

AS/NZS 4270.2:1995

Australian/New Zealand Standard

**Geographic information systems—
Spatial data transfer standard**

Part 2: Spatial features

[Based on FIPS PUB 173-1992, Spatial Data Transfer Standard]

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Part 2: Spatial features

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STANDARDS AUSTRALIA
1 The Crescent,
Homebush NSW 2140 Australia

STANDARDS NEW ZEALAND
Level 10, Standards House,
155 The Terrace,
Wellington 6001 New Zealand

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee IT/4 on Geographical Information Systems. It is based on and has been reproduced from FIPS PUB 173-1992, *Spatial Data Transfer Standard*, Part 2: *Spatial features*, a US Federal Information Processing Standard (FIPS) publication.

The objective of this Standard is to provide users of geographical information systems with a data dictionary of US terms for transferring information using the Spatial Data Transfer Standard.

The Part 2 Annexes A, B and C should be replaced with Australian and New Zealand Standard data dictionaries as they are published. These Standard dictionaries are in the same format as the FIPS PUB 173, Part 2, annexes and are modifications to cater for Australian and New Zealand usage.

FIPS PUB 173 Part 2 has only been retained in this Standard to allow conformance to the US data dictionary for data sets sourced from or destined for the United States.

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AUSTRALIAN/NEW ZEALAND STANDARD

Geographic information systems—Spatial data transfer standard**Part 2:
Spatial features****1 Introduction**

This part of the standard responds to the need for common definitions of spatial features in the process of data transfer. The conceptual model and defined terms are the foundation for exchanging data between existing digital cartographic systems and may also be used as a viable approach to creating a new spatial feature file.

Traditional map symbols and their digital code equivalents often refer to real world features which have been defined only in the mind of the cartographer responsible for compiling the data. Even when agencies make an effort to define systematically the features portrayed in their data bases, these definitions are likely to vary from one organization to another. Thus, agreement on a common format for data exchange is not sufficient to ensure that the information provided by the supplier organization will be meaningful or useful to the receiving organization.

In order to facilitate transfer of data that is meaningful both to exporters and to importers, a common bridge of well understood feature definitions is required. The feature and attribute lists and definitions contained in the annexes to part 2 are a first step in this direction. These lists and definitions are the product of several years of effort during which approximately 2,600 definitions of geographic features were compared and distilled into the initial list of 200 entity types. The definitions of these entity types encompass the meanings found in the definitions of over 1,200 alternative terms.

1.1 Purpose

The purpose of part 2 is to provide a common classification and meaningful definitions for the spatial features identified in a transfer.

1.2 Objectives

Based on the sources consulted at the time of the preparation of this part of the standard, existing hydrographic and topographic features could, with few exceptions, be encoded to one of the 200 defined standard entity types, thereby facilitating transfer between organizations that might otherwise differ on the nuances of their particular term for, or definition of, essentially the same real-world phenomenon.

This list and these definitions are not presented as a definitive product, but as a living compendium subject to future amendments and extensions to meet the diverse needs of the spatial data community.

The primary focus of this initial effort is on topographic and hydrographic features, using sources available at the time of preparation. Among the extensions anticipated are (a) updating to accommodate new topographic and hydrographic products and (b) addition of features from other disciplines concerned with the exchange of spatially referenced geographic information.

Because all spatial data are likely to be exchanged in future, organizations considering the development of new data bases may use these standard categories as the basis for classifying phenomena to be entered into such data bases.

2 Conceptual Model

2.1 Definitions

Spatial features are defined entity types and the representation of instances of those types by spatial objects, as specified in section 2 of part 1.

Spatial features shall be described by the concepts: Entity Type, Entity Instance, Attribute, and Attribute Value; and by the terms Standard and Included. These are defined as follows:

Entity Type - the definition and description of a set into which similar entity instances are classified (e.g., bridge).

Entity Instance - a spatial phenomenon of a defined type that is embedded in one or more phenomena of a different type, or that has at least one key attribute value different from the corresponding attribute values of the surrounding phenomena (e.g., the 10th Street Bridge).

Attribute - a defined characteristic of an Entity Type (e.g., composition).

Attribute Value - a specific quality or quantity assigned to an attribute (e.g., steel) for a specific Entity Instance.

Standard Term - primary label of an Entity Type or Attribute (listed in annex A and B).

Included Term - nonstandard label of an Entity Type or Attribute that is cross-referenced to a Standard Term of an Entity Type or Attribute. Included Terms used in more than one context may be cross-referenced to more than one Standard Term. (See annex C.)

2.2 Conceptual Approach

Many feature classification schemes are based on a hierarchical system. This standard specifically avoids adopting any particular hierarchy, in part because the higher level classifications differ from one organization to another. Hierarchical classification, if desired, may be constructed using standard attributes (such as air/land/water, or manmade/natural) or through user-defined non-standard attributes.

Network, relational, and object-oriented structures of feature data may also be constructed from this non-hierarchized list of standard features and attributes.

The features presented are defined independently of map or geographic scale. Scale independence implies that no specific spatial object (such as a point, line, or area representation) is necessarily used to represent a given Entity Type. Further, the list includes features defined at any level of geographic interest, from mountain ranges and oceans to sidewalks and trees.

3 Scope and Field of Application

3.1 Scope

This part of the standard applies to the terms and definitions used for Entity Types, Attributes, and Attribute Values in a transfer. The terms may appear in the Data Dictionary/Definition, Data Dictionary/Domain, Data Dictionary/Schema, Attribute Primary, and Attribute Secondary module types as specified in part 1. Definitions included in part 2 need not be repeated in a Data Dictionary/Definition module in a given transfer, provided that the Standard Term is used with its standard meaning.

The definitions of standard Entity Types are mutually exclusive, but not exhaustive. Future extensions are anticipated.

3.2 Field of Application

There are two intended applications of this part of the standard for systems employing spatial data in digital form: (a) new users will have a model and the definitions needed for creating a features set, and (b) transfer of the meaning of feature information between existing systems will be facilitated.

4 Relationship to Other Standards

Federal Information Processing Standard codes exist for the instances of certain Entity Types, for example states of the United States (FIPSPUB 5-2). By implication, the Entity Type for which these codes are provided (i.e., states and outlying areas of the United States) has already been recognized as a standard Entity Type.

Many federal agencies have agency standards for the classification and definition of features within their particular realms of responsibility. This standard is not intended to replace existing agency standards, but to provide a basis whereby existing data can be shared with other organizations that do not necessarily accept the same terms and definitions for similar real-world phenomena. Depending on the conformance level selected and the functional requirements of a particular transfer, each agency may find it useful to develop a cross-reference between its internal feature and attribute classification system and the Standard Terms and definitions in annexes A and B.

5 References

Selected references used in the preparation of part 2 of the standard are included in annex F of part 1. The following is a short list of the authors included in these references:

- Canadian Council on Surveying and Mapping
- Defense Intelligence Agency
- Defense Mapping Agency
- Monkhouse, F.J.
- Moore, W.G.
- Stamp, D.
- U.S. Geological Survey, Geographic Names Information System
- U.S. National Ocean Service

This list will be updated and expanded as additional feature lists and definitions are submitted to the maintenance authority.

6 Conformance

All entity type, attribute, and attribute value terms and (or) codes used in a transfer shall be defined. Non-standard Entity Type and Attribute terms shall be specified through the use of the Data Dictionary/Definition module. Attribute Value terms shall be defined in the Data Dictionary/Domain module. See also part 1, 4.1.3.6 (Attributes).

The mandatory Features Level subfield of the Identification Module specifies the conformance level of a transfer with respect to feature definitions (see part 1, 5.2.1.2.3). Use of conformance levels 2, 3, or 4 for features limits the scope of transfer and are discouraged. Recurring needs to resort to non-standard terms and definitions should be referred to the maintenance authority, for possible amendment and extension of the standard.

7 Status of Annexes

Annex A contains definitions for standard Entity Type terms. Annex B contains definitions for standard Attribute terms. Annex C contains cross-reference lists between Included Terms and Standard Terms.

These annexes are normative in that they shall be used for transfers of feature conformance levels 1 and 2, as described in part 1, 5.2.1.2.3. However, use of the terms and definitions contained in these annexes is optional for feature conformance levels 3 and 4.

Part 2

ANNEXES

Normative Annex

A: Entity Types

AIRPORT	A facility, either on land or water, where aircraft can take off and land; usually consists of hard-surfaced landing strips, a control tower, hangars, and accommodations for passengers and cargo.
ANTENNA	A metallic apparatus for sending and receiving electro-magnetic waves.
ANTENNA_ARRAY	A group of directional antennas.
APPROACHWAY	The airspace through which aircraft approach or leave a landing area.
ARCH	A curved structure that supports the weight of material over an open space.
BACKWATER	An area of calm water unaffected by the current of a stream.
BAR	A submerged or emerged mound, ridge, or succession of ridges of sand or other material extending across the bottom, and which may obstruct navigation.
BASIN	Any bowl-shaped depression in the surface of the land or ocean floor.
BEACH	The gently sloping shore which is washed by waves or tides, especially the parts covered by sand or pebbles.
BEACON	A fixed signal, mark, or light and associated facilities erected for the guidance of mariners or airplane pilots.
BERTH	The place where a ship lies when at anchor secured to a pier or wharf.
BOTTOM	The portion of the ground surface which lies below water.
BOUNDARY	A nonphysical line indicating the limit or extent of an area or territory.

BREAKERS	A zone or region of waves breaking into foam as they advance toward the shore.
BREAKWATER	A structure built to break the force of waves so as to protect a beach, harbor, or other waterfront facility.
BRIDGE	A structure erected over a depression or obstacle to carry traffic or some facility such as a pipeline.
BRIDGE SUPERSTRUCTURE	Those elements of the bridge structure which are above the uppermost deck.
BUILDING	A permanent walled and roofed construction.
BUILDING_COMPLEX	A group of buildings and associated facilities functioning together as a unit.
BUOY	A float moored or anchored in water.
CABLEWAY	A conveyor system in which carrier units run on wire cables string between supports.
CAMPGROUND	The ground or area on which tents, huts, etc., are erected for temporary shelter.
CAPE	A relatively extensive land area jutting into a water body, which prominently marks a change in or interrupts notably the coastal trend of that water body.
CATCHMENT	An area drained by a single watercourse; a natural drainage area which may coincide with a river basin, in which the divides direct the water from the rainfall and percolation into a river. However, where underground flow is involved, the catchment may be larger or smaller than that that may be apparent from the surface relief.
CAVE	Naturally formed, subterranean open area or chamber.
CEMETERY	A place for burying the dead.
CHIMNEY	A structure containing a passage or flue for discharging smoke and gases from combustion.
CIRQUE	A deep natural hollow near the crest of a mountain.

CLEARING	An open area in a forest.
CLIFF	A high, steep, or overhanging face of rock.
COAST	The general region of indefinite width that extends from the sea inland to the first major change in terrain features.
CONTINENT	One of the large, unbroken masses of land into which the Earth's surface is divided.
CONTROL_POINT	A point of known location.
CRATER	Circular-shaped depression at the summit of a volcanic cone or on the surface of the land.
CREVASSE	A deep fissure in snow or ice.
CRIB	A crate-like construction of logs or beams, usually filled with stones, placed in water as a free standing mooring device or as the foundation of a pier or wharf.
CROPLAND	Land that has been plowed or otherwise cultivated.
CUT	An excavation of the Earth's surface to provide passage for a road, railway, canal, etc.
DAM	A barrier constructed across a watercourse to control the flow or raise the level of water.
DELTA	A tract of alluvium formed at the mouth of a river where the deposition of some of its load exceeds its rate of removal, crossed by the divergent channels (distributaries) of the river.
DEMILITARIZED_ZONE	An area in which military activity is prohibited.
DESERT	A region rendered barren or partially barren by environmental extremes, especially by low rainfall.
DRY_DOCK	An artificial basin fitted with gate or caisson into which a vessel may be floated and from which the water may be pumped out to expose the bottom of the vessel.
DUMPING_GROUND	Area designated for dumping various types of materials.

EARTH_SURFACE	The outermost surface of the land and waters of the planet.
EMBANKMENT	A raised structure of earth, ground, etc.
EXHIBITION_GROUND	A public area containing buildings, paddocks, etc., for the display of livestock, agricultural produce, machinery, etc.
FARM	A tract of crop or grazing land, as well as the group of buildings with and often surrounding a farmhouse, including barns, sheds, and other outbuildings, used for agricultural production.
FAULT	A fracture in the Earth's crust with displacement on one side of the fracture relative to the other.
FENCE	An enclosure or barrier made of wire, rails, slats or other relatively light material, as opposed to a wall which is of stone or other heavy material.
FILTRATION_BEDS	An area containing layers of material used to filter or aerate water.
FISH_HATCHERY	A facility used for the spawning of fish which are subsequently used to stock lakes and streams.
FISH_LADDER	A facility consisting of a series of small pools each one slightly higher than the preceding, built around a dam to enable fish to make their way upstream.
FISH_TRAP	A device used to catch fish.
FISHING_GROUND	A water area in which fishing is frequently carried on.
FLAT	A level tract lying at a small depth below the surface of water, or alternately covered and left bare by the tide.
FLOOD_PLAIN	An area which is subject to periodic flooding.
FORD	The shallow part of a river which can be easily crossed.
FORT	A fortified place or position.
FUMAROLE	A hole in the Earth's crust from which steam and gases are emitted.

GANTRY	A frame structure raised on side supports so as to span over or around something.
GAP	Low point or opening between hills or mountains or in a ridge or mountain range.
GATE	A structure that may be swung, drawn, or lowered to block an entrance or passageway.
GEYSER	An intermittent fountain of hot water ejected with force from a hole in the Earth's crust.
GOLF_COURSE	An area set out for the playing of golf.
GRANDSTAND	A usually roofed structure for viewing events and having tiers of seats for spectators.
GRASSLAND	An uncultivated area of grass or grass-like vegetation.
GRAVE	A place within a graveyard used for burial.
GROUND	The solid portion of the Earth up to and including the ground surface.
GROUND_SURFACE	The land surface of the Earth, both exposed and underwater.
GUARD_RAIL	A strong fence or barrier to prevent vehicles from leaving the roadway, or for people's safety.
HARBOR	An area of water where ships, planes or other watercraft can anchor or dock. Also spelled HARBOUR.
HEADWATERS	The upper part of a river system, denoting the upper basin and source streams of a river.
HEDGE	A dense growth of shrubbery planted as a fence or boundary.
HELIPAD	A transportation structure used for the landing of helicopters.
HOPPER	A top loading funnel-shaped structure for temporary storage of loose materials which will be dispensed from its bottom.
ICE_FIELD	Large area of permanent sea or land ice.

ICE_RINK	A surface of ice for ice skating.
ICEBERG	A large mass of detached land ice in the sea or stranded in shallow water.
INDIAN_RESERVATION	An area set aside for the use of an indian tribe or tribes.
INLET	An opening of the sea into the land, or of a lake into its shore.
INSHORE_TRAFFIC_ZONE	A designated area between the landward boundary of a traffic separation scheme and the adjacent coast, intended for local traffic.
INTERSECTION	The junction of roads or tracks.
IRRIGATION_SYSTEM	A system designed to supply land with water.
ISLAND	Area of dry or relatively dry land surrounded by water or low wetland.
ISLAND_CLUSTER	A group of islands.
ISTHMUS	Narrow section of land in a body of water connecting two larger land areas.
LAGOON	A sheet of salt water separated from the open sea by sand or shingle banks. The sheet of water between an offshore reef, esp. of coral and mainland. The sheet of water within a ring or horseshoe shaped atoll.
LAKE	Any standard body of inland water.
LANDING_PLACE	A place for loading and unloading passengers or cargo to and from water vessels.
LANE	A prescribed course for ships or aircraft, or a strip delineated on a road to accommodate a single line of automobiles; not to be confused with the road itself.
LAUNCHING_RAMP	A transportation structure used for launching boats.

LOCK	An enclosure in a water body with gates at each end to raise or lower vessels as they pass from one level to another.
MARINA	A harbor facility for recreational craft where supplies, repairs, and various services are available.
MILITARY_BASE	An area owned and operated by the government in which various military activities take place.
MILITARY_BUNKER	A military strong point, usually part of an extensive fortification.
MINE	An excavation in the Earth for the purpose of extracting earth materials.
MINE_FIELD	An area where explosive mines have been anchored or sunk in water or buried on land.
MISSILE_SITE	An area for housing and launching guided missiles.
MOBILE_HOME	A trailer that is a permanent dwelling and is designed without a permanent foundation.
MOBILE_HOME_PARK	An area maintained for the parking of inhabited mobile homes.
MONUMENT	A structure erected as a memorial.
MOORING	The place where a craft may be secured to the ground, wharf, pier, post, or buoy.
MORaine	An accumulation of boulders, stones, or other debris carried and deposited by a glacier.
MOUNT	A mountain or hill.
MOUNT_RANGE	A series of connected and aligned mountains or mountain ridges.
MOUTH	The exit or point of discharge of a stream into another stream, lake or sea.
OASIS	A small, isolated, fertile or green area in a desert region, usually having a spring or well.

OFF ROAD VEHICULAR AREA	An area for the testing of, or use by, vehicles that are designed to travel across the terrain.
OFFSHORE_PLATFORM	A raised surface located in a sea.
OIL_FIELD	An area where petroleum is or was removed from the Earth.
OUTDOOR_THEATER	An outdoor area consisting of a stage or other focal point, and an area where the audience can be seated.
OVERFALLS	Short breaking waves occurring when a current passes over a shoal or other submarine obstruction or meets a contrary current or wind.
OVERRUN/STOPWAY	An area beyond the take-off runway able to support an airplane during an aborted take-off.
PARK	A place or area set aside for recreation or preservation of a cultural or natural resource.
PARKING_AREA	An area set aside for the parking of motor vehicles.
PEAK	The summit of a mountain.
PENINSULA	A body of land jutting out into and nearly surrounded by water.
PIER	A structure built out into the water, usually with its greatest dimension at right angles to the shore, forming a landing place or a place alongside which vessels can lie.
PILING	A set of posts forced into the earth to serve as a support, as for a pier, or to resist lateral pressure.
PILOT_WATERS	Areas in which the services of a marine pilot are essential.
PINNACLE	A tall, slender, spire-shaped rock projecting from a level or more gently sloping surface.
PLACE	An area with definite or indefinite boundaries.
PLAIN	A region of general uniform slope, comparatively level, and of considerable extent.

PLATEAU	An elevated and comparatively level expanse of land.
PLUNGE_POOL	A hollow eroded by the force of the falling water at the base of a waterfall, particularly by the eddying effect.
POLYNA	Any enclosed water area in pack ice other than a lead, not large enough to be called open water. When frozen over, a polyna becomes an ice skylight from the point of view of the submariner. Also called BIG CLEARING, CLEARING, GLADE, ICE CLEARING, POOL, REGIONAL CLEARING.
PORT	A landing place provided with terminal and transfer facilities for loading and discharging cargo or passengers, usually located in a harbor.
POST	A long relatively slender, and generally round piece of wood or other material.
PUMP_OUT_FACILITY	A holding place where ship's bilges and cargo are pumped.
PYRAMID	An ancient structure having a broad base with sides narrowing towards the top.
QUICKSAND	A bed of loose sand mixed with water forming a soft, shifting mass that yields easily to pressure.
RACETRACK	A course laid out for racing.
RADAR_DOME	A dome shaped structure used to protect the antenna of a radar installation.
RADAR_REFLECTOR	A device capable of or intended for reflecting radar signals.
RAILWAY	A permanent way having one or more rails which provides a track for cars.
RAILWAY_YARD	An area provided with a system of tracks where railroad trains are made up and cars are switched, stored, or serviced.
RAPIDS	An area of broken, fast flowing water in a stream, where the slope of the bed increases (but without a prominent break of slope which might result in a waterfall), or where a gently dipping bar of harder rock outcrops.

REEF	A ridge of rocks, lying near the surface of the sea, which may be visible at low tide, but is usually covered by water.
REFUELING_TRACK	Airspace designated for conducting aerial refueling.
RESERVE	A tract of land set aside for a specific use.
RESTRICTED_AREA	An area of air, land, or water in which travel or other activities are subject to specified conditions or constraints.
REVETMENT	A facing, other than a wall, of stone, concrete, wood, etc., built to sustain an embankment.
RIDGE	A long and narrow upland with steep sides.
RIDGE_LINE	The line separating drainage basins.
RIG	Vertical structure fitted for drilling or lifting operations.
ROAD	An open way for the passage of vehicles, persons, or animals on land.
ROCK	An isolated rocky formation or a single large stone, usually one constituting a danger to navigation. It may be always submerged, always uncovered, or alternately covered and uncovered by the tide.
ROUNDBOUT	Area of water subject to a routing measure restricting ship movement to a counter-clockwise direction.
RUNWAY	A straight path used for landing, taxiing, and take-off of aircraft.
SALT_PAN	An area of salt deposits.
SEA	The great body of salt water of the oceans.
SHAFT	A long narrow passage sunk in the earth.
SHINGLE	A collection of loose pebbles on the shore of the sea or a lake.
SHIPYARD	A yard or area where ships are built or repaired.