Amtrak

Mechanical Department
Bureau of Rolling Stock Engineering

SPECIFICATION

for

CAD Model Standards

SPECIFICATION No. 866

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SPECIFICATION CHANGE SHEET

Revision	Date	Description	Originator

Amtrak
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CAD Layer Guidelines

Layer Name Format

Discipline Designator, Level 1

The Discipline Designator denotes the category of subject matter contained on the specified layer.

The Discipline Designator is a two-character field. The first character is the discipline character, and the second character is an optional modifier.

G General

H Hazardous Materials

V Survey / Mapping

B Geotechnical

W Civil Works

C Civil

L Landscape

S Structural

A Architectural

I Interiors

Q Equipment

F Fire Protection

P Plumbing

D Process

M Mechanical

E Electrical

T Telecommunications

R Resource

X Other Disciplines

Z Contractor / Shop Drawings

Operations

Discipline Designator, Level 2

The optional second character is used to further define the discipline character.

Level 2 Discipline Designators for Architectural are shown:

N New

A Architectural

AS Architectural Site

AD Architectural Demolition

AE Architectural Elements

AI Architectural Interiors

AF Architectural Finishes

AG Architectural Graphics

AJ User-Defined

AK User-Defined

Level 2 Mechanical Discipline Designators

M Mechanical

MS Mechanical Site

MD Mechanical Demolition

MH Mechanical HVAC

MP Mechanical Piping

MI Mechanical Instrumentation

MJ User-Defined

MK User-

Mechanical Discipline Layers

M_ANNO Annotation

M_ANNO - DLTA Annotation: revision delta

M_ANNO - TTLB Annotation: titleblock

M_ANNO-TTLB-PROS Annotation: titleblock: date/time/file name stamp

M_BRIN Brine systems Description New

M_BRIN-EQPM Brine systems: equipment

M_BRIN-PIPE Brine systems: piping

M_CHIM Chimneys and stacks

M_CMPA Compressed / processed air systems

M_CMPA-ANNO Compressed / processed air systems: annotation

Major Group Fields

The Major Group is a four-character field that identifies a major building system. The prescribed Major Group field codes (four-character abbreviations) shown on the Layer List are logically grouped with specific discipline designators. However, any Major Group may be combined with any prescribed Discipline Designator, provided that the definition of the Major Group remains unchanged. Therefore, any reasonable combination of the prescribed Discipline Designators and Major Groups is permitted.

NOTE:
User-defined Major Group field codes are not permitted.

NOTE:
For conceptual conformance to ISO 13567, Organization and Naming of Layers for CAD, the use of the Major Group “ANNO” is not permitted. See “Commentary: U.S. NCS and ISO 13567” (p. 91) at the end of AIA CAD Layer Guidelines for detailed information about ISO conformance.

Minor Group Fields

This is an optional, four-character field to further define the Major Groups. For example, AWALL-FULL denotes Architectural, Wall, Full-height. A second minor group may be used for still further delineation of the data contained on a layer. For example, A-WALL-FULL-TEXT indicates Architectural, Wall, Full-height, Text.

The prescribed Minor Group field codes (four-character abbreviations) shown on the Layer List are logically grouped with specific Major Groups. However, any Minor Group may be used to modify any Major Group, provided that the definition of the Minor Group remains unchanged. Therefore, any reasonable combination of the prescribed Major and Minor Groups is permitted.

NOTE:
User-defined Minor Group field codes are permitted. They must contain four alphabetic and/or numeric characters and/or “~”, and must be fully documented on the U.S. NCS (United States – National Cad Standard)

A typical layer name showing the required data fields only.

The mandatory Major Group field is highlighted:

A - WALL

A typical layer name showing one optional Minor Group field:

A - WALL - FULL

A typical layer name showing two optional Minor Group fields:

A - WALL - FULL - TEXT

Layer List

Drawing View Layer List

Drawing View Field Codes

The Drawing View field codes are specialized codes for layers that are organized primarily by drawing type, rather than by major building system.

The field codes DETL, ELEV, and SECT may also be used as Minor Group field codes to modify a major building system.

For data sets that are organized by drawing type, an optional alphanumeric Minor Group field code, ANNN, is prescribed to further distinguish drawings within a single CAD file.

This Minor Group may be used ONLY to modify the prescribed Drawing View Major Groups; it may not be used to modify any other Major Group. The format of ANNN is also prescribed. It must consist of a single alphabetic character followed by a three-digit number between 001 and 999.

The definition of ANNN is not prescribed; it must be defined by the user.

The definition must be documented on the U.S. NCS Compliance Disclosure Statement for the project on which it is used.

The Minor Group field codes MCUT, MBND, PATT, and IDEN may be used to modify any Major or Minor Group in the Layer List.

The definitions of these prescribed field codes cannot be changed.

Drawing View Layer Names

Layer Name Description New (XX= Discipline, ## = Numerical Value)

DETL Detail (Mechanical Discipline)

ELEV Elevation

SECT Section

ANNN Drawing View Major Group: optional number (A = letter, NNN = number between 001 and 999)

ANNN-MCUT Drawing View Major Group: optional number: material cut by the view

NNN-MBND Drawing View Major Group: optional number: material beyond cut

ANNN-PATT Drawing View Major Group: optional number: textures and hatch patterns

ANNN-IDEN Drawing View Major Group: optional number: component identification numbers

ANNN-OTLN Drawing View Major Group: optional number: outline of object drawn

Annotation Layer List

Annotation Field Codes

Annotation consists of text, dimensions, notes, sheet borders, detail references and other elements on CAD drawings that do not represent physical aspects of a building. Use of the Major Group ANNO allows all annotation to be placed in a defined group of layers.

Annotation Layer Names

The Layer Names shown below provide examples for the use of Minor Group field codes for annotation. These Minor Groups may be used to modify any Major or Minor Group in the Layer List. (Blank boxes represent placeholders for layers (see drawing layer view above).

Layer Name	Description	New
□□-ANNO	Annotation	
□□-□□□□-BRNG	Bearings and distance labels (survey coordinates)	
□□-□□□□-DIMS	Dimensions	
□□-□□□□-IDEN	Identification tags	
□□-□□□□-KEYN	Keynotes	
□□-□□□□-LABL	Labels	
□□-□□□□-LEGN	Legends, symbol keys	
□□-□□□□-MARK	Markers, break marks, leaders	
□□-□□□□-MATC	Match lines	
□□-□□□□-NOTE	Notes	

Layer Name	Description	New
□□-□□□□-RDME	Read-me layer (not plotted)	
□□-□□□□-REDL	Redlines	
□□-□□□□-REFR	Reference, external files	
□□-□□□□-REVC	Revision clouds	
□□-□□□□-REVS	Revisions	
□□-□□□□-SCHD	Schedules	
□□-□□□□-SYMB	Reference symbols	
□□-□□□□-TEXT	Text	
□□-□□□□-TABL	Data tables	
□□-□□□□-TITL	Drawing or detail titles	
□□-□□□□-TTLB	Border and title block	

General Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline.

General Layer List

Layer Name	Description	New
G□-ACCS	Access plan	
G□-CODE	Code compliance plan	
G□-EVAC	Evacuation plan	
G□-FIRE	Fire protection plan	
G□-PLAN	Key plan (floor plan)	
G□-SITE	Key plan (site plan)	

General Discipline Designators

Designator	Description	New
G	General	
GI	General Informational	
GC	General Contractual	
GR	General Resource	
GJ	User-Defined	
GK	User-Defined	

Structural Layer List

Structural Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline.

Structural Discipline Designators

Designator	Description	New
S	Structural	
SD	Structural Demolition	
SS	Structural Site	
SB	Structural Substructure	
SF	Structural Framing	
SJ	User-Defined	
SK	User-Defined	

Structural Layer List

Layer Name	Description	New
S□-BEAM	Beams	
S□-BEAM-ALUM	Beams: aluminum	
S□-BEAM-CONC	Beams: concrete	
S□-BEAM-STEL	Beams: steel	
S□-BEAM-WOOD	Beams: wood	
S□-BRAC	Bracing	
S□-BRAC-ALUM	Bracing: aluminum	
S□-BRAC-ALUM-HORZ	Bracing: aluminum: horizontal	
S□-BRAC-ALUM-VERT	Bracing: aluminum: vertical	
S□-BRAC-STEL	Bracing: steel	
S□-BRAC-STEL-HORZ	Bracing: steel: horizontal	
S□-BRAC-STEL-VERT	Bracing: steel: vertical	
S□-BRAC-WOOD	Bracing: wood	
S□-BRAC-WOOD-HORZ	Bracing: wood: horizontal	
S□-BRAC-WOOD-VERT	Bracing: wood: vertical	
S□-COLS	Columns	

Layer Name	Description	New
Structural (continued)		
S□-COLS-ALUM	Columns: aluminum	
S□-COLS-CONC	Columns: concrete	
S□-COLS-STEL	Columns: steel	
S□-COLS-WOOD	Columns: wood	
S□-DECK	Structural deck	
S□-DECK-FLOR	Structural deck: floor	
S□-DECK-FLOR-OPNG	Structural deck: floor: openings	
S□-DECK-ROOF	Structural deck: roof	
S□-DECK-ROOF-OPNG	Structural deck: roof: openings	
S□-FNDN	Foundation	
S□-FNDN-FTNG	Foundation: footings	
S□-FNDN-GRBM	Foundation: grade beams	
S□-FNDN-PCAP	Foundation: pile caps	
S□-FNDN-PIER	Foundation: drilled piers	
S□-FNDN-PILE	Foundation: piles	
S□-FNDN-RBAR	Foundation: reinforcing	
S□-GRID	Column grid	
S□-GRID-EXTR	Column grid: exterior columns	
S□-GRID-INTR	Column grid: interior columns	
S□-JNTS	Joints	
S□-JNTS-CNTJ	Joints: construction	
S□-JNTS-CTLJ	Joints: control	
S□-JNTS-EXPJ	Joints: expansion	
S□-JOIS	Joists	
S□-JOIS-BRGX	Joists: bridging	
S□-PROP	Property lines	
S□-SLAB	Slab	

Layer Name	Description	New
Structural (continued)		
S□-SLAB-CONC	Slab: cast-in-place concrete	
S□-SLAB-OPNG	Slab: openings and depressions	
S□-SLAB-OPNX	Slab: opening indication ("x")	
S□-SLAB-EDGE	Slab: edge of slab	
S□-SLAB-STEL	Slab: steel slab	
S□-SLAB-WOOD	Slab: wood	
S□-STRS	Stairs	
S□-STRS-LADD	Stairs: ladders & ladder assemblies	
S□-TRUS	Trusses	
S□-WALL	Walls	
S□-WALL-CMUW	Walls: concrete masonry unit	
S□-WALL-CONC	Walls: cast-in-place concrete	
S□-WALL-MSNW	Walls: masonry	
S□-WALL-PCST	Walls: pre-cast concrete	
S□-WALL-SHEA	Walls: structural shear walls	
S□-WALL-STEL	Walls: steel stud	
S□-WALL-WOOD	Walls: wood	
S□-□□□□-ABLT	Any major group: anchor bolts	
S□-□□□□-METL	Any major group: misc. metals	
S□-□□□□-GRAT	Any major group: grates	
S□-□□□□-GRAT-OVHD	Any major group: grates: overhead	
S□-□□□□-RBAR	Any major group: reinforcing bar	
S□-□□□□-RBAR-BOT1	Any major group: reinforcing bar: bottom group 1	
S□-□□□□-RBAR-BOT2	Any major group: reinforcing bar: bottom group 2	
S□-□□□□-RBAR-TOP1	Any major group: reinforcing bar: top group 1	
S□-□□□□-RBAR-TOP2	Any major group: reinforcing bar: top group 2	

Architectural Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See page CLG-8 for complete rules and options governing the use of Major and Minor Group field codes.

Architectural Discipline Designators

Designator	Description	New
A	Architectural	
AS	Architectural Site	
AD	Architectural Demolition	
AE	Architectural Elements	
AI	Architectural Interiors	
AF	Architectural Finishes	
AG	Architectural Graphics	
AJ	User-Defined	
AK	User-Defined	

Architectural Layer List

Layer Name	Description	New
A□-□□□□-FNSH	Any major group: finishes	
A□-□□□□-CASE	Any major group: casework	
A□-□□□□-FIXT	Any major group: plumbing fixtures	
A□-□□□□-GRID	Any major group: grid	
A□-□□□□-SIGN	Any major group: signs	
A□-AREA	Area	
A□-AREA-OCCP	Area: occupant or employee names	
A□-CLNG	Ceiling	
A□-CLNG-ACCS	Ceiling: access	
A□-CLNG-OPEN	Ceiling: openings	

A□-AREA	Area
A□-AREA-OCCP	Area: occupant or employee names
A□-CLNG	Ceiling
A□-CLNG-ACCS	Ceiling: access
A□-CLNG-OPEN	Ceiling: openings

Layer Name	Description	New
Architectural (continued)		
A□-CLNG-TEES	Ceiling: main tees	
A□-CLNG-SUSP	Ceiling: suspended elements	
A□-COLS	Columns	
A□-CONV	Conveying systems	
A□-DOOR	Doors	
A□-DOOR-FULL	Doors: full-height (swing and leaf)	
A□-DOOR-PRHT	Doors: partial height (swing and leaf)	
A□-EQPM	Equipment	
A□-EQPM-ACCS	Equipment: access	
A□-EQPM-FIXD	Equipment: fixed equipment	
A□-EQPM-MOVE	Equipment: moveable equipment	
A□-EQPM-NICN	Equipment: not in contract	
A□-EQPM-OVHD	Equipment: overhead	
A□-FLOR	Floor	
A□-FLOR-CASE	Floor: casework	
A□-FLOR-EVTR	Floor: elevator cars and equipment	
A□-FLOR-HRAL	Floor: handrails, guard rails	
A□-FLOR-LEVL	Floor: level changes, ramps, pits, depressions	
A□-FLOR-OTLN	Floor: outline	
A□-FLOR-OVHD	Floor: overhead (objects above)	
A□-FLOR-RAIS	Floor: raised	
A□-FLOR-RISR	Floor: stair risers	
A□-FLOR-SIGN	Floor: signs	
A□-FLOR-SPCL	Floor: specialties (toilet room accessories, display cases)	
A□-FLOR-STRS	Floor: stair treads, escalators, ladders	
A□-FLOR-TPTN	Floor: toilet partitions	

Layer Name	Description	New
Architectural (continued)		
A□-FLOR-WDWK	Floor: architectural woodwork	
A□-FURN	Furnishings	
A□-FURN-FILE	Furnishings: file cabinets	
A□-FURN-FIXD	Furnishings: fixed in place	
A□-FURN-FREE	Furnishings: freestanding	
A□-FURN-PLNT	Furnishings: plants	
A□-FURN-PNLS	Furnishings: system panels	
A□-FURN-SEAT	Furnishings: seating	
A□-FURN-STOR	Furnishings: system storage components	
A□-FURN-WKSF	Furnishings: system work surface components	
A□-GLAZ	Glazing	
A□-GLAZ-FULL	Glazing: full-height	
A□-GLAZ-PRHT	Glazing: partial-height	
A□-GLAZ-SILL	Glazing: window sills	
A□-HVAC	HVAC	
A□-HVAC-SDFF	HVAC: supply diffusers	
A□-HVAC-RDFF	HVAC: return air diffusers	
A□-LITE	Lighting fixtures	
A□-ROOF	Roof	
A□-ROOF-HRAL	Roof: handrails	
A□-ROOF-LEVL	Roof: level changes	
A□-ROOF-OTLN	Roof: outline	
A□-ROOF-RISR	Roof: stair risers	
A□-ROOF-STRS	Roof: stair treads, ladders	
A□-WALL	Walls	
A□-WALL-CAVI	Walls: cavity	
A□-WALL-CNTR	Walls: centerline	
A□-WALL-FIRE	Walls: fire wall	
A□-WALL-FULL	Walls: full-height	
A□-WALL-HEAD	Walls: door and window headers	
A□-WALL-JAMB	Walls: door and window jambs	
A□-WALL-MOVE	Walls: moveable partitions	
A□-WALL-PRHT	Walls: partial-height	
A□-WALL-PATT	Walls: texture or hatch patterns	

Interiors Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline.

Interiors Discipline Designators

Designator	Description	New
I	Interior	
ID	Interior Demolition	
IN	Interior Design	
IF	Interior Furnishings	
IG	Interior Graphics	
IJ	User-Defined	
IK	User-Defined	

Interiors Layer List

Layer Name	Description	New
I□-□□□□-FIXT	Any major group: plumbing fixtures	
I□-□□□□-GRID	Any major group: grid	
I□-□□□□-SIGN	Any major group: signs	
I□-AREA	Area	
I□-AREA-OCCP	Area: occupant or employee names	
I□-CASE	Casework	
I□-CLNG	Ceiling	
I□-CLNG-ACCS	Ceiling: access	
I□-CLNG-OPEN	Ceiling: openings	
I□-CLNG-SUSP	Ceiling: suspended elements	
I□-CLNG-TEES	Ceiling: main tees	
I□-COLS	Columns	
I□-DOOR	Doors	
I□-DOOR-FULL	Doors: full-height	

Layer Name	Description	New
Interiors (continued)		
I□-DOOR-PRHT	Doors: partial height	
I□-EQPM	Equipment	
I□-EQPM-ACCS	Equipment: access	
I□-EQPM-FIXD	Equipment: fixed equipment	
I□-EQPM-MOVE	Equipment: moveable equipment	
I□-EQPM-NICN	Equipment: not in contract	
I□-EQPM-OVHD	Equipment: overhead	
I□-EQPM-STOR	Equipment: storage	
I□-FLOR	Floor	
I□-FLOR-EVTR	Floor: elevator cars and equipment	
I□-FLOR-FIXT	Floor: plumbing fixtures	
I□-FLOR-HRAL	Floor: handrails, guard rails	
I□-FLOR-LEVL	Floor: level changes, ramps, pits, depressions	
I□-FLOR-OTLN	Floor: outline	
I□-FLOR-OVHD	Floor: overhead (objects above)	
I□-FLOR-RAIS	Floor: raised	
I□-FLOR-RISR	Floor: stair risers	
I□-FLOR-SIGN	Floor: signs	
I□-FLOR-STRS	Floor: stair treads, escalators, ladders	
I□-FLOR-SPCL	Floor: architectural specialties (toilet room accessories, display cases)	
I□-FLOR-TPTN	Floor: toilet partitions	
I□-FLOR-WDWK	Floor: architectural woodwork	
I□-FNSH	Finishes	●
I□-FURN	Furnishings	
I□-FURN-FILE	Furnishings: file cabinets	
I□-FURN-FREE	Furnishings: freestanding	

Layer Name	Description	New
Interiors (continued)		
I□-FURN-PLNT	Furnishings: plants	
I□-FURN-PNLS	Furnishings: system panels	
I□-FURN-SEAT	Furnishings: seating	
I□-FURN-STOR	Furnishings: system storage components	
I□-FURN-WKSF	Furnishings: system work surface components	
I□-GLAZ	Glazing	
I□-GLAZ-FULL	Glazing: full-height	
I□-GLAZ-PRHT	Glazing: partial-height	
I□-GLAZ-SILL	Glazing: window sills	
I□-HVAC	HVAC	
I□-HVAC-SDFF	HVAC: supply diffusers	
I□-HVAC-RDFF	HVAC: return air diffusers	
I□-MILL	Millwork	●
I□-PRTN	Partitions	●
I□-PRTN-FULL	Partitions: full-height	●
I□- PRTN-PRHT	Partitions: partial-height	●
I□- PRTN-MOVE	Partitions: moveable partitions	●
I□- PRTN-HEAD	Partitions: door and window headers	●
I□- PRTN-JAMB	Partitions: door and window jambs	●
I□- PRTN-FIRE	Partitions: fire wall	●

Plumbing Layer List

Plumbing Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline

Plumbing Discipline Designators

Designator	Description	New
P	Plumbing	
PS	Plumbing Site	
PD	Plumbing Demolition	
PP	Plumbing Piping	
PQ	Plumbing Equipment	
PL	Plumbing	
PJ	User-Defined	
PK	User-Defined	

Plumbing Layer List

Layer Name	Description	New
P□-ACID	Acid waste systems	
P□-ACID-EQPM	Acid waste systems: equipment	●
P□-ACID-PIPE	Acid waste systems: piping	
P□-ACID-VENT	Acid waste systems: vents	●
P□-DOMW	Domestic water systems	
P□-DOMW-CPIP	Domestic water systems: cold water piping	
P□-DOMW-EQPM	Domestic water systems: equipment	
P□-DOMW-HPIP	Domestic water systems: hot water piping	
P□-DOMW-RISR	Domestic water systems: hot and cold water risers	

Layer Name	Description	New
Plumbing (continued)		
P□-DOMW-RPIP	Domestic water systems: hot water recirculation piping	
P□-MDGS	Medical gas	
P□-MDGS-CAIR	Medical gas: compressed air	
P□-MDGS-EQPM	Medical gas: equipment	
P□-MDGS-NITG	Medical gas: nitrogen	
P□-MDGS-NOXG	Medical gas: nitrous oxide	
P□-MDGS-OXYG	Medical gas: pure O2	
P□-MDGS-PIPE	Medical gas: piping	
P□-MDGS-SAIR	Medical gas: scavenge air	
P□-MDGS-VACU	Medical gas: medical vacuum	
P□-SANR	Sanitary drainage systems	
P□-SANR-PIPE	Sanitary drainage systems: piping	
P□-SANR-FIXT	Sanitary drainage systems: plumbing fixtures	
P□-SANR-FLDR	Sanitary drainage systems: floor drains	
P□-SANR-RISR	Sanitary drainage systems: risers	
P□-SANR-EQPM	Sanitary drainage systems: equipment	
P□-SANR-VENT	Sanitary drainage systems: vent piping	●
P□-STRM	Storm drainage systems	●
P□-STRM-PIPE	Storm drainage systems: piping	●
P□-STRM-RISR	Storm drainage systems: risers	●
P□-STRM-RFDR	Storm drainage systems: roof drains	●

Process Layer List

Process Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline.

Process Discipline Designators

Designator	Description	New
D	Process	
DS	Process Site	
DD	Process Demolition	
DJ	User-Defined	
DK	User-Defined	
DL	Process Liquids	
DG	Process Gases	
DP	Process Piping	
DQ	Process Equipment	
DE	Process Electrical	
DI	Process Instrumentation	
DW	Process Waters	●
DC	Process Chemicals	●
DA	Process Airs	●
DX	Process Exhaust	●
DR	Process Drains and Reclaims	●
DM	Process HPM Gases	●
DY	Process Slurry	●
DO	Process Oils	●
DV	Process Vacuum	●

Process Layer List

Layer Name	Description	New
Process (continued)		
D□-□□□□-□□□□-ANNO	Any major group: any minor group: notes, callouts, specifications	●
D□-□□□□-□□□□-BOLD	Any major group: any minor group: heavy	●
D□-□□□□-□□□□-CNTR	Any major group: any minor group: center line	●
D□-□□□□-□□□□-DIMS	Any major group: any minor group: dimensions	●
D□-□□□□-□□□□-EQPM	Any major group: any minor group: equipment	●
D□-□□□□-□□□□-FINE	Any major group: any minor group: light	●
D□-□□□□-□□□□-HDLN	Any major group: any minor group: hidden line	●
D□-□□□□-□□□□-IDEN	Any major group: any minor group: labels, identifiers	●
D□-□□□□-□□□□-MEDM	Any major group: any minor group: medium	●
D□-□□□□-□□□□-MISC	Any major group: any minor group: miscellaneous	●
D□-□□□□-□□□□-PATT	Any major group: any minor group: cross hatch	●
D□-□□□□-□□□□-PHTM	Any major group: any minor group: phantom	●
D□-□□□□-□□□□-PIPE	Any major group: any minor group: piping systems	●
D□-□□□□-□□□□-SPEC	Any major group: any minor group: specialty items	●
D□-□□□□-□□□□-SUPT	Any major group: any minor group: general pipe supports	●

Layer Name	Description	New
Process (continued)		
D□-□□□□-□□□□-UGRD	Any major group: any minor group: underground	●
D□-DETL-BOLD	Details: bold lines	●
D□-DETL-FINE	Details: fine lines	●
D□-DETL-MEDM	Details: medium lines	●
D□-DETL-NPLT	Details: nonplot layer	●
D□-DETL-TEXT	Details: text	●
D□-PAIR-AA~~	Air: agitation air - system	●
D□-PAIR-BA~~	Air: breathable air - system	●
D□-PAIR-CA~~	Air: compressed air - system	●
D□-PAIR-CDA~	Air: clean dry air - system	●
D□-PAIR-HCDA	Air: high pressure clean dry air - system	●
D□-PAIR-IA~~	Air: instrument air - system	●
D□-PAIR-OA~~	Air: outside air - system	●
D□-PAIR-OFA~	Air: oil free air - system	●
D□-PAIR-PA~~	Air: plant air - system	●
D□-PAIR-V~~~	Air: vent - system	●
D□-PCHM-ARC~	Chemical: regenerative caustic - system	●
D□-PCHM-C~~~	Chemical: caustic - system	●
D□-PCHM-DEV~	Chemical: developer - system	●
D□-PCHM-EG~~	Chemical: ethylene glycol - system	●
D□-PCHM-H2O2	Chemical: hydrogen peroxide - system	●
D□-PCHM-HCL~	Chemical: hydrochloric acid - system	●
D□-PCHM-HF~~	Chemical: hydrofluoric acid - system	●
D□-PCHM-IPA~	Chemical: isopropyl alcohol - system	●

Layer Name	Description	New
Process (continued)		
D□-PCHM-PHOS	Chemical: phosphoric acid - system	●
D□-PCHM-RER~	Chemical: solvent - system	●
D□-PCHM-SULF	Chemical: sulfuric acid - system	●
D□-PCHM-TMAH	Chemical: tmah - system	●
D□-PDRN-AMW~	Drains: ammonia waste - system	●
D□-PDRN-CD~~	Drains: condensate drain - system	●
D□-PDRN-CLW~	Drains: concentrated lead waste - system	●
D□-PDRN-CMW~	Drains: concentrated metals waste - system	●
D□-PDRN-CUPW	Drains: copper plating waste - system	●
D□-PDRN-CURW	Drains: copper rinse waste - system	●
D□-PDRN-CUSW	Drains: copper slurry waste - system	●
D□-PDRN-DIRC	Drains: di reclaim - system	●
D□-PDRN-DLW~	Drains: dilute waste - system	●
D□-PDRN-EGW~	Drains: ethylene glycol waste - system	●
D□-PDRN-HFW~	Drains: hydrofluoric waste - system	●
D□-PDRN-IW~~	Drains: industrial waste - system	●
D□-PDRN-MW~~	Drains: metals waste - system	●
D□-PDRN-NPWR	Drains: non-potable water reuse - system	●
D□-PDRN-OIW~	Drains: organic industrial waste - system	●
D□-PDRN-OLW~	Drains: organic liquid waste - system	●
D□-PDRN-OSW~	Drains: organic solvent waste - system	●
D□-PDRN-PHRC	Drains: phosphoric acid reclaim - system	●
D□-PDRN-PSW~	Drains: photo solvent waste - system	●

Layer Name	Description	New
Process (continued)		
D□-PDRN-SDD~	Drains: scrubber duct drains - system	●
D□-PDRN-SLW~	Drains: slurry waste - system	●
D□-PDRN-SULF	Drains: sulfuric acid waste - system	●
D□-PDRN-SULR	Drains: sulfuric acid reclaim - system	●
D□-PDRN-SW~~	Drains: solvent waste - system	●
D□-PDRN-SWF~	Drains: solvent waste flammable - system	●
D□-PDRN-SWNF	Drains: solvent waste non-flammable - system	●
D□-PEXH-AMEX	Exhaust: ammonia exhaust - system	●
D□-PEXH-AREX	Exhaust: arsenic exhaust - system	●
D□-PEXH-HTEX	Exhaust: heat exhaust - system	●
D□-PEXH-SCEX	Exhaust: scrubber exhaust - system	●
D□-PEXH-SVEX	Exhaust: solvent exhaust - system	●
D□-PGAS-AR~~	Gas: argon - system	●
D□-PGAS-ARB~	Gas: argon bulk - system	●
D□-PGAS-BUT~	Gas: butane - system	●
D□-PGAS-CLG~	Gas: chlorine gas - system	●
D□-PGAS-H2~~	Gas: hydrogen - system	●
D□-PGAS-HE~~	Gas: helium - system	●
D□-PGAS-HPN2	Gas: high purity nitrogen - system	●
D□-PGAS-HPO2	Gas: high purity oxygen - system	●
D□-PGAS-LCHE	Gas: leak check helium - system	●
D□-PGAS-N2~~	Gas: nitrogen - system	●
D□-PGAS-N2O~	Gas: nitrous oxide - system	●
D□-PGAS-NG~~	Gas: natural gas - system	●
D□-PGAS-O2~~	Gas: oxygen - system	●
D□-PGAS-PRO~	Gas: propane - system	●
D□-PGAS-SG~~	Gas: specialty gas - system	●
D□-PGAS-UN2~	Gas: utility nitrogen - system	●

Layer Name	Description	New
Process (continued)		
D□-PGAS-VN2~	Gas: venturi nitrogen - system	●
D□-PGAS-WAR~	Gas: weld argon - system	●
D□-PIPE-CNTR	General: center line	●
D□-PIPE-EQPM	General: equipment	●
D□-PIPE-HDLN	General: hidden line	●
D□-PIPE-IDEN	General: labels & identifiers	●
D□-PIPE-MISC	General: misc.	●
D□-PIPE-PATT	General: crosshatch	●
D□-PIPE-PIPE	General: piping systems	●
D□-PIPE-UGRD	General: underground	●
D□-PLQD-LPG~	Liquid: liquid petroleum gas - system	●
D□-POIL-LO~~	Oil: lube oil - system	●
D□-PSLR-SLR~	Slurry: slurry return - system	●
D□-PSLR-SLS~	Slurry: slurry supply - system	●
D□-PVAC-CLV~	Vacuum: chlorine vacuum - system	●
D□-PVAC-CV~~	Vacuum: chemical vacuum - system	●
D□-PVAC-EV~~	Vacuum: equipment vacuum - system	●
D□-PVAC-HV~~	Vacuum: house vacuum - system	●
D□-PVAC-HVA~	Vacuum: arsenic house vacuum - system	●
D□-PVAC-PV~~	Vacuum: vacuum - system	●
D□-PWTR-BFW~	Water: boiler feed water - system	●
D□-PWTR-DIR~	Water: deionized water return - system	●
D□-PWTR-DIS~	Water: deionized water supply - system	●
D□-PWTR-DIWP	Water: di polishing loop - system	●
D□-PWTR-FW~~	Water: fire water - system	●
D□-PWTR-HDIR	Water: hot di return - system	●
D□-PWTR-HDIS	Water: hot di supply - system	●

Layer Name	Description	New
Process (continued)		
D□-PWTR-HDRC	Water: hot di reclaim - system	●
D□-PWTR-HPDR	Water: high ph di return - system	●
D□-PWTR-HPDS	Water: high ph di supply - system	●
D□-PWTR-ICW~	Water: industrial city water - system	●
D□-PWTR-NPW~	Water: non-potable water - system	●
D□-PWTR-PCWR	Water: cooling water return - system	●
D□-PWTR-PCWS	Water: cooling water supply - system	●
D□-PWTR-PW~~	Water: potable water - system	●
D□-PWTR-RO~~	Water: reverse osmosis water - system	●
D□-PWTR-ROR~	Water: reverse osmosis reject water - system	●
D□-PWTR-TDIR	Water: tempered di return - system	●
D□-PWTR-TDIS	Water: tempered di supply - system	●
D□-PWTR-TW~~	Water: tempered water - system	●
D□-PWTR-UPRW	Water: ultra pure recycle water - system	●
D□-PWTR-UPW~	Water: ultra pure water - system	●

Mechanical Systems List

Mechanical Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline.

Mechanical Discipline Designators

Designator	Description	New
M	Mechanical	
MS	Mechanical Site	
MD	Mechanical Demolition	
MH	Mechanical HVAC	
MP	Mechanical Piping	
MI	Mechanical Instrumentation	
MJ	User-Defined	
MK	User-Defined	

Mechanical Layer List

Layer Name	Description	New
M□-ANNO	Annotation	●
M□-ANNO-DLTA	Annotation: revision delta	●
M□-ANNO-TTLB	Annotation: titleblock	●
M□-ANNO-TTLB-PROS	Annotation: titleblock: date/time/file name stamp	●
M□-BRIN	Brine systems	
M□-BRIN-EQPM	Brine systems: equipment	
M□-BRIN-PIPE	Brine systems: piping	
M□-CHIM	Chimneys and stacks	
M□-CMPA	Compressed / processed air systems	
M□-CMPA-ANNO	Compressed / processed air systems: annotation	●

Layer Name	Description	New
Mechanical (continued)		
M□-CMPA-EQPM	Compressed air systems: equipment	●
M□-CMPA-PIPE	Compressed air systems: piping	
M□-CMPA-PEQP	Compressed air systems: process equipment	
M□-CMPA-PPIP	Compressed air systems: process piping	
M□-CNDW	Condenser water systems	
M□-CNDW-ANNO	Condenser water systems: annotation	●
M□-CNDW-CONP	Condenser water systems: condensate piping	●
M□-CNDW-EQPM	Condenser water systems: equipment	
M□-CNDW-PIPE	Condenser water systems: piping	●
M□-CNDW-RETN	Condenser water systems: return	●
M□-CNDW-RETN-PIPE	Condenser water systems: return: piping	●
M□-CNDW-RETN-SKCH	Condenser water systems: return: sketch	●
M□-CNDW-SUPP	Condenser water systems: supply	●
M□-CNDW-SUPP-PIPE	Condenser water systems: supply: piping	●
M□-CNDW-SUPP-SKCH	Condenser water systems: supply: sketch	●
M□-CNDW-SYMB	Condenser water systems: symbol	●
M□-CONT	Controls and instrumentation	
M□-CONT-THER	Controls and instrumentation: thermostats	
M□-CONT-WIRE	Controls and instrumentation: low voltage wiring	
M□-CWTR	Chilled water systems	

Layer Name	Description	New
Mechanical (continued)		
M□-CWTR-ANNO	Chilled water systems: annotation	●
M□-CWTR-CONP	Chilled water systems: condensate piping	●
M□-CWTR-PIPE	Chilled water systems: piping	
M□-CWTR-EQPM	Chilled water systems: equipment	
M□-CWTR-RETN	Chilled water systems: return	●
M□-CWTR-RETN-PIPE	Chilled water systems: return: piping	●
M□-CWTR-RETN-SKCH	Chilled water systems: return: sketch	●
M□-CWTR-SUPP	Chilled water systems: supply	●
M□-CWTR-SUPP-PIPE	Chilled water systems: supply: piping	●
M□-CWTR-SUPP-SKCH	Chilled water systems: supply: sketch	●
M□-CWTR-SYMB	Chilled water systems: symbols	●
M□-DOMW	Domestic water systems	●
M□-DOMW-ANNO	Domestic water systems: annotation	●
M□-DOMW-MKUP	Domestic water systems: make-up water	●
M□-DUAL	Dual temperature systems	●
M□-DUAL-ANNO	Dual temperature systems: annotation	●
M□-DUAL-RETN	Dual temperature systems: return	●
M□-DUAL-RETN-PIPE	Dual temperature systems: return: piping	●
M□-DUAL-RETN-SKCH	Dual temperature systems: return: sketch	●
M□-DUAL-SUPP	Dual temperature systems: supply	●
M□-DUAL-SUPP-PIPE	Dual temperature systems: supply: piping	●
M□-DUAL-SUPP-SKCH	Dual temperature systems: supply: sketch	●

Layer Name	Description	New
Mechanical (continued)		
M□-DUAL-SYMB	Dual temperature systems: symbols	●
M□-DUST	Dust and fume collection systems	
M□-DUST-DUCT	Dust and fume collection systems: ductwork	
M□-DUST-EQPM	Dust and fume collection systems: equipment	
M□-ELHT	Electric heat	
M□-ELHT-EQPM	Electric heat: equipment	
M□-ENER	Energy management systems	
M□-ENER-EQPM	Energy management systems: equipment	
M□-ENER-WIRE	Energy management systems: wiring	
M□-EXHS	Exhaust system	
M□-EXHS-CDFF	Exhaust system: ceiling diffusers	
M□-EXHS-DUCT	Exhaust system: ductwork	
M□-EXHS-EQPM	Exhaust system: equipment	
M□-EXHS-RFEQ	Exhaust system: rooftop equipment	
M□-FUEL	Fuel systems	
M□-FUEL-EQPM	Fuel systems: equipment	
M□-FUEL-GGEP	Fuel systems: gas general piping	
M□-FUEL-GGEP-ANNO	Fuel systems: gas general piping: annotation	●
M□-FUEL-GGEP-HPIP	Fuel systems: gas general piping: high pressure	●
M□-FUEL-GGEP-LPIP	Fuel systems: gas general piping: low pressure	●
M□-FUEL-GGEP-LQPG	Fuel systems: gas general piping: liquid petroleum gas	●

Layer Name	Description	New
Mechanical (continued)		
M□-FUEL-GGEP-MPIP	Fuel systems: gas general piping: medium pressure	●
M□-FUEL-GPRP	Fuel systems: gas process piping	
M□-FUEL-OPRP	Fuel systems: oil process piping	
M□-FUEL-OGEP	Fuel systems: oil general piping	
M□-FUEL-OGEP-ANNO	Fuel systems: oil general piping: annotation	●
M□-FUEL-OGEP-DISC	Fuel systems: oil general piping: discharge	●
M□-FUEL-OGEP-FLLW	Fuel systems: oil general piping: flow	●
M□-FUEL-OGEP-GAGE	Fuel systems: oil general piping: gauge	●
M□-FUEL-OGEP-RETN	Fuel systems: oil general piping: return	●
M□-FUEL-OGEP-SUPP	Fuel systems: oil general piping: supply	●
M□-FUEL-OGEP-VENT	Fuel systems: oil general piping: vent	●
M□-FUEL-RPIP	Fuel systems: return piping	●
M□-FUEL-SPIP	Fuel systems: supply piping	●
M□-FUME	Fume hood	
M□-FUME-DUCT	Fume hood: exhaust ductwork	●
M□-FUME-EQPM	Fume hood: equipment	
M□-GLYC	Glycol systems	●
M□-GLYC-ANNO	Glycol systems: annotation	●
M□-GLYC-RETN	Glycol systems: return	●
M□-GLYC-RETN-PIPE	Glycol systems: return: piping	●
M□-GLYC-RETN-SKCH	Glycol systems: return: sketch	●
M□-GLYC-SUPP	Glycol systems: supply	●

Layer Name	Description	New
Mechanical (continued)		
M□-GLYC-SUPP-PIPE	Glycol systems: supply: piping	●
M□-GLYC-SUPP-SKCH	Glycol systems: supply: sketch	●
M□-GLYC-SYMB	Glycol systems: symbol	●
M□-HOTW	Hot water heating system	
M□-HOTW-ANNO	Hot water heating system: annotation	●
M□-HOTW-EQPM	Hot water heating system: equipment	
M□-HOTW-PIPE	Hot water heating system: piping	
M□-HOTW-RETN	Hot water heating system: return	●
M□-HOTW-RETN-PIPE	Hot water heating system: return: piping	●
M□-HOTW-RETN: SKCH	Hot water heating system: return: sketch	●
M□-HOTW-SUPP	Hot water heating system: supply	●
M□-HOTW-SUPP-PIPE	Hot water heating system: supply: piping	●
M□-HOTW-SUPP-SKCH	Hot water heating system: supply: sketch	●
M□-HOTW-SYMB	Hot water heating system: symbol	●
M□-HVAC	HVAC systems	
M□-HVAC-ANNO	HVAC systems: annotation	●
M□-HVAC-BOXD	HVAC systems: mixing box, dual duct	●
M□-HVAC-BOXS	HVAC systems: mixing box, single duct	●
M□-HVAC-CDFF	HVAC systems: ceiling diffusers	
M□-HVAC-CLDA	HVAC systems: cold air	●
M□-HVAC-CLDA-ANNO	HVAC systems: cold air: annotation	●
M□-HVAC-CLDA-DUCT	HVAC systems: cold air: ductwork	●

Layer Name	Description	New
Mechanical (continued)		
M□-HVAC-CLDA-EQPM	HVAC systems: cold air: ductwork equipment	●
M□-HVAC-CLDA-RSCH	HVAC systems: cold air: sketch line round or oval duct	●
M□-HVAC-CLDA-SECT	HVAC systems: cold air: ductwork section	●
M□-HVAC-CLDA-SIZE	HVAC systems: cold air: ductwork size	●
M□-HVAC-CLDA-SSCH	HVAC systems: cold air: sketch line rectangular duct	●
M□-HVAC-DMPR	HVAC systems: fire, smoke, volume damper	●
M□-HVAC-DOOR	HVAC systems: equipment doors	
M□-HVAC-EFAN	HVAC systems: equipment with electric fans	●
M□-HVAC-EPDU	HVAC systems: equipment with piping, ductwork and electricity	●
M□-HVAC-EPIP	HVAC systems: equipment with piping and electricity	●
M□-HVAC-EQPM	HVAC systems: equipment	
M□-HVAC-EXHS	HVAC systems: exhaust air	●
M□-HVAC-EXHS-ANNO	HVAC systems: exhaust air: annotation	●
M□-HVAC-EXHS-DUCT	HVAC systems: exhaust air: ductwork	●
M□-HVAC-EXHS-EQPM	HVAC systems: exhaust air: ductwork equipment	●
M□-HVAC-EXHS-GRIL	HVAC systems: exhaust air: grilles	●
M□-HVAC-EXHS-RSCH	HVAC systems: exhaust air: sketch line round or oval duct	●

Layer Name	Description	New
Mechanical (continued)		
M□-HVAC-EXHS-SECT	HVAC systems: exhaust air: ductwork section	●
M□-HVAC-EXHS-SIZE	HVAC systems: exhaust air: ductwork size	●
M□-HVAC-EXHS-SSCH	HVAC systems: exhaust air: sketch line rectangular duct	●
M□-HVAC-HOTA	HVAC systems: hot air	●
M□-HVAC-HOTA-ANNO	HVAC systems: hot air: annotation	●
M□-HVAC-HOTA-DUCT	HVAC systems: hot air: ductwork	●
M□-HVAC-HOTA-EQPM	HVAC systems: hot air: ductwork equipment	●
M□-HVAC-HOTA-RSCH	HVAC systems: hot air: sketch line round or oval duct	●
M□-HVAC-HOTA-SECT	HVAC systems: hot air: ductwork section	●
M□-HVAC-HOTA-SIZE	HVAC systems: hot air: ductwork size	●
M□-HVAC-HOTA-SSCH	HVAC systems: hot air: sketch line rectangular duct	●
M□-HVAC-IDEN	HVAC systems: identification tags	●
M□-HVAC-ODFF	HVAC systems: other diffusers	
M□-HVAC-PIPE	HVAC systems: piping	●
M□-HVAC-RDFF	HVAC systems: return air diffusers	
M□-HVAC-RDFF-IDEN	HVAC systems: return air diffusers: identification tags	●
M□-HVAC-RETN	HVAC systems: return ductwork	
M□-HVAC-RETN-ANNO	HVAC systems: return ductwork: annotation	●
M□-HVAC-RETN-DUCT	HVAC systems: return ductwork: ductwork	●

Layer Name	Description	New
Mechanical (continued)		
M□-HVAC-RETN-EQPM	HVAC systems: return ductwork: equipment	●
M□-HVAC-RETN-RSCH	HVAC systems: return ductwork: sketch line round or oval duct	●
M□-HVAC-RETN-SECT	HVAC systems: return ductwork: ductwork section	●
M□-HVAC-RETN-SIZE	HVAC systems: return ductwork: ductwork size	●
M□-HVAC-RETN-SSCH	HVAC systems: return ductwork: sketch line rectangular duct	●
M□-HVAC-SUPP	HVAC systems: supply ductwork	
M□-HVAC-SUPP-ANNO	HVAC systems: supply ductwork: annotation	●
M□-HVAC-SUPP-DUCT	HVAC systems: supply ductwork: ductwork	●
M□-HVAC-SUPP-EQPM	HVAC systems: supply ductwork: equipment	●
M□-HVAC-SUPP-RSCH	HVAC systems: supply ductwork: sketch line round or oval duct	●
M□-HVAC-SUPP-SECT	HVAC systems: supply ductwork: ductwork section	●
M□-HVAC-SUPP-SIZE	HVAC systems: supply ductwork: ductwork size	●
M□-HVAC-SUPP-SSCH	HVAC systems: supply ductwork: sketch line rectangular duct	●
M□-HVAC-SDFF	HVAC systems: supply diffusers	
M□-HVAC-SDFF-IDEN	HVAC systems: supply diffusers: identification tags	●
M□-LGAS	Laboratory gas systems	

Layer Name	Description	New
Mechanical (continued)		
M□-LGAS-EQPM	Laboratory gas systems: equipment	
M□-LGAS-PIPE	Laboratory gas systems: piping	
M□-MACH	Machine shop	
M□-MDGS	Medical gas	
M□-MDGS-CAIR	Medical gas: compressed air	
M□-MDGS-EQPM	Medical gas: equipment	
M□-MDGS-NITG	Medical gas: nitrogen	
M□-MDGS-NOXG	Medical gas: nitrous oxide	
M□-MDGS-OXYG	Medical gas: pure O2	
M□-MDGS-PIPE	Medical gas: piping	
M□-MDGS-SAIR	Medical gas: scavenge air	
M□-MDGS-VACU	Medical gas: medical vacuum	
M□-MKUP	Make-up air systems	
M□-MKUP-CDFF	Make-up air systems: ceiling diffusers	
M□-MKUP-DUCT	Make-up air systems: supply ducts	
M□-MKUP-EQPM	Make-up air systems: equipment	
M□-MPIP	Miscellaneous piping systems	●
M□-MPIP-ANNO	Miscellaneous piping systems: annotation	●
M□-MPIP-IDEN	Miscellaneous piping systems: identification tags	●
M□-MPIP-PIPE	Miscellaneous piping systems: piping	●
M□-MPIP-SYMB	Miscellaneous piping systems: symbols	●
M□-NGAS	Natural gas systems	
M□-NGAS-EQPM	Natural gas systems: equipment	
M□-NGAS-PIPE	Natural gas systems: piping	

Layer Name	Description	New
Mechanical (continued)		
M□-PROC	Process systems	
M□-PROC-EQPM	Process systems: equipment	
M□-PROC-PIPE	Process systems: piping	
M□-RAIR	Relief air systems	
M□-RCOV	Energy recovery systems	
M□-RCOV-EQPM	Energy recovery systems: equipment	
M□-RCOV-PIPE	Energy recovery systems: piping	
M□-REFG	Refrigeration systems	
M□-REFG-ANNO	Refrigeration systems: annotation	●
M□-REFG-DISC	Refrigeration systems: discharge	●
M□-REFG-EQPM	Refrigeration systems: equipment	
M□-REFG-PIPE	Refrigeration systems: piping	
M□-REFG-RETN	Refrigeration systems: return	●
M□-REFG-SUPP	Refrigeration systems: supply	●
M□-SMOK	Smoke extraction systems	
M□-SMOK-CDFF	Smoke extraction systems: ceiling diffusers	
M□-SMOK-DUCT	Smoke extraction systems: duct	
M□-SMOK-EQPM	Smoke extraction systems: equipment	
M□-SPCL	Special systems	
M□-SPCL-EQPM	Special systems: equipment	
M□-SPCL-PIPE	Special systems: piping	
M□-STEM	Steam systems	
M□-STEM-ANNO	Steam systems: annotation	●
M□-STEM-BLBD	Steam systems: boiler blow down piping	●

Layer Name	Description	New
Mechanical (continued)		
M□-STEM-BLBD-PIPE	Steam systems: boiler blow down piping: piping	●
M□-STEM-CONP	Steam systems: condensate piping	
M□-STEM-CONP-PIPE	Steam systems: condensate piping: piping	●
M□-STEM-CONP-SKCH	Steam systems: condensate piping: sketch	●
M□-STEM-EQPM	Steam systems: equipment	
M□-STEM-HPIP	Steam systems: high-pressure steam piping	
M□-STEM-HPIP-PIPE	Steam systems: high-pressure steam piping: piping	●
M□-STEM-HPIP-SKCH	Steam systems: high-pressure steam piping: sketch	●
M□-STEM-LPIP	Steam systems: low-pressure steam piping	
M□-STEM-LPIP-PIPE	Steam systems: low-pressure steam piping: piping	●
M□-STEM-LPIP-SKCH	Steam systems: low-pressure steam piping: sketch	●
M□-STEM-MPIP	Steam systems: medium-pressure steam piping	
M□-STEM-MPIP-PIPE	Steam systems: medium-pressure steam piping: piping	●
M□-STEM-MPIP-SKCH	Steam systems: medium-pressure steam piping: sketch	●
M□-STEM-SYMB	Steam systems: symbols	●
M□-TEST	Test equipment	

Electrical Layer List

Electrical Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline.

Electrical Discipline Designators

Designator	Description	New
E	Electrical	
ES	Electrical Site	
ED	Electrical Demolition	
EP	Electrical Power	
EL	Electrical Lighting	
EI	Electrical Instrumentation	
ET	Electrical Telecommunications	
EY	Electrical Auxiliary Systems	
EJ	User-Defined	
EK	User-Defined	

Electrical Layer List

Layer Name	Description	New
E□-□□□□-1LIN	Any major group: one-line diagrams	
E□-□□□□-RISR	Any major group: riser diagram	
E□-ALRM	Alarm system	
E□-AUXL	Auxiliary systems	
E□-BELL	Bell system	
E□-CABL	Cable system	●
E□-CABL-ANNO	Cable system: annotation	●
E□-CABL-ANNO-KEYN	Cable system: annotation: keynotes	●

Layer Name	Description	New
Electrical (continued)		
E□-CABL-ANNO-NOTE	Cable system: annotation: notes	●
E□-CABL-COAX	Cable system: coax cable	●
E□-CABL-FIBR	Cable system: fiber optics cable	●
E□-CABL-MULT	Cable system: multi-conductor cable	●
E□-CABL-REVC	Cable system: revision clouds	●
E□-CABL-REVS	Cable system: revisions	●
E□-CABL-TRAY	Cable system: cabletray and wireways	●
E□-CCTV	Closed-circuit TV	
E□-CLOK	Clock system	
E□-CLOK-ANNO	Clock system: annotation	●
E□-CLOK-ANNO-KEYN	Clock system: annotation: keynotes	●
E□-CLOK-ANNO-NOTE	Clock system: annotation: notes	●
E□-CLOK-CIRC	Clock system: circuits	●
E□-CLOK-CLNG	Clock system: ceiling-mounted	●
E□-CLOK-CNMB	Clock system: circuit numbers	●
E□-CLOK-EQPM	Clock system: equipment	●
E□-CLOK-FLOR	Clock system: floor-mounted	●
E□-CLOK-IDEN	Clock system: identification and text	●
E□-CLOK-REVC	Clock system: revision clouds	●
E□-CLOK-REVS	Clock system: revisions	●
E□-CLOK-WALL	Clock system: wall-mounted	●
E□-COMM	Telephone, communication outlets	
E□-COMM-ANNO	Telephone, communication outlets: annotation	●
E□-COMM-ANNO-KEYN	Telephone, communication outlets: annotation: keynotes	●

Layer Name	Description	New
Electrical (continued)		
E□-COMM-ANNO-NOTE	Telephone, communication outlets: annotation: notes	●
E□-COMM-CIRC	Telephone, communication outlets: circuits	●
E□-COMM-CLNG	Telephone, communication outlets: ceiling-mounted	●
E□-COMM-CNMB	Telephone, communication outlets: circuit numbers	●
E□-COMM-EQPM	Telephone, communication outlets: equipment	●
E□-COMM-IDEN	Telephone, communication outlets: identification and text	●
E□-COMM-REVC	Telephone, communication outlets: revision clouds	●
E□-COMM-REVS	Telephone, communication outlets: revisions	●
E□-COMM-WALL	Telephone, communication outlets: wall-mounted	●
E□-CTRL	Control systems	
E□-CTRL-DEVC	Control systems: devices	
E□-CTRL-WIRE	Control systems: wiring	
E□-DATA	Data outlets	
E□-DATA-ANNO	Data outlets: annotation	●
E□-DATA-ANNO-KEYN	Data outlets: annotation: keynotes	●
E□-DATA-ANNO-NOTE	Data outlets: annotation: notes	●
E□-DATA-CIRC	Data outlets: circuits	●
E□-DATA-CLNG	Data outlets: ceiling-mounted	●
E□-DATA-CNMB	Data outlets: circuit numbers	●
E□-DATA-EQPM	Data outlets: equipment	●

Layer Name	Description	New
Electrical (continued)		
E□-DATA-FLOR	Data outlets: floor-mounted	●
E□-DATA-IDEN	Data outlets: identification and text	●
E□-DATA-REVC	Data outlets: revision clouds	●
E□-DATA-REVS	Data outlets: revisions	●
E□-DATA-WALL	Data outlets: wall-mounted	●
E□-DIAG	Diagrams	●
E□-DIAG-ANNO	Diagrams: annotation	●
E□-DIAG-ANNO-KEYN	Diagrams: annotation: keynotes	●
E□-DIAG-ANNO-NOTE	Diagrams: annotation: notes	●
E□-DIAG-BKRS	Diagrams: breakers	●
E□-DIAG-BUSS	Diagrams: bus duct	●
E□-DIAG-ENCL	Diagrams: equipment enclosures	●
E□-DIAG-EQPM	Diagrams: equipment	●
E□-DIAG-FEED	Diagrams: feeders	●
E□-DIAG-FLOR	Diagrams: floor lines	●
E□-DIAG-GRND	Diagrams: grounding	●
E□-DIAG-REVC	Diagrams: revision clouds	●
E□-DIAG-REVS	Diagrams: revisions	●
E□-DIAG-SWCH	Diagrams: switches	●
E□-DIAG-XFMR	Diagrams: transformers	●
E□-DICT	Central dictation system	
E□-DICT-ANNO	Central dictation system: annotation	●
E□-DICT-ANNO-KEYN	Central dictation system: annotation: keynotes	●
E□-DICT-ANNO-NOTE	Central dictation system: annotation: notes	●
E□-DICT-CIRC	Central dictation system: circuits	●

Uniform Drawing System

Sheet Identification

The sheet identification format has its roots in traditional construction drawing techniques. However, the advent of systems methods, overlay drafting, and CAD has demanded more consistency in labeling and organizing sheets. These technologies have also provided an opportunity to expand the role of the sheet identifier. Accordingly, the sheet identification format is a key part of UDS.

Standard Sheet Identification

The sheet identification format is applicable to both manual and CAD drawing production. It is consistent, yet flexible enough for a wide range of project scopes. The UDS sheet identification format depicted here has four components:

The discipline designator, consisting of one or two alphabetical characters

The hyphen separates the disciplined designator from the sheet type designator

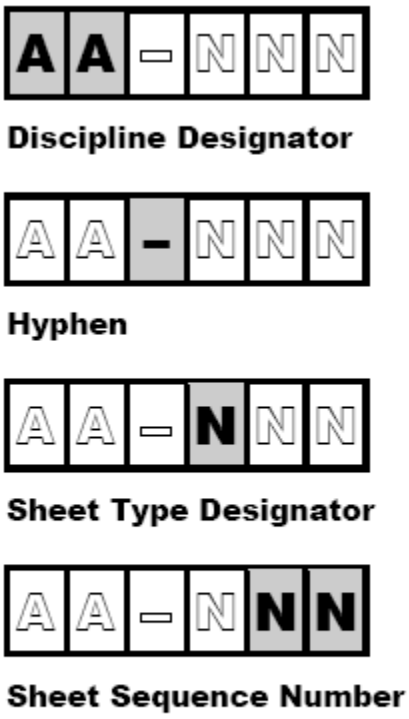
The sheet type designator, consisting of one numerical character

The sheet sequence number, consisting of two numerical characters

The one- or two-character discipline designator identifies the sheet as a member of a subset. A sheet type designator that identifies the type of information on the sheet is followed by the sheet sequence number. Recognizing the wide variance in project complexity, UDS allows two levels of sheet identification. Either of these or a combination of the two can be used to suit the project or the intended use of the drawings.

Level 1 offers the simplest identification format and would be suitable for all but the most complex projects.

Level 2 provides guidance for complex or special types of projects.



A = *alphabetical character*
N = *numerical character*

Note that the hyphen in the Level 1 discipline designator is a required place holder in the absence of the second character. The hyphen is preferred rather than a decimal point due to the use of the “dot” in electronic file names. Alternatively, an underscore may be used to replace the hyphen when a particular operating system does not accept hyphens in file names.

Abbreviated Sheet Identification

UDS also provides for an abbreviated sheet identification format. While a large, complex project can obviously make use of the full set of discipline designators, sheet type designator, and sheet sequence numbers, a small project's one sheet could simply use the identifier A-1.

For example, A-1 represents the designation A- - -1 with the modifier character, sheet type designator, and the first of the two sheet sequence numbers as an understood entity. The lack of the second, third, and fourth characters in the middle does not make finding a particular piece of information more difficult because all the information is contained on one sheet. For this reason, and because "understood" place holders may be misinterpreted, the standard sheet identification format makes use of all designators.

Discipline Designator

The first component of the sheet identification format, the discipline designator, is based on the traditional system of alphabetical discipline designators, using either a single alphabetical character with a hyphen (Level 1) or two alphabetical characters (Level 2). The discipline designator denotes the category of subject matter contained in the file or on the layer designated. A dash always follows the discipline designator, to separate the one- or two character discipline designator from the sheet number.

LEVEL 1 DISCIPLINE DESIGNATORS	
G	General
H	Hazardous Materials
V	Survey/Mapping
B	Geotechnical
W	Civil Works
C	Civil
L	Landscape
S	Structural
A	Architectural
I	Interiors
Q	Equipment
F	Fire Protection
P	Plumbing
D	Process
M	Mechanical
E	Electrical
T	Telecommunications
R	Resource
X	Other Disciplines
Z	Contractor/Shop Drawings
O	Operations

For example, the electrical engineer may be the designer for a telephone system. The drawings required may be included on the E (Electrical) sheets along with the rest of the drawings produced by that designer. If the level of detail demands it, the electrical engineer may decide to segregate the telephone system information onto sheets with the Level 2 designator ET (Electrical Telecommunications).

For an even more complex project involving voice, data, security, and signal systems, separate drawings for each communications system may be required, perhaps even produced by a network specialist. In this case the discipline designator T (Telecommunications) could be used, combined with specific modifier characters to create the Level 2 discipline designators TN (Telecommunications Network), TT (Telecommunications Telephone), or TY (Telecommunications Security).

Designator		Description of Suggested Name	Content
Level 1	Level 2		
T	**-**	**Telecommunications**	
-	**TA**	Audio Visual	Cable, music, and closed-circuit television (CCTV) systems
-	**TC**	Clock and Program	Time generators and bell program systems
-	**TI**	Intercom	Intercom and public address systems
-	**TM**	Monitoring	Monitoring and alarm systems
-	**TN**	Data Networks	Network cabling and equipment
-	**TT**	Telephone	Telephone systems, wiring, and equipment
-	**TY**	Security	Access control and alarm systems

Sheet Type Designator

The second component of the sheet identification format is the sheet type designator. The sheet type is identified by a single numerical character. All sheet types may apply to all discipline designators. It is not necessary to use all the sheet types for a project or within a discipline.

SHEET TYPE DESIGNATORS	
0	**General** (symbols legend, notes, etc.)
1	**Plans** (horizontal views)
2	**Elevations** (vertical views)
3	**Sections** (sectional views, wall sections)
4	**Large-Scale Views** (plans, elevations, stair sections, or sections that are not details)
5	**Details**
6	**Schedules and Diagrams**
7	**User Defined** (for types that do not fall in other categories, including typical detail sheets)
8	**User Defined** (for types that do not fall in other categories)
9	**3D Representations** (isometrics, perspectives, photographs)

The use of sheet type designators does not preclude combining different types of drawings on the same sheet for simplicity. For instance, it is acceptable to • Place profile drawings on sanitary sewer or road plan sheets

Place same scale sections on the same sheet as large-scale plans of stairs or escalators

Place schedules on a plan sheet when the information is closely associated • Different types of drawings may be combined on the same sheet on small projects

When the type of drawings on a sheet is mixed, clearly identify all of the drawings contained on the sheet in the sheet title block.

Sheet Sequence Number

The third component of the sheet identification format, a two-digit sheet sequence number, identifies each sheet in a series of the same discipline and sheet type. Sequence numbering starts with 01; sheet number 00 is not permitted. The first sheet of each series is numbered 01, followed by 02 through 99. Sequence numbers need not be sequential, to permit future insertion of sheets during design. While many projects may not require more than a single digit, standardization of a two-digit sequence number allows for efficient electronic file sorting and facility management databases.

On plan sheets, it may be desirable to replicate the floor name within each discipline. This makes sheets A-102, M-102, and E-102 the second floor plan for each of the various disciplines. This system may become cumbersome when basements and mezzanines or split-level plans are involved. Evaluate each project carefully before deciding to implement this option.

Additional drawings inserted in a set of drawings after a sheet identification organization has already been established can be identified with a suffix. This suffix may be comprised of three user-defined designators.

Supplemental Drawings

Small changes on a drawing are normally accomplished with the use of revision clouds and numbers accompanied with a brief description in the revision block. Occasionally an entire drawing must be altered and reissued for supplementary work involving a change in scope. When this occurs, a user-defined suffix character to the sheet identifier may be introduced. Descriptors include R for revised issues of similar scope, X for complete changes, and A, B, C... for phased work where multiple versions of the same drawing are expected. A dash always follows the sheet sequence number to separate it from the numbering for supplemental drawings.

A A – N **N N**

Sheet Sequence Number

A A – N N N – **U U U**

User-Defined Designators

A A – N N N

Discipline Designator

A A **–** N N N

Hyphen

A A – **N** N N

Sheet Type Designator

A A – N **N N**

Sheet Sequence Number

A = *alphabetical character*
N = *numerical character*

A – 1 0 2 – **R 1**

A-102-R1 *for a partially revised floor plan.*

A – 1 0 2 – **X 1**

A-102-X1 *for a totally revised floor plan.*

A – 1 0 2 – **A 1**

A-102-A1 *for Phase 1 of a sequenced construction floor plan.*

File Naming

A sheet of drafting film or vellum provides the media to organize and present the graphical and non-graphical elements necessary for the design and construction of a facility. The electronic equivalent, the data file, collects and records the same elements in a similar manner. However, the flexibility and ease of use of the electronic form of that information has created new opportunities for building owners, facility managers, space planners, and others. Construction drawings developed for a project have value throughout the entire life of the building.

The electronic data file is now the sheet that not only documents the efforts of a design team, but also organizes information needed for the operation and maintenance of a facility. The way the data file is structured, how members of the team access and contribute to the file, and who uses the file in the future are all new thought processes to a firm making the transition from a manual production system.

Consistent file naming and folder (directory) structures are necessary for management of the information that is reusable from project to project, as well as effective management of the graphical and non-graphical information related to a construction project.

File Categories

The two broad categories of files, library and project, require consistent but different approaches to developing a file name format.

Library Files

Library files are those used as sources of information for more than one project. They can be detail, schedule, text, database, symbol, border, and title block files. The term “reference” file is not used here because that has taken on a specific meaning in current CAD software. It is recommended that manufacturers, suppliers, vendors, and all associated parties who intend to produce library files for use on multiple projects present these library files in full compliance with the U.S. National CAD Standard. The naming of these files shall follow either the MasterFormat™ or UniFormat™ file naming method as adopted by the U.S. National CAD Standard.

Naming Library Files - Library files should be named differently from project files because the classification and indexing requirements are different. Library file naming should be grouped by building systems, assemblies, or usage because that is the most natural way to search for them. MasterFormat and UniFormat numbers provide a useful method of organization for this purpose.

There are growing numbers of trade associations, manufacturers, and suppliers who supply details and product information in an electronic catalog. These catalogs are classified as a specific type of library file. Currently, manufacturers and industry associations are developing conventions for library file naming.

Library files are not intended to be edited directly for a project. If a drawing is needed from the library, the library file should always be copied into the project directory and assigned a file name appropriate to the project. It can then be modified to suit the project requirements while the original library file is preserved for another use. A project detail is simply a drawing that is specifically indexed and cross-referenced within a project.

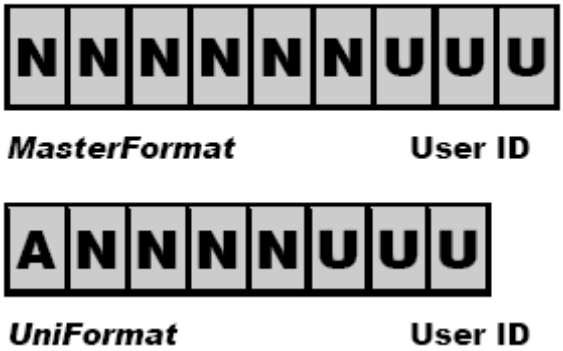
Project Files

Project files are specific to a project and must be organized to make it easy to produce contract documents, record documents, and facility management documents from many different files.

Project files can be building and site models, details, sheets, schedules, text, database, symbols, borders, title blocks, and other files created for the project.

Naming Project Files - For a given project, the project file name must be consistent from firm to firm. These files may be used by clients, consultants, regulatory agents, facility managers, and others. UDS provides a guideline for the uniform naming of files.

Library File Format



Project File Types

The type of file directly affects the format of the file name of project files. The following types of files may be used in electronic construction documentation:

Model

Detail

Sheet

Schedule

Text

Database

Symbols

Border

Title Block

Model Files

A building model is an electronic representation of a building. Elements graphically representing the building or site should always be created at their “real-world” size in their “realworld” units.

A model file contains a whole or partial full-scale digital model of the building or site. A model is not intended to represent an ideal, standard, or template as in “a model to follow.”

There are three main variations in the processes of building digital models and extracting or composing construction drawings from them. There can be a single multi-discipline building model a single model for each construction discipline or several models per discipline

These models may be 2D or 3D, but they all must be accurate, complete, and in conformance to emerging industry standards in regard to layer/level usage and symbology.

Naming Model Files

The first character is the single letter discipline designator. These are presented in the sheet identification format section of this module.

The second character is the hyphen. It serves as a placeholder that makes the name more readable and easier to manage.

The third and fourth characters define the type of model. The following designations are examples.

The optional prefix is for project identification for use by computer operation systems that allow more than 8.3 characters.

MODEL FILE TYPES	
FP	Floor Plan
SP	Site Plan
DP	Demolition Plan
QP	Equipment Plan
XP	Existing Plan
EL	Elevation
SC	Section
DT	Detail
SH	Schedules
3D	Isometric/3D
DG	Diagrams

The fifth through eighth positions are alphanumeric user-defined modifiers for the model types. The three remaining characters after the required decimal point are defined by the CAD

software and represent file extensions such as .dgn, .dwg, .dwf, and .dxf.

Discipline Designator

Placeholder

Type of Model

Optional Prefix

User-Defined Model Type Modifiers

File Extension

Detail Files

Project detail files are a specific type of model file. They can include plans, elevations, sections, and details. They are discussed here because they form the majority of the individual files in a project.

When project detail files are incorporated on a sheet, they are indexed using sheet grid coordinates. Their file names require close coordination with the sheet file upon which they are placed. The identification of details is part of the system that includes the drawing blocks (drawing area coordinate system), the sheet identification format, and the use of a two-part reference bubble.

Naming Detail Files

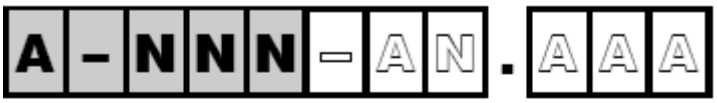
The first five characters are identical to the sheet identification of the sheet file that contains the detail. This coordinates the individual detail file to the specific detail sheet.

The sixth character is the hyphen. It serves as a placeholder that makes the name more readable and easier to manage.

The seventh and eighth characters are used for the detail identification number.

This is an example of a file name of a specific project detail found on sheet A-501. The detail identification number B3 indicates that it is located on the sheet at grid coordinates B3. The two-part reference bubble for this detail would be B3/A-501.

Detail File Name Format



Sheet Identification

Placeholder

Detail Identification Number

Example of Detail Identification

File Management Recommendations

Effective file management is an important part of an efficient design and production operation. Unless properly controlled, there will be no end to the quantity of CAD files that accumulate on a computer's disk drive during the course of a project. Computer operating systems provide a tool that carries the office metaphor into the electronic environment. This tool is the folder or directory.

File Folders

There will usually be more than one project on a computer's hard drive at any point in time. Because the file name uses the available eight-character limitation of the current DOS- or Mac-based system (and the software applies the three-character extension), the preceding file naming system recommendations will obviously create many files with the same name. Operating systems software will not allow two identical file names to exist in the same folder in

the system. Separate folders are required, and because they offer powerful disk management capability, they are also desired.

Folder Names shall follow convention listed above

When using Solid Modeling or three dimensional (3D) software, all associated files must be contained within the parent folder.

Most solid modeling software offers “ Pack and Go “ features. This feature finds all references of all data associated with the model.