United States National CAD Standard®- V5

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AIA CAD Layer Guidelines

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0.0 Introduction

0.1 OVERVIEW

Virtually all vector-based CAD systems support the concept of layers. This function allows building design information to be organized in a systematic fashion, facilitates the visual display of the information on a computer screen, and allows the information to be efficiently converted to the conventional print media of drawings. Efficient use of layers can reduce document preparation time and improve document coordination. Organizing data by layers allows a single CAD file to contain a wealth of information about a building or facility. By turning selected layers on or off, data can be created, reviewed and edited according to a hierarchy that simulates the physical organization of building systems, the relative position of building elements, or the sequence of construction.

0.2 A BRIEF HISTORY OF CAD LAYER GUIDELINES (CLG)

The American Institute of Architects (AIA) published the first edition of *CAD Layer Guidelines* in 1990. The early success of the first edition and rapidly evolving technology resulted in the second edition being published in 1997. The most significant change between the first and second editions was the elimination of the "short" layer name

format and the adoption of the long layer name format as a single standard. The second edition also included additional layer field codes for remodeling projects, added new discipline designations for interiors, telecommunications, and other disciplines, and improved the method of organizing drawing annotation.

In July 1997, the AIA agreed to incorporate *CAD Layer Guidelines* into the emerging *United States National CAD Standard*® (NCS), a project of the National Institute of Building Sciences (NIBS). The AIA and NIBS were joined in that effort by the Construction Specifications Institute (CSI) and what is now known as the CADD/GIS Technology Center of the U.S. Army Corps of Engineers. CSI and CADD/GIS Technology Center agreed to incorporate their own publications, the *Uniform Drawing System* and the *Plotting Guidelines*, respectively, into the NCS. These four constituent publishers, as they came to be known, were joined by a number of building design and construction industry organizations in developing and publishing the NCS.

In March 1999, the U.S. National CAD Standard Project Committee (NCS Project Committee) formally accepted *CAD Layer Guidelines, Second Edition* (with minor amendments) as a constituent document of the NCS Version 1.0, published in July 1999. The NCS Project Committee immediately set to work on publication of Version 2.0, which was published in 2002.

Considerable confusion resulted from the lack of "alignment" between the "Second Edition" of *CAD Layer Guidelines* and "Version 1.0" of the NCS. Because *CAD Layer Guidelines, Second Edition* was published before, and later incorporated into, the NCS Version 1.0, this could not be avoided. With publication of the NCS Version 2.0, this problem was corrected by giving the constituent document an entirely new name. For the first time, "AIA" became part of the title of the publication, and the numbered "editions" were abandoned. As a result, this publication became known as *AIA CAD Layer Guidelines: U.S. National CAD Standard - Version 2.0*. Subsequent editions of the NCS adopted the same nomenclature.

1.0 Layer Name Format

1.1 HIERARCHY OF DATA FIELDS

The layer name format is organized as a hierarchy. This arrangement allows users to select from a number of options for naming layers according to the level of detailed information desired. Layer names consist of distinct data fields separated from one another by dashes. A detailed list of abbreviations, or field codes, is prescribed to define the content of layers. Most field codes are mnemonic English abbreviations of construction terminology that are easy to remember.

There are four defined layer name data fields: Discipline Designator, Major Group, two Minor Groups, and Status. The Discipline Designator and Major Group fields are mandatory. The Minor Group and Status fields are optional. Each data field is separated from adjacent fields by a dash ("-") for clarity.

The complete NCS layer name format, showing the Discipline Designator, the Major Group, two Minor Groups, and the Status fields.

A	I	-	W	A	L	L	-	F	U	L	L	-	D	I	M	S	-	N

1.2 BEFORE YOU BEGIN

The NCS allows you to select from a number of format options for creating layer names. It is recommended that you select the options that you wish to use for layer names on a given project, and then apply the resulting format consistently for all layer names on that project.

NOTE: For *conceptual conformance* to ISO 13567, *Organization and Naming of Layers for CAD*, the layer name format and length must be the same for all layers on a given project. See *CLG Appendix C - Complying with NCS and ISO 13567, CLG section 6.0* for information about ISO conformance. Δ

1.3 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. The Discipline Designator is described in greater detail in UDS Section 1.3. For a complete list of Discipline Designators see *CLG Appendix A - Discipline Designators, CLG section 4.1* and *UDS Appendix A - Discipline Designators, UDS section 1.6*.

A typical layer name showing the required data fields only.

Note that only the mandatory discipline character is shown, creating a Level 1 Discipline Designator.

A	-	W	A	L	L

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

1.4 DISCIPLINE DESIGNATOR, LEVEL 2

The optional second character is used to further define the discipline character. As an example, the Level 2 Discipline Designators for Architectural are shown:

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

A typical layer name showing the required data fields only.

Note that the mandatory Level 1 discipline character is supplemented by the optional discipline modifier to create a Level 2 Discipline Designator.

A	**D**	-	W	A	L	L

For a complete list of Discipline Designators see *CLG Appendix A - List of Discipline Designators, Major and Minor Groups, and Status Fields, CLG section 4.1* and *UDS Appendix A - Discipline Designators, UDS section 1.6*.

1.5 MAJOR GROUP

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.

A typical layer name showing the required data fields only. The mandatory Major Group field is highlighted:

A	-	**W**	**A**	**L**	**L**

NOTE: The NCS recognizes that there will be instances where user-defined Major Group field codes will be required. The NCS set of Major Group field codes is not intended to be all inclusive. There will be instances when project specific Major Groups will need to be created. In these cases Major Group field codes are allowed, however, they must contain four alphabetic and/or numeric characters and/or "~", and must be fully documented on the NCS Compliance Disclosure Statement for the project or identified as project specific in the standard supplement in which they are used.

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 *CLG Appendix C - Complying with NCS and ISO 13567, CLG section 6.0* for information about ISO conformance. Δ

1.6 MINOR GROUP

This is an optional, four-character field to further define the Major Groups. For example, *A-WALL-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.

A typical layer name showing one optional Minor Group field:

A	-	W	A	L	L	-	**F**	**U**	**L**	**L**

A typical layer name showing two optional Minor Group fields:

A	-	W	A	L	L	-	**F**	**U**	**L**	**L**	-	**T**	**E**	**X**	**T**

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 NCS Compliance Disclosure Statement for the project on which they are used.

NOTE: For *conceptual conformance* to ISO 13567, *Organization and Naming of Layers for CAD*, the use of certain Minor Group field codes is restricted. See *CLG Appendix C - Complying with NCS and ISO 13567, CLG section 6.0* for information about ISO conformance. Δ

1.7 STATUS (PHASE)

The status field is an optional single-character field that distinguishes the data contained on the layer according to the status of the work or the construction phase. The prescribed field codes for this field are as follows:

A typical layer name showing the location of the optional Status field:

A	-	W	A	L	L	-	F	U	L	L	-	T	E	X	T	-	**N**

STATUS FIELD CODES	

A	Abandoned
D	Existing to demolish
E	Existing to remain
F	Future work
M	Items to be moved
N	New work
T	Temporary work
X	Not in contract
1-9	Phase numbers

NOTE: For *conceptual conformance* to ISO 13567, *Organization and Naming of Layers for CAD*, this field may be used to denote either "Status" OR "Phase," but not BOTH. See *CLG Appendix C - Complying with NCS and ISO 13567, CLG section 6.0* for information about ISO conformance. Δ

2.0 Drawing View Layer List

2.1 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 NCS Compliance Disclosure Statement for the project on which it is used.

The Minor Group field codes IDEN, MBND, MCUT, OTLN, and PATT may be used to modify any Major or Minor Group in the Layer List. The definitions of these prescribed field codes cannot be changed. See *CLG Sections 1.5 and 1.6* for rules and options governing the use of field codes.

2.2 DRAWING VIEW LAYER NAMES

Layer Name	Description
□□-DETL	Detail
□□-ELEV	Elevation
□□-SECT	Section
□□-□□□□-**ANNN**	Drawing View Major Group: optional number (**A** = letter, **NNN** = number between 001 and 999)
□□-□□□□-**ANNN**-IDEN	Drawing View Major Group: optional number: identification tags
□□-□□□□-**ANNN**-MBND	Drawing View Major Group: optional number: material beyond cut
□□-□□□□-**ANNN**-MCUT	Drawing View Major Group: optional number: material cut by the view
□□-□□□□-**ANNN**-OTLN	Drawing View Major Group: optional number: outline
□□-□□□□-**ANNN**-PATT	Drawing View Major Group: optional number: textures and hatch patterns

3.0 Annotation Layer List

3.1 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.

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.** See *CLG Sections 1.5* and *1.6* for complete rules and options governing the use of Major and Minor Group field codes.

3.2 ANNOTATION LAYER NAMES

Layer Name	Description
□□-ANNO	Annotation
□□-□□□□-BRNG	Bearings and distance labels (survey coordinates)
□□-□□□□-DIMS	Dimensions
□□-□□□□-IDEN	Identification tags
□□-□□□□-KEYN	Keynotes
□□-□□□□-LABL	Labels
□□-□□□□-LEGN	Legends, symbol keys
□□-□□□□-LOGO	Company logo
□□-□□□□-MARK	Markers, break marks, leaders
□□-□□□□-MATC	Match lines
□□-□□□□-NOTE	Notes
□□-□□□□-NPLT	Non-plotting graphic information
□□-□□□□-PROS	Date/Time/File name stamp
□□-□□□□-RDME	Read-me layer (not plotted)
□□-□□□□-REDL	Redlines
□□-□□□□-REFR	Reference, external files
□□-□□□□-REVC	Revision clouds
□□-□□□□-REVS	Revision indicators and text
□□-□□□□-SCHD	Schedules
□□-□□□□-STMP	Professional stamps
□□-□□□□-SYMB	Reference symbols
□□-□□□□-TABL	Data tables
□□-□□□□-TEXT	Text
□□-□□□□-TITL	Drawing or detail titles
□□-□□□□-TTLB	Border and title block

4.0 Appendix A - List of Discipline Designators, Major and Minor Groups, and Status Fields

The CLG states that "any Major Group may be combined with any prescribed Discipline Designator, provided that the definition of the Major Group remains unchanged" and "any Minor Group may be used to modify any Major Group, provided that the definition of the Minor Group remains unchanged." Therefore the following alphabetical list of all Discipline Designators, Major and Minor Groups, and Status Fields regardless of discipline has been compiled for easy reference.

- 4.1 Discipline Designators
- 4.2 Major Groups
- 4.3 Minor Groups
- 4.4 Status Fields

4.1 DISCIPLINE DESIGNATORS

DOWNLOAD SPREADSHEET

Designator	Description
A	Architectural
AD	Architectural Demolition
AE	Architectural Elements
AF	Architectural Finishes
AG	Architectural Graphics
AI	Architectural Interiors
AJ	User Defined
AK	User Defined
AS	Architectural Site
B	Geotechnical
BJ	User Defined
BK	User Defined
C	Civil
CD	Civil Demolition
CG	Civil Grading
CI	Civil Improvements
CJ	User Defined
CK	User Defined
CN	Civil Nodes
CP	Civil Paving
CS	Civil Site
CT	Civil Transportation
CU	Civil Utilities
D	Process
DA	Process Airs
DC	Process Chemicals
DD	Process Demolition
DE	Process Electrical
DG	Process Gases
DI	Process Instrumentation

DJ	User Defined
DK	User Defined
DL	Process Liquids
DM	Process HPM Gases
DO	Process Oils
DP	Process Piping
DQ	Process Equipment
DR	Process Drains and Reclaims
DS	Process Site
DV	Process Vacuum
DW	Process Waters
DX	Process Exhaust
DY	Process Slurry
E	Electrical
ED	Electrical Demolition
EI	Electrical Instrumentation
EJ	User Defined
EK	User Defined
EL	Electrical Lighting
EP	Electrical Power
ES	Electrical Site
ET	Electrical Telecommunications
EY	Electrical Auxiliary Systems
F	Fire Protection
FA	Fire Detection and Alarm
FJ	User Defined
FK	User Defined
FX	Fire Suppression
G	General
GC	General Contractual
GI	General Informational
GJ	User Defined
GK	User Defined
GR	General Resource
H	Hazardous Materials
HA	Hazardous Materials Asbestos
HC	Hazardous Materials Chemicals
HJ	User Defined
HK	User Defined
HL	Hazardous Materials Lead

HP	Hazardous Materials PCB
HR	Hazardous Materials Refrigerants
I	Interior
ID	Interior Demolition
IF	Interior Furnishings
IG	Interior Graphics
IJ	User Defined
IK	User Defined
IN	Interior Design
L	Landscape
LD	Landscape Demolition
LG	Landscape Grading
LI	Landscape Irrigation
LJ	User Defined
LK	User Defined
LL	Landscape Lighting
LP	Landscape Planting
LR	Landscape Relocation
LS	Landscape Site
M	Mechanical
MD	Mechanical Demolition
MH	Mechanical HVAC
MI	Mechanical Instrumentation
MJ	User Defined
MK	User Defined
MP	Mechanical Piping
MS	Mechanical Site
O	Operations
OJ	User Defined
OK	User Defined
P	Plumbing
PD	Plumbing Demolition
PJ	User Defined
PK	User Defined
PL	Plumbing
PP	Plumbing Piping
PQ	Plumbing Equipment
PS	Plumbing Site
Q	Equipment
QA	Equipment Athletic

QB	Equipment Bank
QC	Equipment Dry Cleaning
QD	Equipment Detention
QE	Equipment Educational
QF	Equipment Food service
QH	Equipment Hospital
QJ	User Defined
QK	User Defined
QL	Equipment Laboratory
QM	Equipment Maintenance
QP	Equipment Parking Lot
QR	Equipment Retail
QS	Equipment Site
QT	Equipment Theatrical
QV	Equipment Video / Photographic
QY	Equipment Security
R	Resource
RA	Resource Architectural
RC	Resource Civil
RE	Resource Electrical
RJ	User Defined
RK	User Defined
RM	Resource Mechanical
RR	Resource Real Estate
RS	Resource Structural
S	Structural
SB	Structural Substructure
SD	Structural Demolition
SF	Structural Framing
SJ	User Defined
SK	User Defined
SS	Structural Site
T	Telecommunications
TA	Telecommunications Audio Visual
TC	Telecommunications Clock and Program
TI	Telecommunications Intercom
TJ	User Defined
TK	User Defined
TM	Telecommunications Monitoring
TN	Telecommunications Data Networks

TT	Telecommunications Telephone
TY	Telecommunications Security
V	Survey / Mapping
VA	Survey / Mapping Aerial
VC	Survey / Mapping Computated Points
VF	Survey / Mapping Field
VI	Survey / Mapping Digital
VJ	User Defined
VK	User Defined
VN	Survey / Mapping Node Points
VS	Survey / Mapping Staked Points
VU	Survey / Mapping Combined Utilities
W	Distributed Energy
WC	Distributed Energy Civil
WD	Distributed Energy Demolition
WI	Distributed Energy Interconnection
WJ	User Defined
WK	User Defined
WP	Distributed Energy Power
WS	Distributed Energy Structural
WT	Distributed Energy Telecommunications
WY	Distributed Energy Auxiliary Systems
X	Other Disciplines
XJ	User Defined
XK	User Defined
Z	Contractor/Shop Drawings
ZJ	User Defined
ZK	User Defined

4.2 MAJOR GROUPS

Major Group Layer Name	Description
ACCS	Access
ACID	Acid waste systems
AERI	Aerial Survey
AFFF	Aqueous film-forming foam system
AFLD	Airfields
AIR~	Air
ALGN	Alignment
ALRM	Alarm system

ANNO	Annotation
AREA	Area
AUXL	Auxiliary systems
BARR	Barrier
BCST	Broadcast related system (radio or TV)
BEAM	Beams
BELL	Bell system
BLDG	Buildings and primary structures
BLIN	Baseline
BNDY	Political boundaries
BORE	Borings
BRCG	Bracing
BRDG	Bridge
BRIN	Brine systems
BRKL	Break / fault lines
BRLN	Building restriction line
BZNA	Buffer zone area
CABL	Cable systems
CATH	Cathodic Protection System
CATV	Cable television system
CCTV	Closed-circuit television system
CEME	Cemetery
CHAN	Navigable channels
CHEM	Chemical
CHIM	Chimneys and stacks
CLNG	Ceiling
CLOK	Clock system
CMPA	Compressed / processed air systems
CMPR	Computer
CNDW	Condenser water systems
CO2S	CO2 system
CODE	Code compliance plan
COLS	Columns
COMM	Communications
CONT	Controls and instrumentation
CONV	Conveying systems
CRPT	Carpet / carpet tiles
CSWK	Casework
CTRL	Control points
CWTR	Chilled water systems

DATA	Data / LAN system
DECK	Deck
DETL	Detail
DFLD	Drain fields
DIAG	Diagrams
DICT	Dictation system
DOMW	Domestic water systems
DOOR	Doors
DRAN	Drains
DRIV	Driveways
DTCH	Ditches or washes
DUAL	Dual temperature systems
DUST	Dust and fume collection systems
ELEC	Electrical system, telecom plan
ELEV	Elevation
ELHT	Electric heat
EMCS	Energy monitoring control system
ENER	Energy management systems
EQPM	Equipment
EROS	Erosion and sediment control
ESMT	Easements
EVAC	Evacuation plan
EXHS	Exhaust system
FENC	Fences
FIRE	Fire protection
FLHA	Flood hazard area
FLOR	Floor
FNDN	Foundation
FNSH	Finishes
FRAM	Braced frame or moment frame
FSTN	Fasteners and connections
FUEL	Fuel systems
FUME	Fume hood
FURN	Furnishings
GAS~	Gas
GATE	Gate
GLAZ	Glazing
GLYC	Glycol systems
GRID	Grids
GRLN	Grade line

GRND	Ground system
HALN	Halon
HWTR	Hot water heating system
HVAC	HVAC systems
HYDR	Hydraulic structure
IGAS	Inert gas
INGR	Ingrants
INST	Instrumentation system
INTC	Intercom / PA systems
IRRG	Irrigation
JNTS	Joints
JOIS	Joists
LAND	Land
LEGN	Legend, symbols keys
LEVE	Levee
LGAS	Laboratory gas systems
LIQD	Liquid
LITE	Lighting
LNTL	Lintels
LOCN	Limits of construction
LTNG	Lightning protection system
MACH	Machine shop
MAJQ	Major equipment
MDGS	Medical gas systems
MILL	Millwork
MINQ	Minor equipment
MKUP	Make-up air systems
MNTG	Mounting system
MPIP	Miscellaneous piping systems
NGAS	Natural gas systems
NODE	Node
NURS	Nurse call system
OBST	Obstructions
OIL~	Oil
OTGR	Outgrants
PADS	Pads
PERC	Perc testing
PGNG	Paging system
PHON	Telephone system
PIPE	Piping

PLAN	Key Plan (Floor Plan)
PLAT	Platform
PLNT	Plant and landscape material
POND	Ponds
POWR	Power
PRKG	Parking lots
PROC	Process systems
PROJ	Projector system
PROP	Property
PROT	Fire protection system
PRTN	Partitions
PVMD	Photovoltaic modules
PVMT	Pavement
RAIL	Railroad
RAIR	Relief air systems
RCOV	Energy recovery systems
REFG	Refrigeration systems
RIGG	Rigging / automation systems
RIVR	River
ROAD	Roadways
ROOF	Roof
RRAP	Riprap
RUNW	Runway
RWAY	Right-of-way
SECT	Section
SERT	Security system
SGHT	Sight distance
SIGN	Sign
SITE	Site features
SLAB	Slab
SLUR	Slurry
SMOK	Smoke extraction systems
SOIL	Soils
SOUN	Sound system
SPCL	Special systems
SPFX	Entertainment special effects system
SPKL	Sprinkler
SSWR	Sanitary sewer
STEM	Steam system
STIF	Stiffener

STRM	Storm sewer
STRS	Stairs
SURV	Survey
SWLK	Sidewalks
TEST	Test equipment
TILE	Tile
TINN	Triangulated irregular network
TOPO	Topographic feature
TRAL	Trails or paths
TRAN	Transmission system
TRUS	Trusses
TVAN	Television antenna system
TVVS	Television and video system
UNID	Unidentified site objects
UTIL	Utilities
VACU	Vacuum
VIDO	Entertainment projection systems
WALL	Walls
WATR	Water supply
WETL	Wetlands
WIND	Wind powered
WWAY	Waterway

4.3 MINOR GROUPS

Minor Group Layer Name	Description
025Y	25-year mark
04FT	Four feet high
050Y	50-year mark
06FT	Six feet high
100Y	100-year mark
200Y	200-year mark
AA~~	Agitation air-system
ABLT	Anchor bolts
ABOV	Above
ABUT	Abutment
ACCS	Access
ACFU	Fused ac
ACTL	Aerial horizontal and vertical control points
ACNF	Unfused ac

AGGR	Exposed aggregate
AIR~	Air
ALOC	Allocation
ALRM	Alarm
ALUM	Aluminum
AMEX	Ammonia exhaust-system
AMW~	Ammonia waste-system
ANNN	Optional number (A = letter, NNN = number between 001 and 999)
ANNO	Annotation
ANOD	Sacrificial anode
AR~~	Argon-system
ARB~	Argon bulk-system
ARC~	Regenerative caustic-system
AREX	Arsenic exhaust-system
ASPH	Asphalt
BA~~	Breathable air-system
BACK	Back
BAFL	Baffle block and splash pad
BARR	Barrier
BASN	Stilling and settling basin
BBAC	Battery backup
BEDS	Perennial and annual beds
BENT	Top of bent
BFW~	Boiler feed water-system
BKRS	Breakers
BLBD	Boiler blow down piping
BLDG	Building points
BLIN	Baseline
BMRK	Benchmarks
BNDY	Boundary
BOLD	Bold lines
BORO	Borough
BOT1	Bottom group 1
BOT2	Bottom group 2
BOTB	Bottom of bank
BOTM	Bottom
BOXD	Mixing box, dual duct
BOXS	Mixing box, single duct
BRCK	Brick
BRDG	Bridge

BRGX	Bridging
BRKL	Break lines
BRNG	Bearings and distance labels
BROW	Brush row points
BRSH	Brush points
BUOY	Buoy
BUSH	Bushes and shrubs
BUSS	Bus duct
BUSW	Busways
BUT~	Butane-system
BWTR	Breakwater
C~~~	Caustic-system
CA~~	Compressed air-system
CABL	Cable
CAIR	Compressed air
CARS	Cars and other vehicles
CATV	Cable television
CAVI	Cavity
CBOX	Combiner box
CD~~	Condensate drain-system
CDA~	Clean dry air-system
CDFF	Ceiling diffusers
CHIM	Chimney
CIPR	Culvert inlet protection
CIRC	Circuits
CITY	City
CLAS	Classifications
CLDA	Cold air
CLG~	Chlorine gas-system
CLHD	Ceiling heads
CLNG	Ceiling
CLV~	Chlorine vacuum-system
CLW~	Concentrated lead waste-system
CMTL	Corrugated metal
CMUW	Concrete masonry unit
CMW~	Concentrated metals waste-system
CNDS	Condensate piping
CNDT	Diversionary/bypass conduit/culvert
CNMB	Circuit numbers
CNTE	Construction entrance

CNTJ	Construction joint
CNTR	Center
CNTY	County
COAX	Coax cable
COFF	Coffer dam
CONC	Concrete
CONI	Coniferous trees
CONS	Conservation
CORP	Corporation
COVR	Coverage
CPIP	Cold water piping
CRIT	Critical
CRKT	Crickets
CSTG	Construction/Grading
CSWK	Casework
CTLA	Controlled access
CTLJ	Control joint
CTNR	Container or planter
CUPW	Copper plating waste-system
CURB	Curb
CURR	Impress current
CURT	Curtain
CURV	Curve
CURW	Copper rinse waste-system
CUSW	Copper slurry waste-system
CV~~	Chemical vacuum-system
DACL	De-Authorized channel limits, anchorages, etc.
DAM~	Dam
DASP	Description attributes for survey points
DATA	Data
DCFU	Fused dc
DCNF	Unfused dc
DDIV	Drainage divides
DECK	Deck
DEPR	Depression
DEV~	Developer-system
DEVC	Devices
DFEE	Disposed fee
DIAG	Diagrams
DIMS	Dimensions

DIR~	De-Ionized water return-system
DIRC	DI reclaim-system
DIS~	De-Ionized water supply-system
DISC	Discharge
DIWP	DI polishing loop-system
DLPH	Dolphin
DLW~	Dilute waste-system
DMPR	Fire, smoke, volume damper
DOCK	Decks, docks, floats, piers
DOOR	Equipment doors
DRAN	Drainage slope indications
DRIP	Drip irrigation tubing
DRIV	Driveway points
DRNS	Drains
DSCO	Disconnect switches
DTCH	Ditches or washes
DUCT	Ductwork
DVDK	Diversion dike
DVDR	Thin dividers
EASP	Elevation attributes for survey points
EDGE	Edge
EDGR	Planting bed edger
EFAN	Equipment with electric fans
EG~~	Ethylene glycol-system
EGW~	Ethylene glycol waste-system
ELEC	Electrical
ELEV	Elevation
EMER	Emergency
ENCL	Equipment enclosures
ENGR	Engineering Information
EPDU	Equipment with piping, ductwork and electricity
EPIP	Equipment with piping and electricity
EQPM	Equipment
EQUI	Equipotential
ERTH	Earth
ESMT	Easement
EV~~	Equipment vacuum-system
EVGR	Evergreen trees-broadleaf
EVTR	Elevator cars and equipment
EWAT	Edge of water

EXHS	Exhaust air
EXIT	Exit
EXPJ	Expansion joint
EXTI	Extinguishers
EXTR	Exterior
FACE	Face
FALT	Fault/break lines
FDPL	Flood plain
FDTA	Field data
FEE~	Fee
FEED	Feeders
FENC	Fences
FEND	Fender
FIBR	Fiber optics cable
FILE	File cabinets
FILL	Fill and cover material
FINE	Fine lines
FIRE	Fire protection
FISH	Fish ladder/passage
FIXD	Fixed
FIXT	Fixtures
FLDR	Floor drains
FLLW	Flow
FLNE	Fire lane
FLOR	Floor
FLOW	Flowline
FLPL	Flagpole
FLUM	Flume
FLYS	Fly station
FNSH	Finishes
FORC	Force main
FREE	Freestanding
FRMG	Framing
FTNG	Footings
FTPT	Area footprints
FULL	Full-height
FURN	Furnishings
FW~~	Fire water-system
GAGE	Gauge
GCVR	Ground cover

GENF	General features
GGEP	Gas general piping
GLAZ	Glazing
GNDW	Ground water
GPRP	Gas process piping
GRAL	Guard rail
GRBM	Grade beams
GRID	Grid
GRIL	Grilles
GRND	Ground
GRTG	Grating
GRVL	Gravel
H2~~	Hydrogen-system
H2O2	Hydrogen peroxide-system
HCDA	High pressure clean dry air-system
HCL~	Hydrochloric acid-system
HDIR	Hot DI return-system
HDIS	Hot DI supply-system
HDLN	Hidden line
HDRC	Hot DI reclaim-system
HE~~	Helium-system
HEAD	Door and window headers
HF~~	Hydrofluoric acid-system
HFW~	Hydrofluoric waste-system
HIDD	Objects or lines hidden from view
HOLE	Holes
HORZ	Horizontal
HOSE	Hoses
HOTA	Hot air
HPDR	High pH DI return-system
HPDS	High pH DI supply-system
HPIP	Hot water/high-pressure piping
HPN2	High purity nitrogen-system
HPO2	High purity oxygen-system
HRAL	Handrails/guard rails
HRDW	Hardware
HSSS	Hollow structural steel
HTCH	Hatch
HTEX	Heat exhaust-system
HV~~	House vacuum-system

HVA~	Arsenic house vacuum-system
HVAC	HVAC systems
HVPT	Horizontal/vertical
HWAL	Headwall
HYDT	Hydrants and connections
IA~~	Instrument air-system
ICW~	Industrial city water-system
IDEN	Identification tags
INEG	Ingress/egress
INPR	Inlet protection
INST	Instrumentation
INTK	Intake
INTR	Interior
IPA~	Isopropyl alcohol-system
IW~~	Industrial waste-system
JACK	Jacks
JAMB	Door and window jambs
JBOX	Junction box
JNTC	Control joint
JNTE	Expansion joint
KEYN	Keynotes
LABL	Labels
LADD	Ladders and ladder assemblies
LATL	Lateral line
LCHE	Leak check helium-system
LDTA	Laboratory data
LEAS	Lease
LEGN	Legend, symbol keys
LEVL	Level changes
LFEE	Disposed less than fee
LICN	License
LIMI	Limit of earthwork
LINE	Lines
LINK	Chain link
LMTA	Limited access
LO~~	Lube oil-system
LOGO	Company logo
LONG	Longitudinal
LOWR	Lower
LPG~	Liquid petroleum gas-system

LPIP	Low-pressure piping
LQPG	Liquid petroleum gas
LSCP	Landscape
LTRL	Lateral pipe
MAIN	Mainline
MAJR	Major
MARK	Markers, break marks, leaders
MATC	Match lines
MBND	Material beyond cut
MCUT	Material cut by the view
MEDM	Medium lines
MESH	Mesh or wire
METL	Metal
MHOL	Manhole
MINR	Minor
MISC	Miscellaneous
MKUP	Make-up water
MLCH	Mulches-organic and inorganic
MNTG	Mounting system
MOOR	Mooring
MOVE	Movable
MPIP	Medium-pressure piping
MRKG	Pavement markings
MRKR	Marker
MSNW	Masonry
MULT	Multi-conductor cable
MVNG	Moving/Suspended
MW~~	Metals waste-system
N2~~	Nitrogen-system
N2O~	Nitrous oxide-system
NAID	Navigation aids
NATL	National
NFEE	Non-fee
NG~~	Natural gas-system
NGAS	Natural gas line
NITG	Nitrogen
NOTE	Notes
NOVR	Non-overflow structure
NOXG	Nitrous oxide
NPLT	Non-plotting graphic information

NPW~	Non-potable water-system
NPWR	Non-potable water reuse-system
NSBR	Noise barrier
O2~~	Oxygen-system
OA~~	Outside air-system
OBJT	Objects
OCCP	Occupant or employee names
ODFF	Other diffusers
OFA~	Oil-free air-system
OFST	Offset zones
OGEP	Oil general piping
OIW~	Organic industrial waste-system
OLW~	Organic liquid waste-system
OPNG	Openings
OPNX	Opening indication
OPRP	Oil process piping
OSW~	Organic solvent waste-system
OTHD	Other heads
OTLN	Outline
OVHD	Overhead
OXYG	Pure O2
PA~~	Plant air-system
PADM	Pad-mounted
PADS	Pads
PALM	Palm trees
PANL	Panels
PASP	Point number attributes for survey points
PATT	Texture or hatch patterns
PAVR	Unit pavers
PCAP	Pile caps
PCST	Pre-cast concrete
PCWR	Cooling water return-system
PCWS	Cooling water supply-system
PENE	Penetrations
PENS	Penstock
PEQP	Process equipment
PERI	Perimeter
PERM	Permanent
PHON	Telephone line
PHOS	Phosphoric acid-system

PHRC	Phosphoric acid reclaim-system
PIER	Drilled piers
PILE	Piles
PIPE	Piping
PLAY	Play structures
PLNT	Plants
PLYW	Plywood
PMIT	Permit
PNHS	Penthouse
PNLS	System panels
PNPT	Panel points
POCC	Point of common coupling
POI~	Point of interconnection
POLE	Poles
POLM	Pole-mounted
POND	Retention pond
POOL	Pools and spas
POST	Posts
PPIP	Process piping
PRCH	Porch
PRCL	Parcels
PRHT	Partial-height
PRIM	Primary
PRKG	Parking
PRO~	Propane-system
PROF	Profile
PROS	Date/time/file name stamp
PROV	Province
PRPT	Parapet
PRVC	Privacy
PSW~	Photo solvent waste-system
PV~~	Vacuum-system
PVMT	Pavement
PW~~	Potable water-system
QTRS	Quarter section
RAIS	Raised
RAMP	Accessible ramp
RATE	Ratings
RBAR	Reinforcing bar
RCON	Reinforced concrete

RDFF	Return air diffusers
RDGE	Roof ridges
RDME	Read-me layer (not plotted)
REDL	Redlines
REFR	Reference, external files
RER~	Solvent-system
RETN	Return
REVC	Revision clouds
REVS	Revision indicators and text
RFDR	Roof drains
RFEQ	Rooftop equipment
RISR	Risers
RO~~	Reverse osmosis water-system
ROAD	Roadway
ROCK	Large rocks and rock outcroppings
ROOF	Roof
ROR~	Reverse osmosis reject water-system
RPIP	Recirculation piping
RRAP	Riprap
RSCH	Sketch line round or oval duct
RSRV	Reservation
RTWL	Retaining wall
RWAY	Right-of-way
SAIR	Scavenge air
SATD	Satillite dishes
SAUD	Audio signal
SBCK	Setback lines
SBST	Substations
SCEX	Scrubber exhaust-system
SCHD	Schedules
SCOM	Communications signal
SCTL	Control signal
SDAT	Data signal
SDD~	Scrubber duct drains-system
SDFF	Supply diffusers
SDGA	Digital audio signal
SDGV	Digital video signal
SEAT	Seating
SECD	Secondary
SECT	Section

SEED	Seeding areas
SG~~	Specialty gas-system
SGHT	Sight distance
SHAD	Shadow area
SHEA	Structural bearing or shear walls
SHLF	Wall-mounted shelving
SIGN	Signage
SILL	Window sills
SILT	Silt fence
SIZE	Ductwork size
SKCH	Sketch
SKLT	Skylight
SLR~	Slurry return-system
SLS~	Slurry supply-system
SLVE	Pipe sleeve
SLW~	Slurry waste-system
SMIC	Microphone signal
SMOK	Smoke detector/heat sensors
SOUN	Soundings
SPCL	Special/specialties
SPKL	Sprinklers
SPLY	Supply
SPOT	Spot elevations
SPRT	Sports fields
SPWR	Power signal
SRFI	RF signal
SRGB	RGB and component video signal
SSCH	Sketch line rectangular duct
SSLT	Super silt fence
SSWR	Sanitary sewer
SSYN	Sync signal
STAN	Stationing
STAT	State
STBY	Standby
STEL	Steel
STEP	Steps
STMP	Professional stamp
STOR	Storage
STRC	Structures
STRM	Storm Sewer

STRP	Striping
STRS	Stair treads
SUBA	Cabinet sub-assemblies, drawer boxes
SUBD	Subdivision (interior) lines
SUBS	Sub-surface areas
SULF	Sulfuric acid-system
SULR	Sulfuric acid reclaim-system
SUPT	Support
SURF	Surface areas
SUSP	Suspended elements
SVEX	Solvent exhaust-system
SVID	Video signal
SW~~	Solvent waste-system
SWAY	Spillway
SWBD	Switchboards
SWCH	Switches
SWF~	Solvent waste flammable-system
SWLK	Sidewalks
SWMT	Storm water management
SWNF	Solvent waste non-flammable-system
SXTS	Sixteenth section
SYMB	Reference symbols
TABL	Data tables
TAKE	Taking lines
TANK	Storage tanks
TDIR	Tempered DI return-system
TDIS	Tempered DI supply-system
TEES	Main tees
TEMP	Temporary
TEST	Test stations
TEXT	Text
THER	Thermostats
TICK	Tick marks
TITL	Drawing or detail titles
TMAH	TMAH-system
TOP~	Top
TOP1	Top group 1
TOP2	Top group 2
TOPB	Top of bank
TOWR	Towers

TPIT	Test pits
TPTN	Toilet partitions
TRAC	Tract lines
TRAK	Track
TRAL	Trail or path
TRAV	Transverse
TRAY	Cabletray and wireways
TREE	Trees
TROW	Tree row
TSHP	Town or township
TTLB	Border and titleblock
TURF	Lawn areas
TW~~	Tempered water-system
UCPT	Under-carpet wiring
UCTR	Under counter
UN2~	Utility nitrogen-system
UGND	Underground
UPPR	Upper
UPRW	Ultra-pure recycle water-system
UPS~	Uninterruptible power supply
UPVD	Unpaved surface
UPW~	Ultra-pure water-system
URAC	Under-floor raceways
UTIL	Utility lines
V~~~	Vent-system
VACU	Vacuum
VALV	Valves
VEGE	Trees, shrubs, and other vegetation
VENR	Veneer
VENT	Vents
VERT	Vertical
VIEW	Triangulation view
VINE	Vines
VN2~	Venturi nitrogen-system
VOID	Void regions
W2XS	Dimension lumber
WALL	Wall
WAR~	Weld argon-system
WATR	Water supply
WDWK	Architectural woodwork

WEIR	Pool weir
WELL	Well
WHIT	White paint
WIRE	Wiring
WKSF	Worksurface
WOOD	Wood
XFMR	Transformers
XTRU	Extrusion
YELO	Yellow paint
ZONE	Zoning

4.4 STATUS FIELDS

Codes	Description
A	Abandoned
D	Existing to demolish
E	Existing to remain
F	Future work
M	Items to be moved
N	New work
T	Temporary work
X	Not in contract
1	Phase number 1
2	Phase number 2
3	Phase number 3
4	Phase number 4
5	Phase number 5
6	Phase number 6
7	Phase number 7
8	Phase number 8
9	Phase number 9

5.0 Appendix B - Common Layer Lists by Discipline

The following lists of layers present the most commonly used layers for each discipline. The definitive list of Discipline Designators, Major and Minor Groups, and Status Fields is in *CLG Appendix A - List of Discipline Designators, Major and Minor Groups, and Status Fields, CLG section 4.0*.

- 5.1 Architectural Layer List
- 5.2 Civil Layer List
- 5.3 Contractor/Shop Drawing Layer List
- 5.4 Electrical Layer List
- 5.12 Landscape Layer List
- 5.13 Mechanical Layer List
- 5.14 Operations Layer List
- 5.15 Plumbing Layer List

- 5.5 Distributed Energy Layer List
- 5.6 Equipment Layer List
- 5.7 Fire Protection Layer List
- 5.8 General Layer List
- 5.9 Geotechnical Layer List
- 5.10 Hazardous Materials Layer List
- 5.11 Interiors Layer List
- 5.16 Process Layer List
- 5.17 Resource Layer List
- 5.18 Structural Layer List
- 5.19 Survey/Mapping Layer List
- 5.20 Telecommunications Layer List
- 5.21 Other Disciplines Layer List

5.1 ARCHITECTURAL LAYER LIST

Architectural Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Architectural Discipline Designators

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

Architectural Layer List

Layer Name	Description
A□-AREA	Area
A□-AREA-OCCP	Area: occupant or employee names
A□-BARR	Barrier
A□-BARR-AIR~	Barrier: air
A□-CLNG	Ceiling
A□-CLNG-ACCS	Ceiling: access
A□-CLNG-GRID	Ceiling: grid
A□-CLNG-OPNG	Ceiling: openings
A□-CLNG-SUSP	Ceiling: suspended elements
A□-CLNG-TEES	Ceiling: main tees

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
A□-EQPM-OVHD	Equipment: overhead
A□-FLOR	Floor
A□-FLOR-CSWK	Floor: casework
A□-FLOR-EVTR	Floor: elevator cars and equipment
A□-FLOR-FIXT	Floor: fixtures (plumbing)
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
A□-FLOR-RAIS	Floor: raised
A□-FLOR-RISR	Floor: risers
A□-FLOR-SIGN	Floor: signage
A□-FLOR-SPCL	Floor: specialties (toilet room accessories, display cases)
A□-FLOR-STRS	Floor: stair treads (escalators, ladders)
A□-FLOR-TPTN	Floor: toilet partitions
A□-FLOR-WDWK	Floor: architectural woodwork
A□-FURN	Furnishings
A□-FURN-FILE	Furnishings: file cabinets
A□-FURN-FIXD	Furnishings: fixed
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: storage (component system)
A□-FURN-WKSF	Furnishings: work surface (component system)
A□-GLAZ	Glazing
A□-GLAZ-FULL	Glazing: full-height
A□-GLAZ-PRHT	Glazing: partial-height
A□-GLAZ-SILL	Glazing: window sills
A□-HVAC	HVAC systems
A□-HVAC-RDFF	HVAC systems: return air diffusers
A□-HVAC-SDFF	HVAC systems: supply diffusers

A□-LITE	Lighting
A□-ROOF	Roof
A□-ROOF-HRAL	Roof: handrails/guard rails
A□-ROOF-LEVL	Roof: level changes
A□-ROOF-OTLN	Roof: outline
A□-ROOF-RISR	Roof: risers
A□-ROOF-STRS	Roof: stair treads (ladders)
A□-WALL	Walls
A□-WALL-CAVI	Walls: cavity
A□-WALL-CNTR	Walls: center
A□-WALL-CURT	Walls: curtain
A□-WALL-FIRE	Walls: fire protection
A□-WALL-FULL	Walls: full-height
A□-WALL-FULL-EXTR	Walls: full-height: exterior
A□-WALL-FULL-INTR	Walls: full-height: interior
A□-WALL-HEAD	Walls: door and window headers
A□-WALL-JAMB	Walls: door and window jambs
A□-WALL-MESH	Walls: mesh or wire
A□-WALL-MOVE	Walls: moveable
A□-WALL-PATT	Walls: texture and hatch patterns
A□-WALL-PRHT	Walls: partial-height

5.2 CIVIL LAYER LIST

Civil Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

The Civil Discipline is defined as a project or a portion of a project that is usually contained within a single property boundary.

Civil Discipline Designators

Designator	Description
C	Civil
CD	Civil Demolition
CG	Civil Grading
CI	Civil Improvements
CN	Civil Nodes
CP	Civil Paving
CS	Civil Site

CT	Civil Transportation
CU	Civil Utilities
CJ	User Defined
CK	User Defined

Civil Layer List

Layer Name	Description
C□-AFLD	Airfields
C□-AFLD-ASPH	Airfields: asphalt
C□-AFLD-CNTR	Airfields: center
C□-AFLD-CONC	Airfields: concrete
C□-AFLD-FLNE	Airfields: fire lane
C□-AFLD-FLNE-MRKG	Airfields: fire lane: pavement markings
C□-AFLD-FLNE-SIGN	Airfields: fire lane: signage
C□-AFLD-GRVL	Airfields: gravel
C□-AFLD-MRKG	Airfields: pavement markings
C□-AFLD-SIGN	Airfields: signage
C□-AFLD-STAN	Airfields: stationing
C□-AFLD-WHIT	Airfields: white paint
C□-AFLD-WHIT-TICK	Airfields: white paint: tick marks
C□-AFLD-YELO	Airfields: yellow paint
C□-AFLD-YELO-TICK	Airfields: yellow paint: tick marks
C□-BLDG	Buildings and primary structures
C□-BLDG-DECK	Buildings and primary structures: deck (attached, no roof overhead)
C□-BLDG-OTLN	Buildings and primary structures: outline
C□-BLDG-OVHD	Buildings and primary structures: overhead
C□-BLDG-PRCH	Buildings and primary structures: porch (attached, roof overhead)
C□-BLIN	Baseline
C□-BLIN-STAN	Baseline: stationing
C□-BORE	Borings
C□-BRDG	Bridge
C□-BRDG-CNTJ	Bridge: construction joint
C□-BRDG-CNTR	Bridge: center
C□-BRDG-DECK	Bridge: deck
C□-BRDG-EXPJ	Bridge: expansion joint
C□-BRDG-FALT	Bridge: fault/break line
C□-BRDG-HIDD	Bridge: objects or lines hidden from view

C□-BRDG-OBJT	Bridge: objects
C□-BRDG-OBJT-PRIM	Bridge: objects: primary
C□-BRDG-OBJT-SECD	Bridge: objects: secondary
C□-BRDG-RBAR	Bridge: reinforcing bar
C□-CATV	Cable television system
C□-CATV-OVHD	Cable television system: overhead
C□-CATV-POLE	Cable television system: pole
C□-CATV-UGND	Cable television system: underground
C□-CEME	Cemetery
C□-CHAN	Navigable channels
C□-CHAN-BWTR	Navigable channels: breakwater
C□-CHAN-CNTR	Navigable channels: center
C□-CHAN-DACL	Navigable channels: de-authorized channel limits, anchorages, etc.
C□-CHAN-DOCK	Navigable channels: decks, docks, floats, piers
C□-CHAN-NAID	Navigable channels: navigation aids
C□-COMM	Communications
C□-COMM-OVHD	Communications: overhead
C□-COMM-POLE	Communications: pole
C□- COMM-UGND	Communications: underground
C□-CTRL	Control points
C□-CTR L-BMRK	Control points: benchmarks
C□-CTRL-FLYS	Control points: fly station
C□-CTRL-GRID	Control points: grid
C□-CTRL-HORZ	Control points: horizontal
C□-CTRL-HVPT	Control points: horizontal/vertical
C□-CTRL-PNPT	Control points: panel points
C□-CTRL-TRAV	Control points: transverse
C□-CTRL-VERT	Control points: vertical
C□-DFLD	Drain fields
C□-DFLD-OTLN	Drain fields: outline
C□-DFLD-PROF	Drain fields: profile
C□-DRIV	Driveways
C□-DRIV-ASPH	Driveways: asphalt
C□-DRIV-CNTR	Driveways: center
C□-DRIV-CONC	Driveways: concrete
C□-DRIV-CURB	Driveways: curb
C□-DRIV-CURB-BACK	Driveways: curb: back
C□-DRIV-CURB-FACE	Driveways: curb: face
C□-DRIV-FLNE	Driveways: fire lane
C□-DRIV-FLNE-MRKG	Driveways: fire lane: pavement markings

C□-DRIV-FLNE-SIGN	Driveways: fire lane: signage
C□-DRIV-GRVL	Driveways: gravel
C□-DRIV-MRKG	Driveways: pavement markings
C□-DRIV-SIGN	Driveways: signage
C□-DRI V-UPVD	Driveways: unpaved surface
C□-DRIV-WHIT	Driveways: white paint
C□-DRIV-WHIT-TICK	Driveways: white paint: tick marks
C□-DRIV-YELO	Driveways: yellow paint
C□-DRIV-YELO-TICK	Driveways: yellow paint: tick marks
C□-DTCH	Ditches or washes
C□-DTCH-BOTM	Ditches or washes: bottom
C□-DTCH-CNTR	Ditches or washes: center
C□-DTCH-EWAT	Ditches or washes: edge of water
C□-DTCH-TOP~	Ditches or washes: top
C□-EROS	Erosion and sediment control
C□-EROS-CIPR	Erosion and sediment control: culvert inlet protection
C□-EROS-CNTE	Erosion and sediment control: construction entrance
C□-EROS-DDIV	Erosion and sediment control: drainage divides
C□-EROS-DVDK	Erosion and sediment control: diversion dike
C□-EROS-INPR	Erosion and sediment control: inlet protection
C□-EROS-SILT	Erosion and sediment control: silt fence
C□-EROS-SSLT	Erosion and sediment control: super silt fence
C□-ESMT	Easements
C□-ESMT-ACCS	Easements: access (pedestrian only; private access)
C□-ESMT-CATV	Easements: utility - cable television system
C□-ESMT-CONS	Easements: conservation
C□-ESMT-CSTG	Easements: construction/grading
C□-ESMT-ELEC	Easements: electrical
C□-ESMT-FDPL	Easements: flood plain
C□-ESMT-INEG	Easements: ingress/egress (vehicles; private access)
C□-ESMT-LSCP	Easements: landscape
C□-ESMT-NGAS	Easements: natural gas line
C□-ESMT-PHON	Easements: telephone line
C□-ESMT-ROAD	Easements: roadway
C□-ESMT-ROAD-PERM	Easements: roadway: permanent
C□-ESMT-ROAD-TEMP	Easements: roadway: temporary
C□-ESMT-RWAY	Easements: right-of-way (public access)
C□-ESMT-SGHT	Easements: sight distance
C□-ESMT-SSWR	Easements: sanitary sewer
C□-ESMT-STRM	Easements: storm sewer

C□-ESMT-SWMT	Easements: storm water management
C□-ESMT-TRAL	Easements: trail or path (public access)
C□-ESMT-UTIL	Easements: utility lines
C□-ESMT-WATR	Easements: water supply
C□-FENC	Fences
C□-FENC-GRAL	Fences: guard rail
C□-FENC-POST	Fences: posts
C -FENC-STEL	Fences: steel (barbed wire and/or chain link)
C□-FENC-WOOD	Fences: wood
C□-FIRE	Fire protection
C□-FIRE-HYDT	Fire protection: hydrants and connections
C□-FIRE-PIPE	Fire protection: piping
C□-FIRE-UGND	Fire protection: underground
C□-FLHA	Flood hazard area
C□-FLHA-025Y	Flood hazard area: 25 year mark
C□-FLHA-050Y	Flood hazard area: 50 year mark
C□-FLHA-100Y	Flood hazard area: 100 year mark
C□-FLHA-200Y	Flood hazard area: 200 year mark
C□-FUEL	Fuel systems
C□-FUEL-EQPM	Fuel systems: equipment (pumps, motors)
C□-FUEL-INST	Fuel systems: instrumentation (meters, valves, etc.)
C□-FUEL-MHOL	Fuel systems: manhole
C□-FUEL-PIPE	Fuel systems: piping
C□-FUEL-TANK	Fuel systems: storage tanks
C□-FUEL-UGND	Fuel systems: underground
C□-HYDR	Hydraulic structure
C□-HYDR-BAFL	Hydraulic structure: baffle block and splash pad
C□-HYDR-BASN	Hydraulic structure: stilling and settling basins
C□-HYDR-CNDT	Hydraulic structure: diversion/bypass conduits/culvers
C□-HYDR-COFF	Hydraulic structure: coffer dam
C□-HYDR-DAM~	Hydraulic structure: dam
C□-HYDR-FISH	Hydraulic structure: fish ladder/passage
C□-HYDR-FLUM	Hydraulic structure: flume
C□-HYDR-INTK	Hydraulic structure: intake
C□-HYDR-NOVR	Hydraulic structure: non-overflow structure
C□-HYDR-PENS	Hydraulic structure: penstock
C□-LOCN	Limits of construction
C□-NGAS	Natural gas systems
C□-NGAS-EQPM	Natural gas systems: equipment (pumps, motors)
C□-NGAS-INST	Natural gas systems: instrumentation (meters, valves, etc.)

C□-NGAS-MHOL	Natural gas systems: manhole
C□-NGAS-PIPE	Natural gas systems: piping
C□-NGAS-TANK	Natural gas systems: storage tanks
C□-NGAS-UGND	Natural gas systems: underground
C□-PERC	Perc testing
C□-PERC-HOLE	Perc testing: holes
C□-POND	Ponds
C□-POND-EDGE	Ponds: edge
C□-POND-SWAY	Ponds: spillway
C□-POND-TOPB	Ponds: top of bank
C□-POWR	Power
C□-POWR-FENC	Power: fences
C□-POWR-INST	Power: instrumentation (meters, transformers)
C□-POWR-MHOL	Power: manhole
C□-POWR-OVHD	Power: overhead
C□-POWR-POLE	Power: pole
C□-POWR-STRC	Power: structures
C□-POWR-UGND	Power: underground
C□-PRKG	Parking lots
C□-PRKG-ASPH	Parking lots: asphalt
C□-PRKG-CARS	Parking lots: cars and other vehicles
C□-PRKG-CONC	Parking lots: concrete
C□-PRKG-CURB	Parking lots: curb
C□-PRKG-CURB-BACK	Parking lots: curb: back
C□-PRKG-CURB-FACE	Parking lots: curb: face
C□-PRKG-DRAN	Parking lots: drainage slope indications
C□-PRKG-FIXT	Parking lots: fixtures (wheel stops, parking meters, etc.)
C□-PRKG-FLNE	Parking lots: fire lane
C□-PRKG-FLNE-MRKG	Parking lots: fire lane: pavement markings
C□-PRKG-FLNE-SIGN	Parking lots: fire lane: signage
C□-PRKG-GRVL	Parking lots: gravel
C□-PRKG-MRKG	Parking lots: pavement markings
C□-PRKG-SIGN	Parking lots: signage
C□-PRKG-STRP	Parking lots: striping
C□-PRKG-UPVD	Parking lots: unpaved surface
C□-PRKG-WHIT	Parking lots: white paint
C□-PRKG-WHIT-TICK	Parking lots: white paint: tick marks
C□-PRKG-YELO	Parking lots: yellow paint
C□-PRKG-YELO-TICK	Parking lots: yellow paint: tick marks
C□-PROP	Property

C□-PROP-LINE	Property: lines
C□-PROP-SBCK	Property: setback lines
C□-PVMT	Pavement
C□-PVMT-ASPH	Pavement: asphalt
C□-PVMT-CONC	Pavement: concrete
C□-PVMT-GRVL	Pavement: gravel
C□-RAIL	Railroad
C□-RAIL-CNTR	Railroad: center
C□-RAIL-EQPM	Railroad: equipment (gates, signals, etc.)
C□-RAIL-TRAK	Railroad: track
C□-RIVR	River
C□-RIVR-BOTM	River: bottom
C□-RIVR-CNTR	River: center
C□-RIVR-EDGE	River: edge
C□-RIVR-TOPB	River: top of bank
C□-ROAD	Roadways
C□-ROAD-ASPH	Roadways: asphalt
C□-ROAD-CNTR	Roadways: center
C□-ROAD-CONC	Roadways: concrete
C□-ROAD-CURB	Roadways: curb
C□-ROAD-CURB-BACK	Roadways: curb: back
C□-ROAD-CURB-FACE	Roadways: curb: face
C□-ROAD-FLNE	Roadways: fire lane
C□-ROAD-FLNE-MRKG	Roadways: fire lane: pavement markings
C□-ROAD-FLNE-SIGN	Roadways: fire lane: signage
C□-ROAD-GRVL	Roadways: gravel
C□-ROAD-MRKG	Roadways: pavement markings
C□-ROAD-PROF	Roadways: profile
C□-ROAD-SIGN	Roadways: signage
C□-ROAD-STAN	Roadways: stationing
C□-ROAD-UPVD	Roadways: unpaved surface
C□-ROAD-WHIT	Roadways: white paint
C□-ROAD-WHIT-TICK	Roadways: white paint: tick marks
C□-ROAD-YELO	Roadways: yellow paint
C□-ROAD-YELO-TICK	Roadways: yellow paint: tick marks
C□-RRAP	Riprap
C□-SGHT	Sight distance
C□-SGHT-PROF	Sight distance: profile
C□-SOIL	Soils
C□-SSWR	Sanitary sewer

C□-SSWR-DIAG	Sanitary sewer: diagrams
C□-SSWR-FORC	Sanitary sewer: force main
C□-SSWR-LATL	Sanitary sewer: lateral line
C□-SSWR-MHOL	Sanitary sewer: manhole
C□-SSWR-PIPE	Sanitary sewer: piping
C□-SSWR-PIPE-RCON	Sanitary sewer: piping: reinforced concrete
C□-SSWR-PIPE-STEL	Sanitary sewer: piping: steel
C□-SSWR-PROF	Sanitary sewer: profile
C□-SSWR-STAN	Sanitary sewer: stationing
C□-SSWR-STRC	Sanitary sewer: structures
C□-SSWR-UGND	Sanitary sewer: underground
C□-STEM	Steam system
C□-STEM-INST	Steam system: instrumentation (meters, valves, etc.)
C□-STEM-MHOL	Steam system: manhole
C□-STEM-PIPE	Steam system: piping
C□-STEM-STRC	Steam system: structures
C□-STEM-UGND	Steam system: underground
C□-STRM	Storm sewer
C□-STRM-CNTR	Storm sewer: center
C□-STRM-DIAG	Storm sewer: diagrams
C□-STRM-HWAL	Storm sewer: headwall
C□-STRM-MHOL	Storm sewer: manhole
C□-STRM-PIPE	Storm sewer: piping
C□-STRM-PIPE-CMTL	Storm sewer: piping: corrugated metal
C□-STRM-PIPE-RCON	Storm sewer: piping: reinforced concrete
C□-STRM-PROF	Storm sewer: profile
C□-STRM-STAN	Storm sewer: stationing
C□-STRM-STRC	Storm sewer: structures
C□-STRM-UGND	Storm sewer: underground
C□-SWLK	Sidewalks
C□-SWLK-ASPH	Sidewalks: asphalt
C□-SWLK-CONC	Sidewalks: concrete
C□-TINN	Triangulated irregular network
C□-TINN-BNDY	Triangulated irregular network: boundary
C□-TINN-FALT	Triangulated irregular network: fault/break lines
C□-TINN-VIEW	Triangulated irregular network: triangulation view
C□-TINN-VOID	Triangulated irregular network: void regions
C□-TOPO	Topographic feature
C□-TOPO-DEPR	Topographic feature: depression
C□-TOPO-MAJR	Topographic feature: major (contours)

C□-TOPO-MINR	Topographic feature: minor (contours)
C□-TOPO-SPOT	Topographic feature: spot elevations
C□-TOPO-TPIT	Topographic feature: test pits
C□-TRAL	Trails or paths
C□-TRAL-ASPH	Trails or paths: asphalt
C□-TRAL-CONC	Trails or paths: concrete
C□-TRAL-GRVL	Trails or paths: gravel
C□-TRAL-MRKG	Trails or paths: pavement markings
C□-TRAL-SIGN	Trails or paths: signage
C□-TRAL-UPVD	Trails or paths: unpaved surface
C□-WALL	Walls
C□-WALL-CTLJ	Walls: control joint
C□-WALL-NSBR	Walls: noise barrier
C□-WALL-RTWL	Walls: retaining wall
C□-WALL-SHEA	Walls: structural bearing or shear walls
C□-WATR	Water supply
C□-WATR-DIAG	Water supply: diagrams
C□-WATR-INST	Water supply: instrumentation (meters, valves, etc.)
C□-WATR-PIPE	Water supply: piping
C□-WATR-PROF	Water supply: profile
C□-WATR-STAN	Water supply: stationing
C□-WATR-STRC	Water supply: structures
C□-WATR-UGND	Water supply: underground
C□-WATR-WELL	Water supply: well
C□-WETL	Wetlands
C□-WWAY	Waterway
C□-WWAY-DLPH	Waterway: dolphin
C□-WWAY-FEND	Waterway: fender
C□-WWAY-MOOR	Waterway: mooring

5.3 CONTRACTOR/SHOP DRAWING LAYER LIST

Contractor/Shop Drawing Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Contractor/Shop Drawing Discipline Designators

Designator	Description
Z	Contractor/Shop Drawings

ZJ	User Defined
ZK	User Defined

Contractor/Shop Drawing Layer List

Layer Name	Description
No layer names have been prescribed for this discipline.	

5.4 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. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

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

Electrical Layer List

Layer Name	Description
E□-ALRM	Alarm system
E□-AREA	Area
E□-AREA-OFST	Area: offset zones
E□-AREA-SHAD	Area: shade zones
E□-AUXL	Auxiliary systems
E□-BELL	Bell system
E□-CABL	Cable systems
E□-CABL-COAX	Cable systems: coax cable
E□-CABL-FIBR	Cable systems: fiber optics cable
E□-CABL-MULT	Cable systems: multi-conductor cable

E□-CABL-TRAY	Cable systems: cabletray and wireways
E□-CATH	Cathodic protection system
E□-CATH-ANOD	Cathodic protection system: sacrificial anode
E□-CATH-CURR	Cathodic protection system: impress current
E□-CATH-TEST	Cathodic protection system: test stations
E□-CCTV	Closed-circuit television system
E□-CLOK	Clock system
E□-CLOK-CIRC	Clock system: circuits
E□-CLOK-CLNG	Clock system: ceiling
E□-CLOK-CNMB	Clock system: circuit number
E□-CLOK-EQPM	Clock system: equipment
E□-CLOK-FLOR	Clock system: floor
E□-CLOK-WALL	Clock system: wall
E□-COMM	Communications
E□-COMM-CIRC	Communications: circuits
E□-COMM-CLNG	Communications: ceiling
E□-COMM-CNMB	Communications: circuit number
E□-COMM-EQPM	Communications: equipment
E□-COMM-WALL	Communications: wall
E□-CONT	Controls and instrumentation
E□-CONT DEVC	Controls and instrumentation: devices
E□-CONT-WIRE	Controls and instrumentation: wiring
E□-DATA	Data/LAN system
E□-DATA-CIRC	Data/LAN system: circuits
E□-DATA-CLNG	Data/LAN system: ceiling
E□-DATA-CNMB	Data/LAN system: circuit number
E□-DATA-EQPM	Data/LAN system: equipment
E□-DATA-FLOR	Data/LAN system: floor
E□-DATA-WALL	Data/LAN system: wall
E□-DIAG	Diagrams
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
E□-DIAG-GRND	Diagrams: ground
E□-DIAG-SWCH	Diagrams: switches
E□-DIAG-XFMR	Diagrams: transformers
E□-DICT	Dictation system

E□-DICT-CIRC	Dictation system: circuits
E□-DICT-CLNG	Dictation system: ceiling
E□-DICT-CNMB	Dictation system: circuit number
E□-DICT-EQPM	Dictation system: equipment
E□-DICT-WALL	Dictation system: wall
E□-FIRE	Fire protection
E□-FIRE-BARR	Fire protection: barrier
E□-FIRE-CIRC	Fire protection: circuits
E□-FIRE-CLNG	Fire protection: ceiling
E□-FIRE-CNMB	Fire protection: circuit number
E□-FIRE-EQPM	Fire protection: equipment
E□-FIRE-WALL	Fire protection: wall
E□-GRND	Ground system
E□-GRND-CIRC	Ground system: circuits
E□-GRND-CLNG	Ground system: ceiling
E□-GRND-CNMB	Ground system: circuit number
E□-GRND-DIAG	Ground system: diagrams
E□-GRND-EQPM	Ground system: equipment
E□-GRND-EQUI	Ground system: equipotential
E□-GRND-WALL	Ground system: wall
E□-INST	Instrumentation system
E□-INST-CIRC	Instrumentation system: circuits
E□-INST-CLNG	Instrumentation system: ceiling
E□-INST-CNMB	Instrumentation system: circuit number
E□-INST-EQPM	Instrumentation system: equipment
E□-INST-WALL	Instrumentation system: wall
E□-INTC	Intercom/PA systems
E□-LITE	Lighting
E□-LITE-CIRC	Lighting: circuits
E□-LITE-CIRC-CRIT	Lighting: circuits: critical
E□-LITE-CIRC-EMER	Lighting: circuits: emergency
E□-LITE-CLNG	Lighting: ceiling
E□-LITE-CLNG-CRIT	Lighting: ceiling: critical
E□-LITE-CLNG-EMER	Lighting: ceiling: emergency
E□-LITE-CLNG-EXIT	Lighting: ceiling: exit
E□-LITE-CNMB	Lighting: circuit number
E□-LITE-CNMB-CRIT	Lighting: circuit number: critical
E□-LITE-CNMB-EMER	Lighting: circuit number: emergency
E□-LITE-EMER	Lighting: emergency
E□-LITE-EQPM	Lighting: equipment

E□-LITE-EQPM-CRIT	Lighting: equipment: critical
E□-LITE-EQPM-EMER	Lighting: equipment: emergency
E□-LITE-EXIT	Lighting: exit
E□-LITE-EXTR	Lighting: exterior
E□-LITE-FLOR	Lighting: floor
E□-LITE-JBOX	Lighting: junction box
E□-LITE-OTLN	Lighting: outline
E□-LITE-ROOF	Lighting: roof
E□-LITE-SPCL	Lighting: special
E□-LITE-SWCH	Lighting: switches
E□-LITE-SWCH-CRIT	Lighting: switches: critical
E□-LITE-SWCH-EMER	Lighting: switches: emergency
E□-LITE-WALL	Lighting: wall
E□-LITE-WALL-CRIT	Lighting: wall: critical
E□-LITE-WALL-EMER	Lighting: wall: emergency
E□-LITE-WALL-EXIT	Lighting: wall: exit
E□-LTNG	Lightning protection system
E□-LTNG-CIRC	Lightning protection system: circuits
E□-LTNG-CLNG	Lightning protection system: ceiling
E□-LTNG-CNMB	Lightning protection system: circuit number
E□-LTNG-EQPM	Lightning protection system: equipment
E□-LTNG-WALL	Lightning protection system: wall
E□-MNTG	Mounting system
E□-NURS	Nurse call system
E□-NURS-CIRC	Nurse call system: circuits
E□-NURS-CLNG	Nurse call system: ceiling
E□-NURS-CNMB	Nurse call system: circuit number
E□-NURS-EQPM	Nurse call system: equipment
E□-NURS-FLOR	Nurse call system: floor
E□-NURS-WALL	Nurse call system: wall
E□-OBST	Obstructions
E□-PGNG	Paging system
E□-POWR	Power
E□-POWR-BUSW	Power: busways
E□-POWR-CABL	Power: cable systems
E□-POWR-CBOX	Power: combiner box
E□-POWR-CBOX-FTPT	Power: combiner box: area footprints
E□-POWR-CIRC	Power: circuits
E□-POWR-CIRC-CRIT	Power: circuits: critical
E□-POWR-CLNG	Power: ceiling

E□-POWR-CLNG-CRIT	Power: ceiling: critical
E□-POWR-CNDT	Power: conduit
E□-POWR-CNMB	Power: circuit number
E□-POWR-CNMB-CRIT	Power: circuit number: critical
E□-POWR-DEVC	Power: devices
E□-POWR-DSCO	Power: disconnect switches
E□-POWR-DSCO-ACFU	Power: disconnect switches: fused ac
E□-POWR-DSCO-ACNF	Power: disconnect switches: unfused ac
E□-POWR-DSCO-DCFU	Power: disconnect switches: fused dc
E□-POWR-DSCO-DCNF	Power: disconnect switches: unfused dc
E□-POWR-EQPM	Power: equipment
E□-POWR-EQPM-CRIT	Power: equipment: critical
E□-POWR-EXTR	Power: exterior
E□-POWR-FEED	Power: feeders
E□-POWR-FLOR	Power: floor
E□-POWR-FLOR-CRIT	Power: floor: critical
E□-POWR-JBOX	Power: junction box
E□-POWR-PANL	Power: panels
E□-POWR-POCC	Power: point of common coupling
E□-POWR-POI~	Power: point of interconnection
E□-POWR-ROOF	Power: roof
E□-POWR-SWBD	Power: switchboards
E□-POWR-UCPT	Power: under-carpet wiring
E□-POWR-URAC	Power: underfloor raceways
E□-POWR-WALL	Power: wall
E□-POWR-WALL-CRIT	Power: wall: critical
E□-POWR-XFMR-PADM	Power: transformers: pad-mounted
E□-POWR-XFMR-POLM	Power: transformers: pole-mounted
E□-PVMD	Photovoltaic modules
E□-SITE	Site features
E□-SITE-OVHD	Site features: overhead
E□-SITE-POLE	Site features: pole
E□-SITE-UGND	Site features: underground
E□-SOUN	Sound system
E□-UTIL	Utilities

5.5 DISTRIBUTED ENERGY LAYER LIST

Distributed Energy Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Distributed Energy Discipline Designators

Designator	Description
W	Distributed Energy
WC	Distributed Energy Civil
WD	Distributed Energy Demolition
WI	Distributed Energy Interconnection
WP	Distributed Energy Power
WS	Distributed Energy Structural
WT	Distributed Energy Telecommunications
WY	Distributed Energy Auxiliary Systems
WJ	User Defined
WK	User Defined

Distributed Energy Layer List

Layer Name	Description
No layer names have been prescribed for this discipline.	

5.6 EQUIPMENT LAYER LIST

Equipment Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Equipment Discipline Designators

Designator	Description
Q	Equipment
QA	Equipment Athletic
QB	Equipment Bank
QC	Equipment Dry Cleaning
QD	Equipment Detention
QE	Equipment Educational
QF	Equipment Food Service
QH	Equipment Hospital

QL	Equipment Laboratory
QM	Equipment Maintenance
QP	Equipment Parking Lot
QR	Equipment Retail
QS	Equipment Site
QT	Equipment Theatrical
QV	Equipment Video/Photographic
QY	Equipment Security
QJ	User Defined
QK	User Defined

Equipment Layer List

Layer Name	Description
Q□-CMPR	Computer
Q□-CSWK	Casework
Q□-CSWK-DVDR	Casework: thin dividers
Q□-CSWK-EDGE	Casework: edge
Q□-CSWK-ELEV	Casework: elevation
Q□-CSWK-FIXT	Casework: fixtures (plumbing/service)
Q□-CSWK-FRMG	Casework: structural framing
Q□-CSWK-FULL	Casework: full-height (cabinets/lockers)
Q□-CSWK-GLAZ	Casework: glazing
Q□-CSWK-GRND	Casework: ground
Q□-CSWK-HRDW	Casework: hardware
Q□-CSWK-LOWR	Casework: lower (cabinets)
Q□-CSWK-PATT	Casework: texture and hatch patterns
Q□-CSWK-SHLF	Casework: wall mounted shelving
Q□-CSWK-SUBA	Casework: cabinet sub-assemblies, drawer boxes
Q□-CSWK-UCTR	Casework: undercounter (cabinets-for layout)
Q□-CSWK-UPPR	Casework: upper (cabinets)
Q□-CSWK-WKSF	Casework: work surface
Q□-ELEV	Elevation
Q□-ELEV-EQPM	Elevation: equipment
Q□-ELEV-FIXT	Elevation: fixtures (plumbing/service)
Q□-ELEV-GLAZ	Elevation: glazing
Q□-ELEV-HRDW	Elevation: hardware
Q□-ELEV-OVHD	Elevation: overhead
Q□-ELEV-PATT	Elevation: texture and hatch patterns
Q□-ELEV-STRC	Elevation: structures (support components)

Q□-EXHS	Exhaust system
Q□-MAJQ	Major equipment
Q□-MAJQ-ACCS	Major equipment: access
Q□-MAJQ-ENGR	Major equipment: engineering information
Q□-MAJQ-FIXD	Major equipment: fixed
Q□-MAJQ-MOVE	Major equipment: movable
Q□-MAJQ-MVNG	Major equipment: moving or suspended
Q□-MAJQ-OVHD	Major equipment: overhead
Q□-MAJQ-PATT	Major equipment: texture and hatch patterns
Q□-MAJQ-UCTR	Major equipment: undercounter
Q□-MINQ	Minor equipment
Q□-POWR	Power
Q□-SPCL	Special
Q□-SPCL-ACCS	Special: access
Q□-SPCL-ENGR	Special: engineering information
Q□-SPCL-FIXD	Special: fixed
Q□-SPCL-MOVE	Special: movable
Q□-SPCL-MVNG	Special: moving or suspended
Q□-SPCL-OVHD	Special: overhead
Q□-SPCL-PATT	Special: texture and hatch patterns
Q□-SPCL-UCTR	Special: undercounter

5.7 FIRE PROTECTION LAYER LIST

Fire Protection Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Fire Protection Discipline Designators

Designator	Description
F	Fire Protection
FA	Fire Detection and Alarm
FX	Fire Suppression
FJ	User Defined
FK	User Defined

Fire Protection Layer List

Layer Name	Description

F□-AFFF	Aqueous film-forming foam system
F□-AFFF-EQPM	Aqueous film-forming foam system: equipment
F□-AFFF-PIPE	Aqueous film-forming foam system: piping
F□-CO2S	CO2 system
F□-CO2S-EQPM	CO2 system: equipment
F□-CO2S-PIPE	CO2 system: piping
F□-HALN	Halon
F□-HALN-EQPM	Halon: equipment
F□-HALN-PIPE	Halon: piping
F□-IGAS	Inert gas
F□-IGAS-EQPM	Inert gas: equipment
F□-IGAS-PIPE	Inert gas: piping
F□-PROT	Fire protection system
F□-PROT-ALRM	Fire protection system: alarm
F□-PROT-EQPM	Fire protection system: equipment
F□-PROT-EXTI	Fire protection system: extinguishers
F□-PROT-HOSE	Fire protection system: hoses
F□-PROT-HYDT	Fire protection: hydrants and connections
F□-PROT-RATE	Fire protection system: ratings
F□-PROT-RATE-DOOR	Fire protection system: ratings: doors
F□-PROT-RATE-WALL	Fire protection system: ratings: wall
F□-PROT-SMOK	Fire protection system: smoke detector/heat sensors
F□-SPKL	Sprinkler
F□-SPKL-C LHD	Sprinkler: ceiling heads
F□-SPKL-E QPM	Sprinkler: equipment
F□-SPKL-O THD	Sprinkler: other heads
F□-SPKL-PI PE	Sprinkler: piping

5.8 GENERAL LAYER LIST

General Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

General Discipline Designators

Designator	Description
G	General
GC	General Contractual

GI	General Informational
GR	General Resource
GJ	User Defined
GK	User Defined

General Layer List

Layer Name	Description
G□-ACCS	Access
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 features)

5.9 GEOTECHNICAL LAYER LIST

Geotechnical Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Geotechnical Discipline Designators

Designator	Description
B	Geotechnical
BJ	User Defined
BK	User Defined

Geotechnical Layer List

Layer Name	Description
B□-BORE	Borings
B□-BORE-FDTA	Borings: field data
B□-BORE-HOLE	Borings: holes (perc)
B□-BORE-LDTA	Borings: laboratory data
B□-DETL-ANNN	Detail: optional number (A = letter, NNN = number between 001 and 999)
B□-DETL-ANNN-CONC	Detail: optional number: concrete
B□-DETL-ANNN-ERTH	Detail: optional number: earth

B□-DETL-ANNN-FDTA	Detail: optional number: field data
B□-DETL-ANNN-FILL	Detail: optional number: fill and cover material
B□-DETL-ANNN-GENF	Detail: optional number: general features
B□-DETL-ANNN-GNDW	Detail: optional number: ground water
B□-DETL-ANNN-LDTA	Detail: optional number: laboratory data
B□-DETL-ANNN-PVMT	Detail: optional number: pavement
B□-DETL-ANNN-SPCL	Detail: optional number: special
B□-DETL-ANNN-STRM	Detail: optional number: storm sewer
B□-DETL-ANNN-SUBS	Detail: optional number: sub-surface areas
B□-DETL-ANNN-SURF	Detail: optional number: surface areas

5.10 HAZARDOUS MATERIALS LAYER LIST

Hazardous Materials Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Hazardous Materials Discipline Designators

Designator	Description
H	Hazardous Materials
HA	Hazardous Materials Asbestos
HC	Hazardous Materials Chemicals
HL	Hazardous Materials Lead
HP	Hazardous Materials PCB
HR	Hazardous Materials Refrigerants
HJ	User Defined
HK	User Defined

Hazardous Materials Layer List

Layer Name	Description
H□-PLAN	Key plan (floor plan)
H□-SITE	Key plan (site features)

5.11 INTERIORS LAYER LIST

Interiors Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Interiors Discipline Designators

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

Interiors Layer List

Layer Name	Description
I□-AREA	Area
I□-AREA-OCCP	Area: occupant or employee names
I□-CLNG	Ceiling
I□-CLNG-ACCS	Ceiling: access
I□-CLNG-OPNG	Ceiling: openings
I□-CLNG-SUSP	Ceiling: suspended elements
I□-CLNG-TEES	Ceiling: main tees
I□-COLS	Columns
I□-CRPT	Carpet/carpet tile
I□-CSWK	Casework
I□-DOOR	Doors
I□-DOOR-FULL	Doors: full-height
I□-DOOR-PRHT	Doors: partial-height
I□-EQPM	Equipment
I□-EQPM-ACCS	Equipment: access
I□-EQPM-FIXD	Equipment: fixed
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: fixtures (plumbing)
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
I□-FLOR-RAIS	Floor: raised
I□-FLOR-RISR	Floor: risers
I□-FLOR-SIGN	Floor: signage
I□-FLOR-SPCL	Floor: architectural specialties (toilet room accessories, display cases)
I□-FLOR-STRS	Floor: stair treads (escalators, ladders)
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
I□-FURN-PLNT	Furnishings: plants
I□-FURN-PNLS	Furnishings: system panels
I□-FURN-SEAT	Furnishings: seating
I□-FURN-STOR	Furnishings: storage (component system)
I□-FURN-WKSF	Furnishings: work surface (component system)
I□-GLAZ	Glazing
I□-GLAZ-FULL	Glazing: full-height
I□-GLAZ-PRHT	Glazing: partial-height
I□-GLAZ-SILL	Glazing: window sills
I□-HVAC	HVAC systems
I□-HVAC-RDFF	HVAC systems: return air diffusers
I□-HVAC-SDFF	HVAC systems: supply diffusers
I□-MILL	Millwork
I□-PRTN	Partitions
I□-PRTN-FIRE	Partitions: fire protection
I□-PRTN-FULL	Partitions: full-height
I□-PRTN-HEAD	Partitions: door and window headers
I□-PRTN-JAMB	Partitions: door and window jambs
I□-PRTN-MOVE	Partitions: moveable
I□-PRTN-PRHT	Partitions: partial-height
I□-TILE	Tile

5.12 LANDSCAPE LAYER LIST

Landscape Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Landscape Discipline Designators

Designator	Description
L	Landscape
LD	Landscape Demolition
LG	Landscape Grading
LI	Landscape Irrigation
LL	Landscape Lighting
LP	Landscape Planting
LR	Landscape Relocation
LS	Landscape Site
LJ	User Defined
LK	User Defined

Landscape Layer List

Layer Name	Description
L□-FENC	Fences
L□-FENC-LINK	Fences: chain link
L□-FENC-LINK-04FT	Fences: chain link: four feet high
L□-FENC-LINK-06FT	Fences chain link: six feet high
L□-FENC-PRVC	Fences: privacy
L□-FENC-WOOD	Fences: wood
L□-IRRG	Irrigation
L□-IRRG-COVR	Irrigation: coverage
L□-IRRG-DRIP	Irrigation: drip irrigation tubing
L□-IRRG-EQPM	Irrigation: equipment (pumps, valves, and controllers)
L□-IRRG-LTRL	Irrigation: lateral pipe
L□-IRRG-MAIN	Irrigation: mainline
L□-IRRG-PIPE	Irrigation: piping
L□-IRRG-SLVE	Irrigation: pipe sleeve
L□-IRRG-SPKL	Irrigation: sprinklers (rotors, heads)
L□-IRRG-VALV	Irrigation: valves
L□-PLNT	Plant and landscape material
L□-PLNT-BEDS	Plant and landscape material: perennial and annual beds
L□-PLNT-BUSH	Plant and landscape material: bushes and shrubs

L□-PLNT-CONI	Plant and landscape material: coniferous trees
L□-PLNT-CTNR	Plant and landscape material: container or planter
L□-PLNT-EDGR	Plant and landscape material: planting bed edger
L□-PLNT-EVGR	Plant and landscape material: evergreen trees - broadleaf
L□-PLNT-GCVR	Plant and landscape material: ground cover
L□-PLNT-MLCH	Plant and landscape material: mulches - organic and inorganic
L□-PLNT-PALM	Plant and landscape material: palm trees
L□-PLNT-PLNT	Plant and landscape material: plants
L□-PLNT-SEED	Plant and landscape material: seeding areas
L□-PLNT-SHAD	Plant and landscape material: shadow area
L□-PLNT-TREE	Plant and landscape material: trees
L□-PLNT-TURF	Plant and landscape material: lawn areas
L□-PLNT-VINE	Plant and landscape material: vines
L□-PVMT	Pavement
L□-PVMT-ASPH	Pavement: asphalt
L□-PVMT-BRCK	Pavement: brick
L□-PVMT-CONC	Pavement: concrete
L□-PVMT-CONC-AGGR	Pavement: concrete: exposed aggregate
L□-PVMT-GRVL	Pavement: gravel
L□-PVMT-JNTC	Pavement: control joint
L□-PVMT-JNTE	Pavement: expansion joint (for concrete only)
L□-PVMT-PAVR	Pavement: unit pavers
L□-PVMT-RAMP	Pavement: accessible ramp
L□-PVMT-STRS	Pavement: stair treads
L□-SITE	Site features
L□-SITE-BRDG	Site features: bridge (pedestrian)
L□-SITE-CURB	Site features: curb
L□-SITE-CURB-BACK	Site features: curb: back
L□-SITE-CURB-FACE	Site features: curb: face
L□-SITE-DECK	Site features: deck (wood, typ.)
L□-SITE-FURN	Site features: furnishings
L□-SITE-PLAY	Site features: play structures
L□-SITE-PLAY-EQPM	Site features: play structures: equipment
L□-SITE-PLAY-ZONE	Site features: play structures: zoning
L□-SITE-POOL	Site features: pools and spas
L□-SITE-POOL-BACK	Site features: pools and spas: back of pool wall
L□-SITE-POOL-FACE	Site features: pools and spas: face of pool wall
L□-SITE-PRKG	Site features: parking
L□-SITE-PRKG-STRP	Site features : parking: striping
L□-SITE-ROAD	Site features: edge of roadway line

L□-SITE-ROCK	Site features: large rocks and rock outcroppings
L□-SITE-RRAP	Site features: riprap
L□-SITE-RTWL	Site features: retaining wall
L□-SITE-SPRT	Site features: sports fields
L□-SITE-SPRT-EQPM	Site features: sports fields: equipment
L□-SITE-SPRT-PERI	Site features: sports fields: perimeter
L□-SITE-STEP	Site features: steps
L□-SITE-SWLK	Site features: sidewalks and steps
L□-SITE-TRAL	Site features: trail or path
L□-SITE-TRAL-ASPH	Site features: trail or path: asphalt
L□-SITE-TRAL-CONC	Site features: trail or path: concrete
L□-SITE-TRAL-GRVL	Site features: trail or path: gravel
L□-SITE-WALL	Site features: walls
L□-SITE-WEIR	Site features: pool weir
L□-TOPO	Topographic feature
L□-TOPO-LIMI	Topographic feature: limit of earthwork
L□-TOPO-SPOT	Topographic feature: spot elevations

5.13 MECHANICAL LAYER LIST

Mechanical Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Mechanical Discipline Designators

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

Mechanical Layer List

Layer Name	Description

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-EQPM	Compressed/processed air systems: equipment
M□-CMPA-PEQP	Compressed/processed air systems: process equipment
M□-CMPA-PIPE	Compressed/processed air systems: piping
M□-CMPA-PPIP	Compressed/processed air systems: process piping
M□-CNDW	Condenser water systems
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-SPLY	Condenser water systems: supply
M□-CNDW-SPLY-PIPE	Condenser water systems: supply: piping
M□-CNDW-SPLY-SKCH	Condenser water systems: supply: sketch
M□-CONT	Controls and instrumentation
M□-CONT-THER	Controls and instrumentation: thermostats
M□-CONT-WIRE	Controls and instrumentation: wiring (low voltage)
M□-CWTR	Chilled water systems
M□-CWTR-CNDS	Chilled water systems: condensate piping
M□-CWTR-EQPM	Chilled water systems: equipment
M□-CWTR-PIPE	Chilled water systems: piping
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-SPLY	Chilled water systems: supply
M□-CWTR-SPLY-PIPE	Chilled water systems: supply: piping
M□-CWTR-SPLY-SKCH	Chilled water systems: supply: sketch
M□-DOMW	Domestic water systems
M□-DOMW-MKUP	Domestic water systems: make-up water
M□-DUAL	Dual temperature systems
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-SPLY	Dual temperature systems: supply
M□-DUAL-SPLY-PIPE	Dual temperature systems: supply: piping
M□-DUAL-SPLY-SKCH	Dual temperature systems: supply: sketch

M□-DUST	Dust and fume collection systems
M□-DUST-DUCT	Dust and fume collection systems: ductwork
M□-DUST-DUCT-CNTR	Dust and fume collection systems: ductwork: center
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-DUCT-CNTR	Exhaust system: ductwork: center
M□-EXHS-EQPM	Exhaust system: equipment
M□-EXHS-RFEQ	Exhaust system: rooftop equipment
M□-FLOR	Floor
M□-FLOR-PENE	Floor: penetrations
M□-FUEL	Fuel systems
M□-FUEL-EQPM	Fuel systems: equipment
M□-FUEL-GGEP	Fuel systems: gas general piping
M□-FUEL-GGEP-HPIP	Fuel systems: gas general piping: high pressure piping
M□-FUEL-GGEP-LPIP	Fuel systems: gas general piping: low-pressure piping
M□-FUEL-GGEP-LQPG	Fuel systems: gas general piping: liquid petroleum gas
M□-FUEL-GGEP-MPIP	Fuel systems: gas general piping: medium-pressure piping
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-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-SPLY	Fuel systems: oil general piping: supply
M□-FUEL-OGEP-VENT	Fuel systems: oil general piping: vents
M□-FUME	Fume hood
M□-FUME-DUCT	Fume hood: ductwork
M□-FUME-EQPM	Fume hood: equipment
M□-GLYC	Glycol systems
M□-GLYC-RETN	Glycol systems: return
M□-GLYC-RETN-PIPE	Glycol systems: return: piping
M□-GLYC-RETN-SKCH	Glycol systems: return: sketch

M□-GLYC-SPLY	Glycol systems: supply
M□-GLYC-SPLY-PIPE	Glycol systems: supply: piping
M□-GLYC-SPLY-SKCH	Glycol systems: supply: sketch
M□-HVAC	HVAC systems
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-DUCT	HVAC systems: cold air: ductwork
M□-HVAC-CLDA-EQPM	HVAC systems: cold air: equipment
M□-HVAC-CLDA-RSCH	HVAC systems: cold air: sketch line round or oval duct
M□-HVAC-CLDA-SECT	HVAC systems: cold air: 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-DUCT	HVAC systems: exhaust air: ductwork
M□-HVAC-EXHS-EQPM	HVAC systems: exhaust air: equipment
M□-HVAC-EXHS-GRIL	HVAC systems: exhaust air: grilles
M□-HVAC-EXHS-RSCH	HVAC systems: exhaust air: sketch line round or oval duct
M□-HVAC-EXHS-SECT	HVAC systems: exhaust air: 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-DUCT	HVAC systems: hot air: ductwork
M□-HVAC-HOTA-EQPM	HVAC systems: hot air: equipment
M□-HVAC-HOTA-RSCH	HVAC systems: hot air: sketch line round or oval duct
M□-HVAC-HOTA-SECT	HVAC systems: hot air: 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-ODFF	HVAC systems: other diffusers
M□-HVAC-PIPE	HVAC systems: piping
M□-HVAC-RDFF	HVAC systems: return air diffusers
M□-HVAC-RETN	HVAC systems: return
M□-HVAC-RETN-CNTR	HVAC systems: return: center

M□-HVAC-RETN-EQPM	HVAC systems: return: equipment
M□-HVAC-RETN-RSCH	HVAC systems: return: sketch line round or oval duct
M□-HVAC-RETN-SECT	HVAC systems: return: section
M□-HVAC-RETN-SIZE	HVAC systems: return: ductwork size
M□-HVAC-RETN-SSCH	HVAC systems: return: sketch line rectangular duct
M□-HVAC-SDFF	HVAC systems: supply diffusers
M□-HVAC-SPLY	HVAC systems: supply
M□-HVAC-SPLY-CNTR	HVAC systems: supply: center
M□-HVAC-SPLY-EQPM	HVAC systems: supply: equipment
M□-HVAC-SPLY-RSCH	HVAC systems: supply: sketch line round or oval duct
M□-HVAC-SPLY-SECT	HVAC systems: supply: section
M□-HVAC-SPLY-SIZE	HVAC systems: supply: ductwork size
M□-HVAC-SPLY-SSCH	HVAC systems: supply: sketch line rectangular duct
M□-HWTR	Hot water heating system
M□-HWTR-EQPM	Hot water heating system: equipment
M□-HWTR-PIPE	Hot water heating system: piping
M□-HWTR-RETN	Hot water heating system: return
M□-HWTR-RETN-PIPE	Hot water heating system: return: piping
M□-HWTR-RETN: SKCH	Hot water heating system: return: sketch
M□-HWTR-SPLY	Hot water heating system: supply
M□-HWTR-SPLY-PIPE	Hot water heating system: supply: piping
M□-HWTR-SPLY-SKCH	Hot water heating system: supply: sketch
M□-LGAS	Laboratory gas systems
M□-LGAS-EQPM	Laboratory gas systems: equipment
M□-LGAS-PIPE	Laboratory gas systems: piping
M□-MACH	Machine shop
M□-MDGS	Medical gas systems
M□-MDGS-CAIR	Medical gas systems: compressed air
M□-MDGS-EQPM	Medical gas systems: equipment
M□-MDGS-NITG	Medical gas systems: nitrogen
M□-MDGS-NOXG	Medical gas systems: nitrous oxide
M□-MDGS-OXYG	Medical gas systems: pure O2
M□-MDGS-PIPE	Medical gas systems: piping
M□-MDGS-SAIR	Medical gas systems: scavenge air
M□-MDGS-VACU	Medical gas systems: vacuum
M□-MKUP	Make-up air systems
M□-MKUP-CDFF	Make-up air systems: ceiling diffusers
M□-MKUP-DUCT	Make-up air systems: ductwork
M□-MKUP-EQPM	Make-up air systems: equipment
M□-MPIP	Miscellaneous piping systems

M□-MPIP-PIPE	Miscellaneous piping systems: piping
M□-NGAS	Natural gas systems
M□-NGAS-EQPM	Natural gas systems: equipment
M□-NGAS-PIPE	Natural gas systems: piping
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-DISC	Refrigeration systems: discharge
M□-REFG-EQPM	Refrigeration systems: equipment
M□-REFG-PIPE	Refrigeration systems: piping
M□-REFG-RETN	Refrigeration systems: return
M□-REFG-SPLY	Refrigeration systems: supply
M□-ROOF	Roof
M□-ROOF-PENE	Roof: penetrations
M□-SMOK	Smoke extraction systems
M□-SMOK-CDFF	Smoke extraction systems: ceiling diffusers
M□-SMOK-DUCT	Smoke extraction systems: ductwork
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 system
M□-STEM-BLBD	Steam system: boiler blow down piping
M□-STEM-BLBD-PIPE	Steam system: boiler blow down piping: piping
M□-STEM-CNDS	Steam system: condensate piping
M□-STEM-CNDS-SKCH	Steam system: condensate piping: sketch
M□-STEM-EQPM	Steam system: equipment
M□-STEM-HPIP	Steam system: high-pressure piping
M□-STEM-HPIP-SKCH	Steam system: high-pressure piping: sketch
M□-STEM-LPIP	Steam system: low-pressure piping
M□-STEM-LPIP-SKCH	Steam system: low-pressure piping: sketch
M□-STEM-MPIP	Steam system: medium-pressure piping
M□-STEM-MPIP-SKCH	Steam system: medium-pressure piping: sketch
M□-TEST	Test equipment
M□-WALL	Wall

M□-WALL-PENE	Wall: penetrations

5.14 OPERATIONS LAYER LIST

Operations Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Operations Discipline Designators

Designator	Description
O	Operations
OJ	User Defined
OK	User Defined

Operations Layer List

Layer Name	Description
No layer names have been prescribed for this discipline.	

5.15 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. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Plumbing Discipline Designators

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

Plumbing Layer List

Layer Name	Description
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: risers
P□-DOMW-RPIP	Domestic water systems: recirculation piping
P□-FLOR	Floor
P□-FLOR-PENE	Floor: penetrations
P□-MDGS	Medical gas systems
P□-MDGS-CAIR	Medical gas systems: compressed air
P□-MDGS-EQPM	Medical gas systems: equipment
P□-MDGS-NITG	Medical gas systems: nitrogen
P□-MDGS-NOXG	Medical gas systems: nitrous oxide
P□-MDGS-OXYG	Medical gas systems: pure O2
P□-MDGS-PIPE	Medical gas systems: piping
P□-MDGS-SAIR	Medical gas systems: scavenge air
P□-MDGS-VACU	Medical gas systems: vacuum
P□-ROOF	Roof
P□-ROOF-PENE	Roof: penetrations
P□-SSWR	Sanitary sewer
P□-SSWR-EQPM	Sanitary sewer: equipment
P□-SSWR-FIXT	Sanitary sewer: fixtures
P□-SSWR-FLDR	Sanitary sewer: floor drains
P□-SSWR-PIPE	Sanitary sewer: piping
P□-SSWR-RISR	Sanitary sewer: risers
P□-SSWR-VENT	Sanitary sewer: vents
P□-STRM	Storm sewer
P□-STRM-PIPE	Storm sewer: piping
P□-STRM-RFDR	Storm sewer: roof drains
P□-STRM-RISR	Storm sewer: risers
P□-WALL	Wall
P□-WALL-PENE	Wall: penetrations

5.16 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. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Process Discipline Designators

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

Process Layer List

Layer Name	Description
D□-AIR~-AA~~	Air: agitation air - system
D□-AIR~-BA~~	Air: breathable air - system
D□-AIR~-CA~~	Air: compressed air - system
D□-AIR~-CDA~	Air: clean dry air - system
D□-AIR~-HCDA	Air: high pressure clean dry air - system
D□-AIR~-IA~~	Air: instrument air - system

D□-AIR~-OA~~	Air: outside air - system
D□-AIR~-OFA~	Air: oil free air - system
D□-AIR~-PA~~	Air: plant air - system
D□-AIR~-V~~~	Air: vent - system
D□-CHEM-ARC~	Chemical: regenerative caustic - system
D□-CHEM-C~~~	Chemical: caustic - system
D□-CHEM-DEV~	Chemical: developer - system
D□-CHEM-EG~~	Chemical: ethylene glycol - system
D□-CHEM-H2O2	Chemical: hydrogen peroxide - system
D□-CHEM-HCL~	Chemical: hydrochloric acid - system
D□-CHEM-HF~~	Chemical: hydrofluoric acid - system
D□-CHEM-IPA~	Chemical: isopropyl alcohol - system
D□-CHEM-PHOS	Chemical: phosphoric acid - system
D□-CHEM-RER~	Chemical: solvent - system
D□-CHEM-SULF	Chemical: sulfuric acid - system
D□-CHEM-TMAH	Chemical: tmah - system
D□-DETL-BOLD	Detail: bold lines
D□-DETL-FINE	Detail: fine lines
D□-DETL-MEDM	Detail: medium lines
D□-DRAN-AMW~	Drains: ammonia waste - system
D□-DRAN-CD~~	Drains: condensate drain - system
D□-DRAN-CLW~	Drains: concentrated lead waste - system
D□-DRAN-CMW~	Drains: concentrated metals waste - system
D□-DRAN-CUPW	Drains: copper plating waste - system
D□-DRAN-CURW	Drains: copper rinse waste - system
D□-DRAN-CUSW	Drains: copper slurry waste - system
D□-DRAN-DIRC	Drains: DI reclaim - system
D□-DRAN-DLW~	Drains: dilute waste - system
D□-DRAN-EGW~	Drains: ethylene glycol waste - system
D□-DRAN-HFW~	Drains: hydrofluoric waste - system
D□-DRAN-IW~~	Drains: industrial waste - system
D□-DRAN-MW~~	Drains: metals waste - system
D□-DRAN-NPWR	Drains: non-potable water reuse - system
D□-DRAN-OIW~	Drains: organic industrial waste - system
D□-DRAN-OLW~	Drains: organic liquid waste - system
D□-DRAN-OSW~	Drains: organic solvent waste - system
D□-DRAN-PHRC	Drains: phosphoric acid reclaim - system
D□-DRAN-PSW~	Drains: photo solvent waste - system
D□-DRAN-SDD~	Drains: scrubber duct drains - system
D□-DRAN-SLW~	Drains: slurry waste - system

D□-DRAN-SULF	Drains: sulfuric acid - system
D□-DRAN-SULR	Drains: sulfuric acid reclaim - system
D□-DRAN-SW~~	Drains: solvent waste - system
D□-DRAN-SWF~	Drains: solvent waste flammable - system
D□-DRAN-SWNF	Drains: solvent waste non-flammable - system
D□-EXHS-AMEX	Exhaust: ammonia exhaust - system
D□-EXHS-AREX	Exhaust: arsenic exhaust - system
D□-EXHS-HTEX	Exhaust: heat exhaust - system
D□-EXHS-SCEX	Exhaust: scrubber exhaust - system
D□-EXHS-SVEX	Exhaust: solvent exhaust - system
D□-GAS~-AR~~	Gas: argon - system
D□-GAS~-ARB~	Gas: argon bulk - system
D□-GAS~-BUT~	Gas: butane - system
D□-GAS~-CLG~	Gas: chlorine gas - system
D□-GAS~-H2~~	Gas: hydrogen - system
D□-GAS~-HE~~	Gas: helium - system
D□-GAS~-HPN2	Gas: high purity nitrogen - system
D□-GAS~-HPO2	Gas: high purity oxygen - system
D□-GAS~-LCHE	Gas: leak check helium - system
D□-GAS~-N2~~	Gas: nitrogen - system
D□-GAS~-N2O~	Gas: nitrous oxide - system
D□-GAS~-NG~~	Gas: natural gas - system
D□-GAS~-O2~~	Gas: oxygen - system
D□-GAS~-PRO~	Gas: propane - system
D□-GAS~-SG~~	Gas: specialty gas - system
D□-GAS~-UN2~	Gas: utility nitrogen - system
D□-GAS~-VN2~	Gas: venturi nitrogen - system
D□-GAS~-WAR~	Gas: weld argon - system
D□-LIQD-LPG~	Liquid: liquid petroleum gas - system
D□-OIL~-LO~~	Oil: lube oil - system
D□-PIPE	Piping
D□-PIPE-CNTR	Piping: center
D□-PIPE-EQPM	Piping: equipment
D□-PIPE-HDLN	Piping: hidden line
D□-PIPE-MISC	Piping: miscellaneous
D□-PIPE-PATT	Piping: texture and hatch patterns
D□-PIPE-UGND	Piping: underground
D□-SLUR-SLR~	Slurry: slurry return - system
D□-SLUR-SLS~	Slurry: slurry supply - system
D□-VACU-CLV~	Vacuum: chlorine vacuum - system

D□-VACU-CV~~	Vacuum: chemical vacuum - system
D□-VACU-EV~~	Vacuum: equipment vacuum - system
D□-VACU-HV~~	Vacuum: house vacuum - system
D□-VACU-HVA~	Vacuum: arsenic house vacuum - system
D□-VACU-PV~~	Vacuum: vacuum - system
D□-WATR-BFW~	Water: boiler feed water - system
D□-WATR-DIR~	Water: deionized water return - system
D□-WATR-DIS~	Water: deionized water supply - system
D□-WATR-DIWP	Water: DI polishing loop - system
D□-WATR-FW~~	Water: fire water - system
D□-WATR-HDIR	Water: hot DI return - system
D□-WATR-HDIS	Water: hot DI supply - system
D□-WATR-HDRC	Water: hot DI reclaim - system
D□-WATR-HPDR	Water: high pH DI return - system
D□-WATR-HPDS	Water: high pH DI supply - system
D□-WATR-ICW~	Water: industrial city water - system
D□-WATR-NPW~	Water: non-potable water - system
D□-WATR-PCWR	Water: cooling water return - system
D□-WATR-PCWS	Water: cooling water supply - system
D□-WATR-PW~~	Water: potable water - system
D□-WATR-RO~~	Water: reverse osmosis water - system
D□-WATR-ROR~	Water: reverse osmosis reject water - system
D□-WATR-TDIR	Water: tempered DI return - system
D□-WATR-TDIS	Water: tempered DI supply - system
D□-WATR-TW~~	Water: tempered water - system
D□-WATR-UPRW	Water: ultra pure recycle water - system
D□-WATR-UPW~	Water: ultra pure water - system

5.17 RESOURCE LAYER LIST

Resource Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Resource Discipline Designators

Designator	Description
R	Resource
RA	Resource Architectural
RC	Resource Civil

RE	Resource Electrical
RM	Resource Mechanical
RR	Resource Real Esate
RS	Resource Structural
RJ	User Defined
RK	User Defined

Resource Layer List

ayer Name	Description
R□-INGR	Ingrants
R□-INGR-ESMT	Ingrants: easement
R□-INGR-LEAS	Ingrants: lease
R□-INGR- LICN	Ingrants: license
R□-INGR-PMIT	Ingrants: permit
R□-INGR-RSRV	Ingrants: reservation
R□-LAND	Land
R□-LAND-ALOC	Land: allocation
R□-LAND-CLAS	Land: classification
R□-OTGR	Outgrants
R□-OTGR-LEAS	Outgrants: lease
R□-OTGR-LICN	Outgrants: license
R□-OTGR-PMIT	Outgrants: permit
R□-OTGR-RSRV	Outgrants: reservation
R□-PROP	Property
R□-PROP-PRCL	Property: parcels
R□-PROP-TAKE	Property: taking lines
R□-PROP-TAKE-ELEV	Property: taking lines: elevations
R□-PROP-TRAC	Property: tract lines
R□-PROP-TRAC-DFEE	Property: tract lines: disposed fee
R□-PROP-TRAC-FEE~	Property: tract lines: fee
R□-PROP-TRAC-LFEE	Property: tract lines: disposed less than fee
R□-PROP-TRAC-NFEE	Property: tract lines: non-fee

5.18 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. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Structural Discipline Designators

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

Structural Layer List

Layer Name	Description
S□-ALGN	Alignment
S□-BEAM	Beams
S□-BEAM-ALUM	Beams: aluminum
S□-BEAM-CONC	Beams: concrete
S□-BEAM-STEL	Beams: steel
S□-BEAM-WOOD	Beams: wood
S□-BRCG	Bracing
S□-BRCG-ALUM	Bracing: aluminum
S□-BRCG-ALUM-HORZ	Bracing: aluminum: horizontal
S□-BRCG-ALUM-VERT	Bracing: aluminum: vertical
S□-BRCG-METL	Bracing: metal
S□-BRCG-STEL	Bracing: steel
S□-BRCG-STEL-HORZ	Bracing: steel: horizontal
S□-BRCG-STEL-VERT	Bracing: steel: vertical
S□-BRCG-WOOD	Bracing: wood
S□-BRCG-WOOD-HORZ	Bracing: wood: horizontal
S□-BRCG-WOOD-VERT	Bracing: wood: vertical
S□-COLS	Columns
S□-COLS-ABLT	Columns: anchor bolts
S□-COLS-ALUM	Columns: aluminum
S□-COLS-CONC	Columns: concrete
S□-COLS-STEL	Columns: steel
S□-COLS-WOOD	Columns: wood
S□-DECK	Deck
S□-DECK-FLOR	Deck: floor

S□-DECK-FLOR-OPNG	Deck: floor: openings
S□-DECK-ROOF	Deck: roof
S□-DECK-ROOF-OPNG	Deck: roof: openings
S□-DETL	Detail
S□-DETL-HSSS	Detail: hollow structural steel
S□-DETL-PLYW	Detail: plywood
S□-DETL-W2XS	Detail: dimension lumber
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 bar
S□-FNDN-RBAR-BOT1	Foundation: reinforcing bar: bottom group 1
S□-FNDN-RBAR-BOT2	Foundation: reinforcing bar: bottom group 2
S□-FNDN-RBAR-TOP1	Foundation: reinforcing bar: top group 1
S□-FNDN-RBAR-TOP2	Foundation: reinforcing bar: top group 2
S□-FRAM	Braced frame or moment frame
S□-FSTN	Fasteners and connections
S□-GATE	Gate
S□-GRID	Grids
S□-GRID-EXTR	Grids: exterior
S□-GRID-INTR	Grids: interior
S□-GRLN	Grade line
S□-GRLN-SURF	Grade line: surface areas
S□-GRTG	Grating
S□-GRTG-OVHD	Grating: overhead
S□-HYDR	Hydraulic structure
S□-JNTS	Joints
S□-JNTS-CNTJ	Joints: construction joint
S□-JNTS-CTLJ	Joints: control joint
S□-JNTS-EXPJ	Joints: expansion joint
S□-JOIS	Joists
S□-JOIS-BRGX	Joists: bridging
S□-LNTL	Lintels
S□-PADS	Pads
S□-PADS-EQPM	Pads: equipment
S□-PLAT	Platform
S□-PLAT-FRMG	Platform: framing

S□-PLAT-GRTG	Platform: grating
S□-SIGN	Sign
S□-SIGN-BOUY	Sign: bouy
S□-SIGN-FRMG	Sign: framing
S□-SIGN-GAGE	Sign: gauge (staff)
S□-SIGN-TEXT	Sign: signage text
S□-SIGN-XTRU	Sign: extrusion
S□-SLAB	Slab
S□-SLAB-CONC	Slab: concrete
S□-SLAB-EDGE	Slab: edge
S□-SLAB-OPNG	Slab: openings (and depressions)
S□-SLAB-OPNX	Slab: opening indication ("x")
S□-SLAB-STEL	Slab: steel
S□-SLAB-WOOD	Slab: wood
S□-STIF	Stiffener
S□-STIF-LONG	Stiffener: longitudinal
S□-STIF-TRAV	Stiffener: transverse
S□-STRS	Stairs
S□-STRS-LADD	Stairs: ladders & ladder assemblies
S□-TRUS	Trusses
S□-WALL	Walls
S□-WALL-ABOV	Walls: above
S□-WALL-CMUW	Walls: concrete masonry unit
S□-WALL-CONC	Walls: concrete
S□-WALL-MSNW	Walls: masonry
S□-WALL-PCST	Walls: pre-cast concrete
S□-WALL-SHEA	Walls: structural bearing or shear walls
S□-WALL-STEL	Walls: steel stud
S□-WALL-VENR	Walls: veneer
S□-WALL-WOOD	Walls: wood

5.19 SURVEY/MAPPING LAYER LIST

Survey/Mapping Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Survey/Mapping Discipline Designators

Designator	Description

V	Survey/Mapping
VA	Survey/Mapping Aerial
VC	Survey/Mapping Computated Points
VF	Survey/Mapping Field
VI	Survey/Mapping Digital
VN	Survey/Mapping Node Points
VS	Survey/Mapping Staked Points
VU	Survey/Mapping Combined Utilities
VJ	User Defined
VK	User Defined

Survey/Mapping Layer List

Layer Name	Description
V□-BLDG	Buildings and primary structures
V□-BLDG-DECK	Buildings and primary structures: deck (attached, no roof overhead)
V□-BLDG-OTLN	Buildings and primary structures: outline
V□-BLDG-OVHD	Buildings and primary structures: overhead
V□-BLDG-PRCH	Buildings and primary structures: porch (attached, roof overhead)
V□-BNDY	Political boundaries
V□-BNDY-BORO	Political boundaries: borough
V□-BNDY-CITY	Political boundaries: city
V□-BNDY-CNTY	Political boundaries: county
V□-BNDY-CORP	Political boundaries: corporation
V□-BNDY-NATL	Political boundaries: national
V□-BNDY-PROV	Political boundaries: province
V□-BNDY-STAT	Political boundaries: state
V□-BNDY-TSHP	Political boundaries: town or township
V□-BNDY-ZONE	Political boundaries: zoning
V□-BORE	Borings
V□-BRDG	Bridge
V□-BRDG-BENT	Bridge: top of bent
V□-BRDG-CNTR	Bridge: center
V□-BRDG-CTLJ	Bridge: control joint
V□-BRDG-DECK	Bridge: deck
V□-BRDG-GRAL	Bridge: guard rail
V□-BRKL	Break/fault lines
V□-BRKL-BOTB	Break/fault lines: bottom of bank

V□-BRKL-FLOW	Break/fault lines: flowline (lowest point of ditch)
V□-BRKL-TOPB	Break/fault lines: top of bank
V□-BRLN	Building restriction line
V□-BZNA	Buffer zone area
V□-CHAN	Navigable channels
V□-CHAN-BWTR	Navigable channels: breakwater
V□-CHAN-CNTR	Navigable channels: center
V□-CHAN-DACL	Navigable channels: de-authorized channel limits, anchorages, etc.
V□-CHAN-DOCK	Navigable channels: decks, docks, floats, piers
V□-CHAN-NAID	Navigable channels: navigation aids
V□-COMM	Communications
V□-COMM-MHOL	Communications: manhole
V□-COMM-OVHD	Communications: overhead
V□-COMM-POLE	Communications: pole
V□-COMM-UGND	Communications: underground
V□-CTRL	Control points
V□-CTRL-BMRK	Control points: benchmarks
V□-CTRL-FLYS	Control points: fly station
V□-CTRL-GRID	Control points: grid
V□-CTRL-HORZ	Control points: horizontal
V□-CTRL-HVPT	Control points: horizontal/vertical
V□-CTRL-PNPT	Control points: panel points
V□-CTRL-TRAV	Control points: transverse
V□-CTRL-VERT	Control points: vertical
V□-DRIV	Driveways
V□-DRIV-ASPH	Driveways: asphalt
V□-DRIV-CNTR	Driveways: center
V□-DRIV-CONC	Driveways: concrete
V□-DRIV-CURB	Driveways: curb
V□-DRIV-FLNE	Driveways: fire lane
V□-DRIV-GRVL	Driveways: gravel
V□-DRIV-MRKG	Driveways: pavement markings
V□-DRIV-UPVD	Driveways: unpaved surface
V□-DTCH	Ditches or washes
V□-DTCH-BOTM	Ditches or washes: bottom
V□-DTCH-CNTR	Ditches or washes: center
V□-DTCH-EWAT	Ditches or washes: edge of water
V□-DTCH-TOP~	Ditches or washes: top
V□-ESMT	Easements
V□-ESMT-ACCS	Easements: access (pedestrian only; private access)

V□-ESMT-CATV	Easements: cable television system
V□-ESMT-CONS	Easements: conservation
V□-ESMT-CSTG	Easements: construction/grading
V□-ESMT-ELEC	Easements: electrical
V□-ESMT-FDPL	Easements: flood plain
V□-ESMT-INEG	Easements: ingress/egress (vehicles; private access)
V□-ESMT-LSCP	Easements: landscape
V□-ESMT-NGAS	Easements: natural gas line
V□-ESMT-PHON	Easements: telephone line
V□-ESMT-ROAD	Easements: roadway
V□-ESMT-ROAD-PERM	Easements: roadway: permanent
V□-ESMT-ROAD-TEMP	Easements: roadway: temporary
V□-ESMT-RWAY	Easements: right-of-way (public access)
V□-ESMT-SGHT	Easements: sight distance
V□-ESMT-SSWR	Easements: sanitary sewer
V□-ESMT-STRM	Easements: storm sewer
V□-ESMT-SWMT	Easements: storm water management
V□-ESMT-TRAL	Easements: trail or path (public access)
V□-ESMT-UTIL	Easements: utility lines
V□-ESMT-WATR	Easements: water supply
V□-FLHA	Flood hazard area
V□-FUEL	Fuel systems
V□-FUEL-MHOL	Fuel systems: manhole
V□-FUEL-PIPE	Fuel systems: piping
V□-FUEL-TANK	Fuel systems: storage tanks
V□-FUEL-UGND	Fuel systems: underground
V□-NGAS	Natural gas systems
V□-NGAS-MHOL	Natural gas systems: manhole
V□-NGAS-PIPE	Natural gas systems: piping
V□-NGAS-TANK	Natural gas systems: storage tanks
V□-NGAS-UGND	Natural gas systems: underground
V□-NODE	Node
V□-NODE-ABUT	Node: abutment
V□-NODE-ACTL	Node: aerial horizontal and vertical control points
V□-NODE-BLDG	Node: building points
V□-NODE-BLIN	Node: baseline
V□-NODE-BRDG	Node: bridge survey points
V□-NODE-BRKL	Node: break lines, spot elev. points and lines for creation of break lines as top of bank
V□-NODE-BROW	Node: brush row points

V□-NODE-BRSH	Node: brush points
V□-NODE-CABL	Node: underground cable systems
V□-NODE-CURB	Node: curb
V□-NODE-DASP	Node: description attributes for survey points
V□-NODE-DECK	Node: deck
V□-NODE-DRIV	Node: driveway
V□-NODE-EASP	Node: elevation attributes for survey points
V□-NODE-EXPJ	Node: expansion joint
V□-NODE-GRND	Node: ground
V□-NODE-MHOL	Node: manhole
V□-NODE-MRKG	Node: pavement markings (yellow/white stripes)
V□-NODE-NGAS	Node: natural gas line
V□-NODE-PASP	Node: point number attributes for survey points
V□-NODE-PIPE	Node: piping (driveway/roadway culverts)
V□-NODE-POLE	Node: pole (power, telephone, etc.)
V□-NODE-PVMT	Node: pavement
V□-NODE-SIGN	Node: signage
V□-NODE-SSWR	Node: sanitary sewer
V□-NODE-STRM	Node: storm sewer
V□-NODE-SWLK	Node: sidewalks
V□-NODE-TREE	Node: tree
V□-NODE-TROW	Node: tree row
V□-NODE-WATR	Node: water supply
V□-POWR	Power
V□-POWR-FENC	Power: fences
V□-POWR-INST	Power: instrumentation (meters, transformers)
V□-POWR-MHOL	Power: manhole
V□-POWR-OVHD	Power: overhead
V□-POWR-POLE	Power: pole
V□-POWR-STRC	Power: structures
V□-POWR-UGND	Power: underground
V□-PRKG	Parking lots
V□-PRKG-ASPH	Parking lots: asphalt
V□-PRKG-CNTR	Parking lots: center
V□-PRKG-CONC	Parking lots: concrete
V□-PRKG-CURB	Parking lots: curb
V□-PRKG-DRAN	Parking lots: drainage slope indications
V□-PRKG-FLNE	Parking lots: fire lane
V□-PRKG-GRVL	Parking lots: gravel
V□-PRKG-MRKG	Parking lots: pavement markings

V□-PRKG-STRP	Parking lots: striping
V□-PRKG-UPVD	Parking lots: unpaved surface
V□-PROP	Property
V□-PROP-LINE	Property: lines
V□-PROP-QTRS	Property: quarter section
V□-PROP-RSRV	Property: reservation
V□-PROP-SBCK	Property: setback lines
V□-PROP-SECT	Property: section
V□-PROP-SUBD	Property: subdivision (interior) lines
V□-PROP-SXTS	Property: sixteenth section
V□-PVMT	Pavement
V□-PVMT-ASPH	Pavement: asphalt
V□-PVMT-CONC	Pavement: concrete
V□-PVMT-GRVL	Pavement: gravel
V□-RAIL	Railroad
V□-RAIL-CNTR	Railroad: center
V□-RAIL-EQPM	Railroad: equipment (gates, signals, etc.)
V□-RAIL-TRAK	Railroad: track
V□-RIVR	River
V□-RIVR-BOTM	River: bottom
V□-RIVR-CNTR	River: center
V□-RIVR-EDGE	River: edge
V□-RIVR-TOPB	River: top of bank
V□-ROAD	Roadways
V□-ROAD-ASPH	Roadways: asphalt
V□-ROAD-CNTR	Roadways: center
V□-ROAD-CONC	Roadways: concrete
V□-ROAD-CURB	Roadways: curb
V□-ROAD-FLNE	Roadways: fire lane
V□-ROAD-GRVL	Roadways: gravel
V□-ROAD-MRKG	Roadways: pavement markings
V□-ROAD-UPVD	Roadways: unpaved surface
V□-RRAP	Riprap
V□-RWAY	Right-of-way
V□-RWAY-CNTR	Right-of-way: center
V□-RWAY-CTLA	Right-of-way: controlled access
V□-RWAY-LINE	Right-of-way: lines
V□-RWAY-LMTA	Right-of-way: limited access
V□-RWAY-MRKR	Right-of-way: marker
V□-RWAY-STAN	Right-of-way: stationing

V□-SITE	Site features
V□-SITE-EWAT	Site features: edge of water
V□-SITE-FENC	Site features: fences
V□-SITE-ROCK	Site features: large rocks and rock outcroppings
V□-SITE-RTWL	Site features: retaining wall
V□-SITE-SIGN	Site features: signage
V□-SITE-VEGE	Site features: trees, shrubs, and other vegetation
V□-SSWR	Sanitary sewer
V□-SSWR-MHOL	Sanitary sewer: manhole
V□-SSWR-PIPE	Sanitary sewer: piping
V□-SSWR-STRC	Sanitary sewer: structures
V□-SSWR-UGND	Sanitary sewer: underground
V□-STEM	Steam system
V□-STEM-INST	Steam system: instrumentation (meters, valves, pumps)
V□-STEM-MHOL	Steam system: manhole
V□-STEM-PIPE	Steam system: piping
V□-STEM-STRC	Steam system: structures
V□-STEM-UGND	Steam system: underground
V□-STRM	Storm sewer
V□-STRM-DTCH	Storm sewer: ditches or washes
V□-STRM-MHOL	Storm sewer: manhole
V□-STRM-PIPE	Storm sewer: piping
V□-STRM-POND	Storm sewer: retention pond
V□-STRM-STRC	Storm sewer: structures
V□-STRM-UGND	Storm sewer: underground
V□-SURV	Survey
V□-SURV-DATA	Survey: data
V□-SWLK	Sidewalks
V□-SWLK-ASPH	Sidewalks: asphalt
V□-SWLK-CONC	Sidewalks: concrete
V□-TOPO	Topographic feature
V□-TOPO-EWAT	Topographic feature: edge of water
V□-TOPO-GRID	Topographic feature: grid
V□-TOPO-MAJR	Topographic feature: major (contours)
V□-TOPO-MINR	Topographic feature: minor (contours)
V□-TOPO-SOUN	Topographic feature: soundings
V□-TOPO-SPOT	Topographic feature: spot elevations
V□-UNID	Unidentified site objects
V□-UNID-CABL	Unidentified site objects: cable systems
V□-UNID-PIPE	Unidentified site objects: piping

V□-UNID-TANK	Unidentified site objects: storage tanks
V□-UNID-UTIL	Unidentified site objects: utility lines
V□-UNID-UTIL-OVHD	Unidentified site objects: utility lines: overhead
V□-UNID-UTIL-UGND	Unidentified site objects: utility lines: underground
V□-WATR	Water supply
V□-WATR-INST	Water supply: instrumentation (meters, valves, pumps)
V□-WATR-MHOL	Water supply: manhole
V□-WATR-PIPE	Water supply: piping
V□-WATR-STRC	Water supply: structures
V□-WATR-UGND	Water supply: underground

5.20 TELECOMMUNICATIONS LAYER LIST

Telecommunications Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Telecommunications Discipline Designators

Designator	Description
T	Telecommunications
TA	Audio Visual
TC	Clock and Program
TI	Intercom
TM	Monitoring
TN	Data Networks
TT	Telephone
TY	Security
TJ	User Defined
TK	User Defined

Telecommunications Layer List

ayer Name	Description
T□-ALRM	Alarm system
T□-BCST	Broadcast-related system (radio or TV)
T□-BELL	Bell system
T□-CABL	Cable systems
T□-CABL-COAX	Cable systems: coax cable

T□-CABL-FIBR	Cable systems: fiber optics cable
T□-CABL-MULT	Cable systems: multi-conductor cable
T□-CABL-TRAY	Cable systems: cable tray and wireways
T□-CATV	Cable television system
T□-CCTV	Closed-circuit television system
T□-CLOK	Clock system
T□-CLOK-CIRC	Clock system: circuits
T□-CLOK-CLNG	Clock system: ceiling
T□-CLOK-CNMB	Clock system: circuit number
T□-CLOK-EQPM	Clock system: equipment
T□-CLOK-FLOR	Clock system: floor
T□-CLOK-WALL	Clock system: wall
T□-COMM	Communications
T□-COMM-CIRC	Communications: circuits
T□-COMM-CLNG	Communications: ceiling
T□-COMM-CNMB	Communications: circuit number
T□-COMM-EQPM	Communications: equipment
T□-COMM-FLOR	Communications: floor
T□-COMM-WALL	Communications: wall
T□-CONT	Controls and instrumentation
T□-CONT-DEVC	Controls and instrumentation: devices
T□-CONT-WIRE	Controls and instrumentation: wiring
T□-DATA	Data/LAN system
T□-DATA-CIRC	Data/LAN system: circuits
T□-DATA-CLNG	Data/LAN system: ceiling
T□-DATA-CNMB	Data/LAN system: circuit number
T□-DATA-EQPM	Data/LAN system: equipment
T□-DATA-FLOR	Data/LAN system: floor
T□-DATA-JACK	Data/LAN system: jacks
T□-DATA-WALL	Data/LAN system: wall
T□-DIAG	Diagrams
T□-DIAG-ENCL	Diagrams: equipment enclosures
T□-DIAG-EQPM	Diagrams: equipment
T□-DIAG-GRND	Diagrams: ground
T□-DICT	Dictation system
T□-DICT-CIRC	Dictation system: circuits
T□-DICT-CLNG	Dictation system: ceiling
T□-DICT-CNMB	Dictation system: circuit number
T□-DICT-EQPM	Dictation system: equipment
T□-DICT-FLOR	Dictation system: floor

T□-DICT-WALL	Dictation system: wall
T□-ELEC	Electrical system, telecom plan
T□-EMCS	Energy monitoring control system
T□-FIRE	Fire protection
T□-FIRE-CIRC	Fire protection: circuits
T□-FIRE-CLNG	Fire protection: ceiling
T□-FIRE-CNMB	Fire protection: circuit number
T□-FIRE-EQPM	Fire protection: equipment
T□-FIRE-FLOR	Fire protection: floor
T□-FIRE-WALL	Fire protection: wall
T□-INTC	Intercom/PA systems
T□-NURS	Nurse call system
T□-NURS-CIRC	Nurse call system: circuits
T□-NURS-CLNG	Nurse call system: ceiling
T□-NURS-CNMB	Nurse call system: circuit number
T□-NURS-EQPM	Nurse call system: equipment
T□-NURS-FLOR	Nurse call system: floor
T□-NURS-WALL	Nurse call system: wall
T□-PGNG	Paging system
T□-PHON	Telephone system
T□-PHON-JACK	Telephone system: jacks
T□-PROJ	Projector system
T□-SERT	Security system
T□-SERT-CIRC	Security system: circuits
T□-SERT-CLNG	Security system: ceiling
T□-SERT-CNMB	Security system: circuit number
T□-SERT-EQPM	Security system: equipment
T□-SERT-FLOR	Security system: floor
T□-SERT-WALL	Security system: wall
T□-SOUN	Sound system
T□-TRAN	Transmission system (RF and microwave)
T□-TVAN	Television antenna system
T□-TVAN-CIRC	Television antenna system: circuits
T□-TVAN-CLNG	Television antenna system: ceiling
T□-TVAN-CNMB	Television antenna system: circuit number
T□-TVAN-EQPM	Television antenna system: equipment
T□-TVAN-FLOR	Television antenna system: floor
T□-TVAN-WALL	Television antenna system: wall
T□-TVVS	Television and video systems
T□-TVVS-SAUD	Television and video systems: audio signal

T□-TVVS-SCOM	Television and video systems: communications sIgnal
T□-TVVS-SCTL	Television and video systems: control signal
T□-TVVS-SDAT	Television and video systems: data signal
T□-TVVS-SDGA	Television and video systems: digital audio signal
T□-TVVS-SDGV	Television and video systems: digital video signal
T□-TVVS-SMIC	Television and video systems: microphone signal
T□-TVVS-SPWR	Television and video systems: power signal
T□-TVVS-SRFI	Television and video systems: RF signal
T□-TVVS-SRGB	Television and video systems: RGB and component video signal
T□-TVVS-SSYN	Television and video systems: sync signal
T□-TVVS-SVID	Television and video systems: video signal

5.21 OTHER DISCIPLINES LAYER LIST

Other Disciplines Field Codes

The Layer Names shown below provide examples for the use of Major and Minor Group field codes for this discipline. See *CLG Sections 1.5 and 1.6* for complete rules and options governing the use of Major and Minor Group field codes.

Other Disciplines Discipline Designators

Designator	Description
X	Other Disciplines
XJ	User Defined
XK	User Defined

Other Disciplines Layer List

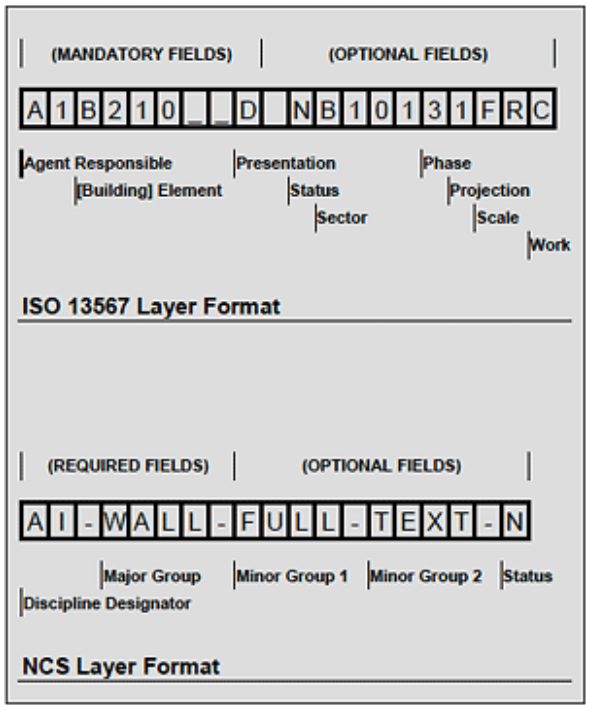
Layer Name	Description
X□-RIGG	Other discipline: entertainment rigging/automation systems
X□-SPFX	Other discipline: entertainment special effects system
X□-VIDO	Other discipline: entertainment projection systems

6.0 Appendix C - Complying with NCS and ISO 13567

6.1 OVERVIEW

The International Standards Organization (ISO) is the only recognized international body promulgating standards in the area of electronic building design data. ISO Standard 13567, *Organization and Naming of Layers for CAD*, can be purchased at

http://www.ansi.org. The complete document is in three parts: 13567-1, 13567-2, and 13567-3.



While the United States National CAD Standard® (NCS) and ISO 13567 differ somewhat in their approach to standards for CAD layers, they are alike in several important respects. Both standards specify the names of the data fields that make up a typical layer name, define the field names, specify which fields are mandatory (required) and which fields are optional, specify the number of characters in each field, and specify the order in which the fields are to appear.

When one compares the NCS and ISO layer formats shown above, the question immediately arises whether it is possible to produce electronic building design documents that conform to both the NCS and ISO 13567. The answer is a qualified "yes."

Both standards provide several options for naming layers. The range of options allows either standard to meet the needs of diverse users and projects. By carefully choosing from among the available NCS options for naming CAD layers, and by establishing and adhering to the guidelines at the end of this Commentary, documents can be produced that are in *full conformance* with the NCS and in *conceptual conformance* with ISO 13567 for the naming of CAD layers (an acceptable alternative to ISO *default conformance*). Adoption of the approach outlined herein could arguably reduce the effort required to produce documents in conformance with ISO 13567 by eliminating the ISO-mandated task of prescribing valid field codes for each project.

6.2 FIELD CODES

The NCS and ISO 13567 differ in one important respect. The NCS prescribes the valid alpha-numeric field codes that can appear in each data field, and the definitions of the field codes (e.g., EQPM = equipment). Users of ISO 13567 must determine, for each project, the valid field codes for that project and their definitions. ISO 13567 users are required to document this information in a metadata file known as a *layer naming system definition file* that must accompany the project data files. In its simplest form, this is nothing more than a tab-delimited text file.

TWO STANDARDS OR ONE?	
•	The NCS offers users an opportunity to comply with both U.S. and ISO CAD standards. By adhering to the guidelines in this commentary, summarized in ten (10) steps on the last page, the NCS becomes a "country-specific" implementation of the ISO CAD Standard.
•	For design firms doing international work, using the NCS can simplify the ISO-mandated task of preparing the layer naming system definition file that must accompany the project data files on every project.

There are valid reasons for both approaches. The prescriptive approach of the NCS relieves users of the task of developing and documenting field codes for every project. However, in order to accommodate all possible users, the list of prescribed NCS field codes must be comprehensive. By not prescribing field codes, ISO 13567 allows the ISO layer format to be applied uniformly without having to define all possible field codes in advance.

6.3 FIELD CODES AND LANGUAGE

By not prescribing field codes, ISO 13567 also allows the ISO layer format to be applied uniformly without regard to language. Users may, if they wish, develop codes endowed with language-specific meaning. Citing our earlier example, English users might use the field code "EQPM" to represent the [major building] element "equipment," while users in another language group might use another field code that has similar mnemonic association to the word for "equipment" in that language.

While the field codes themselves might differ, the category of information contained in any given field is defined by the standard, facilitating translation of the actual content. In practice, ISO 13567 users tend to favor numeric codes to define the content of data fields. This eliminates any need to "translate" the field codes themselves. If, for example, the field code "720" is prescribed to mean "equipment," then only the definition, and not the code itself, would need to be translated. This eliminates the need for "translating" the actual file or layer name.

6.4 ISO 13567 CONFORMANCE

CAD data sets that adhere to ISO 13567 with respect to field names, field length, field definition and field order (as shown at right), and that are accompanied by the required *layer naming system definition file*, are defined by ISO to be in *default conformance* with the ISO standard.

ISO 13567 anticipates that groups of users or national standards bodies might not only wish to prescribe a list of valid field codes (as the NCS has done), but might also wish to vary from the specified ISO layer format. 13567-3 is explicitly designed *"to allow national standards bodies (or projects where agreement is reached between the parties) to implement layer naming conventions which satisfy the requirements of the [ISO] standard while using alternative and more convenient layer naming structures and codes."*

To permit this, ISO 13567-3 establishes rules for modifying the layer format itself. As with the field codes, users are required to fully document layer format modifications in the *layer naming system definition file*. CAD data sets that adhere to these rules are defined by ISO as being in conceptual conformance with the ISO standard, an approved alternative to default conformance.

The rules for *conceptual conformance* specify that the mandatory data fields must always be used, but the order of all fields in the layer name (both mandatory and optional), the number of optional fields used, and the number of characters in each field can vary from the default ISO layer format. Additionally, the *names* of the fields can differ from the names specified, as long as the *conceptual definition* of each field conforms to the ISO standard. All modifications to the default layer format *must be applied uniformly throughout the project*. Layer names must all be of the same length, use the same set of mandatory and optional fields in the same order, and have the same number of characters per field.

These rules allow data sets created in conceptual conformance with ISO 13567 to be mapped to the ISO 13567 *default layer format*. However, ISO does not require users to actually "map" or otherwise convert the data into the default layer format.

Default ISO Layer Format
(Mandatory Fields)

A	**1**	B	2	1	0	_		D		N	B	1	0	1	3	1	F	R	C
Agent Responsible																			

A	1	**B**	**2**	**1**	**0**	_		D		N	B	1	0	1	3	1	F	R	C
		[Building] Element																	

A	1	B	2	1	0	_		**D**	_	N	B	1	0	1	3	1	F	R	C
								Presentation											

(Optional Fields)

A	1	B	2	1	0	_		D	_	**N**	B	1	0	1	3	1	F	R	C
										Status									

A	1	B	2	1	0	_		D	_	N	**B**	**1**	**0**	**1**	3	1	F	R	C
											Sector								

A	1	B	2	1	0	_		D	_	N	B	1	0	1	**3**	1	F	R	C
															Phase				

A	1	B	2	1	0	_		D	_	N	B	1	0	1	3	**1**	F	R	C
																Projection			

A	1	B	2	1	0	_		D	_	N	B	1	0	1	3	1	**F**	R	C
																	Scale		

A	1	B	2	1	0	_		D	_	N	B	1	0	1	3	1	F	**R**	**C**
																		Work Package	

6.5 FIELD NAMES AND DEFINITIONS

Though the specified field names in the NCS layer format differ from the specified field names in the ISO layer format, the definitions of the field names are conceptually the same (with one important exception, discussed in the next paragraph below). This allows NCS-compliant data to meet the principal ISO 13567 criterion for *conceptual conformance*. The Field Name Comparison Table at right highlights additional rules that must be followed to create data that is in conformance with both the NCS and ISO 13567.

6.6 DISCIPLINE DESIGNATOR" VS. "AGENT RESPONSIBLE"

The *conceptual definitions* of these corresponding field names in the NCS and ISO 13567 differ sufficiently to merit detailed discussion. The definition for **Discipline Designator** is defined in NCS as *"the category of subject matter contained in the file or layer designated."* In other words, if the information contained is "structural," the file or layer name will begin with the Discipline Designator "S," regardless of who created the data.

ISO 13567 defines Agent Responsible as *"the construction specialist responsible for the data."* Regrettably, ISO 13567 does not further define the terms *"construction specialist"* and *"responsible for."*

"Construction specialist" could be interpreted to mean "design professional," "design drafter," or even "skilled tradesperson or contractor." Though the text of ISO 13567 does not define which of these individuals is the "agent responsible," one can reasonably infer from the sample *layer naming system definition file* shown in Annex A of ISO 13567-3 that "construction specialist" is defined as the design professional.

Field Name Comparison Table

NCS Field Name	ISO Field Name
Discipline Designator	Agent Responsible
Major & Minor Groups	Element
Annotation Minor Group*	Presentation
Status**	Status
(none)	Sector
Status (Phase)**	Phase
Dwg. View Minor Group***	Projection
(none)	Scale
(none)	Work Package

** ISO compliance requires that the last NCS Minor Group field be reserved for annotation.*
*** ISO compliance requires that this field be reserved for status OR project phase, but not both; duplicate use of the field is not permitted.*
**** ISO compliance requires that Drawing View field names not appear in the same fields as Major or Minor Group fields that define major building elements. If both annotation and drawing view are to be included in any layer names, one Minor Group Field must be reserved for Annotation and the other for Drawing View.*

6.7 "AGENT RESPONSIBLE" AND PROFESSIONAL LIABILITY

Identifying the design professional as the "construction specialist" still allows considerable room for interpretation of the definition for "agent responsible." It could be interpreted to mean either *"design professional who is professionally liable for the information by virtue of professional licensure and role on the project,"* or, alternatively, *"design professional who is professionally liable for the information by virtue of having signed and sealed the document in question."* An example is a lighting plan prepared under the supervision of, and signed and sealed by, the architect. Should the field code for this drawing file or layer name be "E" or "A?" If the field code is "E," is the Electrical Engineer still the designated "Agent Responsible," and therefore professionally liable for data created by others not under his/her supervision?

The burden of professional liability borne by design professionals is generally less in other countries than it is in the U.S. Perhaps for this reason, the issue of defining *agent responsible* more precisely with respect to professional liability did not arise when this field name was defined by ISO 13567.

In the U.S., however, use of the imprecise ISO definition for *agent responsible* might possibly expose design professionals to professional liability for data over which they had no oversight.

6.8 "DISCIPLINE DESIGNATOR" AND THE BUILDING LIFE CYCLE

The NCS definition for the field *Discipline Designator* was agreed-upon following considerable debate by the NCS Project Committee, and with the full understanding that it differed from the conceptual definition of the corresponding ISO 13567 field *Agent Responsible*. In addition to the liability issues cited above, it was the consensus of the Project Committee that the ability to identify the data by subject matter *throughout the life-cycle of a building facility* was ultimately more important than the identity of the person or persons who originally created the data.

6.9 "DISCIPLINE DESIGNATOR" AND ISO 13567 CONFORMANCE

The difference in the conceptual definitions of *Discipline Designator* and *Agent Responsible* would seem to be an insurmountable obstacle to creating data in conformance with both the NCS and ISO 13567. This is not necessarily true. In most cases, the content of the fields *Discipline Designator* and *Agent Responsible* are one and the same, regardless of the definition. For example, if the subject matter contained in the drawing file or layer is "mechanical systems," the mechanical engineer is likely to be the design professional under whose supervision the data was created.

Users who wish to produce data that is in conformance with the NCS and in conceptual conformance with ISO 13567 can do so by establishing a rule for their projects that data will be created only under the supervision of the design professional *typically* responsible for the subject matter. In this way, the *conceptual definition* for the data field can be BOTH *"category of subject matter contained in the file or layer designated"* AND *"construction specialist responsible for the data."* Implementation of this rule can help reduce the risk of professional liability by minimizing the likelihood of conflicts that might arise when different elements of the same building system are designed by more than one design professional.

6.10 FIELD CODE RESTRICTIONS

A key principal of the ISO 13567 layer format is that each data field can be used to define only one category of data. Duplicate use of a field is prohibited. This ensures that data sets in *conceptual conformance* can be readily mapped to the ISO default layer format. Adherence to this provision requires NCS users to restrict their use of certain NCS field codes.

The NCS allows "ANNO" to be used as a Major Group, which allows all annotation to be placed in a defined group of layers. This results in a duplicate use of the Major Group field. The corresponding field in ISO, "Element," is reserved for major building elements. Therefore, the field code "ANNO" cannot be used at all ***CLG Figure 6.10-1***. However, the prescribed annotation Minor Group field codes (TEXT, DIMS, etc.) can be used to modify any preceding Major/Minor Group, provided that the field in which they appear is reserved for annotation field codes.

If Drawing View field codes are used ***CLG Figure 6.10-2***, the Minor Group field in which they appear must likewise exclude any other field codes.

If the Status field is used ***CLG Figure 6.10-3***, the allowable field codes must be restricted to the specified letters (to correspond to the ISO field "Status") or to the specified numbers (to correspond to the ISO field "Phase") but not both.

U.S. NCS Field Code Restrictions
(for conceptual conformance to ISO 13567)

The field code "ANNO" may NOT be used, because "annotation" is not a major building "element:"

A	I	-	**A**	**N**	**N**	**O**	**-**	T	E	X	T	-	N
			Major Group (Element)										

The Annotation Minor Group field codes MAY be used, provided the field is reserved for these codes. Two allowable formats are shown:

A	I	-	W	A	L	L	-	**T**	**E**	**X**	**T**	**-**	N
			(Presentation) **Annotation**										

A	I	-	W	A	L	L	-	F	U	L	L	-	**T**	**E**	**X**	**T**	**-**	N
								(Presentation) **Annotation**										

CLG Figure 6.10-1 - *Annotation Field Codes*

Two allowable formats for Drawing View field codes:

A	I	-	W	A	L	L	-	**E**	**L**	**E**	**V**	**-**	N
			(Projection) **Drawing View**										

A	I	-	W	A	L	L	-	F	U	L	L	-	**E**	**L**	**E**	**V**	**-**	N
								(Projection) **Drawing View**										

CLG Figure 6.10-2 *- Drawing View Field Codes*

Two allowable formats for Status field codes.

A	-	W	A	L	L	-	E	L	E	V	-	T	E	X	T	-	**N**
												(Status) **Status**					

A	-	W	A	L	L	-	E	L	E	V	-	T	E	X	T	-	**2**
												(Phase) **Status**					

CLG Figure 6.10-3 - *"Status" Field Codes*

6.11 NCS AND ISO 13567 IMPLEMENTATION OPTIONS

The examples shown here illustrate two possible NCS layer formats that are in conceptual conformance with ISO 13567. Note that ISO 13567 does not use dashes as field delimiters. For purposes of ISO conformance, the dashes in the NCS layer format are defined as an additional character of the field preceding it.

CLG Figure 6.11-1 shows the optional two-character NCS Level 2 Discipline Designator; together with the dash that follows it, this field is defined as three (3) characters in length. A Major and one Minor Group are defined as corresponding to the ISO field [Building] "Element." The field is ten (10) characters in length. The second Minor Group is reserved for Annotation field codes, corresponds to the ISO field "Presentation," and is five (5) characters in length. The final field is Status, which corresponds to the ISO field of the same name, and is one (1) character in length.

CLG Figure 6.11-2 shows the NCS required Level 1 Discipline Designator only, and is defined as two (2) characters in length. The Major Group is defined as corresponding to the ISO field [Building] "Element," and is five (5) characters in length. The first Minor Group is reserved for Drawing View field codes, corresponds to the ISO field "Projection," and is five (5) characters in length. The second Minor Group is reserved for Annotation field codes, corresponds to the ISO field "Presentation," and is five (5) characters in length. The final field is reserved for Phase field codes, corresponds to the ISO field "Phase," and is one (1) character in length.

Note that for ISO conformance, the total length of the layer name must be the same for all layers on a given project. Layer names that do not require a certain field, such as "Annotation," must use placeholders (usually dashes or underscores) to maintain the length of the layer name and the relative position of the fields.

While the ISO 13567 rules for conceptual conformance allow the fields to appear in any order, ***this is not permitted by the NCS***. The fields must be in the order of Discipline Designator, Major Group, Minor Group 1, Minor Group 2, Status. If a Minor Group field is used to modify the "building element" shown in the Major Group, that Minor Group must appear immediately following the Major Group.

Example NCS Layer Formats
(in conceptual confomance to ISO 13567)

A	**I**	-	W	A	L	L	-	F	U	L	L	-	T	E	X	T	-	N
Level 2 Discipline Designator (Agent Responsible)																		

A	I	-	**W**	**A**	**L**	**L**	**-**	**F**	**U**	**L**	**L**	**-**	T	E	X	T	-	N
			Major, Minor Group (Element)															

A	I	-	W	A	L	L	-	F	U	L	L	-	**T**	**E**	**X**	**T**	**-**	N
													(Presentation) **Annotation**					

A	I	-	W	A	L	L	-	F	U	L	L	-	T	E	X	T	-	**N**
													(Status) **Status**					

CLG Figure 6.11-1

A	**-**	W	A	L	L	-	E	L	E	V	-	T	E	X	T	-	2
Level 1 Discipline Designator (Agent Responsible)																	

A	-	**W**	**A**	**L**	**L**	**-**	E	L	E	V	-	T	E	X	T	-	2
		Major Group (Element)															

A	-	W	A	L	L	-	**E**	**L**	**E**	**V**	**-**	T	E	X	T	-	2
							Drawing View (Projection)										

A	-	W	A	L	L	-	E	L	E	V	-	**T**	**E**	**X**	**T**	**-**	2
							(Presentation) **Annotation**										

A	-	W	A	L	L	-	E	L	E	V	-	T	E	X	T	-	**2**
												(Phase) **Status**					

CLG Figure 6.11-2

6.12 NCS AND ISO 13567 IMPLEMENTATION GUIDELINES

The information in this Commentary is summarized in the following steps for preparing documents with layer names in conformance with the NCS and in conceptual conformance with ISO 13567. While these guidelines are intended to aid NCS users, adherence to these rules in some form would be required by ISO 13567 whether or not the NCS layer format were used.

1. Require that all documents be prepared only under the supervision of the design professional typically responsible for the subject matter contained in the documents.
2. Do not use the field code "ANNO" in any layer name.
3. Determine whether the Discipline Designator will be one character (Level 1) or two characters (Level 2) in length.
4. Determine whether the "building element" will consist of a Major Group only, or of a Major Group and one Minor Group.
5. Determine whether a Minor Group is to be reserved for Drawing View field codes, and fix its position in the sequence of fields.
6. Determine whether a Minor Group is to be reserved for Annotation field codes, and fix its position in the sequence of fields.
7. Note that only two Minor Groups are available. Of the three options described in 4, 5, and 6 above, only two can be exercised on a given project.
8. Determine whether to include the Status field in the layer name and whether to use the specified letters to denote "Status," or the specified numbers to denote "Phase."
9. For layer names in which one or more fields are not required, use placeholders (dashes or underscores) to maintain consistent layer name length and the relative positions of fields. Refer to ***CLG Figure 6.12-1***.
10. Prepare a layer naming system definition file in accordance with ISO 13567-3 that defines the selected layer format for the project.

Required Use of Placeholders
(for conceptual conformance to ISO 13567)
Layers in which reserved field codes are not used must have placeholders in the reserved fields.

A	-	W	A	L	L	-	E	L	E	V	-	_	_	_	_	-	**N**

A	-	W	A	L	L	-	E	L	E	V	-	T	E	X	T	-	**N**

CLG Figure 6.12-1