F & E Program Overview

Prepared for: 2018 Southwest Airport Conference

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Engineering – Ft. Worth

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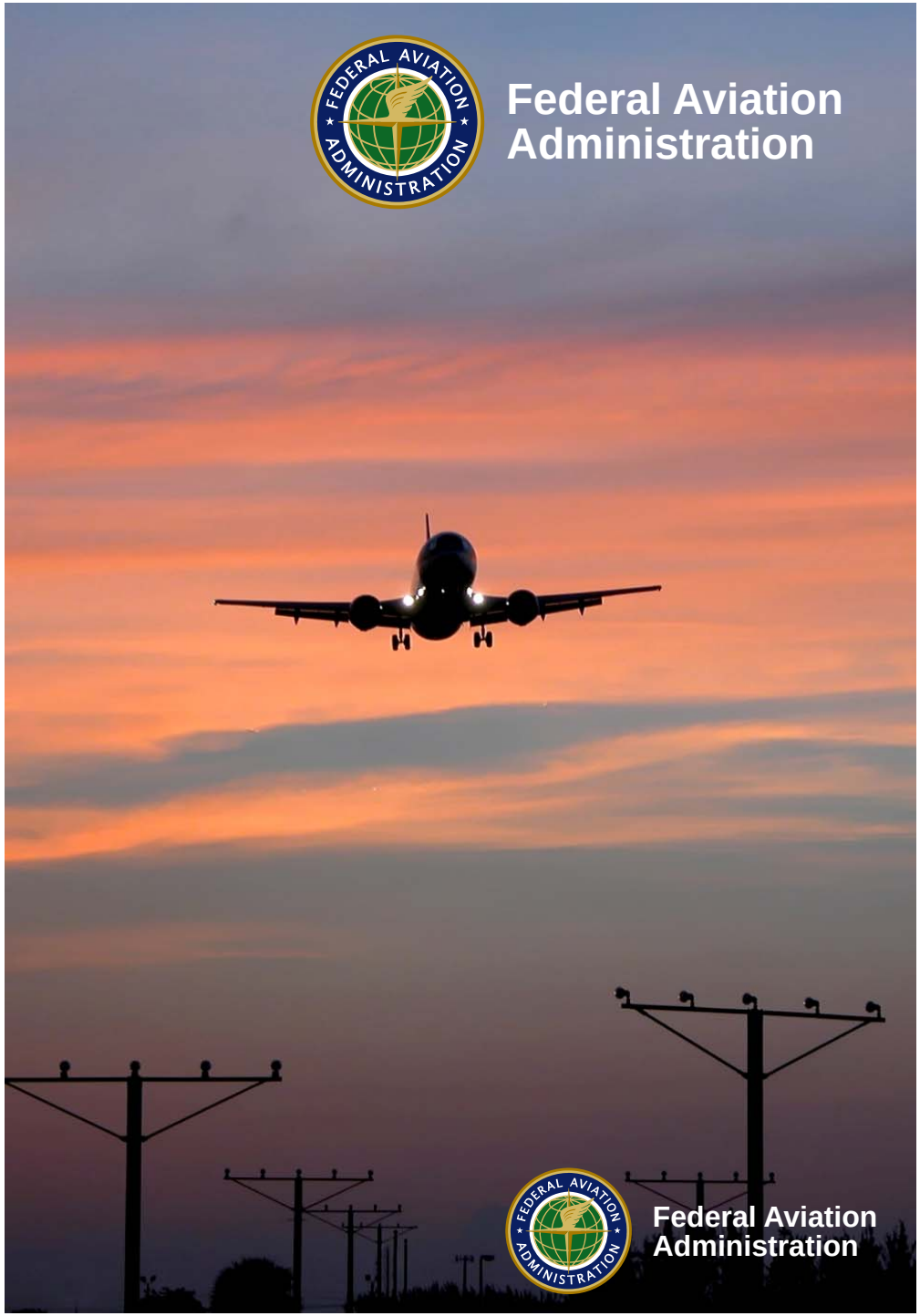
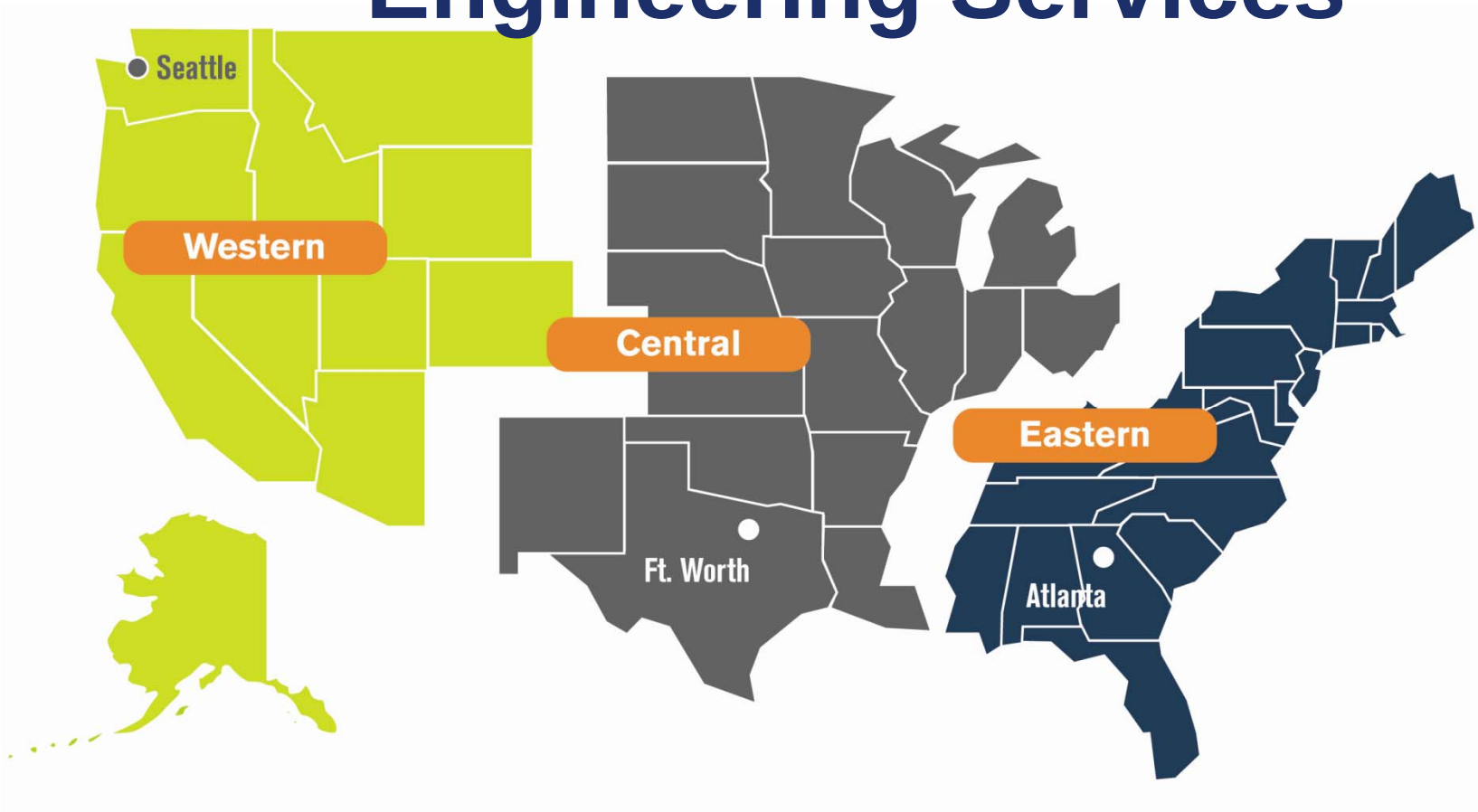
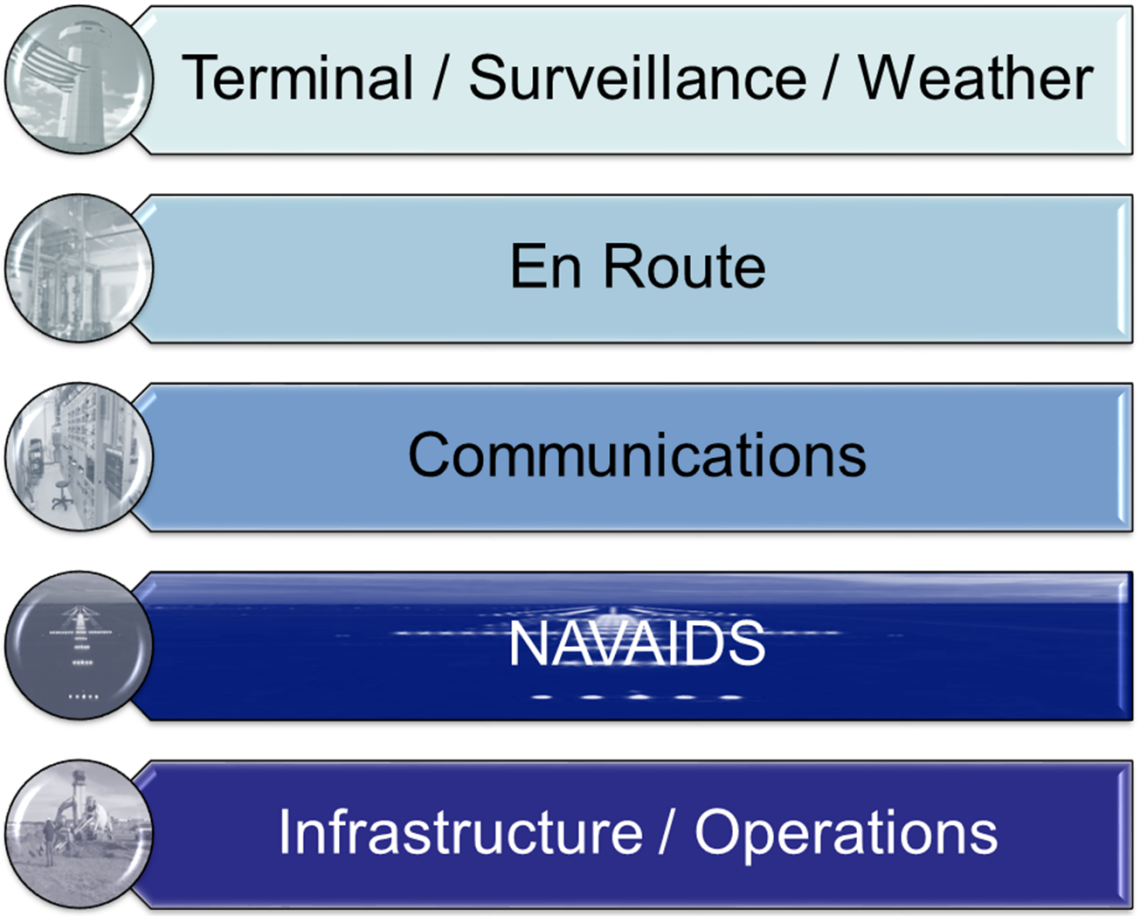


Air Traffic Organization
Technical Operations
Engineering Services



Engineering Services Groups



Engineering Services

The FAA's own engineering presence that designs, constructs, implements and modernizes facilities and the technologies used in the National Airspace System (NAS).

We support a variety of services in project management, engineering design, environment & safety, drafting, construction & contract oversight, and installation.

TERMINAL

TERMINAL

ENROUTE

COMMUNICATIONS

RADAR/SURVEILLANCE

NAVAIDS

NAVAIDS

NAVAIDS

INFRASTRUCTURE

INFRASTRUCTURE

OPERATIONS ENGINEERING

Project Estimates by Facility

FACILITY	CONSTRUCTION	EQUIPMENT	TOTAL
GS	$ 300,000	$ 300,000	$ 600,000
LOC	$ 300,000	$ 300,000	$ 600,000
ILS	$ 600,000	$ 600,000	$ 1,200,000
PAPI	$ 165,000	$ 90,000	$ 255,000
REIL	$ 165,000	$ 90,000	$ 255,000
MALSR	$ 700,000	$ 225,000	$ 925,000
ALSF	$ 2,750,000	$	$ 3,750,000
RRCS	$	$ 1,000,000	$

Estimates may vary due to site specific details (Environmental, Long Cable Runs, Boring, Installation Costs, Monitoring/Control – New Telco Drop)

15,000

65,000

50,000

How does equipment get replaced?

- **Field Requirement**
- **Air Traffic Requirement**
- **Target of Opportunity**
- **Congressional**

How does a Need become a Project

1. **District Office (at local level it is the SSC)**
    1. Identify the Need
    2. Justifies the need with supporting documentation
2. **Requirements at the Service Center (Southwest Regional Office)**
    1. Validates that there is a requirement to address the need
3. **Headquarters**
    1. Prioritizes the projects
    2. Determines which projects to fund based on priority

District Office/SSC Staff Support for a Reimbursable Project

- **Planning for**
  - Outages
  - Affect on other associated systems
  - Resources
  - Training
  - Project Requirements
- **During a Project**
  - Preconstruction Conference
  - Certifying Tech / RTS
- **PROJECT CLOSEOUT**
  - CAI/JAI
  - FLIGHT CHECK
  - CERTIFYING
  - COMMISSIONING

Engineering Long Lead Items

- **CHARTING 18-24 MO.**
- **MOD TO STD W/ NCP, 6-8 MO.**
- **ENVIRONMENTAL**
- **REAL ESTATE**
- **UTILITIES**
- **PROJECT CLOSEOUT**

Utilities for Reimbursable Project

- **EX. RUNWAY EXTENSION**
- **MALSR, PAPI, LOC/DME, ASOS HAVE TO BE RELOCATED**
  - Meter relocation requires a Utility RECO
  - Old account has to be terminated by the RECO
  - New account has to be established to transfer
    - Meter Number, Address of who has the bill, account, POC for the account holder, POC with the utility
  - New account 911 address

RSA and OFA Familiarization

RSA AND ROFA

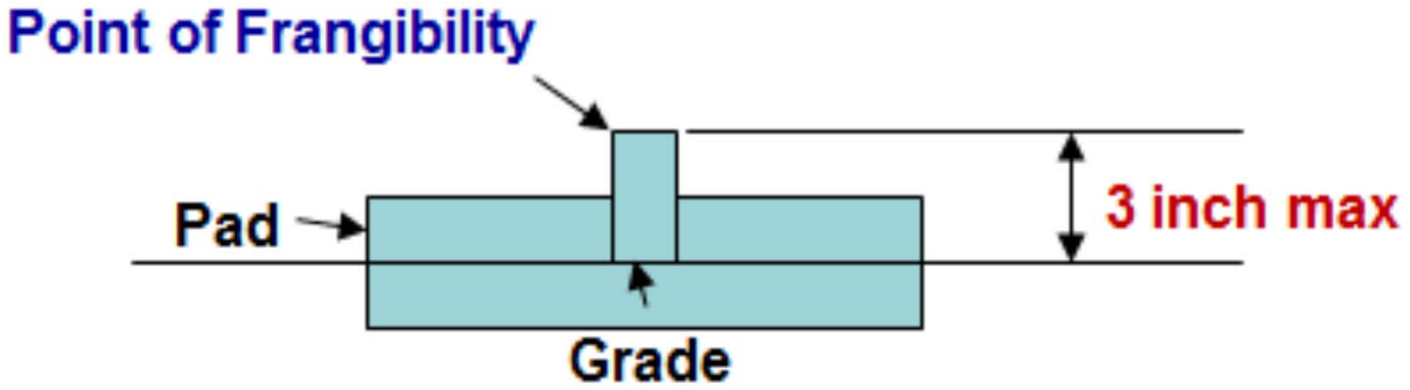
- **PUBLIC LAW 109-115**
- **FIXED BY FUNCTION**
  - SEE AC 150/5300-13A TABLE 6-1 FOR FACILITIES THAT ARE CONSIDERED FIXED BY FUNCTION

TYPICAL RSA AND ROFA

- There may be some Runways that have different dimensions as a result of Declared Distances, Engineered Material Arresting Systems (EMAS), etc.
- Please consult with the FAA Airports Division and review the latest Airport Layout Plan to determine the site specific RSA and ROFA dimensions

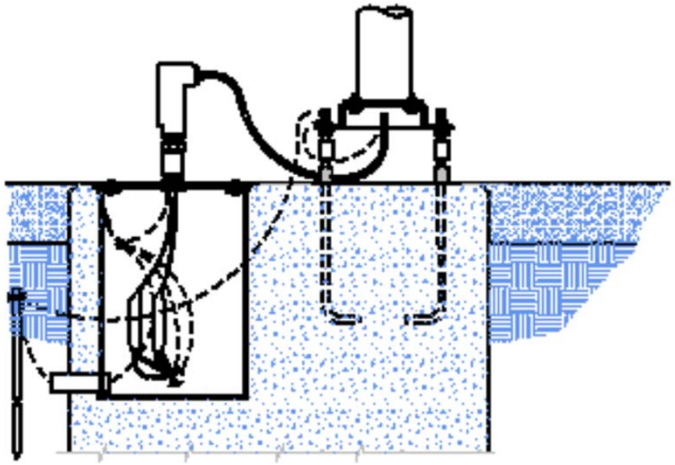
Frangibility

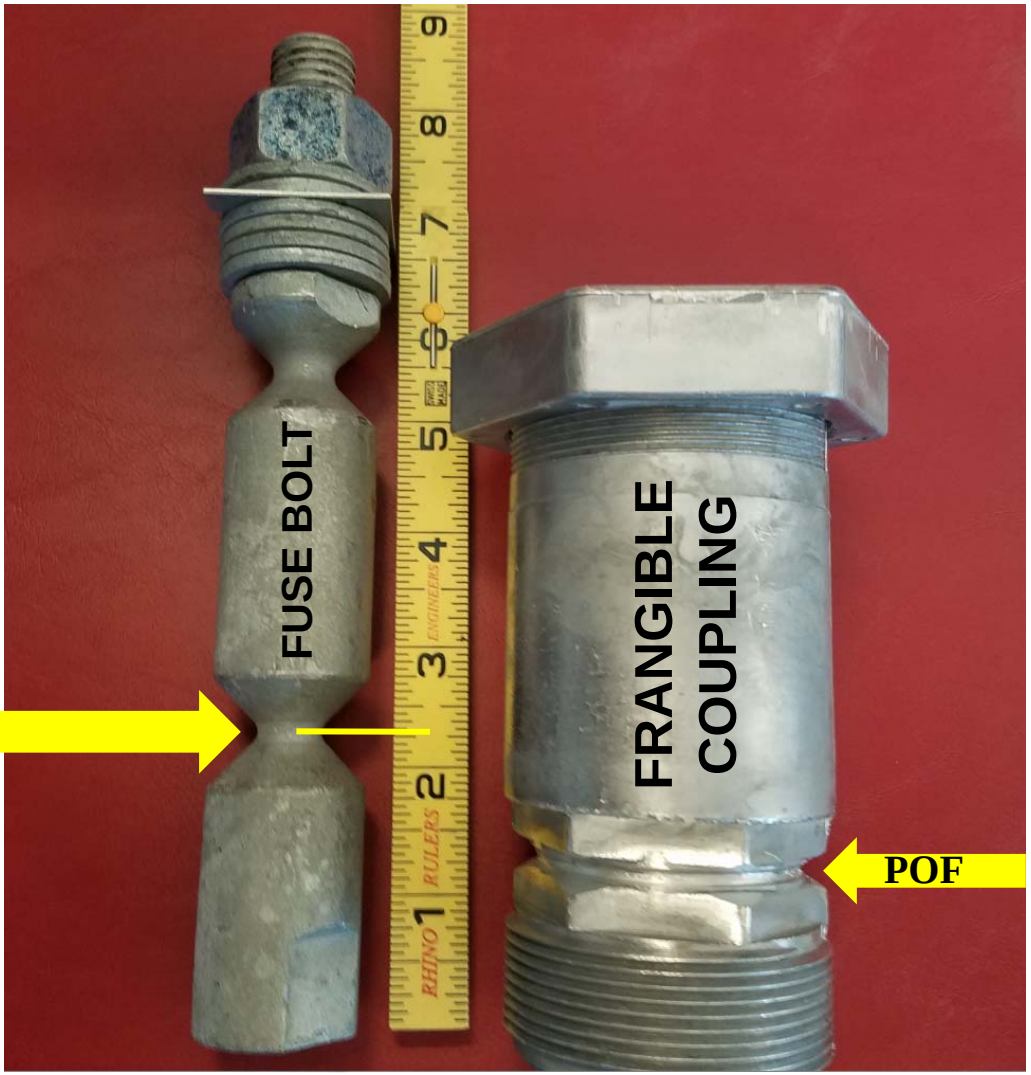
3” maximum height is measured from grade to the point of frangibility, not from the ground to the top of the pad



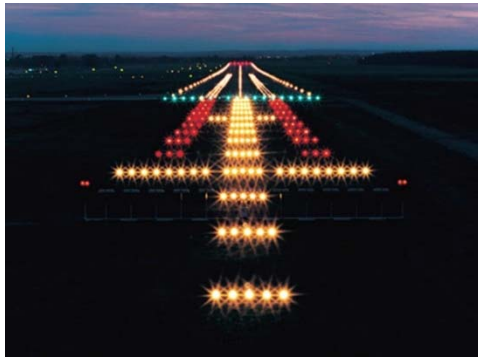
FRANGIBILITY

- FRANGIBLE BOLT (FUSE BOLT) ON THE LEFT 2 ¼ IN. TO POINT OF FRANGIBILITY (POF)
- FRANGIBLE COUPLING ON THE RIGHT
- INSTALL < 3 IN. FROM SURROUNDING GRADE





FACILITIES WITH RSA/OFA VIOLATIONS



ALSF

GS

LOC

MALSR

PAPI

REIL

ALSF

FUSE BOLTS ARE REQUIRED FOR LIR BASES

AND FRANGIBLE COUPLINGS FOR CONDUIT

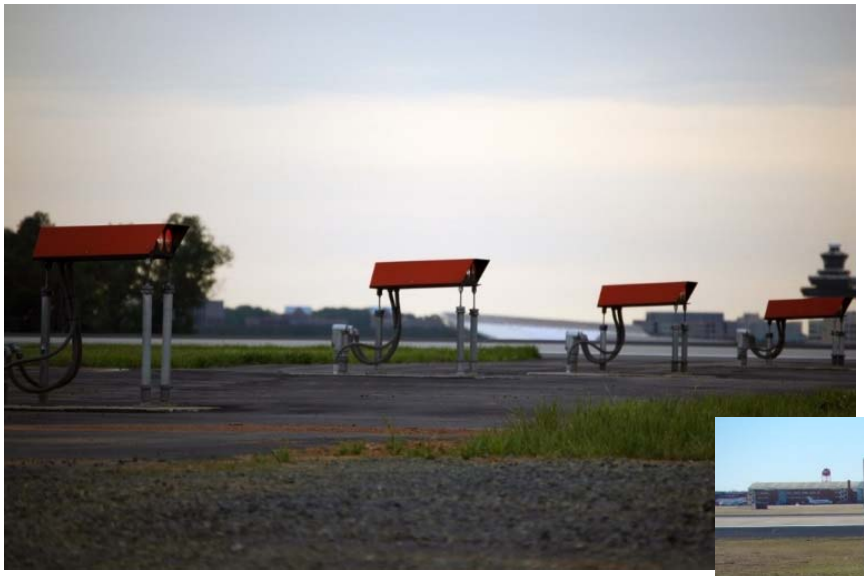
MALSR

Distribution Panels *are not* Fixed by Function - must be located outside the RSA

All Light Stations within the RSA need to be installed on frangible couplings and or break-away bolts

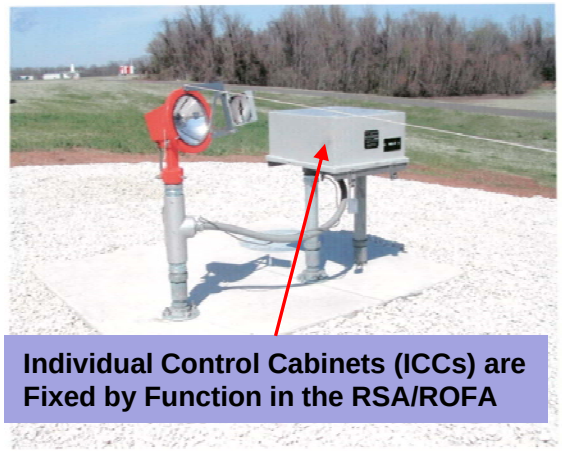
Do not install above ground splice boxes in the RSA or ROFA

PAPI



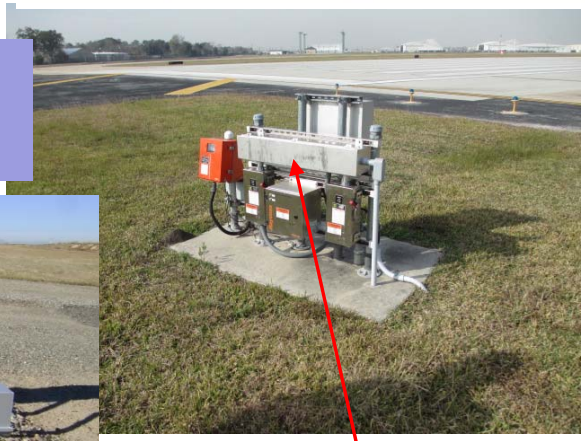
PAPI Power & Control Assembly as per Manufacturer must be installed 25' from the farthest Lamp Housing Unit. Frangibility Point must be no greater than 3" above surrounding grade – *Engineering Amendment Memorandum Dated April 23, 2010.*

REIL



Individual Control Cabinets (ICCs) are Fixed by Function in the RSA/ROFA

Violation: Power & Control Cabinets ***are not*** fixed by function in RSA/ROFA.



Violation: REIL Power & Control Racks are not fixed by function in RSA/ROFA

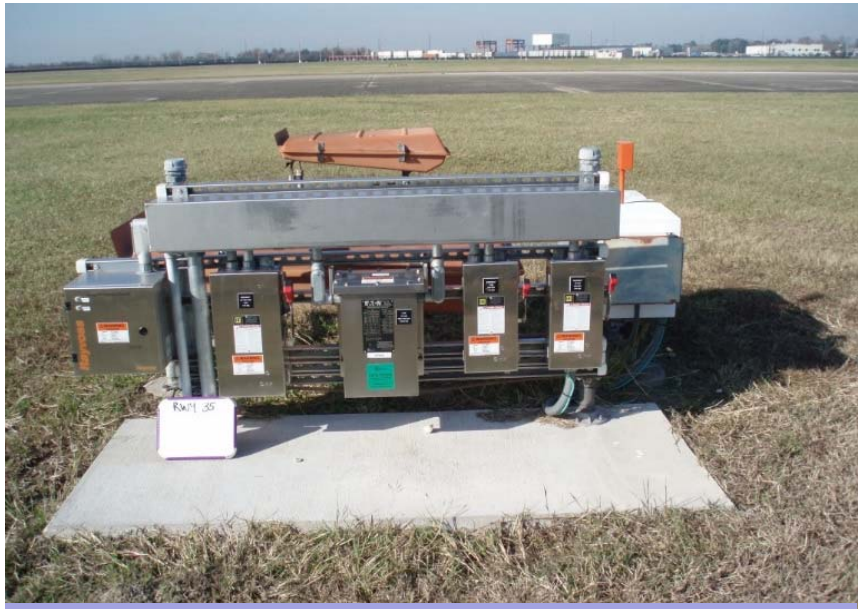
GLIDE SLOPE

- **CAN'T BE IN THE RSA**
- **CAN'T PENETRATE THE OFZ**
- **SHOULD BE OUTSIDE OF THE OFA**
- **PER AC 150/5300-13, PG 201 THE GS EQUIPMENT SHELTER IS LOCATED OUTSIDE OF 400 FT.**

LOCALIZER

- ANTENNA ARRAY HAS TO BE LOCATED OUTSIDE OF THE RSA/OFA
- SHELTER HAS TO BE WITHIN 30 DEGREES OF CENTERLINE
- LOC SHELTER HAS TO BE OUTSIDE OF THE RSA
- COMBINED LOC/ALS SHELTER HAS TO BE LOCATED BEYOND 400 FT. FROM EXTENDED CENTERLINE

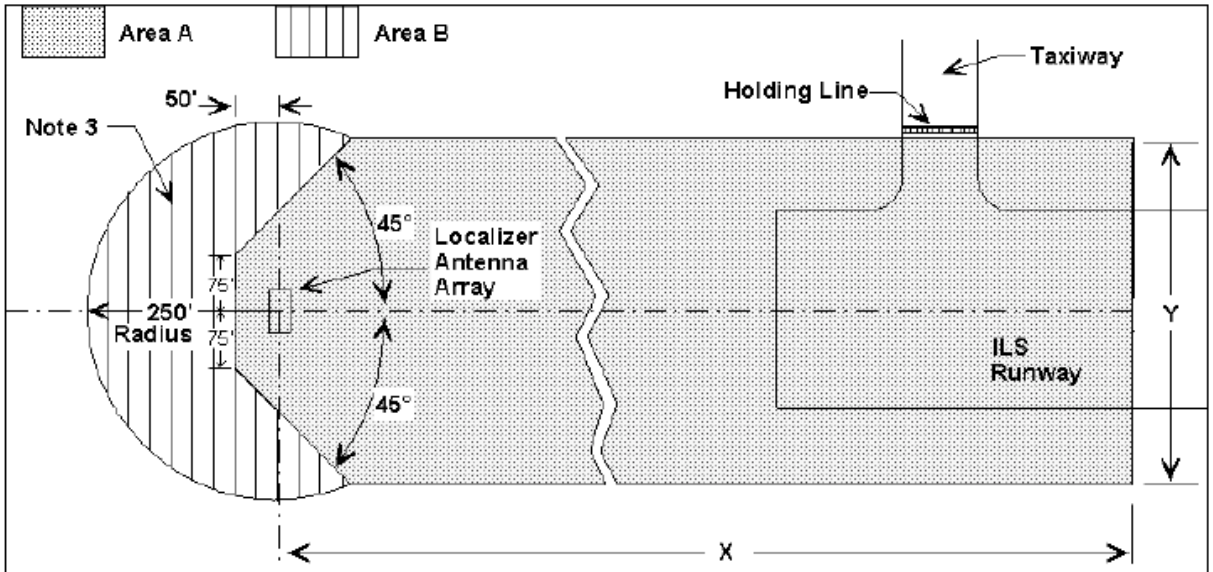
Miscellaneous



Violation: Power/Disconnect Racks *are not* Fixed by Function and should be located outside the RSA/ROFA

Equipment Shelters should be located outside the RSA/ROFA

LOCALIZER CRITICAL AREA

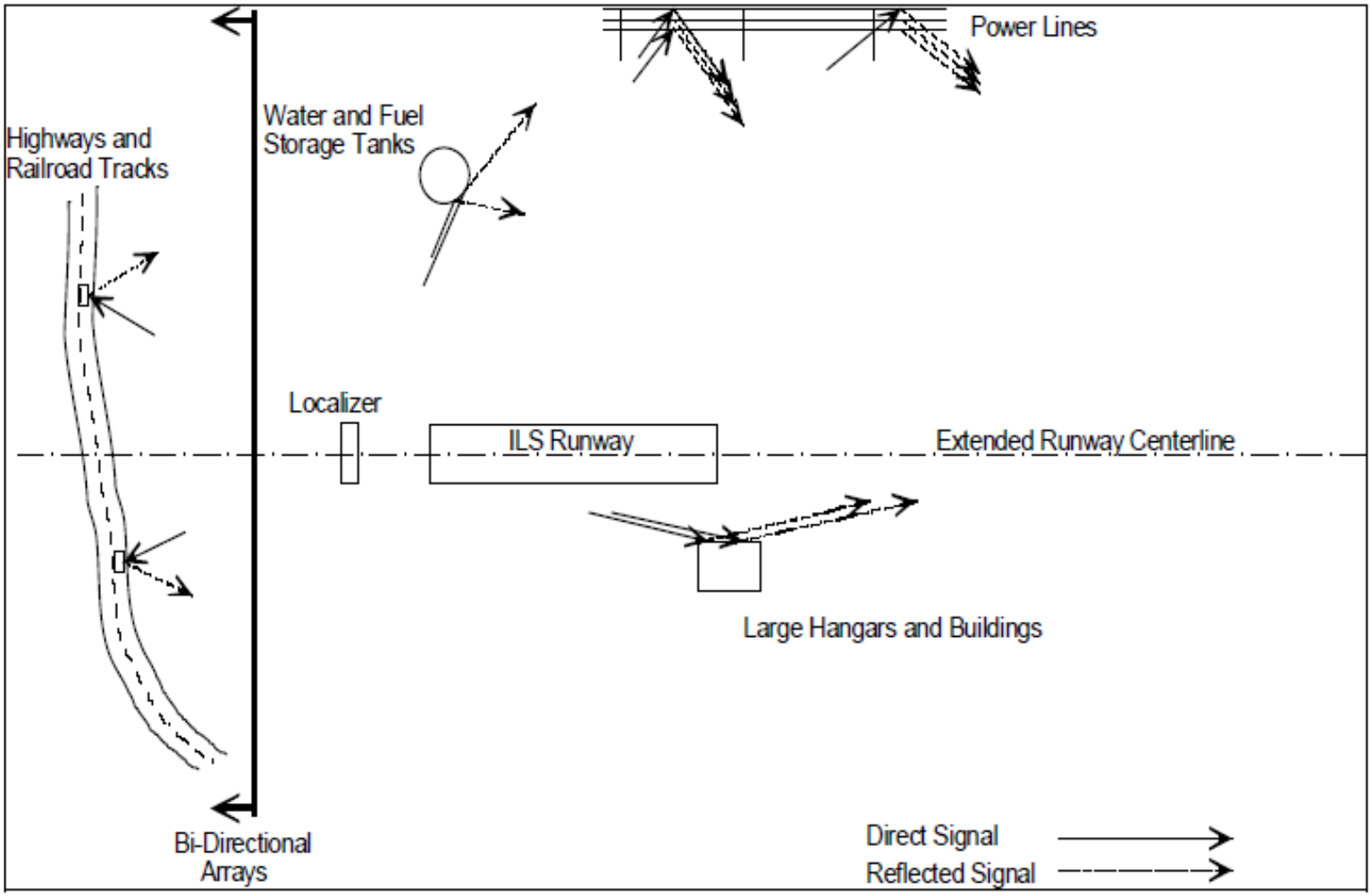


	X	Y	
Category I	2000	400	Note 4
Category II/III	2000	400	Note 5
Category II	4000	500	
Category III	7000	500	

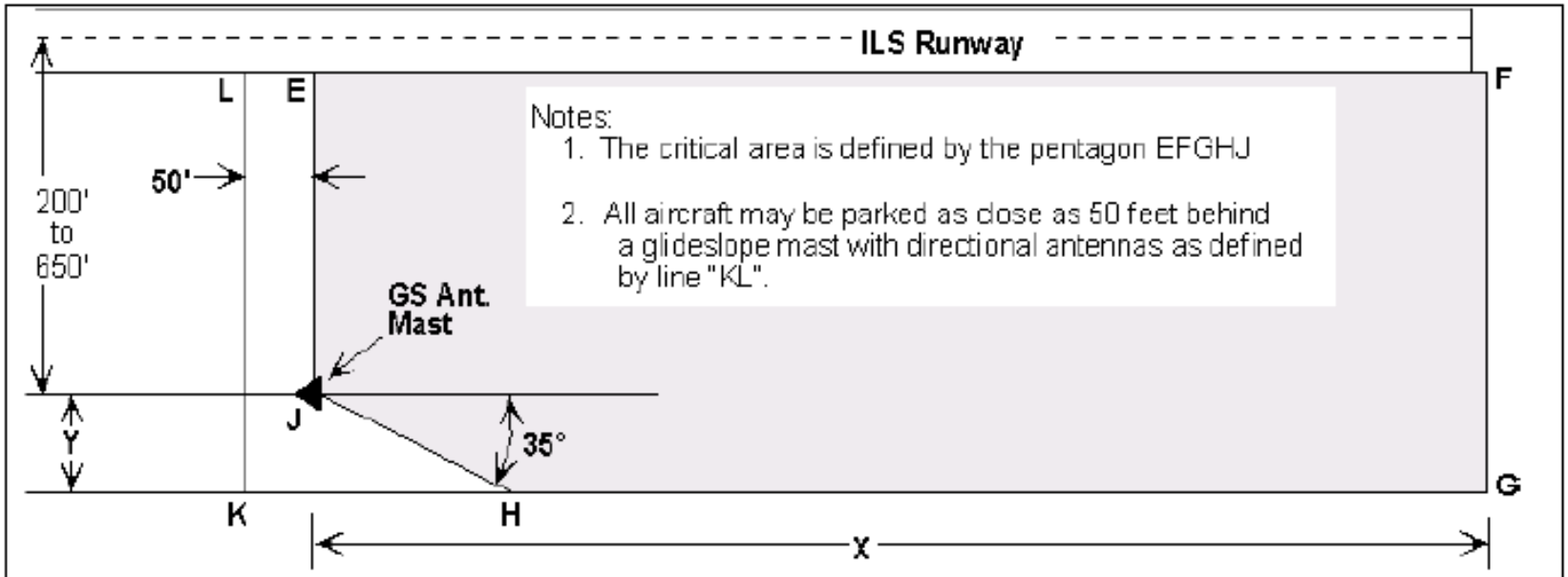
Notes:

1. Critical area is indicated by shaded zones.
2. Hold line/signs indicate the position beyond which aircraft/vehicles will require ATCT authorization before proceeding on or across runway.
3. Area B is deleted from the critical area when a unidirectional localizer antenna is installed. The standard log-periodic dipole antenna array is in this category.
4. For 8-element localizer array with course widths less than 4 degrees and runways which operate B-747-size and larger aircraft, the Y dimension shall be 600 feet.
5. These dimensions apply where aircraft size is equal to or less than 135 feet in length or 42 feet in height, e.g., B-727.
6. Critical areas for LDA, SDF, and Offset Localizer facilities are the same as for Category I, but are centered about the course line.

LOCALIZER REFLECTIONS

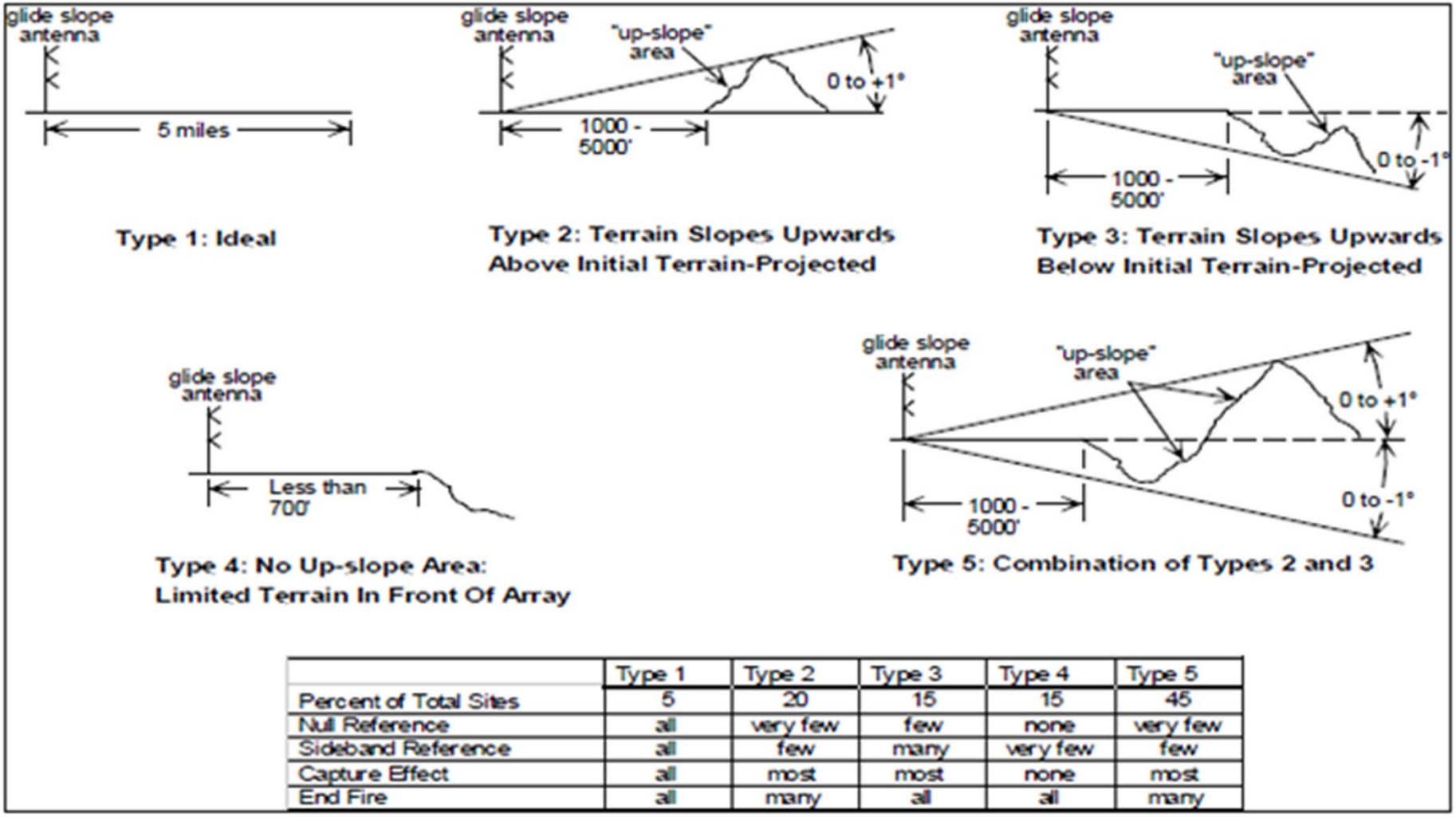


GS CRITICAL AREA



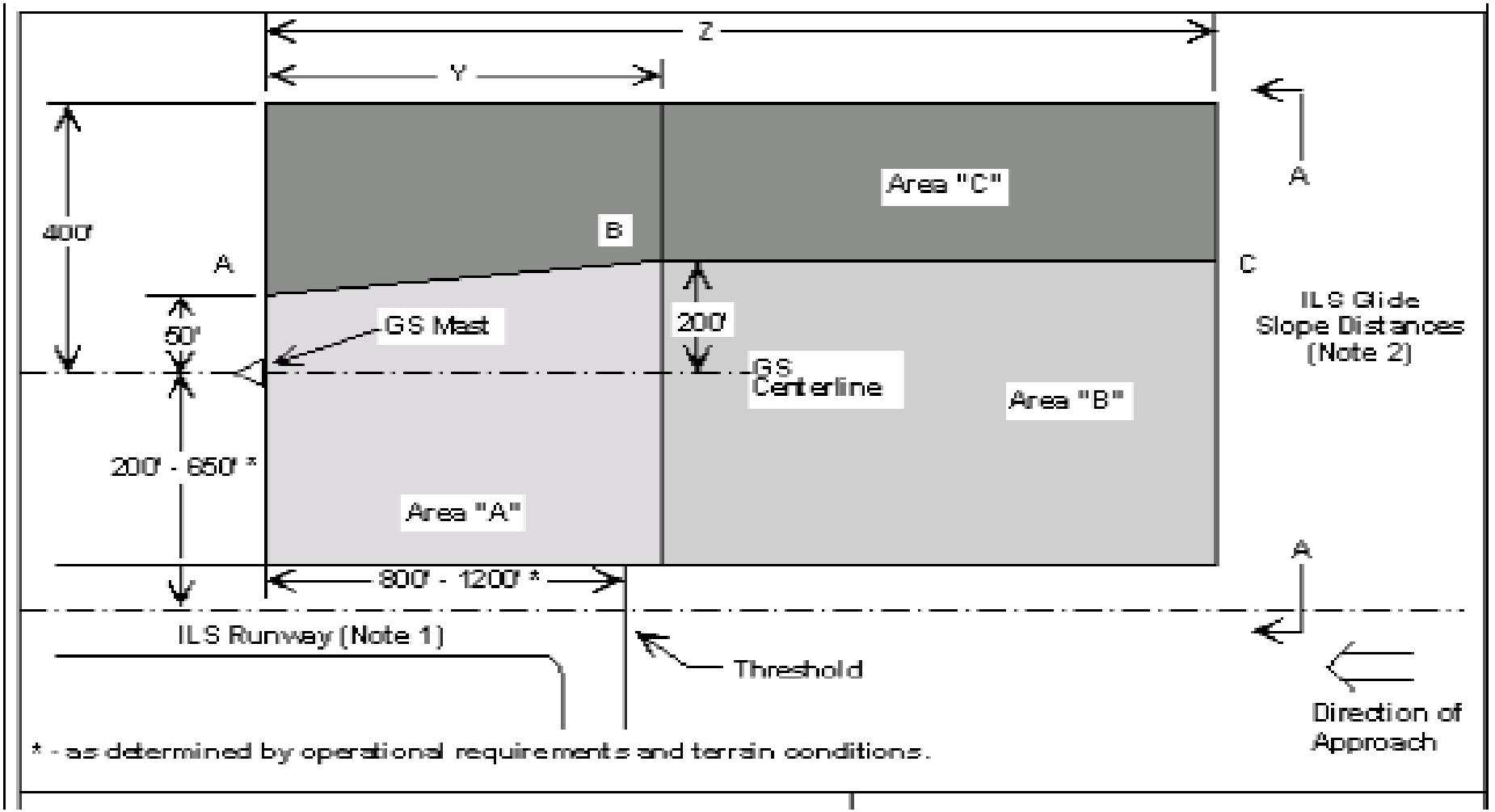
FACILITY TYPE	CATEGORY I X	CATEGORY I Y	CATEGORY II/III X	CATEGORY II/III Y
ALL IMAGE GLIDE SLOPES				
Small Aircraft 2/	800	100	800	100
NULL REFERENCE				
Medium Aircraft 3/	2000	200	2500	200
Large Aircraft 4/	3100	200	3200	200
SIDEBAND REFERENCE & CAPTURE EFFECT				
Medium and Large Aircraft 3/ 4/	1300	200	1300	200

GS SITING CONDITIONS

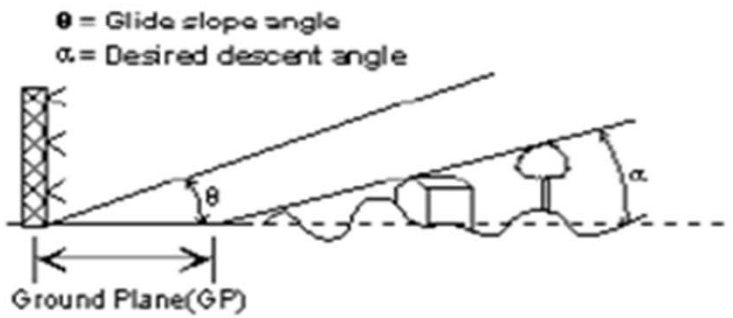


	Type 1	Type 2	Type 3	Type 4	Type 5
Percent of Total Sites	5	20	15	15	45
Null Reference	all	very few	few	none	very few
Sideband Reference	all	few	many	very few	few
Capture Effect	all	most	most	none	most
End Fire	all	many	all	all	many

GS GRADING CRITERIA

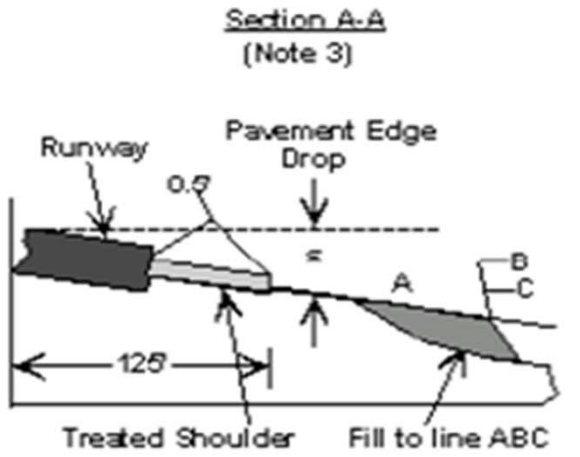


TYPE OF GS



System	GP (Feet)	α Max	GP Smoothness (Area "A")
NR	1500-2000	8/5	±6" from Avg Grade
SBR	800	8/4	±4" from Avg Grade
CEGS	1200	8/3	±6" from Avg Grade

(All Values Typical)



NOTES:
1. Locate glide slope on runway side away from taxiways, roads, etc.
2. Distances
   Y - The greater of 1200 feet or the setback of the glide slope from threshold
   Z - The least of : (a) 3000 feet; (b) distance to the airport property line; (c) distance to where smooth terrain terminates.
3. Grading and obstruction removal
   a. Area A should be uniformly graded and should have the same longitudinal slope as the runway.
   b. Area B should be smoothly graded to comply with terrain roughness criterion of paragraph 3-3e(3)(a). Extensive landfill operations determined by feasibility.
   c. Area C grading may be limited to removal of hills which would reflect the glide slope signal into the usable area.
   d. All possible interference sources (metallic structures, fences, etc.) should be removed from areas A, B, and that portion of C that is within 250 feet of the antenna centerline extended. (Refer to paragraph 3-4c.)

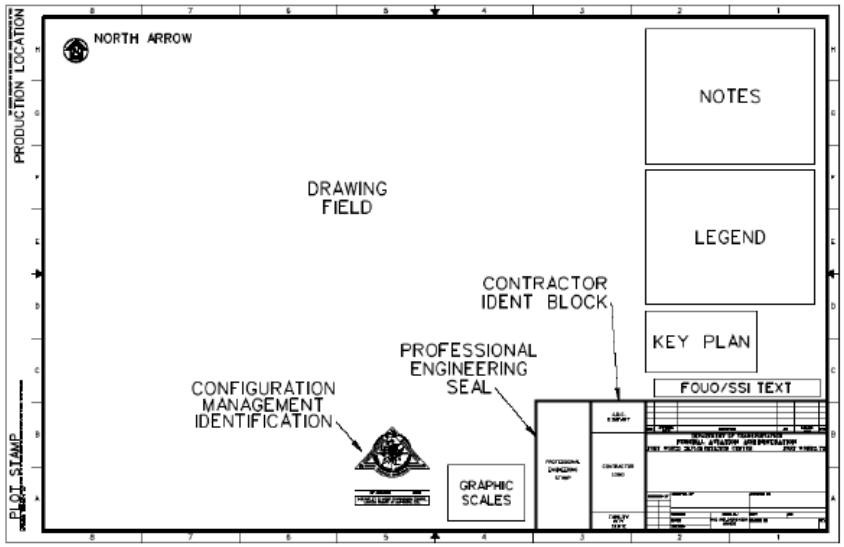
Disposition of Equipment

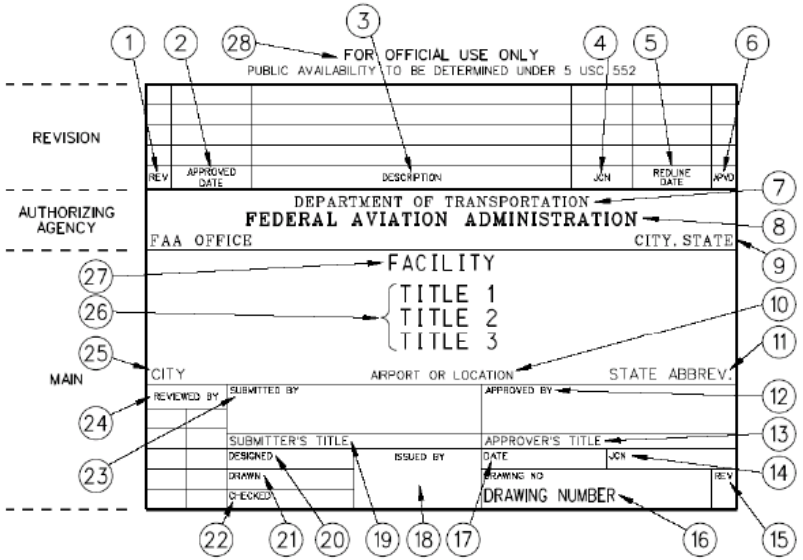
- **NAS EQUIPMENT IS ON THE PROPERTY RECORD OF THE SSC**
  - EQUIPMENT DOES NOT BECOME CONTRACTOR / AIRPORT PROPERTY UNLESS IT CAN BE EXCESSED
- **SALVAGED EQUIPMENT HAS TO BE CRATED AND SHIPPED TO OKC**
- **EXCESSED EQUIPMENT THAT HAS HAZARDOUS MATERIAL HAS TO BE DISPOSED OF IN A SUITABLE WASTE FACILITY**
- **ALL FACILITIES THAT ARE REMOVED HAVE TO BE RESTORED (EX. FOUNDATIONS REMOVED, CABLE BELOW GRADE)**
- **COST INCURRED BY SPONSOR FOR AN IMPACTED FACILITY (EX. CRANE, CRATING AND SHIPMENT)**

YOUR HELP

- AIRPORT PLANNING THAT AFFECTS ENGINEERING DESIGN
- DRAFTING PER FAA-STD-002 (AVG. = 1 DAY TO ARCHIVE DRAWING TO STD. $400/PG)
- DESIGN BY FACILITY
- SUGGESTION OF 100% ENGINEERING DWGS W/ SAMPLE
- REDLINE BY COLLABORATIVE EFFORT
- TRD PROVIDED AS THEY ARE PERFORMED
- FACILITY OUTAGES AND RTS / FORESEEN PROBLEMS
- SCHEDULE CHANGES
- DESIGN CHANGES
- SUBMITTAL REVIEW (NFDC DATA, DESIGN CALCS, MATERIAL DEVIATIONS FROM PLAN)
- GFM INVENTORY W/ COR
- CLOSEOUT PACKAGE W/ PUNCHLIST RESOLUTION BY JAI
- ADDRESS LONG LEAD TIME ITEMS (CRITICAL PATH)

DRAFTING – BORDER AND TITLE BLOCK





XXXX-X-XXXXX[XXX]-XXXX[-XX]

- Configuration Management (2)
- Drawing Sequence Number (4)
- Facility Type (2-8)
- Drawing Size (1)
- Location Identifier (3-4)

UNIQUE AIRPORT REQUIREMENTS

- **WETLANDS**
- **PERMITTING (EX. TENANT IMPROVEMENT PLAN W/ HAS)**
- **STAGING OR PHASING**
- **SECURITY/BADGING/DRIVING**
- **CONSTRUCTION REQ.**
  - TRENCHING (CONCRETE ENCASEMENT?)
  - BALL MARKERS
  - AIRPORT MAINTENANCE OR OTHER CONTRACTORS

- **PLEASE PROVIDE A SPEC. SUPPLEMENT AND LET US KNOW IF THERE ARE TIMEFRAMES/SPECIFIC DAYS TO PLAN FOR ACTIVITIES (SUCH AS DRIVING DATES)**

Questions or Feedback