

## APPENDIX A. Additional References, Glossary and Acronyms

### A.1. REFERENCES AND PROJECT MATERIALS TO REVIEW

The contractor must become thoroughly familiar with each of the following documents and guidance. The most current versions of FAA ACs can be accessed by selecting the “Advisory Circulars” link on the FAA homepage ([www.faa.gov](http://www.faa.gov)).

- A. The requirements in this guidance and attachments.
- B. AC 150/5300-16, *General Guidance and Specifications for Aeronautical Surveys - Establishment Of Geodetic Control And Submission To The National Geodetic Survey.*
- C. AC 150/5300-17, *A General Specifications and guidance for Aeronautical Surveys - Airport Imagery Acquisition and Submission to the National Geodetic Survey.*
- D. AC 150/5340-1, *Standards for Airport Markings.*
- E. AC-150/5210-20, *Ground Vehicle Operations on Airports.*
- F. AC 150/5340-18, *Standards For Airport Sign Systems.*
- G. NGS Aeronautical Survey Program:  
<http://www.ngs.noaa.gov/AERO/aero.html>.
- H. FAA Web site for location identifiers:  
[http://www.faa.gov/airports\\_airtraffic/air\\_traffic/publications/atpubs/LID/LIDHME.HTM](http://www.faa.gov/airports_airtraffic/air_traffic/publications/atpubs/LID/LIDHME.HTM)
- I. FAA Web site for airport managers.  
[http://www.faa.gov/airports\\_airtraffic/airports/airport\\_safety/airportdata\\_5010/](http://www.faa.gov/airports_airtraffic/airports/airport_safety/airportdata_5010/)
- J. Input Formats and Specifications of the National Geodetic Survey Data Base, The “Blue Book”  
<http://www.ngs.noaa.gov/FGCS/BlueBook/>
- K. Listing of airports with PACS and SACS and the dates that they were observed is available at:  
<http://www.ngs.noaa.gov/cgi-bin/airports.prl?TYPE=PACSAC>
- L. Aeronautical Information Manual, *Official Guide to Basic Flight Information and ATC Procedures.*  
[http://www.faa.gov/airports\\_airtraffic/air\\_traffic/publications/atpubs/aim/](http://www.faa.gov/airports_airtraffic/air_traffic/publications/atpubs/aim/)

### APPROPRIATE PAGES FROM U.S. TERMINAL PROCEDURES

U.S. Terminal Procedures are published in 20 loose leaf or perfect bound volumes covering the conterminous U.S., Puerto Rico, and the Virgin Islands. A Change Notice is published at the midpoint

between revisions in bound volume format. The latest edition of the U.S. Terminal Procedures can be obtained from FAA Aeronautical chart agents. The Terminal Procedures Publications include:

A. Instrument Approach Procedure (IAP) Charts: IAP charts portray the aeronautical data that is required to execute instrument approaches to airports. Each chart depicts the IAP, all related navigation data, communications information, and an airport sketch. Most procedures are designated for use with a specific electronic NAVAID, such as Instrument Landing System (ILS), Very High Frequency Omnidirectional Range (VOR), Nondirectional Radio Beacon (NDB), etc.

B. Airport Diagrams: Full page airport diagrams are designed to assist in the movement of ground traffic at locations with complex runway/taxiway configurations and provide information for updating geodetic position navigational systems aboard aircraft. (**NOTE:** *Airport Diagrams are not available for all airports.*)

### **APPROPRIATE PAGES FROM AIRPORT/FACILITY DIRECTORY**

The Airport/Facility Directory is a manual that contains data on public use and joint use airports, seaplane bases, heliports, VFR airport sketches, NAVAIDS, communications data, weather data sources, airspace, special notices, and operational procedures. The Airport/Facility Directory includes data that cannot be readily depicted in graphic form: e.g., airport hours of operation, types of fuel available, runway data, lighting codes, etc. The Airport/Facility Directory is published every 56 days by the National Aeronautical Charting Office, FAA. The latest edition of the Airport/Facility Directory can be obtained from FAA Aeronautical chart agents.

### **FAA NATIONAL FLIGHT DATA DIGEST (NFDD)**

A daily (except weekends and Federal holidays) publication of flight information appropriate to aeronautical charts, aeronautical publications, Notices to Airmen, or other media serving the purpose of providing operational flight data essential to safe and efficient aircraft operations.

### **FAA FORM 5010, AIRPORT MASTER RECORD**

The FAA Form 5010 is prepared for all public-use airports. This master record contains comprehensive data on airports, including obstacles. Much of the information on FAA Form 5010 comes from unverified sources. Often, obstacle heights and positions are estimates which have not been measured and verified by instruments. For these reasons, the Airport Master Record is to be consulted for informational purposes only.

## A.2. GLOSSARY

**Accuracy** – The degree of conformity with a standard, or a value accepted as correct. Precision is the degree of uniformity of repeated measurements or events. For example, repeat measurements of the distance between two points may exhibit a high degree of precision by virtue of the relative uniformity of the measurements. However, if a "short" tape were used in the measurements, accuracy would be poor in that the measured distance would not conform to the true distance between the points. Surveying and mapping accuracy standards should include three elements: (1) a stated variation from a true value or a value accepted as correct, (2) the point to which the new value is relative, and (3) the probability that the new value will be within the stated variation. For example, "Horizontal accuracy will be 10 cm relative to the nearest Continuously Operating Reference Station (CORS) at the 95 percent confidence level."

**Abeam Point** – The point on a line that is nearest to an off line point (for example, a point on the runway centerline is "abeam" the Glide Slope Antenna when the distance from the centerline point to the antenna is at a minimum).

**Accelerate-Stop Distance Available (ASDA)** – The runway plus stopway length declared available and suitable for the acceleration and deceleration of an airplane aborting a takeoff.

**Aeronautical Beacon** – A visual navigational aid displaying flashes of white and/or colored light to indicate the location of an airport, a heliport, a landmark, a certain point of a federal airway in mountainous terrain, or an obstruction. (Refer to **Airport Rotating Beacon** under **Airport Lighting**.)

**Air Navigation Facility** – Any facility used in, available for use in, or designed for use in, aid of air navigation, including landing areas, lights, any apparatus or equipment for disseminating weather information, for signaling, for radio-directional finding, or for radio or other electrical communication, and any other structure or mechanism having a similar purpose for guiding or controlling flight in the air or the landing and takeoff of aircraft. (Refer to **Navigational Aid**.)

**Airport** – An area on land or water that is used or intended to be used for the landing and takeoff of aircraft and includes its buildings and facilities, if any.

**Airport Elevation** – The highest point of an airport's usable runways measured in feet from mean sea level (technically, from the vertical datum).

**Airport Lighting** – Various lighting aids that may be installed on an airport. Types of airport lighting include:

- **Airport Rotating Beacon (APBN)** – A visual navigational aid operated at many airports. At civil airports, alternating white and green flashes indicate the location of the airport. At military airports, the beacons flash alternately white and green, but are differentiated from civil beacons by dual-peaked (two quick) white flashes between the green flashes.
- **Approach Light System (ALS)** – An airport lighting facility which provides visual guidance to landing aircraft by radiating light beams in a directional pattern by which the pilot aligns the aircraft with the extended centerline of the runway on his final approach for landing. Condenser-Discharge Sequential Flashing Lights/Sequenced Flashing Lights may be installed in conjunction with the ALS at some airports.

- ***Omnidirectional Approach Light System (ODALS)*** – Seven omnidirectional flashing lights located in the approach area of a nonprecision approach. Five lights are located on the runway centerline extended with the first light located 300 feet from the threshold and extending at equal intervals up to 1,500 feet from the threshold. The other two lights are located, one on each side of the runway threshold, at a lateral distance of 40 feet from the runway edge or 75 feet from the runway edge when installed on a runway equipped with a VASI.
- ***Precision Approach Path Indicator (PAPI)*** – A visual approach slope indicator normally consisting of light units similar to the VASI but in a single row of either two or four light units set perpendicular to the runway centerline. The row of light units is normally installed on the left side of the runway. Indications are as follows: Below glide path – all lights red; Slightly below glide path – three lights closest to runway red, other light white; On glide path – two lights closest to runway red, other two lights white; Slightly above glide path – light closest to runway red, other three lights white; Above glide path – all lights white.
- ***Pulsating Visual Approach Slope Indicator (PVASI)*** – A pulsating visual approach slope indicator normally consists of a single light unit projecting a two-color visual approach path into the final approach area of the runway upon which the indicator is installed. The on glide path indication is a steady white light. The slightly below glide path indication is a steady red light. If the aircraft descends further below the glide path, the red light starts to pulsate. The above glide path indication is a pulsating white light. The pulsating rate increases as the aircraft gets further above or below the desired glide slope.
- ***Runway Alignment Indicator Lights (RAIL)*** – Sequenced Flashing Lights (SFLs) which are installed only in combination with other light systems.
- ***Runway End Identifier Lights (REIL)*** – Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.
- ***Threshold Lights*** – Fixed green lights arranged symmetrically left and right of the runway centerline identifying the runway end. When all light units are located outside the runway edge or runway edge extended, the runway end lights are considered to be “outboard.” If any light unit is located inside the runway edge or runway edge extended, the lights are considered to be “inboard.”
- ***Tri-Color Visual Approach Slope Indicator (TRVC)*** – A visual approach slope indicator normally consists of a single light unit projecting a three-color visual approach path into the final approach area of the runway upon which the indicator is installed. The below glide path indication is red; the above glide path indication is amber; and the on glide path indication is green.
- ***Visual Approach Slope Indicator (VASI)*** – An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot is "on path" if he sees red/white, "above path" if white/white, and "below path" if red/red. Some airports serving large aircraft have three-bar VASIs which provide two visual glide paths to the same runway.

**Airport Reference Point (ARP)** – The approximate geometric center of all usable runways. ARP is not monumented, therefore not recoverable on the ground.

**Airport Surface Detection Equipment (ASDE)** – Radar equipment specifically designed to detect all principal features on the surface of an airport, including aircraft and vehicular traffic, and to present the entire image on a radar indicator console in the control tower. This is used to augment visual observation by tower personnel of aircraft and/or vehicular movements on the runways and taxiways.

**Airport Surveillance Radar (ASR)** – Approach control radar used to detect and display an aircraft's position in the terminal area. ASR provides range and azimuth information but does not provide elevation data. Coverage of the ASR can extend up to 60 nautical miles.

**Air Route Surveillance Radar (ARSR)** – Air route traffic control center (ARTCC) radar used primarily to detect and display an aircraft's position while en route between terminal areas.

**Air Route Traffic Control Center (ARTCC)** – A facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace and principally during the en route phase of flight. When equipment and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft.

**Apparent Runway/Stopway Surface (ARS)** – The surface that approximates a runway or stopway before the surface is squared off, shortened to good pavement, or otherwise adjusted to meet the criteria of a runway or stopway.

**Apron** – A defined area on an airport or heliport intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking, or maintenance. With regard to seaplanes, a ramp is used for access to the apron from the water.

**Approach Side** – The side occupied by a landing aircraft before the aircraft has passed the feature.

**Area Navigation** – A method of navigation that permits aircraft operation on any desired course within the coverage of station-referenced navigational signals or within the limits of a self-contained system capability. Area navigation systems include GPS, Inertial, and LORAN-C.

**Area Navigation Approach (ANA)** – An instrument approach procedure using an Area Navigation System.

**Attributes or Attribute Data** – Alphabetical and/or numeric information that describes particular characteristics of a geospatial feature, such as type, dimensions, usage, occupancy, etc.

### **Azimuth**

- **Astronomic Azimuth** – At the point of observation, the angle measured from the vertical plane through the celestial pole and the vertical plane through the observed object. The astronomic azimuth is established directly from observations on a celestial body and is measured in the plane of the horizon. Astronomic azimuths differ from geodetic azimuths because of the deflection of the vertical which can be greater than one minute of arc in extreme cases. Astronomic azimuths may be reckoned clockwise or counter-clockwise, from either north or south, as established by convention.
- **Geodetic** – The angle at point A between the tangent to the meridian at A and the tangent to the geodesic from A to B whose geodetic azimuth is wanted. It may be reckoned clockwise from either geodetic north or south as established by convention. Because of earth curvature, the geodetic azimuth from A to B (forward azimuth) differs from the geodetic azimuth from

B to A (back azimuth) by other than 180 degrees, except where A and B have the same geodetic longitude or where the geodetic latitude of both points is zero. The “geodesic line” is the shortest surface distance between two points on the reference ellipsoid. A “geodetic meridian” is a line on the reference ellipsoid defined by the intersection of the reference ellipsoid and a plane containing the minor axis of that ellipsoid.

- **Grid** – The angle in the plane of projection between a straight line and the central meridian of a plane-rectangular coordinate system. Grid azimuths may be reckoned clockwise from either geodetic north or south as established by convention.
- **Magnetic** – At the point of observation, the angle between the vertical plane through the observed object and the vertical plane in which a freely suspended symmetrically magnetized needle, influenced by no transient artificial magnetic disturbance, will come to rest. Magnetic azimuths are reckoned clockwise from magnetic north.

**Bench Mark** – A relatively permanent natural or artificial material object bearing a marked point whose elevation above or below an adopted surface (datum) is known.

**Blast Fence** – A barrier that is used to divert or dissipate jet or propeller blast.

**Blast Pad** – A specially prepared surface placed adjacent to the ends of runways to eliminate the erosive effect of the high wind forces produced by airplanes at the beginning of their takeoff rolls.

**Catenary** – The curve theoretically formed by a perfectly flexible, uniformly dense and thick, inextensible cable suspended from two points. Also a cable suspended between two points having the approximate shape of a catenary.

**Clearway** – An area beyond the takeoff runway under the control of airport authorities within which terrain or fixed obstacles may not extend above specified limits. These areas may be required for certain turbine-powered operations and the size and upward slope of the clearway will differ depending on when the aircraft was certificated.

**Collection** – Any combination of data submitted by a provider at a given time.

**Compass Locator** – A low power, low or medium frequency (L/MF) radio beacon installed at the site of the outer or middle marker of an instrument landing system (ILS). It can be used for navigation at distances of approximately 15 miles or as authorized in the approach procedure.

**Control Station** – A point on the ground whose position and/or elevation is used as a basis for obtaining positions and/or elevations of other points.

**Continuously Operating Reference Station (CORS)** – A permanent GPS facility whose GPS receiver continuously provides observables from the GPS satellites, allowing stations occupied temporarily by GPS receivers to be differentially positioned relative to it. CORS are related to the NAD83 coordinate system at the 1-3 cm level either by being collocated at VLBI sites which were used to define the coordinate system or by being differentially positioned relative to such a collocated GPS station.

**Datum** – In general, a point, line, surface, or set of values used as a reference. A “geodetic datum” is a set of constants specifying the coordinate system and reference used for geodetic control (refer to **Control Station**), i.e. for calculating coordinates of points on the earth. At least eight constants are needed to form a complete datum: three to specify the location of the origin of the coordinate system; three to

specify the orientation of the coordinate system; and two to specify the dimensions of the reference ellipsoid. Any point has a unique X, Y, Z datum coordinate which can be transformed into latitude, longitude, and ellipsoid height (height relative to the ellipsoid). A “horizontal control datum” is a geodetic datum specified by two coordinates (latitude and longitude) on the ellipsoid surface, to which horizontal control points are referenced. A “vertical datum” is a theoretical equipotential surface with an assigned value of zero to which elevations are referenced. (Refer to **GEOID**.)

**Datum Tie** – The process of determining, through appropriate survey methods, a position (horizontal tie) or elevation (vertical tie) of a new point relative to a control station with established datum values such as a control station in the National Spatial Reference System (NSRS). The new point may be a permanent survey monument. This process ensures that the new point will have the proper relationship to NSRS and to all other points tied to NSRS.

**Direction Finder (DF)** – A radio receiver equipped with a directional sensing antenna used to take bearings on a radio transmitter.

**Distance Measuring Equipment (DME)** – Equipment (airborne and ground) used to measure the slant range distance of an aircraft from the DME navigational aid in nautical miles. DME is usually frequency paired with other navigational aids such as a VOR or localizer.

**Displaced Threshold** – A threshold that is located at a point on the runway other than the designated runway end. The displaced area is available for takeoff or rollout of aircraft, but not for landing. A displaced threshold does not mark the end of a runway.

**Ellipsoid** – Refer to **Reference Ellipsoid**.

**Ellipsoid Height** – The distance between a point and the reference ellipsoid taken along the perpendicular to the ellipsoid. Ellipsoid heights are the heights resulting from GPS observations. Ellipsoid heights are positive if the point is above the ellipsoid.  $\text{Ellipsoid Height} = \text{GEOID Height} + \text{Orthometric Height}$ .

**Feature** – A manmade or natural object that appears in the real world such as a building, runway, navigational aid or river.

**Feature Type** – A collection of all features of a given type such as all runways or all buildings. Feature Types are analogous to layers in many GIS applications and are also referred to as Entity Types and Feature Classes in other standards.

**Feature Instance** – A specific feature such as runway 10/28 at Baltimore Washington International Airport.

**Federal Base Network (FBN)** – A fundamental reference network of permanently monumented control stations in the United States at a 1 degree x 1 degree nominal spacing, established, maintained, and monitored by the National Geodetic Survey, providing precise latitude, longitude, ellipsoidal height, orthometric height, and gravity values. The FBN is a very precise subset of the National Spatial Reference System.

**First Good Pavement (FGP)** – The first point on a paved surface through which a perpendicular line to the surface centerline can be constructed to define a runway or stopway end. While this point need not be on the runway/stopway centerline, it must be located so that the resulting runway/stopway surface is rectilinear with full structural integrity to the end. The FGP location is a fundamental factor in establishing runway/stopway length and width.

**Flight Path** – A line, course, or track along which an aircraft is flying or intended to be flown.

**Frangible** – A type of fixture or fixture mounting designed to break at a predetermined point if accidentally struck by an aircraft, resulting in minimal damage to the aircraft.

**GEOID** – The theoretical surface of the earth that coincides everywhere with approximate mean sea-level. The GEOID is an equipotential surface to which, at every point, the plumb line is perpendicular. Because of local disturbances of gravity, the GEOID is irregular in shape.

**GEOID Height** – The distance, taken along a perpendicular to the reference ellipsoid, between the reference ellipsoid and the GEOID. The GEOID height is positive if the GEOID is above the reference ellipsoid. (GEOID height is negative for the conterminous United States). GEOID Height = Ellipsoidal Height – Orthometric Height.

**Geospatial Data, Geospatially-Referenced Data or Geospatial Vector Data** – Data that identifies the geographic location (2D or 3D coordinates) and characteristics (feature attributes) of natural or constructed features and boundaries on the earth. This information may be derived from remote sensing and surveying technologies. The features are represented by a point, line, or polygon. The position of a point feature is described by a single coordinate pair (or triplet for three dimensional data). The spatial extent of a line feature is described by a string of coordinates of points lying along the line, while the extent of a polygon feature is described by treating its boundary as a line feature. Vector data may be stored in a sequential, a chain node, or a topological data structure.

**Global Positioning System (GPS)** – A space-based radio-positioning, navigation, and time-transfer system. The system provides highly accurate position and velocity information and precise time on a continuous global basis, to an unlimited number of properly equipped users.

**Ground Controlled Approach (GCA)** – A radar approach system operated from the ground by air traffic control personnel transmitting instructions to the pilot by radio. The approach may be conducted with airport surveillance radar (ASR) only or with both surveillance and precision approach radar (PAR).

**Helipad** – A small designated area, usually with a prepared surface, on a heliport, airport, landing/takeoff area, apron/ramp, or movement area used for takeoff, landing, or parking of helicopters.

**Heliport** – An area of land, water, or structure used or intended to be used for the landing and takeoff of helicopters, including its buildings and facilities if any.

**Heliport Reference Point (HRP)** – The geographic position of the heliport expressed in latitude and longitude at (1) the center of the final approach and takeoff (FATO) area or the centroid of multiple FATOs for heliports having visual and nonprecision instrument approach procedures or (2) the center of the final approach reference area when the heliport has a precision instrument approach.

**Horizontal Survey Point** – A point that represents the horizontal position of a feature. This point may be located on the feature or located between feature components. For example, the horizontal survey point for a Precision Approach Path Indicator (PAPI) system is the center of the light array which falls between light units.

**Inboard/Outboard Lights** – Used in reference to runway end and threshold lights. The light configuration is considered “inboard” if the center of any light unit in the light array is located inside the runway edge or edge extended. The light configuration is considered “outboard” if all light centers in the



light array are located outside the runway edge or edge extended. In this definition, “light array” includes the lights on both sides of the runway.

**Instrument Landing System (ILS)** – A precision instrument approach system which normally consists of the following electronic components and visual aids: Localizer, Middle Marker, Glide Slope, Approach Lighting, Outer Marker.

**Instrument Runway** – A runway equipped with electronic and visual navigational aids for which a precision or nonprecision approach procedure having straight-in landing minimums have been approved.

**International Civil Aviation Organization (ICAO)** – A specialized agency of the United Nations whose objective is to develop the principles and techniques of international air navigation and to foster planning and development of international civil air transport.

**Landing Area** – Any locality used or intended to be used for the landing and takeoff of aircraft. The locality may be on land, water, or structure including airports/heliports, and intermediate landing fields whether or not facilities are provided for shelter, servicing, or for receiving or discharging passengers or cargo.

**Landing Direction Indicator** – A device, usually a tetrahedron, which visually indicates the direction in which landings and takeoffs should be made.

**Leveling** – The process of determining the difference in elevation between two points. In geodetic leveling, this process results in a vertical distance from a vertical datum.

- **Direct** – The determination of differences in elevation by means of a series of horizontal observations on a graduated rod. The leveling instrument maintains a horizontal line of sight through spirit leveling or a compensation mechanism. The rod is observed while it is resting on a point of known elevation (backsight) and then, without disturbing the elevation of the leveling instrument, is observed a second time while resting on the unknown point (foresight). The differential in rod readings is applied to the starting elevation to determine the elevation of the unknown.
- **Indirect** – The determination of differences in elevation by means other than differential leveling, such as trigonometric leveling. In trigonometric leveling, the vertical angle and distance from the instrument to the point of unknown elevation are measured, and the difference in elevation between the instrument and the unknown point is computed using trigonometry.

**Local Control** – A control station or network of control stations in a local area used for referencing local surveys. Local control may or may not be tied to the National Spatial Reference System. (See Control Station).

**Localizer (LOC)** – The component of an ILS which provides course guidance to the runway.

**Localizer Back Course** – The course line defined by the localizer signal along the extended centerline of the runway in the opposite direction from the normal localizer approach course (front course.)

**Localizer Type Directional Aid (LDA)** – A navigational aid used for nonprecision instrument approaches with utility and accuracy comparable to a localizer but which is not part of a complete ILS and is not aligned with the runway.

**Long Range Navigation (LORAN)** – An electronic navigation system by which hyperbolic lines of position are determined by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. LORAN A operates in the 1750 - 1950 kHz frequency band. LORAN C and D operate in the 100 - 110 kHz frequency band.

**Marker Beacon** – An electronic navigational facility transmitting a 75 MHz vertical fan or bone-shaped radiation pattern to be received by aircraft flying overhead. Marker beacons are identified by their modulation frequency and keying code, and when received by compatible airborne equipment, indicate to the pilot aurally and visually that he is passing over the facility.

- **Back Course Marker (BCM)** – When installed, normally indicates the localizer back course final approach fix where approach descent is commenced.
- **Inner Marker (IM)** – A marker beacon, used with an ILS Category II precision approach, located between the middle marker and the end of the ILS runway and normally located at the point of designated decision height (normally 100 feet above the touchdown zone elevation) on the ILS Category II approach. It also marks progress during a ILS Category III approach.
- **Middle Marker (MM)** – A marker beacon that defines a point along the glideslope of an ILS, normally located at or near the point of decision height for ILS Category I approaches.
- **Outer Marker (OM)** – A marker beacon at or near the glideslope intercept altitude of an ILS approach. The outer marker is normally located four to seven miles from the runway threshold on the extended centerline of the runway.

**Mean Sea Level (MSL)** – The average location of the interface between the ocean and atmosphere, over a period of time sufficiently long so that all random and periodic variations of short duration average to zero.

**Metadata** – Information about the data itself such as source, accuracy, dates for which the data are valid, security classification, etc. Metadata is essential in helping users determine the extent on which they can rely on a given data item to make decisions.

**Minimum Safe Altitude Warning (MSAW)** – A function of the ARTS III computer that aids the controller by alerting him when a tracked Mode C equipped aircraft is below or is predicted by the computer to go below a predetermined minimum safe altitude.

**Minimums** – Weather condition requirements established for a particular operation or type of operation; e.g., IFR takeoff or landing, alternate airport for IFR flight plans, VFR flight etc.

**Missed Approach** – A maneuver conducted by a pilot when an instrument approach cannot be completed to a landing.

**Movement Area** – The runways, taxiways, and other areas of an airport/heliport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports/heliports with a tower, specific approval for entry onto the movement area must be obtained from ATC.

**National Airspace System (NAS)** – The common network of U.S. airspace air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules,

regulations, and procedures, technical information, and manpower and material. Included are system components shared jointly with the military.

**National Flight Data Center (NFDC)** – A facility in Washington, D.C., established by the FAA to operate a central aeronautical information service for the collection, validation, and dissemination of aeronautical data in support of the activities of government, industry, and the aviation community. The information is published in the "National Flight Data Digest."

**National Flight Data Digest (NFDD)** – A daily (except weekends and Federal holidays) publication of flight information related to aeronautical charts, aeronautical publications, Notices to Airmen, or other media serving the purpose of providing operational flight data essential to safe and efficient aircraft operations.

**National Spatial Reference System (NSRS)** – A network of permanent survey monuments located throughout the United States with accurately determined positions (horizontal network) and/or elevations (vertical network). Gravity values, not always monumented, are also part of NSRS. Responsibility for establishing and maintaining NSRS rests with the National Geodetic Survey under the U.S. Department of Commerce. Current authority is contained in United States Code, Title 33, USC 883a as amended, and specifically defined by Executive Directive, Bureau of the Budget (now Office of Management and Budget) Circular No. A-16 Revised.

**Navigable Airspace** – Airspace at and above the minimum flight altitude prescribed in the FARs, including airspace needed for safe takeoff and landing.

**Navigational Aid (NAVAID)** – Any visual or electronic device airborne or on the surface which provides point-to-point guidance information or position data to aircraft in flight. (Refer to Air Navigation Facility).

**Nondirectional Beacon (NDB)** – An L/MF or UHF radio beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his bearing to or from the radio beacon and "home" or track to or from the station. When the NDB is installed in conjunction with an Instrument Landing System marker, it is normally called a Compass Locator.

**Nonprecision Approach Procedure** – A standard instrument approach procedure in which no electronic glide slope is provided; e.g., VOR, TACAN, NDB, LOC, ASR, LDS, and SDF approaches.

**Notice to Airmen (NOTAM)** – A notice containing information (not known sufficiently in advance to publicize by other means) concerning the establishment, condition, or change in any component (facility, service, or procedure of, or hazard in the National Airspace System) the timely knowledge of which is essential to personnel concerned with flight operations.

**Objective Evidence** – The observational and computational data supporting the information being provided. This evidence is used in the verification process to prove the provided aeronautical information and substantiate the change being made.

**Obstacle** – Any object that has a vertical element to it and may or may not penetrate an obstruction identification surface.

**Obstruction** – Any object that penetrates an obstruction identification surface.

**Obstruction Identification Surface (OIS)** – Any imaginary surface authorized by the FAA to identify obstructions. Any object that penetrates an OIS is an obstruction, by definition.

- **Specified OIS** – Any OIS other than a supplemental OIS.
- **Supplemental OIS** – An OIS designated by appropriate FAA authorities as a supplemental OIS. A supplemental OIS, when implemented, will normally lie below a specified OIS and is intended to provide additional obstruction information. An object that penetrates a supplemental OIS only is a supplemental obstruction.

**Offset NAVAID** – A NAVAID used during the final approach segment of a straight in instrument approach and not located on the runway centerline or centerline extended.

**Orthometric Height** – The distance taken along the plumb line between a point and the GEOID. Orthometric heights are positive if the point is above the GEOID. Orthometric Height = Ellipsoid Height – GEOID Height.

**Orthophoto** – An aerial image that has been taken from above (either from an aircraft or a satellite) and has been spatially corrected so that features shown on the photo are displayed in their actual geographic position within a specified range of tolerance.

**Outboard Lights** – Refer to **Inboard/Outboard Lights**.

**Photogrammetry** – The process of creating vector data such as building outlines and elevation contours from stereo imagery (pairs of images taken of the same location but at different angles).

**Positional Accuracy** – The difference between a geospatial feature's displayed position and its actual position. Absolute positional accuracy is the difference between a geospatial feature's displayed position and its actual position on the face of the earth. Relative positional accuracy is the difference between a geospatial feature's displayed position and that of other geospatial features in the same data set.

**Precision** – The smallest separation that can be represented by the method employed to make the positional statement which is the number of units or digits to which a measured or calculated value is expressed and used

**Precision Approach Procedure** – A standard instrument approach procedure in which an electronic glideslope/glidepath is provided; e.g., GPS, ILS, and PAR approaches.

**Precision Approach Radar (PAR)** – Radar equipment in some ATC facilities operated by FAA and/or the military services at joint use civil/military locations and separate military installations used to detect and display azimuth, elevation, and range of aircraft on the final approach course to a runway. This equipment may be used to monitor certain non-radar approaches but is primarily used to conduct a precision instrument approach wherein the controller issues guidance instructions to the pilot based on the aircraft's position in relation to the final approach course (azimuth), glidepath (elevation), and distance (range) from the touchdown point on the runway as displayed on the radar scope.

**Primary Airport Control Station (PACS)** – A control station established in the vicinity of, and usually on, an airport, and tied directly to the National Spatial Reference System. PACS must be declared PACS by the National Geodetic Survey and must meet the specific siting, construction, and accuracy requirements for PACS.

**Progressive Taxi** – Precise taxi instructions given to a pilot unfamiliar with the airport or issued in stages as the aircraft proceeds along the taxi route.

**Published Data** – Data officially issued for distribution to the public.

**Radio Detection and Ranging (RADAR)** – A device which provides information on range, azimuth, and/or elevation of objects in the path of the transmitted pulse by measuring the time interval between transmission and reception of radio pulses and correlating the angular orientation of the radiated antenna beam or beams in azimuth and/or elevation.

- **Primary Radar** – A radar system in which a minute portion of a radio pulse transmitted from a site is reflected by an object and then received back at the site for processing and display at an air traffic control facility.
- **Secondary Radar/Radar Beacon (ATCRBS)** – A radar system in which the object to be detected is fitted with cooperative equipment in the form of a radio receiver/transmitter (transponder). Radar pulses transmitted from the searching transmitter/receiver (interrogator) site are received in the cooperative equipment and used to trigger a distinctive transmission from the transponder. This reply transmission (rather than a reflected signal) is then received back at the transmitter/receiver site for processing and display at an air traffic control facility.

**Radar Approach** – An instrument approach procedure which utilizes Precision Approach Radar (PAR) or Airport Surveillance Radar (ASR).

**Radio Beacon** – Refer to **Nondirectional Beacon**.

**Ramp** – Refer to **Apron**.

**Reference Ellipsoid** – A geometric figure comprising one component of a geodetic datum, usually determined by rotating an ellipse about its shorter (polar) axis, and used as a surface of reference for geodetic surveys. The reference ellipsoid closely approximates the dimensions of the GEOID. Certain ellipsoids fit the GEOID more closely for various areas of the earth. Elevations derived directly from satellite observations are relative to the ellipsoid and are called ellipsoid heights.

**Relocated Threshold** – A threshold located at a point on the runway other than the beginning of the full strength pavement. The area between the former threshold and the relocated threshold is not available for the landing or takeoff of aircraft. Thus, a relocated threshold marks the end of the runway. The precise end is on the landing approach edge of the relocated threshold paint bar. The abandoned runway area may or may not be available for taxiing.

**Remote Communications Outlet (RCO)** – An unmanned communications facility remotely controlled by air traffic personnel. RCOs serve flight service stations. Remote Transmitter/Receivers (RTR) serve terminal ATC facilities.

**Resolution** – The smallest spacing between two display elements expressed as dots per inch, pixels per line, or lines per millimeter.

**Runway** – A defined rectangular area prepared for the landing and takeoff run of aircraft along its length in a land airport. Being exactly rectangular, it excludes narrow, rounded, deteriorated, and irregular ends that are not as wide as the general or overall width of the runway. The runway width is the physical width that extends over the entire length of the rectangle. The runway length does not include blast pad,

clearway, or stopway surfaces. Displaced thresholds are included in the physical length. Runways are normally numbered in relation to their magnetic direction rounded off to the nearest 10 degrees: e.g., Runway 10, Runway 25.

**Runway Centerline** – A line connecting the two opposite runway end points. The line may be physically marked on the surface of the runway.

**Runway End Point** – The point at the runway end halfway between the edges of the runway.

**Runway Length** – The straight line distance between runway end points. This line does not account for surface undulations between points. Official runway lengths are normally computed from runway end coordinates and elevations.

**Remote Transmitter/Receiver (RTR)** – Refer to **Remote Communications Outlet**.

**Schema** – A logical diagram that shows the structure and interrelationships between different feature types of the data standard or model.

**Secondary Airport Control Station (SACS)** – A control station established in the vicinity of, and usually on, an airport, and tied directly to the Primary Airport Control Station. SACS must be declared SACS by the National Geodetic Survey and must meet the specific siting, construction, and accuracy requirements for SACS.

**Simplified Directional Facility (SDF)** – A navigational aid used for nonprecision instrument approaches. The final approach course is similar to that of an ILS localizer except that the SDF course may be offset from the runway, generally not more than 3 degrees, and the course may be wider than the localizer, resulting in a lower degree of accuracy.

**Spatial Data** – Data that depicts a real world feature such as a road, building or runway on a map. The most basic types of spatial data are points, lines and polygons but spatial data can also include orthophotos and other more complex forms of locational information.

**Specially Prepared Hard Surface (SPHS)** – A concrete, asphalt, or other paved surface, or an unpaved surface that has been specially treated to stabilize the surface, protect the subsurface, or provide a smoother rolling surface for aircraft. Unpaved SPHSs include compacted gravel, and gravel treated with a stabilizing bituminous material.

**Stand Alone Weather Station (SAWS)** – A flexible and easy to maintain aviation weather station. It can be used as ASOS backup, which measures the critical parameters of: wind speed and direction, gust, altimeter setting, dew point, air temperature, and relative humidity.

**State Plane Coordinate System** – A series of plane-rectangular coordinate systems established by the U.S. Coast and Geodetic Survey for the entire United States, with a separate system for each state. A mathematical relationship exists between state plane and geodetic coordinates, one being easily transformed into the other. The advantage of the State Plane Coordinate System is that it permits survey computations for small areas to be performed using plane trigonometry (as opposed to more complex spherical trigonometry), while still yielding very nearly the true angles and distances between points.

**Stopway** – An area beyond the takeoff runway which is able to support the airplane during an aborted takeoff without causing structural damage to the airplane. It is centered upon the extended centerline of

the runway, not narrower than the runway, and designated by the airport authorities for use in decelerating the airplane during an aborted takeoff.

**Supplemental Profile Point** – A runway/stopway point selected so that a straight line between any two adjacent published runway/stopway points will be no greater than one foot from the runway/stopway surface.

**Supporting Feature** – A feature such as a runway number or threshold light set which does not precisely define a runway/stopway survey point, but provides evidence that the survey point was correctly selected.

**Surface Model Library (SML)** – An NGS provided library of functions used to create and analyze the mathematical surface models of Obstruction Identification Surfaces (OIS). The SML will be available as a Dynamic Link Library (DLL). NGS will update the SML as needed to reflect changes in the definitions of the OIS.

**Survey Point Locator (SPL)** – A tangible feature, such as the approach side of a threshold bar, or intangible feature (such as a Trim Line) whose intersection with the runway/stopway centerline defines a survey point.

**Take-off Distance Available (TODA)** – The length of the take-off run available plus the length of the clearway, if provided.

**Take-off Run Available (TORA)** – The length of the runway declared available and suitable for the ground run of an airplane take-off.

**Tactical Air Navigation (TACAN)** – An ultra-high frequency electronic rho-theta air navigational aid which provides suitably equipped aircraft a continuous indication of bearing and distance to the TACAN station.

**Taxiway** – A defined path established for the taxiing of aircraft from one part of an airport to another.

**Tetrahedron** – A device normally located on uncontrolled airports and used as a landing direction indicator. The small end of the tetrahedron points in the direction of landing.

**Threshold (THLD)** – The beginning of that portion of the runway available for landing. A displaced threshold (DTHLD) is a threshold that is located at a point on the runway other than the designated beginning of the runway.

**Touchdown Side** – The side occupied by a landing aircraft after the aircraft has passed the feature.

**Touchdown Zone (TDZ)** – The first 3,000 feet of the runway beginning at the threshold.

**Touchdown Zone Elevation (TDZE)** – The highest elevation in the Touchdown Zone.

**Traffic Pattern** – The traffic flow that is prescribed for aircraft landing at, taxiing on, or taking off from an airport. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach.

**Transmissometer (TMOM)** – An apparatus used to determine visibility by measuring the transmission of light through the atmosphere. It is the measurement source for determining runway visual range (RVR) and runway visibility value (RVV).

**Transponder Landing System (TLS)** – Transponder landing system providing azimuth and elevation guidance to aircraft on approach.

**Trim Line** – An imaginary line constructed perpendicular to the runway/stopway centerline which establishes the location of a runway/stopway end or displaced threshold.

**V<sub>1</sub>** – The takeoff decision speed. If a system failure occurs before V<sub>1</sub>, the takeoff is aborted. If the failure occurs at or above V<sub>1</sub>, the pilot is committed to continue the takeoff.

**Vertical Survey Point** – A point that represents the elevation position of a feature. This point may be located on the top or base of the feature or located between feature components. For example, the vertical survey point for a Precision Approach Path Indicator (PAPI) system is the ground at the center of the light array which falls between light units.

**Vertical Takeoff and Landing (VTOL) Aircraft** – Aircraft capable of vertical climbs and/or descents and of using very short runways or small areas for takeoff and landings. These aircraft include, but are not limited to, helicopters.

**Very High Frequency Omnidirectional Range Station (VOR)** – A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, referenced from magnetic north.

**Very High Frequency Omnidirectional Range/Tactical Air Navigation (VORTAC)** – A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance measuring equipment (DME) at one site.

**Visual Approach** – An approach conducted on an instrument flight rules (IFR) flight plan which authorizes the pilot to proceed visually to the airport. The pilot must have either the airport or preceding aircraft in sight at all times.

**Visual Glideslope Indicator** – A navigational aid that provides vertical visual guidance to aircraft during approach to landing by either radiating a directional pattern of high intensity light into the approach area or providing lighted or unlighted panels which can be aligned by the pilot, thereby allowing the pilot to determine if the aircraft is above, below, or on the prescribed glidepath. (See **Airport Lighting**.)

**Waypoint** – A predetermined geographical position used for route/instrument approach definition or progress reporting purposes. The point is defined relative to a VORTAC station or in terms of latitude/longitude coordinates.

**Wide Area Augmentation System (WAAS)** – The total FAA system designed and built to meet the mission needs of insuring satellite integrity for using GPS for required navigation performance (RNP) in the National Airspace System and of improving accuracy to support precision approaches using GPS augmented with the WAAS.



**A.3. ACRONYMS AND WORD PHRASES**

The following list presents the approved contractions for data:

<u>WORD/ PHRASE</u>	<u>ACRONYM</u>
<b>A</b>	
Abandoned .....	ABND
Above Ground Level.....	AGL
Accelerate-Stop Distance Available .....	ASDA
Advisory Circular.....	AC
Architecture, Engineering and Construction.....	A/E/C
Aeronautical Information Exchange Model.....	AIXM
Aeronautical Information Service .....	AIS
Agricultural.....	AG
Air Route Surveillance Radar .....	ARSR
Aircraft.....	ACFT
Airport.....	ARPT
Airport Beacon.....	APBN
Airport District Office.....	ADO
Airport Facility Directory .....	AFD
Airport Layout Plan or Airport Location Point.....	ALP
Airport Obstruction Chart .....	AOC
Airport Reference Point .....	ARP
Airport Surface Detection Equipment.....	ASDE
Airport Surveillance Radar .....	ASR
Airport Traffic Control Tower .....	ATCT
Airway Beacon.....	AWYBN
American Institute of Architects .....	AIA
American National Standards Institute .....	ANSI
American Society for Testing and Materials .....	ASTM
Anemometer.....	AMOM
Antenna .....	ANT
Approach.....	APCH
Approach Light .....	APP LT
Approach Light System .....	ALS
Area Navigation Approach .....	ANA
Arresting Gear.....	A-GEAR
Automated Flight Service Station .....	AFSS
Automated Surface Observing System .....	ASOS
Automatic Weather Observing/Reporting System.....	AWOS
<b>B</b>	
Back Course Marker .....	BCM
Bridge.....	BRDG
Building .....	BLDG

**C**

Centerline .....	C/L
Ceilometer .....	CLOM
Chimney .....	CHY
Closed .....	CLSD
Common Traffic Advisory Frequency .....	CTAF
Computer Aided Drafting and Design .....	CADD
Construction .....	CONST
Continuously Operating Reference Station .....	CORS

**D**

Design File (MicroStation) .....	DGN
Department of Defense (U.S.) .....	DOD
Department of Transportation (U.S.) .....	DOT
Direction Finder .....	DF
Displaced Threshold .....	DTHLD
Distance Measuring Equipment .....	DME
Distance to Centerline .....	DCLN
Distance to Runway End .....	DEND
Distance to Threshold .....	DTHR
Drawing File (AutoDesk or AutoCAD) .....	DWG

**E**

Electrical .....	ELEC
Elevation .....	EL
Elevation .....	ELEV
Ellipsoid .....	ELLIP
Engine Out Departure .....	EOD
Equipment .....	EQUIP
Estimated Maximum Elevation .....	EME

**F**

Fan Marker .....	FM
Federal Aviation Administration .....	FAA
Federal Geographic Data Committee .....	FGDC
Flagpole .....	FLGPL
Flight Service Station .....	FSS

**G**

Geographic Information System .....	GIS
Geographic Markup Language .....	GML
Glide Slope .....	GS

Global Positioning System.....	GPS
Ground .....	GRD
Ground Control Approach .....	GCA

**H**

Hangar.....	HGR
Height Above Airport .....	HAA
Height Above Runway.....	HAR
Height Above Touchdown.....	HAT
Heliport Reference Point.....	HRP
Horizontal .....	HORZ
Horizontal Survey Point.....	HSP

**I**

Inner Marker .....	IM
Inoperative .....	INOP
International Civil Aviation Organization .....	ICAO
International Organization for Standards.....	ISO
Instrument Flight Rules.....	IFR
Instrument Landing System .....	ILS
Instrument Meteorological Conditions .....	IMC
International Civil Aviation Organization .....	ICAO
International Earth Rotation Service	
Terrestrial Reference Frame .....	ITRF
Intersection.....	INTXN

**L**

Lead In Lighting System.....	LDIN
Light.....	LT
Lighted .....	LTD
Localizer .....	LOC
Localizer Type Directional Aid .....	LDA
Localizer Performance with Vertical Guidance.....	LPV
Locator Middle Marker.....	LMM
Locator Outer Marker .....	LOM

**M**

Magnetic Variation .....	VAR
Mean Sea Level.....	MSL
Microwave .....	MCWV
Microwave Landing System .....	MLS
Microwave Landing System Azimuth Guidance .....	MLSAZ
Microwave Landing System Elevation Guidance.....	MLSEL

Middle Marker .....	MM
Monument .....	MON

**N**

National Airspace System .....	NAS
National Flight Data Center .....	NFDC
National Flight Data Digest .....	NFDD
National Geodetic Survey .....	NGS
National Geodetic Vertical Datum of 1929 .....	NGVD 29
National Geospatial Intelligence Agency .....	NGA
National Oceanic and Atmospheric Administration .....	NOAA
National Ocean Service .....	NOS
National Spatial Reference System .....	NSRS
Nautical Mile .....	NM
Navigational Aid .....	NAVAID
Nondirectional Radio Beacon .....	NDB
North American Datum of 1927 .....	NAD27
North American Datum of 1983 .....	NAD83
North American Vertical Datum of 1988 .....	NAVD88
Not Commissioned .....	NCM
Not to Exceed .....	NTE
Notice to Airmen .....	NOTAM

**O**

Observation .....	OBS
Obstruction .....	OBST
Obstruction Identification Surface .....	OIS
Obstruction Lighted .....	OL
Obstruction Light On .....	OL ON
Omnidirectional Approach Light System .....	ODALS
Orthometric .....	ORTHO
Out Of Service .....	OTS
Outer Marker .....	OM

**P**

Point of Contact .....	POC
Permanent Survey Mark .....	PSM
Precision Approach Path Indicator .....	PAPI
Precision Approach Radar .....	PAR
Primary Airport Control Station .....	PACS
Pulsating Visual Approach Slope Indicator .....	PVASI

**R**

Railroad.....	RR
Radio Technical Commission for Aeronautics .....	RTCA
Reflector.....	RFLTR
Relocated .....	RELCTD
Remote Communications Outlet.....	RCO
Remote Transmitter/Receiver .....	RTR
Required Navigation Performance.....	RNP
Road.....	RD
Road (Non-interstate).....	RD (N)
Road (Interstate).....	RD (I)
Runway .....	RWY
Runway Alignment Indicator Lights.....	RAIL
Runway End Identifier Lights.....	REIL
Runway Visual Range.....	RVR

**S**

Secondary Airport Control Station .....	SACS
Sensitive Security Information .....	SSI
Simplified Directional Facility.....	SDF
Spatial Data Standards for Facilities, Infrastructure and Environment .....	SDSFIE
Specially Prepared Hard Surface .....	SPHS
Stack.....	STK
Stand Alone Weather Station.....	SAWS
Standard Instrument Departure .....	SID
Standard Terminal Arrival .....	STAR
Standpipe .....	SPIPE
Stopway .....	STWY

**T**

Tactical Air Navigation Aid.....	TACAN
Tank .....	TK
Taxiway .....	TWY
Temporary.....	TMPRY
Threshold .....	THLD
Take-off Distance Available.....	TODA
Take-off Run Available .....	TORA
Touchdown Reflector.....	TDR
Touchdown Zone .....	TDZ
Touchdown Zone .....	Elevation TDZE
Tower .....	TWR
Transmissometer .....	TMOM
Transmission Tower.....	TRMSN TWR
Transponder Landing System .....	TLS
Tri-color Visual Approach Slope Indicator .....	TRCV

**U**

Under Construction.....	UNC
United States Geological Survey .....	USGS
Until Further Notice.....	UFN

**V**

Vertical.....	VERT
Vertical Navigation.....	VNAV
Vertical Survey Point.....	VSP
Very High Frequency Omnidirectional Range .....	VOR
Visual Approach Slope Indicator .....	VASI
Visual Flight Rules .....	VFR
Visual Meteorological Conditions .....	VMC
VOR/Tactical Air Navigation .....	VORTAC

**W**

Wide Area Augmentation System.....	WAAS
Wind Direction Indicator .....	WDI
Wind Tee.....	WTEE
Wind Tetrahedron .....	WTET
Windsock .....	WSK
World Geodetic System of 1984.....	WGS 84

**Z**

Z Marker .....	ZM
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**ACRONYM****WORD/ PHRASE****A**

ABND .....	Abandoned
AC .....	Advisory Circular
ACFT .....	Aircraft
ADO .....	Airport District Office
A/E/C .....	Architecture/Engineering/Construction
AFD .....	Airport Facility Directory
AFSS .....	Automated Flight Service Station
AG .....	Agricultural
A-GEAR .....	Arresting Gear
AGL .....	Above Ground Level
AIA .....	American Institute of Architects
AIS .....	Aeronautical Information Service
AIXM .....	Aeronautical Information Exchange Model
ALP .....	Airport Location Point
ALS .....	Approach Light System
AMOM .....	Anemometer
ANA .....	Area Navigation Approach
ANSI .....	American National Standards Institute
ANT .....	Antenna
AOC .....	Airport Obstruction Chart
APBN .....	Airport Beacon
APCH .....	Approach
APP LT .....	Approach Light
ARP .....	Airport Reference Point
ARPT .....	Airport
ARSR .....	Air Route Surveillance Radar
ASDA .....	Accelerate-Stop Distance Available
ASDE .....	Airport Surface Detection Equipment
ASOS .....	Automated Surface Observing System
ASR .....	Airport Surveillance Radar
ASTM .....	American Society for Testing and Materials
ATCT .....	Airport Traffic Control Tower
AWOS .....	Automatic Weather Observing/Reporting System
AWYBN .....	Airway Beacon

**B**

BCM .....	Back Course Marker
BLDG .....	Building
BRDG .....	Bridge

**C**

CADD .....	Computer Aided Drafting and Design
C/L .....	Centerline
CHY .....	Chimney
CLOM .....	Ceilometer
CLSD .....	Closed
CONST .....	Construction
CORS .....	Continuously Operating Reference Station
CTAF .....	Common Traffic Advisory Frequency

**D**

DCLN .....	Distance to Centerline
DEND .....	Distance to Runway End
DF .....	Direction Finder
DGN .....	Microstation Design File
DME .....	Distance Measuring Equipment
DoD .....	Department of Defense (U.S.)
DOT .....	Department of Transportation (U.S.)
DTHLD .....	Displaced Threshold
DTHR .....	Distance to Threshold
DWG .....	AutoDesk or AutoCAD Drawing File

**E**

EL .....	Elevation
ELEC .....	Electrical
ELEV .....	Elevation
ELLIP .....	Ellipsoid
EME .....	Estimated Maximum Elevation
EOD .....	Engine Out Departure
EQUIP .....	Equipment

**F**

FAA .....	Federal Aviation Administration
FGDC .....	Federal Geographic Data Committee
FLGPL .....	Flagpole
FM .....	Fan Marker
FSS .....	Flight Service Station

**G**

GCA .....	Ground Control Approach
GIS .....	Geographic Information System
GML .....	Geographic Markup Language



GPS .....	Global Positioning System
GRD .....	Ground
GS .....	Glide Slope

**H**

HAA .....	Height Above Airport
HAR .....	Height Above Runway
HAT .....	Height Above Touchdown
HGR .....	Hangar
HORZ .....	Horizontal
HRP .....	Heliport Reference Point
HSP .....	Horizontal Survey Point

**I**

ICAO .....	International Civil Aviation Organization
IFR .....	Instrument Flight Rules
ILS .....	Instrument Landing System
IM .....	Inner Marker
IMC .....	Instrument Meteorological Conditions
INOP .....	Inoperative
INTXN .....	Intersection
ISO .....	International Standards Organization
ITRF .....	International Earth Rotation Service Terrestrial Reference Frame

**L**

LDIN .....	Lead In Lighting System
LT .....	Light
LDA .....	Localizer Type Directional Aid
LMM .....	Locator Middle Marker
LOC .....	Localizer
LOM .....	Locator Outer Marker
LPV .....	Localizer Performance with Vertical Guidance
LTD .....	Lighted

**M**

MCWV .....	Microwave
MLS .....	Microwave Landing System
MLSAZ .....	Microwave Landing System Azimuth Guidance
MLSEL .....	Microwave Landing System Elevation Guidance
MM .....	Middle Marker
MON .....	Monument
MSL .....	Mean Sea Level

**N**

NAD27.....	North American Datum of 1927
NAD83.....	North American Datum of 1983
NAVD88.....	North American Vertical Datum of 1988
NAVAID.....	Navigational Aid
NCM.....	Not Commissioned
NDB.....	Nondirectional Radio Beacon
NFDC.....	National Flight Data Center
NFDD.....	National Flight Data Digest
NGA.....	National Geospatial Intelligence Agency
NGS.....	National Geodetic Survey
NGVD29.....	National Geodetic Vertical Datum of 1929
NM.....	Nautical Mile
NOAA.....	National Oceanic and Atmospheric Administration
NOS.....	National Ocean Service
NOTAM.....	Notice to Airmen
NSRS.....	National Spatial Reference System
NTE.....	Not to Exceed

**O**

OBS.....	Observation
OBST.....	Obstruction
ODALS.....	Omnidirectional Approach Light System
OIS.....	Obstruction Identification Surface
OL.....	Obstruction Lighted
OL ON.....	Obstruction Light On
OM.....	Outer Marker
ORTHO.....	Orthometric
OTS.....	Out Of Service

**P**

PACS.....	Primary Airport Control Station
PAPI.....	Precision Approach Path Indicator
PAR.....	Precision Approach Radar
POC.....	Point of Contact
PSM.....	Permanent Survey Mark
PVASI.....	Pulsating Visual Approach Slope Indicator

**R**

RAIL.....	Runway Alignment Indicator Lights
RCO.....	Remote Communications Outlet
RD.....	Road
REIL.....	Runway End Identifier Lights
RELCTD.....	Relocated

RFLTR.....	Reflector
RD (I).....	Road (Interstate)
RD (N).....	Road (Non-interstate)
RNP.....	Required Navigation Performance
RR.....	Railroad
RTCA.....	Radio Technical Commission for Aeronautics
RTR.....	Remote Transmitter/Receiver
RVR.....	Runway Visual Range
RWY.....	Runway

**S**

SACS.....	Secondary Airport Control Station
SAWS.....	Stand Alone Weather Station
SDF.....	Simplified Directional Facility
SDSFIE.....	Spatial Data Standards for Facilities, Infrastructure and Environment
SID.....	Standard Instrument Departure
SPHS.....	Specially Prepared Hard Surface
SPIPE.....	Standpipe
SSI.....	Sensitive Security Information
STAR.....	Standard Terminal Arrival
STK.....	Stack
STWY.....	Stopway

**T**

TACAN.....	Tactical Air Navigation Aid
TDR.....	Touchdown Reflector
TDZ.....	Touchdown Zone
TDZE.....	Touchdown Zone Elevation
THLD.....	Threshold
TK.....	Tank
TMOM.....	Transmissometer
TMPRY.....	Temporary
TODA.....	Take-off Distance Available
TORA.....	Take-off Run Available
TRCV.....	Tri-color Visual Approach Slope Indicator
TRMSN TWR.....	Transmission Tower
TRS.....	Transponder Landing System
TWR.....	Tower
TWY.....	Taxiway

**U**

UFN.....	Until Further Notice
UNC.....	Under Construction
USGS.....	United States Geological Survey

**V**

VAR.....	Magnetic Variation
VASI.....	Visual Approach Slope Indicator
VERT.....	Vertical
VFR.....	Visual Flight Rules
VMC.....	Visual Meteorological Conditions
VNAV.....	Vertical Navigation
VOR.....	Very High Frequency Omnidirectional Range
VORTAC.....	VOR/Tactical Air Navigation
VSP.....	Vertical Survey Point

**W**

WAAS.....	Wide Area Augmentation System
WDI.....	Wind Direction Indicator
WGS 84.....	World Geodetic System of 1984
WSK.....	Windsock
WTEE.....	Wind Tee
WTET.....	Wind Tetrahedron

**Z**

ZM.....	Z Marker
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## APPENDIX B. Aeronautical Survey Guidance and Specifications

### B.1. AIRPORT REFERENCE POINT (ARP) COMPUTATION

The Airport Reference Point (ARP) is the approximate geometric center of all usable runways based on the ultimate configuration for the airport. The ARP position computation is somewhat similar to a center of mass computation, except that only two dimensions are considered.

Compute the ARP using the centerline end positions of all usable runways based on the ultimate configuration of the airport. However, since runways without specially prepared hard surfaces (SPHSs) typically are not surveyed, the ARP position for these airports will be approximate. Indicate the ARP computation with the year of the most recent runway end survey used in the ARP computation, such as "ARP (1995)". The following section identifies how to compute the ARP.

#### ARP Computation Methodology

The datums used in the computations are normally selected as the lowest absolute value latitude and longitude coordinates, respectively, of all runway ends used in the computation. This convention eliminates computing with negative moments.

ARP LAT = Latitude Datum + (Sum of Runway Moments about the Latitude Datum/Sum of Runway Lengths)

ARP LON = Longitude Datum + (Sum of Runway Moments about the Longitude Datum/Sum of Runway Lengths)

Runway Moment about the Latitude Datum = Runway Ground Length × the Distance in Seconds between the approximate Runway Center Point\* and the Latitude Datum

Runway Moment about the Longitude Datum = Runway Ground Length × the Distance in Seconds between the approximate Runway Center Point\* and the Longitude Datum

Runway Coordinates must be entered as absolute values.

Runway Lengths must be entered as Ground Length, rounded to the nearest whole foot.

\* The approximate Runway Center Point is the mean of the Latitudes and Longitudes of a Runway's Ends. This convention eliminates the need for complex geodetic formulas to compute the precise Runway Center Point, thus allowing simple and consistent ARP computations after only brief instructions.

A Sample ARP Computation follows (See Figure B - 1):

Approximate Runway Center Pts:

RWY 1/19

LAT = 39 24 57.7852

LON = 77 22 41.1951

RWY 5/23

LAT = 39 24 48.4806

LON = 77 22 34.9130

ARP LAT = 39 24 34.1979 + (4,000 FT (23.5873 SEC) + 3,799 FT (14.2827 SEC))/7,799 FT

= 39 24 34.1979 + 19.0549 SEC

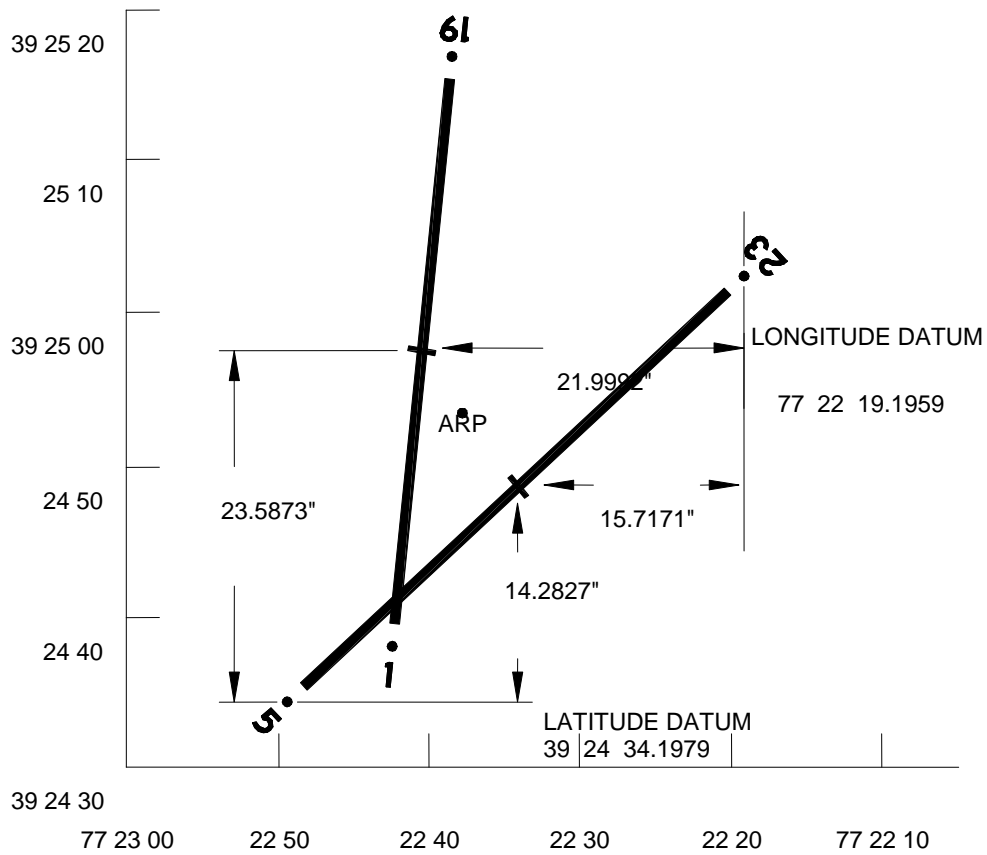
= 39 24 53.3

ARP LON = 77 22 19.1959 + (4,000 FT (21.9992 SEC) + 3,799 FT (15.7171 SEC))/7,799 FT

= 77 22 19.1959 + 18.9391 SEC

= 77 22 38.1

**Figure B - 1. AIRPORT REFERENCE POINT (ARP) COMPUTATION**



RUNWAY END	LATITUDE	LONGITUDE	GROUND LENGTH*
1	39 24 38.0871	077 22 43.3322	4,000 FT
19	39 25 17.4832	077 22 39.0579	
5	39 24 34.1979	077 22 50.6301	3,799 FT
23	39 25 02.7632	077 22 19.1959	

\*USE GROUND, NOT GEODETIC, RUNWAY LENGTH ROUNDED TO THE NEAREST WHOLE FOOT.

NOTES:

1. DO NOT SCALE DRAWING.
2. THIS FIGURE EXPLAINS OR CLARIFIES CERTIAN DATA REQUIREMENTS - SEE TEXT FOR COMPLETE STANDARDS.

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## **APPENDIX C. RUNWAY, STOPWAY, and DISPLACED THRESHOLD END IDENTIFICATION and MONUMENTATION**

### **C.1. RUNWAY, STOPWAY, and DISPLACED THRESHOLD END IDENTIFICATION and MONUMENTATION**

#### **C.1.1. Terminology**

**C.1.1.1.** The precise meaning of terms is always important for a clear understanding of spoken or written information. This understanding is especially critical in technical areas where safety is involved. It is important the surveyor become familiar with runway/stopway terminology and clearly understands the definitions. Certain terms and expressions used in this document have specific meanings that must not be misconstrued or applied incorrectly. Refer to the Glossary for definitions used in this document. Many of these definitions are from the “Aeronautical Information Manual” or other FAA ACs, both document types published by the FAA. Other definitions are from the “Geodetic Glossary” published by the National Geodetic Survey. When adequate definitions were not available from an official source, they were carefully developed as needed for this document.

**C.1.1.2.** Throughout this document, reference is made to the “approach side” or “touchdown side” of a feature. For example, “Threshold lights show green from the approach side.” Correct understanding of these terms is extremely important. The “approach side” of a feature is the side occupied by a landing aircraft before the aircraft has passed the feature. The “touchdown side” of a feature is the side occupied by a landing aircraft after the aircraft has passed the feature. These terms are always referenced to a landing aircraft and the approach end (not the stop end) of the runway.

#### **C.1.2. Features Associated With Runway/Stopway Usage and Survey Point Location**

**C.1.2.1. General Information.** One or more of the features existing on the airport usually indicate the runway/stopway usage or intended usage. These features include surface markings, lights, signs, navigational aids, and physical construction.

**C.1.2.2. Survey Point, and Supporting Features.** The runway/stopway survey point is the intersection of the runway/stopway centerline and a feature precisely defining the survey point, such as the approach side of a threshold bar. The feature precisely defining the survey point is called the survey point locator. A survey point locator may be tangible, such as the approach side of a threshold bar, or intangible, such as an imaginary line constructed relative to a tangible feature or features like outboard (refer to Glossary) runway end lights.

**C.1.2.2.1** A supporting feature is a feature associated with a runway/stopway survey point but does not precisely define the point. A typical supporting feature is the threshold lights located near a displaced threshold. There may be several supporting features for each survey point. Supporting features provide confidence the survey point was correctly selected. The most useful supporting features are usually one or more of the following:

- Threshold bar and other threshold paintings
- Runway number
- Threshold and runway end lights

- Runway edge lights

Less useful features include:

- Signs
- Visual Glideslope Indicators
- Electronic Navigational Aids
- Taxiways

**C.1.2.2.2** Some features are either a survey point locator or a supporting feature, depending on the situation. For example, when a threshold bar is located at a displaced threshold, the approach side of the bar defines the threshold. However, when a threshold bar is located near the end of pavement, the end of pavement usually defines the threshold and the bar is only a supporting feature providing confidence the threshold is located at the end and not at some other location on the runway. Specific features that either define a survey point or are useful in supporting survey point selection are discussed in this section. Because of the many nonstandard situations and configurations encountered in the field, selecting the correct survey point is somewhat complex. When considering the features discussed below and their applicability to survey point location, it may be useful to refer to the associated figures in this section, as well as appropriate FAA ACs.

**C.1.2.3. Limit of Construction.** The limit of construction is usually the survey point locator for the ends of concrete runways when there is no aligned taxiway. There is an operational benefit to the airport sponsor and aircraft operators to have the maximum runway/stopway length possible. The limit of construction, or the runway end trim line, usually provides this maximum. The limit of construction is typically indicated by a surface discontinuity. Be careful not to locate the runway end beyond this discontinuity and on a blast pad, stopway, or other non-runway surface.

**C.1.2.4. Trim Line.** A trim line is an imaginary line constructed perpendicular to the runway/stopway centerline establishing the location of a runway/stopway end or displaced threshold. A trim line is most frequently used to “square off” the ends of an apparent runway/stopway surface (refer to Glossary) establishing the runway/stopway ends. Most apparent runway/stopway surfaces are not concrete and their ends are not perpendicular to the runway/stopway centerline, are breaking up, or are otherwise unsuitable as a runway/stopway. Occasionally, the apparent runway/stopway surface may also narrow toward its end. This narrowing is most likely to occur on shorter runways at smaller airports. In all of these cases, a trim line must be constructed perpendicular to the runway/stopway centerline at the first good pavement. This trim line may be only a few inches or may be many feet from the apparent runway/stopway surface end. In practice, the surveyor is not qualified to accurately determine the load bearing integrity of a surface. As a practical matter, establish the trim line at a point on the apparent runway/stopway surface inside any disintegrating or otherwise questionable surface appearing to be below the full load bearing capacity of the runway/stopway.

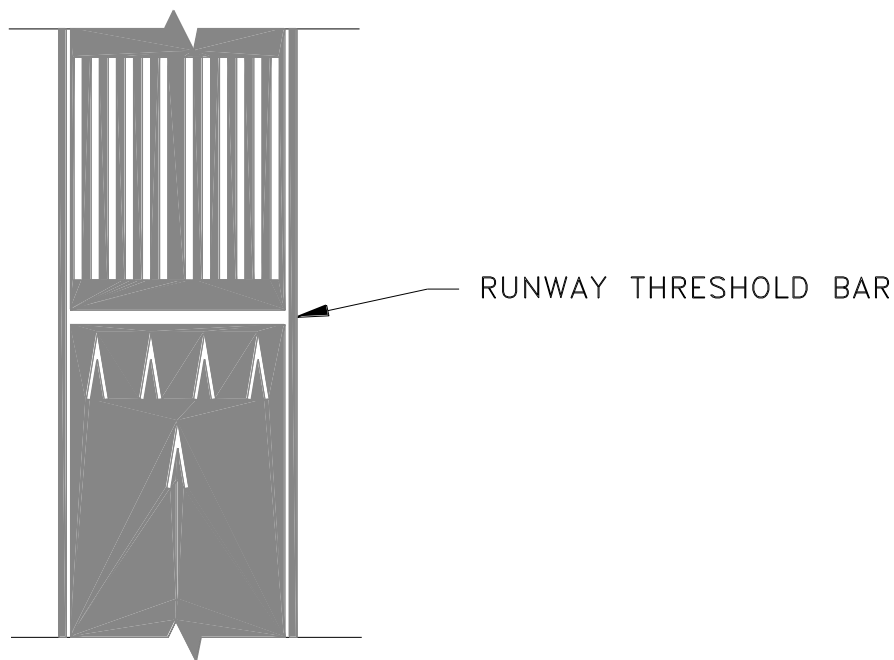
**C.1.2.4.1** Other Uses Of The Trim Line Include:

- Establishing a runway end at outboard runway end lights when an aligned taxiway exists and there is no threshold bar, or the approach side of the bar is located on the approach side of the runway end lights.

- Establishing a runway end at a location determined by operational requirements, such as defining a runway end short of a second runway when abutting surfaces exist.
- Defining a displaced threshold when there is no threshold bar, this may be the case with unpaved runways with outboard threshold lights.

### C.1.2.5. Surface Markings

**C.1.2.5.1** Threshold Bar. A threshold bar delineates the beginning of the runway available for landing (threshold) when there is pavement aligned with the runway on the approach side of the threshold. This pavement may be runway, taxiway, stopway, or a non-usable surface such as a blast pad. Threshold bars precisely delineate displaced thresholds, but in many cases do not precisely delineate runway ends even when a bar is located near the runway end. When a threshold bar does define a threshold or runway end, the approach side of the bar is the survey point locator (with the bar being entirely on the landing surface). Threshold bars define runway ends on paved runways with an aligned taxiway and no displaced threshold, provided the approach side of the bar is aligned with or is on the touchdown side of the runway end lights. In no other case does the threshold bar precisely define the runway end. The threshold bar is only a supporting feature for runway ends with no aligned taxiway since these bars are often not painted precisely at the runway end as defined by the limit of construction or a trim line. A threshold bar painted "close" to the end may be satisfactory for the painting contractor but is not sufficient for precisely defining a runway end. Occasionally, a threshold bar may even be painted on a blast pad or other non-runway surface. Because of the variability and unreliability of threshold bar locations at runway ends with no aligned taxiway, do not use the threshold bar to define the runway end survey point in these situations. It is important to remember the correct painting on runways is white, while correct painting on taxiways, stopways, or blast pads is yellow. If a displaced threshold exists on a runway with an aligned taxiway, the runway end may be marked with a yellow demarcation bar. If painted correctly, this demarcation bar is not on the runway surface.



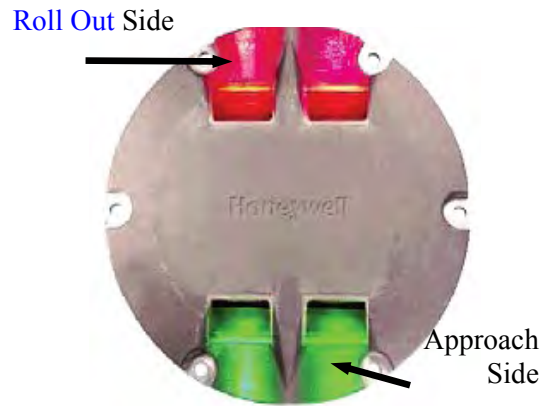
**Figure C-1. Depicts the proper marking of a threshold bar.**

**C.1.2.6. Runway Numbers.** The runway number is a supporting feature. Runway numbers are especially useful and reliable as supporting features since most paved runways, even if unlighted, are painted with runway numbers near the threshold. If a runway number is painted on the runway at a location other than near the apparent threshold, a serious conflict exists requiring resolution. Discuss this matter immediately with airport management.

**C.1.2.7. Other Surface Markings.** Other surface markings are supporting features. Many surface markings, such as threshold markings (specific markings other than the threshold bar), runway side stripes, displaced threshold arrows and arrowheads, the lines and arrowheads on taxiways aligned with runways, and the chevrons on stopways and blast pads are associated with runway/stopway ends and thresholds. While none of these markings precisely define runway/stopway survey points, many can be useful as supporting features providing confidence in survey point selection.

**C.1.2.8. Lights.** Exercise extreme caution when using lights for runway/stopway survey point identification. Be sure to verify the lights are not out-of-service. Be especially vigilant for redundant lights or lights appearing out-of-place. Occasionally, a threshold or runway end may be moved and the original lights placed out-of-service but not physically removed. If this situation is not recognized, it could lead to confusion and incorrect survey point location.

**C.1.2.8.1 Threshold Lights.** Threshold lights are fixed green lights arranged symmetrically left and right of the runway centerline and identify the approximate runway threshold (but not necessarily the runway end). These lights are frequently in multipurpose fixtures showing green from the approach side of the threshold and may show red, white, or amber, or may be obscured from the touchdown side of the threshold, depending on additional function. Threshold lights are usually supporting features for survey points on paved runways. However, they may define the survey point for displaced thresholds when a threshold bar is missing, such as may occur on unpaved runways. (Displaced thresholds on unpaved runways are uncommon). Light characteristics can be useful in distinguishing between a displaced threshold and a runway end with an aligned taxiway. The displaced threshold will include lights showing green from the approach side and white, amber, or obscured from the touchdown side. The runway end with an aligned taxiway will include lights showing green from the approach side and red from the touchdown side. When threshold lights are located at the runway end, they typically are combined with runway end lights into one fixture. In these cases, threshold lights show green from the approach side, while the runway end lights show red from the touchdown side. Special lens or filters are used to give the desired coverage. In the rare case where the light units define a trim line for a displaced threshold survey point (no threshold bar), the two units nearest to the runway (one on each side of the runway) are used. The trim line must always be perpendicular to the runway centerline. If the trim line connecting the lights (or markers if runway is unlighted) is not perpendicular to the runway centerline, then the line must be best fit to the defining lights or markers. When there is no displaced threshold or runway end with an aligned taxiway, threshold and runway end lights are normally located across the runway end and about 10 feet on the approach side of the runway. When there is a displaced threshold or a runway end with an aligned taxiway, these lights are normally located to the side of the runway but are often offset along the runway by 10 feet or more from the true threshold or runway end.



**Figure C-2. Overhead view of a threshold light, which are typically flush mounted with the runway surface.**

**C.1.2.8.2** Runway End Lights. Runway end lights are fixed red lights arranged symmetrically left and right of the runway centerline and identify the approximate runway end, or in some cases, the precise runway end. They show red from the runway side and may also show red from the approach side, if the runway end is not the threshold. If the runway end is also a threshold, the light unit will show green from the approach side. FAA guidelines or regulations do not authorize a runway to extend to the approach side of the runway end lights. Therefore, the runway end cannot be on the approach side of the runway end lights regardless of threshold bar or runway end light location. Do not confuse these situations with that of threshold lights at a displaced threshold where the approach side of the threshold bar defines the threshold and the lights are only supporting features. In most cases where there is no aligned taxiway, limit of construction, or a trim line, the touchdown side of the lights defines the runway end and the runway end lights are supporting features only. In some cases, however, runway end lights can define a runway end survey point. For runways with an aligned taxiway, runway end lights (which can be situated either outboard or flush mounted inboard) define the runway end survey point if there is no threshold bar or if the approach side of the threshold bar is on the approach side of the lights. (If the bar is entirely on the touchdown side of the lights, the approach side of the bar defines the runway end survey point.) In the rare cases where there is no aligned taxiway but the runway end lights are outboard and on the touchdown side of an apparent runway end, the lights define the runway end. The surface on the approach side of the lights is not runway.



**Figure C-3. Typical elevated runway or taxiway edge light with the blue taxiway lens installed.**

**C.1.2.8.3** Runway/Stopway Edge Lights. Runway edge lights are white, except on instrument runways, where amber replaces white in the last 2,000 feet or half the runway length, whichever is less, to form a caution zone for landing. Runway/stopway edge lights are supporting features and do not precisely define survey points. However, in some cases their color characteristics may identify a section of pavement as either runway or taxiway. The edge lights for taxiways are blue, while the edge lights for

runways are white or amber. Stopway lighting is inconsistent and unreliable in stopway survey point identification.

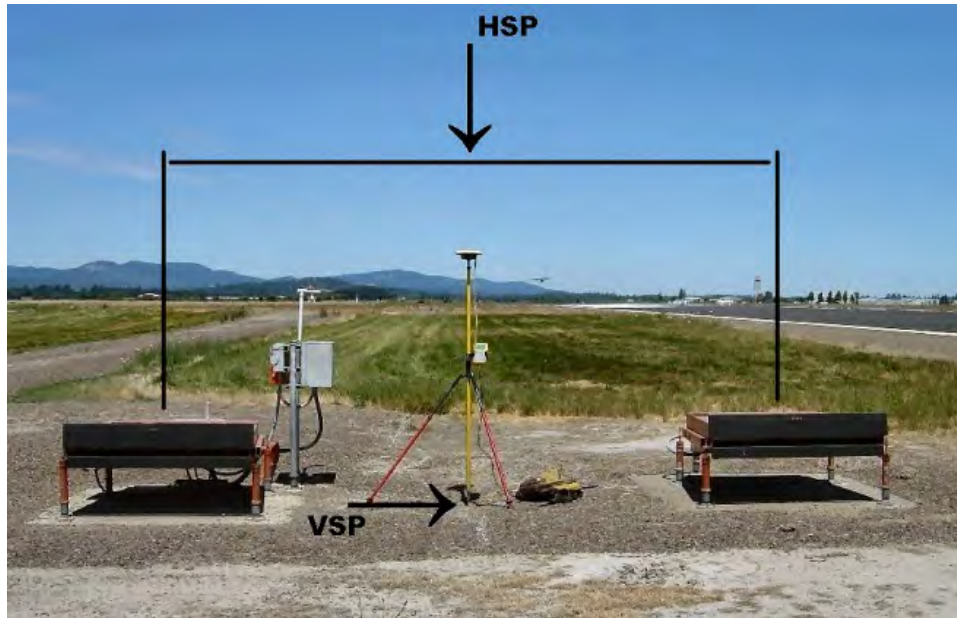
**C.1.2.8.4** Runway End Identifier Lights. Runway End Identifier Lights (REIL) consist of a pair of synchronized flashing lights located laterally on each side of the runway threshold but are typically not aligned precisely with the threshold. They may be omnidirectional or unidirectional facing the approach area. REILs are supporting features and do not precisely identify survey points. REILs may be useful in determining runway usage since they are located near the threshold.



**Figure C-4. Typical installation of the runway end identification light (REIL) with the horizontal and VSPs identified.**

**C.1.2.8.5** Signs. Signs are supporting features and do not precisely identify survey points. Occasionally, signs may be useful in indicating a runway end, especially a runway end with an aligned taxiway. They can also indicate the direction to a runway end.

**C.1.2.8.6** Visual Glideslope Indicators. Visual glideslope indicators are light sources which project directional light into the approach area providing pilots with visual vertical guidance in the final approach phases of flight. The locations and characteristics of visual glideslope indicators vary depending on type. However, all are located beside the runway on the touchdown side of the threshold. Visual glideslope indicators are supporting features and do not precisely define survey points. Occasionally, these indicators may be useful in determining runway usage since they indicate the approximate touchdown area for landing aircraft.



**Figure C-5. Illustrates the proper location of a GPS setup to locate the HSP of a Precision Approach Path Indicator (PAPI) light system. THE PAPI is one type of VGSI.**

**C.1.2.8.7** Electronic Navigational Aids. The Instrument Landing System Glideslope (ILS-GS) antenna is the emission source for electronic signals, providing pilots with electronic vertical guidance in the final approach phases of flight. ILS-GS antennas are typically located at least 400 feet off the runway centerline and approximately 1,000 feet on the touchdown side of the threshold. Electronic navigational aids, including the ILS-GS, do not precisely identify survey points. Occasionally, the ILS-GS antenna may be useful in determining runway usage since most ILS-GS antennas are sited near the touchdown area for landing aircraft.



**Figure C-6. Typical glideslope installation.**

**C.1.2.8.8** Taxiways. Taxiways are movement areas providing access to runways from aircraft parking, maintenance, and other areas on the airport. Taxiways do not precisely identify survey points. However, since runway ends are usually accessed by adjacent taxiways, the location of a taxiway may suggest the proximity of a runway end. While many runway ends coincide with the extension of the taxiway edge onto the runway, this is not always the case. Often a runway extends slightly beyond the taxiway edge, making the survey point locator for the runway end the limit of physical construction, a trim line, or a threshold bar and not the taxiway extension onto the runway. It is not uncommon to have a runway end without direct taxiway access. One common case occurs when a runway is extended, but the taxiway was not extended to the new runway end. This situation is most likely to occur at smaller airports. While taxiway/runway intersections do not define runway points, unusual taxiway/runway configurations can alert the surveyor an unusual situation may exist.



**APPENDIX D. TRUNCATED ATTRIBUTE VALUES TO BE USED WITH ESRI® SHAPEFILES**

**NOTE:** When submitting data as ESRI® shapefiles (geodatabase is not acceptable), the truncated attribute values in the following list must be used. This list includes truncated values for all features identified in Chapter 5 of this AC.

FeatureClass	AttributeName	Shp_Name	NewShp_Name
AircraftGateStand	name	name	
	description	feat_desc	descrip
	status	status	
	gateStandType	gate_sta	gateStType
	length	length	
	pavementClassificationNumber	pavementCl	
	width	width	
	wingspan	wingspan	
	jetwayAvailability	jetwayAvai	
	towingAvailability	towingAvai	
	dockingAvailability	dockingAva	
	groundPowerAvailability	groundPowe	
	surfaceType	surfaceT	
	surfaceCondition	surfaceC	
	userFlag	userFlag	
alternative	alternativ		
AircraftNonMovementArea	name	name	
	description	feat_desc	descrip
	status	status	
	userFlag	userFlag	
	alternative	alternativ	
AirfieldLight	name	name	
	description	feat_desc	descrip
	status	status	
	color	color	
	lightingType	lighting	
	luminescence	luminesc	
	pilotControlFrequency	pilotContr	
	userFlag	userFlag	
alternative	alternativ		
AirOperationsArea	name	name	
	description	feat_desc	descrip
	status	status	
	userFlag	userFlag	
	alternative	alternativ	
AirportBoundary	name	name	
	description	feat_desc	descrip
	status	status	
	airportFacilityType	airportF	airportFac
	faaLocationId	faaLocID	

FeatureClass	AttributeName	Shp_Name	NewShp_Name
	faaSiteNumber	faaSiteNr	
	iataCode	iataCode	
	icaoCode	icaoCode	
	operationsType	operatio	
	owner	owner	
	userFlag	userFlag	
	alternative	alternativ	
AirportControlPoint	name	name	
	description	mon_desc	descrip
	status	status	
	coordinateZone	spcszone	
	dateRecovered	date_recov	dateRecov
	epoch	epoch	
	fieldBook	fieldBook	
	globalPositionSystemSuitable	gps_suit	gpsSuit
	monumentType	mon_typ	monType
	ellipsoidHeight	ellipsoidH	
	permanentId	permanentI	
	pointType	pointType	
	recoveredCondition	recov_cond	recovCond
	runwayDesignator	rwyDesg	
	RunwayEndDesignator	RunwayEndD	
	stampedDesignation	stmpd_desg	stmpdDesg
	yearOfSurvey	yearOfSurv	
userFlag	userFlag		
alternative	alternativ		
AirportParcel	name	name	
	description	feat_desc	descrip
	status	status	
	parcelNumber	parcnum	
	area	area	
	authority	authority	
	previousOwner	prevowner	
	acquisitionType	acquisitio	
	acquisitionPurpose	acqPurpose	
	costToAcquire	costToAcqu	
	grantProjectNumber	grantProje	
	howAcquired	howAcquire	
	marketValue	marketValu	
	yearAssessed	yearAssess	
	yearBuilt	yearBuilt	
	useOfParcel	useParc	
	legalDescription	legalDesc	
	dateAcquired	dateAcquir	
	assessedValue	assdValue	
	deedReference	deedRef	
passengerFacilityChargeNumber	pfcNumber		
userFlag	userFlag		

FeatureClass	AttributeName	Shp_Name	NewShp_Name
	alternative	alternativ	
AirportSign	name	name	
	description	feat_desc	descrip
	status	status	
	height	height	
	message	message	
	signTypeCode	signType	
	userFlag	userFlag	
	alternative	alternativ	
AnchorageArea	name	name	
	description	descrip	
	status	status	
	mooringLocation	mooringLo	
	length	length	
	width	width	
	depth	depth	
	bottomConditions	bottomCond	
	restriction	restrictio	
	userFlag	userFlag	
	alternative	alternativ	
Apron	name	name	
	description	feat_desc	descrip
	status	status	
	apronType	apronType	
	pavementClassificationNumber	pavementCl	
	surfaceCondition	surfaceC	
	surfaceMaterial	surfaceM	
	surfaceType	surfaceT	
	numberOfTiedowns	numberOfTi	
	fuel	fuel	
	userFlag	userFlag	
alternative	alternativ		
ArrestingGear	name	name	
	description	descrip	
	status	status	
	airportFacilityType	airportFac	
	owner	owner	
	alternative	alternativ	
	userFlag	userFlag	
Bridge	name	name	
	description	feat_desc	descrip
	status	status	
	surfaceMaterial	surfaceM	
	bridgeType	bridgeType	
	verticalStructureMaterial	vertical	
	directionality	direction	
	userFlag	userFlag	
alternative	alternativ		

FeatureClass	AttributeName	Shp_Name	NewShp_Name
Building	name	name	
	description	feat_desc	descrip
	status	status	
	buildingNumber	buildng_no	buildingNo
	structureType	str_type	strType
	numberCurrentOccupants	no_occup	noCurOcc
	areaInside	areaInside	
	structureHeight	structHght	
	areaFloor	areaFloor	
	lightingType	lighting	
	markingFeatureType	markingF	
	color	color	
	userFlag	userFlag	
	alternative	alternativ	
ConstructionArea	name	name	
	description	feat_desc	descrip
	status	status	
	projectName	projectNam	
	projectStatus	projectS	
	CoordinationContact	Coordinati	
	userFlag	userFlag	
	alternative	alternativ	
CoordinateGridArea	name	name	
	description	feat_desc	descrip
	status	status	
	gridType	gridType	
	userFlag	userFlag	
	alternative	alternativ	
County	name	name	
	description	feat_desc	descrip
	status	status	
	politicalName	polit_name	politName
	userFlag	userFlag	
	alternative	alternativ	
DeicingArea	name	name	
	description	area_desc	descrip
	status	status	
	userFlag	userFlag	
	alternative	alternativ	
DockArea	name	name	
	description	descrip	
	status	status	
	pier	pier	
	pierLength	pierLength	
	pierWidth	pierWidth	
	pierMaterial	pierMateri	
	hoistingCapability	hoistingCa	
	marineRailwayPlatformLength	mrpLength	

FeatureClass	AttributeName	Shp_Name	NewShp_Name
	marineRailwayPlatformWidth	mrpWidth	
	marineRailwayPlatformCapacity	mrpCapacit	
	gangway	gangway	
	gangwayLength	gangwayLen	
	gangwayWidth	gangwayWid	
	gangwayMaterial	gangwayMat	
	floatingDock	floatDock	
	floatingDockLength	floatDkLen	
	floatingDockWidth	floatDkWid	
	floatingDockMaterial	floatDkMat	
	floatingBarge	floatBarge	
	floatingBargeLength	floatBgLen	
	floatingBargeWidth	floatBgWid	
	floatingBargeMaterial	floatBgMat	
	userFlag	userFlag	
alternative	alternativ		
DrivewayArea	name	name	
	description	feat_desc	descrip
	status	status	
	surfaceMaterial	surfaceM	
	userFlag	userFlag	
	alternative	alternativ	
DrivewayCenterline	name	name	
	description	feat_desc	descrip
	status	status	
	userFlag	userFlag	
	alternative	alternativ	
EasementsAndRightsOfWay	name	name	
	description	feat_desc	descrip
	status	status	
	purpose	purpose	
	userFlag	userFlag	
	alternative	alternativ	
ElevationContour	name	name	
	description	feat_desc	descrip
	status	status	
	length	length	
	contourValue	contourVal	
	userFlag	userFlag	
	alternative	alternativ	
EnvironmentalContamination Area	name	name	
	description	feat_desc	descrip
	status	status	
	cause	cause	
	dateFound	dateFound	
	environmentalHazardCategory	ehazcat	
	pollutantReleaseType	rel_typ	polReType
	pollutionSource	pol_src	polSource

FeatureClass	AttributeName	Shp_Name	NewShp_Name
	remediationUrgency	rem_urg	remUrgncy
	severity	severity	
	toxicStatusOfPollutant	tox_stt	toxStatPol
	userFlag	userFlag	
	alternative	alternativ	
FAARegionArea	name	name	
	description	reg_desc	descrip
	status	status	
	userFlag	userFlag	
	alternative	alternativ	
FaunaHazardArea	name	name	
	description	feat_desc	descrip
	status	status	
	hazardType	hazardType	
	alternative	alternativ	
Fence	name	name	
	description	feat_desc	descrip
	status	status	
	type	type	
	height	height	
	userFlag	userFlag	
	alternative	alternativ	
FloodZone	name	name	
	description	feat_desc	descrip
	status	status	
	userFlag	userFlag	
	alternative	alternativ	
FloraSpeciesSite	name	name	
	description	feat_desc	descrip
	status	status	
	endangeredSpeciesActSite	hab_stt	habStt
	plantHeight	plant_ht	plantHt
	plantType	plantType	
	alternative	alternativ	
ForestStandArea	name	name	
	description	feat_desc	descrip
	status	status	
	habitatCategory	habcat	
	alternative	alternativ	
FrequencyArea	name	name	
	description	feat_desc	descrip
	status	status	
	station	station	

FeatureClass	AttributeName	Shp_Name	NewShp_Name
	userFlag	userFlag	
	alternative	alternativ	
Gate	name	name	
	description	feat_desc	descrip
	status	status	
	attended	attended	
	type	type	
	height	height	
	length	length	
	userFlag	userFlag	
	alternative	alternativ	
HazardousMaterialStorageSite	name	name	
	description	feat_desc	descrip
	status	status	
	storeHazardousMaterialCategory	hsb_cat	hsbCat
	userFlag	userFlag	
	alternative	alternativ	
ImageArea	name	name	
	description	feat_desc	descrip
	status	status	
	frameId	frameId	
	photoDate	photoDate	
	userFlag	userFlag	
	alternative	alternativ	
LandmarkSegment	name	name	
	description	feat_desc	descrip
	status	status	
	landmarkType	landmark	
	userFlag	userFlag	
	alternative	alternativ	
LandUse	name	name	
	description	use_desc	descrip
	status	status	
	useType	useType	
	userFlag	userFlag	
	alternative	alternativ	
LeaseZone	name	name	
	description	feat_desc	descrip
	status	status	
	actualArea	actualArea	
	expectedLeaseExpirationDate	date_lsexp	datelsexp
	leasedArea	leasedArea	
	legalDescription	legl_desc	legalDesc
	permitUse	permitUse	
	tenantName	tenantName	
	userFlag	userFlag	
alternative	alternativ		
MarkingArea	name	name	

FeatureClass	AttributeName	Shp_Name	NewShp_Name
	description	descrip	
	status	status	
	markingFeatureType	markingF	
	color	color	
	alternative	alternativ	
	userFlag	userFlag	
MarkingLine	name	name	
	description	descrip	
	status	status	
	markingFeatureType	markingF	
	color	color	
	userFlag	userFlag	
	alternative	alternativ	
MovementArea	name	name	
	description	descrip	
	status	status	
	userFlag	userFlag	
	alternative	alternativ	
Municipality	name	name	
	description	feat desc	descrip
	status	status	
	userFlag	userFlag	
	alternative	alternativ	
NavaidCriticalArea	name	name	
	description	feat desc	descrip
	status	status	
	dimensionX	dimensionX	
	dimensionY	dimensionY	
	userFlag	userFlag	
	alternative	alternativ	
NavaidEquipment	name	name	
	description	feat desc	descrip
	status	status	
	faaFacilityId	faaFacilid	
	navAidEquipmentType	navaidEq	
	navigationalAidSystemType	navaidSy	
	useCode	useCode	
	antennaToThresholdDistance	antToThres	antentDist
	centerlineDistance	centerline	centlnDist
	stopEndDistance	stopEnDist	
	offsetDistance	offsetDist	
	offsetDirection	offsetDire	
	lightingType	lightConfT	
	owner	owner	
	runwayEndId	rwyEndID	
	referencePointEllipsoidHeight	refPointEH	
referencePointThreshold	refPointTh		
thresholdCrossingHeight	thresholdC		



FeatureClass	AttributeName	Shp_Name	NewShp_Name
	highAngle	highAngle	
	ellipsoidElevation	ellipsoidE	
	userFlag	userFlag	
	alternative	alternativ	
NavaidSite	name	name	
	description	facil_desc	descrip
	status	status	
	faaFacilityId	faaFacilid	
	facilityType	fac typ	facType
	propertyCustodian	propertyCu	
	userFlag	userFlag	
NavigationBuoy	alternative	alternativ	
	name	name	
	description	feat_desc	descrip
	status	status	
	designator	designator	
	type	type	
	lightingType	lighting	
	color	color	
	owner	owner	
NoiseContour	userFlag	userFlag	
	alternative	alternativ	
	name	name	
	description	feat_desc	descrip
	status	status	
	contourValue	contourVal	
NoiseIncident	userFlag	userFlag	
	alternative	alternativ	
	name	name	
	description	incid_desc	descrip
	status	status	
	reporter	reporter	
NoiseMonitoringPoint	userFlag	userFlag	
	alternative	alternativ	
	name	name	
	description	feat_desc	descrip
	status	status	
Obstacle	userFlag	userFlag	
	alternative	alternativ	
	name	name	
	description	feat_desc	descrip
	status	status	
	obstacleType	obstacle	obstacleTy
	obstacleSource	obstacleso	
	aboveGroundLevel	aboveGroun	
	distanceFromDisplacedThreshold	FromDTHLDD	
distanceFromRunwayCenterline	FromRwyCen		
distanceFromRunwayEnd	FromRwyEnd		

FeatureClass	AttributeName	Shp_Name	NewShp_Name
	groupCode	groupCode	
	heightAboveAirport	heightAbov	
	heightAboveRunway	hAbovRwy	
	heightAboveTouchdownZone	hAbovTdz	
	lightCode	lightCode	
	markingFeatureType	markingF	
	penValSpecified	penVal_Spe	penValSpe
	penValSupplemental	penVal_Sup	penValSup
	ellipsoidHeight	ellipsoidH	
	obstructionNumber	obsNumber	
	disposition	dispostn	
	oisSurfaceCondition	oisSurfa	
	frangible	frangible	
	faacoordinationcode	faaCode	
	userFlag	userFlag	
	alternative	alternativ	
ObstructionArea	name	name	
	description	feat_desc	descrip
	status	status	
	obstacleType	obstacle	obstacleTy
	obstacleSource	obstacleso	
	aboveGroundLevel	aboveGroun	
	distanceFromDisplacedThreshold	FromDTHLDD	
	distanceFromRunwayCenterline	FromRwyCen	
	distanceFromRunwayEnd	FromRwyEnd	
	groupCode	groupCode	
	heightAboveAirport	heightAbov	
	heightAboveRunway	hAbovRwy	
	heightAboveTouchdownZone	hAbovTdz	
	lightCode	lightCode	
	markingFeatureType	markingF	
	penValSpecified	penVal_Spe	penValSpe
	penValSupplemental	penVal_Sup	penValSup
	obstructionNumber	obs_number	obsNumber
	obstructionAreaType	obs_typ	obsArType
	disposition	dispostn	
	oisSurfaceCondition	oisSurfa	
	length	length	
	width	width	
	frangible	frangible	
	faaCoordinationCode	faa_d	faaCode
	ellipsoidHeight	ellipsoidH	
userFlag	userFlag		
alternative	alternativ		
ObstructionIdSurface	name	name	
	description	feat_desc	descrip
	status	status	
	oisSurfaceType	oisSurTy	

FeatureClass	AttributeName	Shp_Name	NewShp_Name
	oisZoneType	oisZoneT	
	oisSurfaceCondition	oisSurfa	
	runwayDesignator	rwyDesg	
	RunwayEndDesignator	RunwayEndD	
	safetyRegulation	safety_reg	safetyReg
	zoneUse	zoneUse	
	approachGuidance	approachGu	
	slope	slope	
	userFlag	userFlag	
	alternative	alternativ	
Parcel	name	name	
	description	feat_desc	descrip
	status	status	
	parcelNumber	parc_num	parcNum
	area	area	
	authority	authority	
	previousOwner	prevOwner	
	acquisitionType	acquisitio	
	acquisitionPurpose	acqPurpose	
	costToAcquire	costToAcqu	
	grantProjectNumber	grantProje	
	howAcquired	howAcquire	
	marketValue	marketValu	
	yearAssessed	yearAssess	
	yearBuilt	yearBuilt	
	useOfParcel	use_parc	useParc
	legalDescription	legl_desc	legalDesc
	dateAcquired	dateAcquir	
	assessedValue	assd_value	assdValue
	deedReference	deed_ref	deedRef
userFlag	userFlag		
alternative	alternativ		
ParkingLot	name	name	
	description	feat_desc	descrip
	status	status	
	numberHandicapSpaces	num_hndcp	noHndcpSp
	owner	owner	
	parkingLotUse	park_use	parcUse
	surfaceType	surfaceT	
	totalNumberSpaces	tot_spaces	totSpaces
	userFlag	userFlag	
	alternative	alternativ	
PassengerLoadingBridge	name	name	
	description	feat_desc	descrip
	status	status	
	loadingBridgeType	loadingBT	
	userFlag	userFlag	
	alternative	alternativ	

FeatureClass	AttributeName	Shp_Name	NewShp_Name
RailroadCenterline	name	name	
	description	feat_desc	descrip
	status	status	
	isBridge	isBridge	
	numberOfTracks	numTracks	
	owner	owner	
	isTunnel	isTunnel	
	directionality	direction	
	segmentType	segmentT	
	userFlag	userFlag	
alternative	alternativ		
RailroadYard	name	name	
	description	feat_desc	descrip
	status	status	
	owner	owner	
	userFlag	userFlag	
alternative	alternativ		
RestrictedAccessBoundary	name	name	
	description	area_desc	descrip
	status	status	
	userFlag	userFlag	
alternative	alternativ		
RoadCenterline	name	name	
	description	feat_desc	descrip
	status	status	
	color	color	
	userFlag	userFlag	
alternative	alternativ		
RoadPoint	name	name	
	description	feat_desc	descrip
	status	status	
	userFlag	userFlag	
alternative	alternativ		
RoadSegment	name	name	
	description	feat_desc	descrip
	status	status	
	alternateName	alt_name	altName
	numberOfLanes	num_lanes	numLanes
	route1Name	route1Name	
	route1Type	route1Type	
	route2Name	route2Name	
	route2Type	route2Type	
	route3Name	route3Name	
	route3Type	route3Type	
	length	length	
	width	width	
isBridge	isBridge		
isTunnel	isTunnel		

FeatureClass	AttributeName	Shp_Name	NewShp_Name
	directionality	direction	
	segmentType	segmentT	
	surfaceType	surfaceT	
	surfaceMaterial	surfaceM	
	userFlag	userFlag	
	alternative	alternativ	
Roof	name	name	
	description	feat_desc	descrip
	status	status	
	buildingNumber	buildingNo	
	userFlag	userFlag	
	alternative	alternativ	
Runway	name	name	
	description	feat_desc	descrip
	status	status	
	runwayDesignator	rwyDesg	
	width	width	
	length	length	
	surfaceType	surfaceT	
	surfaceMaterial	surfaceM	
	surfaceCondition	surfaceC	
	pavementClassificationNumber	pavementCl	
	userFlag	userFlag	
alternative	alternativ		
RunwayArrestingArea	name	name	
	description	feat_desc	descrip
	status	status	
	length	length	
	width	width	
	surfaceMaterial	surfaceM	
	surfaceCondition	surfaceC	
	setback	setback	
	userFlag	userFlag	
alternative	alternativ		
RunwayBlastPad	name	name	
	description	feat_desc	descrip
	status	status	
	length	length	
	pavementClassificationNumber	pavementCl	
	RunwayEndDesignator	RunwayEndD	
	surfaceCondition	surfaceC	
	surfaceMaterial	surfaceM	
	surfaceType	surfaceT	
	userFlag	userFlag	
alternative	alternativ		
RunwayCenterline	name	name	
	description	feat_desc	descrip
	status	status	

FeatureClass	AttributeName	Shp_Name	NewShp_Name
	isDerived	isDerived	
	runwayDesignator	rwy_desc	rwyDesg
	userFlag	userFlag	
	alternative	alternativ	
RunwayElement	name	name	
	description	feat_desc	descrip
	status	status	
	pavementClassificationNumber	pavementCl	
	runwayDesignator	rwyDesg	
	surfaceCondition	surfaceC	
	surfaceMaterial	surfaceM	
	surfaceType	surfaceT	
	userFlag	userFlag	
	alternative	alternativ	
RunwayEnd	name	name	
	description	feat_desc	descrip
	status	status	
	ellipsoidHeight	ellipsoidH	
	approachCategory	approach	appCat
	approachGuidance	approachG	
	accelerateStopDistanceAvail	acStpDAvai	
	magneticBearing	brngMagnet	
	TrueBearing	brngTrue	
	designGroup	designGr	
	displacedDistance	displacedD	
	landingDistanceAvailable	landingDis	
	RunwayEndDesignator	RunwayEndD	
	runwaySlope	rwySlope	
	takeOffDistanceAvailable	takeOffDis	
	takeOffRunwayAvailable	takeOffRun	
	thresholdType	threshol	thresholdT
	touchdownZoneElevation	tdzElevati	
	touchdownZoneSlope	tdzSlope	
	userFlag	userFlag	
alternative	alternativ		
RunwayHelipadDesignSurface	name	name	
	description	feat_desc	descrip
	status	status	
	designSurfaceType	designSu	
	zoneUse	zoneUse	
	determination	determinat	
	determinationDate	detDate	
	zoneInnerWidth	zone_inner	zoneInner
	zoneOuterWidth	zone_outer	zoneOuter
	zoneLength	zone_lengt	zoneLength
	slope	slope	
	userFlag	userFlag	
alternative	alternativ		

FeatureClass	AttributeName	Shp_Name	NewShp_Name
RunwayIntersection	name	name	
	description	feat_desc	descrip
	status	status	
	runwayDesignator1	rwy1_desgn	rwy1Desgn
	runwayDesignator2	rwy2_desgn	rwy2Desgn
	runwayDesignator3	rwy3_desgn	rwy3Desgn
	pavementClassificationNumber	pavementCl	
	userFlag	userFlag	
RunwayLabel	alternative	alternativ	
	name	name	
	description	feat_desc	descrip
	status	status	
	RunwayEndDesignator	RunwayEndD	
	userFlag	userFlag	
RunwayLAHSO	alternative	alternativ	
	name	name	
	description	feat_desc	descrip
	status	status	
	color	color	
	protectedRunwayDesignator	protected	
	markingFeatureType	markingF	
	userFlag	userFlag	
RunwayProtectArea	alternative	alternativ	
	name	name	
	description	feat_desc	descrip
	status	status	
	length	length	
	type	type	
	userFlag	userFlag	
RunwaySafetyAreaBoundary	alternative	alternativ	
	name	name	
	description	feat_desc	descrip
	RunwayEndDesignator	RunwayEndD	
	status	status	
	determinationDate	detDate	
	determination	determinat	
	userFlag	userFlag	
SampleCollectionPoint	alternative	alternativ	
	name	name	
	description	feat_desc	descrip
	status	status	
	collectionPointLocation	locdesc	
	userFlag	userFlag	
SeaplaneRampCenterline	alternative	alternativ	
	name	name	
	description	feat_desc	descrip
	status	status	
	length	length	

FeatureClass	AttributeName	Shp_Name	NewShp_Name
	userFlag	userFlag	
	alternative	alternativ	
SeaplaneRampSite	name	name	
	description	feat_desc	descrip
	status	status	
	width	width	
	slope	slope	
	userFlag	userFlag	
	alternative	alternativ	
SecurityArea	name	name	
	description	feat_desc	descrip
	status	status	
	userFlag	userFlag	
	alternative	alternativ	
SecurityIdDisplayArea	name	name	
	description	feat_desc	descrip
	status	status	
	alternative	alternativ	
SecurityPerimeterLine	name	name	
	description	feat_desc	descrip
	status	status	
	alternative	alternativ	
Shoreline	name	name	
	description	shore_desc	descrip
	status	status	
	shorelineType	shr_typ	shoreType
	alternative	alternativ	
Shoulder	name	name	
	description	feat_desc	descrip
	status	status	
	shoulderType	shl_type	shldrType
	length	length	
	width	width	
	restricted	restricted	
	surfaceMaterial	surfaceM	
	surfaceType	surfaceT	
	surfaceCondition	surfaceC	
	sequence	sequence	
	alternative	alternativ	
Sidewalk	name	name	
	description	walk_desc	descrip
	status	status	
	AmericanDisabilitiesAct	ada_acc	adaAcc



FeatureClass	AttributeName	Shp_Name	NewShp_Name
	length	length	
	width	width	
	surfaceMaterial	surfaceM	
	segmentType	segmentT	
	userFlag	userFlag	
	alternative	alternativ	
State	name	name	
	description	feat_desc	descrip
	status	status	
	userFlag	userFlag	
	alternative	alternativ	
SterileArea	name	name	
	description	feat_desc	descrip
	status	status	
	userFlag	userFlag	
	alternative	alternativ	
Stopway	name	name	
	description	feat_desc	descrip
	status	status	
	length	length	
	width	width	
	RunwayEndDesignator	RunwayEndD	
	surfaceMaterial	surfaceM	
	surfaceType	surfaceT	
	surfaceCondition	surfaceC	
	userFlag	userFlag	
	alternative	alternativ	
TankSite	name	name	
	description	feat_desc	descrip
	status	status	
	tankType	tankType	
	topElevation	top_elv	topElev
	lightCode	lightCode	
	verticalStructureMaterial	vertical	
	lightingType	lighting	
	markingFeatureType	markingF	
	color	color	
	userFlag	userFlag	
	alternative	alternativ	
TaxiChannel	name	name	
	description	feat_desc	descrip
	status	status	
	restriction	restrictio	
	length	length	
	width	width	
	depth	depth	
	userFlag	userFlag	
	alternative	alternativ	

FeatureClass	AttributeName	Shp_Name	NewShp_Name
TaxiwayElement	name	name	
	description	feat_desc	descrip
	status	status	
	taxiwayId	taxiwayId	
	taxiwayType	taxiwayT	
	surfaceMaterial	surfaceM	
	pavementClassificationNumber	pavementCl	
	surfaceCondition	surfaceC	
	directionality	direction	
	sequence	sequence	
	surfaceType	surfaceT	
	designGroup	designGr	
	length	length	
	width	width	
	maximumSpeed	maxSpeed	
	wingSpan	wingSpan	
userFlag	userFlag		
alternative	alternativ		
TaxiwayHoldingPosition	name	name	
	description	feat_desc	descrip
	status	status	
	runwayDesignator	rwy_desgn	rwyDesg
	taxiwayDesignator	taxi_desgn	taxiDesgn
	lowVisibilityCategory	low_visi	lowVisCat
	userFlag	userFlag	
	alternative	alternativ	
TaxiwayIntersection	name	name	
	description	feat_desc	descrip
	status	status	
	userFlag	userFlag	
	alternative	alternativ	
TouchDownLiftOff	name	name	
	description	feat_desc	descrip
	status	status	
	length	length	
	width	width	
	surfaceType	surfaceT	
	surfaceMaterial	surfaceM	
	surfaceCondition	surfaceC	
	designHelicopter	designHeli	
	gradient	gradient	
	userFlag	userFlag	
alternative	alternativ		
Tower	name	name	
	description	feat_desc	descrip
	status	status	
	verticalStructureMaterial	vertical	
	structureHeight	structHght	

FeatureClass	AttributeName	Shp_Name	NewShp_Name
	lightCode	lightCode	
	lightingType	lighting	
	markingFeatureType	markingF	
	color	color	
	userFlag	userFlag	
	alternative	alternativ	
Tunnel	name	name	
	description	feat_desc	descrip
	status	status	
	type	type	
	verticalClearance	vert_clr	vertClr
	averageHeight	avg_ht	averageHt
	averageWidth	avg_wd	averageWd
	length	length	
	directionality	direction	
	segmentType	segmentT	
	userFlag	userFlag	
	alternative	alternativ	
TurningBasin	name	name	
	description	feat_desc	descrip
	status	status	
	restriction	restrictio	
	length	length	
	width	width	
	depth	depth	
	diameter	diameter	
	compassLocation	compassLoc	
	userFlag	userFlag	
	alternative	alternativ	
UtilityLine	name	name	
	description	feat_desc	descrip
	status	status	
	utilityType	utilityT	
	directionality	direction	
	userFlag	userFlag	
	alternative	alternativ	
UtilityPoint	name	name	
	description	feat_desc	descrip
	status	status	
	utilityType	utilityT	
	userFlag	userFlag	
	alternative	alternativ	
UtilityPolygon	name	name	
	description	feat_desc	descrip
	status	status	
	utilityType	utilityT	
	userFlag	userFlag	
	alternative	alternativ	

FeatureClass	AttributeName	Shp_Name	NewShp_Name
WaterLaneEnd	name	name	
	description	feat_desc	descrip
	status	status	
	magneticBearing	brngMagnet	
	compassLocation	compassLoc	
	restriction	restrictio	
	airMarker	airMaker	
	type	type	
	color	color	
	lightingtype	lighting	
	approachGuidance	approachGu	
	length	length	
	width	width	
	depth	depth	
	centroid	centroid	
userFlag	userFlag		
alternative	alternativ		
WaterOperatingArea	name	name	
	description	feat_desc	descrip
	status	status	
	surfaceMaterial	surfaceM	
	length	length	
	width	width	
	currentFlowrate	currentFlo	
	compassLocation	compassLoc	
	tidalRange	tidalRange	
	coordinatedUseType	coordUseT	
	coordinatedUseActivityLevel	coordUseA	
	userFlag	userFlag	
alternative	alternativ		
Wetland	name	name	
	description	wetln_desc	descrip
	status	status	
	featureType	feat_typ	featType
	userFlag	userFlag	
	alternative	alternativ	
Zoning	name	name	
	description	feat_desc	descrip
	status	status	
	landOwnerRestriction	restrict	
	zoningClassification	zng_cls	zngClass
	userFlag	userFlag	
	alternative	alternativ	