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TECHNICAL CORRIGENDUM 1

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Industrial automation systems and integration — Product data representation and exchange —

Part 46:

Integrated generic resources: Visual presentation

TECHNICAL CORRIGENDUM 1

Systèmes d'automatisation industrielle et intégration — Représentation et échange de données de produits — Partie 46: Ressources génériques intégrées: Présentation visuelle

RECTIFICATIF TECHNIQUE 1

Technical Corrigendum 1 to International Standard ISO 10303-46:1994 was prepared by Technical Committee ISO/TC 184, *Industrial automation systems and integration*, Subcommittee SC 4, *Industrial data*.

Introduction

This document corrects ISO 10303-46:1994, Product data representation and exchange — Part 46: Integrated generic resources: Visual presentation. The corrected document supersedes ISO 10303-46:1994.

The purpose of the modifications to the text of ISO 10303-46:1994 is to correct errors in the EXPRESS definitions likely to cause a compilation problem, to correct errors in Informal propositions and Formal propositions, to replace the annex for the computer-interpretable EXPRESS with a URL reference, and to replace the object identifier for the document and the schemas.

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Modifications to the text of ISO 10303-46:1994

Clause 4, p. 5

The EXPRESS specification for the **presentation_organization_schema** *did not include a reference to required data type. The first required data type is an entity data type, the* **annotation_occurrence** *for the Formal propositions in* **area_dependent_annotation_representation** *and* **view_dependent_ annotation_representation**. *The second required data type is an entity data type, the* **symbol_ representation** *for the Formal propositions in* **symbol_representation_rule**. *The third required data type is an entity data type, the* **symbol_representation_relationship** *for the Formal propositions in* **symbol_representation_rule**. *The fourth required data type is an entity data type, the* **styled_item** *for the Formal propositions in* **camera_model** *and* **light_source**. *The fifth required data type is an entity data type, the* **founded_item**. *It is required to be referenced since it is now a supertype of* **view_volume**. *Add the following to the EXPRESS specification between the 'SCHEMA presentation_organization_schema;' and the 'REFERENCE FROM presentation_resource_schema':*

```
REFERENCE FROM presentation_definition_schema
    (annotation_occurrence,
     symbol_representation,
     symbol_representation_relationship);
```

```
REFERENCE FROM presentation_appearance_schema
    (styled_item);
```

Delete the following EXPRESS specification:

```
REFERENCE FROM representation_schema
    (item_defined_transformation,
     item_in_context,
     mapped_item,
     representation,
     representation_item,
     representation_map,
     representation_relationship,
     representation_relationship_with_transformation);
```

Replace with the following EXPRESS specification:

```
REFERENCE FROM representation_schema
    (founded_item,
     item_defined_transformation,
     item_in_context,
     mapped_item,
     representation,
     representation_item,
     representation_map,
```

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```
      representation_relationship,
      representation_relationship_with_transformation);
```

With the addition of the **annotation_occurrence, symbol_representation, symbol_representation_** **relationship** *and* **styled_item** *to the* **presentation_organization_schema**, *NOTE 1 changed. Delete NOTE 1 and replace with the following:*

> NOTE 1   The schemas referenced above can be found in the following parts of ISO 10303:
>
> | | |
> |---|---|
> | Presentation_definition_schema | Clause 5 of this part of ISO 10303 |
> | Presentation_appearance_schema | Clause 6 of this part of ISO 10303 |
> | Presentation_resource_schema | Clause 7 of this part of ISO 10303 |
> | Geometry_schema | ISO 10303-42 |
> | Representation_schema | ISO 10303-43 |
> | Measure_schema | ISO 10303-41 |
> | Support_resource_schema | ISO 10303-41 |

Clause 4.3.45, p. 13

The Informal proposition of **layered_item** *contradicts to the intended use of* **presentation_layer_** **assignment**. *The type of* **representation_items** *assigned to a layer shall not be restricted. Remove Informal proposition IP1.*

Clause 4.5.5, p. 26

The EXPRESS specification of **view_volume** *is revised to make it a subtype of* **founded_item** *in order to provide a representation context for the* **projection_point** *and* **planar_box** *attributes. Remove the EXPRESS specification and replace with the following:*

<u>EXPRESS specification:</u>

```
*)
ENTITY view_volume
  SUBTYPE OF (founded_item);
  projection_type              : central_or_parallel;
  projection_point             : cartesian_point;
  view_plane_distance          : length_measure;
  front_plane_distance         : length_measure;
  front_plane_clipping         : BOOLEAN;
  back_plane_distance          : length_measure;
  back_plane_clipping          : BOOLEAN;
  view_volume_sides_clipping   : BOOLEAN;
  view_window                  : planar_box;
END_ENTITY;
(*
```

Add the following note at the end of the entity description:

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NOTE Since **view_volume** is not a subtype of **geometric_representation_item** the instances of
cartesian_point which is the **projection_point** attribute and **planar_box** which is the **view_window** attribute
are not associated in the usual way with the **geometric_representation_context** of each **representation** using a
camera_model_d3 containing this **view_volume**. The **geometric_representation_context** is associated via
the **founded_item** supertype.

Clause 4.5.9, p. 31
The EXPRESS specification of **light_source** *contained logical errors in the WHERE rule. WR1
requires a role name qualified by attribute name 'ITEM' for argument 2 of built-in function USEDIN.
Delete the current WR1 and replace WR1 with the following:*

```
WR1:  SIZEOF(USEDIN(SELF,'PRESENTATION_APPEARANCE_SCHEMA.'+
             'STYLED_ITEM.ITEM')) = 0;
```

Clause 4.5.14, p. 35
*The description of the Formal propositions does not give a correct explanation of WR2. Remove the
description of WR2 and replace with the following:*

WR2: The target of the mapping shall be a **planar_box**.

Clause 4.9.1, p. 39
The EXPRESS specification for the FUNCTION **acyclic_presentation_representation_relationship**
*contained logical errors in the function body. The assignment to variable 'x' requires a 'SET' and not
a 'BAG'. Remove the EXPRESS specification and replace with the following:*

<u>EXPRESS specification:</u>

```
*)
FUNCTION acyclic_presentation_representation_relationship
   ( relation : presentation_representation_relationship;
     children : SET OF presentation_representation ) : BOOLEAN;

  LOCAL
     x : SET OF presentation_representation_relationship;
     local_children : SET OF presentation_representation;
  END_LOCAL;

  REPEAT i:=1 TO HIINDEX(children);
     IF relation\representation_relationship.rep_1 :=: children[i] THEN
        RETURN(FALSE);
     END_IF;
  END_REPEAT;

  x := bag_to_set (USEDIN ( relation\representation_relationship.rep_1,
                    'REPRESENTATION_SCHEMA.'+
                    'REPRESENTATION_RELATIONSHIP.REP_2'));
```

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```
local_children := children + relation\representation_relationship.rep_1;

IF SIZEOF (x) > 0 THEN
   REPEAT i:=1 TO HIINDEX (x);
       IF NOT acyclic_presentation_representation_relationship
              (x[i] , local_children) THEN
          RETURN (FALSE);
       END_IF;
   END_REPEAT;
END_IF;


RETURN (TRUE);


END_FUNCTION;
(*
```

Clause 5, p. 40

The EXPRESS specification for the **presentation_definition_schema** did not include a reference to a required data type. The required reference is a function, the **bag_to_set** for the EXPRESS specifications changed in **acyclic_presentation_representation_relationship**, **acyclic_symbol_ representation_relationship** and **field_in_table**. Delete the following EXPRESS specification:

```
REFERENCE FROM support_resource_schema
     (label,
      text);
```

Replace with the following EXPRESS specification:

```
REFERENCE FROM support_resource_schema
     (label,
      text,
      bag_to_set);
```

Clause 5.4.13, p. 53

The EXPRESS specification of **table_record_representation** contained logical errors in the WHERE rule. WR1 requires 'REPRESENTATION_SCHEMA.REPRESENTATION_MAP' as argument 2 of built-in function USEDIN and not 'REPRESENTATION_SCHEMA.MAPPED_ITEM.MAPPING_ SOURCE.MAPPED_REPRESENTATION'. Delete the current WR1 and replace WR1 with the following:

```
WR1: (SIZEOF(USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                         'REPRESENTATION_RELATIONSHIP.REP_2')) > 0)
                 OR
        (SIZEOF( QUERY( map_item <* USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                         'REPRESENTATION_MAP.'+
```

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```
                                           'MAPPED_REPRESENTATION')  |
     'PRESENTATION_DEFINITION_SCHEMA.TABLE_REPRESENTATION'  IN
     TYPEOF (using_representations (map_item)) )) > 0);
```

Clause 5.4.14, p. 54

The EXPRESS specification of **table_record_field_representation** contained logical errors in the WHERE rule. WR1 requires 'REPRESENTATION_SCHEMA.REPRESENTATION_MAP' as argument 2 of built-in function USEDIN and not 'REPRESENTATION_SCHEMA.MAPPED_ITEM.MAPPING_SOURCE.MAPPED_REPRESENTATION'. Delete the current WR1 and replace WR1 with the following:

```
WR1: (SIZEOF(USEDIN(SELF, 'REPRESENTATION_SCHEMA.' +
                         'REPRESENTATION_RELATIONSHIP.REP_2')) > 0)
                    OR
     (SIZEOF( QUERY( map_item <* USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                                        'REPRESENTATION_MAP.'+
                                        'MAPPED_REPRESENTATION')  |
                         'PRESENTATION_DEFINITION_SCHEMA.' +
                         'TABLE_RECORD_REPRESENTATION' IN
          TYPEOF (using_representations (map_item)) )) > 0);
```

Clause 5.6.2, p. 72

The EXPRESS specification for the FUNCTION **acyclic_symbol_representation_relationship** contained logical errors in the function body. The assignment to variable 'x' requires a 'SET' and not a 'BAG'. Remove the EXPRESS specification and replace with the following:

<u>EXPRESS specification:</u>

```
*)
FUNCTION acyclic_symbol_representation_relationship
  (relation : symbol_representation_relationship;
   children : SET OF symbol_representation ) : BOOLEAN;
  LOCAL
    x : SET OF symbol_representation_relationship;
    local_children : SET OF symbol_representation;
  END_LOCAL;

  REPEAT i:=1 TO HIINDEX(children);
    IF relation\representation_relationship.rep_1 :=: children[i] THEN
      RETURN(FALSE);
    END_IF;
  END_REPEAT;

  x := bag_to_set (USEDIN ( relation\representation_relationship.rep_1,
             'REPRESENTATION_SCHEMA.'+
             'REPRESENTATION_RELATIONSHIP.'+ 'REP_2'));
```

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```
local_children := children + relation\representation_relationship.rep_1;

    IF SIZEOF (x) > 0 THEN
      REPEAT i:=1 TO HIINDEX (x);
        IF NOT acyclic_symbol_representation_relationship(x[i] ,
                                            local_children) THEN
            RETURN (FALSE);
        END_IF;
      END_REPEAT;
    END_IF;


    RETURN (TRUE);


END_FUNCTION;
(*
```

Clause 5.6.3, p. 73

The EXPRESS specification for the FUNCTION **field_in_table** *contained spelling and logical errors. The expression in the first QUERY requires a string 'PRESENTATION_DEFINITION_SCHEMA. TABLE_RECORD_REPRESENTATION' and not a string 'PRESENTATION_DEFINITIONS_ SCHEMA.TABLE_RECORD_REPRESENTATION'. The declaration of variable 'symbol_rep_rel_set' requires a 'SET' and not a 'SET[1:?]'. The declaration of variable mapped_item_set' requires a 'SET' and not a 'SET[1:?]'. The declaration of variable 'table_record_rep_set' requires a 'SET' and not a 'SET[1:?]'.The assignment to variable 'symbol_rep_rel_set' requires a 'SET' and not a 'BAG'. The built-in function USEDIN in the second QUERY requires a role name qualified by an attribute name as argument 2. Remove the EXPRESS specification and replace with the following:*

<u>EXPRESS specification:</u>

```
*)
FUNCTION field_in_table (field : table_record_field_representation;
                          table : annotation_table_occurrence): BOOLEAN;
  LOCAL
    table_rep : table_representation;
    symbol_rep_rel_set : SET OF symbol_representation_relationship;
    mapped_item_set : SET OF mapped_item;
    table_record_rep_set : SET OF table_record_representation := [];
  END_LOCAL;


  table_rep := table\styled_item.item\mapped_item.mapping_source.
    mapped_representation;
  mapped_item_set := QUERY(item <* table_rep.items |
                     ('REPRESENTATION_SCHEMA.MAPPED_ITEM' IN
                     TYPEOF(item))
                            AND
```

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```
                          ('PRESENTATION_DEFINITION_SCHEMA.'+
                          'TABLE_RECORD_REPRESENTATION' IN
                          TYPEOF(item\mapped_item.mapping_source.
                                         mapped_representation ))
                    );
REPEAT i := 1 TO HIINDEX(mapped_item_set);
   table_record_rep_set := table_record_rep_set +
            mapped_item_set[i].mapping_source.mapped_representation;
   END_REPEAT;


   symbol_rep_rel_set := bag_to_set (USEDIN(table_rep,
                          'REPRESENTATION_SCHEMA.'+
                          'REPRESENTATION_RELATIONSHIP.REP_1'));


   REPEAT i := 1 TO HIINDEX(symbol_rep_rel_set);
      table_record_rep_set := table_record_rep_set +
               symbol_rep_rel_set[i]\representation_relationship.rep_2;
   END_REPEAT;


   IF SIZEOF(QUERY( table_record_rep <* table_record_rep_set |
         (SIZEOF(QUERY( rep_rel <* USEDIN(table_record_rep,
                          'REPRESENTATION_SCHEMA.'+
                          'REPRESENTATION_RELATIONSHIP.REP_1') |
                    ('PRESENTATION_DEFINITION_SCHEMA.' +
                    'SYMBOL_REPRESENTATION_RELATIONSHIP' IN
                    TYPEOF(rep_rel))
                    AND
                    (rep_rel.rep_2 :=: field)
                    )) > 0)
                    OR
               (SIZEOF(QUERY(item <* table_record_rep.items |
                    ('REPRESENTATION_SCHEMA.MAPPED_ITEM' IN
                    TYPEOF(item))
                          AND
                    (field :=: item\mapped_item.mapping_source.
                              mapped_representation )
                    )) > 0)
               )) = 0 THEN
      RETURN(FALSE);
   END_IF;


   RETURN(TRUE);


END_FUNCTION;
(*
```

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Clause 6, p. 74

The EXPRESS specification for the **presentation_appearance_schema** did not include a reference to required data type. The first required data type is an entity data type, the group for the amended SELECT type **style_context_select**. The second required reference is a function, the **bag_to_set** for the EXPRESS specifications changed in **acyclic_occlusion_precedence**. Add the following EXPRESS specification before the 'REFERENCE FROM MEASURE_SCHEMA':

```
REFERENCE FROM group_schema
     (group);
```

Delete the following EXPRESS specification:

```
REFERENCE FROM support_resource_schema
     (label);
```

Replace with the following EXPRESS specification:

```
REFERENCE FROM support_resource_schema
     (label,
      bag_to_set);
```

Clause 6.3.1, p. 80

The possibility to control the presentation style by a layer is a fundamental concept of ISO 10303-46. However the EXPRESS specification for the type **style_context_select** did not include the necessary entities. Remove the EXPRESS specification and replace with the following:

EXPRESS specification:

```
*)
TYPE style_context_select = SELECT
   (group,
    presentation_layer_assignment,
    representation,
    representation_item,.
    presentation_set);
END_TYPE;
(*
```

Clause 6.3.43, p. 96

The restriction of invisibility to **presentation_representation** does not satisfy the requirement to define a complete model as invisible. Include the entity representation instead of **presentation_representation** in the SELECT type **invisible_item**. Remove the EXPRESS specification and replace with the following:

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EXPRESS specification:

```
*)
TYPE invisible_item = SELECT
  (styled_item,
   presentation_layer_assignment,
   representation);
END_TYPE;
(*
```

Clause 6.13.1, p. 130

The EXPRESS specification for the FUNCTION **acyclic_occlusion_precedence** *contained logical errors in the function body. The assignment to variable 'x' requires a 'SET' and not a 'BAG'. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
FUNCTION acyclic_occlusion_precedence
    ( relation : occlusion_precedence;
      set_of_lower : SET OF hiding_or_blanking_select ) : BOOLEAN;
    LOCAL
      x : SET OF occlusion_precedence;
      local_set_of_lower : SET OF hiding_or_blanking_select;
    END_LOCAL;
    REPEAT i:=1 TO HIINDEX(set_of_lower);
      IF relation.higher_precedence :=: set_of_lower[i] THEN
        RETURN(FALSE);
      END_IF;
    END_REPEAT;
    x := bag_to_set (USEDIN ( relation.higher_precedence,
                     'PRESENTATION_APPEARANCE_SCHEMA.'+
               'OCCLUSION_PRECEDENCE.LOWER_PRECEDENCE'));
    local_set_of_lower := set_of_lower + relation.higher_precedence;
    IF SIZEOF (x) > 0 THEN
       REPEAT i:=1 TO HIINDEX (x);
          If NOT acyclic_occlusion_precedence(x[i] ,
                                        local_set_of_lower) THEN
             RETURN (FALSE);
          END_IF;
       END_REPEAT;
    END_IF;
    RETURN (TRUE);
END_FUNCTION;
(*
```

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Clause 7.3.13, p.139

The EXPRESS specification of **colour_associated** *contained logical errors in the attribute declaration. Attribute 'name' requires a type 'label' and not 'colour'. Remove the EXPRESS specification and replace with the following:*

<u>EXPRESS specification:</u>

```
*)
ENTITY colour_associated
  SUBTYPE OF (colour);
  name :                  label;
  variable_to_be_shown  : SET [1:?] OF REAL;
  mapping               : colour_association_table;
END_ENTITY;
(*
```

Annex B.1, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for this part of ISO 10303 has changed. Remove the object identifier for the document and replace with the following:

{ iso standard 10303 part(46) version (2) }

Annex B.2.1, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_organisation_schema has changed. Remove the object identifier for the presentation_organisation_schema and replace with the following:

{ iso standard 10303 part(46) version (2) object(1) presentation-organisation-schema(1) }

Annex B.2.2, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_definition_schema has changed. Remove the object identifier for the presentation_definition_schema and replace with the following:

{ iso standard 10303 part(46) version (2) object(1) presentation-definition schema(2) }

Annex B.2.3, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_appearance_schema has changed. Remove the object identifier for the presentation_appearance_schema and replace with the following:

{ iso standard 10303 part(46) version (2) object(1) presentation-appearance-schema(3) }

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Annex B.2.4, p. 151

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_resource_schema has changed. Remove the object identifier for the presentation_resource_schema and replace with the following:

{ iso standard 10303 part(46) version (2) object(1) presentation-resource-schema(4) }

Annex C, p. 152

With the changes identified in this Technical Corrigendum, the EXPRESS contained on the diskette is incorrect. Replace the contents of the annex with the following:

This annex provides a listing of the EXPRESS entity names and corresponding short names as specified in this part of ISO 10303. It also provides a listing of the complete EXPRESS schema specified in this part of ISO 10303 without comments or other explanatory text. This annex is available in computer-interpretable form and can be found at the following URLs:

Short names: http://www.mel.nist.gov/div826/subject/apde/snr/
EXPRESS: http://www.mel.nist.gov/step/parts/part046/is/tc1/

If there is difficulty accessing these sites contact ISO Central Secretariat or contact the ISO TC 184/SC4 Secretariat directly at: sc4sec@cme.nist.gov.

NOTE The information provided in computer-interpretable form at the above URLs is informative. The information that is contained in the body of this part of ISO 10303 is normative.

Annex E, p. 160, 173, 193

The EXPRESS-G diagram figure E.4 should be changed to take account of the revised definition of **view_volume**. *Modify figure E.4 to show* **view_volume** *as a subtype of* **founded_item** *imported from representation schema. The EXPRESS-G diagram figure E.17 should be changed to take account of the revised definition of* **style_context_select**. *Modify figure E.17 to include group and* **presentation_layer_assignment** *in the SELECT. The EXPRESS-G diagram figure E.37 should be changed to take account of the revised definition of* **invisible_item**. *Modify figure E.17 to include* **representation** *instead of* **presentation_representation** *in the SELECT. Replacement pages are provided for figure E.4, E.17 and E.37.*
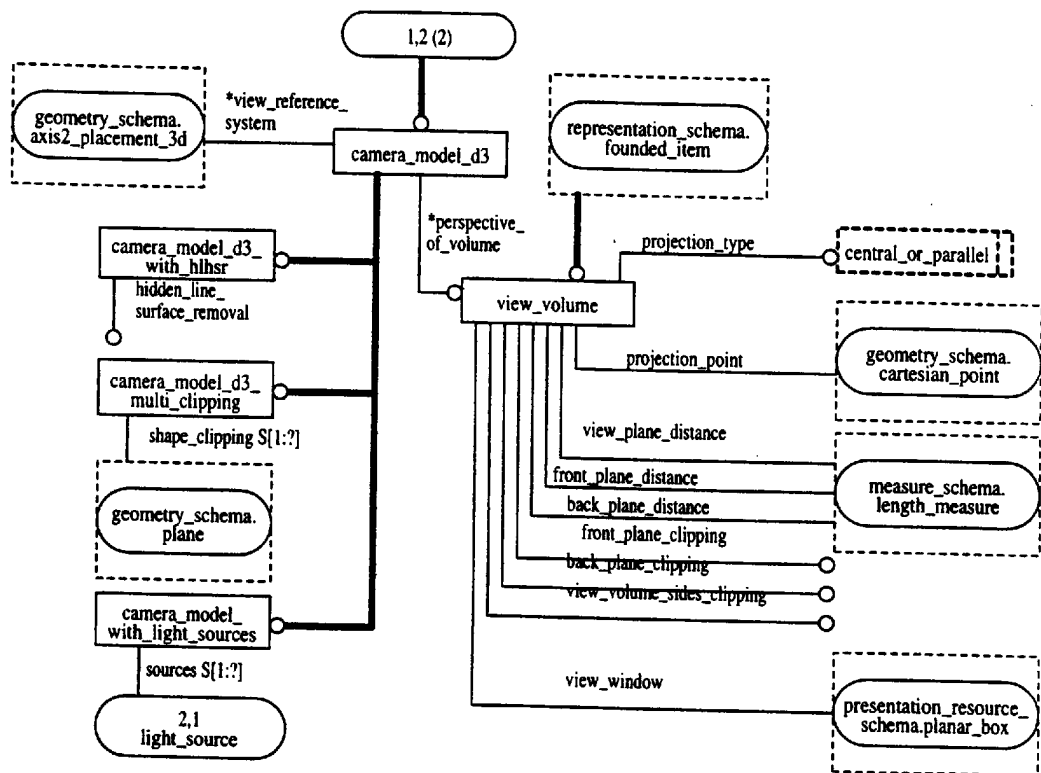
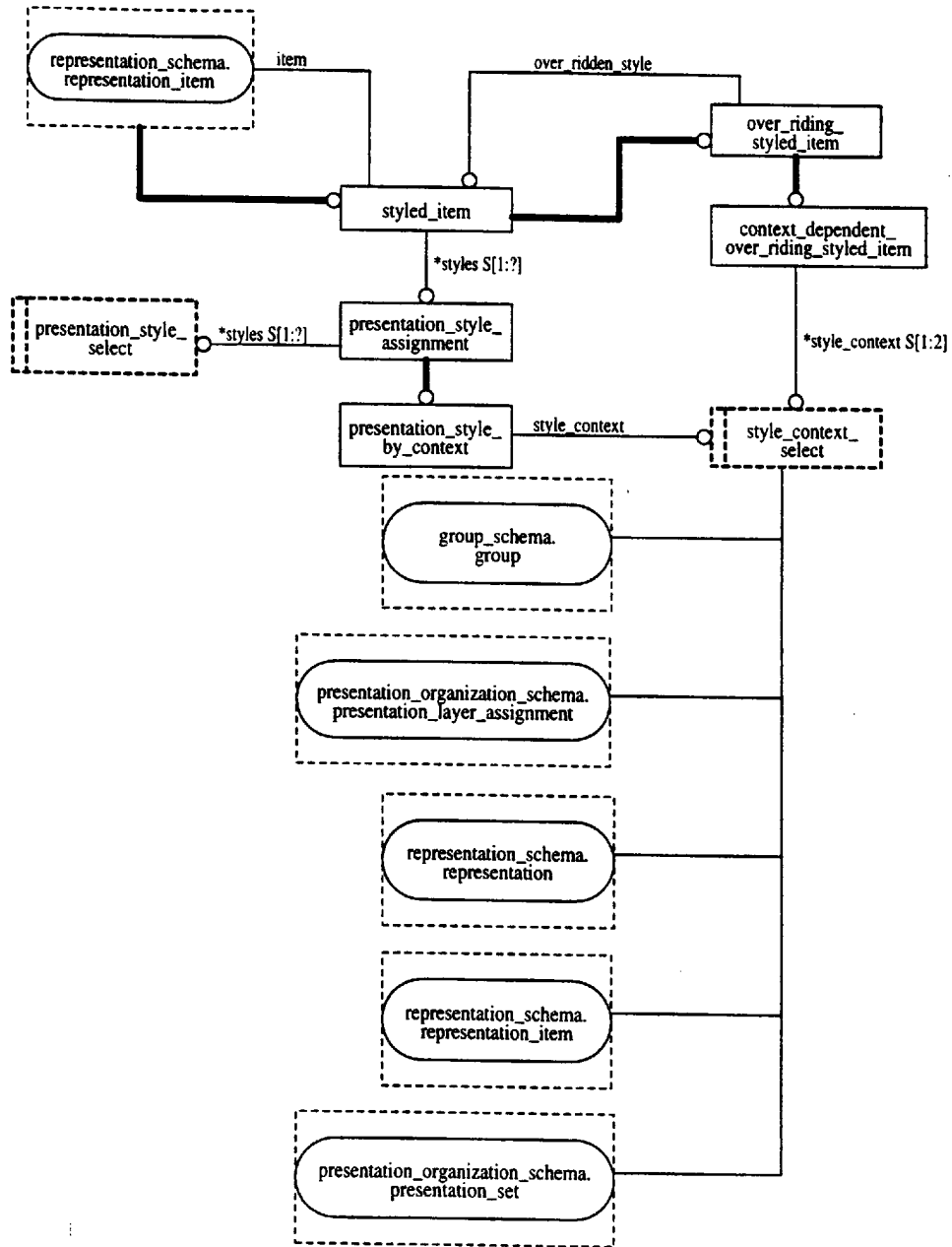**Figure E.4 – presentation_organization_schema – EXPRESS-G diagram 4 of 7**

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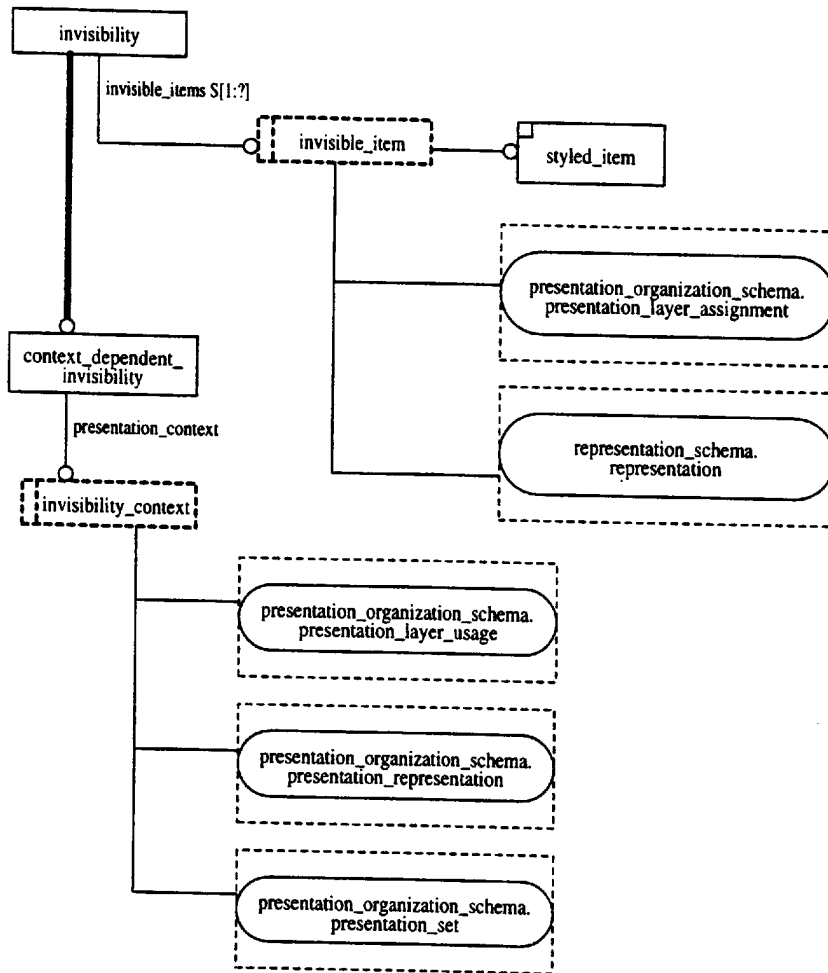**Figure E.17 – presentation_appearance_schema – EXPRESS-G diagram 1 of 21**

Figure E.37 – presentation_appearance_schema – EXPRESS-G diagram 21 of 21