

Geographic Data Files (GDF) Reader/Writer

FORMAT NOTES:

This format is not supported by FME Base Edition.

The Geographic Data Files (GDF) Reader and Writer modules allow the Feature Manipulation Engine (FME) to access files in the Central European Normalisation (CEN) Standard format established by European Committee for Standardisation. This chapter assumes familiarity with this format. (You can find some helpful background information at

http://www.ertico.com/en/links/links/gdf_-_geographic_data_files.htm.)

Overview

The CEN standard for Geographic Data Files (GDF) is commonly called GDF 3.0. The International Standards Organization (ISO) standard is commonly called GDF 4.0. Several GDF data producers, like NAVTEQ and TeleAtlas, for example, do not strictly follow either GDF 3.0 or 4.0 standards, but rather follow their own slightly modified version of these standards.

GDF 3.0 (ASCII Sequential) is currently supported by the FME (including variations such as NAVTEQ, TeleAtlas, and ETAK).

The original GDF specifications (GDF 3.0) were developed in Europe to meet the needs of professionals and organizations involved in the creation, update, supply and application of referenced and structured road network data.

It is much more than a generic GIS standard, as GDF gives rules on how to capture the data, as well as how the features, attributes and relationships are defined.

GDF was developed in a European project named EDRM (European Digital Road Map). Its primary use is for car navigation systems (for example, Bosch, Philips, Volvo); however, because the standard is based on a general, non-application-specific data model, it is also used for many other transport and traffic applications including Fleet Management, Dispatch Management, Traffic Analysis, Traffic Management, and Automatic Vehicle Locations.

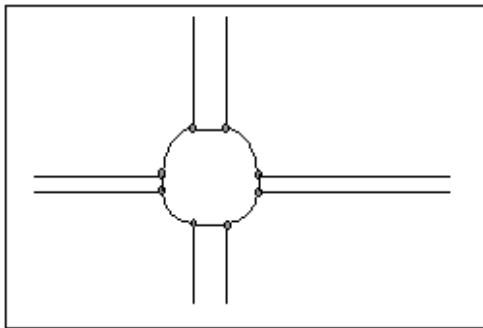
The GDF file format is often referred to as a *database*, and was never intended to be used by applications directly. Indeed, the structure of GDF files themselves impose significant inefficiencies when extracting data from GDF files. GDF users will generally transform the data into some other database or format upon which their application will work directly.

When using the FME to write GDF, building a file containing simple spaghetti linework or road maps is simple. Building an accurate road map for use with Intelligent Transport Systems (ITS) may require professional intervention in mapping file customization. For example, essential information such as direction of traffic flow and turn restrictions cannot be inferred from input road data where no such information is explicitly stored.

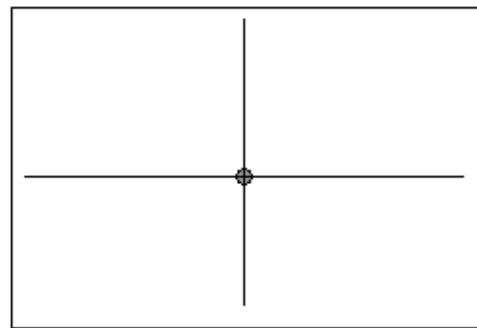
In the GDF file structure, features (or *elements*) are organized into three layers. Features in each layer do not actually contain any geometry, but simply link to features in the layer below from which you are supposed to take the geometry.

Note: The term *features* is used within GDF documentation to refer to elements residing on levels 1 and 2. This chapter uses the term *features* in the manner understood by standard FME terminology.)

1. **Level 0 (Topology):** This level contains elementary GIS topology components. No features overlap in any way, and neighbouring relationships are known. Everything is described by Nodes, Edges and Faces.
2. **Level 1 (Features):** Level 1 is the most used level of GDF. It contains simple features like road elements, rivers, boundaries, and signposts. Features can have attributes that are specific to the feature (for example, one way, width of the road, number of lanes). Features can also have relations, which are very important for car navigation systems. For example, relations can include "forbidden turn from road element 1 to road element 2" or "road element 1 has priority over road element 2."
3. **Level 2 (Complex Features):** At this level, the level 1 "simple features" are aggregated to a higher level feature. For example, at level 1, all road elements of an intersection are represented. At level 2, the intersection may only be represented with a single point. The figure below illustrates this.



Level 1 Representation of a Roundabout



Level 2 Representation of a Roundabout

Roundabout Representation: Levels 1 and 2

Level 2 is of interest mostly when a simplified description of the road network is sufficient. For instance, inter-urban route calculation does not require a high level of detail. Vehicle location by means of a GPS receiver, however, does need the more detailed description of the road network.

The GDF reader and writer use symbolic names for different feature types stored within a data file. Each feature will have a `gdf_type` attribute on it. The following table gives a brief description of each of the different GDF types currently supported by the reader and writer. The entities are described in detail in subsequent sections.

gdf_type	Description
<code>gdf_level_0_point</code>	These are point features found on level 0.
<code>gdf_level_0_line</code>	These are linear features found on level 0.
<code>gdf_level_0_polygon</code>	These are polygonal features found on level 0.

gdf_type	Description
gdf_level_1_point	These are point features found on level 1.
gdf_level_1_line	These are linear features found on level 1.
gdf_level_1_polygon	These are polygonal features found on level 1.
gdf_level_2_point	These are (complex) point features found on level 2.
gdf_level_2_line	These are (complex) linear features found on level 2.
gdf_level_2_polygon	These are (complex) polygonal features found on level 2.
gdf_nullrec	Refer to the official GDF specification for <code>NULLREC</code> records for a full explanation of this feature type.
gdf_volhdrec	Refer to the official GDF specification for <code>VOLHDREC</code> records for a full explanation of this feature type.
gdf_volhdrec_link_daset_vol	This feature type holds mappings between <code>gdf_volhdrec</code> features and their dataset volumes.
gdf_dshdrec_01	Refer to the official GDF specification for <code>DSHDREC</code> records for a full explanation of this feature type.
gdf_dshdrec_01_link_language	This feature type holds mappings between <code>gdf_dshdrec_01</code> features and their languages.
gdf_dshdrec_01_link_country	This feature type holds mappings between <code>gdf_dshdrec_01</code> features and their countries.
gdf_dshdrec_02 gdf_dshdrec_03 gdf_dshdrec_04 gdf_dshdrec_05 gdf_dshdrec_06 gdf_dshdrec_07	Refer to the official GDF specification for <code>DSHDREC</code> records for a full explanation of these feature types.
gdf_fieldefrec	Refer to the official GDF specification for <code>FIELDEFREC</code> records for a full explanation of this feature type.
gdf_recdefrec	Refer to the official GDF specification for <code>RECDEFREC</code> records for a full explanation of this feature type.
gdf_recdefrec_link fld_name	This feature type holds mappings between <code>gdf_recdefrec</code> features and their field names.
gdf_atdefrec	Refer to the official GDF specification for <code>ATDEFREC</code> records for a full explanation of this feature type.
gdf_direc	Refer to the official GDF specification for <code>DIREC</code> records for a full explanation of this feature type.

gdf_type	Description
gdf_featdefrec	Refer to the official GDF specification for FEATDEFREC records for a full explanation of this feature type.
gdf_spadorec	Refer to the official GDF specification for SPA-DOREC records for a full explanation of this feature type.
gdf_feaqualrec	Refer to the official GDF specification for FEAQUALREC records for a full explanation of this feature type.
gdf_atqualrec	Refer to the official GDF specification for ATQUAL-REC records for a full explanation of this feature type.
gdf_srcerec_01 gdf_srcerec_02	Refer to the official GDF specification for SRCEREC records for a full explanation of this feature type.
gdf_srcerec_02_link_language	This feature type holds mappings between gdf_srcerec_02 features and their languages.
gdf_srcerec_02_link_country	This feature type holds mappings between gdf_srcerec_02 features and their countries.
gdf_srcerec_03 gdf_srcerec_04 gdf_srcerec_05 gdf_srcerec_06 gdf_srcerec_07 gdf_srcerec_08 gdf_srcerec_09	Refer to the official GDF specification for SRCEREC records for a full explanation of these feature types.
gdf_dattvalrec	Refer to the official GDF specification for DAT-TVALREC records for a full explanation of this feature type.
gdf_sechrec_01 gdf_sechrec_02 gdf_sechrec_03	Refer to the official GDF specification for SECHREC records for a full explanation of this feature type.
gdf_sechrec_03_link_feature_quality	This feature type holds mappings between gdf_sechrec_03 features and their feature qualities.
gdf_sechrec_03_link_attribute_quality	This feature type holds mappings between gdf_sechrec_03 features and their attribute qualities.
gdf_sechrec_04	Refer to the official GDF specification for SECHREC records for a full explanation of this feature type.
gdf_sechrec_04_link_source_desc	This feature type holds mappings between gdf_sechrec_04 features and their source descriptions.
gdf_sechrec_05	Refer to the official GDF specification for SECHREC records for a full explanation of this feature type.

gdf_type	Description
gdf_sechrec_05_link_declination	This feature type holds mappings between gdf_sechrec_05 features and their declinations.
gdf_sechrec_06	Refer to the official GDF specification for SECHREC records for a full explanation of this feature type.
gdf_sechrec_06_link_geoid	This feature type holds mappings between gdf_sechrec_06 features and their geoids.
gdf_sechrec_07 gdf_sechrec_08 gdf_sechrec_09	Refer to the official GDF specification for SECHREC records for a full explanation of this feature type.
gdf_layhrec	Refer to the official GDF specification for LAYHREC records for a full explanation of this feature type.
gdf_layhrec_link_them_cod	This feature type holds mappings between gdf_layhrec features and their theme codes.
gdf_datelrec	Refer to the official GDF specification for DATEL-REC records for a full explanation of this feature type.
gdf_verdatrec	Refer to the official GDF specification for VER-DATREC records for a full explanation of this feature type.
gdf_verdatrec_link_level	This feature type holds mappings between gdf_verdatrec features and their levels.
gdf_projecrec	Refer to the official GDF specification for PROJE-CREC records for a full explanation of this feature type.
gdf_projecrec_link_parms	This feature type holds mappings between gdf_projecrec features and their projection parameters.
gdf_natgridrec	Refer to the official GDF specification for NATGRIDREC records for a full explanation of this feature type.
gdf_geoidrec	Refer to the official GDF specification for GEOIDREC records for a full explanation of this feature type.
gdf_magnetrec	Refer to the official GDF specification for MAGNETREC records for a full explanation of this feature type.
gdf_commentrec	Refer to the official GDF specification for COMMENTREC records for a full explanation of this feature type.
gdf_voltermrec	Refer to the official GDF specification for VOLTTERMREC records for a full explanation of this feature type.

gdf_type	Description
gdf_xyzrec_point gdf_xyzrec_line	Refer to the official GDF specification for XYZREC records for a full explanation of this feature type.
gdf_nedgerec	Refer to the official GDF specification for NEDG- EREC records for a full explanation of this feature type.
gdf_knotrec	Refer to the official GDF specification for KNOTREC records for a full explanation of this feature type.
gdf_facerec	Refer to the official GDF specification for FACEREC records for a full explanation of this feature type.
gdf_facerec_link_edge_id	This feature type holds mappings between gdf_facerec features and their edge IDs.
gdf_namerec	Refer to the official GDF specification for NAMEREC records for a full explanation of this feature type.
gdf_dsatrec	Refer to the official GDF specification for DSATREC records for a full explanation of this feature type.
gdf_dsatrec_link_attr	This feature type holds mappings between gdf_dsatrec features and their attribute IDs.
gdf_timerec	Refer to the official GDF specification for TIMEREC records for a full explanation of this feature type.
gdf_convertrec	Refer to the official GDF specification for CONVER- TREC records for a full explanation of this feature type.
gdf_relatrec	Refer to the official GDF specification for RELA- TREC records for a full explanation of this feature type.
gdf_relatrec_link_feat	This feature type holds mappings between gdf_relatrec features and their feature IDs.
gdf_relatrec_link_attribute	This feature type holds mappings between gdf_relatrec features and their attribute IDs.
gdf_poferec	Refer to the official GDF specification for POFEREC records for a full explanation of this feature type.
gdf_poferec_link_knot	This feature type holds mappings between gdf_poferec features and their knot IDs.
gdf_poferec_link_attribute	This feature type holds mappings between gdf_poferec features and their attribute IDs.
gdf_linfrec	Refer to the official GDF specification for LINFREC records for a full explanation of this feature type.
gdf_linfrec_link_edge	This feature type holds mappings between gdf_linfrec features and their edge IDs.
gdf_linfrec_link_attribute	This feature type holds mappings between gdf_linfrec features and their attribute IDs.

gdf_type	Description
gdf_arferec	Refer to the official GDF specification for ARFEREC records for a full explanation of this feature type.
gdf_arferec_link_face	This feature type holds mappings between gdf_arferec features and their face IDs.
gdf_arferec_link_attribute	This feature type holds mappings between gdf_arferec features and their attribute IDs.
gdf_compferec	Refer to the official GDF specification for COM-PFEREC records for a full explanation of this feature type.
gdf_compferec_link_feat	This feature type holds mappings between gdf_compferec features and their feature IDs.
gdf_compferec_link_attribute	This feature type holds mappings between gdf_compferec features and their attribute IDs.
gdf_unknown_record	All GDF records which are not completely understood by the FME are output as this feature type.

GDF Quick Facts

Format Type Identifier	GDF
Reader/Writer	Both
Licensing Level	Professional
Dependencies	Requires extra-cost plug-in from Safe Software
Dataset Type	File
Feature Type	Level and geometry based name
Typical File Extensions	.gdf
Automated Translation Support	Yes
User-Defined Attributes	No
Coordinate System Support	No
Generic Color Support	No
Spatial Index	Never
Schema Required	Yes
Transaction Support	No
Geometry Type	gdf_type

Geometry Support				
Geometry	Supported?		Geometry	Supported?
aggregate	no		point	yes
circles	no		polygon	yes
circular arc	no		raster	no
donut polygon	yes		solid	no

Geometry Support			
Geometry	Supported?	Geometry	Supported?
elliptical arc	no	surface	no
ellipses	no	text	no
line	yes	z values	no
none	yes		

Reader Overview

The GDF reader reads the entire file sequentially. Header information from the Volume level is therefore processed first, followed by information from the Dataset, Section, and Layer levels, respectively. Scaling and offset factors found in the header of the GDF file are applied to all coordinates read from the file. The reader extracts each individual feature, one at a time, and passes it on to the rest of the FME for processing.

If `gdf_fielddefrec` features are read, their field width definitions will be honored. This means that the FME will, for example, read both TeleAtlas Multinet 3.1, 3.2, 3.3 and 3.4 GDF files, which use different field widths in several records.

The geometry of level 1 points is the center of the bounding box of all the components. The geometry of level 1 lines is the concatenation of all the components. The geometry of level 1 areas is computed by "dissolving" of all the components.

Complex (Level 2) features symbolize abstract network topology and therefore cannot be faithfully represented by visual graphic representation in all cases. The attributes on complex features will always retain all information necessary to completely reconstruct the level 2 topology or otherwise access every aspect of the data represented in the GDF file. The geometry on complex features is intelligently created to visually represent those parts of the network topology where possible. In most cases, the geometry on complex features is indeed helpful in understanding the network through a graphical viewer.

The geometry assigned to complex features is either lines, points, or polygons. Complex features that have `FROM/TO` links are read as level 2 lines whose geometry is assumed to be a single segment line from the center of the bounding box of the `FROM` feature and to the center of the bounding box of the `TO` feature. If the complex feature has no `FROM/TO` links, then the types of the members are considered. Those with only polygonal members are read as level 2 polygons whose geometry is the result of dissolving all the polygonal members. Finally, those complex features that do not consist entirely of polygonal members are read as level 2 points whose geometry is assumed to be the center of the bounding box of all the components. One exception to the above should be noted; all complex features with no `FROM/TO` links and exactly one member will assume the complete geometry and type of that member. Any complex features that contain a reference to a member that does not appear in the file will be output as a `COMPFEREC` feature with no geometry.

When the GDF reader encounters a record type it does not know how to process, it simply outputs this element as an `UNKNOWN_RECORD` and moves on to read the next feature.

Reader Directives

The suffixes listed are prefixed by the current <ReaderKeyword> in a mapping file. By default, the <ReaderKeyword> for the GDF reader is GDF.

DATASET

Required/Optional: *Required*

The value for this keyword is the file containing the GDF data set to be read.

Example:

```
GDF_DATASET /usr/data/road/amsterdam.gdf
```

Workbench Parameter: [<WorkbenchParameter>](#)

SPECIFICATION

The value for this keyword can be one of the following values `CEN`, `NAVTEQ`, `NAVTECH` (deprecated), `TELEATLAS`, or `BESTGUESS`. This indicates which GDF specification will be used when parsing the input GDF file.

A value of `CEN` means that the official CEN 3.0 specification will be used. The values `NAVTEQ` and `TELEATLAS` indicates that the NAVTEQ or TeleAtlas variants of the GDF specification should be used, respectively. The value `BESTGUESS` tells the GDF reader to use an intelligent guess as to which specification to use, based on the header of the GDF file. The default value is `BESTGUESS`.

Example:

A typical mapping file fragment specifying the specification looks like:

```
GDF_SPECIFICATION BESTGUESS
```

Workbench Parameter: [<WorkbenchParameter>](#)

GEOMETRY_COMPLETION

The value for this keyword should be `NONE`, `LEVEL0`, `LEVEL1`, or `LEVEL2`. The default is `LEVEL2`. This indicates the level up to which the user wants to complete the geometry. All levels above this will have the geometry linked to the features indirectly. All levels with complete geometry will have the geometry explicitly on each feature directly.

When the FME reads GDF files, it requires a lot of effort to store and reference all the features between layers. For example, to get the geometry of a single level 2 feature, first the FME must locate all the level 1 features that are linked to it. Then it has to locate all the level 0 features that are linked to each Level 1 feature. Then it has to locate all the XYZ features that are linked to every Level 0 feature. Finally it has to put all that geometry together and process it to generate the geometry for the single level 2 feature. It is much easier if the features were output with no geometry but instead kept attributes that indicated to which other features it was linked.

For this reason, there is an option of choosing whether features produced by the reader have the "links" on them, or if the FME should go through all the effort to complete the links and form the geometry on each feature. There is also the option of specifying

on which levels the geometry should be completed, and which levels will be left as "linked" to lower-level features.

For example, if you were only interested in the level 1 features of a GDF dataset (you were going to delete or ignore the level 2 features) then there would be no reason for the FME to complete the geometry on level 2 features. You could choose to complete only the geometry on level 1 features and leave the level 2 features as linked (since you would be deleting them anyway).

Another example might be if you are planning to import features into a spatial database. In your new model, you would like to keep the links present so that if you edited and modified the geometry of a level 0 feature, the geometry of all level 1 and 2 features that link to it would immediately change. In this situation, you would select `NONE` for geometry completion, and just import all the features into your database as linked.

Of course, if you are translating GDF to any of the more common file-based formats for general viewing and usage, completing the geometry all the way up to level 2 is probably the most reasonable choice.

Example:

A typical mapping file fragment specifying that geometry be completed only up to level 1 looks like:

```
GDF_GEOMETRY_COMPLETION LEVEL1
```

Workbench Parameter: [<WorkbenchParameter>](#)

ATTRIBUTE_COMPLETION

The value for this keyword should be `Yes` or `No`. The default is `Yes`. This indicates if the user wants to complete the attribute links for each feature. If selected, all features will have their attributes explicitly appear on the features directly. If not selected, all features will have their attribute information remain in separate tables joined with link values.

The issues surrounding attribute completion when reading GDF is similar to geometry completion. Natively, a feature's attributes are referenced through a linking mechanism and extra effort is needed if it is desired that the features read from GDF know all their attributes directly.

Therefore there is an option of choosing between whether features produced by the reader have the "links" on them or if the FME should to go through all the effort to complete the links and supply the attributes directly on each feature as they are read. Reasoning as to whether or not to choose attribute completion is similar to that outlined for geometry completion.

Example:

A typical mapping file fragment specifying that attributes not completed on each feature looks like:

```
GDF_ATTRIBUTE_COMPLETION No
```

Workbench Parameter: [<WorkbenchParameter>](#)

OUTPUT_MERGED_RECORDS

The value for this keyword should be `Yes` or `No`. The default is `No`. This indicates if the user wants attribute features that have been used in attribute completion to be output by the reader. This keyword has no effect if the `ATTRIBUTE_COMPLETION` keyword is set to `No`. If this keyword is set to `Yes` then features that primarily carry attribute values (for example GDF Name records) will be output.

Example:

A typical mapping file fragment specifying that record features that were used in attribute completion should not be output looks like:

```
GDF_OUTPUT_MERGED_RECORDS No
```

[Workbench Parameter: *Output Merged Records*](#)

CODE_VALUE_LOOKUP

The value for this keyword should be `Yes` or `No`. The default is `Yes`. This indicates if the user wants to replace the known codes of attributes with their actual expanded values for each feature. If selected, all features will have the code values of their attributes replaced. For example, an attribute `Vehicle Type` with the value `16` will have that value replaced by `Taxi`. If this option is not enabled, all features will have their attribute values left as the original codes.

Example:

A typical mapping file fragment specifying that code values not be completed on each feature looks like:

```
GDF_CODE_VALUE_LOOKUP No
```

[Workbench Parameter: *<WorkbenchParameter>*](#)

GDF_MULTIPLE_VALUE_SEPARATOR

The value for this keyword can be any string. The default is `|||`. This indicates which characters will separate the values when one attribute has more than one value.

For instance, the `Official Name of an Order 1 Administrative Area (Country)` may have two values: `Japan` and `Nippon`. If the separator above is used, the value for `Official Name` will become `Japan|||Nippon`. It is useful to have known strings as separators when automatically splitting these strings during future processing.

Example:

A typical mapping file fragment specifying the separator as a colon looks like:

```
GDF_MULTIPLE_VALUE_SEPARATOR :
```

Also, to represent multiple values, the GDF Reader will output a list of attributes in the form:

```
Official Name{0} = Japan  
Official Name{1} = Nippon
```

[Workbench Parameter: *<WorkbenchParameter>*](#)

IGNORE_FIELDEFREC_RECORDS

The value for this keyword should be *Yes* or *No*. The default is *No*. This indicates if the user wants to ignore the `FIELDEFREC (03)` records in the GDF file, or parse and honor them. If selected, all `FIELDEFREC (03)` records in the file will be ignored when reading. This is useful for reading files with corrupt `FIELDEFREC (03)` files. Without ignoring these corrupt lines, the file could not be read correctly.

Example:

A typical mapping file fragment specifying that codes not be completed on each feature looks like:

```
GDF_IGNORE_FIELDEFREC_RECORDS No
```

Workbench Parameter: [<WorkbenchParameter>](#)

CODE_LOOKUP

This directive indicates if the user wants to replace the known codes of attribute names with their actual expanded name for each feature. If selected, all features will have the code values of their attribute names replaced. For example, an attribute `ON` will be renamed to `Official Name`. If this option is not enabled, all features will have their attribute names left as the original codes.

A typical mapping file fragment specifying that codes not be completed on each feature looks like:

Values: *YES* | *NO*

Default Value: *YES*

Example:

```
GDF_CODE_LOOKUP No
```

Workbench Parameter: [<WorkbenchParameter>](#)

Writer Overview

Creating a GDF file currently involves a significant amount of customization. All features sent to the GDF writer are assumed to be in the "linked" structure as outlined in the feature representation section. The order of these features must also be correctly determined before sending them to the writer.

Future versions of the GDF writer may acquire more intelligence and be able to correctly produce the necessary "linked" features automatically, given regular lines, polygons, etc; currently, however, custom mapping files are required.

Producing a meaningful GDF file as output will require setting up a custom mapping file that describes the details of your input schema for the following reasons:

- Generic (automatic) translations usually work for most formats because they are so simple. (If some road has an attribute "length" in the source, it makes sense to make an attribute called "length" in the destination.) However, GDF is a special case. GDF is so incredibly complex that such a "best guess" is impossible. Translating most formats does not require the understanding of a schema, just knowl-

edge of it. In GDF, the FME not only needs to know the schema of the input data, but it must actually understand the meaning as well.

- GDF has hundreds, if not thousands, of predefined attributes and values that features can have. When FME is given a source dataset without any indication which attributes in the source data should be used to fill in the required attribution in the output GDF file, most of this information will be lost. (There is no way to "guess" at the feature code value for any road when all it is given is a source file with no knowledge of the meaning of the schema or input data.) Therefore, an "automatic" translation will usually not generate anything useful. What needs to happen is that a user needs to create a custom mapping file that tells the FME where to find all the required GDF data within their specific source dataset.
- If `gdf_fielddefrec` features are written, their field width definitions will be honored. This allows the user to dynamically define custom field widths for use in the GDF files produced. This is useful, for example, in creating both TeleAtlas Multinet 3.1 and 3.2 GDF files, which use different field widths in several records.

Writer Directives

This section lists the directives processed by the GDF Writer. The suffixes shown are prefixed by the current `<WriterKeyword>` in a mapping file. By default, the `<WriterKeyword>` for the GDF writer is `GDF`.

DATASET

Required/Optional: *Required*

The value for this directive is the file where the output GDF data set should be written to.

Example:

```
GDF_DATASET /usr/data/navigate/surrey.gdf
```

Workbench Parameter: [<WorkbenchParameter>](#)

SPECIFICATION

Required/Optional: *Optional*

Sets the specification that should be used when writing the output GDF file.

Values: `CEN`, `NAVTEQ`, `NAVTECH` (deprecated), `TELEATLAS`, or `BESTGUESS`

This indicates which GDF specification will be used when creating the output GDF file.

A value of `CEN` means that the official CEN 3.0 specification will be used. The values `NAVTEQ` and `TELEATLAS` indicates that the NAVTEQ or TeleAtlas variants of the GDF specification should be used, respectively. The value `BESTGUESS` tells the GDF reader to use an intelligent guess as to which specification to use, based on the header of the GDF file it is overwriting, if any.

Default value: `BESTGUESS`

Example:

```
GDF_SPECIFICATION CEN
```

[Workbench Parameter: <WorkbenchParameter>](#)

Feature Representation

Special FME feature attributes are used to hold GDF information. The GDF writer will use these attribute values as it fills in GDF records during output. The GDF reader will set these attributes in the FME feature it creates for each feature it reads.

FME does not typically concern itself with the value of the *FME feature type* of a GDF feature. The GDF writer will ignore the feature type and instead look for the value of the `gdf_type` attribute to know how to correctly write each feature. The feature type set by the reader will be set to the `gdf_type` value without the "gdf_" prefix (and uppercase if the feature corresponds directly to a GDF record type). Subsequent subsections describe parameters specific to each of the supported feature types.

Attribute Name	Contents
<code>gdf_type</code>	The FME name for the type of element this feature represents. Range: See the table in the <i>Overview</i> subsection. Default: No default

Level 1 and Level 2 features may also contain attributes from the GDF specification as well as user-defined attributes.

For example, if a user-defined postal code attribute is included, the following attributes will be present on the feature:

- "Custom Postal Code" - holds the actual value of this attribute
- "Custom Postal Code_ABS_REL" - indicates whether absolute or relative curvilinear positions are stored.
- "Custom Postal Code_ATT_DIR" - holds the direction(s) for which this attribute is valid.

For example, if a standard GDF attribute such as "official name" (ON) is included, the following attributes will be present on the feature:

- "Official Name" - holds the actual value of this attribute.
- "Official Name_ABS_REL" - indicates whether absolute or relative curvilinear positions are stored.
- "Official Name_ATT_DIR" - holds the direction(s) for which this attribute is valid.
- "Official Name_DESCRIPTION_ID" - Source Description Identifier ID. Number of a source document for the attribute.
- "Official Name_LANGUAGE" - The MARC language of the specified name.
- "Official Name_NAME_DESCRIPTION_ID" - Source Description Identifier ID. Number of a source document for the name.

Some attributes are actually composite attributes, meaning they are groups of values that together have a particular meaning. At this point, this representation of composites is handled only by the GDF reader. For example, Direction of Traffic Flow may have different restrictions for bicycles than they do for passenger vehicles. These composite attributes will be represented as follows:

- “Composite Direction of Traffic Flow” - `{{Direction of Traffic Flow=4}{Vehicle Type=10}}`

The outer bracket pair shows that the contained values refer to each other and the inner brackets mark each particular value. In some cases, a composite may contain other composites. In certain instances, it may be inconvenient to deal with such a structure, but composites are also represented on a feature in a list format as follows:

- “Composite Direction of Traffic Flow{0}.Direction of Traffic Flow” = 4
- “Composite Direction of Traffic Flow{0}.Vehicle Type” = 10

Note: In the case of composite attributes, the ABS_REL and ATT_DIR will only appear on the top level (that is, they won't be included for subattributes).

All the standard GDF attributes as well as user-defined attributes are concatenated together as a single string provided in an attribute `gdf_all_attributes`. The attribute names are followed by their values in this string.

All features will have the following attributes: `gdf_volume_id`, `gdf_dataset_id`, `gdf_section_id`, and `gdf_layer_id` where applicable. These values are taken from the header of the corresponding record and attached to the feature. A feature will only have these IDs for its level and those levels that are higher, provided that the ID value is specified.

level_0_point

gdf_type: `gdf_level_0_point`

The geometry of this type of feature is a point. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
KNOTREC_XYZ_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
KNOTREC_KNOT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
KNOTREC_FACE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

Attribute Name	Contents
KNOTREC_STATUS	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

level_0_line

gdf_type: gdf_level_0_line

The geometry of this type of feature is a line. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
NEDGEREC_XYZ_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NEDGEREC_EDGE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NEDGEREC_FKNOT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NEDGEREC_TKNOT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NEDGEREC_LFACE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NEDGEREC_RFACE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

Attribute Name	Contents
NEDGEREC_STATUS	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

level_0_polygon

gdf_type: gdf_level_0_polygon

The geometry of this type of feature is a polygon. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
FACEREC_FACE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
FACEREC_NUM_EDGE{ } . EDGE_ID FACEREC_NUM_EDGE{ } . ORIENT	These are list attributes that hold the NEDGEREC_EDGE_ID numbers of all the edges (NEDGEREC) that are connected to this feature. The orientation these edges are connected with are also stored. Range: 0-2147483647 Default: No Default

level_1_point

gdf_type: gdf_level_1_point

The geometry of this type of feature is a point. As outlined above, this feature may contain attributes from the GDF specification as well as user-defined attributes along with the attributes listed below:

Attribute Name	Contents
POFEREC_POINT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
POFEREC_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

Attribute Name	Contents
POFEREC_FEAT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
POFEREC_NUM_ATT{ }.SATT_ID	This is a list attribute that holds the DSATREC_SATT_ID numbers of all the segmented attributes (DSATREC) that are connected to this feature. Range: 0-2147483647 Default: No Default
POFEREC_NUM_KNOT{ }.KNOT_ID	This is a list attribute that holds the KNOTREC_KNOT_ID numbers of all the knots (KNOTREC) that are connected to this feature. Range: 0-2147483647 Default: No Default
gdf_theme_type	Please refer to the official GDF specifications for details on the description of GDF themes. Range: 254 character string Default: No Default
gdf_feature_type	Please refer to the official GDF specifications for details on the description of GDF feature types. Range: 254 character string Default: No Default

level_1_line

gdf_type: gdf_level_1_line

The geometry of this type of feature is a line. As outlined above, this feature may contain attributes from the GDF specification as well as user-defined attributes along with the attributes listed below:

Attribute Name	Contents
LINFREC_LIFE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
LINFREC_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

Attribute Name	Contents
LINFREC_FEAT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
LINFREC_SPLIT_IND	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default
LINFREC_FROM_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
LINFREC_TO_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
LINFREC_NUM_ATT{ }.SATT_ID	This is a list attribute that holds the DSATREC_SATT_ID numbers of all the segmented attributes (DSATREC) that are connected to this feature. Range: 0-2147483647 Default: No Default
LINFREC_NUM_EDGE{ }.EDGE_ID LINFREC_NUM_EDGE{ }.POS_NEG	These are list attributes that hold the NEDGEREC_EDGE_ID numbers of all the edges (NEDGEREC) that are connected to this feature. The direction these edges are connected are also stored. Range: 0-2147483647 Default: No Default
gdf_theme_type	Please refer to the official GDF specifications for details on the description of GDF themes. Range: 254 character string Default: No Default
gdf_feature_type	Please refer to the official GDF specifications for details on the description of GDF feature types. Range: 254 character string Default: No Default

level_1_polygon

gdf_type: gdf_level_1_polygon

The geometry of this type of feature is a polygon. As outlined above, this feature may contain attributes from the GDF specification as well as user-defined attributes along with the attributes listed below:

Attribute Name	Contents
ARFEREC_AREA_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
ARFEREC_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
ARFEREC_FEAT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
ARFEREC_SPLIT_IND	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default
ARFEREC_NUM_ATT{ }.SATT_ID	This is a list attribute that holds the DSATREC_SATT_ID numbers of all the segmented attributes (DSATREC) that are connected to this feature. Range: 0-2147483647 Default: No Default
ARFEREC_NUM_FACE{ }.FACE_ID	This is a list attribute that holds the FACEREC_FACE_ID numbers of all the faces (FACEREC) that are connected to this feature. Range: 0-2147483647 Default: No Default
gdf_theme_type	Please refer to the official GDF specifications for details on the description of GDF themes. Range: 254 character string Default: No Default
gdf_feature_type	Please refer to the official GDF specifications for details on the description of GDF feature types. Range: 254 character string Default: No Default

level_2_point

gdf_type: gdf_level_2_point

The geometry of this type of feature is a point. As outlined above, this feature may contain attributes from the GDF specification as well as user-defined attributes along with the attributes listed below:

Attribute Name	Contents
COMPFEREC_COMF_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
COMPFEREC_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
COMPFEREC_FEAT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
COMPFEREC_SPLIT_IND	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default
COMPFEREC_NUM_ATT{ }.SATT_ID	This is a list attribute that holds the DSATREC_SATT_ID numbers of all the segmented attributes (DSATREC) that are connected to this feature. Range: 0-2147483647 Default: No Default
COMPFEREC_NUM_PARTS{ }.FEAT_ID COMPFEREC_NUM_PARTS{ }.FEAT_CAT	These are list attributes that hold the ID numbers of all the members (POFEREC, LINFREC, ARFEREC, or COMPFEREC) that are connected to this feature. The category of the member is also stored. (Point = 1, Line = 2, Area = 3, Complex = 4) Range: 0-2147483647 Default: No Default
gdf_theme_type	Please refer to the official GDF specifications for details on the description of GDF themes. Range: 254 character string Default: No Default
gdf_feature_type	Please refer to the official GDF specifications for details on the description of GDF feature types. Range: 254 character string Default: No Default

level_2_line

gdf_type: gdf_level_2_line

The geometry of this type of feature is a line. As outlined above, this feature may contain attributes from the GDF specification as well as user-defined attributes along with the attributes listed below:

Attribute Name	Contents
COMPFEREC_COMF_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
COMPFEREC_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
COMPFEREC_FEAT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
COMPFEREC_SPLIT_IND	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default
COMPFEREC_FROM_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
COMPFEREC_TO_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
COMPFEREC_NUM_ATT{ }.SATT_ID	This is a list attribute that holds the DSATREC_SATT_ID numbers of all the segmented attributes (DSATREC) that are connected to this feature. Range: 0-2147483647 Default: No Default

Attribute Name	Contents
COMPFEREC_NUM_PARTS{ }.FEAT_ID COMPFEREC_NUM_PARTS{ }.FEAT_CAT	These are list attributes that hold the ID numbers of all the members (POFEREC, LINFREC, ARFEREC, or COMPFEREC) that are connected to this feature. The category of the member is also stored. (Point = 1, Line = 2, Area = 3, Complex = 4) Range: 0-2147483647 Default: No Default
gdf_theme_type	Please refer to the official GDF specifications for details on the description of GDF themes. Range: 254 character string Default: No Default
gdf_feature_type	Please refer to the official GDF specifications for details on the description of GDF feature types. Range: 254 character string Default: No Default

level_2_polygon

gdf_type: gdf_level_2_polygon

The geometry of this type of feature is a polygon. As outlined above, this feature may contain attributes from the GDF specification as well as user-defined attributes along with the attributes listed below:

Attribute Name	Contents
COMPFEREC_COMF_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
COMPFEREC_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
COMPFEREC_FEAT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
COMPFEREC_SPLIT_IND	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default

Attribute Name	Contents
COMPFEREC_NUM_ATT{ }.SATT_ID	This is a list attribute that holds the DSATREC_SATT_ID numbers of all the segmented attributes (DSATREC) that are connected to this feature. Range: 0-2147483647 Default: No Default
COMPFEREC_NUM_PARTS{ }.FEAT_ID COMPFEREC_NUM_PARTS{ }.FEAT_CAT	These are list attributes that hold the ID numbers of all the members (POFEREC, LINFREC, ARFEREC, or COMPFEREC) that are connected to this feature. The category of the member is also stored. (Point = 1, Line = 2, Area = 3, Complex = 4) Range: 0-2147483647 Default: No Default
gdf_theme_type	Please refer to the official GDF specifications for details on the description of GDF themes. Range: 254 character string Default: No Default
gdf_feature_type	Please refer to the official GDF specifications for details on the description of GDF feature types. Range: 254 character string Default: No Default

NULLREC

gdf_type: gdf_nullrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
NULLREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
NULLREC_FREE_TEXT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

VOLHDREC

gdf_type: gdf_volhdrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
VOLHDREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
VOLHDREC_SUP_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 20 character string Default: No Default
VOLHDREC_STAN_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 10 character string Default: No Default
VOLHDREC_VERSION	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 4 character string Default: No Default
VOLHDREC_CREA_DATE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999999 Default: No Default
VOLHDREC_VOL_SIZE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
VOLHDREC_ALBUM_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
VOLHDREC_TOT_VOL	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default

Attribute Name	Contents
VOLHDREC_VOL_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
VOLHDREC_CHAR_SET	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 10 character string Default: No Default
VOLHDREC_CORI_DATE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999999 Default: No Default
VOLHDREC_CORI_OWNER	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

VOLHDREC_LINK_DASET_VOL

gdf_type: gdf_volhdrec_link_daset_vol

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
VOLHDREC_VOL_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
DASET_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999999999 Default: No Default
VOL_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default

DSHDREC_01

gdf_type: gdf_dshdrec_01

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
DSHDREC_01_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DSHDREC_01_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DSHDREC_01_IDSI_NR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 13 character string Default: No Default
DSHDREC_01_DASET_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
DSHDREC_01_ED_DATE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999999999 Default: No Default

DSHDREC_01_LINK_LANGUAGE

gdf_type: gdf_dshdrec_01_link_language

The geometry of this type of feature is a none. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
DSHDREC_01_DASET_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

Attribute Name	Contents
LANGUAGE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 254 character string Default: No Default

DSHDREC_01_LINK_COUNTRY

gdf_type: gdf_dshdrec_01_link_country

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
DSHDREC_01_DASET_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
COUNTRY	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 254 character string Default: No Default

DSHDREC_02

gdf_type: gdf_dshdrec_02

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
DSHDREC_02_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DSHDREC_02_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default

Attribute Name	Contents
DSHDREC_02_LAN_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 3 character string Default: No Default
DSHDREC_02_DASET_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

DSHDREC_03

gdf_type: gdf_dshdrec_03

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
DSHDREC_03_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DSHDREC_03_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DSHDREC_03_SEC_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

DSHDREC_04

gdf_type: gdf_dshdrec_04

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
DSHDREC_04_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DSHDREC_04_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DSHDREC_04_CNT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 3 character string Default: No Default
DSHDREC_04_PROD_PLACE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 25 character string Default: No Default
DSHDREC_04_LAN_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 3 character string Default: No Default
DSHDREC_04_PROD_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

DSHDREC_05

gdf_type: gdf_dshdrec_05

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
DSHDREC_05_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DSHDREC_05_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DSHDREC_05_CREA_YEAR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
DSHDREC_05_GEO_AREA	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

DSHDREC_06

gdf_type: gdf_dshdrec_06

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
DSHDREC_06_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DSHDREC_06_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default

Attribute Name	Contents
DSHDREC_06_THEM_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
DSHDREC_06_THEM_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

DSHDREC_07

gdf_type: gdf_dshdrec_07

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
DSHDREC_07_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DSHDREC_07_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DSHDREC_07_XY_RES	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999 Default: No Default
DSHDREC_07_XY_ACC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999 Default: No Default
DSHDREC_07_Z_ACC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

Attribute Name	Contents
DSHDREC_07_REL_ACC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
DSHDREC_07_SURV_DATE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999999 Default: No Default
DSHDREC_07_MAX_AGE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999999 Default: No Default
DSHDREC_07_FEAT_COMP	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
DSHDREC_07_ATT_COMP	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
DSHDREC_07_ATT_COR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

FIELDDEFREC

gdf_type: gdf_fieldefrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
FIELDDEFREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default

Attribute Name	Contents
FIELDREC_FLD_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 10 character string Default: No Default
FIELDREC_FIELD_SIZE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
FIELDREC_DATA_TYPE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
FIELDREC_DATA_UNIT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 3 character string Default: No Default
FIELDREC_UNIT_EXP	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
FIELDREC_NO_DATA	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 6 character string Default: No Default
FIELDREC_MIN_VAL	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 12 character string Default: No Default
FIELDREC_MAX_VAL	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 12 character string Default: No Default
FIELDREC_DATA_USE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default

Attribute Name	Contents
FIELDEFREC_FIELD_DESC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

RECDEFREC

gdf_type: gdf_recdefrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
RECDEFREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
RECDEFREC_REC_TYPE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
RECDEFREC_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
RECDEFREC_REC_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 10 character string Default: No Default
RECDEFREC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
RECDEFREC_COMMENT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

RECDEFREC_LINK_FLD_NAME

gdf_type: gdf_recdefrec_link fld_name

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
RECDEFREC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
FLD_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 8 character string Default: No Default

ATDEFREC

gdf_type: gdf_atdefrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
ATDEFREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
ATDEFREC_ATT_TYPE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
ATDEFREC_FIELD_SIZE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
ATDEFREC_DATA_TYPE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
ATDEFREC_DATA_UNIT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 3 character string Default: No Default

Attribute Name	Contents
ATDEFREC_UNIT_EXP	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
ATDEFREC_NO_DATA	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 6 character string Default: No Default
ATDEFREC_MIN_VAL	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 12 character string Default: No Default
ATDEFREC_MAX_VAL	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 12 character string Default: No Default
ATDEFREC_ATT_DESC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

DIREC

gdf_type: gdf_direc

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
DIREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DIREC_VOL_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default

Attribute Name	Contents
DIREC_SECT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
DIREC_LAY_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
DIREC_REC_TYPE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
DIREC_REC_QTY	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999999 Default: No Default

FEATDEFREC

gdf_type: gdf_featdefrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
FEATDEFREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
FEATDEFREC_FEAT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
FEATDEFREC_FEAT_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 20 character string Default: No Default

Attribute Name	Contents
FEATDEFREC_LAN_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 3 character string Default: No Default
FEATDEFREC_FEAT_SYN	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 20 character string Default: No Default

SPADOREC

gdf_type: gdf_spadorec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SPADOREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SPADOREC_SECT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
SPADOREC_MAX_LAT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999999 Default: No Default
SPADOREC_MIN_LAT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999999 Default: No Default
SPADOREC_MAX_LONG	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999999 Default: No Default

Attribute Name	Contents
SPADOREC_MIN_LONG	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999999 Default: No Default
SPADOREC_GEO_AREA	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

FEAQUALREC

gdf_type: gdf_feaqualrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
FEAQUALREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
FEAQUALREC_FQREC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
FEAQUALREC_FEAT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
FEAQUALREC_FEAT_COMP	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

ATQUALREC

gdf_type: gdf_atqualrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
ATQUALREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
ATQUALREC_AQREC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
ATQUALREC_FEAT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
ATQUALREC_ATT_TYPE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
ATQUALREC_ATT_VAL	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 10 character string Default: No Default
ATQUALREC_SURV_DATE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999999 Default: No Default
ATQUALREC_AGING_RATE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
ATQUALREC_ATT_RES	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
ATQUALREC_ABS_ACC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

Attribute Name	Contents
ATQUALREC_REL_ACC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
ATQUALREC_ATT_COMP	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
ATQUALREC_ATT_COR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

SRCEREC_01

gdf_type: gdf_srcerec_01

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SRCEREC_01_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_01_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_01_DESCR_LEV	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default
SRCEREC_01_COMPL_LEV	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default

Attribute Name	Contents
SRCEREC_01_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
SRCEREC_01_PAR_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

SRCEREC_02

gdf_type: gdf_srcerec_02

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SRCEREC_02_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_02_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_02_ISBN	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 13 character string Default: No Default
SRCEREC_02_ISSN	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 10 character string Default: No Default
SRCEREC_02_SURV_YEAR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default

Attribute Name	Contents
SRCEREC_02_SURV_DATE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999999 Default: No Default

SRCEREC_02_LINK_LANGUAGE

gdf_type: gdf_srcerec_02_link_language

The geometry of this type of feature is a none. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SRCEREC_02_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
LANGUAGE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 254 character string Default: No Default

SRCEREC_02_LINK_COUNTRY

gdf_type: gdf_srcerec_02_link_country

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SRCEREC_02_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
COUNTRY	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 254 character string Default: No Default

SRCEREC_03

gdf_type: gdf_srcerec_03

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SRCEREC_03_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_03_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_03_AUTHOR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

SRCEREC_04

gdf_type: gdf_srcerec_04

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SRCEREC_04_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_04_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_04_MAP_SCALE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999999 Default: No Default

Attribute Name	Contents
SRCEREC_04_LAN_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 3 character string Default: No Default
SRCEREC_04_DOC_TITLE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

SRCEREC_05

gdf_type: gdf_srcerec_05

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SRCEREC_05_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_05_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_05_LAN_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 3 character string Default: No Default
SRCEREC_05_VOL_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

SRCEREC_06

gdf_type: gdf_srcerec_06

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SRCEREC_06_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_06_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_06_EDIT_NR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 20 character string Default: No Default
SRCEREC_06_IMP_NR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 20 character string Default: No Default

SRCEREC_07

gdf_type: gdf_srcerec_07

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SRCEREC_07_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_07_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default

Attribute Name	Contents
SRCEREC_07_PUB_YEAR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
SRCEREC_07_CNT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 3 character string Default: No Default
SRCEREC_07_PUB_PLACE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 20 character string Default: No Default
SRCEREC_07_PUB_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

SRCEREC_08

gdf_type: gdf_srcerec_08

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SRCEREC_08_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_08_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_08_DIST_YEAR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default

Attribute Name	Contents
SRCEREC_08_CNT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 3 character string Default: No Default
SRCEREC_08_DIST_PLACE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 20 character string Default: No Default
SRCEREC_08_DIST_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

SRCEREC_09

gdf_type: gdf_srcerec_09

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SRCEREC_09_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_09_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SRCEREC_09_HOST_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
SRCEREC_09_REL_KIND	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

Attribute Name	Contents
SRCEREC_09_FST_PAGE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
SRCEREC_09_LST_PAGE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
SRCEREC_09_COMMENT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

DATTVALREC

gdf_type: gdf_dattvalrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
DATTVALREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DATTVALREC_ATT_TYPE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DATTVALREC_DATT_VAL	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 10 character string Default: No Default

SECHREC_01

gdf_type: gdf_sechrec_01

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SECHREC_01_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_01_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_01_SECT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
SECHREC_01_GEO_AREA	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

SECHREC_02

gdf_type: gdf_sechrec_02

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SECHREC_02_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_02_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default

Attribute Name	Contents
SECHREC_02_XY_RES	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999 Default: No Default
SECHREC_02_XY_ACC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999 Default: No Default
SECHREC_02_Z_ACC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
SECHREC_02_REL_ACC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
SECHREC_02_SURV_DATE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999999 Default: No Default
SECHREC_02_MAX_AGE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999999 Default: No Default
SECHREC_02_FEAT_COMP	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
SECHREC_02_ATT_COMP	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
SECHREC_02_ATT_COR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

SECHREC_03

gdf_type: gdf_sechrec_03

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SECHREC_03_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_03_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_03_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default

SECHREC_03_LINK_FEATURE_QUALITY

gdf_type: gdf_sechrec_03_link_feature_quality

The geometry of this type of feature is a none. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SECHREC_03_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
FQREC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

SECHREC_03_LINK_ATTRIBUTE_QUALITY

gdf_type: gdf_sechrec_03_link_attribute_quality

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SECHREC_03_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
AQREC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

SECHREC_04

gdf_type: gdf_sechrec_04

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SECHREC_04_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_04_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_04_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default

SECHREC_04_LINK_SOURCE_DESC

gdf_type: gdf_sechrec_04_link_source_desc

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SECHREC_04_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

SECHREC_05

gdf_type: gdf_sechrec_05

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SECHREC_05_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_05_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_05_DATEL_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
SECHREC_05_COORD_TYPE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default

Attribute Name	Contents
SECHREC_05_PROJEC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
SECHREC_05_NATGRID_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
SECHREC_05_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default

SECHREC_05_LINK_DECLINATION

gdf_type: gdf_sechrec_05_link_declination

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SECHREC_05_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
MAGN_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

SECHREC_06

gdf_type: gdf_sechrec_06

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SECHREC_06_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_06_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_06_H_TYPE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default
SECHREC_06_VERDAT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
SECHREC_06_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default

SECHREC_06_LINK_GEOID

gdf_type: gdf_sechrec_06_link_geoid

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SECHREC_06_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default

Attribute Name	Contents
GEOID_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

SECHREC_07

gdf_type: gdf_sechrec_07

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SECHREC_07_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_07_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_07_XY_CONFAC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
SECHREC_07_Z_CONFAC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
SECHREC_07_X_OFFSET	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
SECHREC_07_Y_OFFSET	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

Attribute Name	Contents
SECHREC_07_Z_OFFSET	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
SECHREC_07_X_MAX	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
SECHREC_07_Y_MAX	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
SECHREC_07_X_MIN	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
SECHREC_07_Y_MIN	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

SECHREC_08

gdf_type: gdf_sechrec_08

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SECHREC_08_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_08_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default

Attribute Name	Contents
SECHREC_08_POINT_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 20 character string Default: No Default
SECHREC_08_X_DIG	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 12 digit integer Default: No Default
SECHREC_08_Y_DIG	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 12 digit integer Default: No Default
SECHREC_08_X_SURV	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 12 digit integer Default: No Default
SECHREC_08_Y_SURV	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 12 digit integer Default: No Default

SECHREC_09

gdf_type: gdf_sechrec_09

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
SECHREC_09_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
SECHREC_09_REC_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default

Attribute Name	Contents
SECHREC_09_POINT_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 20 character string Default: No Default
SECHREC_09_X_COORD	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
SECHREC_09_Y_COORD	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
SECHREC_09_Z_DIG	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
SECHREC_09_Z_SURV	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

LAYHREC

gdf_type: gdf_layhrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
LAYHREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
LAYHREC_LAY_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

Attribute Name	Contents
LAYHREC_XY_RES	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999 Default: No Default
LAYHREC_XY_ACC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999 Default: No Default
LAYHREC_Z_ACC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
LAYHREC_REL_ACC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
LAYHREC_SURV_DATE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999999 Default: No Default
LAYHREC_MAX_AGE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999999 Default: No Default
LAYHREC_FEAT_COMP	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
LAYHREC_ATT_COMP	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
LAYHREC_ATT_COR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

LAYHREC_LINK_THEM_COD

gdf_type: gdf_layhrec_link_them_cod

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
LAYHREC_LAY_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
THEM_COD	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

DATELREC

gdf_type: gdf_datelrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
DATELREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DATELREC_DATEL_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
DATELREC_TRANS_X	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
DATELREC_TRANS_Y	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

Attribute Name	Contents
DATELREC_TRANS_Z	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
DATELREC_ROT_Z	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
DATELREC_SCALE_FAC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
DATELREC_DAT_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 47 character string Default: No Default
DATELREC_SEM_MAJOR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999999 Default: No Default
DATELREC_SEM_MINOR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999999 Default: No Default
DATELREC_EL_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 4 character string Default: No Default

VERDATREC

gdf_type: gdf_verdatrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
VERDATREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
VERDATREC_VERDAT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
VERDATREC_CNT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 3 character string Default: No Default
VERDATREC_LEV_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 15 character string Default: No Default

VERDATREC_LINK_LEVEL

gdf_type: gdf_verdatrec_link_level

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
VERDATREC_VERDAT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
COUNTRY	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 254 character string Default: No Default

Attribute Name	Contents
LEV_NAME	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 15 character string Default: No Default
TRANS_H	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

PROJECREC

gdf_type: gdf_projecrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
PROJECREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
PROJECREC_PROJEC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
PROJECREC_PROJ_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 4 character string Default: No Default
PROJECREC_SCALE_FAC	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

PROJECREC_LINK_PARMS

gdf_type: gdf_projecrec_link_parms

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
PROJECREC_PROJEC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
PAR_LAT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
PAR_LONG	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

NATGRIDREC

gdf_type: gdf_natgridrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
NATGRIDREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
NATGRIDREC_NATGRID_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
NATGRIDREC_GRID_ORT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default

Attribute Name	Contents
NATGRIDREC_HELP_LAT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NATGRIDREC_HELP_LONG	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NATGRIDREC_X_ORIG	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NATGRIDREC_Y_ORIG	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NATGRIDREC_ROT_GRID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

GEOIDREC

gdf_type: gdf_geoidrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
GEOIDREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
GEOIDREC_GEOID_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

Attribute Name	Contents
GEOIDREC_REF_LAT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
GEOIDREC_REF_LONG	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
GEOIDREC_GEOID_OND	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

MAGNETREC

gdf_type: gdf_magnetrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
MAGNETREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
MAGNETREC_MAGN_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
MAGNETREC_REF_LAT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
MAGNETREC_REF_LONG	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

Attribute Name	Contents
MAGNETREC_DEC_DATE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-999999 Default: No Default
MAGNETREC_DEC_VALUE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
MAGNETREC_DEV_ANNUAL	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
MAGNETREC_HMAG_INT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
MAGNETREC_VMAG_INT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

COMMENTREC

gdf_type: gdf_commentrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
COMMENTREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
COMMENTREC_FREE_TEXT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

VOLTERMREC

gdf_type: gdf_voltermrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
VOLTERMREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
VOLTERMREC_FREE_TEXT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 76 character string Default: No Default
VOLTERMREC_CONT_VOL	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default

XYZREC

gdf_type: gdf_xyzrec_point

gdf_type: gdf_xyzrec_line

The geometry of this type of feature is either a point or a line. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
XYZREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
XYZREC_XYZ_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
XYZREC_G_TYPE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default

Attribute Name	Contents
XYZREC_Q_PLAN	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
XYZREC_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

NEDGEREC

gdf_type: gdf_nedgereg

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
NEDGEREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
NEDGEREC_EDGE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NEDGEREC_XYZ_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NEDGEREC_FKNOT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NEDGEREC_TKNOT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

Attribute Name	Contents
NEDGEREC_LFACE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NEDGEREC_RFACE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NEDGEREC_STATUS	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

KNOTREC

gdf_type: gdf_knotrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
KNOTREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
KNOTREC_KNOT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
KNOTREC_XYZ_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
KNOTREC_FACE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

Attribute Name	Contents
KNOTREC_STATUS	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

FACEREC

gdf_type: gdf_facerec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
FACEREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
FACEREC_FACE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

FACEREC_LINK_EDGE_ID

gdf_type: gdf_facerec_link_edge_id

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
FACEREC_FACE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
EDGE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

Attribute Name	Contents
ORIENT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

NAMEREC

gdf_type: gdf_namerec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
NAMEREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
NAMEREC_NAME_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
NAMEREC_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
NAMEREC_LAN_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 3 character string Default: No Default
NAMEREC_TEXT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

DSATREC

gdf_type: gdf_dsatrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
DSATREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DSATREC_SATT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
DSATREC_FROM	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
DSATREC_TO	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
DSATREC_ABS_REL	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1 character string Default: No Default
DSATREC_ATT_DIR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1 character string Default: No Default

DSATREC_LINK_ATTR

gdf_type: gdf_dsatrec_link_attr

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
DSATREC_SATT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
ATT_TYPE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
ATT_VAL	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 10 character string Default: No Default

TIMEREC

gdf_type: gdf_timerec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
TIMEREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
TIMEREC_TIME_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

Attribute Name	Contents
TIMEREC_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
TIMEREC_TIME_DOM	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default

CONVERTREC

gdf_type: gdf_convertrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
CONVERTREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
CONVERTREC_DASET_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
CONVERTREC_SECT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
CONVERTREC_FEAT_CAT_FOREIGN	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
CONVERTREC_EXT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

Attribute Name	Contents
CONVERTREC_FEAT_CAT_INTERNAL	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
CONVERTREC_INT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

RELATREC

gdf_type: gdf_relarec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
RELATREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
RELATREC_REL_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
RELATREC_REL_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
RELATREC_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default

RELATREC_LINK_FEAT

gdf_type: gdf_relatrec_link_feat

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
RELATREC_REL_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
FEAT_CAT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
FEAT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

RELATREC_LINK_ATTRIBUTE

gdf_type: gdf_relatrec_link_attribute

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
RELATREC_REL_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
SATT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

POFEREC

gdf_type: gdf_poferec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
POFEREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
POFEREC_POINT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
POFEREC_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
POFEREC_FEAT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default

POFEREC_LINK_KNOT

gdf_type: gdf_poferec_link_knot

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
POFEREC_POINT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
KNOT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

POFEREC_LINK_ATTRIBUTE

gdf_type: gdf_poferec_link_attribute

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
POFEREC_POINT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
SATT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

LINFREC

gdf_type: gdf_linfrec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
LINFREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
LINFREC_LIFE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
LINFREC_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
LINFREC_FEAT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default

Attribute Name	Contents
LINFREC_SPLIT_IND	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default
LINFREC_FROM_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
LINFREC_TO_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

LINFREC_LINK_EDGE

gdf_type: gdf_linfrec_link_edge

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
LINFREC_LIFE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
EDGE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
POS_NEG	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default

LINFREC_LINK_ATTRIBUTE

gdf_type: gdf_linfrec_link_attribute

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
LINFREC_LIFE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
SATT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

ARFEREC

gdf_type: gdf_arferec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
ARFEREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
ARFEREC_AREA_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
ARFEREC_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
ARFEREC_FEAT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default

Attribute Name	Contents
ARFEREC_SPLIT_IND	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default

ARFEREC_LINK_FACE

gdf_type: gdf_arferec_link_face

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
ARFEREC_AREA_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
FACE_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

ARFEREC_LINK_ATTRIBUTE

gdf_type: gdf_arferec_link_attribute

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
ARFEREC_AREA_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
SATT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

COMPFEREC

gdf_type: gdf_compferec

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
COMPFEREC_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
COMPFEREC_COMF_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
COMPFEREC_DESC_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99999 Default: No Default
COMPFEREC_FEAT_CODE	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9999 Default: No Default
COMPFEREC_SPLIT_IND	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-9 Default: No Default
COMPFEREC_FROM_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
COMPFEREC_TO_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

COMPFEREC_LINK_FEAT

gdf_type: gdf_compferec_link_feat

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
COMPFEREC_COMF_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
FEAT_CAT	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-99 Default: No Default
FEAT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

COMPFEREC_LINK_ATTRIBUTE

gdf_type: gdf_compferec_link_attribute

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
COMPFEREC_COMF_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default
SATT_ID	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 0-2147483647 Default: No Default

UNKNOWN_RECORD

gdf_type: gdf_unknown_record

This feature does not contain any geometric information. This feature does not contain any attributes from the GDF specification or user-defined attributes but does have the attributes listed below:

Attribute Name	Contents
UNKNOWN_REC_DESCR	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 2 character string Default: No Default
UNKNOWN_RECORD_DATA	Please refer to the official GDF specifications for details on the description of this attribute and possible range restrictions. Range: 1024 character string Default: No Default