EUROPEAN ORGANISATION
FOR THE SAFETY OF AIR NAVIGATION

EUROCONTROL Guidelines for ED-99 airport mapping requirements in AIXM 5.1

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Abstract

This document contains the EUROCONTROL Guidelines for the support provided in the Aeronautical Information Exchange Model (AIXM) version 5.1 for the Airport Mapping data requirements stated in EUROCAE ED-99, User Requirements for Aerodrome Mapping Information. This supports the standardised encoding and the distribution in digital format of the aeronautical information/data that is in the scope of Aeronautical Data Quality (ADQ) Regulation (EU) 73/2010, developed in accordance with the interoperability Regulation in the framework of the Single European Sky (SES).

Keywords

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AIX	SES	AIS	AIM
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The following table identifies all management authorities who have successively approved the present issue of this document.

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DOCUMENT CHANGE RECORD

The following table records the complete history of the successive editions of the present document.

EDITION NUMBER	EDITION DATE	REASON FOR CHANGE	PAGES AFFECTED
0.1	20 JAN 2012	Initial draft, based on previous work done by Scott Wilson in the frame of the Airport Mapping activities of Eurocontrol	All
0.2	25 APR 2012	Completely reviewed version, using ED 99A and the experience gathered with the writing of the Metadata Requirements documents	All
0.3	1 JUN 2012	Updates on some mappings after EUROCONTROL and AENA review.	20-55
0.4	28 JUN 2012	Update with mappings for ED99B and ED99C	All
0.5	1 AUG 2012	Updated mapping for AM_FrequencyArea. Added “AMDB Extension”. Completed mappings of default values. Started mapping other data types and constraints	All
0.6	09 APR 2013	First attempt to create the AIXM – AMDB extension schema. Included coments from SnowflakeSoftware and AeroNavdata.	Sections 3.1, 3.2,

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CONTENTS

1. Introduction

1.1 Scope and purpose

This document provides evidence for Compliance with [REQ-AMDB-01] of EUROCONTROL's AIX Guidelines.

It analyses the coverage of the "User Requirements for Aerodrome Mapping Information" (ED-99) within AIXM 5.1. A series of tables is provided to map the ED-99 information items to classes, attributes and associations in the AIXM UML model, in particular the AirportHeliport package.

This mapping considers ED-99A as specified in [REQ-AMDB-01]. However, it includes mappings for later versions of the ED-99 documents. These mappings are not required in order to comply with [REQ-AMDB-01] but have been provided for completeness.

This mapping covers:

- Features and their Attributes
- Enumerations, Codelist and "Basic" Datatypes
- Functional and Geometrical Constraints

Note that this document will not provide instructions on how to create an ED-99A compliant Aerodrome Mapping Database. This can only be done by following the complete rules within ED-99A and its sister-document ED-119.

1.2 ED99 versions

ED-99A was published in October 2005. This was the version available at the start of the development of AIXM 5.1.

ED-99B was published in April, 2009.

The latest version of the "User Requirements for Aerodrome Mapping Information" is ED-99C. This was published in September 2011.

1.2.1 Changes in ED-99B

The following features were introduced in ED-99B:

- Aerodrome Surface Lighting
- Blastpad
- Hotspot
- Water

In addition several attributes were added or changed e.g.:

- "idnumber" was added to all features
- "elev" was added to Aerodrome Reference Points
- "papivasi" was renamed to "vasis"

1.2.2 Changes in ED-99C

The following features were introduced in ED-99C:

- Arresting System Locations
- ASRN Edges
- ASRN Nodes

- Runway Centreline Points

In addition several attributes were added or changed e.g.:

- “temporality” related attributes (stfeat, endfeat, stvalid, endvalid, interp) were added to all features
- “restacn” was renamed to “restacft”
- “acn” was renamed to “acft”
- “status” was added to Final Approach and Take-off, Parking Stand Areas, Runway Elements, Taxiway Elements, Touchdown and Lift-off Areas

1.3 ED119

In cases where ED-99A is not clear, ED-119 has been used for extra details. ED-119 details an interchange standard for aerodrome mapping data with accompanying UML diagrams. In particular, the details on the geometries of the features have been taken from ED-119. For example, where ED-99A lists a feature as of type “Point”, ED-119 has added an attribute “geopnt”. This additional attribute is included in the mappings.

In addition, the enumeration and codelist values are taken from ED-119.

1.4 Abbreviations

Term	Definition
ADQ	Aeronautical Data Quality
ADQ IR	Commission Regulation (EU) No. 73/2010, of 26 January 2010, laying down requirements on the quality of aeronautical data and aeronautical information for the single European sky OJ L 23/6 (27.1.2010)
AIM	Aeronautical Information Management
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation And Control
AIS	Aeronautical Information Service
AIX	Aeronautical Information Exchange
AIXM	Aeronautical Information eXchange Model
AMDB	Aerodrome Mapping Database
ANSP	Air Navigation Service Provider
ATM	Air Traffic Management

DSS	Single Sky Directorate (in EUROCONTROL)
EAD	European AIS Database
EC	European Commission
ECTL	EUROCONTROL
ERAF	EUROCONTROL Regulatory and Advisory Framework (Cadre réglementaire et consultatif d'EUROCONTROL)
EU	European Union
GML	Geographical Markup Language
IAIP	Integrated Aeronautical Information Package
ICAO	International Civil Aviation Organization
IR	Implementing Rule (SES)
ISBN	International Standard Book Number
ISO	International Standards Organization
NOTAM	Notice to Airmen
OJ	Official Journal
PDF	Portable Document Format
SARPS	Standards And Recommended Practices
SES	Single European Sky
UML	Unified Modelling Language
UTC	Coordinated Universal Time
XML	EXtensible Markup Language
XSD	XML Schema

1.5 Reference material

[1] Internal guidelines for the development of EUROCONTROL specifications and EUROCONTROL guidelines. Edition 1.0 dated 16 October 2007. Ref. ECTL_SPEC_GUID_1.0 191007

[2] EUROCONTROL Guidelines – Use of AIXM 5.1 in relation with the AIX Specification. Proposed Issue x.x dated xx XXX xxxx. Ref …

[3] [AIXM_5_1] - AIXM 5.1, version of of 2 February 2010, EUROCONTROL and FAA

[4] [GML] - Geography Markup Language Open Geospatial Consortium, Inc.

[5] [UML] - http://www.uml.org/#UML2.0 Object Management Group - Unified Modeling Language

[6] [XML] - http://www.w3.org/XML/ *Extensible Markup Language (XML)* World Wide Web Consortium

[7] [ED-99] - http://www.eurocae.net/publications/publications-list.html

[8] [ED-119] - http://www.eurocae.net/publications/publications-list.html

[9] [RAMD] - Requirements for Aviation Metadata - http://portal.opengeospatial.org/files/?artifact_id=41667

[10] [GAMD] - Guidance on the Aviation Metadata Profile - http://portal.opengeospatial.org/files/?artifact_id=41668

[11] [AIXM-EXT] AIXM Application Schema Generation - http://www.aixm.aero/gallery/content/public/AIXM51/AIXM_Application_Schema_Generation-1.1.pdf

2. Mapping methodology

2.1 Shared vocabulary

The Aeronautical Information Exchange Model (AIXM) version 5.1 makes use of the ISO 19100 series of standards. This includes the uses of base-types (CharacterString, Boolean, Real) and the use of a specific set of stereotypes (e.g. <<Feature>>). The AIXM XML Schema makes use of ISO 19136 (GML) for geometries and ISO 19115 for its metadata encodings.

ED-99 also talks about Features. The ED-119 document, which provides the “interchange standards for terrain, obstacle, and aerodrome mapping data”, makes use of the ISO 19100 series of standards for attribute types.

These similarities mean that it is not necessary to perform a detailed analysis of the base types used in the models.

2.2 Understanding the mappings

The mappings are listed in a series of tables.

2.2.1 Feature level mapping

2.2.1.1 Definitions

Each entry starts with the ED-99 definition of the feature and the AIXM 5.1 definition for the mapped feature.

2.2.1.2 ED-99A to AIXM 5.1 mapping table

The ED-99A to AIXM features mapping tables uses the following columns:

- ED-99A
    - The first row gives the feature name from ED-99A
    - Subsequent rows give the attributes of that feature
- AIXM 5.1
    - The first row gives the name of the AIXM Feature that should act as the root for the mapping.
    - Subsequent rows give the attributes. Where these are from a feature that is related to the root feature, the exact path is given. The syntax used is:
        - <property name>.<feature name>.<property name> e.g. associatedAirportHeliport.AirportHeliport.locationIndicatorICAO.
        - square brackets are used to give conditions on the values of a property e.g. Runway[type=‘FATO’]. This is important as AIXM is often more general that ED-99A.
        - {results of query} is used as shorthand in some mappings. The query should be detailed elsewhere in the table.
    - Notes are included where relevent to the mapping.

2.2.1.3 ED-99B and ED-99C mapping tables

Where new attributes have been added to a feature in subsequent version of the ED-99 document, additional tables are given. Only the new attributes are listed in the table and they can be seen as supplementing the main ED99A to AIXM 5.1 mapping.

Complete mappings are also provided for the new features introduced in ED-99B and ED-99C.

2.2.1.4 General observations

There are some general remarks on the feature level mappings.

- Some attributes map at metadata level rather than feature level. For example, ED-99A's 'vres' attribute maps to a metadata field and not to an attribute that is directly present in the corresponding AIXM 5.1 feature. Such mappings begin with "gmd:Metadata". More details on how to apply metadata within an aviation specific dataset can be found in [9] and [10].
- ED-99A does not include a temporality model. Therefore, no mapping has been attempted from AIXM 5.1's temporality model to ED-99A. In effect, everything can be seen as a SNAPSHOT. However, temporality was added in ED-99C – the mapping to AIXM 5.1's temporality model can be found in the relevant tables.
- AIXM 5.1's temporality model makes use of "TimePrimitive". This is expanded in the AIXM XML Schema using GML constructs. In order to better explain the mapping, the GML constructs are used in the mapping. These begin with "gml:" e.g. "gml:TimePeriod".
- In the case of some features detailing guidance lines and markings (e.g. Land and Hold Short Operations) a choice of mapping approach was possible. The option adopted was to use the marking element as main root of these mappings rather than e.g. the centreline point. This has a practical benefit and is more inline with the philosophy of ED-99A.
- The AM_FrequencyArea mapping is a difficult mapping case. The most correct mapping is to use GroundTrafficControlService and RadioCommunicationChannel. At first glance this seems less logical than using RadioFrqeuencyArea as the root of the mapping. However, the RadioFrequencyArea was intended to provide radio signal coverage limitations for navaids and ATC frequencies, not to designate the area in which a particular frequency has to be used. The AIXM Service concept was intended for that.
- The feattype mapping is noted as 'can be implied'. A query will need to be performed in order to fill out the correct value. The feattype enumeration mapping can be used to define the correct value.
- Three features introduced in ED-99B and ED-99C (AM_Water, AM_AsrnEdge and AM_AsrnNode) have no equivalent in AIXM 5.1. AIXM 5.1 has an extension mechanism which could be used in order to complete these mappings. However, this option is not recommended in these cases.

2.2.2 Enumerations and codelists mapping

2.2.2.1 Table columns

The enumerations and codelists mapping tables use the following columns:

- ED-119
  - The first row gives the codelist/enumeration name from the relevant version of ED-119.
  - Subsequent rows list the possible values.
- AIXM 5.1
  - The first row gives the name of the AIXM codelist that should act as the root for the mapping.
  - Subsequent rows give the mapped value.

2.2.2.2 General observations

There are some general remarks on the enumeration and codelist mappings.

- ED-99A does not provide values for codelists and enumerations. These are taken from ED-119.
- ED-119 uses a mixture of codelists and enumerations. However, AIXM 5.1 only uses codelists. These are open enumerations which means that if there is not direct mapping from the ED-119 value, it is possible to use the construct "OTHER:UPPER_CASE_VALUE". This has been used in several mappings.
- In one case, surftyp, more than one AIXM 5.1 codelist is required in order to complete the mapping.
- In one case, status, a ED-99A attribute can map to two AIXM 5.1 codelist.
- ED-99C added a "Reserved" value to many codelists. This is not mapped as it is a convention to show that certain numbers are not used in codelists, typically the value occurring at position [0].

2.3 Limitations of the mapping

The mapping alone will not guarantee that an ED-99A compliant Aerodrome Mapping Database is created. This can only be done by applying the data product specification rules and the complete functional and geometrical constraints within ED-99A and its sister-document ED-119 (see chapter 7 for AIXM business rules for these constraints).

In addition, where calculations or geometrical mergings are required, visual verification of the result will be required.

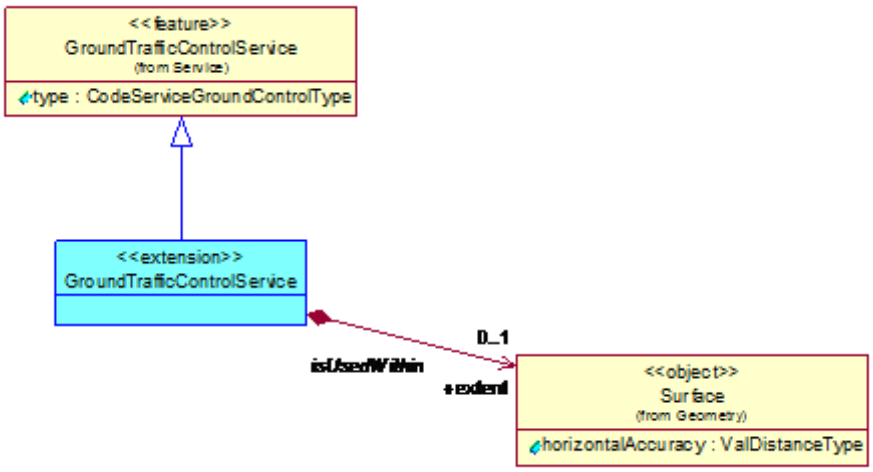
In some cases, additional steps are required by the implementer. For example, AIXM 5.1 allows the use of the geometrical curves and geodesics. ED-99 only allows line-strings. Therefore the curve will need to be transformed into a line-string. Details on such transformations are out of the scope of this document.

3. An "AMDB extension" to AIXM

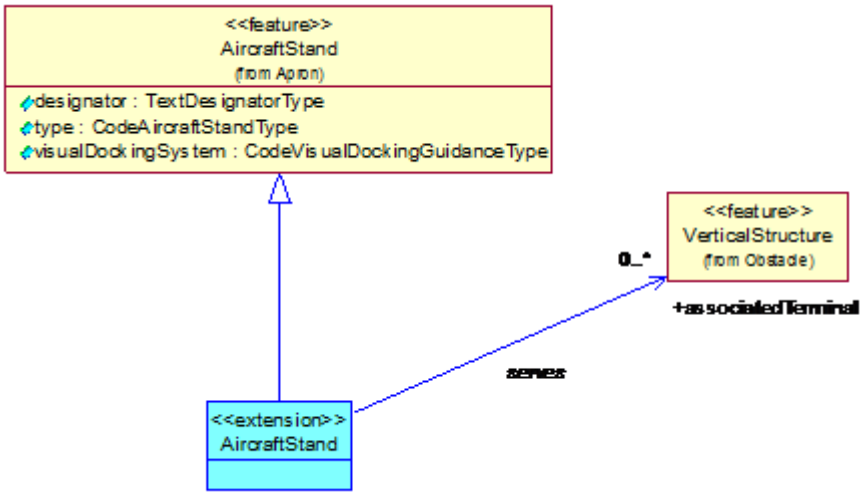
Some mappings are, in fact, impossible to complete using "core" AIXM 5.1. However, AIXM 5.1 includes an extension mechanism (see [11]). Therefore the following "AMDB extension" is proposed in order to complete the mapping.

3.1 Specific Extensions

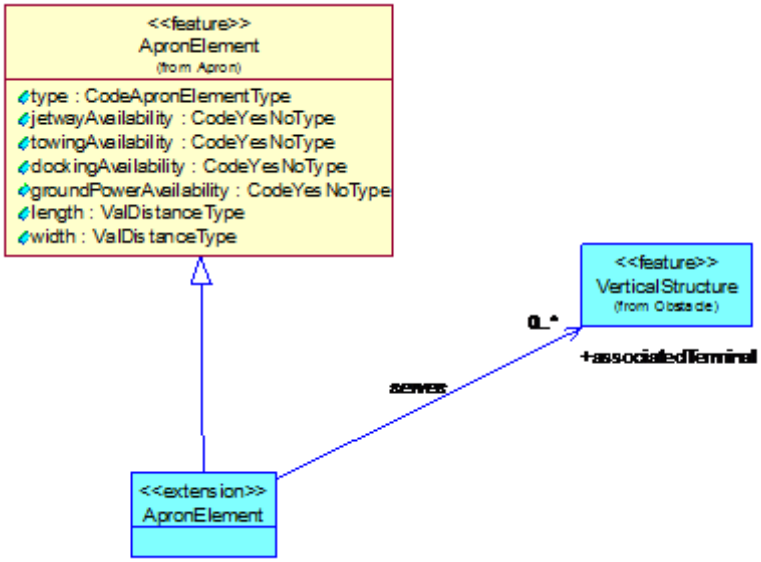
- **GroundTrafficControlService** should be extended to include an "extent" property. This should be an association with the "Surface" object. This extension will allow the AM_FrequencyArea mapping to be completed.



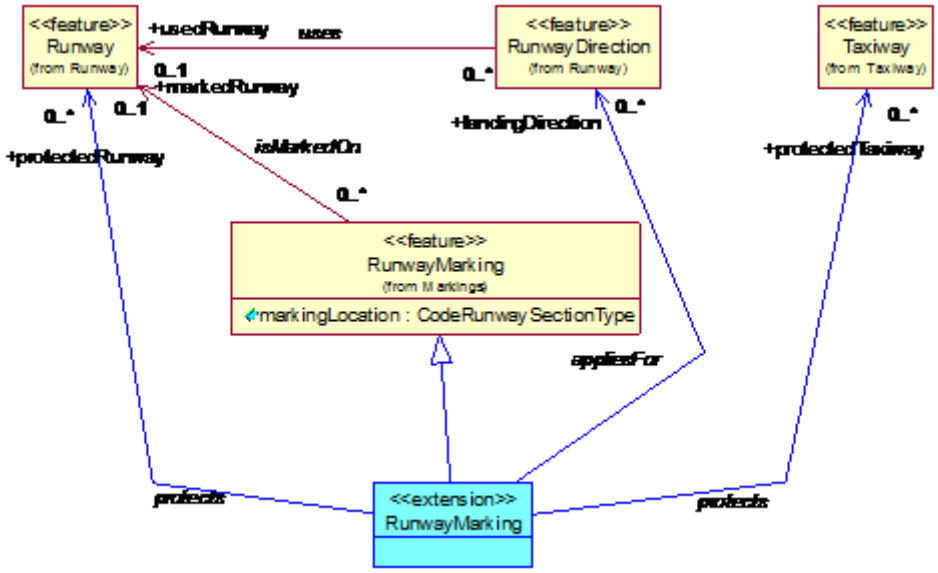
- **AircraftStand** should be extended to include an "associatedTerminal" property. This should be an association with VerticalStructure. This extension will allow the AM_ParkingStandLocation and AM_StandGuidanceLine mappings to be completed. This extension also relies on the ability to add "OTHER:TERMINAL" to the CodeVerticalStructureType.



- **ApronElement** should be extended to include an "associatedTerminal" property. This should be an association with VerticalStructure. This extension will allow the AM_ParkingStandArea mapping to be completed. This extension also relies on the ability to add "OTHER:TERMINAL" to the CodeVerticalStructureType.



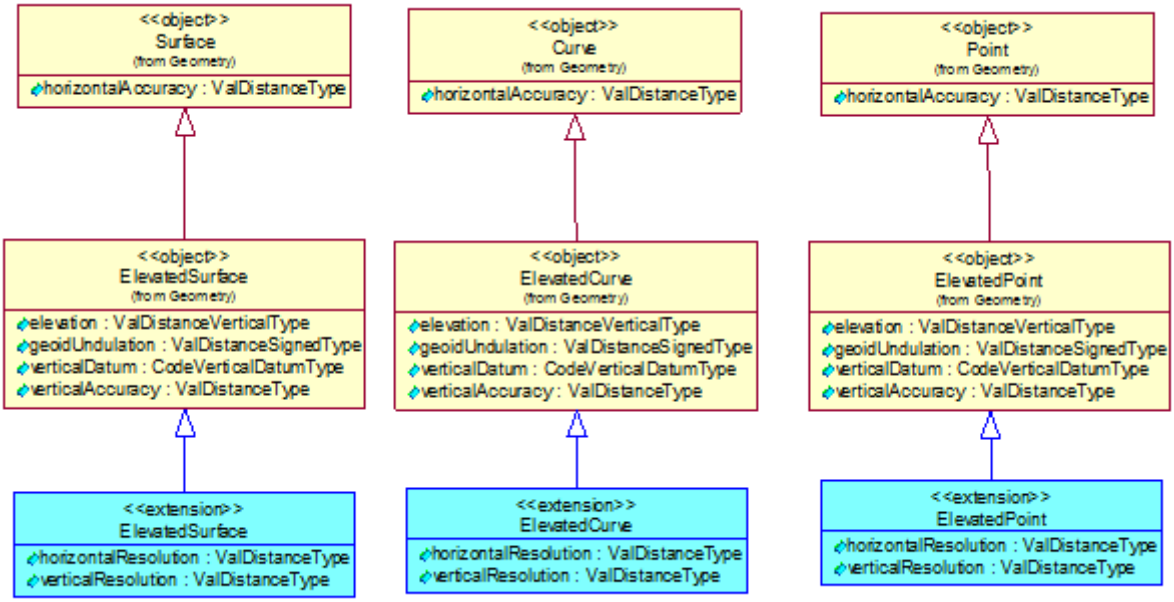
- **RunwayMarking** should be extended to include "protectedTaxiway", "protectedRunway"and "landingDirection" properties. These should be associations with the "Taxiway", "Runway" and "RunwayDirection" features. This extension will allow the AM_LandAndHoldShortOperationLocation mapping to be completed.



3.2 General Extension

- **ElevatedPoint**, **ElevatedCurve** and **ElevatedSurface** shall be extended to include a "horizontalResolution" and "verticalResolution" properties. These attributes do not exist in the "core" AIXM because it was assumed that the resolution is implicit in the latitude, longitude and elevation values. ED-99 asks for the resolution to be explicitly stated in the "vres" attribute. Note: The overall statement of "fine", "medium" or "coarse" should be recorded in the metadata.
    - Because of a limitation of the AIXM 5.1 schema, the extension mechanism cannot be applied to Point, Curve and Surface. Only the ElevatedPoint, ElevatedCurve and ElevatedSurface may be extended. Therefore, the horizontalResolution is also added here. As ElevatedCurve is declared in the substitution group for Curve, if

necessary to fill the horizontalResolution property, an ElevatedCurve element shall be used instead of Curve. A similar procedure shall apply for Point/ElevatedPoint and Surface/ElevatedSurface.



- All AIXM 5.1 features that are relevant for ED-99 AMDB maping shall be extended to include an “integrity” property. Integrity is not in the “core” AIXM as it is a characteristic of a process. If a value is specified in a dataset the author can’t have confidence that that integrity value is preserved at reception of the dataset.
- All AIXM 5.1 features that are relevant for ED-99 AMDB maping should additionally be extended to include a “source” and a “revisionDate” property.
    - It must be noted that the preferred option for these items of information is to use the metadata mapping. Metadata is useful for when a dataset is made available in a registry – source and revision dates are certainly items that a query can be built upon.
    - However, adding this information in the metadata for each feature instance can be seen as heavy. Therefore, the extension mechanism is provided as an alternative solution. Nevertheless, if all feature instances in the AMDB are from same source and have the same revision date, metadata is not heavy and should be used.

As such a simplified metadata schema could be of interest to other applications, all AIXM features are extended with the “integrity”, “source” and “revision”Date” properties, as indicated in the following diagram. A separate namespace is used for this extension.

The mappings make use of this extension where appropriate. The extensions are shown in italics in the mappings. In summary, the mapping of the general extensions is:

ED-99	AIXM 5.1 Extension
Vres	ElevatedPoint.*verticalResolution*; ElevatedCurve.*verticalResolution*; ElevatedSurface.*verticalResolution*
hres	ElevatedPoint.*horizontalResolution*; ElevatedCurve.*horizontalResolution*;

	ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType. gmd:CI_DateTypeCode to be set to "revision"*

4. Feature Mappings

4.1 AM_AerodromeReferencePoint

ED-99A Definition: The designated geographical location of an aerodrome.

AIXM 5.1 Definition: A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft/helicopters.

ED-99A	AIXM 5.1
AM_AerodromeReferencePoint	**AirportHeliport**
idarpt	locationIndicatorICAO
iata	designatorIATA
geopnt	ARP.ElevatedPoint
name	name
feattype	*Note: Can be implied*
vacc	ARP.ElevatedPoint.verticalAccuracy
vres	ARP.ElevatedPoint.*verticalResolution*
hacc	ARP.ElevatedPoint.horizontalAccuracy
hres	ARP.ElevatedPoint.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType. gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier
elev	fieldElevation

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.2 AM_AerodromeSurfaceLighting

ED-99B Definition: Lighting within a movement area.

AIXM 5.1 Defintion: One or more light sources located on the ground and that provide visual assistance for air and ground navigation.

ED-99B	AIXM 5.1
AM_AerodromeSurfaceLighting	**GroundLightSystem** *Note: This is an abstract class and has concrete classes such as TaxiwayLightSystem. TaxiwayLightSystem is used in this mapping.*
idarpt	lightedTaxiway.Taxiway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
	Note: The other concrete classes (ApronLightSystem, TouchDownLiftOffLightSystem, RunwayDirectionLightSystem, VisualGlideSlopeIndicator, TaxiHoldingPositionLightSystem, RunwayProtectAreaLightSystem and GuidanceLineLightSystem) have similar relationships *Note: ED-99 is only interested in the sub-set of these features which are within a movement area.*
geopnt	element.LightElement.location.ElevatedPoint
feattype	*Note: Can be implied*
idnumber	identifier
vacc	element.LightElement.location.ElevatedPoint.verticalAccuracy
vres	element.LightElement.location.ElevatedPoint.*verticalResolution*
hacc	element.LightElement.location.ElevatedPoint.horizontalAccuracy
hres	element.LightElement.location.ElevatedPoint.*horizontalResolution*
integr	*integrity*
source	*source*

	OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType. gmd:CI_DateTypeCode to be set to "revision"*
status	availability.GroundLightingAvailability.operationalStatus

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.3 AM_ApronElement

ED-99A Definition: The remaining parts of a defined apron area that are not covered by Parking Stand Area features or Taxiway Element features.

AIXM 5.1 Definition: A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.

ED-99A	AIXM 5.1
AM_ApronElement	**ApronElement**
idarpt	associatedApron.Apron.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idapron	associatedApron.Apron.name
gsurftyp	surfaceProperties.SurfaceCharactersitics.composition
pcn	surfaceProperties.SurfaceCharactersitics.classPCN
status	availability.ApronAreaAvailability.operationalStatus
geopoly	extent.ElevatedSurface
feattype	*Note: Can be implied*
vacc	extent.ElevatedSurface.verticalAccuracy
vres	extent.ElevatedSurface.*verticalResolution*
hacc	extent.ElevatedSurface.horizontalAccuracy
hres	extent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier
restacn	availability.ApronAreaAvailability.usage.ApronAreaUsage[type=”FORBID”].selection.ConditionCombination.aircraft.AircraftCharacteristic.typeAircraftICAO

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
restacft [= restacn]	*Note: See restacn above*
aprontyp	type

4.4 AM_ArrestingGearLocation

ED-99A Definition: Location of the arresting gear cable across the runway.

AIXM 5.1 Definition: A series of devices, namely engaging or catching devices and energy absorption devices used to stop an aircraft by absorbing its momentum in a routine, emergency landing or aborted take-off.

ED-99A	AIXM 5.1
AM_ArrestingGearLocation	**ArrestingGear**
idarpt	runwayDirection.RunwayDirection.usedRunway.Runway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idthr	runwayDirection.RunwayDirection.designator
status	status
geoline	extent.ArrestingGearExtent.curveExtent.ElevatedCurve
feattype	*Note: Can be implied*
vacc	extent.ArrestingGearExtent.curveExtent.ElevatedCurve.verticalAccuracy
vres	extent.ArrestingGearExtent.curveExtent.ElevatedCurve.*verticalResolution*
hacc	extent.ArrestingGearExtent.curveExtent.ElevatedCurve.horizontalAccuracy
hres	extent.ArrestingGearExtent.curveExtent.ElevatedCurve.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date

Note: also needs gmd:CI_Date.gmd:dateType. gmd:CI_DateTypeCode to be set to "revision"

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.5 AM_ArrestingSystemLocation

ED-99C Definition: High energy absorbing material located at the end of a runway or stopway designed to crush under the weight of an aircraft as the material exerts deceleration forces on the aircraft landing gear.

AIXM 5.1 Defintion: A series of devices, namely engaging or catching devices and energy absorption devices used to stop an aircraft by absorbing its momentum in a routine, emergency landing or aborted take-off.

ED-99C	AIXM 5.1
AM_ArrestingSystemLocation	**ArrestingGear[engageDevice='EMAS']**
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
feattype	Note: Can be implied
idnumber	identifier
idarpt	runwayDirection.RunwayDirection.usedRunway.Runway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idthr	runwayDirection.RunwayDirection.designator
setback	location
aslength	length
aslwidth	width
status	status
vacc	extent.ArrestingGearExtent.surfaceExtent.ElevatedSurface.verticalAccuracy
hacc	extent.ArrestingGearExtent.surfaceExtent.ElevatedSurface.horizontalAccuracy
vres	extent.ArrestingGearExtent.surfaceExtent.ElevatedSurface.*verticalResolution*
hres	extent.ArrestingGearExtent.surfaceExtent.ElevatedSurface.*horizontalResolution*
integr	*integrity*

source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*
geopoly	extent.ArrestingGearExtent.surfaceExtent.ElevatedSurface

4.6 AM_AsrnEdge

ED-99C Definition: A connection between two nodes in a graph defining the Aerodrome Surface Routing Network.

AIXM 5.1 Defintion: *not applicable*

Note: No mapping is possible to AIXM 5.1 Core. This ED-99 feature is out of scope of AIXM 5.1.

4.7 AM_AsrnNode

ED-99C Definition: A vertex in a graph defining the Aerodrome Surface Routing Network.

AIXM 5.1 Defintion: *not applicable*

Note: No mapping is possible to AIXM 5.1 Core. This ED-99 feature is out of scope of AIXM 5.1.

4.8 AM_Blastpad

ED-99B Definition: Specially prepared surface placed adjacent to the end of a runway to eliminate the erosive effect of the high wind forces produced by airplanes at the beginning of their takeoff roll.

AIXM 5.1 Defintion: Specially prepared surface placed adjacent to the end of a runway to eliminate the erosive affect of the high wind forces produced by airplanes at the beginning of their takeoff rolls.

ED-99B	AIXM 5.1
AM_Blastpad	**RunwayBlastPad**
idarpt	usedRunwayDirection.RunwayDirection.usedRunway.Runway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
geopoly	extent.ElevatedSurface
feattype	Note: Can be implied
idnumber	identifier
idthr	usedRunwayDirection.RunwayDirection.designator
vacc	extent.ElevatedSurface.verticalAccuracy
hacc	extent.ElevatedSurface.horizontalAccuracy
vres	extent.ElevatedSurface.verticalResolution
hres	extent.ElevatedSurface.horizontalResolution
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.9 AM_ConstructionArea

ED-99A Definition: Part of a movement area under construction.

AIXM 5.1 Definition: Part of a movement area under construction

ED-99A	AIXM 5.1
AM_ConstructionArea	**WorkArea**
idarpt	associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
pstdate	featureLifetime.TM_Period.begin.TM_Instant.position *Note: This makes use of the AIXM 5.1 temporality model*
pendate	featureLifetime.TM_Period.end.TM_Instant.position *Note: This makes use of the AIXM 5.1 temporality model*
piocdate	plannedOperational
geopoly	extent.ElevatedSurface
feattype	*Note: Can be implied*
vacc	extent.ElevatedSurface.verticalAccuracy
vres	extent.ElevatedSurface.*verticalResolution*
hacc	extent.ElevatedSurface.horizontalAccuracy
hres	extent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.10 AM_DeicingArea

ED-99A Definition: An area comprising an inner area for the parking of an airplane to receive de-icing treatment and an outer area for the maneuvering of two or more mobile de-icing equipment.

AIXM 5.1 Defintion: An area comprising an inner area for the parking of an aircraft to receive de-icing treatment and an outer area for the manoeuvring of two or more mobile de-icing equipment.

ED-99A	AIXM 5.1
AM_DeicingArea	**DeicingArea**
idarpt	associatedApron.Apron.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO *Note: Can also be taxiwayLocation or standLocation*
idbase	associatedApron.Apron.name *Note: Can also be taxiwayLocation or standLocation*
ident	identifier *Note: This is inherited from AIXMFeature*
gsurftyp	surfaceProperties.SurfaceCharacteristics.composition
geopoly	extent.ElevatedSurface
feattype	*Note: Can be implied*
vacc	extent.ElevatedSurface.verticalAccuracy
vres	extent.ElevatedSurface.*verticalResolution*
hacc	extent.ElevatedSurface horizontalAccuracy
hres	extent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date

Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"

ED-99B	AIXM 5.1
idnumber	identifier
restacn	availability.ApronAreaAvailability.usage.ApronAreaUsage[type="FORBID"].selection.ConditionCombination.aircraft.AircraftCharacteristic.typeAircraftICAO

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
restacft [= restacn]	*Note: See restacn above*

4.11 AM_FinalApproachAndTakeOffArea

ED-99A Definition: The beginning of that portion of the helipad that is available for landing.

AIXM 5.1 Defintion: A defined rectangular area on a land aerodrome/heliport prepared for the landing and take-off of aircraft.

ED-99A	AIXM 5.1
AM_FinalApproachAndTakeOffArea	**Runway[type='FATO']**
idarpt	associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idrwy	designator
surftype	surfaceProperties.SurfaceCharacteristics.composition AND surfaceProperties.SurfaceCharacteristics.preparation
geopoly	QUERY= RunwayElement[associatedRunway.Runway.designator="."].extent.ElevatedSurface *Note: In some cases a collection of RunwayElements will need to be merged in order to make the FATO*
feattype	*Note: Can be implied*
vacc	{result of query}.ElevatedSurface.verticalAccuracy *Note: In some cases the vacc will need to be chosen from the collection of RunwayElements that are needed in order to make the FATO*
vres	{result of query}.ElevatedSurface.*verticalResolution*
hacc	{result of query}.ElevatedSurface.horizontalAccuracy *Note: In some cases the hacc will need to be chosen from the collection of RunwayElements that are needed in order to make the FATO*
hres	{result of query}.ElevatedSurface.*horizontalResolution*

integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
status	QUERY= RunwayDirection[usedRunway.Runway.designator="."].availability.ManoeuvringAreaAvailability.operationalStatus

4.12 AM_FrequencyArea

ED-99A Definition: Designated part of a surface movement area where a specific frequency is required by air traffic control or ground control.

AIXM 5.1 Definition: A kind of service that provides control and separation services, to aircraft at the airport.

ED-99A	AIXM 5.1
AM_FrequencyArea	**GroundTrafficControlService**
idarpt	clientAirport.AirportHeliport.locationIndicatorICAO
frq	uses.RadioCommunicationChannel.frequencyTransmission *Note: This should be used in preference to uses.RadioCommunicationChannel.frequencyReception*
station	name
geopoly	extent.Surface *Note: This is part of the proposed "AMDB extension"*
feattype	*Note: Can be implied*
hacc	extent.Surface.horizontalAccuracy *Note: This is part of the proposed "AMDB extension"*
hres	extent.Surface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to*

be set to “revision”

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.13 AM_HelipadThreshold

ED-99A Definition: Threshold of a helipad.

AIXM 5.1 Defintion: An operationally significant position on the centre line of a runway direction. A typical example is the runway threshold.

ED-99A	AIXM 5.1
AM_HelipadThreshold	**RunwayCenterlinePoint[role='THR' and onRunway.RunwayDirection.usedRunway.Runway[type='FATO']]**
idarpt	onRunway.RunwayDirection.usedRunway.Runway.associatedAirportHeliport.AirportHeliportlocationIndicatorICAO
idthr	designator
status	onRunway.RunwayDirection.availability.ManoeuvringAreAvailability.operationalStatus
ellipse	*Note: Will be calculated*
geound	location.ElevatedPoint.geoidUndulation
geopnt	location.ElevatedPoint
feattype	*Note: Can be implied*
vacc	location.ElevatedPoint.verticalAccuracy
vres	location.ElevatedPoint.*verticalResolution*
hacc	location.ElevatedPoint.horizontalAccuracy
hres	location.ElevatedPoint.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode*

to be set to “revision”

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
elev	location.ElevatedPoint .elevation

4.14 AM_Hotspot

ED-99B Definition: A location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary. (ICAO Annex 4)

AIXM 5.1 Defintion: A location on aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary.

ED-99B	AIXM 5.1
AM_Hotspot	**AirportHotSpot**
idarpt	affectedAirport.AirportHeliport.locationIndicatorICAO
geopoly	area.ElevatedSurface
feattype	*Note: Can be implied*
idnumber	identifier
idhot	designator
hacc	area.ElevatedSurface.horizontalAccuracy
hres	area.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition

stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.15 AM_LandAndHoldShortOperationLocation

ED-99A Definition: Location of marking used for Land and Hold Short Operations (LAHSO).

AIXM 5.1 Definition: A symbol or group of symbols displayed on the surface of the runway.

ED-99A	AIXM 5.1
AM_LandAndHoldShortOperationLocation	**RunwayMarking[markingLocation='OTHER:LAHSO']**
idarpt	markedRunway.Runway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idp	*protectedRunway*.Runway.designator OR *protectedTaxiway*.Taxiway.designator
idthr	*landing*Direction.RunwayDirection.designator
geoline	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve
feattype	*Note: Can be implied*
vacc	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.verticalAccuracy
vres	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.*verticalResolution*
hacc	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.horizontalAccuracy
hres	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*

revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.16 AM_PaintedCenterline

ED-99A Definition: Continuous line along the painted line in the center of a runway connecting the two thresholds.

AIXM 5.1 Definition: A symbol or group of symbols displayed on the surface of the runway.

ED-99A	AIXM 5.1
AM_PaintedCenterline	**RunwayMarking[markingLocation='CL']**
idarpt	markedRunway.Runway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idrwy	markedRunway.Runway.designator
geoline	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve
feattype	*Note: Can be implied*
vacc	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.verticalAccuracy
vres	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.*verticalResolution*
hacc	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.horizontalAccuracy
hres	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to*

“revision”

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.17 AM_ParkingStandArea

ED-99A Definition: A designated area on an apron intended to be used for parking an aircraft.

AIXM 5.1 Definition: A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.

ED-99A	AIXM 5.1
AM_ParkingStandArea	**ApronElement[type='PARKING']**
idarpt	associatedApron.Apron.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idstd	QUERY= AircraftStand.designator *Note: Can be a collection* *Note: Needs to be a spatial query*
idapron	associatedApron.Apron.name
gsurftyp	surfaceProperties.SurfaceCharactersitics.composition
pcn	surfaceProperties.SurfaceCharactersitics.classPCN
jetway	jetwayAvailabilty
fuel	supplyService.AirportSupplyService.fuelSupply.Fuel.category
towing	towingAvailabilty
docking	dockingAvailabilty
gndpower	groundPowerAvailabilty
geopoly	extent.ElevatedSurface
feattype	*Note: Can be implied*
vacc	extent.ElevatedSurface.verticalAccuracy
vres	extent.ElevatedSurface.*verticalResolution*
hacc	extent.ElevatedSurface.horizontalAccuracy
hres	extent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gm

	d:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier
restacn	availability.ApronAreaAvailability.usage.ApronAreaUsage[type="FORBID"].selection.ConditionCombination.aircraft.AircraftCharacteristic.typeAircraftICAO

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
restacft [= restacn]	*Note: See restacn above*
termref	*associatedTerminal*.VerticalStructure.name
status	availability.ApronAreaAvailability.operationalStatus

4.18 AM_ParkingStandLocation

ED-99A Definition: Location of an aircraft stand.

AIXM 5.1 Definition: A designated area on an apron intended to be used for parking an aircraft.

ED-99A	AIXM 5.1
AM_ParkingStandLocation	**AircraftStand**
idarpt	apronLocation.ApronElement.associatedApron.Apron.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idstd	designator
acn[1]	availability.ApronAreaAvailability.usage.ApronAreaUsage[type="PERMIT"].selection.ConditionCombination.aircraft.AircraftCharacteristics.typeAircraftICAO
geopnt	location.ElevatedPoint
feattype	*Note: Can be implied*
vacc	location.ElevatedPoint.verticalAccuracy
vres	location.ElevatedPoint.*verticalResolution*
hacc	location.ElevatedPoint.horizontalAccuracy
hres	location.ElevatedPoint.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

[1] This was renamed to 'acf't in later versions of ED-99

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
acft [= acn]	*Note: See acn above*
termref	*associatedTerminal*.VerticalStructure.name

4.19 AM_RunwayCentrelinePoint

ED-99C Definition: A position on the centerline of a runway.

AIXM 5.1 Definition: An operationally significant position on the centre line of a runway direction. A typical example is the runway threshold.

ED-99C	AIXM 5.1
AM_RunwayCentrelinePoint	**RunwayCentrelinePoint**
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
feattype	*Note: Can be implied*
idnumber	identifier
idarpt	onRunway.RunwayDirection.usedRunway.Runway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idrwy	onRunway.RunwayDirection.usedRunway.Runway. designator
vacc	location.ElevatedPoint.verticalAccuracy
hacc	location.ElevatedPoint.horizontalAccuracy
vres	location.ElevatedPoint.*verticalResolution*
hres	location.ElevatedPoint.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to “originator”.*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:dat

	e *Note: also needs gmd:CI_Date.gmd:dateType. gmd:CI_DateTypeCode to be set to “revision”*
ellipse	*Note: Can be calculated.*
geound	location.ElevatedPoint.geoidUndulation
elev	location.ElevatedPoint.elevation
geopnt	location.ElevatedPoint

4.20 AM_RunwayDisplacedArea

ED-99A Definition: That portion of a runway between the beginning of the runway and the displaced threshold.

AIXM 5.1 Definition: Runway element may consist of one ore more polygons not defined as other portions of the runway class.

ED-99A	AIXM 5.1
AM_RunwayDisplacedArea	**RunwayElement[type='DISPLACED']**
idarpt	associatedRunway.Runway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idthr	QUERY= RunwayDirection[startingElement= '.'].designator
status	availability.ManoeuvringAreaAvailability.operationalStatus
surftype	surfaceProperties.SurfaceCharacteristics.composition AND surfaceProperties.SurfaceCharacteristics.preparation
geopoly	extent.ElevatedSurface
feattype	*Note: Can be implied*
vacc	extent.ElevatedSurface.verticalAccuracy
vres	extent.ElevatedSurface.*verticalResolution*
hacc	extent.ElevatedSurface.horizontalAccuracy
hres	extent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date

Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to “revision”

ED-99B	AIXM 5.1
idnumber	identifier
pcn	surfaceProperties.SurfaceCharacteristics.classPCN
restacn	availability.ManoeuvringAreaAvailability.usage.ManoeuvringAreaUsage[type=”FORBID”].selection.ConditionCombination.aircraft.AircraftCharacteristics.typeAircraftICAO

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
restacft [= restacn]	*Note: See restacn above*

4.21 AM_RunwayElement

ED-99A Definition: Part of a runway.

AIXM 5.1 Definition: Runway element may consist of one ore more polygons not defined as other portions of the runway class.

ED-99A	AIXM 5.1
AM_RunwayElement	**RunwayElement[type='NORMAL']**
idarpt	associatedRunway.Runway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idrwy	associatedRunway.Runway.designator
pcn	surfaceProperties.SurfaceCharacteristics.classPCN
width	width *Note: there is also nominalWidth on Runway*
length	length *Note: there is also nominalLength on Runway*
surftype	surfaceProperties.SurfaceCharacteristics.composition AND surfaceProperties.SurfaceCharacteristics.preparation
geopoly	extent.ElevatedSurface
feattype	*Note: Can be implied*
vacc	extent.ElevatedSurface.verticalAccuracy
vres	extent.ElevatedSurface.*verticalResolution*
hacc	extent.ElevatedSurface.horizontalAccuracy
hres	extent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate*

	OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier
restacn	availability.ManoeuvringAreaAvailability.usage.ManoeuvringAreaUsage[type="FORBID"].selection.ConditionCombination.aircraft.AircraftCharacteristics.typeAircraftICAO

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
restacft [= restacn]	*Note: See restacn above*

4.22 AM_RunwayExitLine

ED-99A Definition: Guidance line painted on the runway exit.

AIXM 5.1 Definition: A symbol or group of symbols displayed as the guidance line.

ED-99A	AIXM 5.1
AM_RunwayExitLine	**GuidanceLineMarking[markedGuidanceLine.GuidanceLine[type='RWY']]**
idarpt	markedGuidanceLine.GuidanceLine.connectedTaxiway.Taxiway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO *Note: Also possible to use RunwayDirection*
idlin	markedGuidanceLine.GuidanceLine.designator
status	markedGuidanceLine.GuidanceLine.connectedTaxiway.Taxiway.availability.manoeuvringAreaAvailability.operationalStatus
direc	markedGuidanceLine.GuidanceLine.usageDirection
color	element.MarkingElement.colour
style	element.MarkingElement.style
geoline	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve
feattype	*Note: Can be implied*
vacc	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.verticalAccuracy
vres	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.*verticalResolution*
hacc	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.horizontalAccuracy
hres	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep

	Note: Needs processor with a role set to "originator".
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.23 AM_RunwayIntersection

ED-99A Definition: Intersecting area shared by two or more runways.

AIXM 5.1 Definition: Runway element may consist of one ore more polygons not defined as other portions of the runway class.

ED-99A	AIXM 5.1
AM_RunwayIntersection	**RunwayElement[type='INTERSECTION']**
idarpt	associatedRunway.Runway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idrwi	identifier *Note: this is inherited from AIXMFeature*
pcn	surfaceProperties.SurfaceCharacteristics.classPCN
surftype	surfaceProperties.SurfaceCharacteristics.composition AND surfaceProperties.SurfaceCharacteristics.preparation
geopoly	extent.ElevatedSurface
feattype	*Note: Can be implied*
vacc	extent.ElevatedSurface.verticalAccuracy
vres	extent.ElevatedSurface.*verticalResolution*
hacc	extent.ElevatedSurface.horizontalAccuracy
hres	extent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode*

to be set to “revision”

ED-99B	AIXM 5.1
idnumber	identifier
restacn	availability.ManoeuvringAreaAvailability.usage.ManoeuvringAreaUsage[type=”FORBID”].selection.ConditionCombination.aircraft.AircraftCharacteristics.typeAircraftICAO

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
restacft [= restacn]	*Note: See restacn above*
status	availability.ManoeuvringAreaAvailability.operationalStatus

4.24 AM_RunwayMarking

ED-99A Definition: A symbol or group of symbols displayed on the surface of the runway in order to convey aeronautical information.

AIXM 5.1 Definition: A symbol or group of symbols displayed on the surface of the runway.

ED-99A	AIXM 5.1
AM_RunwayMarking	**RunwayMarking**
idarpt	markedRunway.Runway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idrwy	markedRunway.Runway.designator
geopoly	element.MarkingElement.surfaceExtent.ElevatedSurface
feattype	*Note: Can be implied*
vacc	element.MarkingElement.surfaceExtent.ElevatedSurface.verticalAccuracy
vres	element.MarkingElement.surfaceExtent.ElevatedSurface.*verticalResolution*
hacc	element.MarkingElement.surfaceExtent.ElevatedSurface.horizontalAccuracy
hres	element.MarkingElement.surfaceExtent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
rwymktyp	markingLocation

4.25 AM_RunwayShoulder

ED-99A Definition: An area adjacent to the edge of a runway pavement so prepared as to provide a transition between the pavement and the adjacent surface.

AIXM 5.1 Definition: Runway element may consist of one ore more polygons not defined as other portions of the runway class.

ED-99A	AIXM 5.1
AM_RunwayShoulder	**RunwayElement[type='SHOULDER']**
idarpt	associatedRunway.Runway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idrwy	associatedRunway.Runway.designator
status	availability.ManoeuvringAreaAvailability.operationalStatus
gsurftyp	surfaceProperties.SurfaceCharacteristics.composition
geopoly	extent.ElevatedSurface
feattype	*Note: Can be implied*
vacc	extent.ElevatedSurface.verticalAccuracy
vres	extent.ElevatedSurface.*verticalResolution*
hacc	extent.ElevatedSurface.horizontalAccuracy
hres	extent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1

idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.26 AM_RunwayThreshold

ED-99A Definition: The beginning of that portion of the runway that is available for landing.

AIXM 5.1 Definition: An operationally significant position on the centre line of a runway direction. A typical example is the runway threshold.

ED-99A	AIXM 5.1
AM_RunwayThreshold	**RunwayCentrelinePoint[role='THR' OR 'DISTHR']**
idarpt	onRunway.RunwayDirection.usedRunway.runway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idthr	onRunway.RunwayDirection.designator
tdze	onRunway.RunwayDirection.elevationTDZ
tdzslope	onRunway.RunwayDirection.slopeTDZ
brngtrue	onRunway.RunwayDirection.trueBearing
brngmag	onRunway.RunwayDirection.magneticBearing
rwyslope	onRunway.RunwayDirection.annotation.Note[propertName='tdzslope', purpose='DESCRIPTION'].translatedNote.LinguisticNote.note
tora	associatedDeclaredDistance.RunwayDeclaredDistance[type='TORA'].declaredValue.RunwayDecalredDistanceValue.distance
toda	associatedDeclaredDistance.RunwayDeclaredDistance[type='TODA'].declaredValue.RunwayDecalredDistanceValue.distance
asda	associatedDeclaredDistance.RunwayDeclaredDistance[type='ASDA'].declaredValue.RunwayDecalredDistanceValue.distance
lda	associatedDeclaredDistance.RunwayDeclaredDistance[type='LDA'].declaredValue.RunwayDecalredDistanceValue.distance
cat	onRunway.RunwayDirection.precisionApproachGuidance
papivasi[2]	QUERY= VisualGlideSlopeIndicator[runwayDirection.RunwayDirection[designator='.']] *Note: need to evaluate if query is true or false*
status	onRunway.RunwayDirection.availability.ManoeuvringAreaAvailability.operationalStatus
geound	location.ElevatedPoint.geoidUndulation

[2] Renamed to 'vasis' in later version of ED-99.

thrtype	role
ellipse	*Note: Will be calculated*
geopnt	location.ElevatedPoint
feattype	*Note: Can be implied*
vacc	location.ElevatedPoint.verticalAccuracy
vres	location.ElevatedPoint.*verticalResolution*
hacc	location.ElevatedPoint.horizontalAccuracy
hres	location.ElevatedPoint.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier
vasis [= papivasi]	*Note: See papivasi above*

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition

interp	interpretation
elev	location.ElevatedPoint.elevation

4.27 AM_ServiceRoad

ED-99A Definition: Part of aerodrome surface used by service vehicles.

AIXM 5.1 Definition: An established surface route on the aerodrome meant for the exclusive use of authorized vehicles and personnel.

ED-99A	AIXM 5.1
AM_ServiceRoad	**Road**
idarpt	associatedAirport.AirportHeliport.locationIndicatorICAO
idbase	*Note: Needs a spatial query*
surftype	surfaceProperties.SurfaceCharacteristics.composition AND surfaceProperties.SurfaceCharacteristics.preparation
featbase	*Note: Needs a spatial query*
geopoly	surfaceExtent.ElevatedSurface
feattype	*Note: Can be implied*
vacc	surfaceExtent.ElevatedSurface.verticalAccuracy
vres	surfaceExtent.ElevatedSurface.*verticalResolution*
hacc	surfaceExtent.ElevatedSurface.horizontalAccuracy
hres	surfaceExtent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.28 AM_StandGuidanceLine

ED-99A Definition: Guidance line on a designated area on an apron intended to be used for parking an aircraft.

AIXM 5.1 Definition: A symbol or group of symbols displayed as the guidance line.

ED-99A	AIXM 5.1
AM_StandGuidanceLine	**GuidanceLineMarking[markedGuidanceLine.GuidanceLine[type='GATE_TLANE']]**
idarpt	markedGuidanceLine.GuidanceLine.connectedTaxiway.Taxiway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idstd	markedGuidanceLine.GuidanceLine.connectedStand.AircraftStand.designator
status	markedGuidanceLine.GuidanceLine.connectedStand.AircraftStand.availability.ApronAreaAvailability.operationalStatus
direc	markedGuidanceLine.GuidanceLine.usageDirection
wingspan	markedGuidanceLine.GuidanceLine.connectedStand.AircraftStand.availability.ApronAreaAvailability.usage.ApronAreaUsage.selection.ConditionCombination.aircraft.AircraftCharacteristics.wingSpan
color	element.MarkingElement.colour
style	element.MarkingElement.style
geoline	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve
feattype	*Note: Can be implied*
vacc	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.verticalAccuracy
vres	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.*verticalResolution*
hacc	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.horizontalAccuracy
hres	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.*horizontalResolution*
integr	*integrity*
source	*source*

	OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
termref	markedGuidanceLine.GuidanceLine.connectedStand.AircraftStand *associatedTerminal*.VerticalStructure.name

4.29 AM_Stopway

ED-99A Definition: A defined rectangular area on the ground at the end of takeoff run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned takeoff.

AIXM 5.1 Definition: An area situated in the vicinity of a runway or provided to protect aircraft during manoeuvring, take-off and landing operations.

ED-99A	AIXM 5.1
AM_Stopway	**RunwayProtectArea[type='STOPWAY']**
idarpt	protectedRunwayDirection.RunwayDirection.usedRunway.Runway associatedAirportHeliport.AirportHeliport. locationIndicatorICAO
idthr	protectedRunwayDirection.RunwayDirection.designator
status	status
surftype	surfaceProperties.SurfaceCharactersitics.composition AND surfaceProperties.SurfaceCharactersitics.preparation
geopoly	extent.ElevatedSurface
feattype	*Note: Can be implied*
vacc	extent.ElevatedSurface.verticalAccuracy
vres	extent.ElevatedSurface.*verticalResolution*
hacc	extent.ElevatedSurface.horizontalAccuracy
hres	extent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd :processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd: citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to*

be set to “revision”

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.30 AM_SurveyControlPoint

ED-99A Definition: A monumented survey control point.

AIXM 5.1 Definition: A monumented survey control point.

ED-99A	AIXM 5.1
AM_SurveyControlPoint	**SurveyControlPoint**
idarpt	associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idsurv	designator
coord	annotation.Note[propertName='location', purpose='DESCRIPTION'].translatedNote.LinguisticNote.note
hdatum	*Note: calculated from CRS on* referencePoint.ElevatedPoint
spheroid	*Note: calculated from CRS on* referencePoint.ElevatedPoint
vdatum	referencePoint.ElevatedPoint.verticalDatum
project	*Note: calculated from CRS on* referencePoint.ElevatedPoint
geopnt	location.ElevatedPoint
feattype	*Note: Can be implied*
vacc	location.ElevatedPoint.verticalAccuracy
vres	location.ElevatedPoint.*verticalResolution*
hacc	location.ElevatedPoint.horizontalAccuracy
hres	location.ElevatedPoint.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs*

gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.31 AM_TaxiwayElement

ED-99A Definition: Part of a taxiway.

AIXM 5.1 Defintion: Part of a Taxiway.

ED-99A	AIXM 5.1
AM_TaxiwayElement	**TaxiwayElement[type='NORMAL']**
idarpt	associatedTaxiway.Taxiway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idlin	associatedTaxiway.Taxiway.designator
idapron	QUERY= ApronElement.associatedApron.Apron.name
gsurftyp	surfaceProperties.SurfaceCharactersitics.composition
pcn	surfaceProperties.SurfaceCharactersitics.classPCN
bridge	gradeSeparation
geopoly	extent.ElevatedSurface
feattype	*Note: Can be implied*
vacc	extent.ElevatedSurface.verticalAccuracy
vres	extent.ElevatedSurface.*verticalResolution*
hacc	extent.ElevatedSurface.horizontalAccuracy
hres	extent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs*

	gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"

ED-99B	AIXM 5.1
idnumber	identifier
restacn	availability.ManoeuvringAreaAvailability.usage.ManoeuvringAreaUsage[type="FORBID"].selection.ConditionCombination.aircraft.AircraftCharacteristic.typeAircraftICAO

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
restacft [= restacn]	*Note: See restacn above*
status	availability.ManoeuvringAreaAvailability.operationalStatus

4.32 AM_TaxiwayGuidanceLine

ED-99A Definition: Guidance line painted on a taxiway.

AIXM 5.1 Definition: A symbol or group of symbols displayed as the guidance line.

ED-99A	AIXM 5.1
AM_TaxiwayGuidanceLine	**GuidanceLineMarking[markedGuidanceLine.GuidanceLine[type='TWY']]**
idarpt	markedGuidanceLine.GuidanceLine.connectedTaxiway.Taxiway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idlin	markedGuidanceLine.GuidanceLine.connectedTaxiway.Taxiway.designator
status	markedGuidanceLine.GuidanceLine.connectedTaxiway.Taxiway.availability.ManoeuvringAreaAvailability.operationalStatus
wingspan	markedGuidanceLine.GuidanceLine.connectedTaxiway.Taxiway.availability.ManoeuvringAreaAvailability.usage.ManoeuvringAreaUsage.selection.ConditionCombination.aircraft.AircraftCharacteristics.wingSpan
maxspeed	markedGuidanceLine.GuidanceLine.maxSpeed
direc	markedGuidanceLine.GuidanceLine.usageDirection
color	element.MarkingElement.colour
style	element.MarkingElement.style
geoline	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve
feattype	Note: Can be implied
vacc	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.verticalAccuracy
vres	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.*verticalResolution*
hacc	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.horizontalAccuracy
hres	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.*horizontalResolution*
integr	*integrity*

source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.33 AM_TaxiwayHoldingPosition

ED-99A Definition: Taxiway holding position painted across a taxiway.

AIXM 5.1 Definition: A designated position intended for traffic control at which taxiing aircraft and vehicles shall stop and hold until further cleared to proceed, when so instructed by the aerodrome control tower.

ED-99A	AIXM 5.1
AM_TaxiwayHoldingPosition	**TaxiwayHoldingPosition**
idarpt	associatedGuidanceLine.GuidanceLine.connectedTaxiway.Taxiway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idp	associatedGuidanceLine.GuidanceLine.connectedTaxiway.Taxiway.designator OR protectedRunway.Runway.designator
idlin	associatedGuidanceLine.GuidanceLine.designator
status	status
catstop	landingCategory
geoline	associatedGuidanceLine.GuidanceLine.extent.ElevatedCurve
feattype	*Note: Can be implied*
vacc	associatedGuidanceLine.GuidanceLine.extent.ElevatedCurve.verticalAccuracy
vres	associatedGuidanceLine.GuidanceLine.extent.ElevatedCurve.*verticalResolution*
hacc	associatedGuidanceLine.GuidanceLine.extent.ElevatedCurve.horizontalAccuracy
hres	associatedGuidanceLine.GuidanceLine.extent.ElevatedCurve.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*

revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
rwyahtxt	*Note: This can be captured as a note in AIXM 5.1*

4.34 AM_TaxiwayIntersectionMarking

ED-99A Definition: Taxiway intersection marking painted across a taxiway.

AIXM 5.1 Definition: A symbol or group of symbols displayed on the surface of the taxiway.

ED-99A	AIXM 5.1
AM_TaxiwayIntersectionMarking	**TaxiwayMarking[type='TWY_INT']**
idarpt	markedTaxiway.Taxiway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idlin	markedTaxiway.Taxiway.designator
geoline	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve
feattype	*Note: Can be implied*
vacc	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.verticalAccuracy
vres	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.*verticalResolution*
hacc	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.horizontalAccuracy
hres	element.MarkingElement.extent.MarkingExtent.curveExtent.ElevatedCurve.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be*

set to “revision”

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.35 AM_TaxiwayShoulder

ED-99A Definition: An area adjacent to the edge of a taxiway pavement so prepared as to provide a transition between the pavement and the adjacent surface.

AIXM 5.1 Defintion: Part of a Taxiway

ED-99A	AIXM 5.1
AM_TaxiwayShoulder	**TaxiwayElement[type='SHOULDER']**
idarpt	associatedTaxiway.Taxiway.associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
gsurftyp	surfaceProperties.SurfaceCharacteristics.composition *Note: It is also possible to use: associatedTaxiway.Taxiway.surfaceProperties.SurfaceCharacteristics.composition*
status	availability.ManoeuvringAreaAvailability.operationalStatus
geopoly	extent.ElevatedSurface
feattype	*Note: Can be implied*
vacc	extent.ElevatedSurface.verticalAccuracy
vres	extent.ElevatedSurface.*verticalResolution*
hacc	extent.ElevatedSurface.horizontalAccuracy
hres	extent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.36 AM_TouchDownLiftOffArea

ED-99A Definition: A load bearing area on which a helicopter may touchdown or liftoff.

AIXM 5.1 Definition: A load bearing area on which a helicopter may touch down or lift-off.

ED-99A	AIXM 5.1
AM_TouchDownLiftOffArea	**TouchDownLiftOff**
idarpt	associatedAirportHeliport.AirportHeliport.locationIndicatorICAO
idrwy	designator
surftype	surfaceProperties.SurfaceCharacteristics.composition AND surfaceProperties.SurfaceCharacteristics.preparation
geopoly	extent.ElevatedSurface
feattype	*Note: Can be implied*
vacc	extent.ElevatedSurface.verticalAccuracy
vres	extent.ElevatedSurface.*verticalResolution*
hacc	extent.ElevatedSurface.horizontalAccuracy
hres	extent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1

idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation
status	availability.ManoeuvringAreaAvailability.operationalStatus

4.37 AM_VerticalLineStructure

ED-99A Definition: Line structure of a defined vertical extent that is located within an area that extends from the edge(s) of the runway(s) to 90m from the runway centerline(s) and for all other parts of the aerodrome movement area(s), 50m from the edge(s) of the defined area(s).

AIXM 5.1 Defintion: All fixed (whether temporary or permanent) and mobile objects, or parts thereof that extend above the surface of the Earth. Those vertical structures that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight are considered obstacles.

ED-99A	AIXM 5.1
AM_VerticalLineStructure	**VerticalStructure**
idarpt	QUERY= ObstacleArea[type='AREA3' and obstacle.VerticalStructure.name='.'].ownerAirport.AirportHeliport.locationIndicatorICAO
linsttyp	type
material	part.VerticalStructurePart.visibleMaterial
height	part.VerticalStructurePart.verticalExtent *Note: In AIXM take the elevation and subtract local ground if the object is floating. Otherwise verticalExtent is equal to the height.*
elev	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedCurve.elevation
lighting	lightingICAOStandard
marking	markingICAOStandard
geoline	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedCurve *Note: AIXM divides it into VerticalStructureParts so a merge function will be required in AMDB*
feattype	*Note: Can be implied*
vacc	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedCurve.verticalAccuracy
vres	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedCurve.*verticalResolution*
hacc	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedCurve.horizontalAccuracy

hres	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedCurve.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.38 AM_VerticalPointStructure

ED-99A Definition: Point structure of a defined vertical extent that is located within an area that extends from the edge(s) of the runway(s) to 90m from the runway centerline(s) and for all other parts of the aerodrome movement area(s), 50m from the edge(s) of the defined area(s).

AIXM 5.1 Defintion: All fixed (whether temporary or permanent) and mobile objects, or parts thereof that extend above the surface of the Earth. Those vertical structures that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight are considered obstacles.

ED-99A	AIXM 5.1
AM_VerticalPointStructure	**VerticalStructure**
idarpt	QUERY= ObstacleArea[type='AREA3' and obstacle.VerticalStructure.name='.'].ownerAirport.AirportHeliport.locationIndicatorICAO
pntsttyp	type
material	part.VerticalStructurePart.visibleMaterial
height	part.VerticalStructurePart.verticalExtent *Note: In AIXM take the elevation and subtract local ground if the object is floating. Otherwise verticalExtent is equal to the height.*
elev	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedPoint.elevation
lighting	lightingICAOStandard
radius	radius
marking	markingICAOStandard
geopnt	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedPoint *Note: AIXM divides it into VerticalStructureParts so a merge function will be required in AMDB*
feattype	*Note: Can be implied*
vacc	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedPoint.verticalAccuracy
vres	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedPoint.*verticalResolution*

hacc	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedPoint.horizontalAccuracy
hres	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedPoint.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.39 AM_VerticalPolygonalStructure

ED-99A Definition: Polygonal structure of a defined vertical extent that is located within an area that extends from the edge(s) of the runway(s) to 90m from the runway centerline(s) and for all other parts of the aerodrome movement area(s), 50m from the edge(s) of the defined area(s).

AIXM 5.1 Defintion: All fixed (whether temporary or permanent) and mobile objects, or parts thereof that extend above the surface of the Earth. Those vertical structures that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight are considered obstacles.

ED-99A	AIXM 5.1
AM_VerticalPolygonalStructure	**VerticalStructure**
idarpt	QUERY= ObstacleArea[type='AREA3' and obstacle.VerticalStructure.name='.'].ownerAirport.AirportHeliport.locationIndicatorICAO
ident	name
plysttyp	type
material	part.VerticalStructurePart.visibleMaterial
height	part.VerticalStructurePart.verticalExtent *Note: In AIXM take the elevation and subtract local ground if the object is floating. Otherwise verticalExtent is equal to the height.*
elev	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedSurface.elevation
geopoly	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedSurface *Note: AIXM divides it into VerticalStructureParts so a merge function will be required in AMDB*
feattype	*Note: Can be implied*
vacc	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedSurface.verticalAccuracy
vres	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedSurface.*verticalResolution*
hacc	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedSurface.horizontalAccura

	cy
hres	part.VerticalStructurePart.horizontalProjection.VerticalStructurePartGeometry.linearExtent.ElevatedSurface.*horizontalResolution*
integr	*integrity*
source	*source* OR gmd:MD_Metadata.gmd:dataQualityInfo.gmd:lineage.gmd:LI_Lineage.gmd:processStep.gmd:LI_ProcessStep *Note: Needs processor with a role set to "originator".*
revdate	*revisionDate* OR gmd:MD_Metadata.gmd:identificationInfo.gmd:MD_DataIdentification.gmd:citation.gmd:CI_Citation.gmd:date.gmd:CI_Date.gmd:date *Note: also needs gmd:CI_Date.gmd:dateType.gmd:CI_DateTypeCode to be set to "revision"*

ED-99B	AIXM 5.1
idnumber	identifier

ED-99C	AIXM 5.1
stfeat	featureLifetime.gml:TimePeriod.gml:beginPosition
endfeat	featureLifetime.gml:TimePeriod.gml:endPosition
stvalid	validTime.gml:TimePeriod.gml:beginPosition
endvalid	validTime.gml:TimePeriod.gml:endPosition
interp	interpretation

4.40 AM_Water

ED-99B Definition: Water bodies close to the movement zone.

AIXM 5.1 Definition: *not applicable*

Note: No mapping is possible to AIXM 5.1 Core. This ED-99 feature is out of scope of AIXM 5.1.

5. Enumeration and Codelists

5.1 aprontyp

ED-119B	AIXM 5.1
aprontypType	**CodeApronElementType**
General [1]	NORMAL
Penalty Box [2]	OTHER:PENALTY_BOX
Turnaround [3]	TURNAROUND

5.2 bridge

ED-119A	AIXM 5.1
bridgeType	**CodeGradeSeparationType**
None [0]	OTHER:NONE
Underpass [1]	UNDERPASS
Overpass [2]	OVERPASS

5.3 cat

ED-119	AIXM 5.1
catType	**CodeApproachGuidanceType**
NPA [0]	NON_PRECISION
CAT I [1]	ILS_PRECISION_CAT_I
CAT II [2]	OTHER:CAT_II
CAT III A [3]	ILS_PRECISION_CAT_IIIA
CAT III B [4]	ILS_PRECISION_CAT_IIIB
CAT III C [5]	ILS_PRECISION_CAT_IIIC

5.4 catstop

ED-119	AIXM 5.1
catstopType	**CodeHoldingCategoryType**

None [0]	NON_PRECISION
CAT I [1]	CAT_1
CAT II/III [2]	CAT_II_III

5.5 color

ED-119	AIXM 5.1
colorType	**CodeColourType**
Yellow [0]	YELLOW
Orange [1]	ORANGE
Blue [2]	BLUE
White [3]	WHITE

5.6 direc

ED-119A	AIXM 5.1
direcType	**CodeDirectionType**
Bidirectional [0]	BOTH
Start To Endpoint [1]	FORWARD
End To Startpoint [2]	BACKWARD

5.7 docking

ED-119	AIXM 5.1
dockingType	**CodeYesNoType**
Unavailable [0]	NO
Available [1]	YES

5.8 featbase

Note: This is not mapped directly. It can be calculated based on the feature type and some attributes.

ED-119A	AIXM 5.1
featbaseType	

None [0]	*Not applicable*
service_road [1]	Road
apron_element [2]	ApronElement
taxiway [3]	TaxiwayElement[type='NORMAL']
parking_stand_area [4]	ApronElement[type='PARKING']
stopway [5]	RunwayProtectArea[type='STOPWAY']
runway_element [7]	RunwayElement[type='NORMAL']
runway_intersection [8]	RunwayElement[type='INTERSECTION']
runway_shoulder [9]	RunwayElement[type='SHOULDER']
fato [10]	Runway[type='FATO']
tlof [11]	TouchDownLiftOff
taxiway_shoulder [12]	TaxiwayElement[type='SHOULDER']
deicing_area [13]	DeicingArea
construction_area [14]	WorkArea
blastpad [15]	RunwayBlastPad
runway_displaced_area [16]	RunwayElement[type='DISPLACED']

5.9 feattype

Note: This is not mapped directly. It can be calculated based on the feature type and some attributes.

ED-119	AIXM 5.1
feattype	
runway_element [0]	RunwayElement[type='NORMAL']
runway_intersection [1]	RunwayElement[type='INTERSECTION']
threshold [2]	RunwayCentrelinePoint[role='THR' OR 'DISTHR']
runway_marking [3]	RunwayMarking
centerline [4]	RunwayMarking[markingLocation='CL']
lahso [5]	RunwayMarkingt[markingLocation='OTHER:LAHSO']
arrest_gear [6]	ArrestingGear
runway_shoulder [7]	RunwayElement[type='SHOULDER']

stopway [8]	RunwayProtectArea[type='STOPWAY']
runway_displaced_area [9]	RunwayElement[type='DISPLACED']
clearway [10]	*Note: This is not used in ED-99*
fato [11]	Runway[type='FATO']
tlof [12]	TouchDownLiftOff
helipad_threshold [13]	RunwayCenterlinePoint[role='THR' and onRunway.RunwayDirection.usedRunway.Runway[type='FATO']]
taxiway [14]	TaxiwayElement[type='NORMAL']
taxiway_shoulder [15]	TaxiwayElement[type='SHOULDER']
taxiway_guidance_line [16]	GuidanceLineMarking[markedGuidanceLine.GuidanceLine[type='TWY']]
taxiway_intersection_marking [17]	TaxiwayMarking[type='TWY_INT']
taxiway_holding_position [18]	TaxiwayHoldingPosition
exit_line [19]	GuidanceLineMarking[markedGuidanceLine.GuidanceLine[type='RWY']]
frequency_area [20]	GroundTrafficControlService
apron_element [21]	ApronElement
stand_guidance_taxiline [22]	GuidanceLineMarking[markedGuidanceLine.GuidanceLine[type='GATE_TLANE']]
parking_stand_location [23]	AircraftStand
parking_stand_area [24]	ApronElement[type='PARKING']
deicing_area [25]	DeicingArea
aerodrome_reference_point [26]	AirportHeliport
vertical_polygon_object [27]	VerticalStructure
vertical_point_object [28]	VerticalStructure
vertical_line_object [29]	VerticalStructure
construction_area [30]	WorkArea
survey_control_point [31]	SurveyControlPoint

asle [32]	AeroGroundLight

ED-119A	AIXM 5.1
blastpad [33]	RunwayBlastPad
service_road [34]	Road
water [35]	-
hotspot [36]	AirportHotSpot

ED-119B	AIXM 5.1
runway_centerline_point [37]	RunwayCentrelinePoint
arresting_system_location [38]	ArrestingGear[engageDevice='EMAS']
asrn_edge [39]	-
asrn_node [40]	-

5.10 fuel

ED-119	AIXM 5.1
fuelType	**CodeFuelType**
Jet A-1 [1]	A1
Avgas 100 LL [2]	AVGAS-LL
Mogas [3]	MOGAS
Jet B [4]	B
73 Oct [5]	OCT73
80-87 [6]	OCT80-87
100-130 [7]	OCT100-130
115-145 [8]	OCT115-145
Jet [9]	JET
Jet A [10]	A
Jet A+ [11]	A1+
JP4 [12]	JP4

5.11 gndpower

ED-119	AIXM 5.1
gndpowerType	**CodeYesNoType**
Unavailable [0]	NO
Available [1]	YES

5.12 gsurftyp

ED-119	AIXM 5.1
gsurftypType	**CodeSurfaceCompositionType**
Concrete [1]	CONC
Asphalt [2]	ASPH
Desert or Sand or Dirt [3]	SAND
Bare Earth [4]	EARTH
Snow or Ice [5]	SNOW
	OR
	ICE
Water [6]	WATER
Grass or Turf [7]	GRASS
Gravel or Cinders [8]	GRAVEL
Pierced Steel Planks [9]	PIERCED_STEEL

ED-119A	AIXM 5.1
Bitumen [10]	BITUM
Brick [11]	BRICK
Macadam [12]	MACADAM
Stone [13]	STONE
Coral [14]	CORAL
Clay [15]	CLAY

Laterite [16]	LATERITE
Landing Mats [17]	MATS
Membrane [18]	MEMBRANE
Wood [19]	WOOD

5.13 interp

ED-119B	AIXM 5.1
interpType	**TimeSliceInterpretationType**
Snapshot [0]	SNAPSHOT
Baseline [1]	BASELINE
TempDelta [2]	TEMPDELTA
PermDelta [3]	PERMDELTA
Stream [4]	OTHER:STREAM

5.14 jetway

ED-119	AIXM 5.1
jetwayType	**CodeYesNoType**
Unavailable [0]	NO
Available [1]	YES

5.15 lighting

ED-119	AIXM 5.1
lightingType	**CodeYesNoType**
Non Conformant [0]	NO
Conformant [1]	YES

5.16 linsttyp

ED-119	AIXM 5.1
linsttypType	**CodeVerticalStructureType**
Power Line [1]	TRANSMISSION_LINE

Cable Railway [2]	CABLE_CAR
Bushes or Trees [3]	TREE
Wall [4]	WALL

ED-119A	AIXM 5.1
Navaid [5]	NAVAID
Sign [6]	SIGN

ED-119B	AIXM 5.1
Fence [7]	FENCE
Blastfence [8]	OTHER:BLASTFENCE

5.17 marking

ED-119	AIXM 5.1
markingType	**CodeYesNoType**
Non Conformant [0]	NO
Conformant [1]	YES

5.18 material

ED-119	AIXM 5.1
materialType	**CodeVerticalStructureMaterialType**
Concrete [1]	CONCRETE
Metal [2]	METAL
Stone or Brick [3]	BRICK OR STONE
Composition [4]	OTHER:COMPOSITION
Rock [5]	OTHER:ROCK
Earthen Works [6]	OTHER:EARTHERNWORKS

Wood [7]	WOOD

5.19 papivasi (vasis)

ED-119	AIXM 5.1
papivasiType / vasisType	**CodeVASISType**
None [0]	OTHER:NONE
PAPI [1]	PAPI
APAPI [2]	APAPI
VASIS [3]	VASIS
A-VASIS [4]	AVASIS

5.20 plysttyp

ED-119	AIXM 5.1
plysttypType	**CodeVerticalStructureType**
Terminal Building [1]	OTHER:TERMINAL
Hangar [2]	OTHER:HANGAR
Control Tower [3]	CONTROL_TOWER
Non Terminal Building [4]	BUILDING
Tank [5]	TANK
Tree [6]	TREE
Bush [7]	OTHER:BUSH
Forest [8]	OTHER:FOREST
Earthen Works [9]	OTHER:EARTHERN_WORKS

ED-119A	AIXM 5.1
Navaid [10]	NAVAID
Sign [11]	SIGN

ED-119B	AIXM 5.1

Fixed Base Operator [12]	OTHER:FIXED_BASE_OPERATOR

5.21 pntsttyp

ED-119	AIXM 5.1
pntsttypType	**CodeVerticalStructureType**
Smokestack [1]	STACK
Powerline Pylon [2]	OTHER:POWERLINE_PYLON
Antenna [3]	ANTENNA
Windsock [4]	OTHER:WINDSOCK
Tree [5]	TREE
Lightpole [6]	POLE
Light Stanchion [7]	OTHER:LIGHT_STANCHION

ED-119A	AIXM 5.1
Airport Beacon [8]	OTHER:AIRPORT_BEACON
Navaid [9]	NAVAID
Sign [10]	SIGN

5.22 rwymktyp

ED-119B	AIXM 5.1
rwynktypType	**CodeRunwaySectionType**
Threshold [1]	THR
Designation [2]	DESIG
Side Stripes [3]	EDGE
Aiming Point [4]	AIM
Centerline [5]	CL
Touchdown Zone [6]	TDZ
Chevron [7]	OTHER:CHEVRON
Arrow [8]	OTHER:ARROW

ED-119B	AIXM 5.1
Arrowhead [9]	OTHER:ARROW_HEAD

5.23 status

Note: Depending on the ED-119 attribute, different AIXM 5.1 codelists are used. For example, AM_AerodromeSurfaceLighting makes use of CodeStatusOperationsType and AM_ApronElement uses CodeStatusAirportType. Both are listed here.

ED-119	AIXM 5.1
status	**CodeStatusAirportType**
Closed [0]	CLOSED
Open [1]	NORMAL

ED-119	AIXM 5.1
status	**CodeStatusOperationsType**
Closed [0]	UNSERVICEABLE
Open [1]	NORMAL

5.24 style

ED-119	AIXM 5.1
style	**CodeMarkingStyleType**
Solid [0]	SOLID
Dashed [1]	DASHED
Dotted [2]	DOTTED

5.25 surftype

Note: This needs two mappings: Composition and Preparation

5.25.1 Composition

ED-119	AIXM 5.1
surftype	**CodeSurfaceCompositionType**
Concrete Grooved [1]	CONC

Concrete Non Grooved [2]	CONC
Asphalt Grooved [3]	ASPH
Asphalt Non Grooved [4]	ASPH
Desert or Sand or Dirt [5]	SAND
Bare Earth [6]	EARTH
Snow or Ice [7]	SNOW OR ICE
Water [8]	WATER
Grass or Turf [9]	GRASS
Aggregate Friction Seal Coat [10]	Not applicable
Gravel or Cinders [11]	GRAVEL
Porous Friction Courses Courses [12]	Not applicable
Pierced Steel Planks [13]	PIERCED_STEEL
Rubberized Friction Seal Coat [14]	Not applicable

ED-119A	AIXM 5.1
Bitumen [15]	BITUM
Brick [16]	BRICK
Macadam [17]	MACADAM
Stone [18]	STONE
Coral [19]	CORAL
Clay [20]	CLAY
Laterite [21]	LATERITE
Landing Mats [22]	MATS
Membrane [23]	MEMBRANE
Wood [24]	WOOD

5.25.2 Preparation

ED-119	AIXM 5.1
surftype	**CodeSurfacePreparationType**
Concrete Grooved [1]	GROOVED
Concrete Non Grooved [2]	NON_GROOVED
Asphalt Grooved [3]	GROOVED
Asphalt Non Grooved [4]	NON_GROOVED
Desert or Sand or Dirt [5]	Not applicable
Bare Earth [6]	Not applicable
Snow or Ice [7]	Not applicable
Water [8]	Not applicable
Grass or Turf [9]	Not applicable
Aggregate Friction Seal Coat [10]	AFSC
Gravel or Cinders [11]	Not applicable
Porous Friction Courses Courses [12]	PFC
Pierced Steel Planks [13]	Not applicable
Rubberized Friction Seal Coat [14]	RFSC

ED-119A	AIXM 5.1
Bitumen [15]	Not applicable
Brick [16]	Not applicable
Macadam [17]	Not applicable
Stone [18]	Not applicable
Coral [19]	Not applicable
Clay [20]	Not applicable
Laterite [21]	Not applicable
Landing Mats [22]	Not applicable
Membrane [23]	Not applicable

Wood [24]	Not applicable

5.26 thrtype

ED-119	AIXM 5.1
thrtype	**CodeRunwayPointRoleType**
Threshold [0]	THR
Displaced Threshold [1]	DISTHR

5.27 towing

ED-119	AIXM 5.1
towing	**CodeYesNoType**
Unavailable [0]	NO
Available [1]	YES

6. Other Datatypes

This chapter shows how the basic data types used in the ED-99 standard are mapped to the basic types in AIXM. For example, where a feature has a property called ‘acn’ in ED-99, the equivalent property in AIXM uses the CodeAircraftICAOType basic type.

ED-119	AIXM 5.1
acn	CodeAircraftICAOType *Note: AIXM has 4 characters but the AircraftCharacterisitcs object can be repeated.*
asda	ValDistanceType
brngmag	ValBearingType
brngtrue	ValBearingType
coord	ElevatedPoint
elev	ValDistanceVerticalType
ellipse	*Note: No mapping as this is calculated*
frq	ValFrequencyType
geoline	ElevatedCurve
geopnt	ElevatedPoint
geopoly	ElevatedSurface
geound	ValDistanceSignedType
hacc	ValDistanceType
hdatum	*Note: Derived from CRS*
height	ValDistanceType
hres	-tbd-
idarpt	CodeICAOType
idlin	TextNameType
idp	TextDesignatorType
idrwi	TextDesignatorType
idrwy	TextDesignatorType

ED-119	AIXM 5.1
idstd	TextDesignatorType
idthr	TextDesignatorType
integr	-tbd-
lda	ValDistanceType
length	ValDistanceType
maxspeed	ValSpeedType
pcn	ValPCNType
pendate	DateType
piocdate	DateType
project	*Note: Derived from CRS*
pstdate	DateType
radius	ValDistanceType
revdate	date
rwyslope	*Note: Extension uses TextDescriptionType*
source	*Note: Extension uses TextDescriptionType*
spheroid	*Note: Derived from CRS*
station	TextNameType
tdze	ValDistanceVerticalType
tdzslope	ValSlopeType
toda	ValDistanceType
tora	ValDistanceType
vacc	ValDistanceType
vdatum	CodeVerticalDatumType
vres	-tbd-
width	ValDistanceType
wingspan	ValDistanceType

ED-119A	AIXM 5.1
brngtrue	ValBearingType *Note: Change of domain*
hres	-tbd- *Note: Change of domain*
iata	designatorIATA
idapron	TextNameType
idbase	TextNameType
ident	TextNameType
idhot	TextNameType
idnumber	CodeUUIDType
idsurv	TextNameType
name	TextNameType
restacn	CodeAircraftICAOType

ED-119B	AIXM 5.1
acft [= acn]	CodeAircraftICAOType *Note: Change of name between versions of ED.*
aslength	ValDistanceType
aswidth	ValDistanceType
endfeat	DateTime
endvalid	DateTime
idnetwork	*Note: not applicable*
idnumber	CodeUUIDType *Note: Change of domain*
node1ref	*Note: not applicable*
node2ref	*Note: not applicable*
restacft [= restacn]	CodeAircraftICAOType

ED-119B	AIXM 5.1
	Note: Change of name between versions of ED.
rwyahtxt	TextNoteType
setback	ValDistanceType
stfeat	DateTime
stvalid	DateTime
termref	TextNameType

7. Geometrical and Functional Constraints

ED-99 contains a series of constraints that must be applied in order to make a compliant AMDB. AIXM 5.1 must therefore satisfy these requirements. However, all features and their properties are optional in AIXM 5.1. Therefore, a series of business rules or constraints must be added to ensure that the AIXM 5.1 dataset conforms to the AMDB rules.

This chapter includes a set of business rules written in the Semantics of Business Vocabulary and Business Rules (SBVR) language.

For the functional constraint, the business rules generally involve ensuring that an association between features is present. The geometrical constraints are….

7.1.1 Functional Constraints

ED-99A	AIXM 5.1
Each RunwayElement feature's attribute idrwy shall provide the idrwy object identifier value corresponding to the name of the real world runway (Rule 1).	RunwayElement(type = NORMAL) isPartOf [0..*] Runway
Each RunwayIntersection feature's attribute idrwi shall provide an idrwi object identifier value that corresponds to the names of the real world intersection runways (idrwy) (Rule 2).	RunwayElement (type = INTERSECTION) isPartOf [0..*] Runway
Each RunwayShoulder feature's attribute idrwy shall provide the idrwy object identifier value of the real world runway (Rule 3).	RunwayElement (type = SHOULDER) isPartOf [0..*] Runway
Each RunwayMarking feature's attribute idrwy shall provide the idrwy object identifier value of the real world runway (Rule 4).	RunwayMarking isMarkedOn Runway
If the LandAndHoldShortOperationLocation feature protects a runway, the value of a LandAndHoldShortOperationLocation feature's attribute idp shall be identical to the idrwy object identifier value of the protected real world runway (Rule 5).	RunwayCenterLinePoint(role=LAHSO) isLocatedOn.RunwayDirection
The value of a TaxiwayHoldingPosition feature's attribute idp shall be identical to the idrwy object identifier value of the protected real world runway (Rule 6).	TaxiwayHoldingPosition preventsEntryOn RunwayDirection

ED-99A	AIXM 5.1
Each RunwayDisplacedArea feature's attribute idthr shall provide the idthr object identifier value of the operationally corresponding RunwayThreshold (Rule 7).	RunwayElement isStartOf RunwayDirection
Each Stopway feature's attribute idthr shall provide the idthr object identifier value of the operationally corresponding RunwayThreshold (Rule 8).	RunwayProtectionArea (type = STOPWAY) protects RunwayDirection.
Each TaxiwayElement feature's attribute idlin shall provide the idlin object identifier value corresponding to the name of the real world taxiway (Rule 9).	TaxiwayElement describesPartOf Taxiway
The value of a TaxiwayGuidanceLine feature's attribute idlin shall be identical to the value of the corresponding TaxiwayElement feature's attribute idlin (Rule 10).	GuidanceLineMarking isMarkedOn GuidanceLine (type = TWY) connects Taxiway
The value of a TaxiwayIntersectionMarking feature's attribute idlin shall be identical to the value of the corresponding TaxiwayElement feature's attribute idlin (Rule 11).	TaxiwayMarking (type = TWY_INT) isMarkedOn Taxiway
The value of a TaxiwayHoldingPosition feature's attribute idlin shall be identical to the value of the corresponding TaxiwayElement feature's attribute idlin (Rule 12).	TaxiwayHoldingPosition isLocatedOn GuidanceLine connects Taxiway
Each ParkingStandArea feature's attribute idstd shall provide an idstd object identifier value that holds the idstd object identifier values of all corresponding ParkingStandLocations (Rule 13).	GateStand isLocatedOn ApronElement
Each FinalApproachAndTakeOff feature's attribute idrwy shall provide the idrwy object identifier value of the corresponding TouchDownAndLiftOff (Rule 14).	TouchDownLiftOff isSituatedOn Runway (type = FATO)
Each FinalApproachAndTakeOff feature's attribute idthr shall provide the idrwy object identifier value of the corresponding HelipadThreshold (Rule 15).	RunwayDirection uses Runway (type = FATO)
The value of an ArrestingGearLocation feature's attribute idthr shall be identical to the value of its	ArrestingGear isUsedOn RunwayDirection

ED-99A	AIXM 5.1
operationally corresponding RunwayThresholds feature's attribute idthr (Rule 16).	
For runways with thresholds at both ends, the value of a PaintedCenterline feature's attribute idrwy shall be identical to the value of the corresponding real world runway. For runways with one threshold only, the value of a PaintedCenterline feature's attribute idrwy shall be identical to the value of the real world runway (Rule 17).	RunwayMarking (type=CL) paintedOn Runway
The value of a LandAndHoldShortOperationLocation feature's attribute idthr shall be identical to the value of the operationally corresponding RunwayThresholds feature's attribute idthr (Rule 18).	RunwayCenterLinePoint isLocatedOn RunwayDirection
The value of a RunwayExitLine feature's attribute idlin shall be identical to the value of every connecting TaxiwayGuidanceLine feature's attribute idlin, in case they are located on the same corresponding TaxiwayElement or if multiple adjacent TaxiwayElements share the same attribute's value idlin (Rule 19).	GuidanceLine connects Taxiway
The value of a TaxiwayHoldingPosition feature's attribute idp shall be identical to the value of the operationally corresponding RunwayThresholds feature's attribute idthr (Rule 20).	TaxiwayHoldPosition preventsEntryOn Runway RunwayDirection uses Runway
The value of a RunwayExitLine feature's attribute idthr shall be identical to the value of the operationally corresponding RunwayThresholds feature's attribute idthr (Rule 21).	GuidanceLine connects RunwayCentreLinePoint isLocatedOn RunwayDirection
Each StandGuidanceLine feature's attribute idstd shall provide object identifier values for all corresponding ParkingStandLocations (Rule 22).	GuidanceLine connects GateStand
The value of a ParkingStandArea feature's attribute idapron shall be identical to the value of the operationally corresponding ApronElement feature's	ApronElement (type = PARKING) describesPartOf Apron

ED-99A	AIXM 5.1
attribute idapron (Rule 23).	
The value of a TaxiwayElement feature's attribute idapron shall be identical to the value of the operationally corresponding ApronElement feature's attribute idapron (Rule 24).	
The value of a ParkingStandArea feature's attribute idapron shall be identical to the value of the operationally corresponding TaxiwayElement feature's attribute idapron (Rule 25).	Taxiway situatedOn Apron. ApronElement (type = PARKING) describesPartOf Apron
The value of a DeicingArea feature's attribute idbase shall be identical to the value of the underlying ApronElement feature's attribute idapron (Rule 26).	DeicingArea isLocatedOn Apron
The value of a DeicingArea feature's attribute idbase shall be identical to the value of the underlying TaxiwayElement feature's attribute idlin (Rule 27).	DeicingArea isLocatedOn Taxiway
The value of a DeicingArea feature's attribute idbase shall be identical to the value of the underlying ParkingStandArea feature's attribute idstd (Rule 28).	DeicingArea isLocatedAt GateStand
In some particular cases, functional connections may not be complete regarding certain real world constraints (e.g. missing paint), therefore, these connections may not be applicable and mandatory to all functions using this data.	
Each RunwayExitLine feature's attribute idrwy should provide the idrwy object identifier value of the PaintedCenterline from which the RunwayExitLine starts.	

ED-99B	AIXM 5.1
The value of a PaintedCenterline feature's attribute idrwy shall be identical to the value of the corresponding real world runway. (Rule 17).	
Each Blastpad feature's attribute idthr shall provide the idthr object identifier value of the operationally	

ED-99B	AIXM 5.1
corresponding RunwayThreshold (Rule 30).	

ED-99C	AIXM 5.1
Each RunwayElement feature's attribute idrwy shall provide the name of the corresponding real world runway (Rule 1). Each RunwayIntersection feature's attribute idrwi shall provide the names of the corresponding real world intersection runways (Rule 2). Each RunwayShoulder feature's attribute idrwy shall provide the name of the corresponding real world runway (Rule 3). Each RunwayMarking feature's attribute idrwy shall provide the name of the corresponding real world runway (Rule 4). If the LandAndHoldShortOperationLocation feature protects a runway, the value of a LandAndHoldShortOperationLocation feature's attribute idp shall be identical to the name of the protected real world runway (Rule 5). The value of a TaxiwayHoldingPosition feature's attribute idp shall be identical to the name of the protected real world runway (Rule 6). Each TaxiwayElement feature's attribute idlin shall provide the name of the corresponding real world taxiway (Rule 9). The value of a TaxiwayIntersectionMarking feature's attribute idlin shall be identical to the value of the corresponding TaxiwayElement feature's attribute idlin, unless otherwise identifiable for the airport to which the feature belongs (Rule 11). The value of a TaxiwayHoldingPosition feature's attribute idlin shall be identical to the value of the	

ED-99C	AIXM 5.1
corresponding TaxiwayElement feature's attribute idlin, unless otherwise identifiable for the airport to which the feature belongs (Rule 12).	
Each ParkingStandArea feature's attribute idstd shall provide the idstd values of all corresponding ParkingStandLocations (Rule 13).	
Each FinalApproachAndTakeOff feature's attribute idrwy shall provide the idrwy value of the corresponding TouchDownAndLiftOff (Rule 14).	
Each StandGuidanceLine feature's attribute idstd shall provide the idstd values for all corresponding ParkingStandLocations (Rule 22).	
Each AsrnEdge feature's attribute node1ref shall be identical to the value of the corresponding AsrnNode feature's attribute idnumber (Rule 31).	
Each AsrnEdge feature's attribute node2ref shall be identical to the value of the corresponding AsrnNode feature's attribute idnumber (Rule 32).	
Each RunwayCenterlinePoint feature's attribute idrwy shall provide the name of the corresponding real world runway (Rule 33).	
Each ArrestingSystemLocation feature's attribute idthr shall provide the idthr value of the operationally corresponding RunwayThreshold (Rule 34).	
The value of a StandGuidanceLine, ParkingStandLocation, or ParkingStandArea feature's attribute termref shall be identical to the value of the ident attribute for the adjacent or closest VerticalPolygonalStructure feature associated with a terminal (Rule 35).	
Each DeicingArea or ServiceRoad feature's attribute idbase shall provide the idlin, idstd, or idapron of the associated TaxiwayElement, ParkingStandArea, or ApronElement, respectively (Rule 36).	

7.1.2 Geometrical Constraints

ED-99A	AIXM 5.1
A RunwayIntersection feature should be attached to all corresponding RunwayElement features (Rule 1).	- TBD as Business Rules -
A RunwayDisplacedArea feature should be attached to the corresponding RunwayElement feature (Rule 2).	- TBD as Business Rules -
A RunwayShoulder feature should be attached to the corresponding RunwayElement feature and/or RunwayIntersection feature and/or RunwayDisplacedArea feature and/or Stopway feature and/or RunwayShoulder feature and/or RunwayMarking feature (Rule 3).	- TBD as Business Rules -
A Stopway feature should be attached to the corresponding RunwayElement feature or RunwayIntersection feature or RunwayDisplacedArea feature (Rule 4).	- TBD as Business Rules -
A RunwayMarking feature should be contained in a RunwayElement feature and/or a RunwayDisplacedArea feature and/or a Stopway feature and/or a RunwayIntersection feature (Rule 5).	- TBD as Business Rules -
A TaxiwayElement feature adjacent to a RunwayElement should be attached to the corresponding RunwayElement feature (Rule 6).	- TBD as Business Rules -
A RunwayMarking feature which composes the runway designation (e.g. 0, 4, 6, 8, and 9 numbers) shall be attached to other RunwayMarking features that compose the same runway designation (Rule 7). See Figure 4-5.	- TBD as Business Rules -
A RunwayDisplacedArea feature should be attached to an adjacent TaxiwayElement feature (Rule 8).	- TBD as Business Rules -
A LandAndHoldShortOperationLocation feature should start and end at the edge of the corresponding RunwayElement feature (Rule 9).	- TBD as Business Rules -

An ArrestingGearLocation feature should cross the corresponding RunwayElement feature and/or RunwayDisplacedArea feature and/or Stopway feature (Rule 10).	- TBD as Business Rules -
A PaintedCenterline feature should cross all corresponding RunwayElement features and/or RunwayIntersection features (Rule 11).	- TBD as Business Rules -
A PaintedCenterline feature should start/end at the edge of a corresponding RunwayDisplacedArea feature and/or the corresponding Stopway feature (Rule 12).	- TBD as Business Rules -
A RunwayExitline feature should intersect the corresponding RunwayElement feature and/or RunwayDisplacedArea feature (Rule 13).	- TBD as Business Rules -
A RunwayThreshold feature should be located at the edge of the corresponding RunwayElement feature and/or RunwayDisplacedArea feature and/or Stopway feature (Rule 14).	- TBD as Business Rules -
A TaxiwayElement feature should be attached to all corresponding TaxiwayElement features (Rule 15).	- TBD as Business Rules -
A TaxiwayShoulder feature should be attached to all corresponding TaxiwayElement features (Rule 16).	- TBD as Business Rules -
An ApronElement feature should be attached to all corresponding TaxiwayElement features (Rule 17).	- TBD as Business Rules -
A ParkingStandArea feature should be attached to all corresponding TaxiwayElement features (Rule 18).	- TBD as Business Rules -
A DeicingArea feature should be attached to all adjacent TaxiwayElement features (Rule 19).	- TBD as Business Rules -
A TaxiwayGuidanceLine feature should be contained in the corresponding TaxiwayElement feature (Rule 20).	- TBD as Business Rules -
A TaxiwayIntersectionMarking feature should intersect the corresponding TaxiwayElement feature (Rule 21).	- TBD as Business Rules -

A TaxiwayHoldingPosition feature should be attached to the corresponding TaxiwayElement feature and not intersect the corresponding TaxiwayElement feature (Rule 22).	- TBD as Business Rules -
A RunwayExitLine feature should intersect the corresponding TaxiwayElement feature (Rule 23).	- TBD as Business Rules -
A StandGuidanceLine feature should intersect the corresponding TaxiwayElement feature (Rule 24).	- TBD as Business Rules -
A TaxiwayShoulder feature should be attached to all corresponding TaxiwayShoulder features (Rule 25).	- TBD as Business Rules -
An ApronElement feature should be attached to all corresponding ApronElement features (Rule 26).	- TBD as Business Rules -
A ParkingStandArea feature should be attached to all corresponding ApronElement features (Rule 27).	- TBD as Business Rules -
A DeicingArea feature should be attached to all adjacent ApronElement features (Rule 28).	- TBD as Business Rules -
A VerticalPolygonStructure feature should be attached to the corresponding ApronElement features (Rule 29).	- TBD as Business Rules -
A TaxiwayGuidanceLine feature should be contained in the corresponding ApronElement features (Rule 30).	- TBD as Business Rules -
A StandGuidanceLine feature should be contained in the corresponding ApronElement feature (Rule 31).	- TBD as Business Rules -
A ParkingStandLocation feature should be contained in the corresponding ApronElement feature (Rule 32).	- TBD as Business Rules -
A ParkingStandArea feature should be attached to all corresponding ParkingStandArea features (Rule 33).	- TBD as Business Rules -
A StandGuidanceLine feature should intersect with the corresponding ParkingStandArea feature (Rule 34).	- TBD as Business Rules -
A ParkingStandLocation feature should be contained in the corresponding ParkingStandArea feature (Rule	- TBD as Business Rules -

35).

A DeicingArea feature should be attached to all corresponding DeicingArea features (Rule 36).	- TBD as Business Rules -
A TaxiwayGuidanceLine feature should intersect the corresponding DeicingArea feature (Rule 37).	- TBD as Business Rules -
A StandGuidanceLine feature should intersect with the corresponding DeicingArea feature (Rule 38).	- TBD as Business Rules -
A ParkingStandLocation feature should be contained in the corresponding DeicingArea feature (Rule 39).	- TBD as Business Rules -
A TouchDownLiftOffArea feature should be contained in the corresponding FinalApproachAndTakeOffArea feature (Rule 40).	- TBD as Business Rules -
A HelipadThreshold feature should be located at the edge of the corresponding FinalApproachAndTakeOffArea. feature (Rule 41).	- TBD as Business Rules -
A HelipadThreshold feature should be located at the edge of the corresponding TouchDownLiftOffArea feature (Rule 42).	- TBD as Business Rules -
An ArrestingGearLocation feature should cross a PaintedCenterline feature (Rule 43).	- TBD as Business Rules -
A LandAndHoldShortOperationLocation feature should cross a PaintedCenterline feature (Rule 44).	- TBD as Business Rules -
A RunwayExitLine feature should intersect a PaintedCenterline feature (Rule 45).	- TBD as Business Rules -
A PaintedCenterline feature should end at a RunwayThreshold feature (Rule 46).	- TBD as Business Rules -
A TaxiwayIntersectionMarking feature should cross a TaxiwayGuidanceline feature (Rule 47).	- TBD as Business Rules -
A TaxiwayHoldingPosition feature should cross a TaxiwayGuidanceline feature (Rule 48).	- TBD as Business Rules -
A RunwayExitLine feature should be connected to a TaxiwayGuidanceline feature (Rule 49).	- TBD as Business Rules -
A StandGuidanceLine feature should be connected	- TBD as Business Rules -

to a TaxiwayGuidanceline feature (Rule 50).	
A TaxiwayHoldingPosition feature should cross a RunwayExitLine feature (Rule 51).	- TBD as Business Rules -
A StandGuidanceLine feature should end at a ParkingStandLocation feature (Rule 52)	- TBD as Business Rules -

ED-99B	AIXM 5.1
A RunwayShoulder feature should be attached to the corresponding RunwayElement feature and/or RunwayIntersection feature and/or RunwayDisplacedArea feature and/or Stopway feature and/or RunwayShoulder feature and/or RunwayMarking feature and/or Blastpad feature (Rule 3).	
A RunwayMarking feature should be contained in a RunwayElement feature and/or a RunwayDisplacedArea feature and/or a Stopway feature and/or a RunwayIntersection feature and/or Blastpad feature (Rule 5).	
A Blastpad feature should be attached to the corresponding RunwayElement feature or RunwayIntersection feature or Stopway feature or RunwayDisplacedArea feature (Rule 53).	

ED-99C	AIXM 5.1
A PaintedCenterline feature should start/end at the edge of a corresponding RunwayDisplacedArea feature and/or the corresponding Stopway feature and/or the corresponding ArrestingSystemLocation feature and/or the corresponding Blastpad feature (Rule 12).	
A RunwayExitLine feature should start/end at the edge of a PaintedCenterline feature (Rule 45).	
A TaxiwayGuidanceLine feature should start/end at the edge of a TaxiwayHoldingPosition feature (Rule	

ED-99C	AIXM 5.1
48).	
A RunwayExitLine feature should be connected to a corresponding TaxiwayGuidanceLine feature (Rule 49).	
A StandGuidanceLine feature should be connected to a corresponding TaxiwayGuidanceLine feature (Rule 50).	
A RunwayExitLine feature should start/end at the edge of a TaxiwayHoldingPosition feature (Rule 51).	
An ArrestingSystemLocation feature should be attached to the corresponding RunwayElement or Stopway or RunwayDisplacedArea (Rule 54).	
A TaxiwayShoulder feature should be attached to all corresponding ApronElement features (Rule 55).	
A RunwayCenterlinePoint feature should be located on a corresponding PaintedCenterline feature (Rule 56).	
An AsrnNode feature should be contained in or located on the edge of the corresponding TaxiwayElement, RunwayElement, RunwayDisplacedArea, or RunwayIntersection feature (Rule 57).	
An AsrnNode feature should be located on the corresponding TaxiwayHoldingPosition or PaintedCenterline feature (Rule 58).	
An AsrnEdge feature should be contained in the corresponding TaxiwayElement, RunwayElement, RunwayDisplacedArea, or RunwayIntersection feature, or cross the corresponding feature as long as it is contained in the union of all corresponding features (Rule 59).	
An AsrnEdge feature should start/end at the corresponding AsrnNode features (Rule 60).	

ED-99C	AIXM 5.1
A TaxiwayGuidanceLine feature should be connected to at least two other TaxiwayGuidanceLine features except if one or both ends represent the termination of the painted taxiline (Rule 61).	
A TaxiwayGuidanceLine feature should start at the endpoint of a corresponding TaxiwayGuidanceLine feature as shown in Figure 4.6 (Rule 62).	

8. Default Values

ED-99 states that if “a particular attribute is “null,” “unknown,” “not entered,” or “not applicable”, it shall be listed as such”. AIXM 5.1 makes use of GML’s nilReason codelist in order to capture such details. These values can be mapped as follows:

ED-99	AIXM 5.1
null	*Note: AIXM allows empty attributes*
unknown	unknown
not entered	missing OR withheld OR template
not applicable	inapplicable

ED119 goes on to provide the exact encoding of the default values to be used in an AMDB.