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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.

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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.

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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.

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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.

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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.

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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

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	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

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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

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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 - 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 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 (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

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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

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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.

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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.

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- 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.

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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]

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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

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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.

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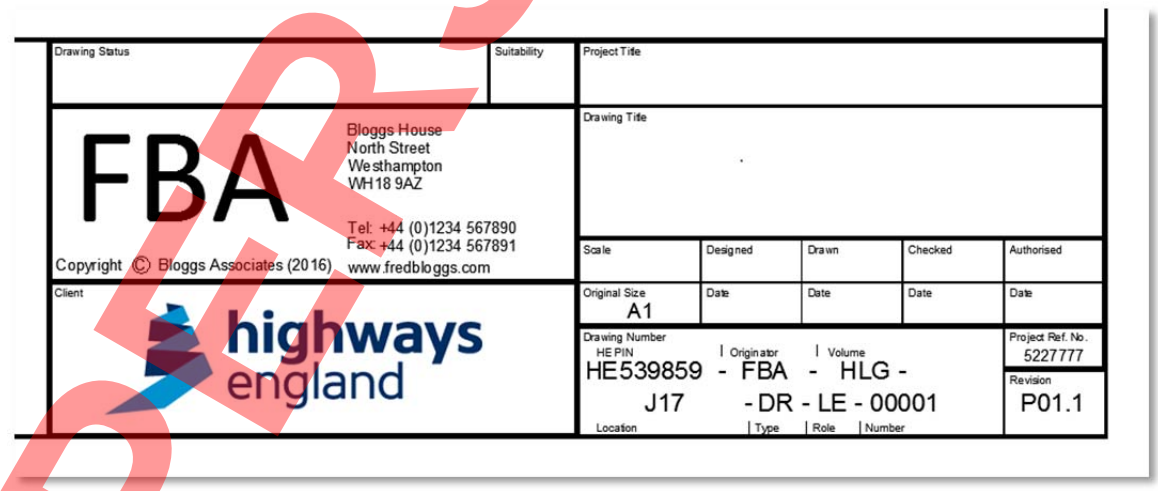
3.4. CAD Composition and Presentation

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.

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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

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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.

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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.

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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

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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.

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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.

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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

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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

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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.

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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)

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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

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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.

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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

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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

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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
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

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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

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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

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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

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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

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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

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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

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