

## CHAPTER 7. SPECIAL CONSIDERATIONS

37. PROVISIONS FOR THE HANDICAPPED. There are a significant and increasing number of handicapped travelers that by law must be provided with adequate accommodations in the design and construction of transportation facilities in which Federal funds are utilized. The first legal requirements for accommodating the physically handicapped in building design occurred with the passage of the Architectural Barriers Act of 1968 (P.L. 90-480). This law required the establishment of Federal standards to insure that physically handicapped persons will have ready access to public buildings constructed or leased on behalf of the Federal Government and buildings subsidized under Federal programs which may be utilized for the employment or residence of physically handicapped persons. Section 504 of the Rehabilitation Act of 1973 (P.L. 93-112) further expanded on this requirement by provided that "no otherwise qualified handicapped individual . . . shall solely by reason of his handicap be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." This same Act established within the Federal Government an Architectural and Transportation Barriers Compliance Board with the responsibility of insuring compliance with Federal standards pertaining to accommodating the physically handicapped, investigating complaints, examining alternative approaches, and reporting to Congress on its activities relating to transportation barriers and housing needs of handicapped individuals. In May 1979, the Department of Transportation (DOT) published in the Federal Register (Vol. 44, No. 106 dated 5/31/79) the final regulation specifying those requirements necessary to implement Section 504 of the Rehabilitation Act. This regulation requires that airport terminal facilities receiving Federal financial assistance be designed and constructed in accordance with the minimum standards specified by the American National Standards Institute. These standards are contained in document ANSI A117.1-1961 (R 1971) entitled "American National Standards Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped" and are currently being revised and updated. Copies of this document are available from the American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018. The regulation also specifies additional measures required to facilitate the arrival and departure processes for handicapped persons, including matters relating to terminal circulation and flow, the use of the international accessibility symbol, design of ticketing systems, phones, teletypewriters, vehicular loading and unloading areas, parking areas, baggage check-in and retrieval, and walking areas. Existing airport terminals will be required to comply with the ANSI standards within 3 years of the regulation's effective date. AC 150/5200-11, Airport Terminals and the Physically Handicapped, current edition, is, as of the date of this circular, being revised to provide details on the regulation and its implementation. In the meantime, airport terminal planners, designers, and airport authorities should contact appropriate FAA Airports field offices for the latest information and details on the implementation of this regulation.

38. ENERGY CONSERVATION. The airport terminal requires higher energy consumption than most public buildings. This is due primarily to its generally unprotected location and exposure to weather extremes, to the heat loss or gain resulting from the movement of people and baggage through the building, and to its 24-hour-a-day operation. The architect/engineer should pay particular attention to energy conservation early in the planning of a terminal building in order to reduce dependence on irreplaceable and increasingly costly fossil fuels. If a terminal addition is being planned, existing mechanical systems should be analyzed for methods in which they could become more energy efficient. Solar architecture can be incorporated in new or existing buildings to replace or supplement conventional heating systems. Active and/or passive systems can utilize the sun's energy to considerably reduce energy usage in buildings for space heating. Active solar systems generally utilize special hardware to collect and store solar heat in order to replace or supplement conventional heating systems. The installation of an active solar system will result in a substantially higher initial construction cost, but will greatly reduce heating requirements. Passive solar systems simply use solar-oriented and energy-conserving architectural elements, such as maximum southern glazing, and selection of building materials on the basis of thermal properties, with little additional construction cost. This system simply allows solar penetration into the building during sunny winter days. Solid concrete block walls and thickened concrete floors reradiate the heat absorbed from the sun into the building's interior space at night. During the evening or on cold, cloudy days, glazed areas can be sealed with controlled movable insulating louvers. Combined with minimum window exposure on the north, east, and west walls, this passive solar heating system can offset the demand for conventional heating by as much as 50%. Earth berms used around perimeter walls can lower the building profile and further reduce heat gain or loss. The use of vestibules, automatic doors at baggage conveyors passing from exterior to interior spaces, wind-protected baggage unloading areas, and ample lighting control to avoid the necessity of full lighting loads when not required should be considered. In addition to the accommodation of specific terminal functions, resource conservative buildings designed to utilize materials, components, and construction techniques that place a low demand on natural resources should be an overall design objective.

39. NOISE ATTENUATION. Aircraft engines generate sound that is transferred to the terminal building and becomes a problem when it causes discomfort or interferes with communication. Tolerance is affected by the frequency of the noise and length of exposure to it. The medium-to-high-frequency noise, often produced by jet aircraft, will cause a greater disruptive effect on speech and hearing than a low-frequency tone of the same intensity. Noise problems usually occur during the starting of the jet engines and the initial taxiing away from the terminal. While it is not practical to plan for costly noise control measures, terminal construction should be solid and of dense materials, and workmanship should be first class to avoid most problems. Construction materials should be of a type not to preclude their

removal for future additions or modifications. The acceptable noise level for the various specialized terminal building areas varies with respect to the function of each area. Operational and baggage-handling areas with higher degrees of noise acceptability will act as a noise barrier for more sensitive terminal areas if located on the field side of the building. Where possible, the shortest wall of rooms should face the noise source. Noise transmission is reduced by the use of dense building materials and the incorporation of airspace within walls. The use of materials with low transmission loss should be minimized. Transmission of sound through windows can be reduced by using fixed sash and double glazing. Doors, windows, and hardware should be of a heavy duty nature, adequate in quality to assure tight fitting with a minimum of maintenance. Residential construction or inexpensive commercial methods are inappropriate to airport terminals if noise is to be controlled. Building insulation should be specified that will have a high level of noise suppression as well as heat loss reducing qualities. Utilization of sound-absorbing surfaces within rooms and the careful selection of furnishings also contribute to the total room noise reduction.

40. MAINTENANCE CONSIDERATIONS. Nonhub airports usually are very limited from a budget and staffing standpoint. The architect/engineer, in planning an airport terminal facility, should be conscious of this in order to avoid design features that require costly and time-consuming building repair maintenance. For example, terminals with large expansions of glass may be pleasing aesthetically, but require frequent and costly cleaning and repairs. Use of carpeting can be both pleasing to the eye and safe and may be easier to maintain than a resilient tile flooring which requires frequent waxing. In the operational areas where impact damage to walls and columns from baggage carts and tugs is prevalent, building materials should be selected that will withstand the forces of impact, e.g., jacket columns, with steel plates or protect walls with curbs. These and similar considerations can, in the long run, be major factors in determining whether a building design is successful.

41. SYMBOL SIGNS. The American Institute of Graphic Arts in cooperation with the DOT, Office of Facilitation, has undertaken a study to inventory and evaluate symbol systems to be used for transportation-related facilities in the United States. As a result of this effort, in 1974 DOT published Report DOT-OS-40192, Symbol Signs, which recommended a set of 34 symbol signs. The report also contains guidelines for their legibility and presentation. It is anticipated that these symbol signs will eventually be adopted by DOT as standards for all federally funded transportation-related projects. Consequently, their use in new construction projects is highly recommended.

42. AIRPORT SECURITY CONSIDERATIONS. FAR, Part 107, Airport Security, prescribes aviation security rules governing the operators of airports regularly serving airlines to whom FAR's Part 121, Certification and Operations: Domestic, Flag, and Supplemental Air Carriers and Commercial Operators of Large Aircraft (section 121.538), and Part 129, Operations of Foreign Air

Carriers (section 129.25) apply. FAR Part 107 assigns the responsibility and places requirements on the airport operator for maintaining overall airport security. This regulation along with FAR section 121.538, which places a requirement on airlines to screen passengers prior to boarding the aircraft, has had a major effect on the design and layout of airport terminal buildings. The architect/engineer should contact airport management and the FAA for interpreting these regulations and establishing security planning requirements. In addition to the discussion of passenger security screening contained in paragraph 31c and security measures described in previous paragraphs of this circular, the following material points out other aspects of this important consideration.

a. Access to the Air Operations Area (AOA). FAR Part 107 (and section 121.538) includes requirements for securing the AOA to deter and prevent access by unauthorized persons and vehicles. The AOA is described as that portion of the airport designed and used for landing, taking off, or surface maneuvering of airplanes. Provisions must be made to prevent unauthorized access into the AOA, including access from a terminal building. This can be accomplished by installing security fencing, gates, or doors separating the secured AOA from the unsecured public area. Vehicles using service roads that provide access to the AOA must pass through controlled gates. Passengers are permitted access to the AOA only after undergoing passenger screening. Obviously, it is important in the design of the terminal building to limit the number and provide for the control of the doors, gates, passageways, conveyor belts, jetways, stairwells, etc., that provide direct or indirect access to the AOA. Doors leading to the AOA that are not under visual control of authorized personnel must be locked or equipped with alarms that will signal unauthorized use. Fire codes permit the locking of emergency exits provided they contain panic knockout devices.

b. Observation Decks. An effective barrier is needed on decks to deter and prevent unauthorized access from them to the aircraft parked on the apron and to deter persons from hurling dangerous objects at an airplane from the observation deck.

c. Coin-operated Locker Security. Lockers provide a valuable and desired service to the traveling public. Obviously, from a security view, the best location for coin-operated lockers is within a sterile concourse; however, this is not always possible. If lockers cannot be located within a secured area, the FAA recommends the location in those public areas where an explosion would cause the least amount of injuries and damage. Consideration should be given to their location in the building and the material used. The construction of blast-proof barriers for protection purposes may be advisable.

d. Curbside Check-in Facilities. Curbside check-in facilities are used infrequently at nonhub airports. However, if such procedures are employed, facilities for the safe and secure storage of baggage tags are required. This prevents the baggage tags from being stolen and utilized to introduce bombs or incendiary devices aboard aircraft.

e. Security Guidance Material. In addition to the FAR's previously cited, the FAA publishes AC 107-1, Aviation Security - Airports, current edition, which discusses in greater detail many aspects of airport security. Additional guidance is contained in the following AC's:

(1) AC 121-17, Aviation Security: Certain Air Carriers and Commercial Operators - Security Programs and Other Requirements, current edition.

(2) AC 135-4, Aviation Security: Air Taxi Commercial Operators (ATCO), current edition.

43. ENVIRONMENTAL IMPACT ANALYSIS. An environmental assessment may be required for a terminal building facility at a nonhub location. Guidance on this determination and subsequent requirements are discussed below.

a. Requirement for Environmental Assessment. If proposed terminal expansion or new construction involves the FAA through an ADAP grant application, it may be necessary to prepare an analysis of the environmental consequences of the project. Appendix 6 to FAA Order 1050.1, Policies and Procedures for Considering Environmental Impacts, current edition, requires the preparation of an environmental assessment for the following projects:

(1) Major new construction or expansion of passenger handling or parking facilities proposed to be accomplished with Federal funding. Major new construction or expansion is defined as "development on a hub airport that would provide for accommodation of part or whole of an aggregate increase of 25% (but not less than 100,000) in enplanements for the forecast period." For the most part, nonhub locations will not be dealing with this projected volume of enplanements; however, there may be cases in which a nonhub is proposing development to accommodate such future increases in enplanement level.

(2) Any terminal development that involves Federal funding and will have a significant impact on the environment or is highly controversial. Appendix 6 to FAA Order 1050.1 lists the types of significant impacts and controversy which generate the requirement for an environmental assessment.

(3) Any terminal development that involves Federal funding and involves one or more of the following:

(i) Use of any Department of Transportation Act Section 4(f) lands (i.e., publicly owned parks, recreation areas, wildlife and waterfowl refuges of local, state, or national significance and public or privately owned historic sites of local, state, or national significance).

(ii) An effect on property included in or eligible for inclusion in the National Register of Historic Places or other property of state or local historical, architectural, archeological, or cultural significance.

(iii) Wetlands, flood plains, or coastal zones.

(iv) Endangered or threatened species.

(4) Land acquisition associated with the above items plus any land acquisition which causes relocation of residential or business activities.

b. Environmental Factors to be Considered. For any of the above proposed projects, the airport sponsor must prepare and submit to the FAA an environmental assessment exploring potential environmental consequences. The environmental factors to be considered are detailed in Chapter 5, of Appendix 6, FAA Order 1050.1. Prior to the airport sponsor or the consultant initiating the preparation of an assessment, it is advisable to consult with the local FAA Airports District Office or regional office to define those issues which must be addressed. The holding of a public hearing may be advisable, particularly in a case of potential significant impacts or public controversy. The FAA will use the environmental assessment to determine whether to prepare an environmental impact statement or a finding of no significant impact. An environmental impact statement is required if the FAA believes the proposed project would have significant impacts or is highly controversial on environmental grounds.

c. Other Environmental Requirements. Many states and local governments now have environmental laws and regulations. It is especially advantageous to the airport sponsor or the consultant to spend the time early in the project development on coordination with local, state, and Federal officials concerned with environmental issues. This early coordination can help to clear up questions and issues, assist in the identification of impacts, trigger advance planning of mitigation measures, and inform interested parties of the proposed project. In accordance with the DOT's policy and the Council of Environmental Quality's regulations, it is intended that a single environmental document meet all Federal, state, and local requirements.

## APPENDIX 1. Bibliography

1. The latest issuance of the following free advisory circulars may be obtained from the Department of Transportation, Publications Section, M-443.1, Washington, D.C. 20590. AC 00-2, updated triannually, contains the listing of all current issuances of these circulars and changes thereto.
  - a. AC 00-2, Advisory Circular Checklist. Transmits the revised checklist of current FAA advisory circulars.
  - b. AC 00-44, Status of the Federal Aviation Regulations. Lists FAR prices and provides ordering instructions for purchasing the regulations.
  - c. AC 150/5000-3, Address List of Regional Airports Divisions and Airports District/Field Offices.
  - d. AC 150/5200-11, Airport Terminals and the Physically Handicapped. Discusses the problems of the physically handicapped air traveler and suggests features that can be incorporated in modification or new construction of airport terminal buildings.
  - e. AC 150/5300-2, Airport Design Standards - Site Requirements for Terminal Navigational Facilities. Provides information regarding the relative location and siting requirements for the terminal navigation facilities located on or close to an airport.
  - f. AC 150/5300-4, Utility Airports - Air Access to National Transportation. Establishes design standards for utility airports which are constructed for and intended to be used in propeller-driven aircraft of 12,500 pounds (5670 kg) maximum gross weight or less.
  - g. AC 150/5300-6, Airport Design Standards, General Aviation Airports, Basic and General Transport. Provides recommended design criteria for the development of larger than general utility airports.
  - h. AC 150/5325-5, Aircraft Data. Presents a listing of aircraft affecting airport design for guidance in airport development.
  - i. AC 150/5325-6, Airport Design Standards - Effects and Treatment of Jet Blast. Presents criteria on the jet engine blast velocities associated with aircraft in common use in air carrier service, the effects of these blast velocities during ground operations, and suggested means to counteract or minimize these effects.
  - j. AC 150/5335-1, Airport Design Standards - Airports Served by Air Carriers - Taxiways. Provides criteria on taxiway design for airports served by certificated route air carriers with present airplanes and those anticipated in the near future.

k. AC 150/5335-4, Airport Design Standards - Airports Served by Air Carriers - Runway Geometrics. Provides criteria on runway geometric design for airports served by certificated route air carriers.

l. AC 150/5360-4, Announcement of Availability--Guidelines for Federal Inspection Services Facilities at International Airports of Entry and at Landing Rights Airports. Announces the availability of a booklet containing more current information on the requirements for Federal Inspection Services at airports of entry and at landing rights airports.

m. AC 150/5360-6, Airport Terminal Building Development with Federal Participation. Provides guidance pertaining to Federal participation in airport terminal building construction under the provisions of the Airport and Airway Development Act, as amended.

n. AC 150/5360-7, Planning and Design Consideration for Airport Terminal Building Development. Presents planning and design procedures to be considered in airport terminal building development funded under the Airport and Airway Development Act, as amended.

o. AC 150/5900-1, The Planning Grant Program for Airports. Offers guidance to the sponsors of airport system plans and airport master plans on how to participate in the FAA's Planning Grant Program. It describes the application process and the administrative procedures to be followed in performing planning projects.

p. AC 70/7460-1, Obstruction Marking and Lighting. Describes FAA standards on obstruction marking and lighting and establishes the methods, procedures, and equipment types for both aviation red and high intensity white obstruction lights.

q. AC 107-1, Aviation Security - Airports. Furnishes guidance to those individuals and organizations having responsibilities under Part 107 of the Federal Aviation Regulations. It also provides recommendations for establishing and improving security for restricted or critical facilities and areas the security of which is not dealt with in Part 107.

2. The following advisory circulars and Federal Aviation Regulations (FAR) may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Refer to AC 00-2 and AC 00-44 for pricing and additional ordering information.

a. AC 150/5070-6, Airport Master Plans. Provides guidance for the preparation of individual airport master plans as provided for under the Airport and Airway Development Act of 1970.

b. FAR Part 77, Objects Affecting Navigable Airspace. Provides criteria and standards for determining obstructions in navigable airspace and their determination of effects on the safe and efficient use of airspace.



c. FAR Part 107, Airport Security. Prescribes aviation security rules and requirements for operators of airports serving scheduled certificated air carriers and commercial operators of large aircraft engaged in intrastate common carriage.

d. FAR Part 121, Certification and Operations: Domestic, Flag, and Supplemental Air Carriers and Commercial Operators of Large Aircraft. Prescribes certification and operational requirements for air carriers and commercial operators of large aircraft.

e. FAR Part 129, Operations of Foreign Air Carriers. Prescribes rules governing the operation of foreign air carrier aircraft within the United States.

f. FAR Part 152, Airport Aid Program. Prescribes the policies and procedures for administering the Airport Aid Program for airport development and planning grant projects under the Airport and Airway Development Act of 1970, as amended.

3. The following Government reports are for sale and may be obtained from the National Technical Information Service (NTIS), Springfield, Virginia 22151. The number in brackets following the report title represents the NTIS ordering number.

a. FAA-RD-73-82, The Apron-Terminal Complex, Analysis of Concepts for Evaluation of Terminal Buildings (AD-771 186).

b. FAA-RD-75-191, The Apron and Terminal Building Planning Report (AD-A018 120).

c. FAA-AP-77-1, Environmental Assessment of Airport Development Actions (AD-A039 274).

d. DOT-OS-40192, Symbol Signs (PB-239 352).

4. The following Federal Aviation Administration order may be obtained on request at any FAA Regional Office or Airports District Office.

a. Order 1050.1C, Policies and Procedures for Considering Environmental Impacts.