Title: Part 10b (GML Profile) clarifications

S-100 Maintenance - Change Proposal Form (Rev.1)

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Change Proposal Type *(Select only one option)*

1.Clarification	2.Correction	3.Extension
		X

Location (*Identify all change proposal locations*)

S-100 Version No.	Part No.	Section No.	Proposal Summary
4.0.0	3	5.2	Add a masking attribute to the metaclass S100_GF_SpatialAttributeType (Figure 3-1).
	3	5.3.1 5.3.5	Show the structure of the masking attribute in Figure 3-2. Add the masking attribute to Table 3-13 (S100_GF_SpatialAttributeType) and describe its structure in the new Table 3-14 and the enumeration in a new Table 3.15. Renumber subsequent tables in Part 3 accordingly and update the references to those tables.
	10a	5.11.6	Add text relating the fields of "masked spatial type" to the masking attribute in the GFM.
	10b	8.5.6 (new)	New clause describing how masking is implemented in the GML format.

Change Proposal

While the S-100 ISO 8211 format (Part 10a) includes a masking/truncation indicator for spatial records, this is not formally described in the General Feature Model (GFM) and the GML format leaves it to application schemas to implement indicators of masking/truncation. This proposal adds a formal specification for an indicator of masking/truncation of spatial primitives to the S-100 GFM and documents how it is implemented in the GML format.

In order to maintain compatibility with both the ISO 8211 format and the standard GML method of referencing objects (which is already being used for feature and information associations in the S-100 GML format), the masking attribute is defined to be compatible with both the existing masked spatial attribute field in Part 10a (10a-5.11.6) and the GML ReferenceType datatype, and the S-100 GML format merely constrains the allowed values for object references and roles in the GML ReferenceType datatype.

This proposal does not entail any change to the masked spatial type field for the ISO 8211 format which is currently defined in Part 10a.

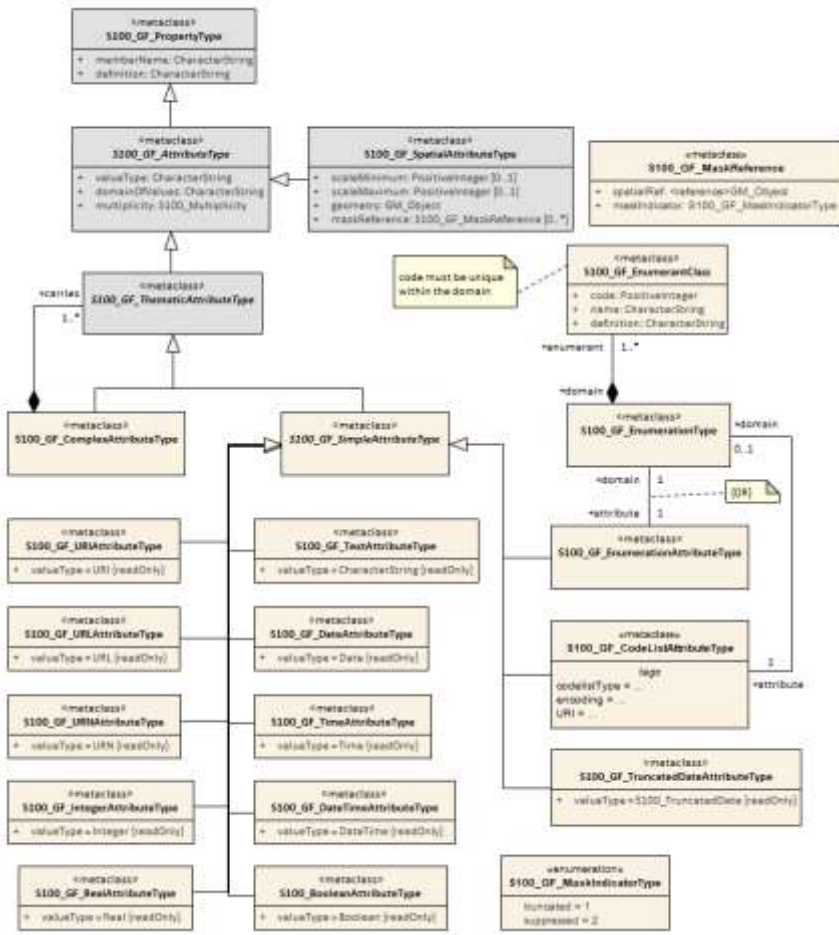**3-5.2 The General Feature Model**
3-5.2.1 Introduction

[Replace Figure 3-1 with the figure below.]
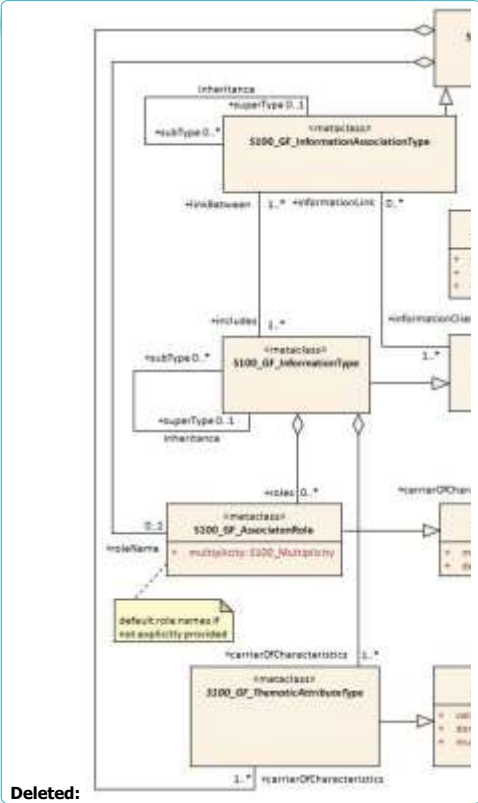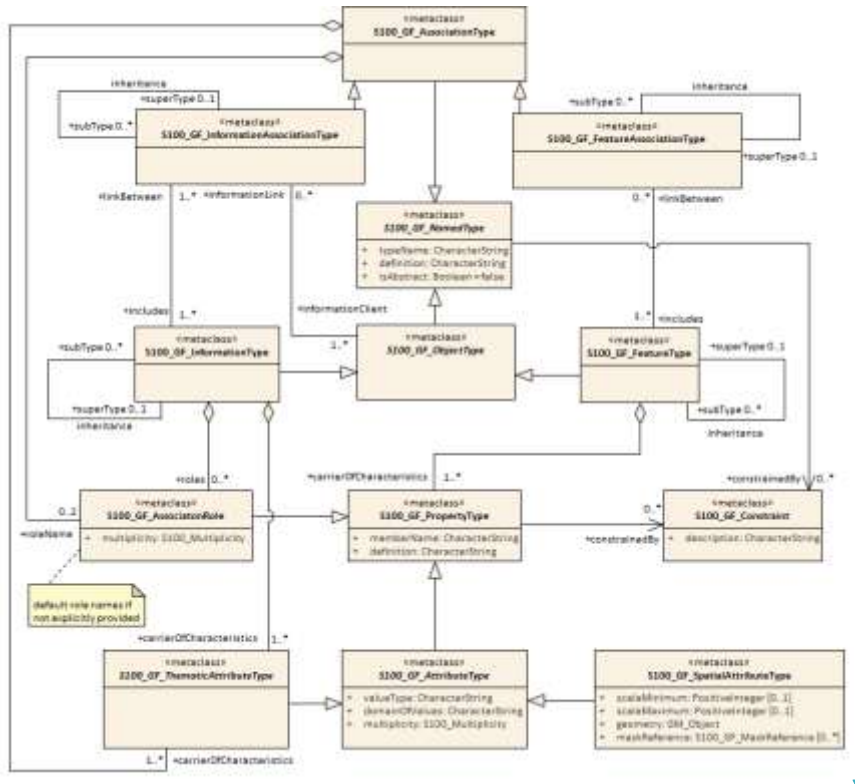
3-5.3 Attributes of feature types
3-5.3.1 Introduction

[Replace Figure 3-2 with the figure below.]

[Note: Ellipses were added to tag values in S100_GF_CodeListAttributeType as a workaround to ensure the tags appear in the diagram.]

3-5.3.5 S100_GF_SpatialAttributeType

[Add the following row to Table 3-13 – S100_GF_SpatialAttributeType and insert the text following it and a new Table 3-14 defining the type for mask indicators. New text is in red.]

The class S100_GF_SpatialAttributeType is a realisation of the ISO 19109 class GF_SpatialAttributeType. A spatial attribute type shall have a GM_Object as its value type. GM_Object and its sub-types are defined in the Spatial Schema, S-100 Part 7.

Masking or truncation shall be indicated by providing the identifiers of the masked or truncated primitives and an indicator of whether the referenced primitive is masked or truncated in *maskReference* attributes. The structure of the *maskReference* attribute is defined by the type *S100_GF_MaskReference*, shown in Table 3-14.

The implementation of mask references in different S-100 formats is specified in the respective data format specifications (Part 10a for the ISO 8211 data format and Part 10b for the GML format) and may use constructs built into the core specification. For example, the S-100 GML format uses the GML type *ReferenceType* with restrictions on allowed values of the *xlink:href*
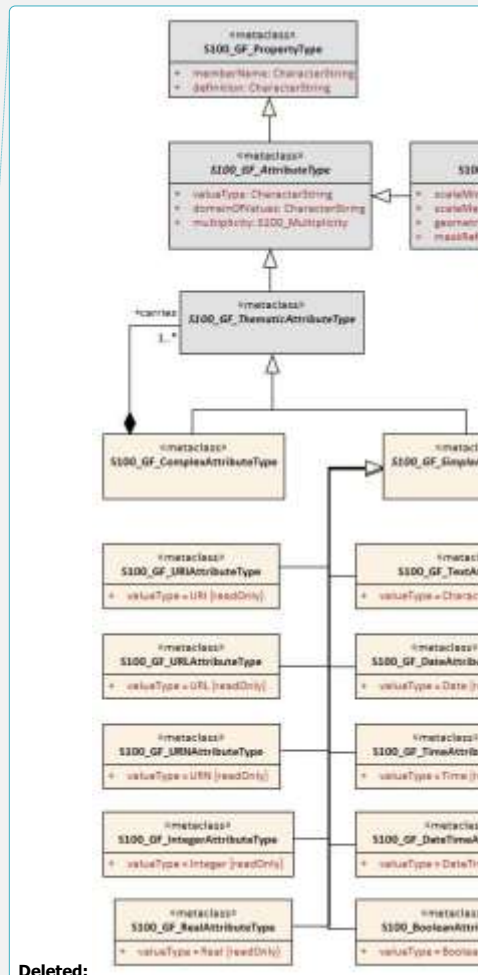
and *xlink:role* attributes; the ISO 8211 format uses unsigned integers containing the record identifier of a spatial object and the numeric code of the mask indicator value.

The spatial objects referenced in the masking attribute must be among the components of the GM_Object that constitutes the spatial object referenced by the same instance of the spatial attribute. They may be components at any level, for example, components of components, etc. (In other words, the masked or truncated geometry must be part of the geometry of that particular instance of the spatial attribute.)

Product specifications should restrict the use of masking to specific spatial types if needed, for example. to curves.

[Note: This constraint precludes masking in the broader sense, e.g., masking part of a surface by another surface or masking multiple points using a surface. This limitation should be discussed by the working group and either confirmed or revised.]

Table 3-13 - S100_GF_SpatialAttributeType

Role Name	Name	Description	Mult.	Type
Attribute	maskReference	Reference indicating masked or truncated spatial primitives or objects.	0..*	S100_GF_MaskReference

Table 3-14 - S100_MaskReference

Role Name	Name	Description	Mult.	Type
Class	S100_GF_MaskReference	Reference to a masked or truncated spatial primitive. Model is based on gml:Reference but limits the allowed attributes and makes the identifier and role mandatory.	--	--
Attribute	spatialRef (alias xlink:href)	Identifier of a spatial primitive.	1	<reference>GM_Object
Attribute	maskIndicator (alias xlink:role)	Indicates whether a spatial primitive is masked, or truncated by the dataset limit.	1	Enumeration S100_GF_MaskIndicatorType.

Table 3.15 S100_MaskIndicatorType

Role Name	Name	Description	Code	Remarks
Enumeration	S100_GF_MaskIndicatorType	Indicates masking or truncation at dataset limit.	--	--
Literal	truncated	The spatial primitive is truncated at a dataset limit.	1	
Literal	suppressed	Portrayal of the spatial primitive is suppressed.	2	

Deleted: *m*

Deleted: ¶
1: truncated¶
2: suppressed

Part 10a – ISO 8211 format:

10a-5.11.6   Masked Spatial Type field structure
[Add the following text]

The *Referenced Record identifier* field corresponds to the *spatialRef* attribute of S100_GF_MaskReference (Part 3, Table 3-14). The *Mask Indicator* field corresponds to the *maskIndicator* attribute of S100_GF_MaskReference.

Part 10b – GML format:

10b-8.5.6   Masking, truncation, and scale ranges

Beginning with Edition 4.1, the S-100 GML format defines a generic complex type S100_SpatialAttributeType for spatial attributes with *scaleMinimum* and *scaleMaximum* attributes and a *maskReference* tag. These correspond to the attributes of the S100_SpatialAttribute metaclass in the S-100 General Feature Model (Part 3, Figures 3-1 and 3-2 and clause 3-5.3.5). *scaleMinimum* and *scaleMaximum* are implemented as integer attributes. The *maskReference* attribute is implemented using the GML Reference Type with the following constraints:

- The value of the xlink:href attribute must be the gml:id of the masked/truncated object.
- The value of the xlink:role attribute must be either 'truncated' or 'suppressed'.
- The meaning of other attributes is undefined in S-100. Product specifications may specify their use depending on the needs of the data product.

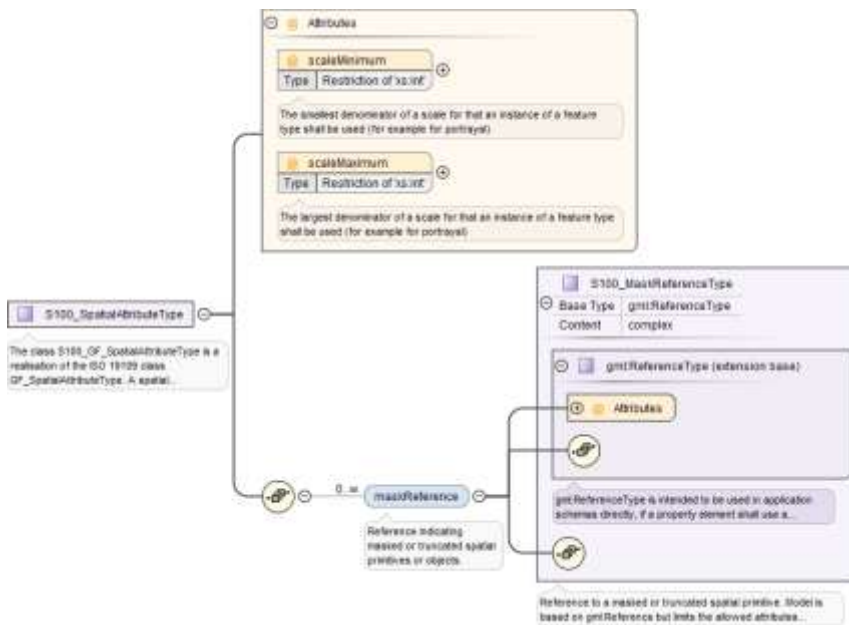The structure of the S100_SpatialAttribute Complex type is depicted in Figures X.X and X.X below.

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Figure X.X Structure of generic spatial attribute type in the S-100 GML format
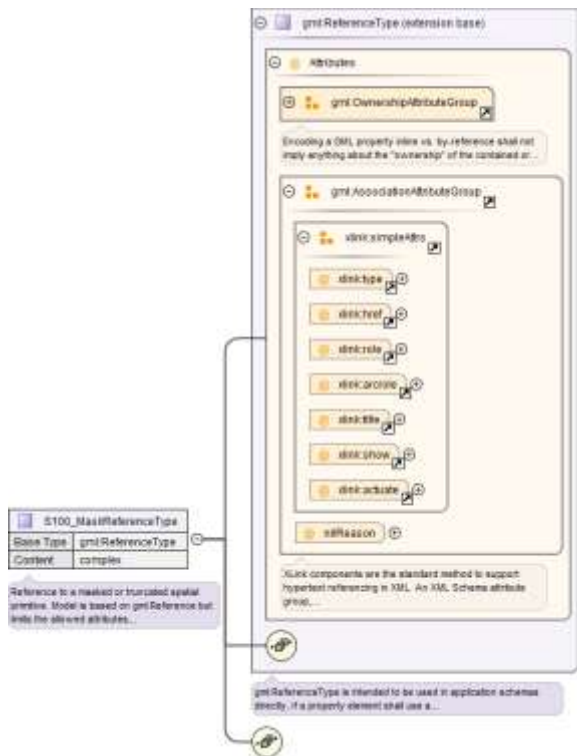

Figure X.X Structure of mask reference type. This Part specifies only the *href* and *role* attributes. The other *AssociationAttributeGroup* members, *OwnershipAttributeGroup* members, and *nilReason* are not used.

An example of the use of masking is depicted in Figure X.X below. The surface boundary is defined by reference to two curves (sequential curves comprising the exterior ring), whose gml:id's are JS.C.123 and JS.C.567. These curves are defined elsewhere in the file. The *maskReference* tag in the example indicates that the curve JS.C.567 is suppressed.

NOTE 1: The S-100 GML format does not require that the object geometry (the Surface object in Figure X.X) be encoded inline as depicted in Figure X.X. It can be encoded elsewhere in the dataset as an separate spatial data object, like the curves.

NOTE 2: The '#' character preceding the identifier is an XML convention indicating that the part which follows is the identifier of an XML element inside an XML file (since no filename is specified, the convention is that the referenced element is in the same file). Note that the reference mechanism also allows references to objects in external files by prefixing the object identifier with the file name or URL of the external file.

[Question: Should this edition of S-100 constrain whether referenced spatial objects must be in the same file?]

```
<S127:MilitaryPracticeArea gml:id="JS.MIPARE.676">
    <featureName><name>Jussland Naval Firing Area</name></featureName>
    <textContent><information><text>Example of masked spatial type</text></inform
    <theServiceHours xlink:href="#JS.SRVHRS.685"/>
    <geometry>
        <S100:surfaceProperty scaleMinimum="1000000" scaleMaximum="10000">
            <S100:maskReference xlink:href="#JS.C.567" xlink:role="suppressed"/>
            <S100:Surface gml:id="JS.MIPARE.676.S.1" srsDimension="2" srsName="u
                <gml:patches><gml:PolygonPatch><gml:exterior>
                    <gml:Ring>
                        <gml:curveMember xlink:href="#JS.C.123"/>
                        <gml:curveMember xlink:href="#JS.C.567"/>
                    </gml:Ring>
                </gml:exterior></gml:PolygonPatch></gml:patches>
            </S100:Surface>
        </S100:surfaceProperty>
    </geometry>
    <geometry>
```

Figure X.X Example of masking in the GML format.

Other

The S-100 GML profile will need to be updated to add the masking reference type. **Validation rules will need to be defined to check the validity of references to masked spatial primitives**. **These rules should be added to the generic S-100 validation tests.** Product specifications which use masked spatial types will need to add these validation rules either individually or by incorporating a common set of validation rules (this common set is as yet not formally defined, and exists only informally for certain NIPWG specifications).

Change Proposal Justification

Fills an implementor / test-bed request to describe how masked spatial types are indicated in S-100 GML format datasets. S-100 WG discussions added truncated spatial types to this request.

What parts of the S-100 Infrastructure will this proposal affect?

☐ S-100 Feature Concept Dictionary Interface or Database
☐ S-100 Portrayal Register
☐ S-100 Feature Catalogue Builder
☐ S-100 Portrayal Catalogue Builder
☒ S-100 UML Models

Please send completed forms and supporting documentation to the secretary S-100WG.