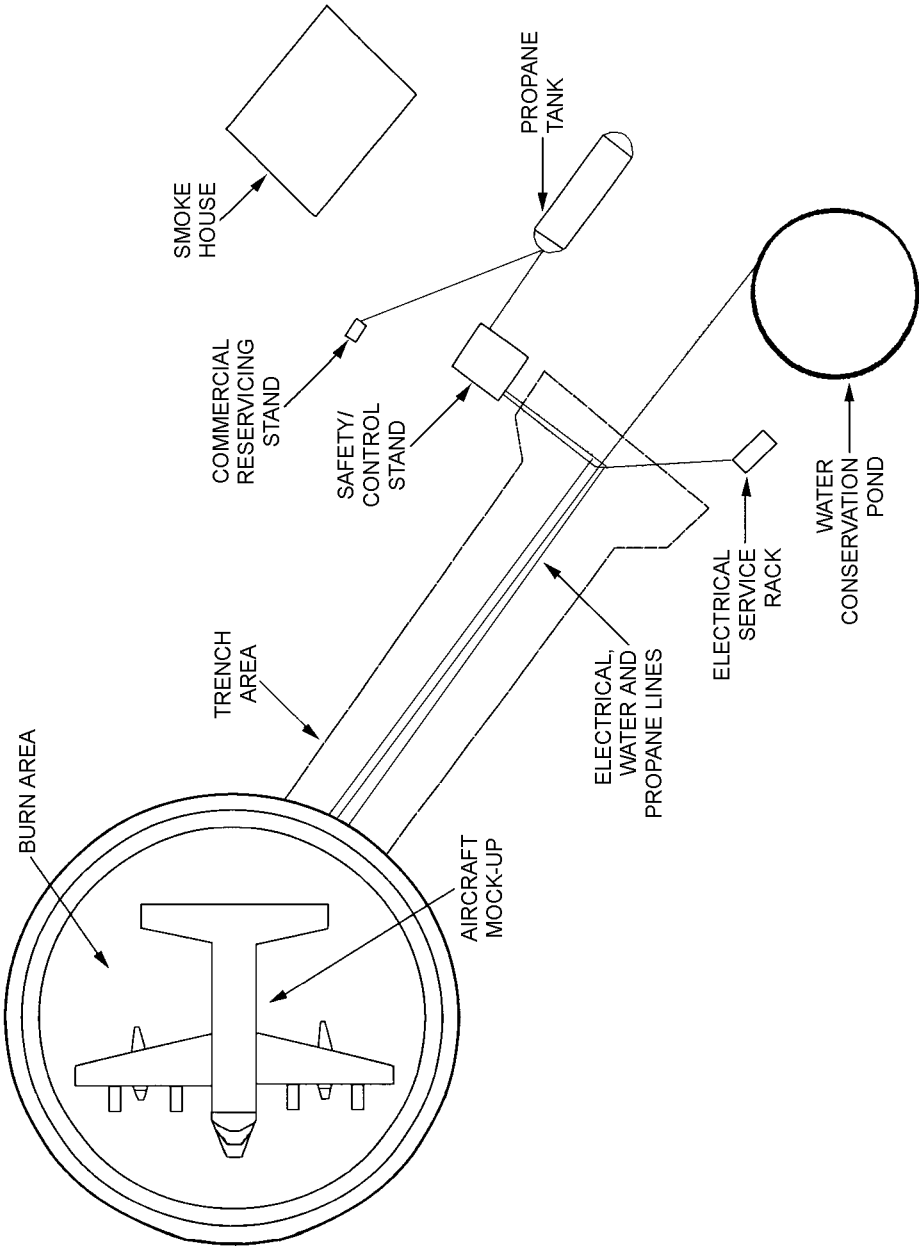

Figure 66. Peterson AFB Colorado Springs, Colorado

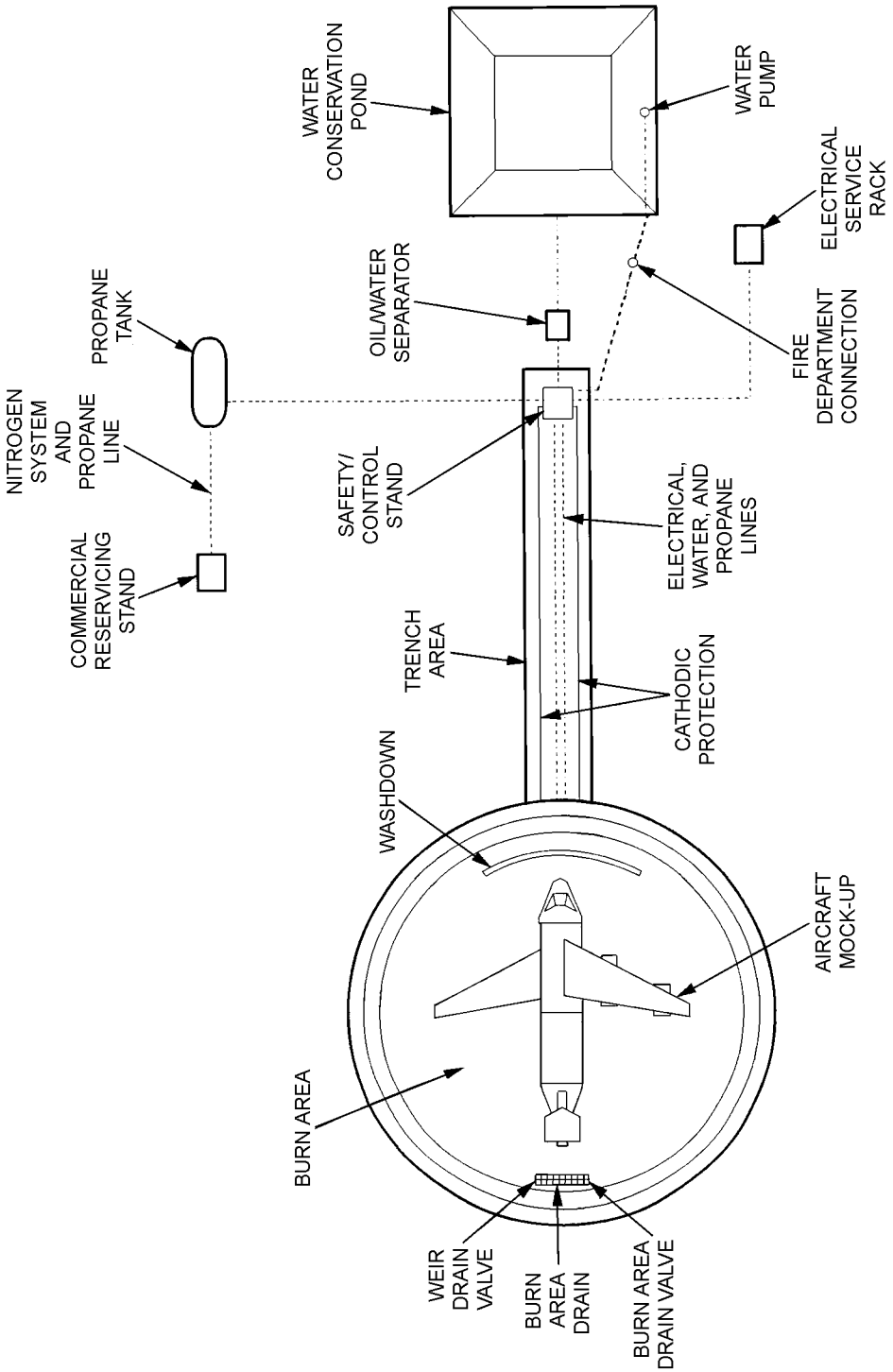

Figure 67. Pope AFB Fayetteville, North Carolina

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NO DRAWING REQUIRED

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Figure 68. Ramstein AB Ramstein, Germany

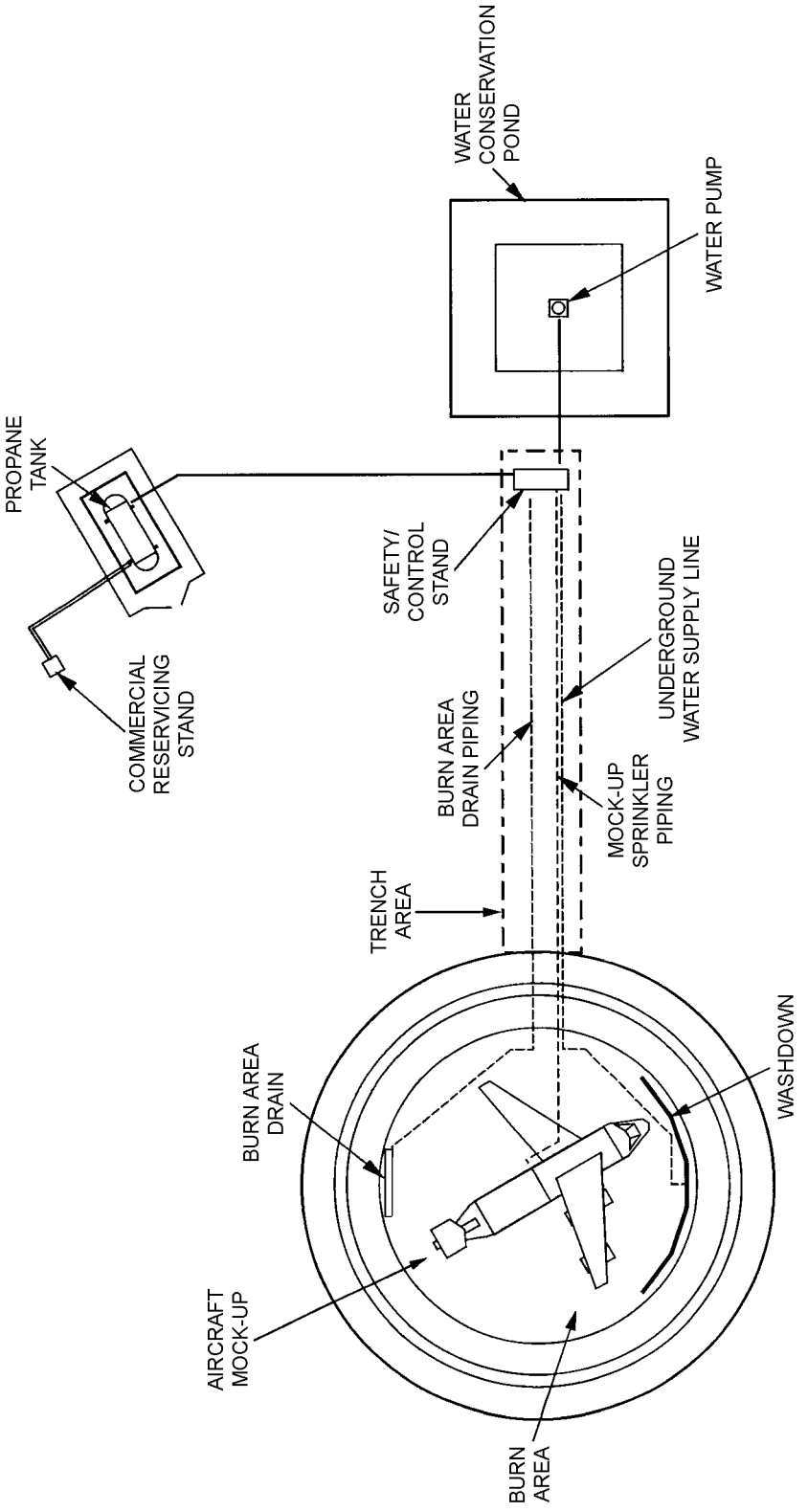

Figure 69. Randolph AFB San Antonio, Texas

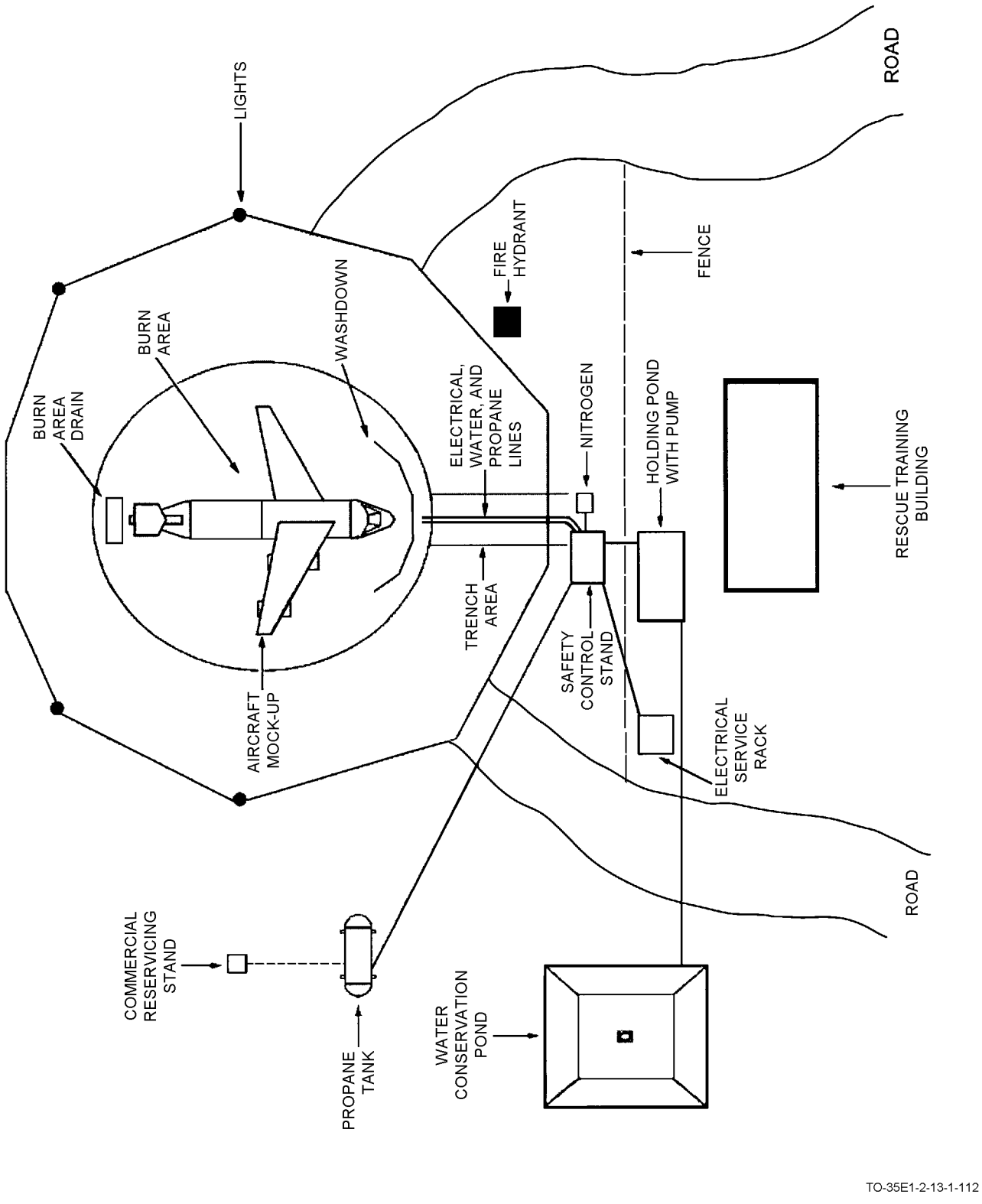

Figure 70. Robins AFB Warner Robins, Georgia

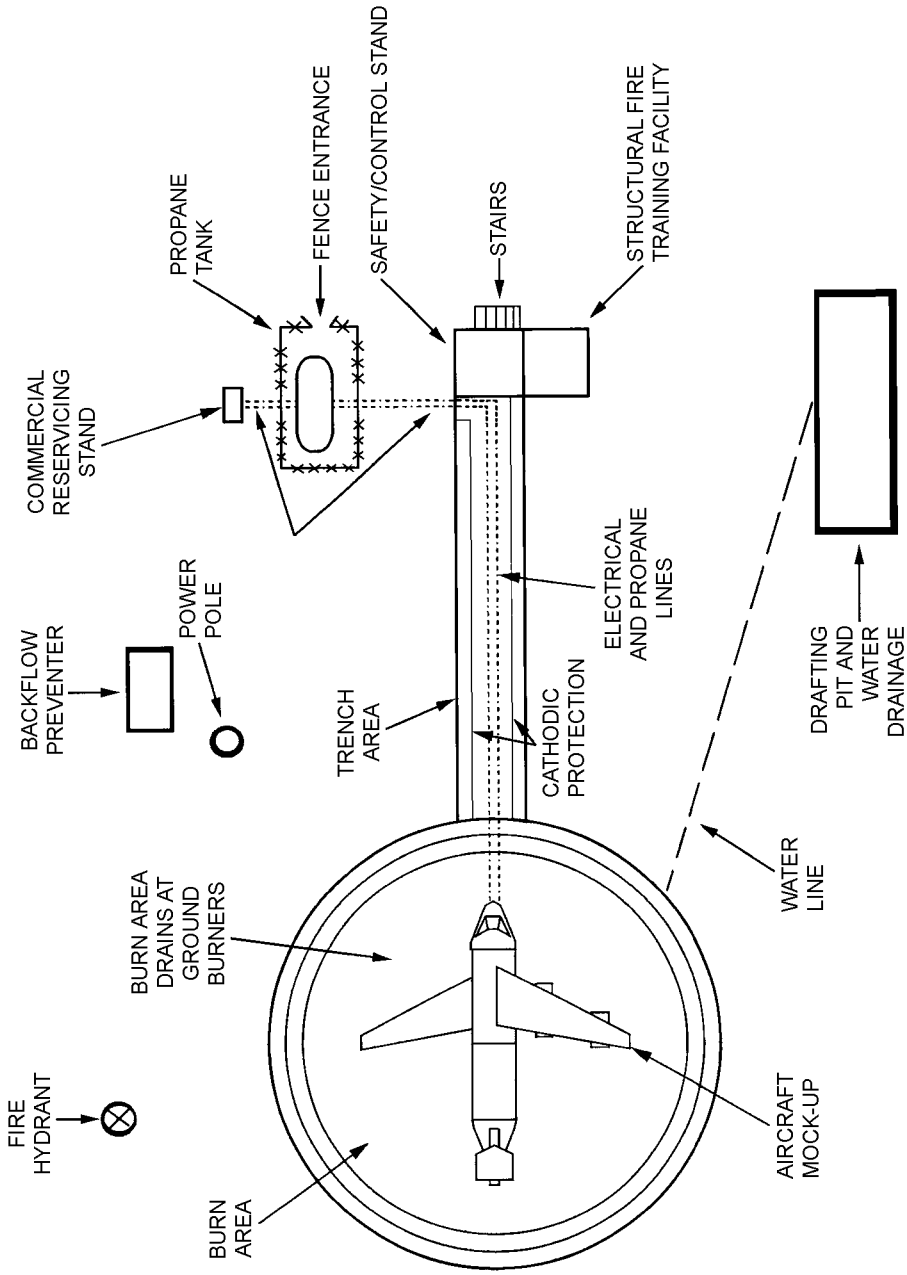

Figure 71. Savannah ANGB Savannah, Georgia

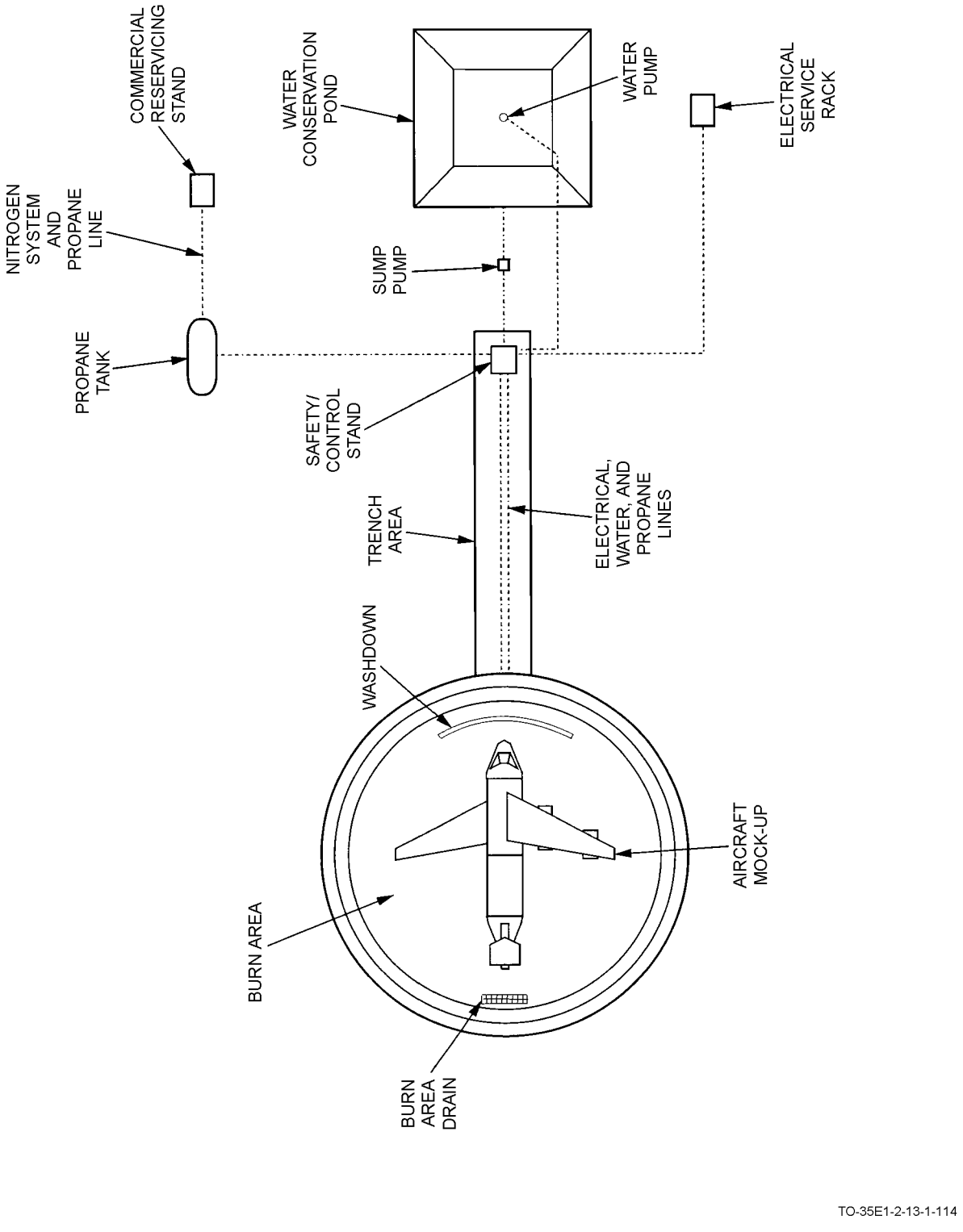

Figure 72. Scott AFB Belleville, Illinois

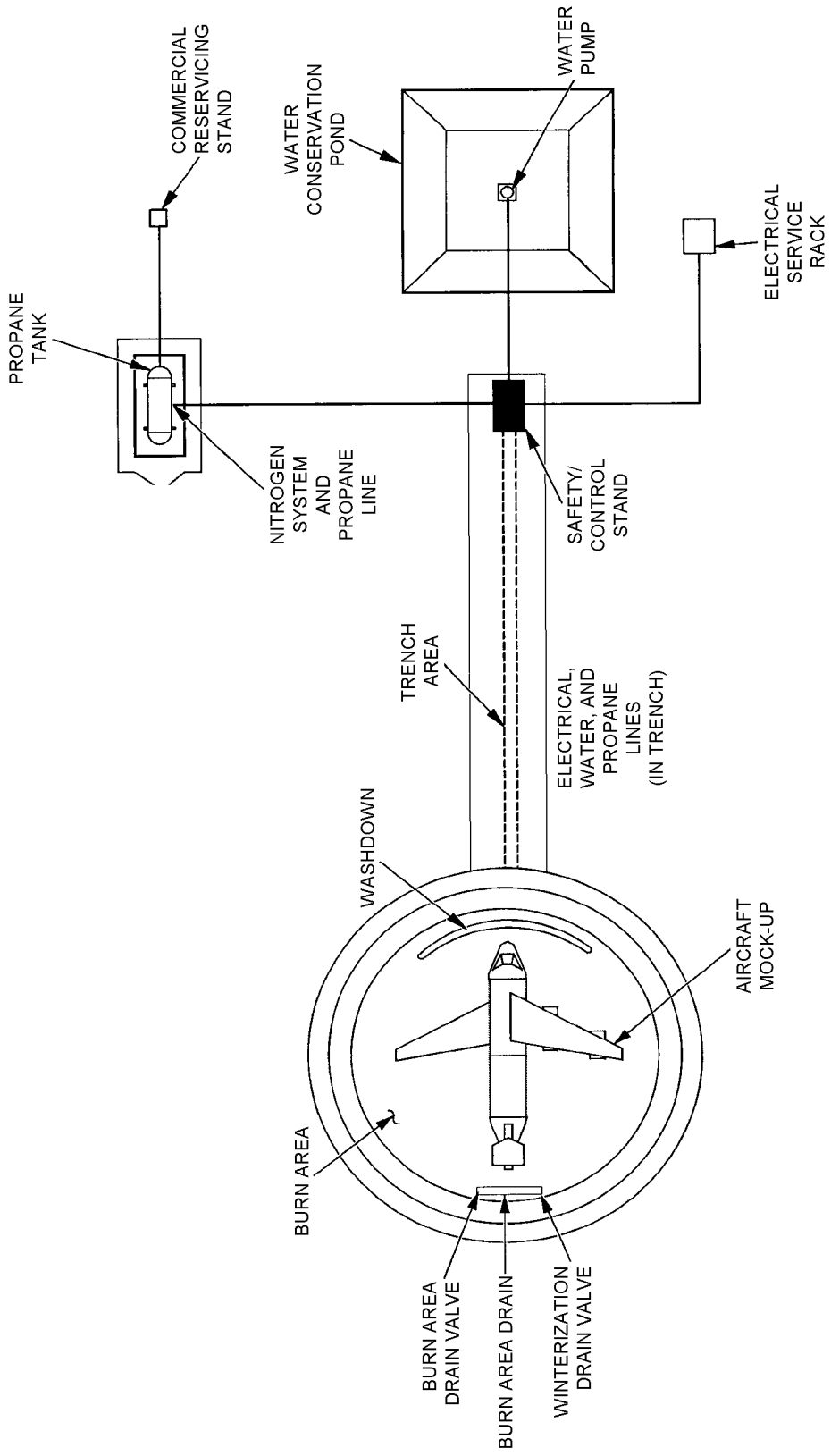

Figure 73. Seymour-Johnson AFB Goldsboro, North Carolina

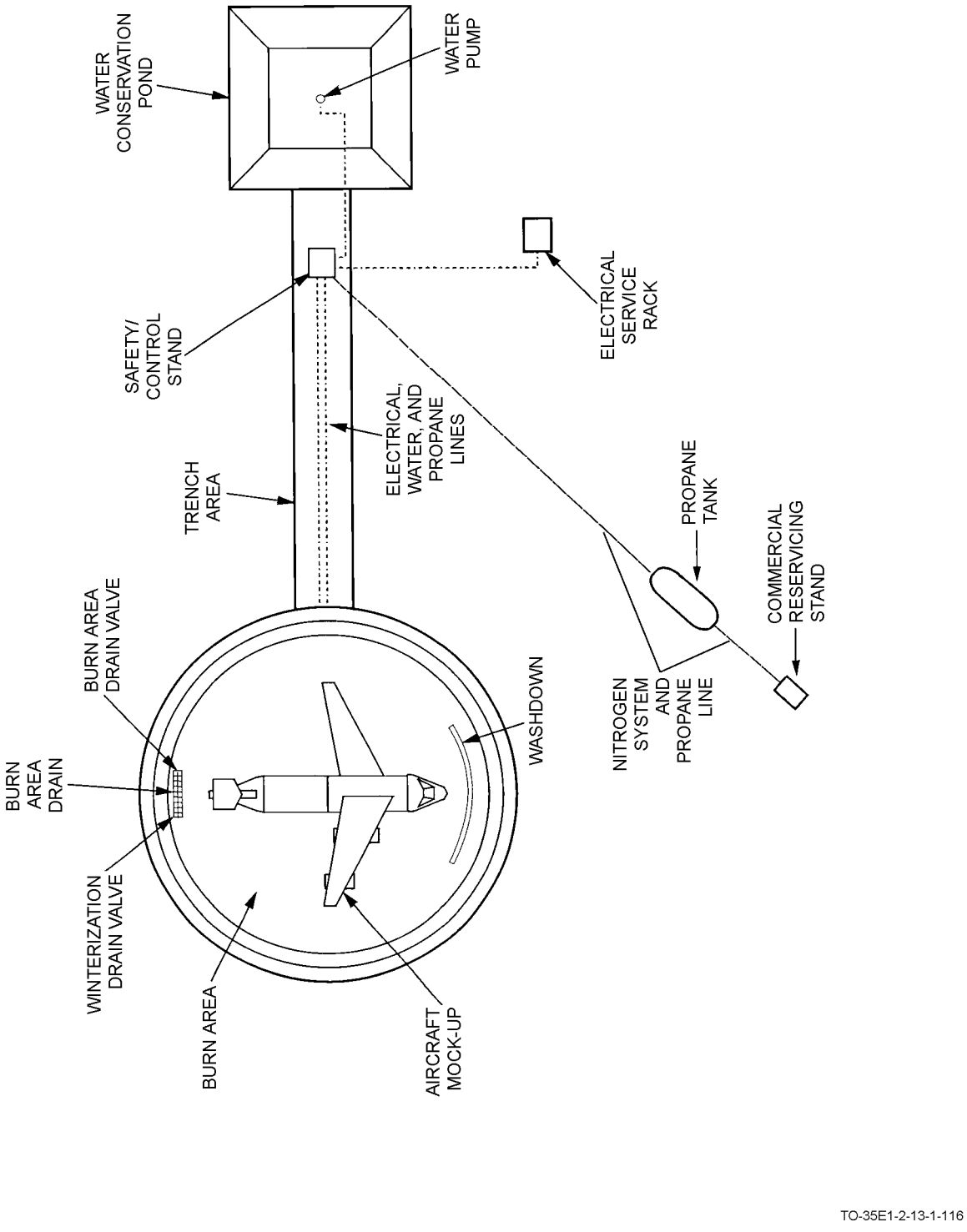

Figure 74. Shaw AFB Sumter, South Carolina

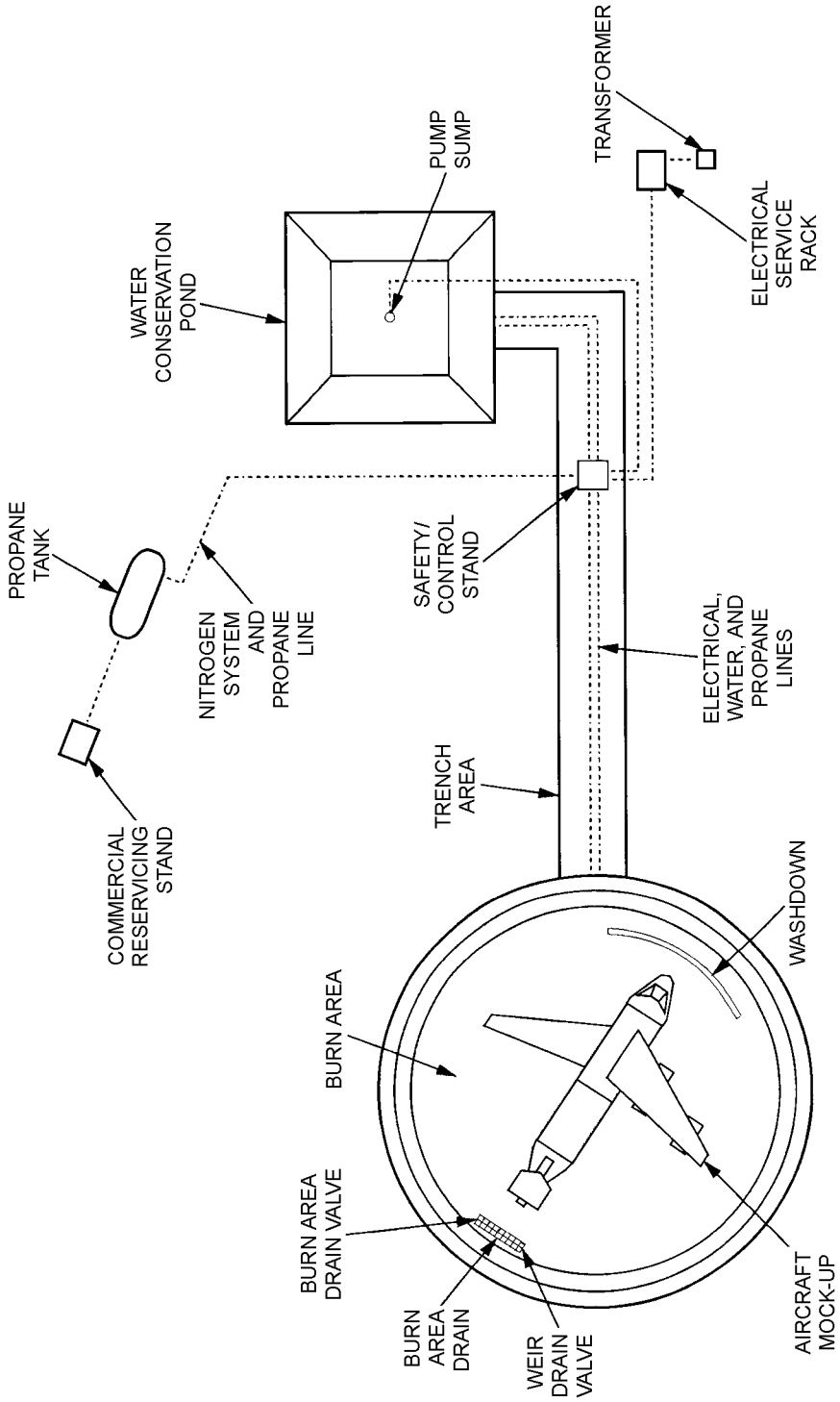

Figure 75. Sheppard AFB Wichita Fall, Texas

THIS SITE USES AN ICS MOBILE TRAINER
NO DRAWING REQUIRED

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Figure 76. Spangdahlem AB Germany

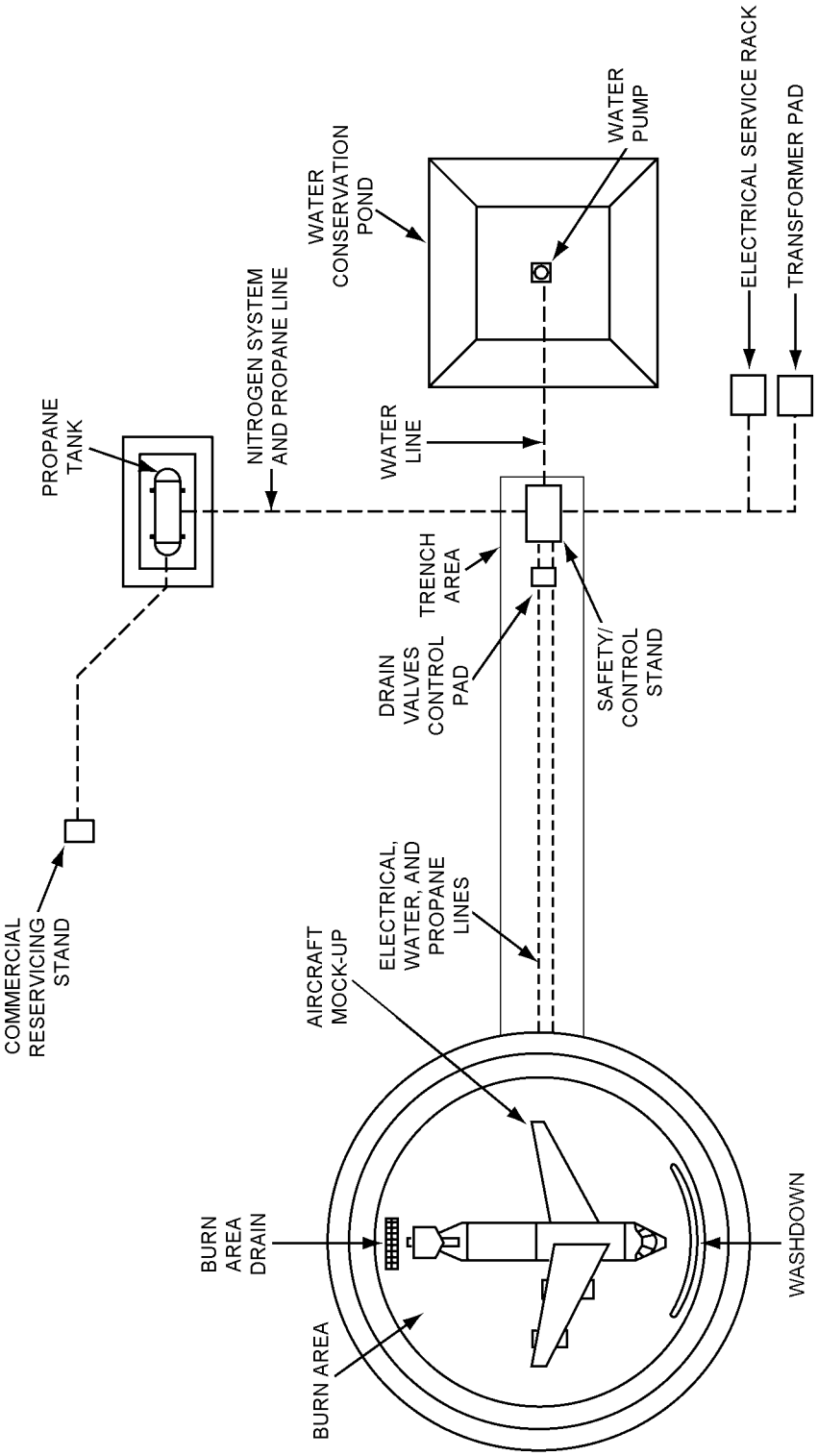

Figure 77. Tinker AFB Oklahoma City, Oklahoma

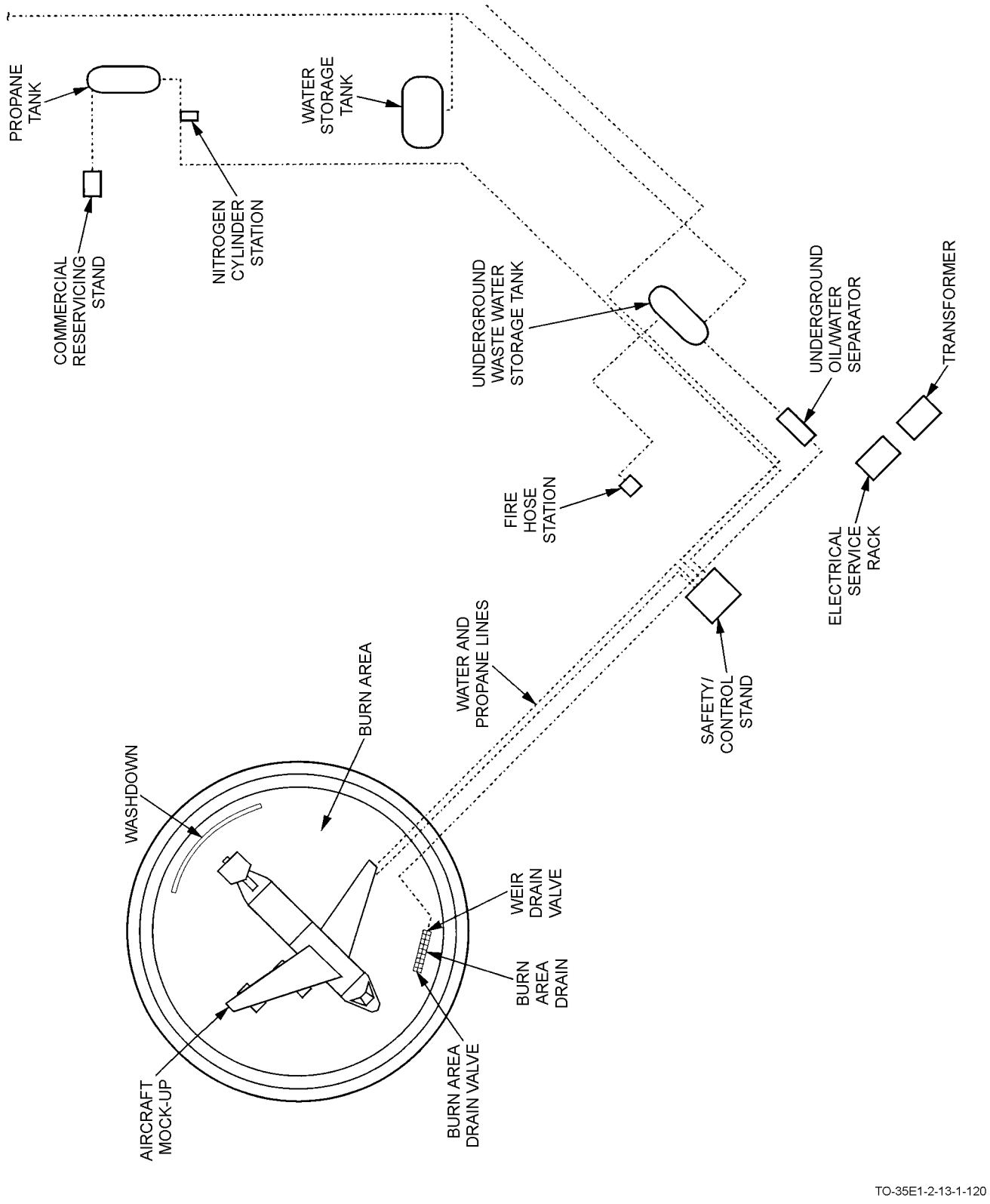

Figure 78. Travis AFB Fairfield, California

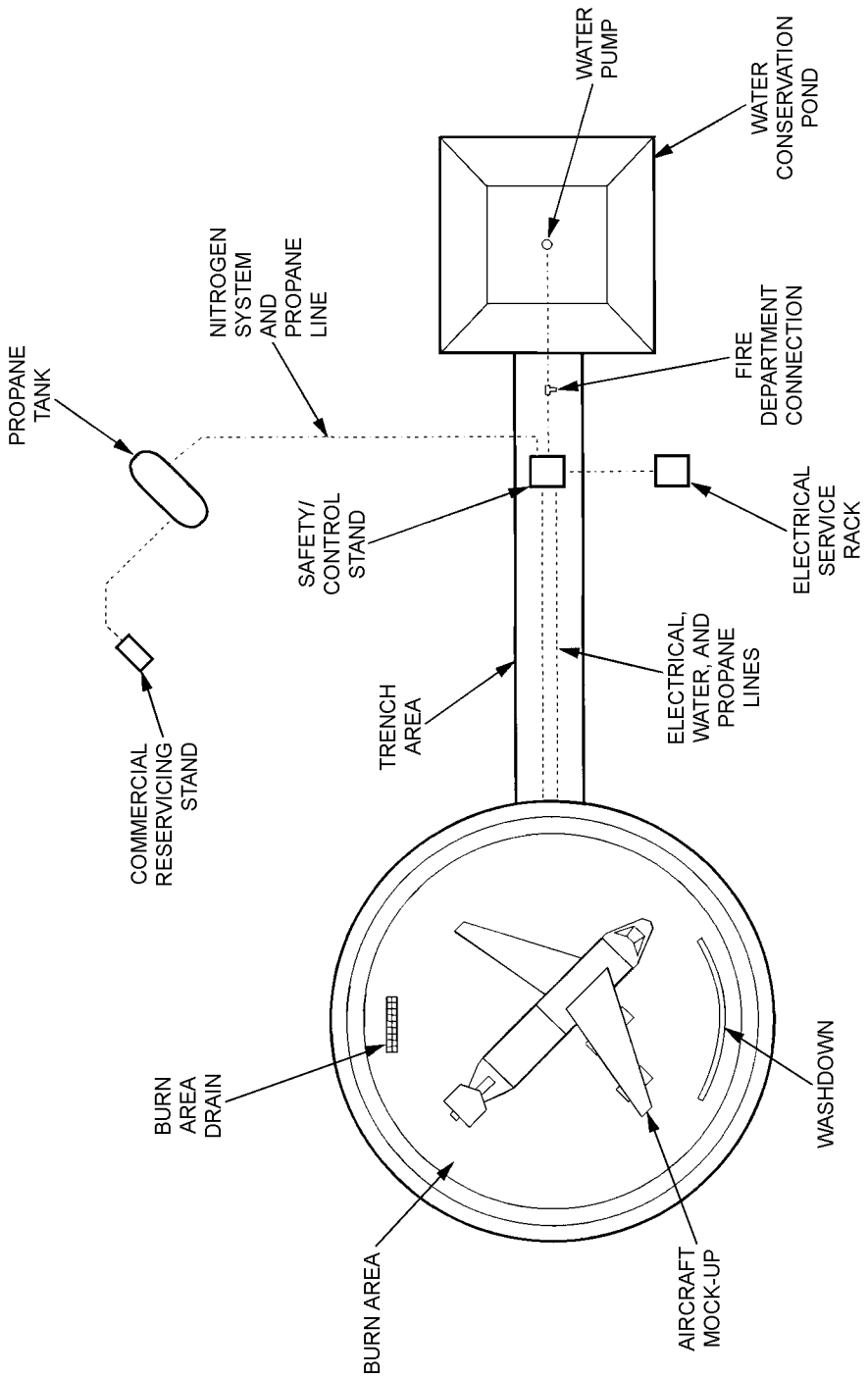

Figure 79. Tyndall AFB Panama City, Florida

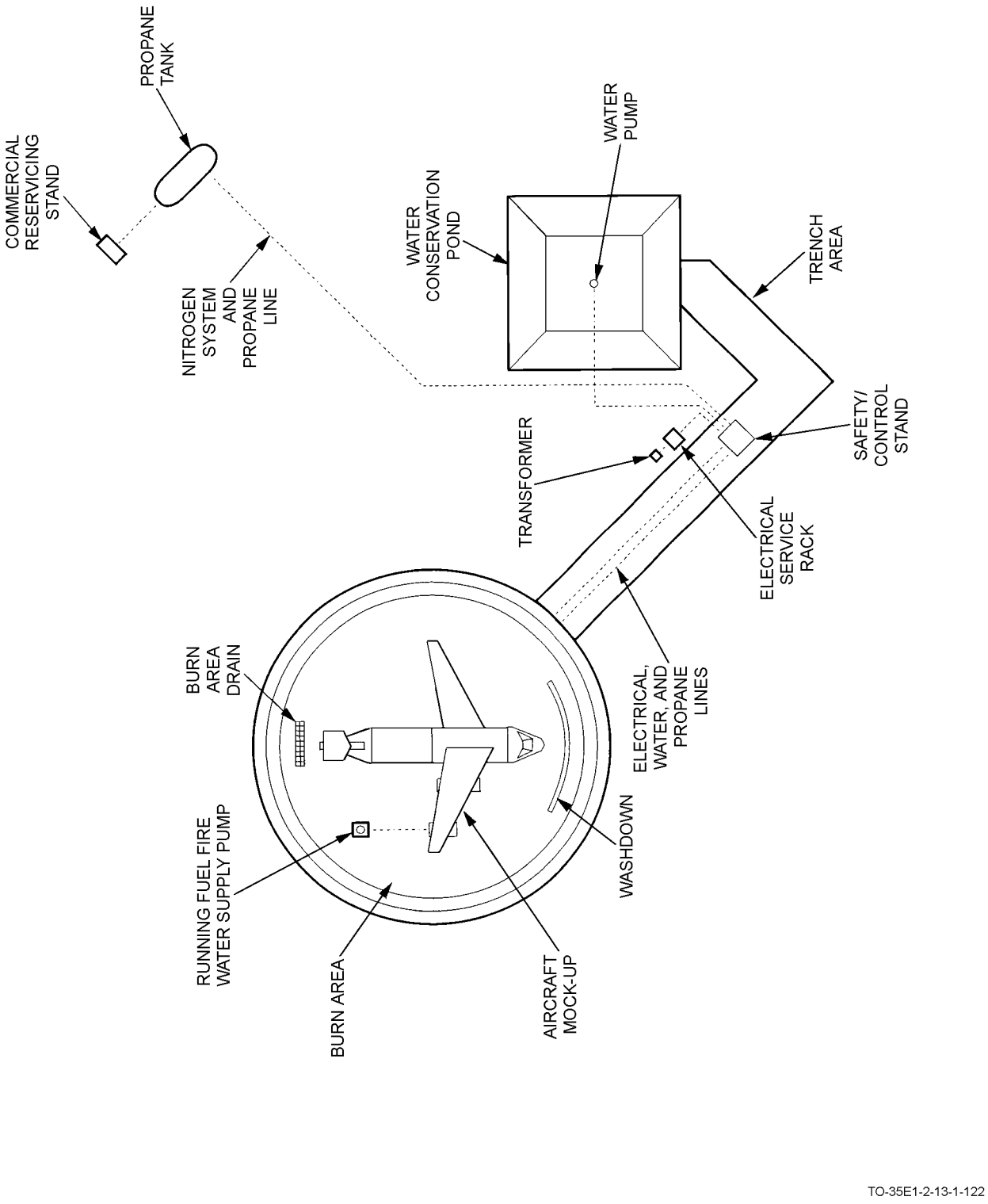

Figure 80. Vance AFB Enid, Oklahoma

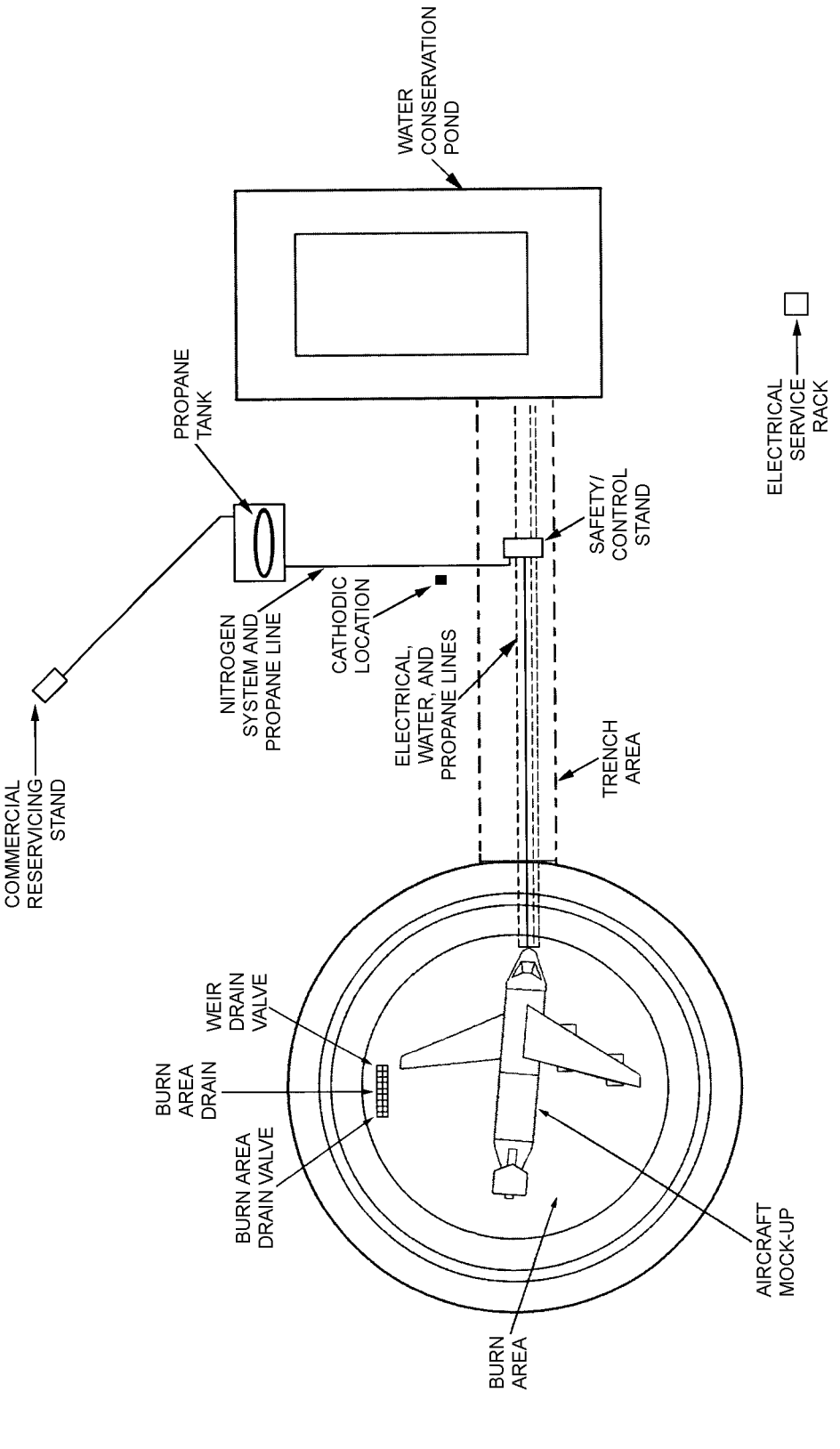

Figure 81. Vandenberg AFB Lompoc, California

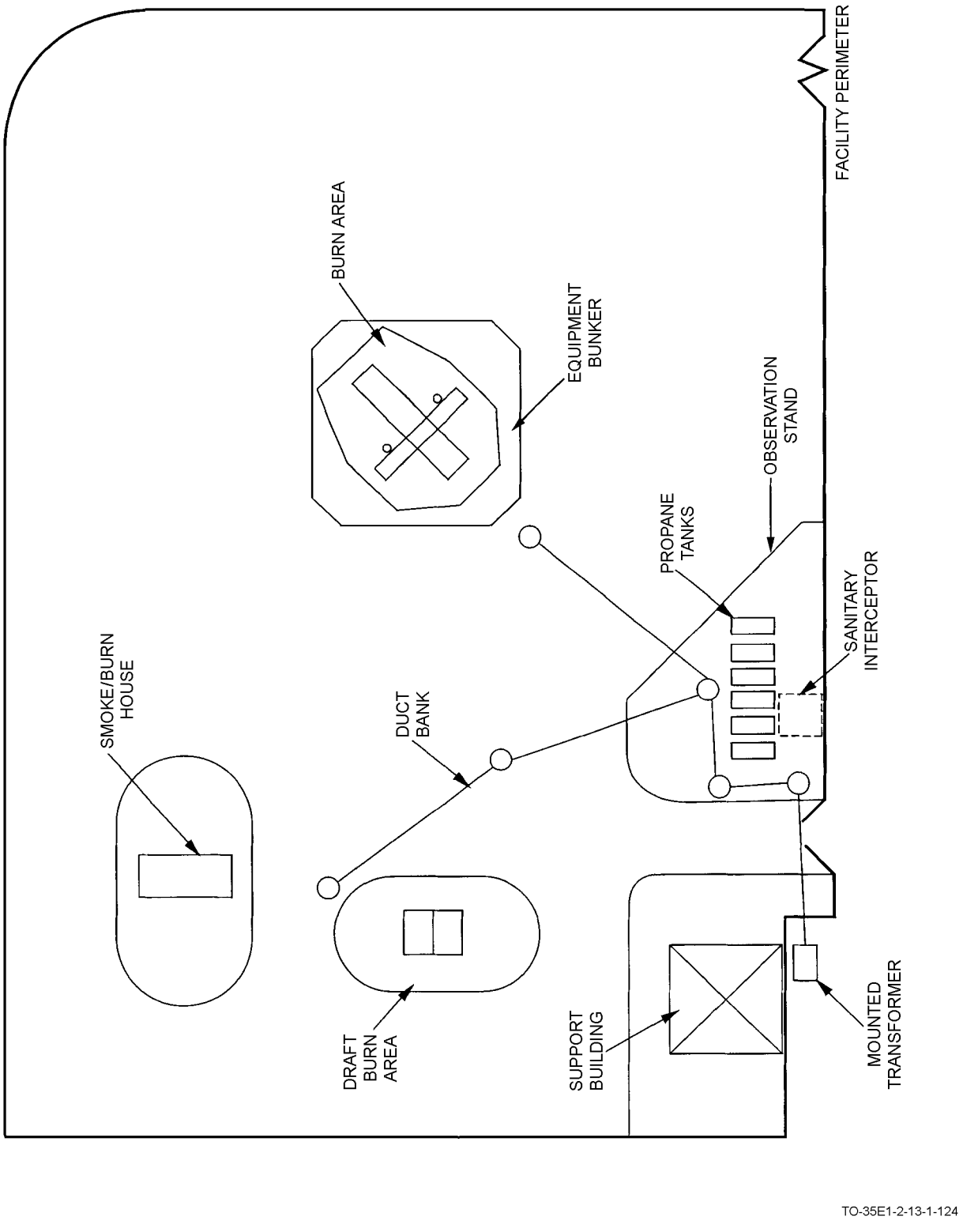

Figure 82. Volk Field ANGB Camp Douglas, Wisconsin

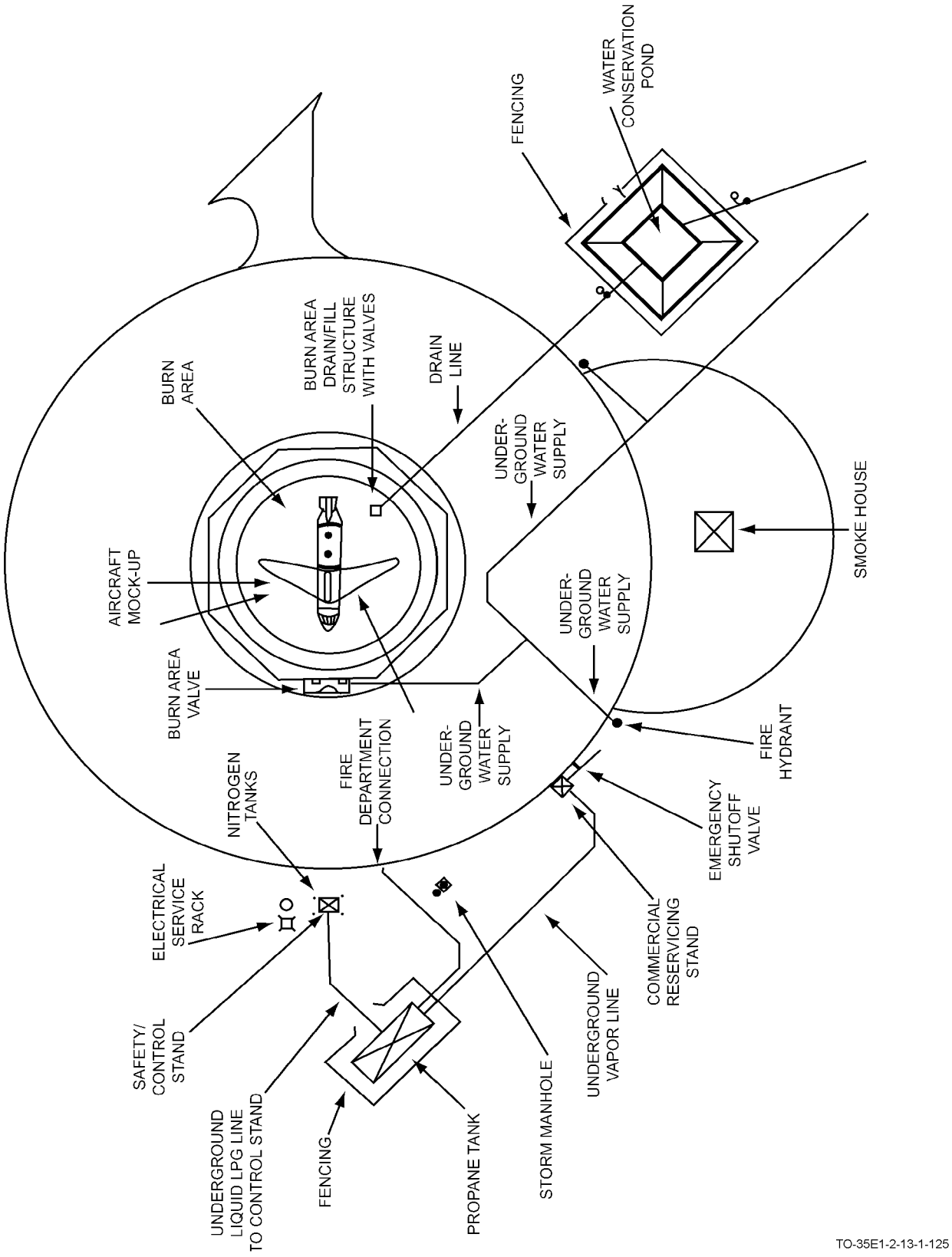

Figure 83. Westover AFRB Ludlow, Massachusetts

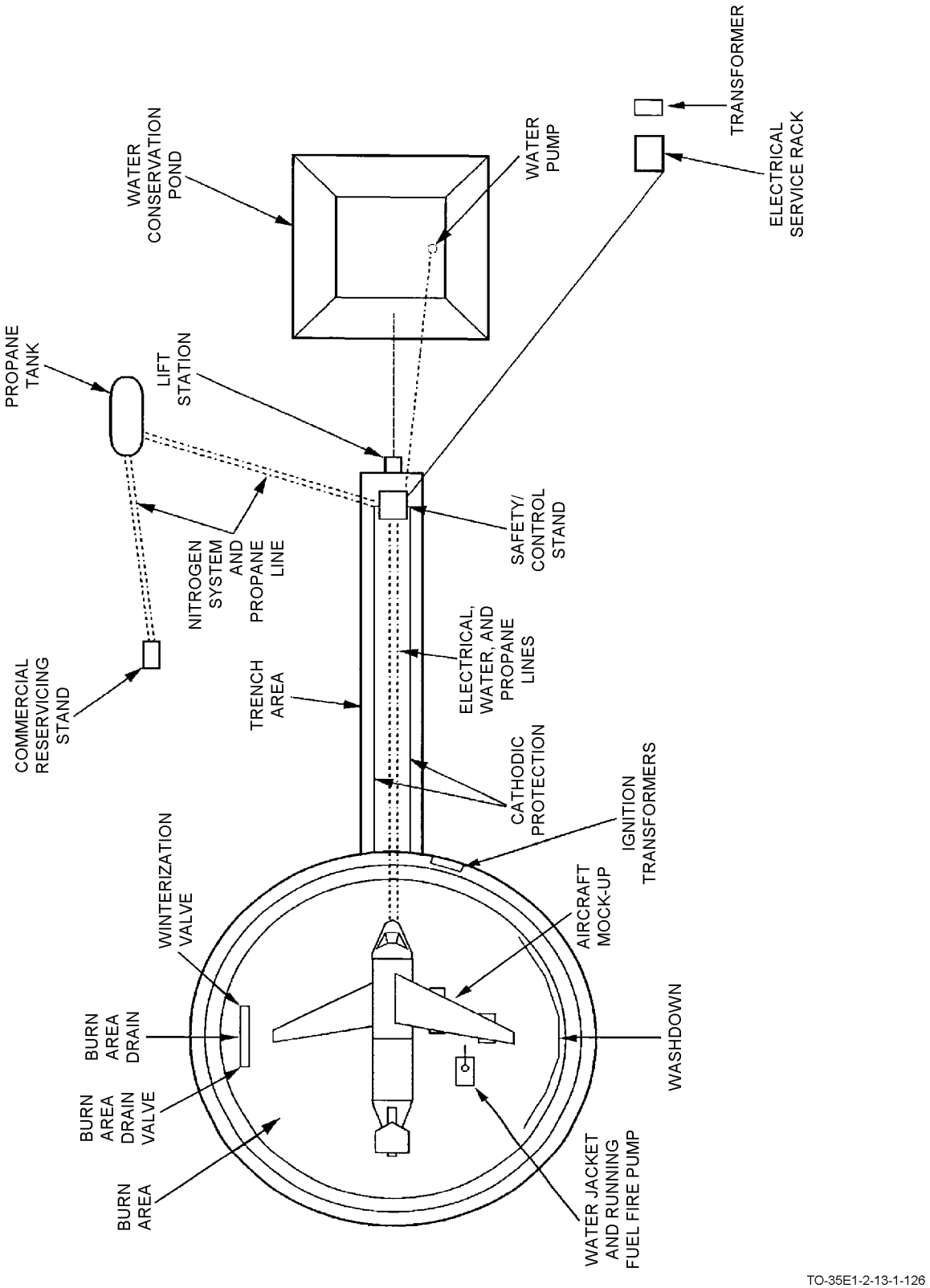

Figure 84. Whiteman AFB Knob Noster, Missouri

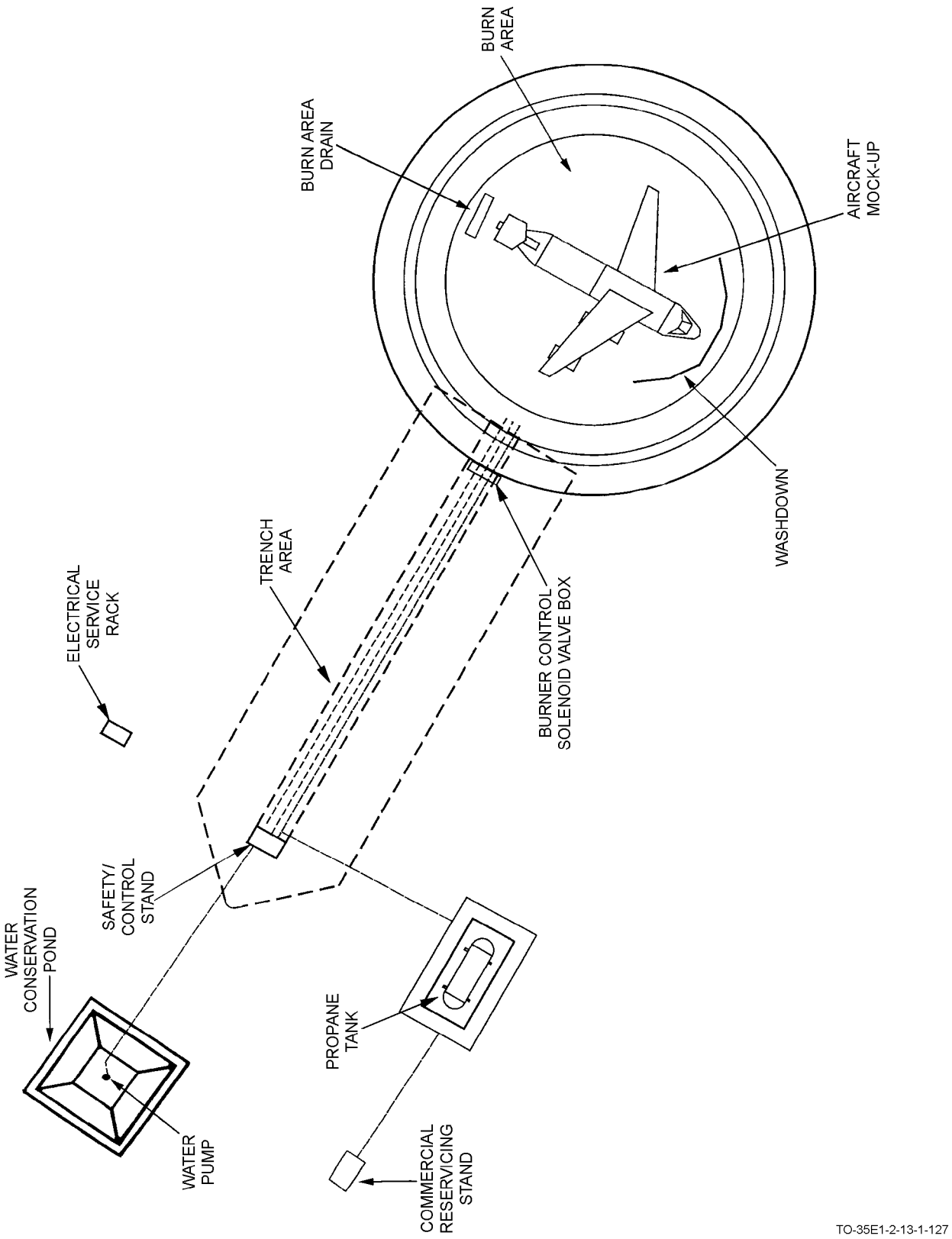

Figure 85. Wright-Patterson AFB Dayton, Ohio

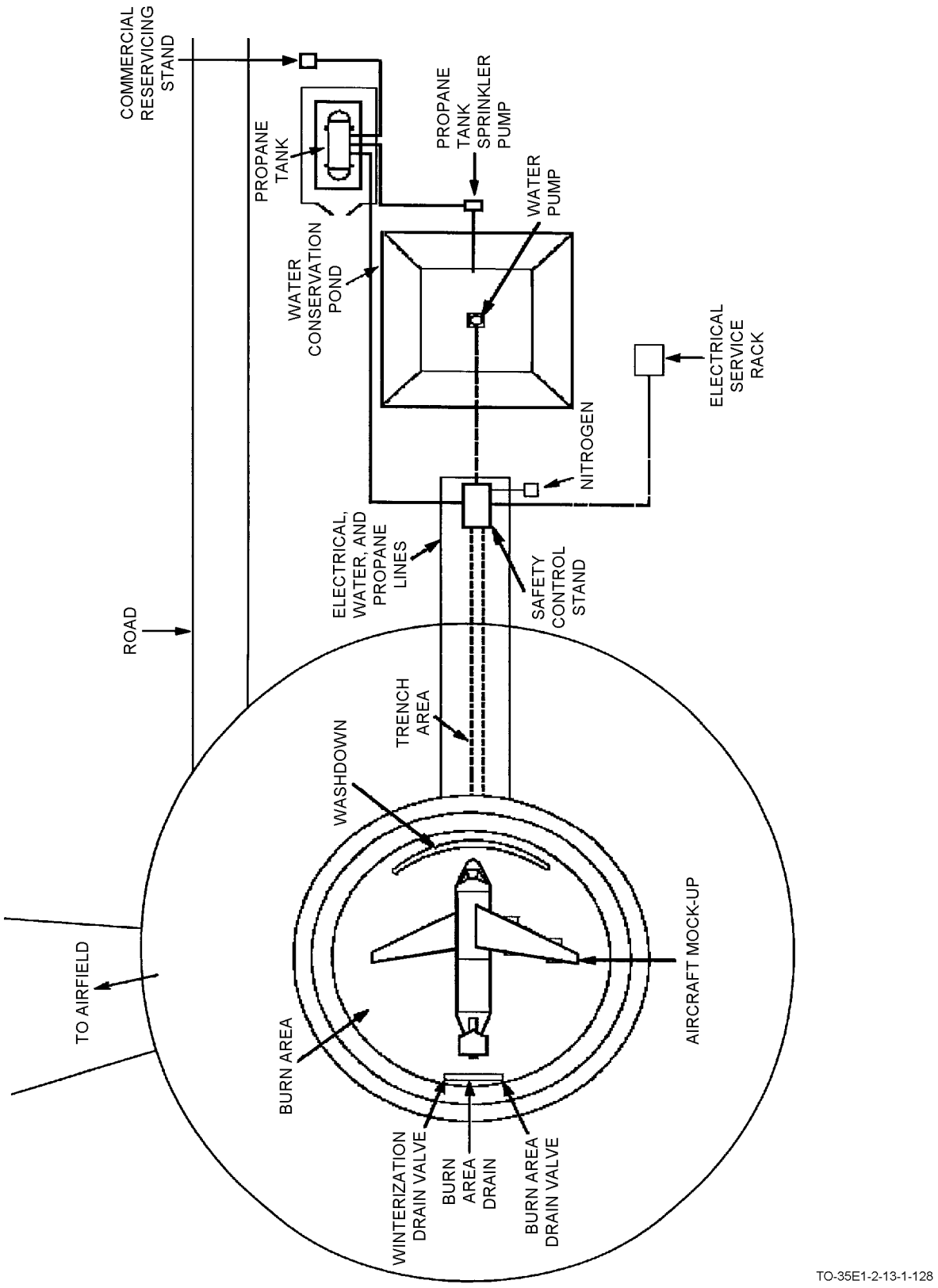

Figure 86. Yokota AB Fuzza, Japan

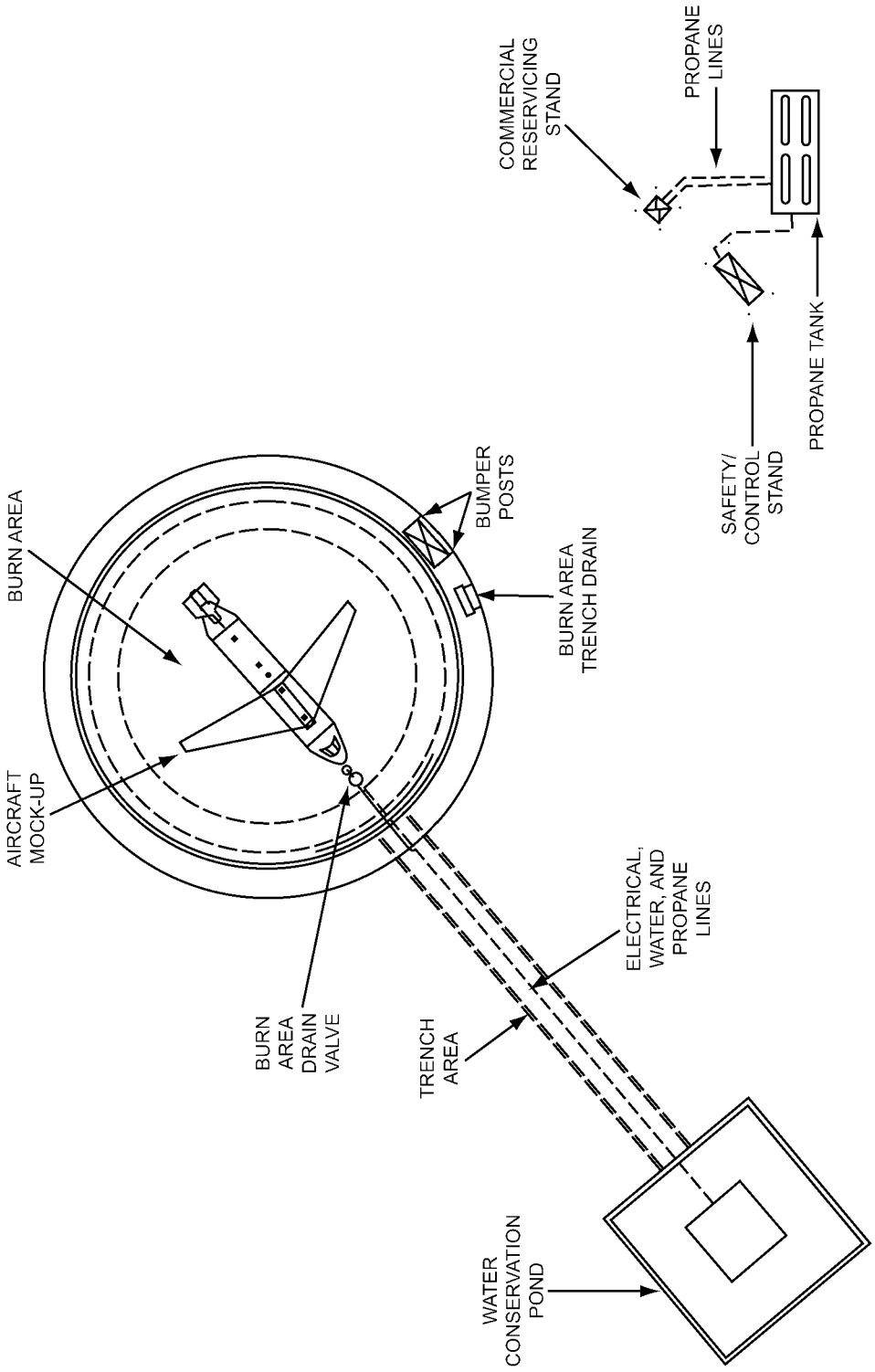

Figure 87. Youngstown AFRB Youngstown, Ohio

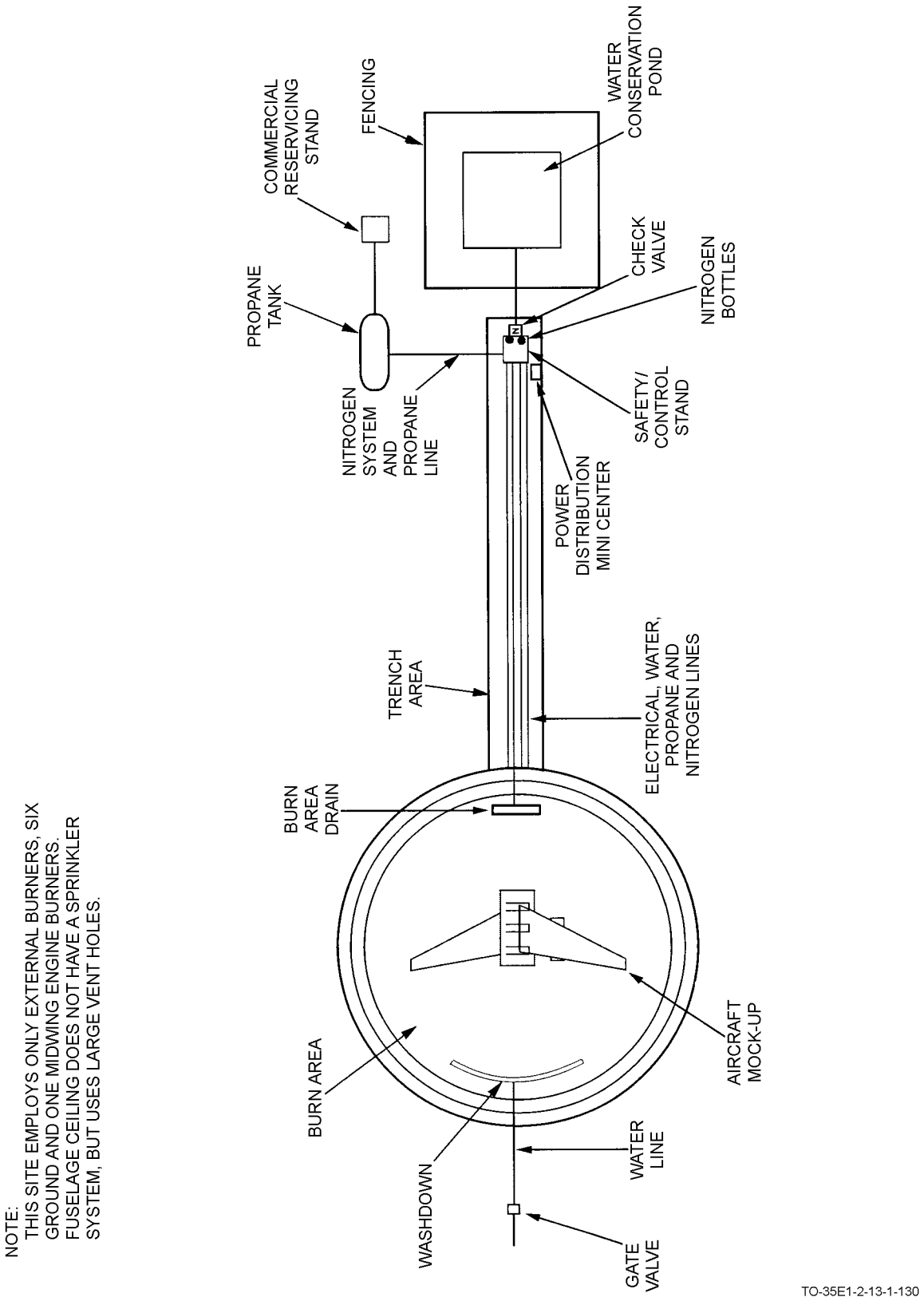

Figure 88. Ft. Bliss USA El Paso, Texas

WORK PACKAGE

TECHNICAL PROCEDURES

GOODFELLOW AFB TEXAS OPERATING PROCEDURES

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE WP PAGES

Total Number of Pages in this WP is 10 consisting of the following:

* Zero in this column indicates an original page.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
1 - 3	1	5 - 6	1		
4	0	7 - 10	0		

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

REFERENCE MATERIAL REQUIRED

Publication Number	Publication Title
WP 004 00	(Paragraph 7-Paragraph 8) Emergency Procedures
WP 007 00	General Maintenance

APPLICABLE TCTOs
NONE

CONSUMABLE MATERIALS
NONE

APPLICABLE SUPPORT EQUIPMENT
NONE

1 FOREWORD.

This work package contains setup and operating procedures for the Aircraft Fire Training Facility (AFTF). These procedures include pre-exercise inspection, pre-exercise setup, training exercise, and system shutdown and clean up.

2 SAFETY SUMMARY.

Various steps in this work package may require personnel to be exposed to extremely high temperatures, open flames, liquid propane vapor and fumes, and hot surfaces. It is imperative to wear appropriate protective clothing and to be aware of the EMERGENCY PROCEDURES in Work Package 004 00, Paragraph 7 and Paragraph 8. High voltage will be present at burn area ignitors. All personnel shall remain clear of ignitors while in use. Failure to comply may cause serious injury. Use of Self Contained Breathing Apparatus (SCBA) is required for all fires. Exposed skin areas may result in burns by heat/steam.

3 RESPONSIBILITIES.

3.1 Ignition Team. Shall be responsible for performing the pre-exercise inspection and setup.

3.2 Training Instructor in Charge. Training Instructor responsibilities include:

a. Shall have sole responsibility for the training exercise, to include all students, instructors and equipment.

b. Shall have dedicated radio communications with the Safety Officer and Ignition Team.

c. Shall pre-brief, assign personnel duties, initiate, oversee, evaluate, terminate, and de-brief the training exercise.

3.3 Safety Officer. Safety Officer responsibilities include:

a. Shall make sure the control tower has been properly configured for emergency shutdown and normal operation.

b. Shall make sure the Ignition Team has properly configured the control stand, for emergency shutdown and normal operation.

c. Shall report to the training officer in charge that the training exercise may commence.

d. Shall monitor the training evolution.

4 PRE-EXERCISE INSPECTION/SETUP.

WARNING

If an obvious unsafe or unserviceable condition is noted, halt operations and rectify condition prior to proceeding. Failure to halt and correct conditions may cause injury or death to personnel.

CAUTION

- The entire training facility is a no smoking area.
- Make sure propane tank level is sufficient for scheduled training exercise. Use adjacent small tank or reservice as required.

NOTE

- Make sure all personnel are clear of mock-up and burn area.
- This facility operates under warm weather operational guidelines year round.

Pre-exercise inspection/setup shall be performed by the following authorized personnel immediately prior to commencement of training exercise: Training Instructor in Charge, Safety Officer, and Ignition Team.

a. In the control tower second floor, make sure all circuit breakers are in the on position, and visually inspect the air compressor and filter/dryer for excess corrosion, wear, and serviceability.

b. In the control tower third floor, pull OUT the propane tank emergency shutoff and control panels emergency electrical shutoff buttons.

c. Insert keys into selected mock-up control panel master switches and activate. If jet fuel will be used in the helicopter and/or the LFA, insert the JP-8 key(s) into the control panel master switches and activate. Pull OPEN the emergency shutdown control button on the control stand.

d. Push the JP-8 master electrical switch located on the third floor wall when JP-8 is required for training.

e. Inspect the propane storage tanks, associated gauges, piping and valves for excessive corrosion or obvious damage.

WARNING

Gloves and face shield shall be worn during Roto Gauge operation.

f. Take tank level reading. Accurate tank level readings can be obtained using the tank Roto Gauge. To read the gauge:

(1) Rotate the lever to the 12 o'clock position.

(2) Open the petcock valve on the end of the gauge, cold propane vapor will escape.

(3) Turn the lever to the left or right slowly until liquid propane escapes through the open petcock. The corresponding reading on the gauge under the lever is the percentage of LPG in the storage tank.

(4) Close the petcock valve.

(5) Return the lever to the 12 o'clock position.

g. Open selected propane storage tank manual liquid supply valve. Open valve (1A) if utilizing tank A, or (1B) if utilizing tank B.

h. Open selected propane storage tank manual vapor return valve. Open valve (2A) if utilizing tank A, or (2B) if utilizing tank B.

i. Make sure valves 3, 4, 5, and 6 are in the open position on the associated piping.

j. If jet fuel fires are planned during training, visually make sure the JP-8 master power switch located near the JP-8 storage tank is on.

k. Make sure the JP-8 Outside Screw and Yoke (OS&Y) supply valve, located near the storage tank, is open (approximately 2 inches of threads showing above handle).

l. Inspect the JP-8 storage tank, associated gauges, piping and valves for excessive corrosion or obvious damage.

m. Inspect the control stand/mock-up to include electrical and mechanical components, piping, valves, regulators, and pneumatic system.

n. Inspect burn area. Make sure rock is level and that when flooded, water covers entire pit from side to side without covering ground ignitors.

o. Make sure that rock level is 1/2 inch to 1 inch below top of burn area drain and level throughout the pit.

p. Make sure burn area drain valve inside weir is closed and weir drain valve outside of weir is open.

q. Inspect exterior and interior burners and ignitors and make sure that burner grates are not excessively corroded and ignitor protectors are in place.

r. Inspect mock-up for excessive corrosion. Inspect all doors for freedom of operation and excessive corrosion.

s. Inspect fuel, water piping and water jackets for excessive corrosion.

t. Inspect exterior lighting for proper operation, if applicable.

u. Open water jacket(s) manual control valve on the control stand. Make sure water continuously flows to all water jackets on the mock-up.

v. Make sure pneumatic system vent valve next to cylinder(s) and the 2 in-line valves above cylinder(s) are closed. Open (counter clockwise) pneumatic system valve on top of pneumatic system cylinder. A minimum of 500 psi is required in the cylinders to ensure emergency shutdown and pneumatic system valves work properly.

w. Turn on washout system timer switch and bring water level to top of weir drain. Select desired time as required. Turn washout off when water level begins to flow into weir drain.

x. Perform operational check on all ignitors by activating the appropriate ignitor switch.

y. Repeat procedure by slowly opening corresponding manual propane valve until fully open. If flame height is inadequate for training purposes due to low temperatures, turn the LPG transfer pump master switch on and position the transfer pump control switch to the automatic position. Close valve 3. Close manual propane valve and repeat for all burners to be utilized.

5 TRAINING EXERCISE.

WARNING

- Extremely high temperatures and hot surfaces will be encountered during training exercise. It is imperative to wear appropriate protective clothing and to locate and be familiar with the Emergency Procedures in Work Package 004 00, Paragraph 7 and Paragraph 8. Failure to comply may cause serious injury or death to personnel. SCBA shall be utilized for all exercises.

- While attempting to ignite fires, if flames are not present within a reasonable amount of time (15 seconds), close burner valve(s) and allow area to vent before attempting reignition. Failure to comply could pose a serious risk of explosive gas build up.

- The following are considered abnormal conditions and/or emergency situations requiring activation of the system E-Stop switch for emergency shutdown anytime a firefighter: appears to have blown out or extinguished the fire; fails to follow any direction of the Instructor-in-Charge or the Safety Officer; falls down inside the AFTF; or enters inside the AFTF standing completely upright with fire operating.

- Since the fires are intended to simulate a solid object fire event, the following actions are inappropriate and constitute an emergency condition requiring activation of the system E-Stop switch for emergency shutdown anytime the nozzle or any firefighter including his PPE: breaks the vertical plane of the cargo box; breaks the plane of the control surfaces in the cockpit; breaks the plane of any passenger fire burner shield or the area above the burner itself; breaks either end plane of an engine; enters the area under the cockpit stairs; enters the area under the passenger seats or breaks the plane of the front surface of the passenger seat backs; enters an area above an operating burner; or enters the area directly below the APU or Wheel fire when the burner is operating.

The Training Instructor in Charge shall confirm all Pre-Exercise Inspection and Set Up procedures have been completed by the Ignition Team and Safety Officer.

a. Open the control stand manual shut off propane valve.

b. Ignite selected burners by activating the appropriate ignitor switch and slowly opening the corresponding manual propane valve until fully open. Repeat step until all required burners are ignited.

c. For running fuel fires, open the JP-8 supply ball valve on the ground control stand.

d. Set the fuel meter by pushing the set button until it latches.

e. Set the gallon amount for dispensing (gallons and tenths).

f. Cock the meter valve handle.

g. Select the desired engine and open the appropriate ball valve.

h. Ignite the selected engine using LP procedures in step b of this section.

i. Activate the JP-8 solenoid (white) dispense button. Once the jet fuel is ignited, shutdown the propane burner in accordance with normal procedures. Repeat as desired.

j. Once the fuel meter flow has stopped, deactivate the JP-8 solenoid by pressing the white button.

5.1 Exercise Shutdown Procedures. Exercise Shutdown Procedures are as follows:

a. Close manual propane valve(s) on control stand.

b. Turn the ignitor switches off.

c. If jet fuel burning is complete, close the JP-8 supply valve and the engine supply valve.

d. Shut off the JP-8 transfer pump switch located in the control tower.

6 SYSTEM SHUTDOWN AND CLEAN UP.

When training on a specific mock-up is complete, the Training Instructor in Charge shall direct the Ignition Team to:

a. Close the control stand master propane valve. Flare off all gas in the propane manifold by activating the corresponding ignitor while opening a manual propane valve.

b. Once fire has burned out, make sure all manual propane valves on the LPG distribution rack are closed.

c. Position all ignitor control switches to OFF.

d. Position emergency shutdown switch on control stand to OFF.

e. Make sure water jacket control valve remains open while mock-up cools (approximately one hour).

f. Close pneumatic system cylinder valve. Close the second in-line valve above the cylinder(s). Open drain valve next to cylinder(s). When pressure is relieved, close drain valve and first in-line valve.

g. In control tower third floor, turn off master switch key for the appropriate mock-up and push emergency shutdown button on control panel. If JP-8 was utilized, turn off the JP-8 master switch key for the appropriate mock-up and turn off the JP-8 master electrical switch (push button located on the north east interior wall).

h. Activate washout system control valve in control tower to flush burn area. Set washout timer for a minimum of one hour.

NOTE

At end of training day the Ignition Team will perform steps i through m.

i. Push (IN) master electrical switch for JP-8 to CLOSED.

j. Push (IN) propane tank emergency shutoff and control panel emergency electrical shutoff buttons.

k. Close selected propane storage tank manual liquid supply valve. Close valve (1A) if utilizing tank A, or (1B) if utilizing tank B.

l. Close selected propane storage tank manual vapor return valve. Close valve (2A) if utilizing tank A, or (2B) if utilizing tank B.

m. Turn off master switch keys for all mock-up control panels.

7 THEORY OF OPERATION - GOODFELLOW AFB, TX.

This theory of operation is based on a site specific design for Goodfellow AFB LPG (Liquid Propane Gas) Aircraft Fire Training Facility (AFTF). The AFTF consists of five (5) fire training mock-ups, individual burn areas and ground control stands, a master control tower, liquid propane gas and JP-8 fuel supply systems, cathodic protection and a self-contained water supply system. General maintenance procedures are described in WP 007 00.

7.1 Large Frame Aircraft Mock-up. The Large Frame Aircraft (LFA) mock-up is constructed of uncoated/unpainted carbon steel. It is approximately 72 feet long, 25 feet high at the tip of the tail and has a wing span of 75 feet. The burn area is 150 feet in diameter. The mock-up has fifteen burners with dedicated ignitors. There are six ground burners surrounding the mock-up to simulate exterior ground fires. The burners are located on the left and right sides of the front fuselage, between the right wing engines, under the left wing, and the left and right rear fuselage. The mock-up is configured with three simulated aircraft engines, two on the right wing and one on the vertical stabilizer on the tail. Each engine contains one burner assembly with two ignitors. Water sprinklers and water dams are installed in the wing engines. Three dimensional running fuel fires can be created by injecting JP-8 into the water flowing over the water dams which in turn allows JP-8 to flow on to the ground surrounding the engines. Wheel-well and auxiliary power unit fires are simulated on the right side of the fuselage adjacent to the inboard engine. In the interior of the mock-up, ignitors and burners are installed to simulate flight deck, battery box, passenger compartment and cargo bay fires. A water sprinkler system is installed along the top of the interior to cool and washout the mock-up after training is complete. Replaceable sheet metal cut out panels are located on the left side of the mock-up. The panels are used to simulate emergency entrance into aircraft. Two hinged doors are located on the left side and one on the right side of the mock-up.

7.2 Fighter, Helicopter, Tanker and Automobile Mock-up. The Fighter, Helicopter, Tanker, and Automobile mock-ups are all constructed of uncoated/unpainted carbon steel.

7.2.1 The Fighter mock-up has six ground and one engine burner. Two are located forward of the left wing, two forward of the right wing, one left and one right on the rear of the mock-up. The engine burner is accessible from the rear of the mock-up. The burn area is 75 feet in diameter.

7.2.2 The Helicopter mock-up has four ground burners. They are located front right and left and rear right and left of the fuselage. The mock-up's interior burners simulate an under dash battery fire and a rear wall cockpit fire. An additional burner is located in the engine stack and has both LPG and JP-8 fire capabilities. The burn area is 50 feet in diameter.

7.2.3 The Tanker has two ground burners, one at the rear and one under the center. There are two burners located in the open tank accessible from the top of the mock-up, one in the dome tank and one on the left side piping assembly. The burn area is 75 feet in diameter.

7.2.4 The Automobile mock-up has one ground burner on the rear of the vehicle. There are additional burners located in the engine compartment, passenger compartment and in the trunk. The burn area is 30 feet in diameter.

7.3 Water Jackets. Water jackets are installed on all ignitor units on all mock-ups with the exception of the ground burners. The water jackets cool and protect ignitor wiring assemblies. Each burner is equipped with an emergency shutdown system. Any combination of burners may be utilized thus creating unlimited training scenarios.

7.4 Burn Areas. The burn areas are recessed and lined with an 80 mil thick high density polyethylene (HDPE) liner. The liner is back filled with a 6 inch layer of sand and then covered by 18 inches of 1 to 2 inch crushed aggregate. The burn area washout piping allows for water induction into the burn area and for washout upon completion of training. The burn area weir drain allows water to return to the water recover and distribution system and for winterizing the facility if required. Water leaving the burn area is recycled through a fuel/oil separator prior to recovery in the system water storage and distribution system.

7.5 Ground Control Stand. A ground control stand is provided for operation of the mock-up. Located on the control stand are various valves, regulators, solenoids and switches used to control LPG/JP-8 flow, ignition, emergency shut down, and extinguishment during training evolutions. A control panel displays all burner locations and corresponding ignition switches. An emergency shut down control button located on the control panel will turn off power to all ignitors and close burner propane supply valves at the mock-up. The LPG/JP-8, water piping, pneumatic system tubing, and electrical conduit from the control stand to the burn area are located in an underground HDPE lined trench. Fire size can be adjusted at individual regulators for all mock-up burners. The LFA's six ground burners **do not** have regulators.

7.6 LPG Fuel System. An LPG fuel system supplies fuel for training fires. LPG is stored in two independently operated tanks. Tank A has a capacity of 30,000 water gallons and tank B has a capacity of 10,000 water gallons. LPG is distributed to each ground control stand and burn area through a series of piping and valves. LPG is directed from the control stand to selected burners by individual manual control valves. Emergency shut down safety features are incorporated at the ground control stand and the control tower for shutting off LPG flow and for shutting off electrical power. Cathodic protection is installed to protect below ground piping from corrosion through sacrificial anodes. Propane expands 1.5% for each 10 degrees of increased temperature. As the temperature rises, the vapor pressure within the tank also rises accordingly. Propane has an octane rating of 125. It is recommended to reservice the tank(s) when 15% to 20% of capacity remains. Commercial vendors will reservice the tanks. The tank shall only be reserviced to 85% of capacity. LPG has a boiling point of minus 44 degrees Fahrenheit and flammability limits between vapor and liquid are minute. A LPG pump is available at the storage tanks for use in cold weather should tank pressure be inadequate for transferring LPG to the burn areas.

7.7 JP-8. JP-8 fuel can be used alone or combined with LPG on the LFA right wing engine burners and on the helicopter stack burner. JP-8 is stored in a 5000 water gallon tank adjacent to the LPG storage tanks. JP-8 is distributed to the burners under the same operating principle as LPG. Once JP-8 has been distributed into the burners/ground area, the fuel will burn until extinguished and cannot be terminated by emergency shutdown procedures.

7.8 Safety Control Tower. A safety control tower located in the center of the training complex allows visual and audible communications with all 5 training mock-ups. The master switch for each mock-up control stand is activated on the corresponding tower control panel. JP-8, propane tank emergency shut off, and the control panels emergency electrical shut off buttons are located on the third floor of the tower. An air compressor housed on the second floor of the tower provides air pressure for opening the LPG storage tank(s) emergency shut off valves. The safety control tower also houses various circuit breakers for the entire complex.

7.9 Water System. The water system is composed of a closed loop non potable distribution system. Water discharged into the burn area(s) is recycled through a fuel/oil separator and into a 500,000 gallon water storage tank. Three in-line pumps draw water from the storage tank into a 10,000 gallon distribution tank and fire hydrant system.

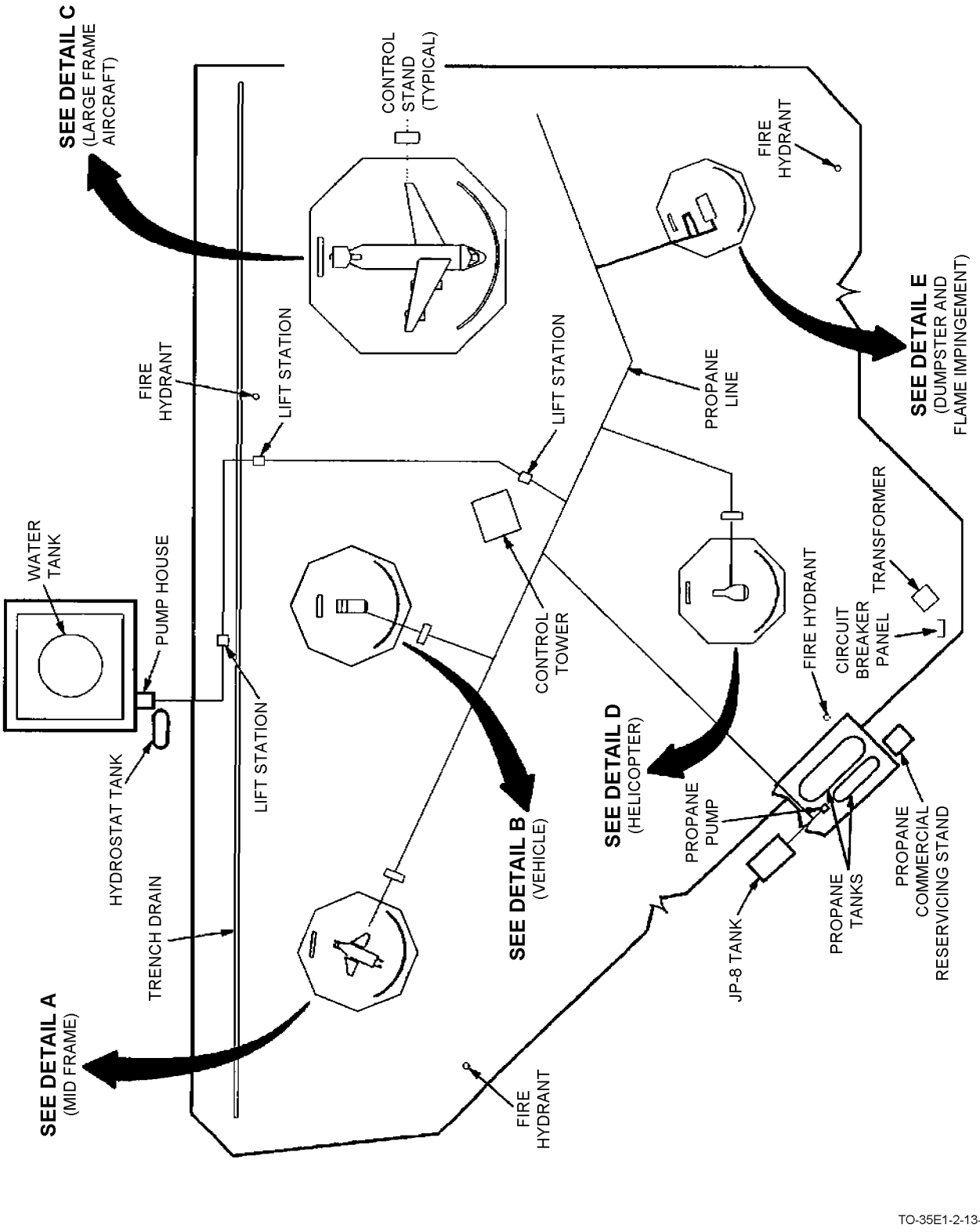

Figure 1. Goodfellow AFB San Angelo, Texas (Sheet 1 of 4)

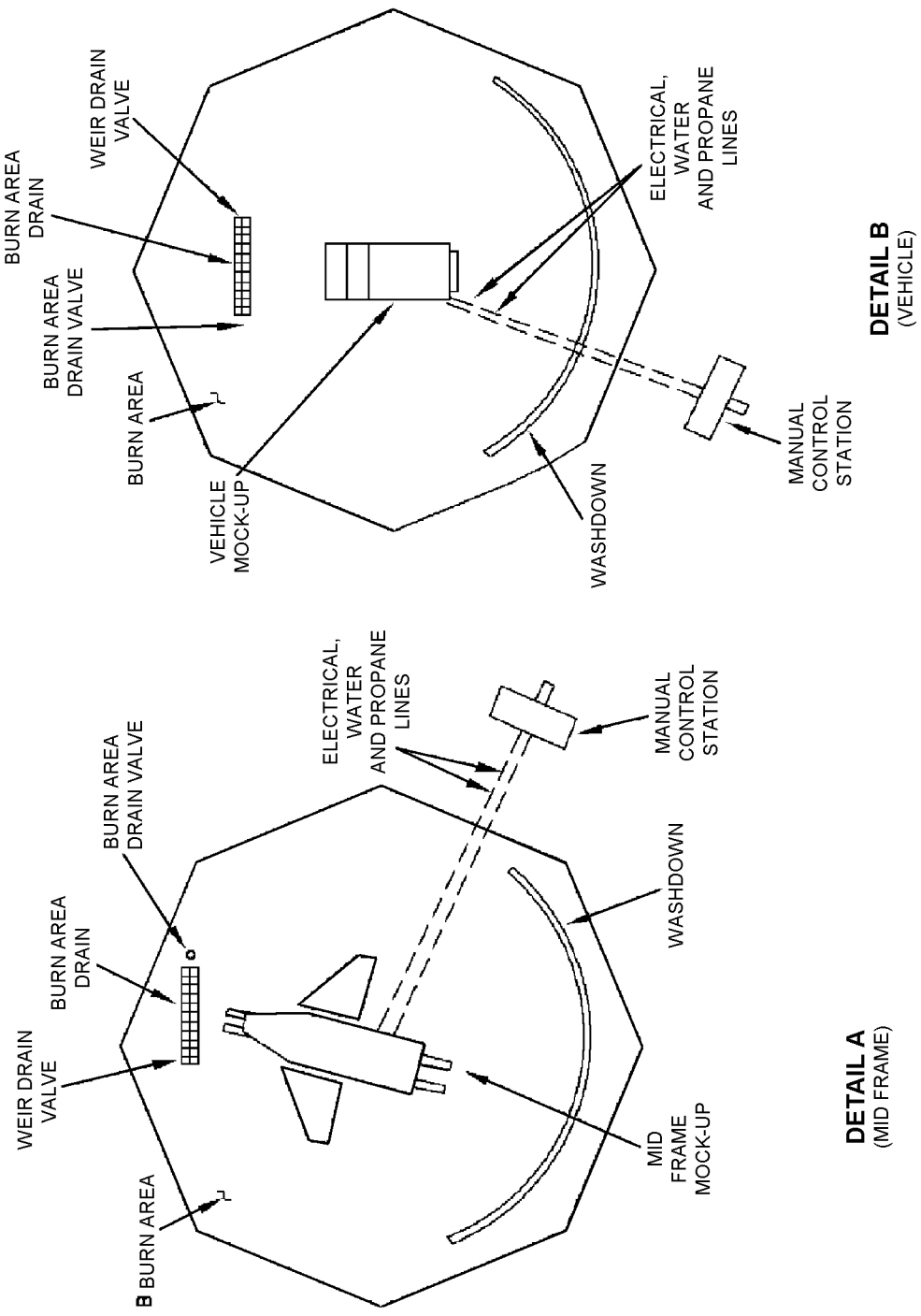

Figure 1. Goodfellow AFB San Angelo, Texas (Sheet 2)

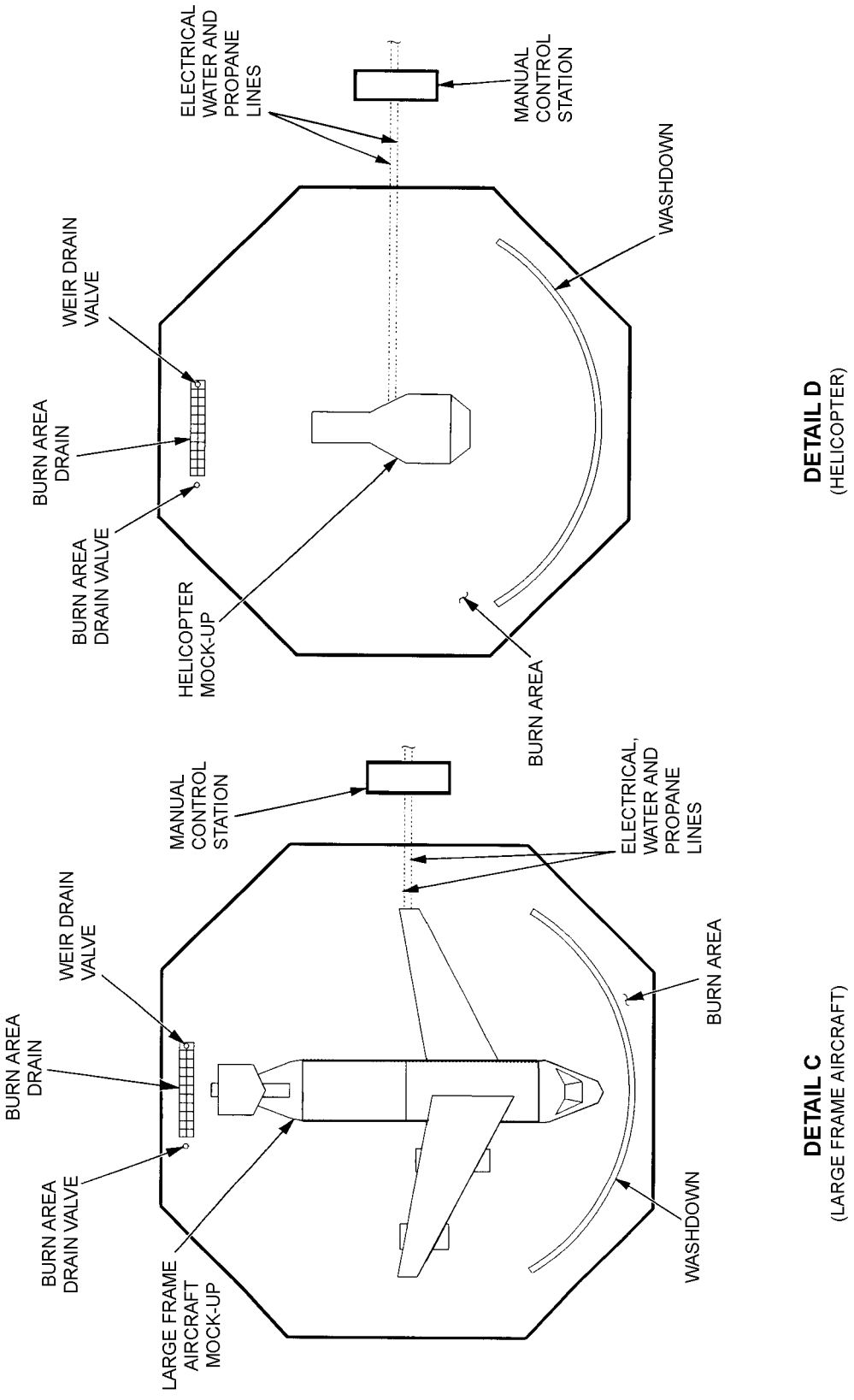

Figure 1. Goodfellow AFB San Angelo, Texas (Sheet 3)

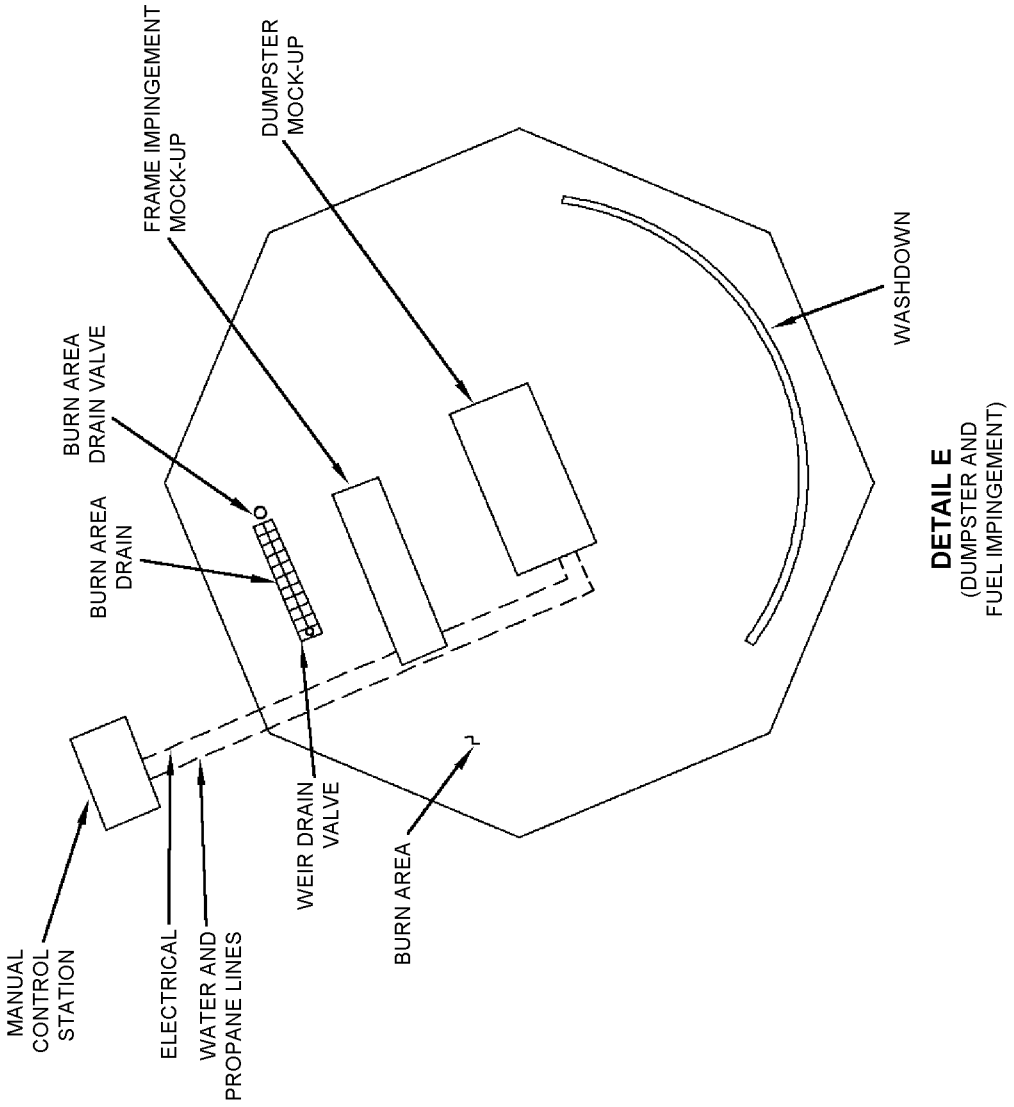

Figure 1. Goodfellow AFB San Angelo, Texas (Sheet 4)

WORK PACKAGE

TECHNICAL PROCEDURES

OPERATION AND MAINTENANCE INSTRUCTIONS
THULE AB GREENLAND OPERATING PROCEDURES

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE WP PAGES

Total Number of Pages in this WP is 10 consisting of the following:

* Zero in this column indicates an original page.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
1 - 9	0	10 Blank	0		

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LIST OF ILLUSTRATIONS

REFERENCE MATERIAL REQUIRED

Publication Number	Publication Title
WP 004 00	(Paragraph 7-Paragraph 8) Emergency Procedures
WP 007 00	General Maintenance

APPLICABLE TCTOs
NONE

CONSUMABLE MATERIALS
NONE

APPLICABLE SUPPORT EQUIPMENT
NONE

1 FOREWORD.

This work package contains setup and operating procedures for the Aircraft Fire Training Facility (AFTF) that uses JP-8 fuel. These procedures include establishing water levels, dispensing fuels into the burn pit, igniting the fuel, flushing out the burn area and separator, skimming of unburned fuel and the reburn tank. Also explained, the facility shutdown and the reservicing of the fire vehicles from the effluent holding pond.

2 SAFETY SUMMARY.

Various steps in this work package may require personnel to be exposed to extremely high temperatures, open flames, JP-8 vapor and fumes, and hot surfaces. It is imperative to wear appropriate protective clothing and to be aware of the EMERGENCY PROCEDURES in Work Package 004 00, Paragraph 7 and Paragraph 8. High voltage will be present at burn area igniters. All personnel shall remain clear of ignitors while in use. Failure to comply may cause serious injury. Use of Self Contained Breathing Apparatus (SCBA) is required for all fires. Exposed skin areas may result in burns by heat/steam.

3 GENERAL.

The Thule AB facility is the only AFTF based on the standardized Air Force design using JP-type fuel as a fire source. The fire events provided are the same as the propane fuel system except atomized JP-8 is used as the fuel source.

NOTE

The Thule AB facility is a warm weather operation only. The facility cannot be used for fire training while winterized.

4 RESPONSIBILITIES.

4.1 Ignition Team. Shall be responsible for performing the pre-exercise inspection and setup.

4.2 Training Instructor in Charge. Training Instructor responsibilities include:

a. Shall have sole responsibility for the training exercise, to include all students, instructors and equipment.

b. Shall have dedicated radio communications with the Safety Officer and Ignition Team.

c. Shall pre-brief, assign personnel duties, initiate, oversee, evaluate, terminate, and de-brief the training exercise.

4.3 Safety Officer. Safety Officer responsibilities include:

a. Shall make sure the control tower has been properly configured for emergency shutdown and normal operation.

b. Shall make sure the Ignition Team has properly configured the control stand, for emergency shutdown and normal operation.

c. Shall report to the training officer in charge that the training exercise may commence.

d. Shall monitor the training evolution.

5 PRE-EXERCISE INSPECTION.

WARNING

If an obvious unsafe or unserviceable condition is noted, halt operations and rectify condition prior to proceeding. Failure to halt and correct conditions may cause injury or death to personnel.

CAUTION

The entire training facility is a no smoking area.

NOTE

- Check JP-8 tank level is sufficient for scheduled training exercise. Do not begin training exercise if level is below 300 gallons. Reservice tank, as required. Do not use contaminated fuel.
- Expansion joint bolts on mock-up are to remain finger tight.

Pre-exercise procedures shall be performed by authorized personnel immediately prior to commencement of training exercise.

a. Inspect burn area.

(1) Make sure rock is level and when flooded, water covers the area from side to side without covering ground igniters.

(2) Inspect exterior burners and igniters, and make sure that burner grates are not excessively corroded and igniter protectors are in place.

(3) Inspect aircraft mock-up for excessive corrosion.

(4) Inspect mock-up doors for freedom of operation and excessive corrosion.

(5) Inspect fuel piping for excessive corrosion.

NOTE

Ground burners will not be used during cold weather operations. They are expected to be under ice and not operational.

b. Inspect driving area around burn area for ruts. Level all ruts before proceeding. Failure to do so could upset Aircraft Rescue Fire Fighting vehicles (ARFF).

c. Inspect exterior lighting for proper operation, if applicable.

d. Inspect JP-8 system to include tank, gauges, valves, piping, or manual safety system, and regulators for excessive corrosion, wear, a serviceability. Repair leaks before proceeding with any training exercise.

e. Inspect control stand and fuel valve bank to include electrical and mechanical components, piping, valves, and regulators. Check fuel valve indicators are not lit. Check for excessive corrosion, wear, or serviceability.

f. On electrical service rack, make sure all DISCONNECT switches are ON.

g. Inspect Air Systems gauge(s), valve(s), and line(s) for serviceability in accordance with manufacturer's specifications.

6 PRE-EXERCISE SETUP.

CAUTION

The entire training facility is a no smoking area.

NOTE

Make sure all personnel are internally and externally clear of mock-up and burn area.

These procedures shall be performed by the following authorized personnel immediately prior to commencement of training exercise: Training Instructor in Charge, Safety Officer, Ignition Officer, and Fuel Control Officer. Dedicated radio communication shall be established by: Training Instructor in Charge, Safety Officer, Ignition Officer, and Fuel Control Officer.

a. Press START on compressor control panel to turn on Air System compressor and let it come up to operating pressure, (90 psi +).

b. Completely open air valve to burn area. (After punch list is complete.)

NOTE

Air will not be flowing to ground ignitors.

c. Verify air is flowing to all ignition heads.

d. Verify valve from surge tank to burn area is open.

e. Verify valves from wash-down and sprinkler lines are closed.

f. Verify valves from surge tank to SURGE WATER pump P-6 is open.

g. Verify valves from separator to water storage tank are open.

h. Verify that between 10,000 to 12,000 gallons is in water storage tank.

i. Verify valve from water storage tank to burn area is open.

j. Position SEPARATOR WATER pump P-4 and SURGE WATER pump P-6 MODE SELECTOR switches to AUTO.

k. Position WASH-DOWN AND SPRINKLER pump P-5 PUMP SPEED switch to LOW.

l. Allow pumps P-4 and P-6 to operate until they reach their low level cutoff. The liquid level in the third stage of the oil/water separator should be just above inlet holes from stage two.

m. Press WASH-DOWN AND SPRINKLER pump P-5 START switch and fill the burn area until water begins to flow into weir drain box. Press WASH-DOWN AND SPRINKLER pump P-5 STOP switch.

n. Position IGNITION MASTER switches to ON.

NOTE

The HIGHTAIL engine ignitors cannot be readily verified from ground level.

o. Press each ignitor switch and visually verify corresponding ignitor in burn area is working.

p. Position IGNITION MASTER switches to OFF.

q. Check the fuel level in the JP-8 storage tank, a minimum of 300 gallons are required to conduct a fire exercise.

r. Reset the FUEL METER counter to 00000 (zero).

s. Make sure both fuel valves are open.

t. Position FUEL PUMP P-1 MODE SELECTOR switch (at base of tower) to HAND.

7 TRAINING EXERCISE.

WARNING

- Extremely high temperatures and hot surfaces will be encountered during the training exercise. It is imperative to wear appropriate protective clothing and to locate and be familiar with the Emergency Procedures in Work Package 004 00, Paragraph 7 and Paragraph 8. Failure to comply may cause serious injury or death to personnel. SCBA shall be utilized for all internal exercises.

- The following are considered abnormal conditions and/or emergency situations requiring activation of the system E-Stop switch for emergency shutdown anytime a firefighter: appears to have blown out or extinguished the fire; fails to follow any direction of the Instructor-in-Charge or the Safety Officer; falls down inside the AFTF; or enters inside the AFTF standing completely upright with fire operating.

- Since the fires are intended to simulate a solid object fire event, the following actions are inappropriate and constitute an emergency condition requiring activation of the system E-Stop switch for emergency shutdown anytime the nozzle or any firefighter including his PPE: breaks the vertical plane of the cargo box; breaks the plane of the control surfaces in the cockpit; breaks the plane of any passenger fire burner shield or the area above the burner itself; breaks either end plane of an engine; enters the area under the cockpit stairs; enters the area under the passenger seats or breaks the plane of the front surface of the passenger seat backs; enters an area above an operating burner; or enters the area directly below the APU or Wheel fire when the burner is operating.

NOTE

- While attempting to ignite fires, if flames are not present within a reasonable amount of time (15 seconds), close fuel valve(s).

- The Training Instructor in Charge shall be in control of the training exercise. Dedicated radio communication shall be established between Ignition Officer, Training Instructor in Charge, Safety Officer, and Fuel Control Officer.

- The Training Instructor in Charge initiates, oversees and terminates the training exercise.

- Actual exercise burn time will be determined by the Training Instructor in Charge. After manual control valves are closed fire will continue to burn.

a. Position IGNITOR MASTER switches to ON.

b. Press FUEL pump P-1 START switch.

7.1 Air Frame and Hightail Fire. Frame and Hightail fire training exercises are as follows:

CAUTION

If any fire is extinguished by firefighting operations, immediately close the associated manual fuel valve.

a. At the prompt of the training Instructor in Charge, ignite the appropriate burners by depressing and holding the appropriate ignitor switch and slowly opening the corresponding manual fuel valve until flame is present. Repeat step until all required burners are ignited.

b. Once training objectives have been achieved, close manual fuel valve(s) on Fuel Valve Bank.

7.2 Inboard and Outboard Engine Fires. Inboard and Outboard Engine fires training exercises are as follows:

a. At the prompt of the training Instructor in Charge, ignite the appropriate burners by depressing and holding the appropriate ignitor switch and slowly opening the corresponding manual fuel valve until flame is present.

b. If desired, open RUNNING FUEL FIRE valves for appropriate engines.

c. Once training objectives have been achieved, close manual fuel valve(s) on Fuel Valve Bank.

7.3 Ground Fires. Ground Fires training exercises are as follows:

a. Open manual valves A, B, C, and D (Ground Fire Fuel valves) on Fuel Valve Bank.

b. At the prompt of the training Instructor in Charge, open the appropriate Ground Spill valve(s) not exceeding 300 gallons of fuel in the burn area.

c. At the prompt of the training Instructor in Charge, ignite the appropriate burners by depressing and holding the appropriate ignitor switch(s) until it is obvious that the spilled fuel is ignited.

d. Close manual valves A, B, C, and D (Ground Fire Fuel valves) on Fuel Valve Bank.

8 SYSTEM SHUTDOWN AND CLEANUP.

a. Position IGNITION MASTER switches to OFF.

b. Press FUEL pump P-1 STOP switch and set FUEL PUMP P-1 MODE SELECTOR switch to OFF.

c. Check that all valves on Fuel Valve Bank are closed.

CAUTION

Failure to operate Air System and wash-down system for at least one hour after last training event may result in severe damage to the training device, especially the ignition system.

d. Press WASH-DOWN AND SPRINKLER WATER pump P-5 START switch and run for five minutes, then press P-5 STOP switch. Set WASH-DOWN AND SPRINKLER pump P-5 MODE SELECTOR switch to LOW and run for one hour or until all fuel is washed from burn area, whichever is longer.

e. One hour after last training event, press AIR COMPRESSOR STOP switch.

f. Record the number of gallons of fuel used from the resettable counter and the fixed counter fuel meter reading on the Fire Exercise Check Sheet. These readings are on the fuel meter at the JP-8 fuel storage area.

g. Position SEPARATOR WATER pump P-4 and SURGE WATER pump P-6 MODE SELECTOR switches to AUTO.

9 FIRE VEHICLE RESERVICING FROM THE WATER STORAGE TANK.

NOTE

Utilizing the water from the water storage tank to refill truck reduces the amount of new water added to the system, therefore, reducing the total amount of effluent produced.

a. Verify there is sufficient water in the water storage tank (a minimum of 13,000 gallons) to fill the fire truck.

b. Connect a 2-1/2 inch (or larger) hose from the fire department connection.

c. Close the Outside Screw and Yoke (OS&Y) valve downstream of WASH-DOWN AND SPRINKLER pump P-5.

d. Position pump WASH-DOWN AND SPRINKLER P-5 MODE SELECTOR switch to LOW and Press WASH-DOWN AND SPRINKLER pump P-5 START switch and fill the fire truck.

e. Press WASH-DOWN AND SPRINKLER pump P-5 STOP switch when the fire truck is filled.

f. Open the OS&Y valve downstream of WASH-DOWN AND SPRINKLER pump P-5.

g. Disconnect the 2-1/2 inch hose from the fire department connection outlet and reinstall the protective cap to the outlet.

10 THEORY OF OPERATION.

This theory of operation is based on the generic design. The Aircraft Fire Training Facility (AFTF) consists of an aircraft mock-up, burn area, control stand, liquid jet fuel system, cathodic protection system and water conservation system. Refer to Figure 1 and Figure 2 for specific site configurations in this WP. General maintenance procedures are described in WP 007 00. The aircraft mock-up, located in the burn area, is constructed of uncoated/unpainted carbon steel. It is approximately 72 feet long, 25 feet high at tip of tail, with a wingspan of 72 feet. The mock-up is configured with three simulated aircraft engines, two on the high wing and one located on the vertical stabilizer. Each engine contains a burner assembly and two ignitors. The wiring to all mockup ignitors is enclosed in air jackets to protect from extreme heat generated by ground burner fires. The wing engines have plumbing installed to simulate running fuel fires. Wheel well and auxiliary power unit fires are simulated on the high wing side of the fuselage adjacent to the inboard engine. In the interior of the mock-up, ignitors and burners are installed to simulate flight deck, battery box, passenger compartment, and cargo fires. A water sprinkler system is installed along the top of the fuselage to cool and washout the mock-up. An expansion joint is located midway on the fuselage to allow for expansion and contraction during training. Cutout panels are located on the left and right sides of the fuselage. These replaceable panels are constructed of 0.031 inch sheet metal. The panels are used to simulate emergency entrance into an aircraft. Two steel hinged doors are located at the left side of the fuselage. (See Figure 1 and Figure 2).

10.1 Burn Area. The burn area is 100 feet in diameter. It is recessed and lined with two 80-mil thick high-density polyethylene (HDPE) liner(s). The liner(s) is sandwiched between 6 inch thick layers of sand and covered by an 18 inch thick layer of 1-1/2 inch rock.

10.2 Atomized Jet Fuel. The system uses jet fuel pumped at a moderate pressure through atomizing nozzles across electric ignitors to create the mock-up fire events. (Atomizing the jet fuel creates an easily ignited mixture that ignites similar to propane.) Adjusting the appropriate control stand ball valve controls the fire size.

10.3 Ground Fires. For ground fires, the burn area is first flooded with water. A weir is used to maintain the proper water level in the burn area. Jet fuel is then pumped on to the surface of the water in the burn area. Depending on the section of the burn area where the wind pushes the jet fuel, the appropriate ignitor is activated and the associated jet fuel valve is opened to provide an ignition flame to the jet fuel floating on the water. Opening the burn area drain valve allows all the water in the burn area to drain to the water conservation system. Located on the control stand are the valves, regulators, solenoids, and switches used to control water, propane and ignitors during training events. Pushing the emergency shutdown switch IN will deactivate all ignitors and close all solenoid valves in jet fuel lines to burners. Jet fuel, water piping, and electrical conduits from the control stand to the burn area are located in an underground HDPE lined trench. Valves in jet fuel lines to mock-up burners are adjusted to increased or decreased for flame size.

10.4 Jet Fuel System. The jet fuel system supplies fuel for training exercises. Jet fuel is supplied from a 50,000 gallon tank to the various burners in the burn area through a series of pipes and valves. It is recommended to reservice the tank when 25% of its capacity remains.

10.5 Water Conservation System. The water conservation system is a three stage process. Water flows across the weir in the burn area, then by gravity drain into a holding/stabilizing tank where the water rests while the water and jet fuel come out of a mixed solution. The water is then pumped into a multistage oil-water separator and the remaining oil is pumped off for reuse/reburn. The water is then pumped into a heated 20,000 gallon storage tank for reuse in the burn area.

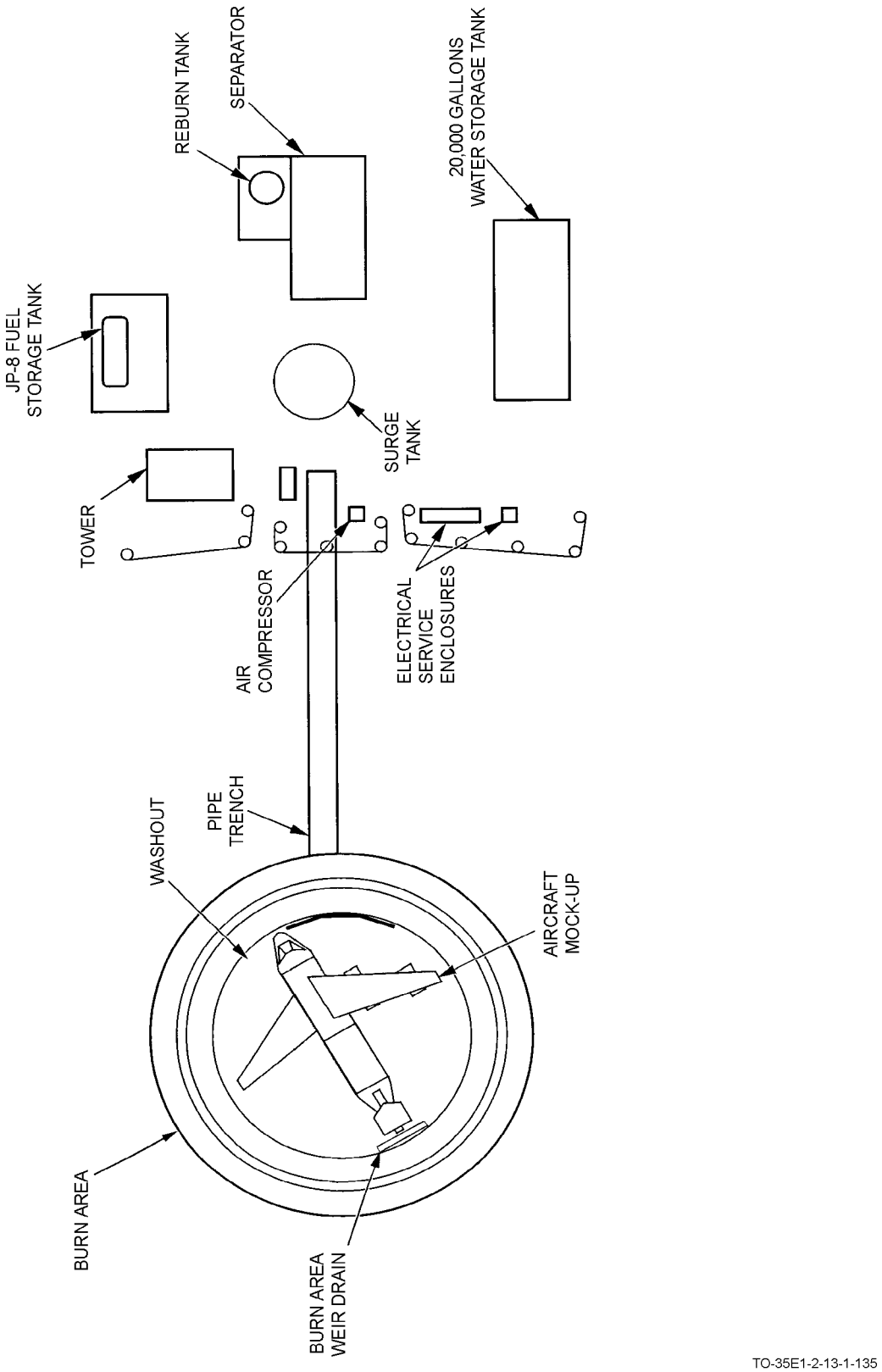

Figure 1. Thule AB Greenland

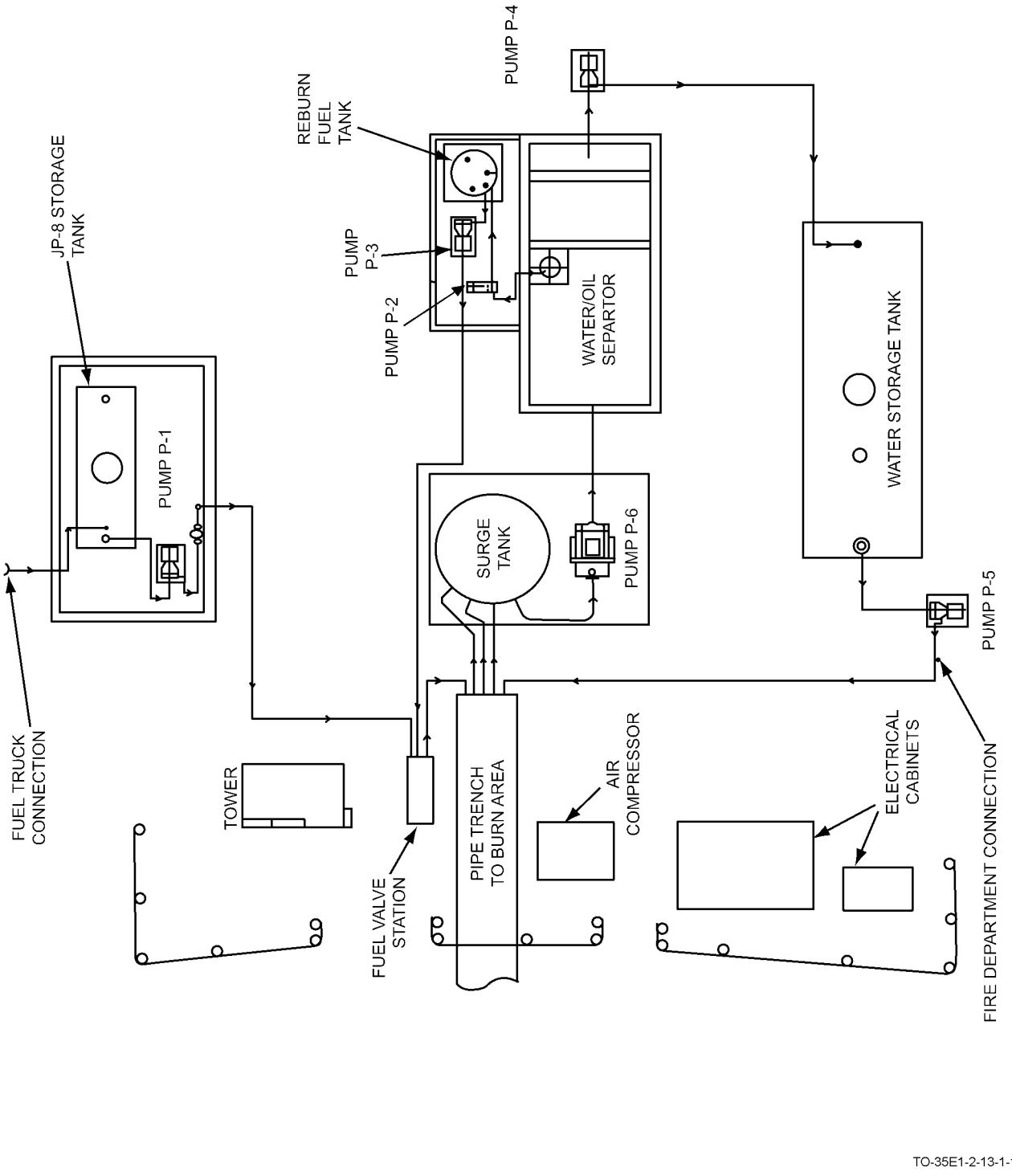

Figure 2. Control Area Layout

SUBORDINATE WORK PACKAGE

TECHNICAL PROCEDURES

OPERATION AND MAINTENANCE INSTRUCTIONS
THULE AB GREENLAND WINTERIZATION PROCEDURES

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE SWP PAGES

Total Number of Pages in this SWP is 4 consisting of the following:

* Zero in this column indicates an original page.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
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REFERENCE MATERIAL REQUIRED

Publication Number	Publication Title
WP 004 00	(Paragraph 7-Paragraph 8) Emergency Procedures
WP 005 01	(Figure 1) Burn Area Drain
WP 007 00	General Maintenance

APPLICABLE TCTOs
NONE

CONSUMABLE MATERIALS
NONE

APPLICABLE SUPPORT EQUIPMENT
NONE

1 FOREWORD.

This work package contains winterization procedures for the Aircraft Fire Training Facility (AFTF) at Thule AB, Greenland.

2 SAFETY SUMMARY.

Various steps in this work package may require personnel to be exposed to JP-8 vapor and fumes. It is imperative to be aware of the EMERGENCY PROCEDURES in Work Pack-

age 004 00, Paragraph 7 and Paragraph 8. Failure to comply may cause serious injury.

3 WINTERIZE.

WARNING

If an obvious unsafe condition is noted, halt operations and rectify condition prior to proceeding. Failure to halt and correct conditions may cause injury.

CAUTION

The entire training facility is a no smoking area

NOTE

- Winterization procedures shall be performed by authorized personnel.
- No vehicles are allowed in burn area.
- Perform semi-annual inspection in accordance with WP 006 00 prior to performing these procedures.

a. Position SEPARATOR WATER PUMP P-4 and SURGE WATER PUMP P-6 MODE SELECTOR switches to AUTO and WASH-DOWN AND SPRINKLER WATER PUMP P-5 SPEED switch to LOW.

b. Position FUEL PUMP P-1 MODE SELECTOR switch at base of tower to HAND and press FUEL pump P-1 START switch.

c. Activate each fuel line until fuel flow is seen from their respective nozzles in the burn area.

d. Press FUEL pump P-1 STOP switch and position FUEL pump P-1 MODE SELECTOR switch to OFF.

e. Using a portable separator, drain, collect, and process any water in the fuel storage tank.

f. Flush burn area for not less than one hour or until all fuel is flushed from the burn area, whichever is longer.

g. Install PORTABLE SUMP pump into burn area sump and discharge into WEIR DRAIN BOX until burn area is drained.

h. Make sure there is no water in the lines from weir drain box to surge tank.

i. Open the three Outside Screw and Yoke (OS&Y) valves into the surge tank and close the OS&Y valve downstream of WASH-DOWN AND SPRINKLER WATER pump P-5.

j. Install gasket and blind flange to the inlet flange of the drain pipe located in the burn area weir drain box.

NOTE

Water storage tank may reach high limit. If needed, discharge water from the fire department connection using a 2 1/2 inch hose to avoid erosion.

k. Allow the system to run until surge tank and separator tank reach their low level cutoffs.

l. Press SEPARATOR WATER PUMP P-4 and SURGE WATER PUMP P-6 STOP switches.

m. Using a portable separator, drain and process the water in the surge tank.

n. Using a portable separator, drain, collect, and process the water in the lines between the surge tank and separator.

o. Using a portable separator, drain and process the water in the separator.

p. Drain the line and SEPARATOR WATER pump P-4 located between separator and water storage tank.

q. Position IMMERSION HEATER WATER STORAGE TANK switch to OFF. Set IMMERSION HEATER WATER STORAGE TANK circuit breaker to OFF.

r. Drain water storage tank.

s. Drain line and WASH-DOWN AND SPRINKLER WATER pump P-5 from water storage tank to OS&Y valve downstream from WASH-DOWN AND SPRINKLER WATER pump P-5.

t. Open OS&Y valve downstream from WASH-DOWN AND SPRINKLER WATER pump P-5.

u. Position all disconnect switches on MAIN ELECTRICAL panel to OFF. Position PRIMARY disconnect located in transformer compartment to off.

v. Disconnect air compressor and portable sump pump and store with the Fire Department.

w. Verify all door clamps are secure.

4 DE-WINTERIZE.

WARNING

If an obvious unsafe condition is noted, halt operations and rectify condition prior to proceeding. Failure to halt and correct conditions may cause injury.

CAUTION

The entire training facility is a no smoking area.

NOTE

- De-winterization procedures shall be performed by authorized personnel.
- No vehicles are allowed in burn area.

a. Conduct all annual maintenance requirements on the air compressor in accordance with the manufacturer's manual.

b. Reinstall air compressor.

c. Position PRIMARY disconnect located in transformer compartment to ON. Position all disconnects switches on MAIN ELECTRICAL panel to ON.

d. Make sure that all heat tape is working for one week prior to charging the system with water.

e. Verify that MODE SELECTION switches for pumps P1, P-4, and P-6 are in OFF position.

f. Make sure power is present at all control panels and pumps.

NOTE

A ladder will be required to check functions in HIGHTAIL area. The air compressor should run continually for 24 hours to remove any moisture in the lines.

g. Press START on air compressor control panel and let it come up to operating pressure. Verify air is flowing to all ignitors heads.

h. Press each ignitor switch and visually verify corresponding ignitor in burn area is working.

i. Remove gasket and blind flange to the inlet flange of the drain pipe located in the burn area.

j. Verify OS&Y valves at surge tank from wash-down and sprinkler are closed.

k. Verify OS&Y valve from weir drain box to surge tank is open.

l. Verify OS&Y valves from surge tank to separator are open.

m. Verify all OS&Y valves are open from separator to water storage tank and all drains are closed.

n. Verify separator stage drain valves are closed and plugs installed.

o. Verify OS&Y valves between separator and water storage tank are open and all drain valves closed.

p. Verify OS&Y valves between water storage tank and burn area are open and all drain valves are closed.

q. Set pumps P-4 and P-6 MODE SELECTOR switches to AUTO.

CAUTION

Once high limit is reached on surge tank, a light in the control panel will illuminate.

r. Charge system with water at weir drain box or surge tank until high limit on water storage tank, separator, and surge tank activate.

s. Set IMMERSION HEATER WATER STORAGE TANK circuit breaker to ON. Position IMMERSION HEATER WATER STORAGE TANK switch to ON.

t. Position pump P-5 PUMP SPEED switch to LOW and press pump P-5 START switch.

NOTE

10,000 gallons in the water storage tank allows additional capacity for water to be added during the fire department exercises.

u. Run system until low level limits on separator, surge, and water storage tank are activated. Then add additional water until burn area is full to top of weir, surge

tank is at its low level limit, separator is at its low level limit, and water storage tank is between 10,000 and 12,000 gallons.

v. Open OS&Y valves between fuel tank and Fuel Valve Bank.

w. Position Fuel pump P-1 MODE SELECTOR switch to HAND and press P-1 START switch.

x. Activate each fuel line until fuel flow is seen from their respective nozzles in the burn area.

y. Open manual valves A, B, C, and D on Fuel Valve Bank.

NOTE

The fuel nozzles may require adjustments.

z. Ignite each burner by depressing and holding the appropriate ignitor switch and slowly opening the corresponding manual fuel valve until flame is present. Repeat step until all burners are tested.

aa. Open the appropriate Ground Spill valves and ignite the burner by depressing and holding the appropriate ignitor switch until it is obvious that the spilled fuel is ignited.

ab. Position IGNITION MASTER switches to OFF.

ac. Press FUEL pump P-1 STOP switch and set FUEL pump MODE SELECTOR switch to LOW.

ad. Press WASH-DOWN AND SPRINKLER pump P-5 START switch and run for five minutes then press STOP switch for pump P-5. Set WASH-DOWN AND SPRINKLER pump P-5 MODE SELECTOR switch to LOW and press START switch for pump P-5 and let it run for one hour or unit all fuel is washed from burn area, whichever is longer.

ae. Press Air Compressor STOP switch.

af. Record the number of gallons of fuel used from the resettable counter and the fixed counter fuel meter reading on the Fire Exercise Check sheet. These readings are on the fuel meter at the JP-8 fuel storage tank.

NOTE

Refer to WP 005 01, Figure 1 to view the Burn Area Drain.

WORK PACKAGE

TECHNICAL PROCEDURES

OPERATION AND MAINTENANCE INSTRUCTIONS AFTF PERFORMANCE TEST

EFFECTIVITY: AIRCRAFT FIRE TRAINING FACILITY

LIST OF EFFECTIVE WP PAGES

Total Number of Pages in this WP is 8 consisting of the following:

* Zero in this column indicates an original page.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
1 - 6	1	7	0	8 Blank	0

TABLE OF CONTENTS

REFERENCE MATERIAL REQUIRED
NONE

APPLICABLE TCTOs
NONE

CONSUMABLE MATERIALS
NONE

APPLICABLE SUPPORT EQUIPMENT
NONE

1 FOREWORD.

1.1 Performance Test Instructions. This performance test provides detailed performance checklist items for candidate testing. Performance tests should not be conducted until the candidate has successfully completed the academic portion of the course. However, it is strongly encouraged that this supplement and the checklist it contains be used during the normal course of study. Candidates may practice the performance tests at any time during study and up until performance testing is conducted. Practice is highly encouraged; however any operations performed by the candidate prior to

becoming certified and during performance testing must be conducted with a certified operator. **Under no circumstances will personnel be allowed inside the training area (burn area) while the candidate is practicing or conducting performance tests.**

1.1.1 Evaluators must be a DoD, IFSAC, or NPQS certified Fire Officer III. Evaluators should review the checklist paying specific attention to the "Candidate/Evaluator" notes. Scenarios developed should be as realistic and complete as possible and should be changed periodically to dissuade future candidates from gaining an unfair advantage or allowing for test compromise.

1.1.2 Remember performance test notification must be made ten days prior to the actual performance test or the candidate stands the chance of the results being unaccepted by the administrative center. For specific guidance consult DoD Manual 6055.06. Performance test notifications may be made at www.afcec.af.mil. See Reach Back Assistance.

1.1.3 This particular course uses six workstations. Within each workstation there are several tasks and objectives. A "Performance Summary Sheet" precedes each workstation or group of evaluated tasks. This sheet lists the items evaluated and the specific tasks that must be accomplished. Each performance test lists the setting and tools/equipment required for the listed tasks.

1.2 Grading Criteria. The following criteria will be used to evaluate and determine the pass/fail status of a candidate. Each item in the Performance Test Checklist has been given a critical rating. The AFTF is a live fire trainer intended to expose the firefighter/trainee to the same thermal and direct fire exposure experienced in an actual uncontrolled fire emergency. The system is not a fire simulator, there is nothing simulated about the fires in the system. The potential for thermal injury is no less than that in an actual uncontrolled fire emergency. The Critical rating has been assigned to all items because if omitted or performed incorrectly it could result in severe injury to or death of an individual. Should the candidate fail to perform any one item he/she would be unsuccessful in attaining the required proficiency level for that performance test.

2 SAFETY SUMMARY.

Various steps in this work package may require personnel to be exposed to extremely high temperatures, open flames, liquid propane vapor and fumes, and hot surfaces. It is imperative to wear appropriate protective clothing and to be aware of the EMERGENCY PROCEDURES in Work Package 004 00, Paragraph 7 and Paragraph 8. High voltage will be present at burn area igniters. All personnel shall remain clear of igniters while in use. Failure to comply may cause serious injury. Use of Self Contained Breathing Apparatus (SCBA) is required for all fires. Exposed skin areas may result in burns by heat/steam and secondary burns can occur using wet gloves while firefighting.

3 PRE-EXERCISE INSPECTION.

Performance Test Item - Pre-Exercise Inspection
Personal Classification: **Aircraft Fire Training Facility (AFTF) Operator**
Objective: **TO 35E1-2-13-1, WP 005 00, Page 3 and 4**
Task: Perform pre-exercise inspection
Settings: Fire department aircraft fire training facility.
Tools Equipment: Fire department aircraft training facility, tools, ladder, radios and Personal Protective Equipment (PPE).
Attainment Standard: Successfully complete all elements/steps within 90 minutes.

Elements/Steps	Standards	Yes	No
1. Conduct pre-exercise inspection procedures prior to commencement of training exercise	1. In accordance with (IAW) TO 35E1-2-13-1 and local policies and procedures		
	A. Inspected propane system	_____	_____
	B. Inspected control stand	_____	_____
	C. Inspected burn area	_____	_____
	D. Inspected exterior/interior burners and igniters	_____	_____
	E. Inspected mock-up	_____	_____
	F. Inspected propane piping, water piping and water jackets	_____	_____
	G. Inspected drive around area	_____	_____
	H. Inspected area lighting if applicable	_____	_____
	I. Inspected water conservation pond	_____	_____
	J. Inspected air or pneumatic system	_____	_____
	K. Positioned circuit breakers	_____	_____
	L. Positioned water valves	_____	_____

4 PRE-EXERCISE SET UP.

Performance Test Item - Pre-Exercise Set Up
Personal Classification: **Aircraft Fire Training Facility (AFTF) Operator**
Objective: **TO 35E1-2-13-1, WP 005 00, Page 4**
Task: Perform pre-exercise set up
Settings: Fire department aircraft fire training facility.
Tools Equipment: Fire department aircraft training facility, radios, vehicle apparatus and Personal Protective Equipment (PPE).
Attainment Standard: Successfully complete all elements/steps within 60 minutes.

Elements/Steps	Standards	Yes	No
1. Conduct pre-exercise set up procedures prior to commencement of training exercise	1. In accordance with (IAW) TO 35E1-2-13-1 and local policies and procedures		
	A. Configured mock up for exercise scenario	_____	_____
	B. Inspected control stand	_____	_____
	C. Positioned electrical switches	_____	_____
	D. Opened/closed water valves	_____	_____
	E. Opened air or pneumatic system	_____	_____
	F. Opened propane system	_____	_____
	G. Pulled emergency shut down switch out	_____	_____
	H. Check all igniters for operation	_____	_____
	I. Made sure ignitor cooling water jackets were properly operating	_____	_____
	J. Checked burner operation and flame height	_____	_____

Elements/Steps	Standards	Yes	No
	K. Inspected water conservation pond	_____	_____
	L. Checked emergency shut-down (proper times)	_____	_____

5 CONDUCT TRAINING EXERCISE.

Performance Test Item - Conduct Training Exercise

Personal Classification: **Aircraft Fire Training Facility (AFTF) Operator**

Objective: **TO 35E1-2-13-1, WP 004 00, Page 4, Paragraph 8.1 through Paragraph 8.3**

Task: Conduct three live fire training exercises filling each functional position (Training Officer, Safety Officer and Ignition Officer).

Settings: Fire department aircraft fire training facility.

Tools Equipment: Fire department aircraft training facility, radios, vehicle apparatus and Personal Protective Equipment (PPE).

Attainment Standard: Successfully complete all elements/steps for each within 180 minutes.

Element/Steps	Standards	Yes	No
1. Perform Training Instructor duties during training exercises	1. In accordance with (IAW) TO 35E1-2-13-1 and local policies and procedures		
	A. Established dedicated radio communications between Training Officer, Safety Officer, Ignition Officer and crews	_____	_____
	B. Conducted pre-exercise inspection	_____	_____
	C. Conducted pre-exercise set up	_____	_____
	D. Assigned personnel duties	_____	_____
	E. Pre-briefed training exercise scenario	_____	_____
	F. Initiated training exercise	_____	_____
	G. Oversaw training exercise	_____	_____
	H. Evaluated training exercise	_____	_____
	I. Terminated training exercise	_____	_____
	J. Debriefed training exercise	_____	_____
	K. Eliminated all distractions	_____	_____
2. Perform Safety Officer duties during a training exercise	2. In accordance with (IAW) TO 35E1-2-13-1 and local policies and procedures		
	A. Established dedicated radio communications between Training Officer, Safety Officer, Ignition Officer and crews	_____	_____
	B. Conducted pre-exercise inspection	_____	_____
	C. Conducted safety briefing and PPE inspection prior to initiating exercise scenario	_____	_____
	D. Oversaw training exercise	_____	_____
	E. Evaluated training exercise	_____	_____
	F. Terminated training exercise	_____	_____
	G. Debriefed training exercise	_____	_____
	H. Eliminated all distractions	_____	_____
3. Perform Ignition Officer duties during training exercise	3. In accordance with (IAW) TO 35E1-2-13-1 and local policies and procedures		
	A. Activated appropriate igniter switch(s) for scenario	_____	_____
	B. Opened proper burner control valve(s)	_____	_____
	C. Repeated steps for all burners for scenario	_____	_____
	D. Ensured flames were present within 5-10 seconds	_____	_____
	E. Ensured pre burn time did not exceed 3 minutes	_____	_____
	F. Exercised normal shut down when prompted	_____	_____
	G. Closed individual burner control valve(s)	_____	_____

Element/Steps	Standards	Yes	No
(Firefighters will not enter burn area)	H. Confirmed all flames were extinguished	_____	_____
	I. Positioned all igniter switches to the off position	_____	_____

6 PERFORM EMERGENCY SHUTDOWN PROCEDURES.

Performance Test Item - Perform Emergency Shutdown Procedures

Personal Classification: **Aircraft Fire Training Facility (AFTF) Operator**

Objective: **TO 35E1-2-13-1, WP 004 00, Page 3 and 4**

Task: Perform emergency shutdown procedures.

Settings: Fire department aircraft fire training facility.

Tools Equipment: Fire department aircraft training facility, radios, vehicle apparatus and Personal Protective Equipment (PPE).

Attainment Standard: Successfully complete all elements/steps within 30 minutes.

Elements/Steps	Standards	Yes	No
1. Perform emergency shutdown procedures	1. In accordance with (IAW) TO 35E1-2-13-1 and local policies and procedures		
	A. Activated emergency shutdown switch (push in)	_____	_____
	B. Closed all proper burner control valve(s)	_____	_____
	C. Positioned all igniter control valves to the off position	_____	_____
	D. Verified all personnel evacuated the burn area	_____	_____
	E. Purged all trapped LPG in the lines	_____	_____
	F. Locked and tagged all inoperable components out of service (if applicable)	_____	_____
	G. Notified appropriate agency for corrective actions	_____	_____

7 PERFORM SYSTEM SHUTDOWN AND CLEANUP.

Performance Test Item - Perform System Shutdown and Cleanup

Personal Classification: **Aircraft Fire Training Facility (AFTF) Operator**

Objective: **TO 35E1-2-13-1, WP 005 00, Page 5**

Task: Perform system shutdown and cleanup procedures.

Settings: Fire department aircraft fire training facility.

Tools Equipment: Fire department aircraft training facility, radios, vehicle apparatus and Personal Protective Equipment (PPE).

Attainment Standard: Successfully complete all elements/steps within 90 minutes.

Elements/Steps	Standards	Yes	No
1. Perform system shutdown and cleanup	1. In accordance with (IAW) TO 35E1-2-13-1 and local policies and procedures		
	A. Closed propane tank globe valve	_____	_____
	B. Burned off all LPG in lies by igniting predetermined burners	_____	_____
	C. Closed all burner control valves one fire was out	_____	_____
	D. Positioned all igniter switches to OFF	_____	_____
	E. Determined the area safe	_____	_____
	F. Pushed the emergency shutdown switch to the OFF position	_____	_____

Elements/Steps	Standards	Yes	No
	G. Activated sprinkler system and ensured the water cooling jackets remained on for a minimum of 15 minutes	_____	_____
	H. Activated wash down for a minimum of 1 hour	_____	_____
	I. Closed propane manifold valve located on the control stand	_____	_____
	J. Closed valves on the pneumatic system	_____	_____
	K. Positioned master power switch on the control stand to the OFF position	_____	_____
	L. Positioned all applicable circuit breakers on the electrical service rack to the OFF position	_____	_____
	M. Leveled gravel in the drive around and burn area	_____	_____

8 CONDUCT SEMI-ANNUAL SYSTEM SAFETY INSPECTION AND OPS CHECKS.

Performance Test Item - Conduct semi-annual System Safety Inspection and Operational Checks

Personal Classification:	**Aircraft Fire Training Facility (AFTF) Operator**
Objective:	**TO 35E1-2-13-1, WP 006 00**
Task:	Conduct semi-annual system safety inspection, operational checks and documentation.
Settings:	Fire department aircraft fire training facility.
Tools Equipment:	Fire department aircraft training facility, WP 006 00 checklist, tools and equipment, and Personal Protective Equipment (PPE).
Attainment Standard:	Successfully complete all elements/steps within 8 hours.

Element/Steps	Standards	Yes	No
1. Conduct semi-annual system safety inspection, operational checks and documentation	1. In accordance with (IAW) TO 35E1-2-13-1 and local policies and procedures		
	A. Performed a semi-annual system safety inspection and operational checks IAW the form provided in TO 35E1-2-13-1, WP 006 00	_____	_____
	B. Completed and filed the semi-annual safety inspection and operational checks form	_____	_____

AFTF Performance Test Record

INSTRUCTIONS: This form must be completed and kept on record.

Date of Evaluation _____

Candidate Rank/Name _____ **SSN** _____

Evaluators Rank/Name _____ **SSN** _____

The candidate has PASSED/FAILED the Aircraft Fire Training Facility Performance Tests for the stations marked below:

Performance Test Station	Passed	Failed
Pre-Exercise Inspection	_____	_____
Pre-Exercise Set Up	_____	_____
Training Exercise		
- Training Officer	_____	_____
- Safety Officer	_____	_____
- Ignition Officer	_____	_____
Emergency Shutdown Procedures	_____	_____
System Shutdown and Cleanup	_____	_____
Quarterly Safety Inspection and General Maintenance	_____	_____

If candidate has failed the performance evaluation, provide the following information: (Use additional sheets, if necessary)

Objective(s):

Reason(s) for failure:

Candidate Signature _____

Evaluator Signature _____

"FOUO. This document contains information exempt from mandatory disclosure under FOIA. Exemption 5 U.S.C. 552(b)(6) applies. This information is also protected by the Privacy Act of 1974 and must be safeguarded from unauthorized disclosure."

TO-35E1-2-13-1-137