# INTERIM ADVICE NOTE 184/16

# Highways England Data & CAD Standard

# Instructions on naming conventions, file types and data structures for the delivery and transfer of CAD / BIM files to Highways England and its supply chain.

**Summary**

The Government Construction Strategy requires fully collaborative 3D BIM. This IAN updates key enabling measures to facilitate this on Highways England projects. It implements the BS1192 / PAS1192 series of standards to give a consistent approach to file naming, structure and data delivery across the whole supply chain. It specifies acceptable file formats and gives rules for their use.

**Instructions for Use**

This guidance is to be adopted for all new projects.

## Amendments

| | |
|---|---|
| 06/2014 | First edition |
| 05/2016 | Amendment to incorporate Uniclass2015 and non-graphic data |

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## Executive Summary

Highways England, as a Government-owned company, has adopted the UK Government Construction Strategy which requires fully collaborative 3D BIM (with all project and asset information, documentation and data being electronic).

Highways England shares the vision that significant improvement in cost, value and carbon performance can be achieved through the use of open sharable asset information. To Highways England, BIM means Better Information Management.

BIM facilitates the delivery of consistently high quality asset data for use in operational, financial and engineering decision making and planning processes across the Highways England.

Highways England has:

- moved from a control focus to a decision based delivery model
- integrated teams to accelerate delivery and reduce waste
- driven improvement, innovation and value

This IAN defines the governance needed for the implementation of BS1192+A1 and PAS1192-2. It enables the supply chain to configure their systems and Common Data Environments to produce and receive information in a consistent manner on behalf of Highways England. It aligns with the Asset Data Management Manual ADMM, planning from the outset to provide accurate asset data for effective long-term management of the network.

As Highways England undertakes improvements to its Asset Management systems, and as technology and process for the design and construction of infrastructure improve, this IAN will be updated accordingly.

# 1. General Requirements for data files

## 1.1. Units

All coordinated model files shall be in metres.

Standard detail drawings, sections and component models may be in metres or millimetres. Where such details are incorporated into coordinated models they shall be scaled to metres.

Dimensions may be displayed in metres or millimetres in accordance with normal practice.

## 1.2. Coordinates

Options and feasibility stages shall be developed in Ordnance Survey's National Grid 1936 (OSGB36) coordinates, which is also used in Operation and Maintenance.

All levels shall be relative to Ordnance Datum Newlyn (ODN).

Minor works may be developed and constructed in OSGB36 coordinates throughout. Detailed design and construction for all major projects shall be developed in the appropriate local grid as defined by IAN 99/07. IAN 99/07 is not applicable if project surveys have been carries out to OS grid coordinates.

*Reference part 3 paragraph 2 in IAN 99/07*

Any local grid(s) used for the project shall be recorded in the Highways England Supply Chain Portal. See Appendix B

Where the whole project is in the same zone and height band, as defined in Section 5 of IAN 99/07, then the shorthand name (eg B17H1) is sufficient. Where non-standard local grids are used, or more than one IAN 99/07 grid (which implies a shifted origin for all but the furthest west zone), then the equivalent OSGB36 origin and scale factor shall be recorded, along with the applicable extents of each grid in OSGB36.

## 1.3. File Types

No limitation is imposed by this standard on the software, file formats or versions used within an organisation, or by mutual agreement between supply chain parties.

However, where delivery is to Highways England, or to a project data room, or where future recipients are unknown, or they use incompatible systems, then the appropriate file types, formats and structures defined in this standard shall be used. No file format version that has been fully released for less than two years may be used for such delivery without agreement.

### 1.4. Rationale of data structure

This standard sets a consistent framework for the creation and development of information that will feed into Highways England asset databases. Property data may be attached to the geometric modelling during the design and construction phases.

- No folder structure is stipulated. The supply chain is free to choose an appropriate document management method.
- Files are named in accordance with BS1192:2007, using the conventions for each field set out in Section 2,
- Layers within CAD files are named in accordance with BS1192:2007, using the conventions for each field set out in Section 3.3. The Classification field of the layer name adopts Uniclass2015.
- 3D-modelled asset objects will each carry an assigned unique identifier (as an attribute, tag, GUID etc). Each object may correspond to all, or part of, one of the assets in Highways England databases. The unique identifiers are used to link the modelled objects to tabular schedules, databases, details, specifications, photographs etc in BIM viewing and manipulation tools, and Highways England databases.
- It is recommended that the ADMM Asset Type (4 character code) form part of the unique ID during the course of PCF Stages 3-6 to facilitate the mapping into Highways England Asset Information Database system at PCF Stage 7.

## 2. File names

All deliverable or exchanged computer files that are created specifically for Highways England projects shall be named in accordance with this standard.

Files that are not specific to the Highways England project under consideration, and which have well recognised naming conventions, need not be renamed for each project. Examples of these include tiled Ordnance Survey vector or raster mapping, files from adjacent Highways England or other infrastructure projects or third-party record drawings that are named in accordance with BS1192:2007.

BS1192:2007 defines that file names are composed of “fields”, separated by hyphens, in the specific order:

**Project-Originator-Volume-Location-Type-Role-Number.Extension**

The file extension is not affected, and remains associated with the relevant software.

- No other hyphens are permitted in the file names.
- Where separators are needed within fields, the underscore character shall be used.

In order to achieve file names that have readily understandable names across all Highways England projects, the conventions to be applied within each field are as follows:

### 2.1. Project

**Unless otherwise instructed by Highways England Project Management Office**, the project field shall be the characters “HE” followed by the Highways England 6-digit PIN (Project Identification Number).

A lookup table of PINs will be held in the Highways England Supply Chain Portal

### 2.2. Originator

The Originator field shall contain the unique abbreviation for the company or organisation that creates the file.

Abbreviations may be from 2 to 6 characters long

Suppliers shall register their abbreviation with Highways England. Registered abbreviations and their owners may be checked on the Highways England Supply Chain Portal.

Examples

| | |
|---|---|
| FBA | Fred Bloggs Associates |
| SJJV | Smith and Jones Joint Venture |

For deliverables to Highways England, the originator code shall reflect the contractual relationship with Highways England. Joint ventures shall adopt a shared code. Principal designers’ and Tier 1 suppliers’ originator codes shall be shown on their own deliverables and those from their sub consultants and supply chain.

## 2.3. Volume

The Volume field shall be a 3-character code from the Table 2.3.
The first character denotes the category to aid recognition of the codes.

Electronic document management systems for whole projects may need other categories that are outside the scope of this IAN, which concentrates on geographic aspects. Volume codes with the first character P are reserved for the Highways England Project Management Office. The first characters C and D will be kept free for internal use by Contractors and Designers respectively.

**Table 2.3**

| Category | Code | Purpose |
|---|---|---|
| General | GEN | Scheme wide generic information |
| | GHS | Health and Safety |
| Highways | HAC | Highway Approvals & Consents |
| | HAW | Accommodation Works |
| | HDG | Drainage |
| | HEL | Power / Electrical |
| | HFE | Fencing |
| | HGT | Geotechnical |
| | HGN | General |
| | HKF | Kerbs, Footways and Paved Areas |
| | HLG | Road Lighting |
| | HMC | Motorway Communications |
| | HMK | Road Markings |
| | HML | Mainline Geometric Layout |
| | HPV | Road Pavements |
| | HRR | Road Restraint System (Vehicle and Pedestrian) |
| | HSC | Site Clearance |
| | HSN | Traffic Signs |
| | HSR | Side Roads Geometric Layout |
| Structures | SBR | Bridges and Major Culverts |
| | SGN | General |
| | SGT | Geotechnical |
| | SGY | Gantries |
| | SMA | Masts |
| | SMN | Minor Structures and Culverts |
| | SRW | Retaining Walls |
| | SSP | Special structures |
| | STU | Tunnels |
| Environment | EAC | Environmental Approvals & Consents |
| | EAQ | Air Quality |
| | EBD | Biodiversity |
| | EGN | General |
| | EGT | Geology and Soils |
| | EHR | Heritage/Historic resources |
| | ELS | Landscape |
| | ENM | Non-Motorised Users |
| | ENV | Noise & Vibration |
| | ETS | Townscape |

| | | |
|---|---|---|
| | EWE | Water Environment |
| Survey | VAB | Asbestos survey |
| | VAS | Accident Statistics |
| | VDS | Drainage Survey |
| | VES | Environmental survey |
| | VGN | Survey General |
| | VGT | Geotechnical Investigation |
| | VNR | National Road Telecommunications Services (NRTS) |
| | VPS | Pavement Systems |
| | VSM | Structures management |
| | VSS | Stakeholder Surveys |
| | VTO | Topographical |
| | VTR | Traffic Survey |
| | VUT | Utilities |
| Legal | LSI | Statutory Instruments |
| | LLO | Land Ownership Boundaries |
| Temporary | TTM | Traffic management |
| | TTW | Temporary works |

## 2.4. Location

The Location field is flexible in order to accommodate the variety of disciplines and type of project. It may indicate a specific structure on a project, or a position along the route. The general form should be optional letters followed by an integer number. The overall field length should not exceed 16 characters.

It is recommended that this number increases in the direction of mainline chainage, to facilitate sorting. It may be sequential, or represent a chainage. Leading zeros may sometimes be desirable.

Examples of Location codes

**SECTION_TYPE_ID_DIRECTION**

**SECTION EXAMPLES**

| | |
|---|---|
| -S1 | Section 1, Junction 1 to 3 |
| -S2 | Section 2, Junction 3 to 6 |
| -L1 | Link 1, Mainline between Junction 1 and 3 |
| -J1 | Junction 1 |

**TYPE EXAMPLES**

| | |
|---|---|
| _ML | Mainline |
| _JN | Junction |
| _MLA | Mainline option A |
| _SR | Slip Road |

**ID**

For individual assets like gantry, retaining walls these will be numbered GY or RT then the asset number e.g.

_GY048
_RW011

For linear information e.g. drainage or carriageways they will be designed by a 1:1250 location code first one in section 1 being 0101

Direction

DIRECTION EXAMPLES

| | |
|---|---|
| _A | Carriageway A |
| _B | Carriageway B |
| _CR | Central Reservation |
| _Z | for both Carriageways including Central Reservation |
| _J | Carriageway A off slip |
| _K | Carriageway A on slip |
| _L | Carraigeway B ofd slip |
| _M | Caraigway B on slip |

Full Location Example with Volume Code

HDG-S1_JN_03_A -
Highways Drainage-Section1_Junction_03_Carriageway A

HDG-S1_ML_0101_A
Highways Drainage- Section 1_Mainline_0101_Carriageway A

SGY-S1_GY_01_Z
Structural Gantry-Section 1_Gantry_01_Both Carriageways (Super Span Gantry)

SRW-S1_RW_01_J
Structural Retaining Wall-Section 1_Retaining Wall_01_Carriageway A off slip

## 2.5. Type

The Type field shall be from the fixed list in BS1192 Section 9.2, or one of the additional codes in Table 2.5.

Document type codes have been added for files managed in the CDE for functions beyond CAD and BIM.

**Table 2.5**

| Code | Type | Description |
|---|---|---|
| BQ | Bill of Quantities | Bill of Quantities<br>- Used by commercial function only |
| CA | Calculation(s) | Structural calcs, pavement calcs, hydraulic calcs |
| CC | Contract Certificates | Used by Commercial only |
| CD | Contract Documents | Used by Commercial only |
| CE | Compensation Events | Used by Commercial only |
| CH | Change Control Document | Register of changes etc |
| CI | Correspondence incoming | Email, Fax, Letter, File Note, Memo |
| CL | Claim | Items not covered under CE or VR |
| CO | Correspondence outgoing | Email, Fax, Letter, File Note, Memo |
| DE | Detail Drawing | Standard detail drawings and content not included in the model |
| DF | Departure Submissions | DFS |
| DI | Design site instructions | Design site instructions, |
| DN | Design Change notice | Contractual notifications of Design Changes |
| DR | Drawing | Drawing Rendition, created solely to be<br>printed either to pdf or paper, drawing templates etc |
| DS | Diary/Activity Sheet | Site diary sheets |
| DT | Document Transmittal Note | Correspondence management |
| EW | Early Warning | Contractual Early Warning notifications |
| FM | Forms | Internal process forms |
| FS | Functional specification | Functional specification<br>(PLQ, Non-technical requirements) |
| GS | GIS dataset | |
| HS | Health and Safety | |
| IC | Confirmation of Verbal Instruction | Confirmation of Verbal Instruction |
| IN | Invoice | Invoices |
| IS | Instruction | Contractual Instructions |
| IT | Inspection and test plan | Quality Checklists |
| LI | Licence | Licences for water abstraction/discharge etc |

| Code | Type | Description |
|---|---|---|
| LN | Legal Notices/Orders | Section 61, NTP, |
| M2 | Model - Two dimensional | Typically an xref contents are 2D only |
| M3 | Model - Three dimensional | Typically an xref contents are 3D only |
| MR | Model Rendition | Publication of a 3D file, consumed into the MC |
| MS | Method Statement | Directives for design, modelling, execution etc |
| NC | Non Conformance Report | |
| PH | Photographs | Progress Photographs, Quality reporting photos |
| PT | Permit | |
| RA | Risk assessment | Commercial / reputational and health and safety |
| RI | Request for information | Request for information |
| RM | RAMS/WASP | |
| RS | Site Change Request | Design change requests etc |
| RT | Reconciliation | To cover Human Resources and contractual discussions |
| SC | Schematic | Model based on chainage, eg for communications drawings |
| SE | Security | Separate bucket classification to restrict access? |
| SK | Sketch | Typically singular plan/section, not for HA approval. |
| SU | Survey | Topographical, structural inspection, Environmental, socio-economic, Geotechnical investigation, coring investigations, materials investigation, condition |
| TK | Tracker | Deliverables Tracker, MIDP, TIDP |
| VS | Visualisation | Typically a photo rendering/montage |
| | | |

## 2.6. Role

The Role field shall be either a single character from the fixed list in BS1192 Section 10.2 or one of the two-character codes from Table 2.6

This table consolidates preferences from the supply chain, some of whom use membership of Role groups to set data access rights in their CDE, and to delimit different divisions of the same company.

**Table 2.6**

| Code | Role |
|---|---|
| AX | Architectural - General |
| CB | Civil - Bridges and Structures |
| CD | Civil - Drainage |
| CE | Civil - Earthworks and Geotechnics |
| CH | Civil - Highways |
| CT | Civil - Tunnels |
| CU | Civil - Utilities |
| CW | Civil - Temporary Works |
| EC | Electrical - Control Systems and Technology |
| EO | Lighting Engineer |
| GI | Geospatial |
| KK | Client |
| LA | Landscape and environment - Air and Noise |
| LE | Landscape and environment - Environmentalist |
| LH | Landscape and environment - Heritage |
| QS | Quantity Surveyor |
| TR | Civil - Traffic Modelling |
| VT | Geographical and Land Surveyor |
| WM | Contractors - Main Contractor |
| XX | Subcontractor |
| ZC | Commercial and Cost Management |
| ZH | Stakeholder Liaison |
| ZL | Legal |
| ZM | Project Management |
| ZQ | Quality Assurance |
| ZS | Health & Safety / CDM |

## 2.7. Number

The number need have no significance, other than to give a unique file name. The originating organisation may choose to allocate blocks of numbers, or to generate them as needed. Each project should fix a consistent length from 4 to 6 digits, using leading zeros where necessary.

### 2.8. Suitability and Revision

All file issues and transfers shall be accompanied by an electronic transmittal document that tabulates for each file:

- File Name
- File Description
- Suitability code as specified in BS1192 Table 5
- Revision code as specified in BS1192 Section 15.3.3.
- Software dependencies
- Warning to open Read-Only if dependent software unavailable

The text in the transmittal shall be capable of being copied as characters, not solely as an image.

**Example File Name**

HE539859 -FBA-HLG-S1_ML_101-M3-EO-0001.dgn

| | | |
|---|---|---|
| **Project** | HE539859 | M1 J19 to J16 (HE PIN) |
| **Originator** | FBA | Fred Bloggs Associates |
| **Volume** | HLG | Lighting |
| **Location** | S1_ML_0101 | Section1_Mainline_0101 |
| **Type** | M3 | 3D model |
| **Role** | EO | Lighting Engineer |
| **No** | 0101 | 1 |
| **Extension** | dgn | Microstation |

## 3. CAD model and drawing files

### 3.1. Content

The goal of 3D interoperable BIM brings a change in the primary purpose of CAD drawings. They are no longer intended purely for interpretation by the human eye. With BIM they need also to be capable of interrogation and analysis by software processes.

CAD entities that bound or enclose 3D space are preferred to wireline representations. Entities such as solids and “watertight” (topologically closed) meshes have intrinsic properties of volume. These, along with other meshes, surfaces and faces, have surface area. Some extruded shapes may have readily found length and cross-sectional area. Adopting these kinds of entities for the components of the design will facilitate time and cost modelling.

- Where both 3D and 2D representations are required, they shall be consistent. One form shall be derived automatically from the other.
- The accuracy and completeness of the 3D modelling shall be appropriate to the stage of the project and the intended use of the model.
- Unique identifiers, other than the internal identifiers of the CAD system, should be assigned to each component.
- Schedule information shall be prepared in database-ready form. For example database tables or spreadsheets (for each relevant discipline) that give all properties for each component in single-line records. The property names shall be the column titles, starting with the unique identifiers in the first column.

- Attention shall be paid to the property requirements of the Highways England Asset Data Management Manual (ADMM). Individual designed components shall not include more than one Asset Type from the ADMM.

**Point Assets**

- Point Assets shall be represented by dimensionally correct 3D components, and optionally by 2D symbols where the true size of the component could be overlooked on the finished drawing.
- The insertion point and axes of such components and symbols shall be meaningful and logical in the context of that object's purpose on the project.

**Linear Assets**

- Linear Assets shall be represented by dimensionally correct 3D components, and optionally by 2D line styles where the true size of the component could be confusing in a plan view.
- It is acceptable to model thin components, such as safety fence rails and posts, as extruded profiles
- The "spine" line of any extrusion shall be in a meaningful and logical position on the cross section.

### 3.2. File Formats

As there is no widely used open format for CAD, the commonly used proprietary dwg, dgn and rvt, and the open BuildingSmart ifc formats are acceptable.

Files that have software dependencies beyond standard CAD, for example 3rd-party add-on products or primary vendors' layered products, shall declare these in the transmittal information. Those that would be corrupted if re-saved without those software products shall be declared Read-Only.

### 3.3. CAD Layer names

The term "Layer" here indicates generic grouping functionality in the chosen CAD system.

An optional Usage field has been added to the fields defined by BS1192:2007 in the position shown below. See section 3.3.4 for explanation

**Role-Classification-Presentation[-Usage]_Description**

- The field separator shall be hyphen (dash).
- No other hyphens may be used within a field
- If separators are required within a field, the underscore character shall be used.
- No characters may be used apart from upper-case and lower-case letters, digits, space, dollar, underscore and hyphen.

#### 3.3.1. Role

The Role field is as defined in Section 2.6

#### 3.3.2. Classification

The Uniclass2015 classification system from National Building Specification NBS shall be used.

For feasibility stages, classes will generally be taken from the tables: Entities (En), Entities by Form (EF), Spaces / Locations (SL) and Elements (Ee).

For detailed design and construction, the classes should be taken from the tables:

Systems (Ss), Products (Pr) and Construction Aids (CA).

The table for CAD (Zz) is applicable to drawing-related matters at all stages.

This consists of a two-character table identifier, followed by two to four pairs of digits, each pair separated by underscores.

Example

"Ss_15_10_75" [Site clearance]

##### 3.3.2.1. ADMM codes

For items that are covered by Asset Codes in the Highways England Asset Data Management Manual (ADMM), or in Appendix D, the Asset code shall be appended to the Uniclass2015 code, after a space

Example
"Pr_35_31_85_90 MKLO"
[Thermoplastic road marking – Longitudinal road marking]

### 3.3.3. Presentation

The Presentation field shall be from the fixed list in BS1192 Section 12.2

| | | | |
|---|---|---|---|
| D | Dimensioning | H | Hatching and shading |
| M | Model related | P | Paper related |
| T | Text | | |

### 3.3.4. Usage

The Infrastructure Asset Data Dictionary for the UK (IADD4UK) defines Physical Asset Status in Asset Data Dictionary Definition Document (AD4) Generic Attributes.

Object-based systems should set this attribute directly on the asset's object. Proposed and existing assets defined in layer-based systems shall include an additional Usage field that encodes the appropriate AD4 Asset Status from Table 3.7

**Table 3.7**

| Code | AD4 Asset Status | Description |
|---|---|---|
| Dn | Design | Asset being designed, but not yet approved for construction |
| Ap | Approved | Asset been designed and has approval for construction |
| Nt | Notices | Asset has comments against and still needs Approval before moving to procurmeent |
| Pc | Procurement | Asset ready to be cost calculated |
| Fm | Fabricated & Manufacture | Asset moves to Fabrication and Manufacture |
| Cn | Constructed | Asset has been Constructed out on site |
| Cd | Commissioned | Asset that has passed testing and commissioning but is not under control of the Infrastructure Manager |
| Hd | Handover | Asset Ready to be Handed Over to the Maintainer for Operation |
| Op | Operational | Asset that has been commissioned and is under control of Infrastructure Manager |
| Ty | Temporary | Asset which supports a programme of works but will not be handed over to an Infrastructure Manager |
| Dc | Decommissioned | Asset decommissioned, but remaining on site |
| Rm | Removed | Asset decommissioned and removed or to be removed from site |
| Ex | Existing | Survey code where status is unknown |

### 3.3.5. Description

#### 3.3.5.1. Descriptive Text

The description should give a clear and concise explanation of the Uniclass2015 code.
The full text descriptions from the NBS table is often unsuitable, as these can be long and may contain punctuation characters
Consistency is strongly encouraged in the descriptive text used, through the use of template / seed files appropriate to each discipline.

Example layer names with descriptions are given in Appendix C

#### 3.3.5.2. Options

Where it is necessary to distinguish between different types or configurations of items that fall under the same classification code, one or more options may be appended to the description.

Each option shall be of the form
<underscore>OptionName<space>OptionValue
Where an OptionName is given with no OptionValue, that value will default to Boolean TRUE

Example
EC-Pr_65_70_12_93 MCDG-M-Dn_Ducts
_Dia 110_Cover 600_Count 1_Type multi
(Single proposed multiduct)

EC- Pr_65_70_12_93 MCDG-M-Cd_Ducts_Dia 100_Cover 850_Count 4
(Block of 4 commissioned ducts to be retained)

EH-Ss_30_75_45_65 KFKP-M-Dn_KerbPrecast_Left
(where the default value of “Left” is TRUE)
is equivalent to the explicit form
EH-Ss_30_75_45_65 KFKP-M-Dn_KerbPrecast_Hand Left

The options can be interpreted by software to turn polylines into schedules, quantities, 3D models etc.
It is not proposed to limit or dictate how any optional information is used, but clarity is encouraged.

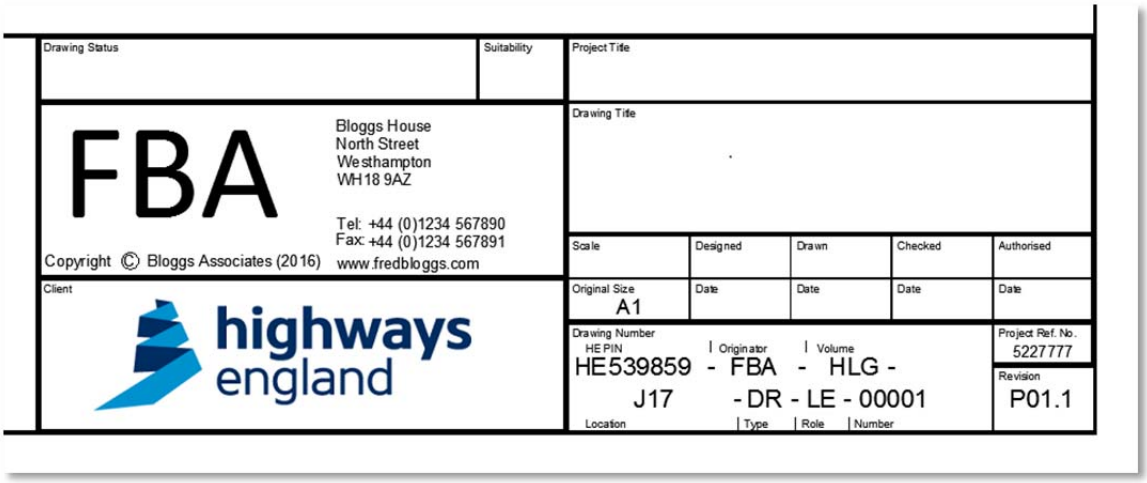
### 3.4. CAD Composition and Presentation

Specific guidance is given for AutoCAD and Microstation. The general guidelines also apply to presentation from other systems.

#### 3.4.1. Composition

- Drawing sheet files shall compose the necessary reference files, frames and notes to achieve the required drawing.
- Drawing sheet files shall not contain more than one drawing (ie multiple tabs are not permitted), so that management and version control are not compromised.
- Drawing sheet files shall not be attached as reference files, except where the capabilities of the CAD system make this unavoidable, for example vertical profiles, developed elevations etc.
- Model drawings may reference other model drawings during development, but shall not retain those references when shared or used by drawing sheet files.
- However, for convenience, otherwise empty arrangement drawings may be saved with assemblies of reference files such as survey tiles. These arrangements can thus be attached in a single command.
- Drawing sheet files shall attach model drawings on dedicated layers, one for unclipped content and one for each clip boundary such as cut lines.
- Model files shall be attached in model space; frames etc shall be attached in paper space

Example title block layout




#### 3.4.2. Interoperability

Interoperability issues shall be resolved at project outset to ensure consistent appearance of CAD elements (e.g. line type/styles, text, dimensioning, hatching, etc.) when translating between software packages.

The following guidelines for AutoCAD/Microstation shall be adopted:

- Use the native Microstation Line Styles and AutoCAD Line Types where possible.
- When editing AutoCAD files in Microstation, use the Line Types that import with the drawing.
- When editing AutoCAD files converted from Microstation, use the Line Styles that import with the drawing.
- Note that the AutoCAD annotative functionality does not translate to Microstation.

### 3.4.3. Text Style

The following settings shall be adopted:

- Arial True Type font shall be used for all annotation.
- Text width factor = 1.
- Line Spacing for interoperability:
  AutoCAD = 1.0x (default): Microstation = 0.667.
- Justification = Left Centre (except for titles which can be Centre justified).
- UPPER CASE is preferred and should be used for all annotation, titles and labels.
- Sentence case is permitted. Abbreviations such as ‘mm’, ‘kg’ and ‘kN’ shall use lowercase appropriately.
- Text case adopted shall be used consistently across a set of drawings.
- Text shall not obscure content.
- Text shall be legible when printed at reduced size (e.g. A1 to A3).

### 3.4.4. Text Sizes

The following text sizes shall be adopted

| Plotted Height (mm) (At full size) | Purpose |
|---|---|
| 1.8 | A4 & A3 sketches |
| 2.5 | General annotation, labels and dimensions |
| 3.5 | More prominent notes, labels, dimensions and minor headings |
| 5.0 | Headings, titles and grid text |
| 7.0 | Larger headings |

### 3.4.5. Dimensions

The following settings shall be adopted:

- Filled 2.5mm arrow heads shall be used
- Text Justification = Above and Centred (Default).
- Dimension line weight shall be set to 0.18mm.
- Dimension text height shall be consistent with general text height.
- Dimensions shall be created using the software application dimensioning tools.
- Dimensions styles and text heights shall be consistent across a set of drawings.
- Dimensions shall be legible when printed at reduced size (e.g. A1 to A3).
- Dimensions shall be Associative without dimension overrides.
- Dimensions should be Annotative (ACAD) or Annotation Scale (MS).
- AutoCAD annotative dimensions are preferred, but are not compatible with Microstation.
- Dimensions shall reside on one or more dedicated Layers

### 3.4.6. Linework

The following guidelines shall be adopted:

- For interoperability use standard Line Types and Styles provided by the CAD application software where possible. Refer to tables below.
- Where these are not suitable, additional custom line types may be defined
- Element line type designation shall be determined at project outset and used consistently across a project.
- In general, Line Types shall be defined by Layer

| *AutoCAD Line Types* | |
|---|---|
| *ACADISO.lin* | |
| **Line Type** | |
| Continuous | |
| Dot | Dot2 |
| Hidden | Hidden2 |
| Dashed | Dashed2 |
| Dashdot | Dashdot2 |
| Divide | Divide2 |
| Center | Center2 |
| Border | Border2 |
| Phantom | Phantom2 |

| *Microstation Line Styles* | |
|---|---|
| *lstyle.rsc* | |
| **Line Style** | **Description** |
| 0 | Continuous |
| 1 | Dot |
| 2 | Medium dash |
| 3 | Long dash |
| 4 | Dot, dash |
| 5 | Short dash |
| 6 | Dash, dot, dot |
| 7 | Long dash, short dash |

| **AutoCAD Line Type Settings** | | |
|---|---|---|
| | **LTSCALE** | **PSLTSCALE** |
| Element | 1 | |
| Model Space | Finished drawing scale e.g. 500 | n/a |
| Paper Space | 1 | 1 |

| **Microstation Custom Line Style Settings** | |
|---|---|
| Global Line Style Scale | Finished drawing scale e.g. 500 |
| Reference: Global Line Style Scale | Master |
| References: Scale Line Styles by Reference Scale | On |

### 3.4.7. Line Weights and Colours

To enable interoperability and obtain consistent printed output

- Permitted plotted line widths are:
  **0.05mm; 0.13mm; 0.18mm; 0.25mm; 0.35mm 0.5mm; 0.7mm; 1.0mm; 1.4mm; 2.0mm.**
- Pen widths shall be set by object line weight, not by pen table
- Setting line weights by layer is preferred to by element
- Colours 0 to 9 inclusive shall plot as black lines. Other colours shall plot in monochrome or their drawn colour according to the chosen plot settings.

### 3.4.8. Hatching and Toning

Hatching and shading shall be kept to the minimum necessary to define areas clearly. In order to keep CAD file sizes down to a minimum, it is acceptable and preferred to show only patches of the material hatch pattern sufficient to clearly show the intent of the hatching.

Guidance for hatching is as follows:

- Default patterns should be used where possible. Custom hatch patterns maybe used where necessary
- Hatching shall be consistent across a project for the same element designation.
- Hatching/patterning shall be created using the relevant tools available within the software.
- Care shall be taken to ensure that the draw order and transparency settings of filled regions do not cover required graphical information.
- All hatching shall be Associative and Annotative.
- All hatching shall reside on dedicated layers to allow easy control of visibility.
- All hatching shall reside in model space /design view.
- Each hatched area shall be defined as a single hatched entity and not grouped with other hatched areas.
- For large regions of hatching and zoning, creation of a separate model drawing shall be considered. This will aid drawing update order and speed of display (e.g. landscaping, zoning and staging drawings).

### 3.4.9. Drawing Scales

Scales used on drawings shall be selected from the following table:

| Permitted drawing scales | | | | |
|---|---|---|---|---|
| 1:1 | 1:10 | 1:100 | 1:1000 | 1:10000 |
| | | 1:125 | 1:1250 | |
| 1:2 | 1:20 | 1:200 | 1:2000 | 1:20000 |
| | 1:25 | 1:250 | 1:2500 | |
| 1:5 | 1:50 | 1:500 | 1:5000 | 1:50000 |

- The number of scales used on a drawing shall be kept to a minimum.
- The scale box contained within the standard title block shall be populated to show the scales of drawn elements.
- Plans, details, sections and elevations shall clearly indicate the scale to which they are drawn.
- On multi-disciplinary projects, wherever practical the adopted scale should be the same for similar areas covered across all disciplines.

Where a scale is not relevant to the drawing sheet the following may be used:

| Scale Text | Usage |
|---|---|
| As Shown | Multiple scale drawings (Show scale with the detail title), Non-standard scales, |
| NTS | Not to Scale. Schematic views etc. |
| N/A | Not Applicable. Standard notes drawing, schedules etc. |

#### 3.4.10. Revision Clouding

- The technique of clouding shall be used to highlight changes to a drawing between drawing issues.
- AS-BUILT drawings shall contain no clouding.

#### 3.4.11. Ordnance Survey (OS) Data

Where OS data products are used in drawings, the appropriate copyright acknowledgements shall be included. For further guidance see

https://www.ordnancesurvey.co.uk/business-and-government/help-and-support/public-sector/copyright-acknowledgements.html

See Appendix A for guidance on obtaining the relevant OS products.

### 3.5. Naming of standard components

Blocks, cells and other components designed for multiple use, within and across projects, shall be named in the following way. This implements the requirements of BS8541-1 2012, using the fields already defined.

[ BS8541: Role-Classification-Presentation-Source-Type-Subtype ]

- For Classification use “Volume_ADMM”
  (or just Volume where no ADMM code is defined)
- For Presentation use either M2 or M3
- For Source use Originator code
- For Type use a short CamelCase description
- For Subtype use a 4-digit number for uniqueness

Thus a new type of catchpit could be named

ED-HDG_DGCP-M3-FBA-SlotDrainCatchPit-0001

## 4. Asset coding and non-graphic data

4.1. Until instructed differently, the provisions of IAN 182/14 “Major Schemes: Enabling Handover into Operation and Maintenance” remain in force.

However, BS1192-4 “UK Implementation of COBie” is likely to be the eventual mechanism for transfer of asset data between project phases.

4.2. Attribute data for asset classes that are defined in ADMM may be supplied in the form of comma-separated variables (csv) files.

- Each file shall contain only one asset class, though a single asset class for a project may be spread across multiple files, provided that there is no duplication.
- File names shall follow the guidelines in this IAN
- The ADMM asset code shall either be appended to the Location field, or replace the Location field
- The first row in the file shall contain the column headings in database-ready form (alphanumeric characters and underscores only, no spaces, all headings different, none blank).
- The first column heading shall be “UNIQUE_ID”, and shall contain the supplier’s assigned identifier that is unique across the whole project. See 4.3
- All attributes defined in ADMM shall have column headings that correspond to the field names given in ADMM, but with spaces replaced by underscores. (eg Lamp Type to be entered as Lamp_Type). Units and other explanations in brackets shall be omitted.
- Where field names would exceed 10 characters, they shall be composed from the starts of the given words, separated by underscores, to achieve an unambiguous result in 10 characters or fewer.
  For example “Column Material”, and “Column Manufacturer” may be “Col_Mat” and “Col_Man” respectively, but not “Material” (does not match start), “Col_M” (ambiguous), “Col_Material” (too long). This approach meets the restrictions of the shapefile format, and may be simply matched by software.
- Values entered for any asset shall comply with the Field Format and Field Domain stated in ADMM
- At construction handover stage, all mandatory fields shall be populated
- Coordinates shall be given in OSGB36 grid.
- The X (Easting) and Y (Northing) fields shall all be considered mandatory for point assets, overriding ADMM requirements.
- X, Y, and X2, Y2 fields shall be considered mandatory for the start and end of all continuous assets, overriding ADMM requirements.
- Additional non-ADMM fields may be supplied at all data transfer stages.

Spine lines for each continuous asset shall also be supplied, either in ESRI Shapefile format, or as 3D polylines / linestrings on layers that comply with this standard.

## Alternative Clause 4.2 assuming GIS as main tool

All assets, complete with their non-graphic data shall be delivered ready to load into Highways England's HAGIS geographic information system.

The delivery format shall be ESRI Shapefile, a composite of 4 mandatory linked files:

- *Filename*.shp contains the graphic definition of the point assets, continuous assets or area assets of a given type.
- *Filename*.shx contains indexes to the shp file
- *Filename*.dbf is a Dbase-compliant file containing the non-graphic data for the same assets in the same order
- *Filename*.prj sets the projection as OSGB36

- Each Shapefile set shall contain only one asset class, though a single asset class for a project may be spread across multiple files, provided that there is no duplication.
- File names shall follow the guidelines in this IAN
- The ADMM asset code shall either be appended to the Location field, or replace the Location field of the file name
- The first row in the file shall contain the column headings in database-ready form (alphanumeric characters and underscores only, no spaces, all headings different, none blank).
- The first field heading in the dbf file shall be "UNIQUE_ID". Asset records shall contain the supplier's assigned identifier that is unique across the whole project - see 4.3. The inclusion of this field makes the dbf files also suitable for linking to 3D BIM models.
- All attributes defined in ADMM shall have column headings that correspond to the field names given in ADMM, but with spaces replaced by underscores. (eg Lamp Type to be entered as Lamp_Type). Units and other explanations in brackets shall be omitted.
- Where field names would exceed 10 characters, they shall be composed from the starts of the given words, separated by underscores, to achieve an unambiguous result in 10 characters or fewer.
  For example "Column Material", and "Column Manufacturer" may be "Col_Mat" and "Col_Man" respectively, but not "Material" (does not match start), "Col_M" (ambiguous), "Col_Material" (too long). This approach meets the restrictions of the shapefile format, and may be simply matched by software.
- Values entered for any asset shall comply with the Field Format and Field Domain stated in ADMM
- At construction handover stage, all mandatory fields shall be populated
- Coordinates shall be given in OSGB36 grid.
- The X (Easting) and Y (Northing) fields shall all be considered mandatory for point assets, overriding ADMM requirements.
- X, Y, and X2, Y2 fields shall be considered mandatory for the start and end of all continuous assets, overriding ADMM requirements.
- Additional non-ADMM fields may be supplied at all data transfer stages.

## 4.3. Project Unique ID

The required properties of a Project Unique ID are

- It shall start with the appropriate 4-character ADMM Asset Type code
- This shall be followed by a string of alphanumeric or hyphen or underscore characters that make it unique across the whole project.

A suggested means of achieving this is to assemble fields from the file name, as this reduces the task quickly to uniqueness within each file. It also makes the ID simple to read and audit.
For example

> Asset Code-Volume-Location-Drawing Number-Unique Number
> DGMH-HDG-M4_1350-0003-0029
> Represents manhole (DGMH) number 29 on drawing number
> HE123456-FBA-HDG-M4_1350-D-0003
> This order of elements will sort in a logical way.

However, an integrated database system could keep track of each asset with a more straightforward counter that is independent of drawing numbers. This is also acceptable.

> Asset Code-Unique Number
> DGMH-0002517

# 5. Survey Data

## 5.1. Topographic Survey

A topographic survey is the production of an accurate map of specified features within a specific area.

- Topographic survey shall be delivered as 3D CAD model files in accordance with the requirements of Sections 3.1 to 3.6
- Unless otherwise specified, symbols and annotation in topographic survey drawings shall be suitable for presentation at 1:500 scale.
- Where the objects surveyed extend up or down from ground level, separate layers shall be provided for the ground level lines and the other vertical extent. For example, the tops of walls, fences, ditches shall be in separate layers from their bases.
- Features at ground level shall not cross except at a common point.
- Features at ground level shall not be continuous across bridge decks. They shall stop and restart at the ends of the deck.
- Features that represent closed boundaries shall be geometrically closed.
- Property information relating to point assets (spot levels, references etc) shall be provided as linked attributes, not as unrelated text. Within AutoCAD the association shall be achieved through attributed blocks and within Microstation through tags.
- ADMM codes to be used for Survey Asset Coding

## 5.2. Geotechnical Survey

Survey data for boreholes and trial pits shall be presented in AGS (Association of Geotechnical and Geoenvironmental Specialists) format in accordance with HD22/08.

- File format shall be AGS version 3.1 or later (within the limitations of section 1.3)
- A strategy for unique borehole numbering shall be implemented and maintained, in accordance with BS8574.

## 5.3. LIDAR Point Cloud Survey

- File format shall be one of the following open standards
  - LAS version 1.1 or later (within the limitations of section 1.3)
  - ASTM E57
- The data shall have been processed to remove background noise, atmospheric interference and sensor-related artefacts
- The metadata shall include capture method

## 5.4. Orthorectified Aerial Survey

- Aerial survey photographs shall be georeferenced to OSGB36
- They shall be orthorectified to a representative digital terrain model that has levels based on OS Datum Newlyn
- The delivery format shall be one of the following
  - .ecw
  - .jpeg 2000
  - .jpeg

### 5.5. Underground Asset Survey

Underground asset data shall be delivered in accordance with PAS 128, Specification for underground utility detection, verification and location.

### 5.6. Overhead Power Cable Survey

Overhead Line Clearances shall be checked in accordance with the Technical Specification 43-8 from the Energy Networks Association.

For all cable routes across or within 40m of existing or proposed roads that are affected by Highways England projects, the following information shall be gathered:

- The line voltage
- For the lowest layer of conductors, the coordinates of the attachment points of the cables to the insulators
- Where these are high voltage transmission lines, the coordinates of the attachment points of the insulators to the arms of the pylon
- The “design sag” diagram for all relevant spans of the power line from the infrastructure owner, giving the worst case to be considered.

The plan length of the “design sag” line shall be scaled to fit the surveyed distance between the attachment points for each cable.
Where there is the possibility that

- lighting columns, masts, gantries etc may be located within 40m in plan of a cable,
- changes to the width and type of the road may change the required clearance to the road surface

the safety clearance surfaces for swaying and vertical configurations of each cable shall be modelled in 3D.

# 6. Geometric modelling data

## 6.1. Alignment

Horizontal and vertical alignments shall be delivered in one of the following formats

- IfcAlignment 1.0
- OGC GML Alignment
- LandXML 1.2 [ideally using the restricted schema of the Model View Definition – but no software validated against it yet.
- MX Genio text files. Alignments as 12-dimensional Geometry strings, and using default 23D17 number format to preserve accuracy

## 6.2. Terrain

Triangulated surfaces may be delivered in the following formats

- LandXML 1.2 (ideally using the restricted schema of the Model View Definition)
- MX Genio text files
- OGC GML 3.3 or higher (within the limitations of section 1.3)

## 7. Contacts

Questions on this IAN should be submitted to the Standards Feedback and Enquiries email box:

Standards_Feedback&Enquiries@highwaysengland.co.uk

Or

Alex Bywaters
Email alex.bywaters@highwaysengland.co.uk

## 8. Normative References

BS1192:2007+A1:2015 Collaborative production of architectural, engineering and construction information – Code of practice

BS8574 Code of practice for the management of geotechnical data for ground engineering projects

BS8541-1:2012 Library objects for architecture, engineering and construction

PAS1192-2:2013 Specification for information management for the capital/delivery phase of construction projects using building information modelling

PAS128, Specification for underground utility detection, verification and location.

HD 22/08 Managing Geotechnical Risk

IAN 99/07 Implementation of Local Grid Referencing System for England

IAN 182/14 Major Schemes: Enabling Handover into Operation and Maintenance

Uniclass2015 NBS

AD4 Generic Attributes Infrastructure Asset Data Dictionary for the UK
http://www.bimtaskgroup.org/wp-content/uploads/2014/02/IADD4UK-AD4-generic-attributes-V2-0.pdf

ENA-TS-43-8 Issue 3, 2004 with Amendment 1, 2004 Overhead Line Clearances Energy Networks Association www.energynetworks.org

## Appendix A

### Ordnance Survey Data Supply

Highways England has a service called GeoStore® for Highways England.

GeoStore allows Highways England's contractors to search for and order geographic data such as Ordnance Survey mapping products and aerial photography.
A complete list of data products and data formats is available. Data may be downloaded or ordered for the specific geographic area of interest.

Access and register for the service at http://www.geostore.com/highwaysengland

## Appendix B

### Project Information Search Table

Highways England will make available via its Supply Chain Portal the following searchable information about each project:

| | |
|---|---|
| PIN | The Highways England 6-digit Project Information Number |
| Title | The official title of the project |
| Route(s) | The road number(s) of the principal routes, separated by spaces if necessary |
| Start Date | Date of first Task Order |
| End Date | Blank until completion |
| Local Grid | The IAN 99/07 Zone and Height band (or Origin and Scale Factor for each zone where more than one is affected) |
| Designer | Designer(s) associated with this PIN, separated by spaces if necessary |
| Contractor | Contractor(s) associated with this PIN, separated by spaces if necessary |

This information is to give context to files that are named in accordance with this IAN, and to enable searches for adjacent or previous project data that may be relevant to current projects.

## Appendix C

### Example CAD Layer Names

The following list shows the form that layer names should take to meet the requirements of Section 3.3. The list is not exhaustive but gives reasonable coverage of highways and associated structures.

- Usage is mostly shown as Dn (Design). Layers for other usages should be made as necessary
- The descriptions have been kept short and are in CamelCase, with words in decreasing order of significance

| |
|---|
| ROADS GENERAL |
| CH-Zz_35_10_40-M-Dn_AlignHoriz |
| CH-Zz_35_10_90-M-Dn_AlignVert |
| CH-Zz_35_10_80-M-Dn_SuperElev |
| CH-En_80_35_74-M-Dn_PaveEdge |
| CH-SL_80_98_85-M-Dn_SweptPath |
| BOUNDARIES |
| ZL-Zz_50_10_10-M-Cd_BdryExist |
| ZL-Zz_50_10_70-M-Dn_BdryProposed |
| ZL-Zz_50_60-M-Dn_BdryLandParcel |
| LE-Zz_50_95-M-Dn_ZoneEnvir |
| PAVEMENTS |
| CH-Ss_30_14 PVPV-M-Dn_Pavement |
| CH-Ss_30_14_15 PVRD-M-Dn_PaveRigid |
| CH-Ss_30_14_05 PVPF-M-Dn_PaveFlex |
| CH-Ss_30_14_80 PVPU-M-Dn_PaveUnbound |
| CH-CA_50_40_60-M-Dn_PaveMilling |
| CH-Ss_30_14_15-M-Dn_PaveRegulateRigid |
| CH-Pr_35_31_05_84-M-Dn_PaveRegulateFlex |
| CH-Ss_30_14 PVST-M-Dn_PaveLayBy |
| CH-SL_80_35_16 PVCR-M-Dn_CResGen |
| CH-SL_80_35_16 PVRR-M-Dn_CResRigid |
| CH-SL_80_35_16 PVRF-M-Dn_CResFlex |
| CH-SL_80_35_16 PVRU-M-Dn_CResUnbound |
| CH-SL_80_35_18 PVRC-M-Dn_CResCrossover |
| VERGES |
| CH-SL_80_35_81 GTVE-M-Dn_VergeGen |
| CH-SL_80_35_81 GTVR-M-Dn_VergeRigid |
| CH-SL_80_35_81 GTVF-M-Dn_VergeFlex |
| CH-SL_80_35_81 GTVO-M-Dn_VergeUnbound |
| CH-SL_80_35_72 PVRE-M-Dn_RestArea |
| NMU PATHS |
| CH-En_80_40 NMFW-M-Dn_PathGen |
| CH-En_80_40_30 NMFW-M-Dn_PathRigid |
| CH-En_80_40_30 NMFW-M-Dn_PathFlex |
| CH-En_80_40_30 NMFW-M-Dn_PathUnbound |
| CH-Pr_25_93_60_23-M-Dn_PathTactile |
| CH-En_80_40_20 NMCT-M-Dn_PathBikeLane |
| CH-En_80_40_08 NMBW-M-Dn_PathBridleway |
| ROAD ISLANDS AND KERBS |
| CH-Pr_25_30_86_91 MLCI-M-Dn_IslandGen |

| |
|---|
| CH-Pr_25_30_86_91 MLCI-M-Dn_IslandRigid |
| CH-Pr_25_30_86_91 MLCI-M-Dn_IslandFlex |
| CH-Pr_25_30_86_91 MLCI-M-Dn_IslandUnbound |
| CH-Pr_25_30_86_91 MLCI-M-Dn_IslandBlocks |
| CH-Ss_30_75_45 KFKB-M-Dn_KerbGen |
| CH-Pr_25_93_60_18 KFKB-M-Dn_KerbPrecast |
| CH-Ss_30_75_45_45 KFKB-M-Dn_KerbExtruded |
| CH-Pr_25_93_60_21 KFKB-M-Dn_KerbSafety |
| CH-Pr_25_93_60_15-M-Dn_KerbEdging |
| CH-Ss_20_05_15_91-M-Dn_KerbBedding |
| EARTHWORKS |
| CH-Ss_15_10_75-M-Dn_EwksSiteClearance |
| CH-Zz_40_20-M-Dn_EwksTadpoles |
| CH-En_32_40_20 GTCU-M-Dn_EwksCutGen |
| CH-Ss_15_10_30_25-M-Dn_EwksCutSoil |
| CH-Ss_15_10_30_25 GTCU-M-Dn_EwksCutSuitable |
| CH-Ss_15_10_30_25-M-Dn_EwksCutUnsuitable_U1 |
| CH-En_32_40_26 GTEM-M-Dn_EwksFillGen |
| CH-Pr_15_31_26_90-M-Dn_EwksFillSoil |
| CH-Pr_15_31_26_46-M-Dn_EwksFillLscape |
| CH-Zz_60_45_60 GTEO-M-Op_EwksOriginal |
| ROAD MARKINGS |
| CH-Ss_40_10_90-M-Dn_RdMkGen |
| CH-Pr_35_31_85_90 MKLO-M-Dn_RdMkLinear |
| CH-Ss_40_10_90_36 MKHM-M-Dn_RdMkHatch |
| CH-Ss_40_10_90_23 MKTS-M-Dn_RdMkSym |
| CH-Ss_40_10_90_23 MKTS-M-Dn_RdMkChar |
| CH-Pr_35_31_85_90 MKTS-M-Dn_RdMkTrans |
| CH-Pr_35_90_60_71 MKRS-M-Dn_RdMkStud |
| CH-Pr_35_90_60_71 MKCW-M-Dn_RdMkStud_Clr White |
| CH-Pr_35_90_60_71 MKCR-M-Dn_RdMkStud_Clr Red |
| CH-Pr_35_90_60_71 MKCG-M-Dn_RdMkStud_Clr Green |
| CH-Pr_35_90_60_71 MKCY-M-Dn_RdMkStud_Clr Yellow |
| CH-Pr_35_90_60_41 MKRS-M-Dn_RdMkStudLit |
| CH-Pr_35_90_60_41 MKLW-M-Dn_RdMkStudLit_Clr White |
| CH-Pr_35_90_60_41 MKLR-M-Dn_RdMkStudLit_Clr Red |
| CH-Pr_35_90_60_41 MKLG-M-Dn_RdMkStudLit_Clr Green |
| CH-Pr_35_90_60_41 MKLY-M-Dn_RdMkStudLit_Clr Yellow |
| SIGNS |
| CH-Ss_40_10_25_30-M-Dn_SignGen |
| CH-Pr_40_10_77_72 SNSF-M-Dn_SignFace |
| CH-Pr_40_10_77_72 SNGS-M-Dn_SignFace_Mount Gantry |
| CH-Pr_40_10_77_72 SNPS-M-Dn_SignFace_Mount Post |
| CH-Ss_40_10_90_72 SNPS-M-Dn_SignSuppGen |
| CH-Ss_40_10_90_72 SNPS-M-Dn_SignSuppPostGen |
| CH-Ss_40_10_90_72 SNPS-M-Dn_SignSuppPostSteel |
| CH-Pr_20_76_08_63 SNBO-M-Dn_SignBollard |
| CH-Pr_20_76_64_04 SNPS-M-Dn_SignSuppPostPassive |
| CH-Pr_70_75_72_89 SNBL-M-Dn_SignBollardLit |
| CH-Ss_40_10_90_72 SNFG-M-Dn_SignFoundGen |
| CH-Ss_40_10_90_72 SNFC-M-Dn_SignFoundConc |
| CH-Ss_40_10_90_72 SNFP-M-Dn_SignFoundPiled |
| CH-Ss_40_10_90_72-M-Dn_SignLighting |

| |
|---|
| CH-Ss_40_10_90_72 SNSS-M-Dn_SignSundries |
| CH-Pr_40_10_77_37 MKRP-M-Dn_SignMarkerPost |
| DRAINAGE |
| CD-Ss_50_30_08_85-M-Dn_DrainageGen |
| CD-Ss_50_30_08_85 DGPW-M-Dn_DrainageCarrier |
| CD-Ss_50_30_45_30 DGFD-M-Dn_DrainageFilterGen |
| CD-Ss_50_30_45_30 DGFD-M-Dn_DrainageFilterPipe |
| CD-Ss_50_30_45_30 DGFD-M-Dn_DrainageFilterMaterial |
| CD-Ss_50_30_45_30 DGFD-M-Dn_DrainageFilterMembrane |
| CD-Pr_65_52_24_47 DRCS-M-Dn_DrainageSlotGen |
| CD-Pr_65_52_24_47 DRPC-M-Dn_DrainageSlotPrecast |
| CD-Pr_65_52_24_18 DGGU-M-Dn_DrainageGully |
| CD-Pr_65_52_24_47 DRSS-M-Dn_DrainageSlotSlipform |
| CD-Ss_50_70_05_84 DRSP-M-Dn_DrainageSeparator |
| CD-Pr_25_93_60_14 DGLI-M-Dn_DrainageChanGen |
| CD-Pr_25_93_60_14 DRCP-M-Dn_DrainageChanPrecast |
| CD-Ss_50_70_05_95 DGOU-M-Dn_DrainageOutfallGen |
| CD-Pr_25_93_60_14 DRCS-M-Dn_DrainageChanSlipform |
| CD-Pr_20_93_37-M-Dn_DrainageOufallHeadwall |
| CD-En_32_95_23 DGDT-M-Dn_DrainageDitchGen |
| CD-Pr_25_93_60_12 DGHS-M-Dn_DrainageKerb |
| CD-En_50_70 DRSG-M-Dn_DrainageStoragePipe |
| CD-Pr_20_31_04_08 DRBD-M-Dn_DrainageBedding |
| CD-Ss_50_30_06 DRCG-M-Dn_DrainageChamberGen |
| CD-Ss_50_70_85_72 DGPU-M-Dn_DrainagePond |
| CD-Ss_50_30_06_14 DGMH-M-Dn_DrainageManhole |
| CD-Ss_50_70_85 DGRB-M-Dn_DrainageSUDS |
| CD-Ss_50_30_06_18 DGCP-M-Dn_DrainageCatchpit |
| CD-Pr_60_45_30_52 DROC-M-Dn_DrainageValve |
| CD-Pr_65_52_01_95 DROC-M-Dn_DrainageVortex |
| CD-Pr_65_52_01_58 DROC-M-Dn_DrainageOrifice |
| CD-Ss_50_70_05_83 DGPC-M-Dn_DrainageInterceptor |
| CD-Ss_50_70_05_85 DRST-M-Dn_DrainageStorageTank |
| CD-Pr_20_93_37 DGHW-M-Dn_DrainageHeadwall |
| CD-Pr_65_52_01_01 DGRD-M-Dn_DrainageRoddingEye |
| CD-Ss_50_70_05_79 DGSB-M-Dn_DrainageSoakaway |
| CD-Ss_50_70_05_79 DGSO-M-Dn_DrainageOutfallSoakaway |
| CD-Pr_65_52_07 DRFG-M-Dn_DrainageFittingGen |
| CD-Pr_65_52_01_02 DRFC-M-Dn_DrainageFittingCover |
| CD-Pr_65_52_01_03 DRGT-M-Dn_DrainageFittingGrating |
| VEHICLE RESTRAINT SYSTEMS |
| CH-Ss_25_16_94-M-Dn_VrsGen |
| CH-Zz_85_05_60-M-Dn_VrsSpine |
| CH-SL_80_98_97-M-Dn_VrsWorkingWidth |
| CH-Ss_25_16_94_50 RRVR-M-Dn_VrsBarrier_H1 |
| CH-Ss_25_16_94_50 RRET-M-Dn_VrsTerminal_H1_P1 |
| CH-Ss_25_16_94_50 RRET-M-Dn_VrsTerminal_H1_P4 |
| CH-Ss_25_16_94_50 RRVR-M-Dn_VrsTransition_H1 |
| CH-Ss_25_16_94_50 RRVR-M-Dn_VrsConnection_H1 |
| CH-Ss_25_16_94_50 RRVR-M-Dn_VrsBarrier_H2 |
| CH-Ss_25_16_94_50 RRET-M-Dn_VrsTerminal_H2_P1 |
| CH-Ss_25_16_94_50 RRET-M-Dn_VrsTerminal_H2_P4 |
| CH-Ss_25_16_94_50 RRVR-M-Dn_VrsTransition_H2 |

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| CH-Ss_25_16_94_50 RRVR-M-Dn_VrsConnection_H2 |
| CH-Ss_25_16_94_50 RRVR-M-Dn_VrsBarrier_H4a |
| CH-Ss_25_16_94_50 RRET-M-Dn_VrsTerminal_H4a_P1 |
| CH-Ss_25_16_94_50 RRET-M-Dn_VrsTerminal_H4a_P4 |
| CH-Ss_25_16_94_50 RRVR-M-Dn_VrsTransition_H4a |
| CH-Ss_25_16_94_50 RRVR-M-Dn_VrsConnection_H4a |
| CH-Ss_25_16_94_50 RRVR-M-Dn_VrsBarrier_N2 |
| CH-Ss_25_16_94_50 RRET-M-Dn_VrsTerminal_N2_P1 |
| CH-Ss_25_16_94_50 RRET-M-Dn_VrsTerminal_N2_P4 |
| CH-Ss_25_16_94_50 RRVR-M-Dn_VrsTransition_N2 |
| CH-Ss_25_16_94_50 RRVR-M-Dn_VrsConnection_N2 |
| CH-Ss_25_16_94_16 RRCS-M-Dn_VrsCsbGen |
| CH-Ss_25_16_94_16 RRCS-M-Dn_VrsCsb |
| CH-Ss_25_16_94_16 RRCS-M-Dn_VrsCsbTrans |
| CH-Ss_25_16_94_16 RRCS-M-Dn_VrsCsbConn |
| CH-Ss_25_16_94_16 RRCS-M-Dn_VrsCsbBifur |
| CH-Ss_25_16_94_16 RRCS-M-Dn_VrsCsbSignbase |
| CH-Ss_25_16_94_65 RRVA-M-Dn_VrsBikeProt |
| CH-Pr_20_76_08 RRCC-M-Dn_VrsCrashCushion |
| CH-Ss_25_36_95_96 RRAB-M-Dn_VrsArresterBed |
| CH-Ss_25_15_60 PEGR-M-Dn_VrsPedBarrier |
| LIGHTING |
| EO-Ss_70_80_25_70 LGLP-M-Dn_LightingPoint |
| EO-Pr_65_52_01_01 LGCH-M-Dn_LightingChamber |
| EO-Pr_65_70_12_93 LGDG-M-Dn_LightingDuctGen |
| EO-Pr_65_70_12_93 LGDL-M-Dn_LightingDuctLong |
| EO-Pr_65_70_12_93 LGDT-M-Dn_LightingDuctTrans |
| EO-Pr_70_70_48_32-M-Dn_LightingLuminaire |
| EO-Pr_80_77_48_81-M-Dn_LightingBracket |
| EO-Pr_80_77_48_80-M-Dn_LightingColumn |
| EO-Pr_60_70_22 LGFP-M-Dn_LightingFeederPillar |
| EO-Pr_65_70_48 LGCP-M-Dn_LightingCablePower |
| TECHNOLOGY |
| EC-Pr_65_52_01 MCCH_01-M-Dn_TechChamber |
| EC-SL_75_10_88 MCSG-M-Dn_TechSiteGen |
| EC-Pr_20_85_13_63-M-Dn_TechSitePlinth |
| EC-Ss_30_14_90-M-Dn_TechSitePave |
| EC-Ss_25_15_60_35 FEHR-M-Dn_TechSiteHandRail |
| EC-Pr_70_75_72_22 MCLP-M-Dn_TechLoop |
| EC-Pr_65_70_12_93 MCDG-M-Dn_TechDuctGen |
| EC-Pr_65_70_12_93 MCDL-M-Dn_TechDuctLong |
| EC-Pr_65_70_12_93 MCDT-M-Dn_TechDuctTrans |
| EC-SL_90_90_85 BGSR-M-Dn_TechSwitchroom |
| EC-Pr_60_70_22 MCDP-M-Dn_TechPowerSupply |
| EC-Pr_80_77_28_98 MCCC-M-Dn_TechCabinet |
| EC-SL_80_98_01-M-Dn_TechWorkingSpace |
| EC-Ss_75_30_35 MCSN-M-Dn_TechSignalGen |
| EC-Pr_70_75_72_50 MCSL-M-Dn_TechSignalLane |
| EC-Pr_70_75_72 SNTS-M-Dn_TechSignalTrafficLight |
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| EC-Pr_70_75_72 MCRS-M-Dn_TechSignalRamp |
| EC-Pr_20_85_50_90 SNPS-M-Dn_TechSignalSupport |
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| EC-SL_80_35_57 NMNC-M-Dn_TechCrossingNMU |
| EC-Ss_80_70_46_60 NMPX-M-Dn_TechCrossingPed |
| EC-Pr_70_75_88_27 MCET-M-Dn_TechPhone |
| EC-Pr_60_75_86 MCCM-M-Dn_TechCctvGen |
| EC-Pr_60_75_86_65 MCCM-M-Dn_TechCctvCamera |
| EC-Pr_60_75_86_90 MCCM-M-Dn_TechCctvSpeed |
| EC-Ss_37_17_50_72 MNCM-M-Dn_TechCctvMast |
| EC-Co_80_40_40 MCTG-M-Dn_TechTollGen |
| EC-Ss_75_60_50 MCSF-M-Dn_TechSensorFog |
| EC-Pr_80_51_51_05 MCSW-M-Dn_TechSensorWind |
| EC-Pr_70_75_72_01 MCRA-M-Dn_TechSensorRadar |
| EC-Pr_65_70_48 MCCP-M-Dn_TechCablePower |
| EC-Pr_65_70_15 MCCO-M-Dn_TechCableComms |
| EC-Pr_65_70_15_58 MCCF-M-Dn_TechCableFibre |
| FENCES AND GATES |
| CH-Ss_25_14 FEFB-M-Dn_FenceGen |
| CH-Ss_25_14_63_63 FEFB-M-Dn_FencePostRail |
| CH-Ss_25_14_67_34 FEFB-M-Dn_FenceMesh |
| CH-Ss_25_14_63_62 FEFB-M-Dn_FencePanelled |
| CH-Ss_25_14_67_33 FEFB-M-Dn_FencePostWire |
| CH-Ss_25_25_05 FEFB-M-Dn_FenceAcoustic |
| CH-Ss_30_34_03_11 FECG-M-Dn_FenceCattleGrid |
| CH-Ss_25_32_35_37 LSBG-M-Dn_FenceGateCWay |
| CH-Ss_25_32_35 FEFG-M-Dn_FenceGate |
| CH-Pr_30_59_34_14 FESG-M-Dn_FenceGateSnow |
| CH-Ss_25_32_35_85 FESI-M-Dn_FenceStile |
| CH-Ss_35_10_25_35 MNST-M-Dn_FenceSteps |
| RETAINING WALLS |
| CE-Ss_20_60_30 RWEM-M-Dn_RetwallEmbedGen |
| CE-Ss_20_60_35 RWGR-M-Dn_RetwallGravityGen |
| CE-Pr_15_57_33-M-Dn_GeotechTextile |
| CE-Ss_15_10_80_80-M-Dn_GeotechSoilNail |
| CE-Ss_20_60_35_50 RWGR -M-Dn_RetwallMasonry |
| CE-Ss_25_13_30 RWGR -M-Dn_RetwallGabion |
| CE-Ss_20_60_35_72 RWGR -M-Dn_RetwallReinforcedEarth |
| CE-Ss_20_60_35_70 RWGR -M-Dn_RetwallReinforcedConcrete |
| CE-Ss_20_60_30_92 RW RWGR MC-M-Dn_RetwallMassConcrete |
| CE-Pr_25_93_50_22-M-Dn_RetwallCappingConcrete |
| CE-Ss_20_50_30_11-M-Dn_RetwallCappingSteel |
| CE-Pr_20_29_03_33-M-Dn_GeotechGroundAnchor |
| CE-Ss_20_60_30_85 RWEM -M-Dn_RetwallSheetPile_Steel |
| CE-Pr_20_85_62_66 RWEM -M-Dn_RetwallSheetPile_Plastic |
| CE-Ss_20_60_30_80 RWEM -M-Dn_RetwallSecantPile_Hard |
| CE-Ss_20_60_30_80 RWEM -M-Dn_RetwallSecantPile_Soft |
| CE-Ss_20_60_30_15 RWEM -M-Dn_RetwallContigPile |
| CE-Ss_20_60_30_45 RWEM -M-Dn_RetwallKingPost |
| CE-Ss_20_60_30_70 RWEM -M-Dn_RetwallDiaphragm |
| GEOTECHNICAL |
| CE-Ac_15_75_35 GTBH-M-Dn_GeotechBorehole |
| CE-Ac_15_10_90-M-Dn_GeotechTrialPit |
| CE-Ac_15_75_36-M-Dn_GeotechSurvey |
| ENVIRONMENT |
| EN-Ac_15_20_41-M-Dn_EnvironSpeciesGen |

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| EN-Ac_15_20-M-Dn_EnvironSurvey |
| EN-Ss_45_35_08_38-M-Dn_EnvironHabitatProtection |
| EN-Ha_14_09-M-Dn_EnvironTypeBuilt |
| EN-Ss_25_16_73_26 NMWB-M-Dn_EnvironSpeciesBarrier |
| EN-Ss_45_35_08_37 NMHS-M-Dn_EnvironSpeciesProvision |
| EN-Ac_32_10-M-Dn_EnvironTypeAgric |
| EN-Ac_15_20_48-M-Dn_EnvironVisualGen |
| EN-Ac_15_20_48-M-Dn_EnvironVisualSurvey |
| EN-Ss_25_16_73_26-M-Dn_EnvironVisualBarrier |
| EN-Ac_15_55_04-M-Dn_EnvironNoiseGen |
| EN-Ac_15_55_04-M-Dn_EnvironNoiseSurvey |
| EN-Ss_25_25_05-M-Dn_EnvironNoiseBarrier |
| EN-Pr_75_50_76_02-M-Dn_EnvironAirQualityGen |
| EN-Pr_75_50_76_02-M-Dn_EnvironAirQualitySurvey |
| EN-Ha_14_08-M-Dn_EnvironTypeGen |
| EN-Co_32_65_30 EBHF-M-Dn_EnvironTypeForest |
| EN-Ac_15_20_46 LSGL-M-Dn_EnvironLscapeGen |
| EN-Ss_45_35_30 EBOP-M-Dn_EnvironLscapePlant |
| EN-Ss_45_35_30 EBIT-M-Dn_EnvironTree |
| EN-Ss_45_35_30 EBNH-M-Dn_EnvironHedge |
| EN-En_32_35_36-M-Dn_EnvironLscapeHard |
| EN-Co_32_20_22-M-Dn_EnvironArchGen |
| UTILITIES |
| CU-Ss_55-UE-Op_UtilPipedGen |
| CU-Ss_55_70_95_50-UE-Op_UtilWater |
| CU-Ss_50_30_08_30-UE-Op_UtilFoulGravity |
| CU-Ss_50_30_85-UE-Op_UtilFoulPumped |
| CU-Ss_55_20_33-UE-Op_UtilGas |
| CU-Ss_55_50_47-UE-Op_UtilOil |
| CU-Ss_70_30_35_35-UE-Op_UtilElecHvBuried |
| CU-Ss_70_30_35_40-UE-Op_UtilElecHvOverhead |
| CU-Ss_70_30_45_45-UE-Op_UtilElecLvBuried |
| CU-Ss_70_30_45_45-UE-Op_UtilElecLvOverhead |
| CU-Co_75_30_20-UE-Op_UtilTelcoBuried |
| CU-Co_75_30_20-UE-Op_UtilTelcoOverhead |
| CU-Pr_65_54_95-UE-Op_UtilWaterValve |
| CU-Ss_35_13_50-UE-Op_UtilFoulChamber |
| CU-Pr_65_54_33-UE-Op_UtilGasValve |
| CU-Pr_65_54_33-UE-Op_UtilOilValve |
| CU-Pr_20_76_88_77-UE-Op_UtilElecLvSupport |
| CU-Pr_80_51_51_95-UE-Op_UtilElecLvTransformer |
| CU-En_70_30_18-UE-Op_UtilElecHvPylon |
| CU-SL_80_98_75-UE-Op_UtilSafetyOverhead |
| CU-SL_80_98_75-UE-Op_UtilSafetyBuried |
| MAINTENANCE |
| D-Co_80_35_35 DEPO-M-Dn_MaintDepot |
| D-Ss_15_30_22 SPKT-M-Dn_MaintSpillKit |
| D-En_32_35_80 SOFT-M-Dn_MaintSoftEstate |
| TRAFFIC MANAGEMENT |
| XX-Ss_25_95_85-M-Ty_TmBarrier |
| XX-Pr_25_30_86-M-Ty_TmCones |
| STRUCTURES |
| FOUNDATIONS |

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| CB-Ss_20_05_65_24 BRPL-M-Dn_FoundPile_Precast |
| CB-Ss_20_05_65_41 BRPL-M-Dn_FoundPile_InSitu |
| CB-Ss_20_05_65_84 BRPL-M-Dn_FoundPile_SteelBearing |
| CB-Ss_20_05_65_76 BRPL-M-Dn_FoundPile_Screw |
| CB-Ss_20_05_15_70 GNFS-M-Dn_FoundStrip |
| CB-Ss_20_05_15_72 GNFR-M-Dn_FoundRaft |
| CB-Pr_20_85_13_32 GNFD-M-Dn_FoundPad |
| CB-Pr_20_76_78_12 GNFC-M-Dn_FoundCaisson |
| PILECAPS |
| CB-Ss_20_05_15_71 GNPL-M-Dn_StructPileCapGen |
| CB-Ss_20_05_15_71 GNSI-M-Dn_StructPileCapInsitu |
| CB-Ss_20_05_15_71 GNPE-M-Dn_StructPileCapPrecast |
| ABUTMENTS AND PIERS |
| CB-EF_20_50 BRAB-M-Dn_StructAbutGen |
| CB-EF_20_50 BRBK-M-Dn_StructAbutBankSeat |
| CB-EF_20_50 BRGB-M-Dn_StructAbutGroundBeam |
| CB-EF_25_10 BRWL-M-Dn_StructAbutWall |
| CB-EF_25_10 BRAC-M-Dn_StructAbutCurtain |
| CB-EF_25_10 BRAM-M-Dn_StructAbutMask |
| CB-EF_25_10 BRAW-M-Dn_StructAbutWing |
| CB-Pr_25_93_50_23 BRWC-M-Dn_StructAbutWingCoping |
| CB-Pr_25_71_57_13 BRWP-M-Dn_StructAbutWingParapet |
| CB-EF_20_50 BRPG-M-Dn_StructPierGen |
| CB-EF_20_50 BRCI-M-Dn_StructPierConcInsitu |
| CB-EF_20_50 BRCP-M-Dn_StructPierContPrecast |
| CB-EF_20_50 BRPS-M-Dn_StructPierSteel |
| DECKS |
| CB-EF_30_70 BRDG-M-Dn_StructDeckGen |
| CB-Ss_30_16_10 BRDC-M-Dn_StructDeckConcGen |
| CB-Ss_30_16_10 BRIN-M-Dn_StructDeckConcInsitu |
| CB-Ss_30_16_10 BRCV-M-Dn_StructDeckConcVoided |
| CB-Pr_25_71_29_37 BRVF-M-Dn_StructDeckConcVoidForm |
| CB-Pr_25_71_51_15 BRDI-M-Dn_StructDeckSteelDiaphragm |
| CB-Ss_30_16_10 BRCS-M-Dn_StructDeckConcSegment |
| CB-Ss_30_16_10 BRCD-M-Dn_StructDeckConcDiaphragm |
| CB-Pr_20_96_71_14 BRCR-M-Dn_StructDeckConcRebar |
| CB-Pr_20_96_71_97 BRCM-M-Dn_StructDeckConcMesh |
| CB-Pr_20_85_08_66 BRPR-M-Dn_StructDeckConcPrecast |
| CB-Ss_30_16_10 BRST-M-Dn_StructDeckSteelGen |
| CB-Pr_20_76_51_12 BRSR-M-Dn_StructDeckSteelRolled |
| CB-Ss_30_16_10_80 BRPD-M-Dn_StructDeckSteelPlateGirder |
| CB-Ss_30_16_10_08 BRGR-M-Dn_StructDeckSteelBoxGirder |
| CB-Pr_25_71_51_15 BRSF-M-Dn_StructDeckSteelStiffener |
| CB-Pr_20_85_84_88 BRBC-M-Dn_StructDeckSteelBracing |
| CB-Ss_25_16_94_14 BRPP-M-Dn_StructDeckParapetGen |
| CB-Pr_20_29_03_05 BRAN-M-Dn_StructDeckParapetAnchor |
| PARAPETS |
| CB-Pr_20_76_64 BRPT-M-Dn_StructDeckParapetPost |
| CB-Pr_20_85_07 BRRL-M-Dn_StructDeckParapetRail |
| CB-Pr_25_71_50_16 BRMH-M-Dn_StructDeckParapetMesh |
| CB-Pr_25_71_50 BRSH-M-Dn_StructDeckParapetSheet |
| BEARINGS |
| CB-Pr_20_85_10 BRBG-M-Dn_StructDeckBearingGen |

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| CB-Pr_20_85_10_35 BRBF-M-Dn_StructDeckBearingFixed |
| CB-Pr_20_85_10_79 BRBS-M-Dn_StructDeckBearingSlide |
| CB-Pr_20_85_10_73 BRBR-M-Dn_StructDeckBearingRoller |
| CB-Pr_20_85_10_27 BRBE-M-Dn_StructDeckBearingElastomeric |
| WATERPROOFING |
| CB-Pr_35_31_68-M-Dn_StructWaterproofingGen |
| STRUCTURAL CONNECTIONS |
| CB-Pr_20_29_31 BRCG-M-Dn_StructConnGen |
| CB-Pr_20_29_97 BRCW-M-Dn_StructConnWeld |
| CB-Pr_20_29_31_08 BRCB-M-Dn_StructConnBolted |
| CB-Pr_20_96_71_51 BRRC-M-Dn_StructConnRebarCoupler |
| STRUCTURE PRESTRESSING |
| CB-Ss_30_16_10_65 BRTR-M-Dn_StructPrestressingGen |
| CB-Pr_20_29_29_66 BRDT-M-Dn_StructPrestressingDuct |
| CB-Pr_20_96_71_16 BRTD-M-Dn_StructPrestressingTendon |
| CB-Pr_20_29_03_97 BRCH-M-Dn_StructPrestressingAnchor |
| CB-SL_80_98_97 BRCL-M-Dn_StructPrestressingClearance |
| SUSPENSION |
| CB-Ss_20_40_07 BRSU-M-Dn_StructSuspensionGen |
| CB-Ss_20_40_07 BRCT-M-Dn_StructCatenaryGen |
| CB-Pr_20_85_11 BRCC-M-Dn_StructCatenaryCable |
| CB-Pr_20_29_03_86 BRCA-M-Dn_StructCatenaryAnchor |
| CB-Pr_20_29_10 BRHG-M-Dn_StructCatenaryHangerGen |
| CB-Pr_20_85_11 BRHC-M-Dn_StructCatenaryHangerCable |
| CB-Pr_20_29_03_86 BRHA-M-Dn_StructCatenaryHangerAnchor |
| CB-Pr_20_29_10 BRHB-M-Dn_StructCatenaryHangerBar |
| CB-Ss_20_40_07_11 BRSG-M-Dn_StructStayGen |
| CB-Pr_20_85_11 BRSC-M-Dn_StructStayCable |
| CB-Pr_20_29_10 BRSA-M-Dn_StructStayAnchor |
| EXPANSION JOINTS |
| CB-Pr_35_90_09 BREG-M-Dn_StructExpansionGen |
| CB-Pr_35_90_09_27 BRES-M-Dn_StructExpansionSeal |
| CB-Pr_35_90_09_85 BRED-M-Dn_StructExpansionDowel |
| CB-Pr_35_90_09_11 BREM-M-Dn_StructExpansionMechanical |
| GANTRIES |
| CB-Ss_37_17_35_60 GYPG-M-Dn_GantryPortalGen |
| CB-Ss_37_17_35_11 GYSC-M-Dn_GantryCantileverGen |
| CB-Pr_20_76_52_16-M-Dn_GantrySupportSteel |
| CB-Ss_20_10_75_65-M-Dn_GantrySupportConc |
| CB-Pr_20_76_52_16-M-Dn_GantryBoomSteel |
| CB-Pr_20_85_08_65-M-Dn_GantryBoomConc |
| CB-Ss_37_17_35-M-Dn_GantrySignSupport |
| CB-Ss_37_17_35 -M-Dn_GantrySignalSupport |
| CB-Pr_65_70_11_17-M-Dn_GantryCableTray |
| TUNNELS |
| CT-En_80_96_90-M-Dn_TunnelGen |
| CT-En_80_96_90-M-Dn_TunnelBored |
| CT-En_80_96_90-M-Dn_TunnelCutCover |
| CT-En_80_96_90-M-Dn_TunnelImmersed |
| CT-En_80_96_80-M-Dn_TunnelShaft |
| CT-Pr_25_71_90-M-Dn_TunnelLiningSegmental |
| CT-Ss_65_40_94_90-M-Dn_TunnelVent |
| CT-En_80_96_90 TUOA-M-Dn_TunnelOpeningAccess |

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| CT-En_80_96_90 TUPN-M-Dn_TunnelOpeningNonAccess |
| CT-En_80_96_90 TUCG-M-Dn_TunnelCovering |
| CT-Pr_35 TUFN-M-Dn_TunnelFinish |
| CT-Pr_30_59_59 TUBR-M-Dn_TunnelBarrier |
| CT-En_80_96_90-M-Dn_TunnelPortal |
| CT-En_80_96_90-M-Dn_TunnelAntiRecirc |
| CT-Pr_65_67_29_44-M-Dn_TunnelVent_Jet |
| CT-Pr_65_67_29_05-M-Dn_TunnelVent_Axial |
| CT-Pr_65_67_29_12-M-Dn_TunnelVent_Centri |
| CT-Pr_30_59_96_92-M-Dn_TunnelVentDuct |
| CT-Pr_30_59_94-M-Dn_TunnelVentGrille |
| CT-Pr_75_50_76_12-M-Dn_TunnelScada_CO |
| CT-Pr_75_50_76_33-M-Dn_TunnelScada_NO |
| CT-Pr_75_50_76_33-M-Dn_TunnelScada_NO2 |
| CT-Pr_75_50_52_94-M-Dn_TunnelScada_Vis |
| CT-Pr_75_50_76_03-M-Dn_TunnelScada_AirVel |
| CT-Pr_65_57_02_28-M-Dn_TunnelScada_Precipitator |
| CT-Ss_75_40_53-M-Dn_TunnelScada_PlantMonitor |
| CT-Pr_75_75_42-M-Dn_TunnelScada_Intruder |
| CT-Pr_30_59_59_38-M-Dn_TunnelScada_Overheight |
| CT-Ss_75_70_54-M-Dn_TunnelScada_Control |
| CT-Pr_70_70_48_71-M-Dn_TunnelLight_Op |
| CT-Ss_70_80_33_12-M-Dn_TunnelLight_Emerg |
| CT-Ss_55_70_95_66-M-Dn_TunnelFireMain |
| CT-Pr_70_55_97-M-Dn_TunnelFileHydrant |
| CT-Ss_55_30_35_31-M-Dn_TunnelFireFoam |
| CT-Ss_55_30-M-Dn_TunnelFireExtinguish |
| CT-Ss_55_30_96_29-M-Dn_TunnelFireHose |
| CT-Ss_25_30_20_25-M-Dn_TunnelFireDoor |
| CT-Ss_65_40_80-M-Dn_TunnelFireSmokeControl |
| CT-Pr_70_75_69_70-M-Dn_TunnelRadioAntenna |
| CT-Ss_75_10_70_70-M-Dn_TunnelRadioRebroadcast |
| CT-Pr_60_70_64-M-Dn_TunnelPowerSupply |
| CT-Pr_65_72_43_96-M-Dn_TunnelPowerTransform |
| CT-Pr_60_70_48-M-Dn_TunnelPowerSwitchgear |
| CT-Pr_60_70_65-M-Dn_TunnelPowerStandby |
| CT-Pr_60_70_64_93-M-Dn_TunnelPowerUPS |
| CT-En_90_90-M-Dn_TunnelServiceBuild |
| CT-SL_90_90_64-M-Dn_TunnelPlantRoom |
| CT-SL_90_10_95-M-Dn_TunnelWalkway |
| CT-Ss_25_15_60_35-M-Dn_TunnelHandrail |
| CT-Ss_50_30_80_72-M-Dn_TunnelDrainSump |
| CT-Ss_65_40_33-M-Dn_TunnelDrainSumpVent |
| CT-Pr_65_55_76_59-M-Dn_TunnelDrainSeparator |
| CT-Ss_50_70_05_83-M-Dn_TunnelDrainInterceptor |
| CT-Pr_60_55_97_86-M-Dn_TunnelDrainSkimmer |
| CT-Pr_65_53_24-M-Dn_TunnelDrainSkimmerPump |
| CT-Pr_65_53_96_95-M-Dn_TunnelDrainSludgePump |
| CAD |
| Z-Zz_10_20-Z-P_CadFrame |
| Z-Zz_10_20_45-Z-P_CadLogo |
| Z-Zz_10_20_95-Z-P_CadViewport |
| Z-Zz_10_40-Z-P_CadHoldCloud |

| |
|---|
| Z-Zz_10_70_20-Z-P_CadRevCloud |
| Z-Zz_10_80-Z-P_CadStatusStamp |
| Z-Zz_20_10-Z-T_CadTextAnno |
| Z-Zz_20_10_40-Z-T_CadTextKeynote |
| Z-Zz_20_10_45-Z-T_CadTextLabel |
| Z-Zz_20_10_50-Z-T_CadTextLeader |
| Z-Zz_20_10_55-Z-T_CadTextNote |
| Z-Zz_20_20-Z-D_CadDims |
| Z-Zz_20_30_50-Z-P_CadMask |
| Z-Zz_20_30_95-Z-P_CadWipeout |
| Z-Zz_20_40_05-Z-H_CadHatchFill |
| Z-Zz_20_40_35-Z-H_CadHatchBdry |
| Z-Zz_20_40_60-Z-H_CadHatchPatt |
| Z-Zz_20_40_80-Z-H_CadHatchSolid |
| Z-Zz_20_70_20-Z-P_CadRedlineComment |
| Z-Zz_20_70-Z-P_CadRedlineLines |
| Z-Zz_20_80-Z-P_CadSymbol |
| Z-Zz_20_80_10-Z-P_CadScalebar |
| Z-Zz_20_80_15-Z-P_CadCrossRef |
| Z-Zz_20_80_40-Z-P_CadKeyplan |
| Z-Zz_20_80_50-Z-P_CadLegend |
| Z-Zz_20_80_55-Z-P_CadNorth |
| Z-Zz_20_90-Z-T_CadTitle |
| Z-Zz_30_40-Z-P_CadImage |
| Z-Zz_30_90-Z-T_CadTable |
| Z-Zz_35-Z-P_CadSetout |
| Z-Zz_35_20-Z-M_CadCL |
| Z-Zz_35_40-Z-M_CadGrid |
| Z-Zz_35_80-Z-P_CadSurveyControl |
| Z-Zz_40_15-Z-M_CadContour |
| Z-Zz_40_15_50-Z-M_CadContourMajor |
| Z-Zz_40_15_55-Z-M_CadContourMinor |
| Z-Zz_60_45_20-Z-P_CadDatum |
| Z-Zz_60_50_20-Z-P_CadCallout |
| Z-Zz_60_50_30 GNSL-Z-P_CadElev |
| Z-Zz_60_50_80-Z-P_CadSection |
| Z-Zz_60_55-Z-P_CadMatchline |
| Z-Zz_70_05-Z-P_CadView3D |
| Z-Zz_90_20-Z-P_CadInfoConstruction |
| Z-Zz_90_30-Z-P_CadInfoXref |
| Z-Zz_90_70-Z-T_CadInfoReadme |

## Appendix D
## Additional Asset Codes

The Asset Data Management Manual (ADMM) does not currently encompass all the asset databases. This table gives 4-character codes for asset classes that are not yet covered.

- The first 2 characters indicate the discipline.
- The second 2 characters give a unique mnemonic.

| ADMM-Style Asset Type Code | Description |
|---|---|
| | |
| BDHS | EnvWildlifeHousing |
| BDOS | EnvWildlifeOverpass |
| BDUS | EnvWildlifeUnderpass |
| BDWB | EnvWildlifeBarrier |
| BGSR | BuildSwitchRoom |
| BRAO | BridgeAccomOver |
| BRAU | BridgeAccomUnder |
| BRBO | BridgeNmuOver |
| BRBU | BridgeNmuUnder |
| BRER | BridgeElevatedRoad |
| BRFB | BridgeFootbridge |
| BRGR | BridgeDeckSteelBoxGirder |
| BRHO | BridgeHighwayOver |
| BRHU | BridgeHighwayUnder |
| BROB | BridgeBridgeMoveable |
| BRRO | BridgeRailwayOver |
| BRRU | BridgeRailwayUnder |
| BRUP | BridgeUnderpass |
| DGCG | DrainChamberGen |
| DGIN | DrainInterceptor |
| DGOL | DrainOutletHeadwall |
| DGSD | DrainSlotDrain |
| DGSG | DrainStoragePipe |
| DGSP | DrainSeparator |
| DGST | DrainStorageTank |
| EGFC | EwksFalseCutting |
| EGGR | EnvWallGrassReinforced |
| GTBH | GeoBorehole |
| GTFS | GeoEwksFillSoil |
| GTGA | GeoGroundAnchor |
| GTRK | GeoEwksRock |
| GTSC | GeoEwksSiteClearance |
| GTSE | GeoEwksFillLScape |
| GTSN | GeotechSoilNail |
| GTTP | GeoTrialPit |
| GTUS | GeoEwksUnsuitable |

| | |
|---|---|
| GTVF | GeoVergeFlex |
| GTVG | GeoVergeGen |
| GTVO | GeoVergeUnbound |
| GTVR | GeoVergeRigid |
| GTVT | GeoEmbankTop |
| GYGG | GantryGen |
| GYPG | GantryPortal |
| GYSC | GantryCantilevered |
| KFTS | TraffSeparSys |
| LGCB | LightingCable |
| LGCH | LightingChamber |
| LGDG | LightingDuctGen |
| LGDL | LightingDuctLong |
| LGDT | LightingDuctTrans |
| LGSC | LightingSolarCell |
| LSAR | EnvLscapeArtwork |
| LSBS | EnvLscapeBushes |
| LSCT | EnvLscapeClimberTrailer |
| LSEW | EwksReturnedAgric |
| LSGA | EnvLscapeGrassAmenity |
| LSGB | EnvGrasslandBulbs |
| LSGL | EnvLscapeUndergrowthExtent |
| LSGO | EnvOpenGrassland |
| LSGS | EnvGrasslandSpeciesRich |
| LSHB | EnvLscapeHedgeLarge |
| LSHC | EnvLscapeHedgeCL |
| LSHM | EnvHeathMoorland |
| LSHN | EnvLscapeHedgerowNative |
| LSHO | EnvLscapeHedgerowOrnamental |
| LSHT | EnvLscapeHedgerowTreeNative |
| LSNG | EnvLscapeUndergrowthExtent_2D |
| LSOP | EnvLscapePlantingOffSite |
| LSRS | EnvRockScree |
| LSSH | EnvLscapeShrub |
| LSSL | EnvLscapeTreeShrubLinearBelt |
| LSSO | EnvLscapeShrubOrnamental |
| LSSP | EnvLscapeSapling |
| LSTI | EnvLscapeTreeIndividual |
| LSWL | EnvLscapeWoodland |
| MAAM | TechMastANPR |
| MABM | EnvMastBatGuidance |
| MACM | LightingMastCatenary |
| MAEM | StructMastTelecom |
| MAFM | MastFTMS |

| | |
|---|---|
| MAHM | LightingHighMast |
| MALM | LightingMastLamps |
| MAMM | TechMastVmsMatrix |
| MAPT | StructPost |
| MARM | TechMastVmsPrism |
| MASM | MastTrafficSignals |
| MAST | Mast |
| MATM | TechMastCCTV |
| MAVM | MastVariableSpeedRestrictionSi |
| MCCA | TechCabinet |
| MCCB | TechCableBridge |
| MCCC | TechCableComms |
| MCCF | TechCableFibre |
| MCCI | TechCctvCamera |
| MCCM | TechCamera |
| MCCP | TechCablePower |
| MCCV | TechTraffSignDetect |
| MCDD | TechDrcDevices |
| MCDE | TechDevices |
| MCDG | TechDuctLong |
| MCDL | TechDuctLocal |
| MCDT | TechDuctTrans |
| MCDU | TechDuctGen |
| MCEC | TechCameraEnforce |
| MCES | TechSensorEnviron |
| MCFD | TechSignalFound |
| MCGN | TechCableGen |
| MCIS | TechIncidentSupport |
| MCLP | TechLoop |
| MCMA | TechMatrixSigns |
| MCME | TechMessSign |
| MCMT | TechSensorMeteo |
| MCRA | TechSensorRadar |
| MCRM | TechRampMeter |
| MCRS | TechSignalRamp |
| MCSF | TechSensorFog |
| MCSG | TechSiteGen |
| MCSL | TechSignalLane |
| MCSN | TechSignalGen |
| MCSP | TechSignalSupport |
| MCSP | TechSitePlinth |
| MCSS | TechSiteSteps |
| MCSV | TechSitePave |
| MCSW | TechSensorWind |

| | |
|---|---|
| MCTC | TechTraffSignControl |
| MCTD | TechTraffSignInstat |
| MCTG | TechTollGen |
| MCTL | TechSignalTrafficLight |
| MCTM | TechTmeDevices |
| MCTN | TechTraffSignMonUnit |
| MCTP | TechTraffSignPole |
| MCTR | TechSignalGen |
| MCTT | TechTraffSignTransUnit |
| MCWS | TechWorkingSpace |
| MKAN | RdMkAlphaNum |
| MKLO | RdMkLongitudinal |
| MKPC | RdMkPedCrossing |
| MKSL | RdMkStudLit |
| MKST | RdMkStud |
| NVNB | EnvNoiseBund |
| PVBN | PaveBinderCourse |
| PVBS | PaveBaseCourse |
| PVCP | PaveCapping |
| PVCR | PaveCResGen |
| PVHW | PaveCarrageway |
| PVMC | PaveCwayMain |
| PVPF | PaveFlex |
| PVPU | PaveUnbound |
| PVPV | PaveGen |
| PVRC | CResCrossover |
| PVRD | PaveRigid |
| PVRF | CResFlex |
| PVRR | CResRigid |
| PVRU | CResUnbound |
| PVSB | PaveSubBase |
| PVSF | PaveSurfaceCourse |
| PVSR | PaveSlipRoad |
| PVST | PaveLayby |
| RRAG | VrsAntiGlare |
| RRBP | VrsBikeProt |
| RRCG | VrsCsbGen |
| RRCP | VrsCsbPrecast |
| RRGB | VrsGroundBeam |
| RRPB | VrsPedBarrier |
| RRSF | VrsCsbSlipform |
| RRVG | VrsGen |
| RRVS | VrsSpine |
| RWEB | RetwallEmbedGen |

| | |
|---|---|
| RWGR | RetwallGravityGen |
| SGLC | TechSignalControl |
| SGLT | TechSignal |
| SNBL | SignBollardLit |
| SNBO | SignBollard |
| SNFC | SignFoundConc |
| SNFG | SignFoundGen |
| SNFP | SignFoundPiled |
| SNGS | SignFace_Mount Gantry |
| SNMP | SignMarkerPost |
| SNPG | SignSuppPostGen |
| SNPL | SugnSuppPost_Steel |
| SNPP | SignSuppPost_Passive |
| SNSG | SignGen |
| SNSL | SignLighting |
| SNSN | SignSuppGen |
| SNSP | SignFace_Mount Post |
| SNSS | SignSundries |
| SNTD | TrafficSignal |
| TUBD | TunnelBored |
| TUBR | TunnelBarrier |
| TUCC | TunnelCutCover |
| TUCG | TunnelCovering |
| TUFN | TunnelFinish |
| TUGN | TunnelGen |
| TUIM | TunnelImmersed |
| TULS | TunnelLiningSegmental |
| TUMJ | TunnelRoadMajor |
| TUMN | TunnelRoadMinor |
| TUNT | TunnelNatm |
| TUOA | TunnelOpeningAccess |
| TUPH | TunnelPath |
| TUPN | TunnelOpeningNonAccess |
| TURD | TunnelPilesSettlementReducing |
| TURH | TunnelRailHeavy |
| TURL | TunnelRailLight |
| TUSH | TunnelShaft |
| TUST | TunnelImmersedTube |
| TUTP | TunnelPortal |
| TUVT | TunnelVent |