United States National CAD Standard®- V5

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0.0 Introduction

0.1 UNIFORM DRAWING SYSTEM (UDS)

In 1989, The Construction Specifications Institute (CSI) recognized the need for an organizational structure and standards for drawings. In 1990, CSI created a drawings-related subcommittee of the Technical Committee to address this issue. The first product developed was *Technical Document TD-2-6, Standard Reference Symbols*, published in 1990. An electronic version was released in 1991. During the following few years, CSI extensively researched the availability of, and need for, graphic standards in the construction industry. It was determined that there were few standards relating to drawings.

In 1994, CSI began development of the Uniform Drawing System (UDS). This system initially identified modules for the organization and presentation of drawing sets, sheets, schedules, and diagrams. Graphic standards for drafting conventions and color and standard systems for keynotes, attributes, and CAD layering were also identified as necessary.

In February 1995, representatives from CSI, the American Institute of Architects (AIA), the Tri-Service CADD/GIS Technology Center, the United States Coast Guard, and the National Institute of Building Sciences (NIBS) CADD Council met to discuss ways in which the graphic standards efforts of the attending organizations could work together. CSI's Uniform Drawing System was accepted by the representatives of these organizations as being the core group of graphic standards needed in the industry. These organizations have since worked cooperatively in the development of several graphic standards, notably CAD layering.

CAD: Computer-Aided Drafting.

CADD: Computer-Aided Design and Drafting.

In 1997, CSI published the first three modules of UDS. These were submitted to the NIBS CADD Council for consideration as part of a proposed national CAD standard.

0.2 OVERVIEW

UDS is composed of interrelated modules consisting of standards, guidelines, and other tools for the organization and presentation of drawing information used for the planning, design, construction, and operation of facilities. UDS provides uniformity for graphical information in drawings, just as *MasterFormat*™, *SectionFormat*™, and *PageFormat*™ provide uniformity for textual information in specifications.

UDS organizes drawings and

- Establishes a uniform set of standards for all drawing types.
- Functions for all drawing users involved in the facility cycle.
- Organizes project information needed for drawings and allows it to be integrated with other information sources involved in a project.
- Establishes a standard drawing format that users can recognize and understand, resulting in more efficient

MasterFormat™: A master list of numbers and titles classified by work results or construction practices that is primarily used to organize project manuals and detailed cost information and relate drawing notations to specifications.

SectionFormat™: A format that provides a uniform approach to organizing specification text contained in a project manual by establishing a structure consisting of three primary parts.

PageFormat™: A format for an orderly and uniform arrangement of text on the pages of specification section contained in a project manual.

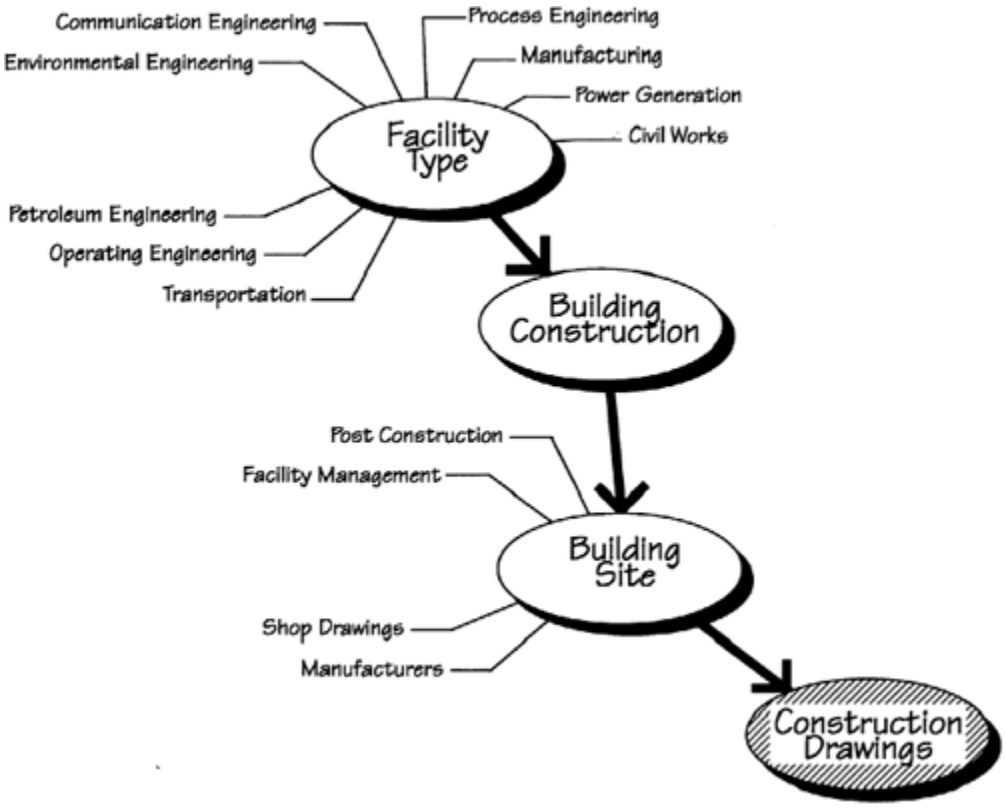
UniFormat™: A classification system for construction information based on construction elements including systems and assemblies that perform a given function

production, reduced errors and omissions, and better coordination among all project documents.

without regard to the design solution, specified material, or construction method.

- Promotes effective communication among drawing users as graphical information is more consistently organized and presented.
- Allows drawing users to capture evolving information for use throughout the facility cycle and for future projects.
- Fosters integration and accuracy of facility information while providing for new and improved project delivery methodologies.
- Complements *MasterFormat*™ and *UniFormat*™ to provide a complete organizational system for construction documents.
- Aids electronic organization, storage, and transfer of graphical information related to facilities.

The initial focus of UDS is the development of construction drawings for buildings, as indicated in ***UDS Figure 0.2-1***. However, UDS also considers drawing users' needs during the design process as well as facility management and other post-construction activities.

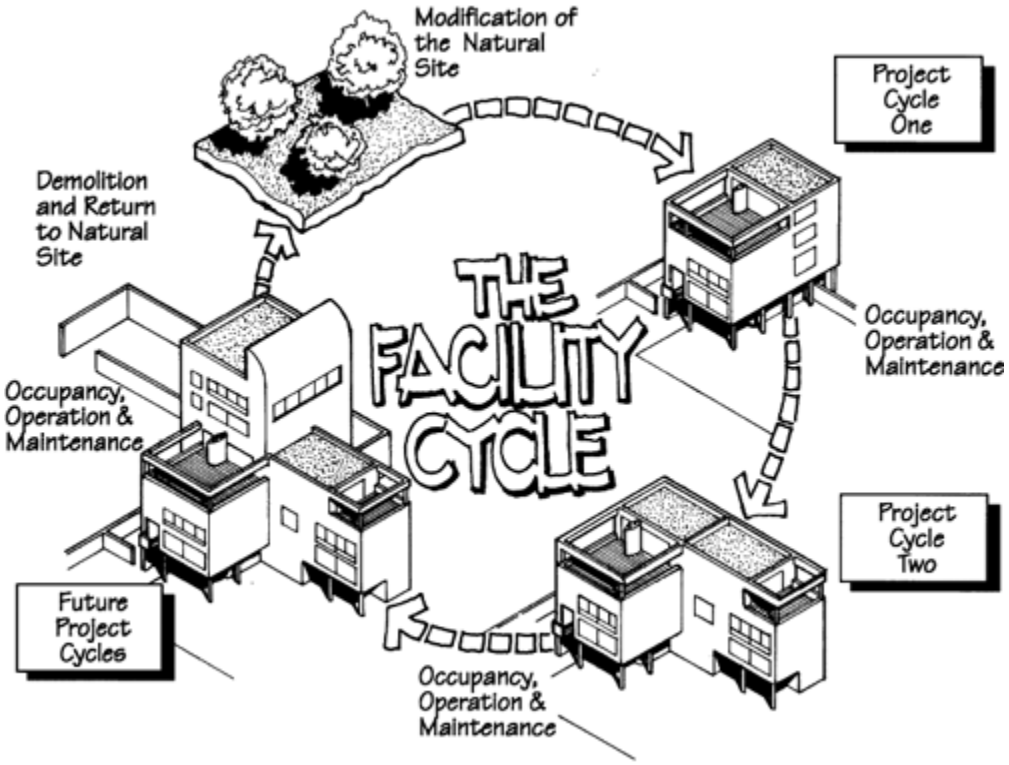


UDS Figure 0.2-1 *Current UDS focus is construction drawings for buildings.*

0.3 FACILITY AND PROJECT LIFE CYCLES

Facility: A physical structure or group of structures, including site construction, serving one or more purposes.

A facility is a physical structure or group of structures, including site construction, serving one or more purposes. Buildings are types of facilities composed of partially or totally enclosed spaces. Site construction includes changes to terrain and systems such as transportation and utilities. All facilities go through cycles during their useful life, beginning with inception, including changes over time, and eventually ending in reuse or demolition, as illustrated in ***UDS Figure 0.3-1***.



UDS Figure 0.3-1 *Drawings are used throughout the multiple project cycles that may take place for any given facility.*

A project is a set of related activities taking place in, around, and in connection with a facility and may include planning and pre-design activities, design and construction documents, procurement/negotiation, construction, and post-construction activities. Post-construction activities may include facilities management and operation and maintenance documents.

Project: A set of related activities taking place in, around, and in connection with a facility.

Projects go through cycles, beginning with the identification of a need, development of a response to the need through programming and design, performance and physical implementation, facility commissioning and operation, and possible modification to meet new needs. This cycle may be repeated numerous times throughout the life of a facility.

During the design process, information concerning a project is collected, analyzed, and recorded for incorporation into the proposed facility. Drawings allow users to document and share graphical information for a project. A drawing is a place where information is cataloged, stored, and distributed. This information is recorded as part of the drawings and evolves as the project cycle runs its course and as drawing users change. Drawings can also evolve, be modified, and change over time. UDS allows the continuing use of drawings as the needs of the project change.

Drawings: Graphic and textual information organized on a two-dimensional surface for the purpose of conveying data about a specific portion of a project.

The need for information contained within drawings is different for each phase of a facility or project cycle. Often, information in one cycle is the basis for developing new information for the next cycle. Therefore, it is critical that this information is accurate and organized in a way that facilitates easy retrieval and reuse.

0.4 MEETING THE NEEDS OF DRAWING USERS

Drawing users are a changing group of individuals and organizations that participate in a project at various points in the facility life cycle. The initial users of drawings may consist of the parties traditionally bound to each other to design and construct

Drawing Users:

Owner
Design Professional

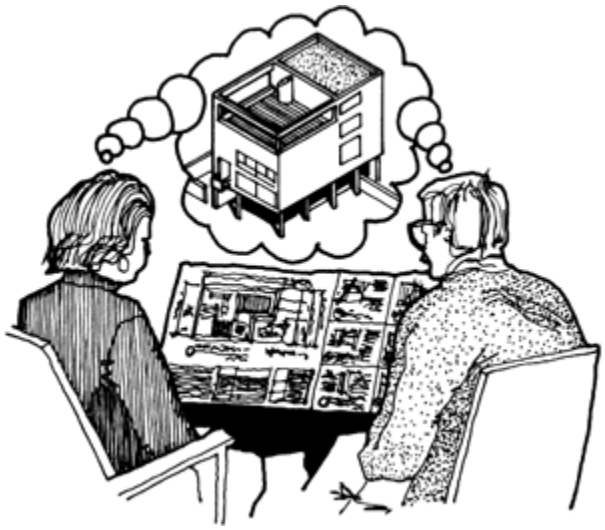
a project: an owner, a design professional, and a contractor. Other users of drawings related to a project include the various owner's representatives, consultants, and subcontractors that form the next tier of the project team. There is also a broader group of users that includes material suppliers, product manufacturers, building officials, government officials, accountants, attorneys, lenders, other construction professionals, and end users of the project. ***UDS Figure 0.4-1*** illustrates that communication through drawings enables users to share their understanding and to translate that common vision into constructed reality.

Contractor

Owner's Representative
Consultant
Subcontractor

Material Supplier
Product Manufacturer
Building Official
Government Official
Accountant
Attorney
Lender

End User



UDS Figure 0.4-1 *The common vision of drawing users.*

Each drawing user brings a different level of experience, understanding, capability, and purpose to a project. This group constantly evolves and changes throughout the project cycle. As one project cycle leads to another, the user group forms, disbands, and reforms many times and with many different users. As facilities grow more sophisticated and regulated, there is a need for clear, correct, complete, and concise information in the form of drawings that do not duplicate, misplace, or conflict with previously generated information.

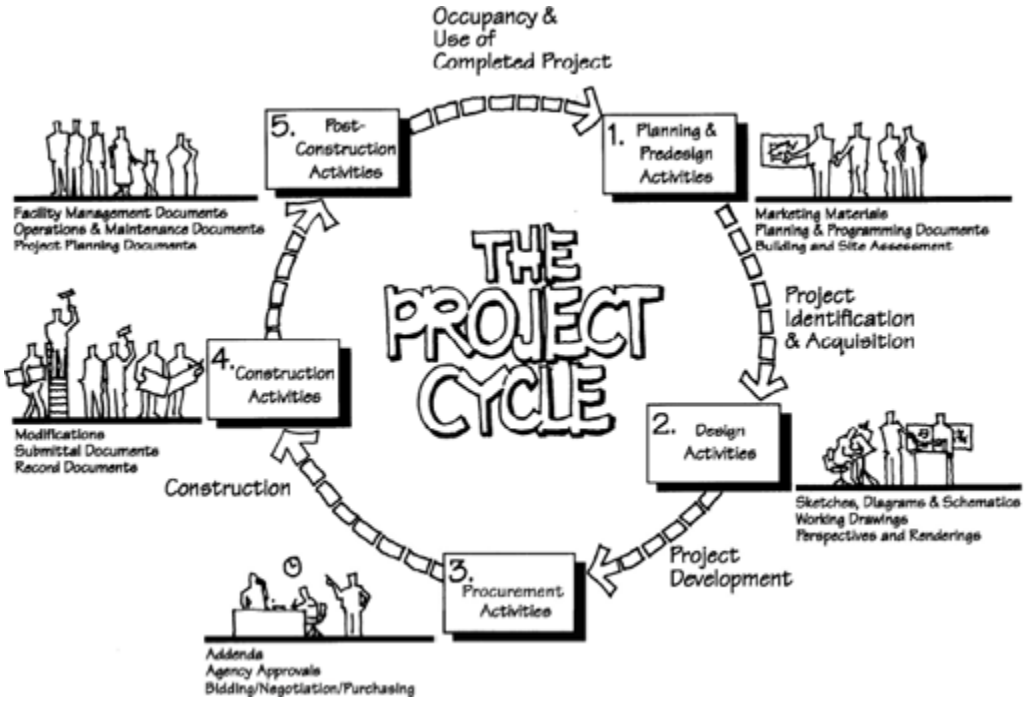
UDS provides a framework for the organization of drawing-related facility information, creation of the facility model, and representation through drawings. The facility model is all information created relating to a particular facility.

Facility Model: All information created relating to a particular facility.

The principles of UDS are organized around the precepts of modularity, flexibility, consistency, and linking.

Modular Structure

- UDS is an open system composed of a series of application modules organized around the phases of a facility cycle. Refer to ***UDS Figure 0.3-1***. The modular structure of UDS provides a place for the integration of existing non-drawing formats, such as *MasterFormat*™ and *UniFormat*™, for keynoting, specifications, and other customized applications. UDS, because of its open structure, allows the integration of new drawing techniques and information types. UDS modules provide a framework for the location and organization of information and the presentation of drawings appropriate to the context of drawing users and their tasks relative to the project cycle. Refer to ***UDS Figure 0.4-2***.
- The modular precept extends to the organizational standards and formats in each module. The organization of drawings on a sheet is based on a standard module, providing a framework for locating and retrieving information contained in drawings.



UDS Figure 0.4-2 *Drawing users change throughout facility and project cycles.*

Flexibility

UDS meets the requirements of different users of drawings at progressive stages of the project cycle. Project delivery methods vary from project to project and may include fast-track, design-build, multiple prime contracts, and construction management, as well as the traditional design-negotiate-build method. Project methodologies may reflect regional circumstances and economies. In a global market, the methodologies are tailored to an international set of priorities and customs. Project scopes vary with each project; some large, some small. UDS offers a familiar format and location of subject matter for a wide spectrum of uses.

- UDS is structured in a hierarchical set of systems and subsystems. Information used and presented through UDS and its facility database vary with the context of the facility life cycle and the composition of the project's drawing users. UDS-based information has the flexibility to be presented differently depending on the targeted audience and application. For example, a geographer or urban planner requires site information that is related but distinctly different than that needed by an irrigation subcontractor. UDS provides assistance in filtering these information subsets and in presenting them appropriately.
- Flexibility is integral to UDS's organization of drawing sets, which can use as many of the disciplines as necessary.

Consistency

- UDS establishes a uniform set of standards for different drawing types. It functions for all drawing users throughout the project cycle. This standardization aids consistency of drawings prepared by multiple design professionals. Drawing users are better able to communicate with each other because of this consistency. UDS allows the project team to present solutions in a uniform and integrated manner, resulting in more efficient production of drawings, reduced errors and omissions, and better document coordination. UDS organizes project information needed for drawings and integrates it with other information sources involved in a project.
- UDS set organization provides consistency among different disciplines. Thus, a floor plan may be located and identified consistently, for example:

  S - 101 Structural First Floor Plan

  A - 101 Architectural First Floor Plan

M - 101 Mechanical First Floor Plan

E - 101 Electrical First Floor Plan

Linking

- UDS forms the basis for a relationship among individual electronic applications that exchange drawing information by providing standard formats. UDS enhances both manual and computer-aided methods and formats familiar to users. UDS provides standards for linking notes and terminology to specifications and for linking facility management information.
- By using UDS formats in digital form, the facility database allows electronic storage, linking, and retrieval of project information.

0.5 UDS MODULES

Drawing Set Organization

Organizing a set of drawings is influenced by many factors, including project size, complexity, regulatory and client requirements, and the type and number of contracts. UDS provides guidelines for organizing drawing sets to accommodate these influences. The basic method for organizing drawing sets is based on use by the traditional architectural/engineering disciplines. The *Drawing Set Organization Module* establishes standard discipline designators for each discipline, such as A for Architectural, as well as for unique types of construction elements. UDS also establishes modifiers for each designator, allowing for more detail if required by project needs. UDS establishes the order of presentation of these disciplines within a drawing set.

UDS establishes consistency through the use of standard sheet types that are common to all disciplines. Sheet types are classified as plans, elevations, sections, large-scale views, details, schedules/diagrams, and three-dimensional (3D) representations. These classifications create consistency and facilitate use of the drawing set. A numerical sheet type designator is assigned to each sheet type classification.

The identification of sheets within a set is based on a discipline designator and a sheet type designator. The UDS system accommodates both simple and complex projects. This module includes a file naming system for project files and for library files. Project file names are based on the sheet identifier. Detail library file names are based on *MasterFormat*™ and/or *UniFormat*™ numbers.

Sheet Organization

The most important aspect of the *Sheet Organization Module* is the sheet format. UDS provides standards for sheet sizes for both metric (SI) and inch-pound measurement systems. UDS establishes a graphic layout that divides the sheet into the drawing area, the title block area, and the production data area. The *Sheet Organization Module* includes a grid system of blocks or modules for organizing drawing information on a sheet. The system for identifying each drawing on the sheet is based on the location of the drawing relative to this sheet module.

UDS also provides a format for title blocks that includes locations and content of data areas. The format is intentionally flexible, allowing design professionals to continue to create their own distinctive title block designs consistent with UDS principles.

Schedules

The *Schedules Module* provides standard formats for numerous schedules used in construction documents. These formats provide consistent format, heading terminology, and organization of content.

Additionally, UDS provides guidelines on creating project-specific schedules. These guidelines allow users to tailor standard schedule formats to accommodate the unique needs of individual projects.

Just as the *Drawings Set Organization Module* provides a system for identifying sheets and drawings, the *Schedules Module* provides an organizational system for identifying and filing schedules. This system groups and identifies schedule types and is based on *MasterFormat*™ numbers with cross-references to *UniFormat*™.

Drafting Conventions

The *Drafting Conventions Module* is a joint effort of CSI and the CADD/GIS Technology Center. It provides a standard format for both graphic and textual information within drawings. Subjects covered include drawing standards, scale, lines, dimensions, material indications, notations, sheet types, and mock-up drawing sets.

Terms and Abbreviations

The *Terms and Abbreviations Module* establishes guidelines for consistent terminology used in the construction industry. Consistent terms ensure clear and concise communication among the lead designer, owner, contractor, and consultants. The purpose of this module is to provide a standard for preferred construction document terms and abbreviations.

Symbols

The *Symbols Module* compiles a full range of standard symbols used throughout the construction industry. Covered in this module are standard symbols, their graphic representation, and their role in creating, understanding, and fulfilling the intent of construction documents. Standard symbols ensure clear and concise communication among the lead designer, owner, contractor, and consultants. This module is a joint effort of CSI and the CADD/GIS Technology Center.

Notations

The *Notations Module* establishes guidelines for the systematic presentation of textual information on drawings. Subjects covered include note types, use of notes, placement of notes, formats for notes, note terminology, and linking notes to specifications.

Code Conventions

The *Code Conventions Module* establishes guidelines for consistency in identifying necessary regulatory information to be shown in the construction documents. This is needed to facilitate both the design process and the permit application process.

0.6 DRAWINGS

Drawings are visual communication tools documenting the existing world and graphically indicating proposed changes to it. Drawings in the construction industry are generated to record and communicate information more readily understood through pictures rather than just words. Drawings may depict an existing site condition, delineate proposed designs, record the ongoing process of construction, or provide data for facility operation and management.

Drawings depict spatially related objects in a flat, two-dimensional (2D) format represented by a shorthand of lines, symbols, text, and other graphic symbols. These representations take many forms: highly abstract and symbolic sketches, or more accurately scaled plans, elevations, sections, and details.

Drawings: Graphic and textual information organized on a two-dimensional surface for the purpose of conveying data about a specific portion of a project.

Assembly: A collection of elements and components that relate to each other and combine to form a whole construction object.

Component: A collection of elements that relate to each other and combine to form a constituent part of a construction object, e.g., a window frame (metal extrusion + gaskets + seals).

Plans: Views of horizontal planes, showing components in their horizontal relationship.

Drawings are generally produced manually or electronically on physical media such as paper or mylar. However, drawings may be distributed and viewed entirely in digital form. Increasingly, computer-generated 3D models are being created, from which 2D drawings are extracted.

Drawings indicate relationships among elements and show the following characteristics for each material, assembly, component, and accessory

- location
- identification
- dimension and size
- details and diagrams of connections
- shape and form

Elevations: Views of vertical planes, showing components in their vertical relationship, viewed perpendicularly from a selected vertical plane.

Sections: Views of vertical cuts through and perpendicular to components, showing their detailed arrangement.

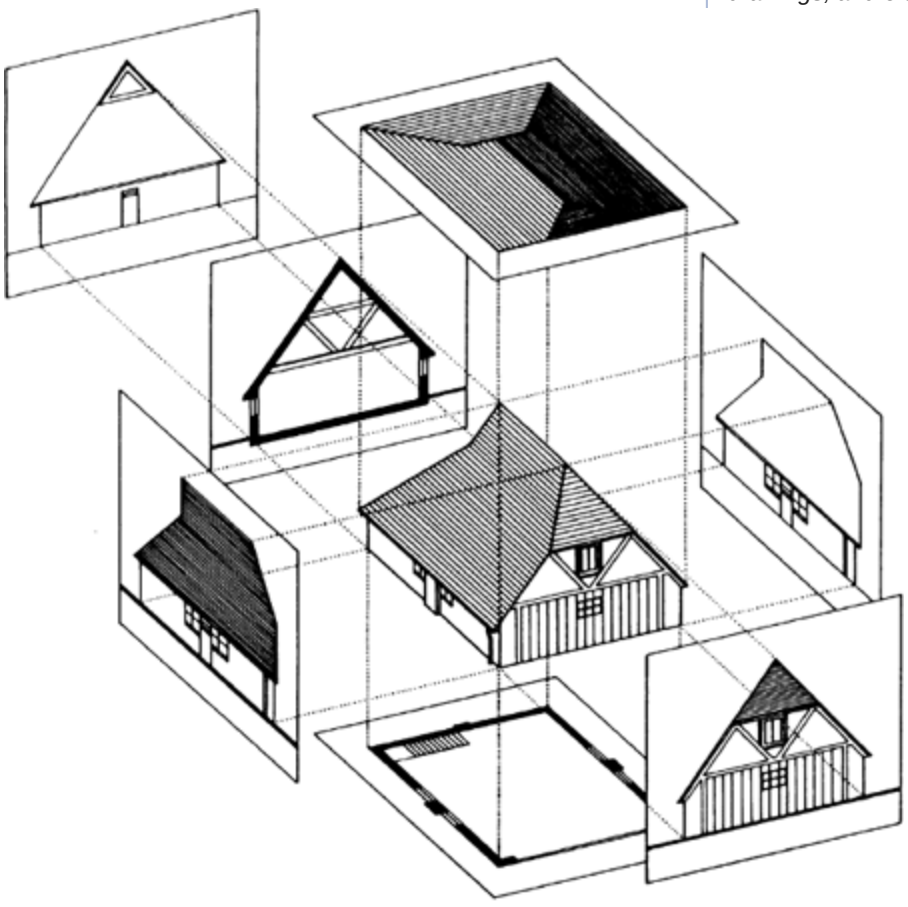
Large-Scale Views: Views of plans, elevations, or sections at a larger scale and with more detail than the referenced view.

Details: Plans, elevations, or sections that provide more specific information about a portion of a project component or element than smaller-scale drawings.

Schedules: Tables or charts that include data about materials, products, and equipment.

Diagrams: Nonscaled views showing arrangements of special system components and connections not possible to clearly show in scaled views.

3D Representations: Perspectives, isometric drawings, and electronic CAD models.



***UDS Figure 0.6-1** Drawing views.*

Drawings consist of plans, elevations, sections, large-scale views, details, schedules, diagrams, and 3D representations.

0.7 SUMMARY

UDS applies to drawings for all facilities, regardless of how they are produced or by whom. It focuses on the systematic organization and presentation of drawing information. UDS provides a logical basis for the organization and production of drawings that allows the use of time-honored manual drawing techniques as well as CAD technologies. It also recognizes and accommodates both a metric Systeme International (SI) measurement system and an inch-pound measurement system.

UDS serves as the foundation for the development and application of future advances in design, construction, and facility management.

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Module 1 - Drawing Set Organization

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Module 1 - Drawing Set Organization

1.1 INTRODUCTION

Drawing Set Organization is a standardized method for organizing information about a facility that is presented graphically. Effective organization facilitates accurate communication between the drawing creator and those who use that drawing. Organization also promotes information retrieval and preservation.

Organization standards affect production, delivery, and identification of hardcopy drawings as well as electronic (CAD) drawings. A solitary determination made on how or where to display information has a domino effect on multiple aspects of the drawing set.

The *Drawing Set Organization Module* provides a consistent, familiar environment for producing and viewing construction drawings. Particularly suited to buildings, the standards easily adapt to other types of facilities including civil and process dominant projects.

The following brief synopsis provides an overview of where to look for help in making decisions about organizing a drawing set.

Set Content and Order

- Organizes graphical information into subsets to create convenient work partitions for multiple design and construction disciplines
- Provides an order for displaying subsets in a logical sequence for review and construction
- Identifies types of electronic files (or sheets) that best illustrate categories of drawing information
- Utilizes an electronic model concept to share information common to multiple disciplines without duplicating work

Sheet Identification

- Provides a list of discipline designators and modifiers
- Organizes the categories of information into drawing sheet types
- Provides guidelines for a sheet numbering sequence

Sheet: As a delivery media, the document sheet is the hardcopy representation of information presented on a vellum or mylar "original" or "tracing." In an electronic media sense, the document sheet is the screen window.

Discipline Designator: The first component of the sheet identification format based on the traditional system of alphabetical discipline designators.

Modifier: The second character of a two-character discipline designator, used to further subdivide the discipline for a specific use or purpose.

File Naming

- Handles special situations created by internal and external influences
- Identifies drawing categories
  - Project files for project specific drawings and sheets; used once
  - Library files for generic drawings and master sheet or template files; used many times
- Provides file naming standards for different types of project files
  - Model
  - Details
  - Sheet
  - Schedules
  - Text
  - Database

- Provides file management strategies for each category
- Provides additional references for easy reading

Influences

Provides a table illustrating how various factors influence drawing set content and order, sheet identification, and the naming of files.

Module 1 - Drawing Set Organization

1.2 SET CONTENT AND ORDER

The organization of a drawing set should support the requirements and facilitate the production efforts of the design and construction team. The organization system must be flexible and adaptive to the influences of project size and complexity, including delivery requirements. Uniform Drawing System (UDS) provides the methodology to organize drawing sets in the following manner:

- Segregate the information by disciplines (both design and construction) to form subsets of the total drawing package
- Order the subsets to correspond to the natural sequence of construction, closely associating disciplines where topics are similar
- Collect and present each drawing (plan, elevation, section…) on a sheet dedicated to that drawing type so that different drawing types may be combined for small projects
- Present information within each subset from general to specific

A drawing set for a project or a facility must also provide for the inclusion of each of the various types of construction drawings, as follows:

Procurement Drawings
Contract Drawings
Resource Drawings
Addenda Drawings
Modification Drawings

Procurement Drawings: Drawings issued for bidding or negotiating before signing of an agreement.

Contract Drawings: Drawings that describe the work of the project.

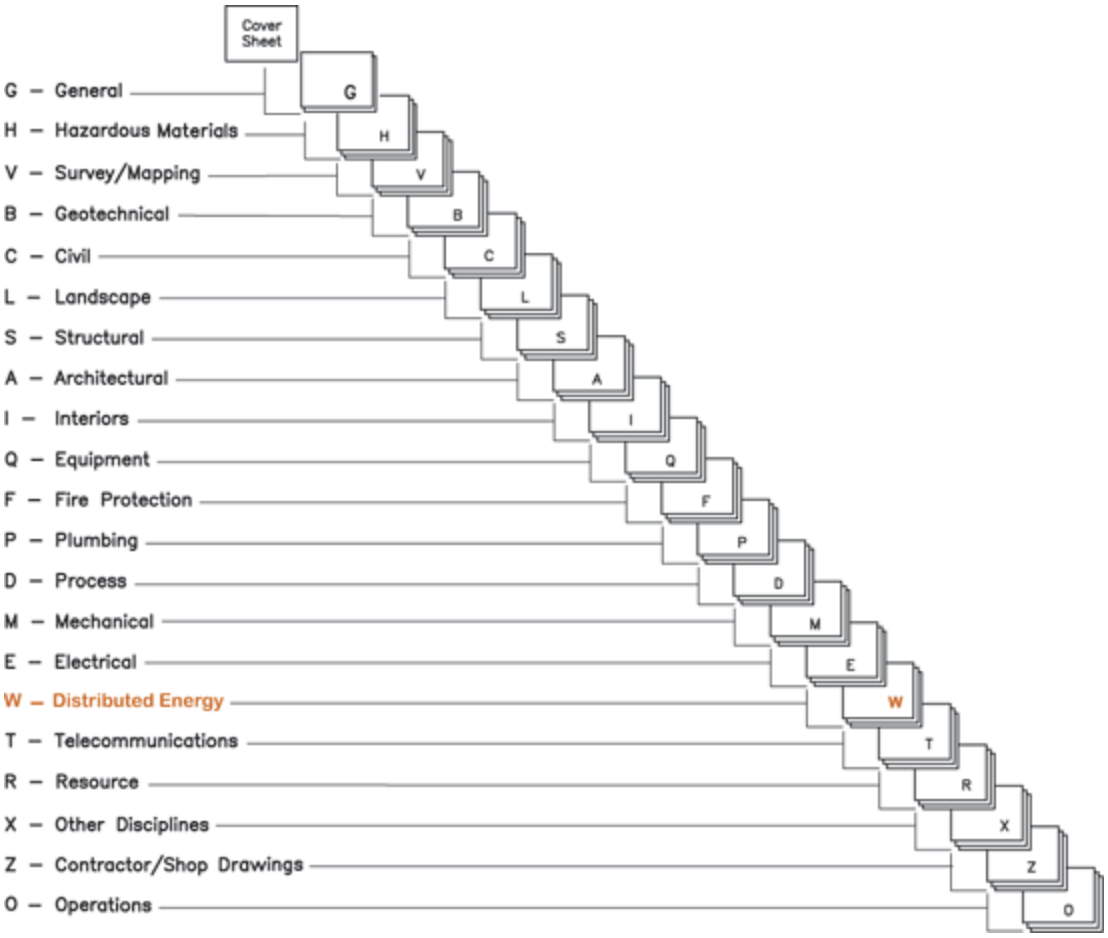
Resource Drawings: Drawings that show existing conditions, or new construction related to the work, but are not included in the contract.

Addenda and *Modification Drawings:* Collectively known as Supplemental Drawings.

Although the initial purpose of construction drawings is to build or modify a facility, portions of a drawing set can be reused for facility management or for future projects. Logical set organization and sheet identification procedures facilitate retrieval and use of information.

Subsets

Following the cover sheet, sheets should be organized into subsets in the order illustrated in ***UDS Figure 1.2-1***. All of the subsets may not apply, or more specific additional categories may be required depending on the size, scope, and complexity of the project.



UDS Figure 1.2-1 *Illustration of a typical drawing set.*

Electronic Models

The use of electronic models is a common method of sharing information among design disciplines when using CAD to produce construction drawings. A model file contains elements of a facility that are created by one designer and referenced but not modified by another. One example is simply the floor plan that is used to overlay the duct work or electrical power information. That floor plan can contain the reflected ceiling grid or the grid can be referenced also. The *AIA CAD Layer Guidelines* is a valuable tool in segregating information in a model because it organizes information into subsets similar to those described above.

Module 1 - Drawing Set Organization

1.3 SHEET IDENTIFICATION

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

Standard Sheet Identification

The sheet identification format is applicable to both manual and CAD drawing production. It is consistent, yet flexible enough for

Sheet ID Name Format

a wide range of project scopes. The UDS sheet identification format depicted here includes the following components:

- the discipline designator, consisting of one alphabetical character and a hyphen or two alphabetical characters.
- the sheet type designator, consisting of one numerical character
- the sheet sequence number, consisting of two numerical characters

The one- or two-character discipline designator identifies the sheet as a member of a subset. A sheet type designator that identifies the type of information on the sheet is followed by the sheet sequence number.

Discipline Designator

Sheet Type Designator

Sheet Sequence Number

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

Recognizing the wide variance in project complexity, UDS allows two levels of sheet identification. Either of these or a combination of the two can be used to suit the project or the intended use of the drawings. Level 1 offers the simplest identification format and would be suitable for all but the most complex projects. Level 2 provides guidance for complex or special types of projects. Refer to *UDS Appendix A - Discipline Designators, UDS section 1.6* for examples of the two levels of sheet identification.

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

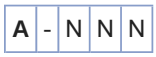
Discipline Designator

The first component of the sheet identification format, the discipline designator, is based on the traditional system of alphabetical discipline designators, using either a single alphabetical character with a hyphen (Level 1) or two alphabetical characters (Level 2).

The discipline designator denotes the category of subject matter contained in the file or on the layer designated. A dash always follows the Level 1 discipline designator; a dash is not used when the Level 2 discipline designator is used.

LEVEL 1 DISCIPLINE DESIGNATORS	
G	General
H	Hazardous Materials
V	Survey/Mapping
B	Geotechnical
C	Civil
L	Landscape
S	Structural
A	Architectural
I	Interiors
Q	Equipment
F	Fire Protection
P	Plumbing
D	Process

Discipline Designator Name Format



Level 1 Discipline Designator

Level 2 Discipline Designator

Discipline Character

Modifier Character

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

M	Mechanical
E	Electrical
W	Distributed Energy
T	Telecommunications
R	Resource
X	Other Disciplines
Z	Contractor/Shop Drawings
O	Operations

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

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

In order to differentiate among multiple buildings on a "campus" or among multiple features on a large civil works project the use of additional user-defined Level 2 Discipline Designators will be allowed.

For additional examples of discipline designators for other disciplines, refer to *UDS Appendix A - Discipline Designators, UDS section 1.6*. A detailed example of discipline designators based on the Telecommunications discipline follows.

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

Sheet Type Designator

The sheet type designator is a single numerical character that identifies the sheet type. All sheet types may apply to all discipline designators. It is not necessary to use all the sheet types for a project or within a discipline.

SHEET TYPE DESIGNATORS

Sheet Type Name Format

A	A	**N**	N	N

Sheet Type Designator

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

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

The use of sheet type designators does not preclude combining different types of drawings on the same sheet for simplicity. For instance, it is acceptable to

- Place profile drawings on sanitary sewer or road plan sheets
- Place same scale sections on the same sheet as large-scale plans of stairs or escalators
- Place schedules on a plan sheet when the information is closely associated
- Combine different types of drawings on the same sheet on small projects

Refer to discussion on *Sheet Title Blocks, UDS section 2.3* for information about naming sheet titles.

Sheet Sequence Number

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

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

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

Sheet Sequence Name Format

A A N **N** **N**

Sheet Sequence Number

A A N N N - **U** **U** **U**

User-Defined Designators

A - 1 0 2 - **R** **1**

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

A - 1 0 2 - **X** **1**

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

A - 1 0 2 - **A** **1**

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

***A** = alphabetical character*
***N** = numerical character*
***U** = user-defined character*

Supplemental Drawings

Small changes on a drawing are normally accomplished with the use of revision clouds and numbers accompanied with a brief description in the revision block. Occasionally an entire drawing must be altered and reissued for

supplementary work involving a change in scope. When this occurs, a user-defined suffix character to the sheet identifier may be introduced. Descriptors include R for revised issues of similar scope, X for complete changes, and A, B, C,… for phased work where multiple versions of the same drawing are expected. A dash always follows the sheet sequence number to separate it from the numbering for supplemental drawings.

Module 1 - Drawing Set Organization

1.4 FILE NAMING

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

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

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

File Categories

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

Library Files

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

Naming Library Files - Library files should be named differently from project files because the classification and indexing requirements are different. Library file naming should be grouped by building systems, assemblies, or usage because that is the most natural way to search for them. *MasterFormat*™ and *UniFormat*™ numbers provide a useful method of organization for this purpose. The library file naming format includes three user-defined characters after the *MasterFormat*™ or *UniFormat*™ numbers, which are followed by a period (called a dot) and the file name extension (.dgn, .dwg, .dxf, etc.).

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

Library File Name Format

N	**N**	**N**	**N**	**N**	**N**	**U**	**U**	**U**	·	**E**	**X**	**T**
MasterFormat™						User ID				Extension		

A	**N**	**N**	**N**	**N**	**U**	**U**	**U**	·	**E**	**X**	**T**
UniFormat™					User ID				Extension		

***A** = alphabetical character*
***N** = numerical character*
***U** = user-defined character*
***EXT** = file name extension*

(The file extensions shown above all show 3 characters. The actual number of

manufacturers and industry associations are developing conventions for library file naming.

characters is based on the software used.)

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

Project Files

Project files are specific to a project and must be organized to make it easy to produce contract documents, record documents, and facility management documents from many different files. Project files can be building and site models, details, sheets, schedules, text, database, symbols, borders, title blocks, and other files created for the project.

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

Project File Types

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

- Model
- Detail
- Sheet
- Schedule
- Text
- Database
- Symbols
- Border
- Title Block

Model Files

A model file is an electronic representation of a building, site, or work area. Elements graphically representing the building or site should always be created at their "real-world" size in their "real-world" units. A model file contains a whole or partial full-scale digital model of the building or site. A model is not intended to represent an ideal, standard, or template as in "a model to follow."

Model Files: A model file contains a whole or partial full-scale digital model of the building or site.

There are three main variations in the processes of building digital models and extracting or composing construction drawings from them. There can be

- a single multi-discipline building model
- a single model for each construction discipline
- several models per discipline

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

Naming Model Files - The first two characters are the discipline designator, consisting of one alphabetical character and a placeholder (hyphen) for Level 1 discipline designators, or two alphabetical characters for Level 2 discipline designators. The Level 2 discipline designator is optional. These are presented in the sheet identification format section of this module.

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

The fifth through eighth characters are alphanumeric user-defined modifiers for the model types.

Δ

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

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

The three remaining characters after the required decimal point are defined by the CAD software and represent file name extensions such as .dgn, .dwg, .dwf, and .dxf.

Model File Name Format

A	–	A	A	U	U	U	U	·	E	X	T

Level 1 Discipline Designator and Placeholder (Hyphen)

A	**A**	A	A	U	U	U	U	·	E	X	T

Level 2 Discipline Designator

A	–	**A**	**A**	U	U	U	U	·	E	X	T

Type of Model

O	**O**	**O**	**O**	**O**	A	–	A	A	U	U	U	U	·	E	X	T

Optional Prefix

A	–	A	A	**U**	**U**	**U**	**U**	·	E	X	T

User-Defined Model Type Modifiers

A	–	A	A	U	U	U	U	·	**E**	**X**	**T**

File Name Extension

***A** = alphabetical character*
***N** = numerical character*
***U** = user-defined character*
***O** = optional character (user-defined)*
***EXT** = file name extension*

(The file extensions shown above all show 3 characters. The actual number of characters is based on the software used.)

Detail Files

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

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

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

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

Detail File Name Format

A	**–**	**N**	**N**	**N**	–	A	N	·	E	X	T

Sheet Identification

A	–	N	N	N	–	A	N	·	E	X	T

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

This is an example of a file name of a specific project detail found on sheet A-501. The detail identification number B3 indicates that it is located on the sheet at grid coordinates B3. The two-part reference bubble for this detail would be B3/A-501. Refer to *Sheet Organization, UDS section 2.3* for further explanation.

Placeholder

A	–	N	N	N	–	**A**	**N**	·	E	X	T

Detail Identification Number

A	**–**	**5**	**0**	**1**	**–**	**B**	**3**	·	**D**	**W**	**G**

Example of Detail Identification

***A** = alphabetical character*
***N** = numerical character*
***U** = user-defined character*
***EXT** = file name extension*

(The file extensions shown above all show 3 characters. The actual number of characters is based on the software used.)

Sheet Files

When there is sufficient information to "print" a sheet, it becomes necessary to create a "sheet" file. The "electronic sheet file" may be comprised of a border template (a file that contains graphic and text elements common to all sheets of a specific size), text, symbols and views of files, representing everything that appears on the final sheet.

Sheet files are sometimes erroneously referred to as "plot" files. Plot files are the files that result from CAD software, using a specific plotter or printer device driver. Plot files exist in the plotter's native language (such as HP-GL or Postscript®) and are generally usable only by the specific device.

Sheet files are created by and can be edited by CAD software.

Naming Sheet Files - Because the main purpose of the sheet file is to prepare information for the production of a specific sheet, the format of the file name should be consistent with the format for the sheet identification. The sheet file name should categorize the contents of each electronic "sheet" file to the same degree as the sheet identification categorizes the physical sheet of drawings.

Schedule Files

The *Schedules Module* provides discussion on schedule files. Several issues related to electronic applications are important to note. Unlike model and sheet files, schedule files (and the following file types of text and database) may be produced by software other than CAD, for example, word processing, spreadsheets, and databases. In addition to CAD software, word processor, spreadsheet, and database applications can be used to create and modify schedule templates.

If CAD software is used to create schedule file graphics, the graphics should be created full size. This will allow library schedule templates to be used more easily in the project sheet composition process for electronic sheet files. It will also make it simpler to use the template in a word processor, if schedules reside in the specifications.

If the CAD software is object linking and embedding **(**OLE**)** compatible, schedule templates will most likely exist as a database report template, spreadsheet template, or word processing table, not as an element of CAD graphics.

***OLE:** Allows objects like tables and spreadsheets to be linked or inserted (format intact) from other software.*

Regardless of the origin of the schedule, copy the library master template into the project sheet file. After adding project specific information to the schedule, insert, reference, or link the schedule into the project sheet file.

Naming Schedule Files - For project schedule file naming, the format is similar to the project detail format. Note that this naming format does not rely on any specific file extension, which makes it valid for all types of software.

To the left is an example of a file name of a specific project mechanical schedule found on the sheet labeled M-601. The

Schedule Files Name Format

number C1 indicates that the schedule is located at grid coordinate C1 on that sheet.

Refer to the discussions in "Naming Library Files" and *Schedules, UDS section 3.6* for library schedule file naming.

M	–	6	0	1	–	C	1

Example of Schedule Identification

Using Schedule Files - These files are similar in use to library detail files, in that they provide a resource that is usable from project to project.

Text Files

Text files that are usable from project to project may be general notes, discipline specific notes, sheet type specific notes (for example, notes that always apply only to foundation plans), and symbol legends. Word processors or databases are almost always the originating software of text files.

Refer to the discussions in "Naming Library Files" for library text file naming. Project text file naming is more complex and is closely tied to the degree of segregation desired.

A project text file name, for example, may not be needed under the following scenario. The library text file for "General Demolition Notes" is inserted without linkage or embedment into the project sheet file G-003. Using the CAD software, the text is edited to suit the project requirements, and the sheet file saved with that information. The project specific text file then exists integrally with the sheet file and does not require a separate file or file name.

Using the same "General Demolition Notes" example above, the library text file is first copied into the name G-003-DN.TXT. Then, using the word processor, the project text file is edited before referencing or inserting the text file into the sheet.

If the latter approach is used, the text file name format parallels that of the detail files described above.

Database Files

Database files include tables that predefine and label "fields" (columns) of data. The process of creating a table requires that each field be labeled uniquely, and that the allowable kind of data be identified (for example, whether or not field values must be alphanumeric, text, graphics, dates, integers, real numbers, etc.). Most applications also let the creator define valid ranges of values for the fields. In addition, all databases provide the means to set up formats for both data input and report output and index files to optimize performance.

Examples of database tables include just about any schedule used in construction documents, inventory listings for equipment and furnishings, master keynote listings, and numerous other lists or tabulations.

As mentioned in the previous "Text File" discussion, file naming of database files is dependent on how much optimizing and linking information among various software applications is needed within a project. In addition, integration of database tools into CAD varies with the choice of CAD software and is very dependent on the degree of customization within the application. Examples of the potential may be found in Geographic Information Systems (GIS) and Facility Management (FM) software.

As noted earlier, a schedule can be a report from a database table. As a start, consider the creation of database tables for some of the more common schedules and, if keynoting is used, for the master keynote listing. The project specific files will be text file reports from the tables and named similarly to the detail, schedule, and text files discussed previously.

Module 1 - Drawing Set Organization

1.5 FILE MANAGEMENT RECOMMENDATIONS

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

Project Folders

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

Naming Project Folders

While rules for folder tree structures are described in the operating system user's manuals, they do not offer any constructive naming conventions. Most organizations base folder names on the system used for project identification.

DOS allows a maximum of eight characters in a folder name, while other operating systems may allow up to 255 characters. Subfolder names follow the same pattern and are useful in classifying information by level of detail.

A unique project identification name or number up to eight characters long should be used to identify the project folder so that files can be shared with all users. The next level of subfolders could consist of names identifying the progression of the project files according to their development phase. The next lower level of subfolders could identify the type of project files described in "Project File Types."

In the format for suggested folder names, a prefix number is included to preserve the sorting of subfolders by development sequence.

Project Folders Name Format

1	P	R	E	D	E	S	

Programming and predesign phase

2	S	C	H	E	M		

Schematic design and concept phase

3	D	E	S	D	E	V	

Design and development phase

4	C	O	N	D	O	C	

Construction document phase

5	C	O	N	T	R	A	C

Contract submittal phase

6	R	E	C	O	R	D	

Record document phase

7	F	A	C	M	A	N	

Facility management phase

File Backups

In addition to providing a consistent place for each document as it progresses through the project cycle, the project folder structure simplifies file management tasks. Specific projects or individual phases may be easily identified for file searches, making backup or archive copies, and transferring files for distribution.

Evolving drawings should be placed in an unrestricted volume or folder and backed up daily.

Data Protection

Even when an effective folder tree and file naming system are in place, the possibility of operator error resulting in overwriting or erasing an important file still exists. There are procedures that, when followed, can protect valuable work. Frequently saving work in progress, using the application's automatic timed-save function, and automatically backing up files to a tape drive on a daily basis are a few ways to avoid losing files. Deleted files may also be recovered from the trash can or recycle bin of some operating systems, but these files are permanently lost in the event of a hard-drive failure.

Protecting the computer system from power outages with an uninterruptible power supply (UPS) is an additional measure of protection recommended to reduce the loss of completed work.

Archiving and Distributing Data

As each drawing reaches a milestone, it should be copied to an archive folder. Weekly archival backups are highly recommended.

The entire drawing set should be transferred to an archival record medium at the completion of each stage of work. In a networked office, this can be a dedicated hard drive, tape drive, or recordable CD-ROM. In a smaller firm, this archive can be a partition or folder on a hard disk, a library of high-capacity removable disks, or one of the available file compression software programs.

Password restriction to a limited number of qualified people who can responsibly manage the task is mandatory.

Module 1 - Drawing Set Organization

1.6 APPENDIX A - DISCIPLINE DESIGNATORS

The following schedule illustrates discipline designators and the order in which they shall appear when used:

Designator		Description of Suggested Names	Content
Level 1	Level 2		
G	**-**	**General**	**All or any portion of subjects included in Level 2**
-	**GC**	General Contract	Phasing, schedules, contractor staging areas, fencing, haul routes, erosion control, temporary and special requirements
-	**GI**	General Information	List of sheets and symbols, code summary, symbol legend, orientation maps
-	**GR**	General Resource	Photographs, soil borings
-	**GJ**		User Defined
-	**GK**		User Defined
H	**-**	**Hazardous Materials**	**All or any portion of subjects included in Level 2**
-	**HA**	Hazardous Materials Asbestos	Asbestos abatement, identification or containment
-	**HC**	Hazardous Materials Chemicals	Toxic chemicals handling, removal or storage
-	**HL**	Hazardous Materials Lead	Lead piping or paint removal
-	**HP**	Hazardous Materials PCB	PCB containment and removal
-	**HR**	Hazardous Materials Refrigerants	Ozone depleting refrigerants

-	**HJ**		User Defined
-	**HK**		User Defined
V	**-**	**Survey/Mapping**	**All or any portion of subjects included in Level 2**
-	**VA**	Survey/Mapping Aerial	Aerial surveyed points and features
-	**VC**	Survey/Mapping Computated Points	Computated points and features
-	**VF**	Survey/Mapping Field	Field surveyed points and features
-	**VI**	Survey/Mapping Digital	Digitized points and features
-	**VN**	Survey/Mapping Node Points	Node points and features
-	**VS**	Survey/Mapping Staked Points	Staked points and features
-	**VU**	Survey/Mapping Combined Utilities	
-	**VJ**		User Defined
-	**VK**		User Defined
B	**-**	**Geotechnical**	**All or any portion of subjects included in Level 2**
-	**BJ**		User Defined
-	**BK**		User Defined
C	**-**	**Civil**	**All or any portion of subjects included in Level 2**
-	**CD**	Civil Demolition	Structure removal and site clearing
-	**CG**	Civil Grading	Excavation, grading, drainage, erosion control
-	**CI**	Civil Improvements	Pavers, flagstone, exterior tile, furnishings, retaining walls, and water features
-	**CN**	Civil Nodes	
-	**CP**	Civil Paving	Roads, driveways, parking lots
-	**CS**	Civil Site	Plats, dimension control
-	**CT**	Civil Transportation	Waterways, wharves, docks, trams, railways, people movers
-	**CU**	Civil Utilities	Water, sanitary sewer, storm sewer, power, communications, fiber optic, telephone, cable television, natural gas, and steam systems
-	**CJ**		User Defined
-	**CK**		User Defined
L	**-**	**Landscape**	**All or any portion of subjects included in Level 2**
-	**LD**	Landscape Demolition	Demolition, relocation, and salvage information
-	**LG**	Landscape Grading	Proposed contours and spot grades
-	**LI**	Landscape Irrigation	Mainlines, valves, controllers, pumps, etc
-	**LL**	Landscape Lighting	
-	**LP**	Landscape Planting	Landscape Planting
-	**LR**	Landscape Relocation	Vegetation relocation information
-	**LS**	Landscape Site	All site hardscape and call-outs
-	**LJ**		User Defined

-	**LK**		User Defined
S	**-**	**Structural**	**All or any portion of subjects included in Level 2**
-	**SB**	Structural Substructure	Foundations, piers, slabs, and retaining walls
-	**SD**	Structural Demolition	Protection and removal
-	**SF**	Structural Framing	Floors and roofs
-	**SS**	Structural Site	
-	**SJ**		User Defined
-	**SK**		User Defined
A	**-**	**Architectural**	**All or any portion of subjects included in Level 2**
-	**AD**	Architectural Demolition	Protection and removal
-	**AE**	Architectural Elements	General Architectural
-	**AF**	Architectural Finishes	
-	**AG**	Architectural Graphics	
-	**AI**	Architectural Interiors	
-	**AS**	Architectural Site	
-	**AJ**		User Defined
-	**AK**		User Defined
I	**-**	**Interiors**	**All or any portion of subjects included in Level 2**
-	**ID**	Interior Demolition	
-	**IF**	Interior Furnishings	
-	**IG**	Interior Graphics	Murals and visuals
-	**IN**	Interior Design	
-	**IJ**		User Defined
-	**IK**		User Defined
Q	**-**	**Equipment**	**All or any portion of subjects included in Level 2**
-	**QA**	Equipment Athletic	Gymnasium, exercise, aquatic, and recreational
-	**QB**	Equipment Bank	Vaults, teller units, ATMs, drive-through
-	**QC**	Equipment Dry Cleaning	Washers, dryers, ironing, and dry cleaning
-	**QD**	Equipment Detention	Prisons and jails
-	**QE**	Equipment Educational	Chalkboards, library
-	**QF**	Equipment Food Service	Kitchen, bar, service, storage, and processing
-	**QH**	Equipment Hospital	Medical, exam, and treatment
-	**QL**	Equipment Laboratory	Science labs, planetariums, observatories
-	**QM**	Equipment Maintenance	Housekeeping, window washing, and vehicle servicing
-	**QP**	Equipment Parking Lot	Gates, ticket and card access
-	**QR**	Equipment Retail	Display, vending, and cash register
-	**QS**	Equipment Site	Bicycle racks, benches, playgrounds
-	**QT**	Equipment Theatrical	Stage, movie, rigging systems

-	**QV**	Equipment Video/Photographic	Television, darkroom, and studio
-	**QY**	Equipment Security	Access control and monitoring, surveillance
-	**QJ**		User Defined
-	**QK**		User Defined
F	**-**	**Fire Protection**	**All or any portion of subjects included in Level 2**
-	**FA**	Fire Protection Detection and Alarm	
-	**FX**	Fire Protection Suppression	Fire extinguishing systems and equipment
-	**FJ**		User Defined
-	**FK**		User Defined
P	**-**	**Plumbing**	**All or any portion of subjects included in Level 2**
-	**PD**	Plumbing Demolition	Protection, termination, and removal.
-	**PL**	Plumbing	Domestic water, sanitary and storm drainage, fixtures
-	**PP**	Plumbing Piping	Piping, valves and insulation
-	**PQ**	Plumbing Equipment	Pumps and tanks
-	**PS**	Plumbing Site	Extension and connections to Civil Utilities
-	**PJ**		User Defined
-	**PK**		User Defined
D	**-**	**Process**	**All or any portion of subjects included in Level 2**
-	**DA**	Process Airs	Piping, valves, system components, equipment
-	**DC**	Process Chemicals	Piping, valves, system components, equipment
-	**DD**	Process Demolition	Protection, termination and removal
-	**DE**	Process Electrical	Electrical exclusively associated with a process and not the facility
-	**DG**	Process Gases	Gaseous process systems
-	**DI**	Process Instrumentation	Instrumentation, measurement, recorders, devices and controllers (electrical and mechanical)
-	**DL**	Process Liquids	Liquid process systems
-	**DM**	Process HPM Gases	Piping, valves, system components, equipment
-	**DO**	Process Oil	Piping, valves, system components, equipment
-	**DP**	Process Piping	Piping, valves, insulation, tanks, pumps, etc.
-	**DQ**	Process Equipment	Systems and equipment for thermal, electrical, materials handling, assembly and manufacturing, nuclear, power generation, chemical, refrigeration, and industrial processes
-	**DR**	Process Drains and Reclaims	Piping, valves, system components, equipment
-	**DS**	Process Site	Extension and connection to civil utilities
-	**DV**	Process Vacuum	Piping, valves, system components, equipment
-	**DW**	Process Waters	Piping, valves, system components, equipment
-	**DX**	Process Exhaust	Ducting, piping, valves, system components, equipment
-	**DY**	Process Slurry	Piping, valves, system components, equipment

-	**DJ**		User Defined
-	**DK**		User Defined
M	**-**	**Mechanical**	**All or any portion of subjects included in Level 2**
-	**MD**	Mechanical Demolition	Protection, termination, and removal
-	**MH**	Mechanical HVAC	Ductwork, air devices, and equipment
-	**MI**	Mechanical Instrumentation	Instrumentation and controls
-	**MP**	Mechanical Piping	Chilled and heating water, steam
-	**MS**	Mechanical Site	Utility tunnels and piping between facilities
-	**MJ**		User Defined
-	**MK**		User Defined
E	**-**	**Electrical**	**All or any portion of subjects included in Level 2**
-	**ED**	Electrical Demolition	Protection, termination, and removal
-	**EI**	Electrical Instrumentation	Controls, relays, instrumentation, and measurement devices
-	**EL**	Electrical Lighting	
-	**EP**	Electrical Power	
-	**ES**	Electrical Site	Utility tunnels, site lighting
-	**ET**	Electrical Telecommunications	Telephone, network, voice and data cables
-	**EY**	Electrical Auxiliary Systems	Alarms, nurse call, security, CCTV, PA, music, clock, and program
-	**EJ**		User Defined
-	**EK**		User Defined
W	**-**	**Distributed Energy**	**All or any portion of subjects included in Level 2**
-	**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
T	**-**	**Telecommunications**	**All or any portion of subjects included in Level 2**
-	**TA**	Telecommunications Audio Visual	Cable, music, and CCTV systems
-	**TC**	Telecommunications Clock and Program	Time generators and bell program systems

-	**TI**	Telecommunications Intercom	Intercom and public address systems
-	**TM**	Telecommunications Monitoring	Monitoring and alarm systems
-	**TN**	Telecommunications Data Networks	Network cabling and equipment
-	**TT**	Telecommunications Telephone	Telephone systems, wiring, and equipment
-	**TY**	Telecommunications Security	Access control and alarm systems
-	**TJ**		User Defined
-	**TK**		User Defined
R	**-**	**Resource**	**Data furnished without warrant as to accuracy**
-	**RA**	Resource Architectural	Existing facility architectural drawings
-	**RC**	Resource Civil	Surveyor's information and existing civil drawings
-	**RE**	Resource Electrical	Existing facility electrical drawings
-	**RM**	Resource Mechanical	Existing facility mechanical drawings
-	**RR**	Resource Real Estate	Real Estate Drawings
-	**RS**	Resource Structural	Existing facility structural drawings
-	**RJ**		User Defined
-	**RK**		User Defined
X	**-**	**Other Disciplines**	**All or any portion of subjects included in Level 2**
-	**XJ**		User Defined
-	**XK**		User Defined
Z	**-**	**Contractor / Shop Drawings**	**All or any portion of subjects included in Level 2**
-	**ZJ**		User Defined
-	**ZK**		User Defined
O	**-**	**Operations**	**All or any portion of subjects included in Level 2**
-	**OJ**		User Defined
-	**OK**		User Defined

Module 1 - Drawing Set Organization

1.7 APPENDIX B - SHEET IDENTIFICATION EXAMPLES

The following table illustrates hypothetical indexes of drawings for two similar construction projects. The Level 1 project is a typical two-story professional office building. The Level 2 project is a four-story medical rehabilitation care facility. In the examples, the Level 1 drawing sheet may contain all the information listed for the Level 2 sheets below it, if required for the project.

Although not included in these examples, Plumbing, Mechanical, and Electrical sheets would be required for both projects. Those sheets should be identified according to the Level 1 and Level 2 designators presented in Appendix A, and arranged in the appropriate sequence.

Note: This table is ordered by the Level 2 discipline designators. Level 1 sheet identification numbers below may not be shown in order, but should be assembled in numerical sequence within each discipline designator.

Level 1	Level 2	Sheet Title
General Drawings		
G-001	**GI001**	List of Sheets and Symbols
	GI101	Location and Area Maps
	GI102	Code Summary Fire Exiting and Separation
G-002	**GC001**	General Requirements Notes
G-101	**GC101**	Site Utilization Plan
	GC102	Phasing Plans
	GC601	CPM Schedules
Civil Drawings		
	CD101	Site Demolition Plan
	CD102	Utilities Demolition Plan
C-101	**CS101**	Dimension Control Plan
	CG001	Grading and Excavation Notes
	CG101	Excavation Plan
C-102	**CG102**	Grading Plan
	CG201	Grading Profiles
	CG301	Excavation Sections
	CG302	Grading Sections
	CG501	Grading Details
	CP001	Paving Notes
C-103	**CP101**	Paving Plan
	CP301	Paving Sections
C-501	**CP501**	Paving Details
	CI101	Exercise Walk & Equipment
	CI501	Aerobic Equipment Details
	CT101	Heliport Plan
	CT301	Heliport Sections
	CT501	Heliport Details
	CT502	Heliport Details
C-104	**—**	Site Utilities Plan
	CU001	Utilities Distribution Notes and Symbols
	CU101	Domestic Water Distribution Plan and Profile

	CU102	Fire Protection Water Distribution Plan and Profile
	CU103	Sanitary Sewer Plan and Profile
	CU104	Electrical Power Distribution
	CU401	Large-Scale Plan at Medical Gas Storage Pad
C-502	**—**	Site Utilities Details
	CU501	Domestic Water Distribution Details
	CU502	Sanitary Sewer Details
	CU503	Site Electrical Utilities Details
Landscape Drawings		
L-101	**—**	General Landscape Architectural Plan
L-101	**LD101**	Landscape Demolition Plan
	LD102	Irrigation Demolition Plan
	LD103	Planting Removal Plan
L-101	**LG101**	Landscape Grading Plan
L-102	**—**	Landscape Irrigation Plan
	LI001	Landscape Irrigation Plan
	LI002	Irrigation Notes and Symbols
	LI401	Large-Scale Irrigation Plans
	LI501	Irrigation Details
	LI601	Irrigation Schedules
	LI602	Irrigation Diagrams
L-103	**LL101**	Landscape Lighting Plan
	LP001	Planting Notes and Symbols
L-103	**LP101**	Landscape Planting Plan
	LP401	Large-Scale Planting Plans
	LP501	Landscape Details
	LP601	Plant Materials Schedules
	LP602	Planting Diagrams
	LP901	Landscape 3D Representations
L-104	**LR101**	Landscape Relocation Plan
L-104	**LS101**	Landscape Site Hardscape Plan
Structural Drawings		
S-101	**SB102**	Foundation and First Floor Plan
	SB201	Foundation Wall Elevations
S-301	**SB301**	Foundation Sections
	SB401	Large-Scale Foundation Plans
	SB501	Foundation Details
	SB601	Foundation Schedules
	SB602	Foundation Load Diagrams

	SF001	Framing Notes
S-102	**SF101**	Second Floor Framing Plan
	SF102	Third Floor Framing Plan
	SF103	Fourth Floor Framing Plan
S-103	**SF104**	Roof Framing Plan
	SF201	Framing Elevations
S-302	**SF301**	Framing Sections
	SF302	Wall Sections
	SF401	Large-Scale Plan at Physical Therapy
S-501	**SF501**	Framing Details
S-502	**SF502**	Stair and Elevator Details
S-601	**SF601**	Reinforcing Schedules
	SF602	Column and Beam Schedules
S-602	**SF603**	Framing Schedules
	SF604	Load Diagrams
	SF901	Framing Isometrics
Architectural Drawings		
A-101	**AS101**	Architectural Site Plan
A-001	**AE001**	Architectural Notes and Symbols
A-102	**AE101**	First Floor Plan
A-103	**AE102**	Second Floor Plan
	AE103	Third Floor Plan
	AE104	Fourth Floor Plan
A-104	**AE105**	First Floor Reflected Ceiling Plan
A-105	**AE106**	Second Floor Reflected Ceiling Plan
	AE107	Third Floor Reflected Ceiling Plan
	AE108	Fourth Floor Reflected Ceiling Plan
A-106	**AE109**	Roof Plan
A-201	**AE201**	Exterior Elevations
	AE202	Exterior Elevations
A-202	**AE203**	Interior Elevations
	AE204	Interior Elevations
A-301	**AE301**	Building Sections
	AE302	Building Sections
A-302	**AE303**	Wall Sections
	AE304	Wall Sections
A-401	**AE401**	Large-Scale Toilet Plans
A-402	**AE402**	Stair and Elevator Plans and Sections
	AE403	Treatment Room Plan

	AE404	Physical Therapy Room Plan
	AE405	Kitchen and Dining Room Plan
A-501	**AE501**	Exterior Details
	AE502	Exterior Details
A-502	**AE503**	Interior Details
	AE504	Interior Details
A-601	**AE601**	Door and Window Schedules
	AE602	Diagrams
	AE901	3D Representations and Isometrics
A-701	**AF101**	First Floor Finishes Plan
A-702	**AF102**	Second Floor Finishes Plan
	AF103	Third Floor Finishes Plan
	AF104	Fourth Floor Finishes Plan
A-602	**AF601**	Room Finish Schedules
A-107	**AG101**	Signage Plan
	AG201	Signage Elevations
	AG301	Signage Sections
	AG401	Large-Scale Signage Drawings
	AG501	Signage Details
A-603	**AG601**	Signage Schedules
Interior Design Drawings		
I-001	**IN001**	Interior Design Notes and Symbols
I-101	**IN101**	First Floor Interior Design Plan
I-102	**IN102**	Second Floor Interior Design Plan
	IN103	Third Floor Interior Design Plan
	IN104	Fourth Floor Interior Design Plan
I-103	**IN105**	First Floor Interior Design Reflected Ceiling Plan
I-104	**IN106**	Second Floor Interior Design Reflected Ceiling Plan
	IN107	Third Floor Interior Design Reflected Ceiling Plan
	IN108	Fourth Floor Interior Design Reflected Ceiling Plan
I-201	**IN201**	Interior Design Elevations
I-301	**IN301**	Interior Design Sections
I-401	**IN401**	Large-Scale Interior Design Plans
	IN501	Interior Design Details
	IN601	Interior Design Schedules
	IN602	Interior Design Diagrams
	IN901	Interior Design Isometrics
	IF001	Interior Furnishing Symbols
I-105	**IF101**	First Floor Interior Furnishing Plan

I-106	**IF102**	Second Floor Interior Furnishing Plan
	IF103	Third Floor Interior Furnishing Plan
	IF104	Fourth Floor Interior Furnishing Plan
I-202	**IF201**	Interior Furnishing Elevations
I-302	**IF301**	Interior Furnishing Sections
	IF401	Large-Scale Interior Furnishing Plans
	IF501	Interior Furnishing Details
	IF601	Interior Furnishing Schedules
	IF602	Interior Furnishing Diagrams
	IF901	Interior Furnishing Isometrics
I-002	**IG001**	Interior Graphics Notes and Symbols
I-107	**IG101**	First Floor Interior Graphics Plan
I-108	**IG102**	Second Floor Interior Graphics Plan
	IG103	Third Floor Interior Graphics Plan
	IG104	Fourth Floor Interior Graphics Plan
I-203	**IG201**	Interior Graphics Elevations
	IG301	Interior Graphics Sections
	IG401	Large-Scale Interior Graphics Plans
I-501	**IG501**	Interior Graphics Details
	IG601	Interior Graphics Schedules
	IG602	Interior Graphics Diagrams

Module 1 - Drawing Set Organization

1.8 APPENDIX C - INFLUENCES TABLE

The following table illustrates how various physical, regulatory, workflow, contract, and delivery system influences affect sheet identification and drawing set organization.

Physical Influences	Affected Character	Effect on Sheet Identification	Effect on Set Organization
	A A N N N U U U		
Scope - size of project	**A - 1 0 1** **A E 1 0 1**	Use Level 2 discipline designators for large projects **A-101** vs. **AE101**	Grouping and sequence of sheets
Scope - number of buildings	**A - 1 0 1 1** **A E 1 0 1 1**	Use 1, 2, 3, etc. or A, B, C, etc. for different buildings **A-1011** or **AE1011**	Subsets may be required
Scope - number of floors	**A - 1 0 1** **A - 1 0 2** **A - 1 0 9**	Coordinate floor level with sheet sequence number **A-101** for 1st floor plan **A-102** for 2nd floor plan **A-109** for 9th floor plan	Quantity of sheets

Scope - number of systems	**A E 1 0 1 1** **A G 1 0 1 1**	Use Level 2 discipline designator and user-defined character **AE1011** or **AG1011**	Quantity of sheets and subsets
Media - sheet size		No effect	Size and quantity of sheets
Media - required scale	**A - 4 0 1** **A E 4 0 1**	Use appropriate sheet type designator **A-401** or **AE401**	Size and quantity of sheets

A = Alphabetical Character
N = Numerical Character
U = User-Defined Character

Regulatory Influences	Affected Character	Effect on Sheet Identification	Effect on Set Organization
	A A N N N U U U		
Code compliance requirements	**A - 1 0 1 - H C**	Use to designate special sheets **A-101-HC** (for ADA review)	May require additional sheets
Building official requirements	**A - 1 0 1 - B D**	Use to designate special sheets **A-101-BD** (for building department)	May require additional sheets
Client requirements	**A - 1 0 1 - L S**	Use to designate special sheets **A-101-LS** (for leasable space)	May require additional sheets
Facility management requirements	**A - 1 0 1 - F M**	Use to designate special sheets **A-101-FM** (for facility management)	May require additional sheets or subsets

A = Alphabetical Character
N = Numerical Character
U = User-Defined Character

Workflow Influences	Affected Character	Effect on Sheet Identification	Effect on Set Organization
	A A N N N U U U		
Master planning	**A - 1 0 1 - O C**	Treat as special architectural sheets **A-101-OC** (for occupancy code)	Include in facility management set
Project definition		Minimal or no effect	Internal to A/E firm
Conceptual design		No effect-use subfolder **1PREDES, 2SCHEM…** to indicate phase	Defines concept subset
Construction documents	**A - 1 0 1** **A E 1 0 1**	Final sheet identification **A-101, A-102,** etc. **AE101, AE102,** etc.	Defines bid set
Project record drawings	**A - 1 0 1 - R D**	Use **RD** for record drawing, and/or use subfolder **6RECORD** to indicate phase **A-101-RD**	Defines project record set
Facility management	**A - 6 0 1 - P S**	Use facility management work codes **A-601-PS** (for painting schedule)	Defines facility management set
Partially revised drawing	**A - 1 0 1 R 1**	Use **R** for revisions of similar scope **A-101R1** (first revision)	
Totally revised drawing	**A - 1 0 1 X 1**	Use **X** for complete changes requiring new sheet **A-101X1** (first revised drawing)	

Addenda drawing	**A - 1 0 1 - A D**	Use **AD** for addenda drawing **A-101-AD**

A = Alphabetical Character
N = Numerical Character
U = User-Defined Character

Contract Influences	Affected Character	Effect on Sheet Identification	Effect on Set Organization
	A A N N N U U U		
Type of construction contract		No effect-influence in sheet content	Types of sheets in bid set
Number of construction contracts		No effect-information in title block	Group common details in first set
Number of professional disciplines	**A - 1 0 1** **A G 1 0 1**	Use only disciplines needed **A-101** (for Architectural) **AG101** (for Architectural Graphics)	Determines discipline subsets
Number of construction trades		No effect-not organized by trade	May require additional sheets
Phases of construction	**A - 1 0 1 A** **A - 1 0 1 B**	Use **A, B** etc. to indicate construction phase **A-101A** or **A-101B**	Sequence of sheets and subsets
Conformed Drawing	**A - 1 0 1 - C D**	Use **CD** for conformed drawing **A-101-CD**	
Clarification Drawing	**A - 1 0 1 - C L**	Use **CL** for clarification drawing **A-101-CL**	

A = Alphabetical Character
N = Numerical Character
U = User-Defined Character

Delivery System Influences	Affected Character	Effect on Sheet Identification	Effect on Set Organization
	A A N N N U U U		
Media type		Not applicable	Larger project sets may require higher-capacity media such as CD-ROM or rewritable-optical disks
Production vs. delivery format		Must work for manual and electronic methods	"Portable" digital set (independent of operating system and hardware)
Sheet Identification system		Not applicable	Expedites communication of data
File naming system	**A - 1 0 1 - - -** **A E 1 0 1** _ _ _	If eight-character limit, fill unused positions with dashes (- - -) or underscores (_ _ _) **A-101**- - -, **AE101**_ _ _	Coordinates digital version with hardcopy output

A = Alphabetical Character
N = Numerical Character
U = User-Defined Character

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Module 2 - Sheet Organization

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Module 2 - Sheet Organization

2.1 INTRODUCTION

The *Sheet Organization Module* establishes guidelines for consistency in the systematic presentation of drawings organized on sheets. Sheets thus organized are suitable for compiling into sets according to the *Drawing Set Organization, UDS section 1.2* guidelines, thereby providing a uniform location of graphical data.

The *Sheet Organization Module*:

- Provides a consistent sheet format
- Presents usable examples of sheet formats
- Provides a location system for drawings on a sheet
- Establishes guidelines for management, notation, and title block information

The benefits of sheet organization standards are:

- Enhanced communication among drawing preparers and users
- Improved quality control by providing a quality assurance standard
- Easier data management
- Consistent sheet format among design disciplines, conveying a coordinated image

Module 2 - Sheet Organization

2.2 SHEET SIZES

Many commercial sheet sizes are available. Sheet size selection is dependent on many factors. A common sheet size for all projects facilitates filing hard copy documents, provides efficiencies in reducing multiple media requirements, and maintains consistency for users of printed documents. Other factors influencing sheet size may include plotter capabilities, project complexity or size, filing capabilities, and handling of hard copy deliverables. Some firms or owners also require reduced size sheets for bidding or office use.

The single most important determinant in selecting the sheet size is to prepare a floor plan drawing on a single sheet without dividing the plan into sections. Large projects, however, may require the plan to be divided into multiple parts depending upon sheet size and scale. When plans are divided, a key plan is necessary on each plan sheet to indicate the sector or quadrant location. The key plan location is described in the drawing area portion of this module.

As of January 1, 1992, the federal government requires all construction documents used for federal government projects to be developed using the International System of Units (Systeme International d'Unites), or SI System, commonly called the metric system. Typically, government agencies also require that construction documents be prepared on American National Standards Institute (ANSI) sheet sizes. ***UDS Figure 2.2-1*** indicates the standard sheet sizes and their typical uses.

SHEET SIZES						
ANSI		ISO		Architectural		
Mark	**Size mm (inches)**	**Mark**	**Size mm (inches)**	**Mark**	**Size mm (inches)**	**Typical Uses**
A	216 x 279 (8.5 x 11)	**A4**	210 x 297 (8.3 x 11.7)	**A**	229 x 305 (9 x 12)	Project book. Supplemental drawings. Mock-up sheets.
B	279 x 432 (11 x 17)	**A3**	297 x 420 (11.7 x 16.5)	**B**	305 x 457 (12 x 18)	Reduced drawings from "D" size and "A1" originals. Supplemental drawings. Mock-up sheets.
C	432 x 559 (17 x 22)	**A2**	420 x 594 (16.5 x 23.4)	**C**	457 x 610 (18 x 24)	Small projects accommodating preferred plan scale.
D	559 x 864 (22 x 34)	**A1**	594 x 841 (23.4 x 33.1)	**D**	610 x 914 (24 x 36)	Projects accommodating preferred plan scale. Government projects.
E	864 x 1118 (34 x 44)	**A0**	841 x 1189 (33.1 x 46.8)	**E**	914 x 1219 (36 x 48)	Large projects accommodating preferred plan scale. Mapping and GIS.
—	—	**—**	—	**F**	762 x 1067 (30 x 42)	Alternate size for projects accommodating preferred plan scale.

UDS Figure 2.2-1 *ANSI, International Organizations for Standardization, and all but F of Architectural size sheets have a consistent sheet module within each system. The sheet size for each type of sheet is an equal module to the next larger sheet size.*

Module 2 - Sheet Organization

2.3 SHEET LAYOUT

As illustrated in ***UDS Figure 2.3-1*** sheets are divided into three main areas: drawing area, title block area, and production data area. The drawing area and title block area are required, while the production data area is optional. Each of these areas contains information concerning construction or reference information, project management or presentation information, and project production information.

Each of these areas contains different types of information necessary for the presentation and management of the project. These areas should be defined by a border, tick marks, or other means to graphically separate them from each other.

Drawing Area: That portion of the sheet containing drawings, keynotes, key plans, schedules, and other graphic and text data necessary to illustrate the work.

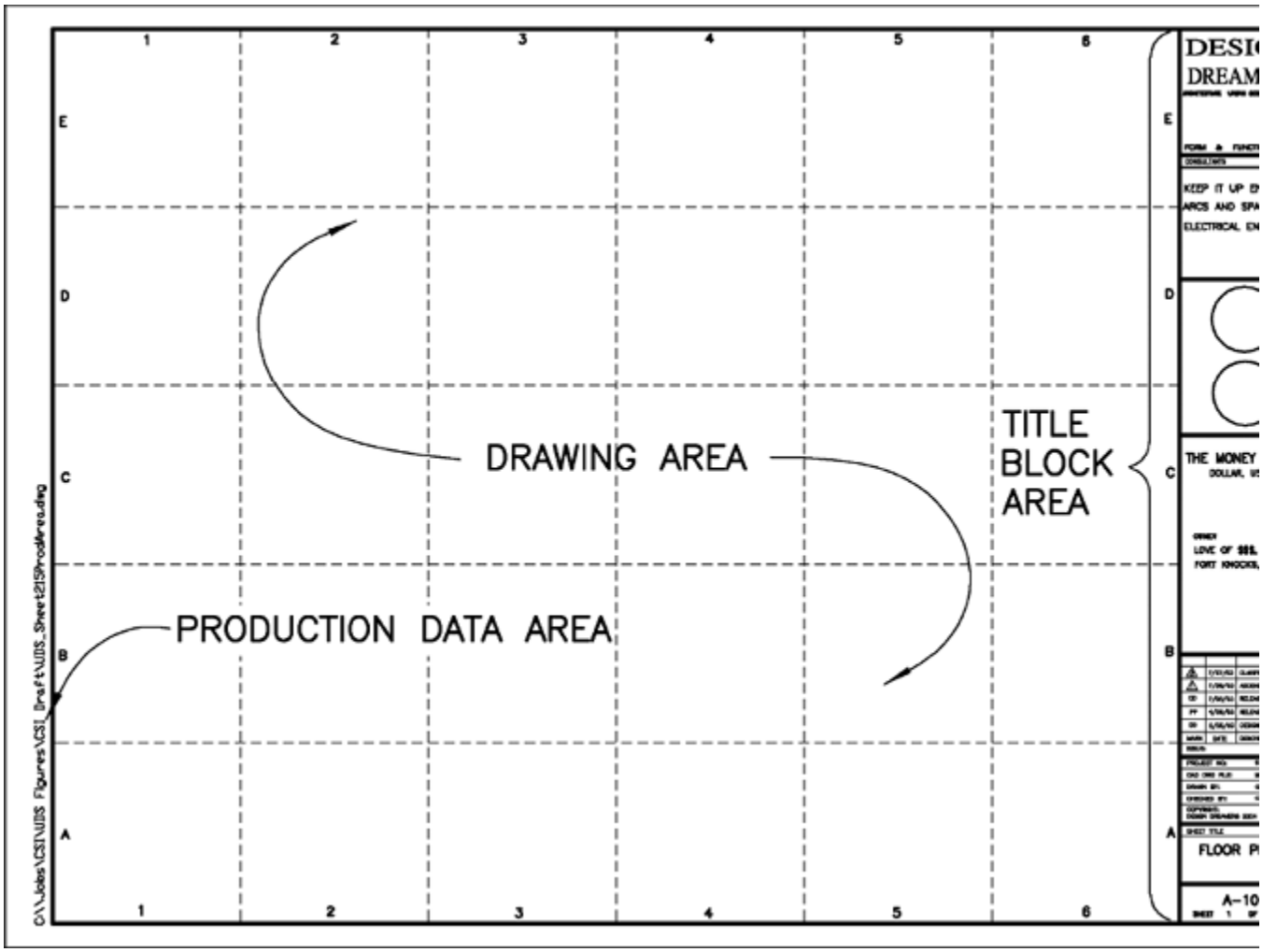
Title Block Area: That portion of the sheet containing project, client, designer, sheet identification, and sheet management information needed by the user of the sheet.

Production Data Area: That portion of the sheet containing information on the production of the sheet.

Sheet margins are the space between the edge of the sheet and the sheet area. The sheet margins may vary depending on plotter capabilities, sheet size, and sheet area dimensions.

The practical minimum sheet margins are as follows:

- Top and bottom margin: 20 mm (3/4 inch)
- Left margin: 40 mm (1-1/2 inch)
- Right margin: 20 mm (3/4 inch)



UDS Figure 2.3-1 *Overall sheet layout.*

Drawing Area

The drawing area is that portion of the sheet containing drawings, keynotes, key plans, schedules, and other graphic and text data necessary to illustrate the work. The drawing area is divided into modules. Factors that may influence the number and size of modules include sheet size, margins, title block area, client requirements, and typical drawing block size. The user should establish a standard drawing module size as required to meet these factors. Examples of typical modules may be 38 mm 38 mm, 75 mm 75 mm, and 150 mm 150 mm (1½" x 1½", 3" x 3", 6" x 6"). Modules should remain the same throughout the drawing set. This allows the creation of library files of standard graphic and text information that may be located easily within the drawing area grid or be moved between sheets or projects. Refer to *Drawing Set Organization, UDS section 1.4* for a discussion of library files.

Individual drawings may comprise one or more drawing modules. Drawing modules containing graphic or textual information are called drawing blocks. Each drawing block is identified by the drawing area coordinate system.

> *Drawing Blocks: Drawing modules containing graphic or textual information.*

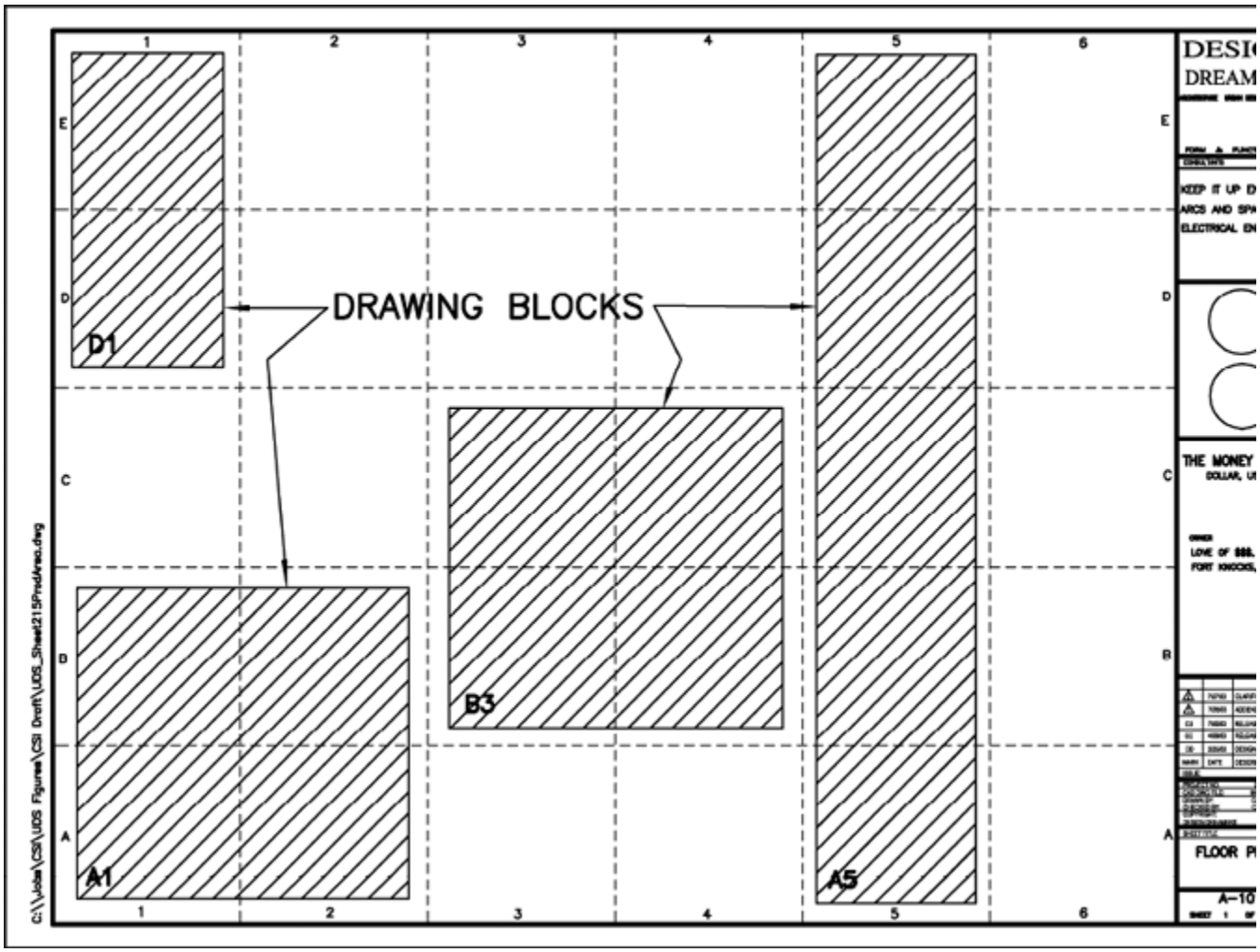
Drawing Area Coordinate System

The drawing modules are arranged in columns and rows. Columns are identified with numerical characters starting with 1 and increasing to the right. Rows are identified with alphabetical characters beginning at the bottom starting with A and increasing toward the top of the sheet. Each module is therefore identified by a letter

and a number. A drawing block may be composed of one or more drawing area modules and is identified based on the lower left hand location. Therefore, a drawing located in the lower left hand corner of the drawing area, two modules high by two modules wide, would be identified as A1. ***UDS Figure 2.3-2*** indicates examples of how several drawings would be identified.

It is preferred that drawing area coordinates be positioned outside the drawing area itself, although some plotting hardware may require that the coordinates be located within the drawing area. At a minimum these coordinates should be placed on the left hand side as well as the top or bottom of the drawing area. Coordinates may be placed in the sheet margins to avoid interfering with text and graphics in the drawing area. However, it is preferred that they appear on all four sides of the drawing area. Coordinates are not required for schematic design drawings.

This numbering system allows drawings to be numbered during early stages of the project or as late as construction record drawings while providing for a consistent location throughout the drawing set and project cycle.

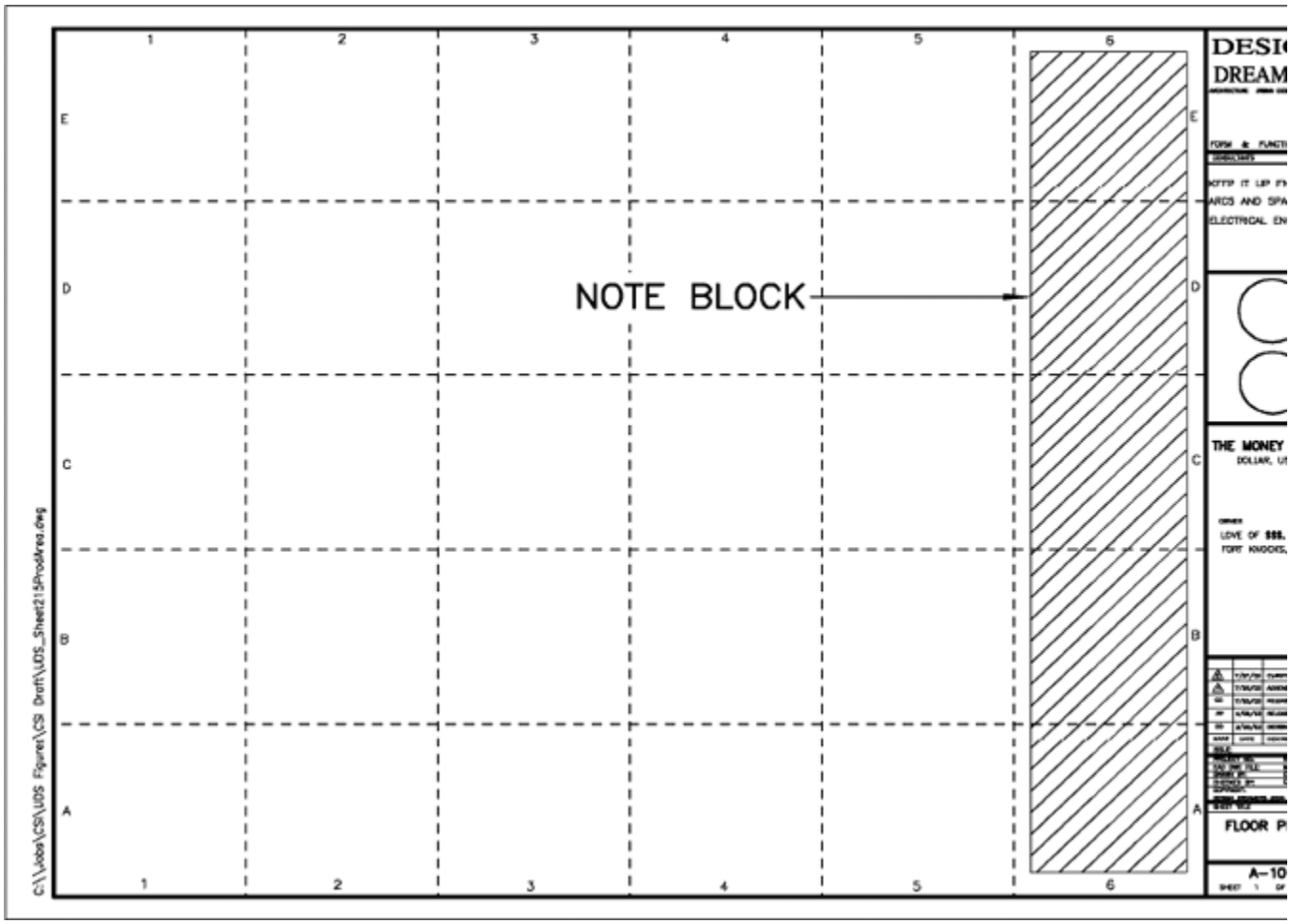


UDS Figure 2.3-2 *Drawing area coordinate system.*

Note Block

The note block is the module or modules within the drawing area where keynotes, general notes, and key plans are located. Not all sheets will have a note block. The note block is located in the far right column of the drawing area. A key plan block, when used, should always be located in the lowest module of the note block. Refer to

UDS Figure 2.3-3. If the sheet does not have a note block locate the key plan block in the lowest module next to the title block. Refer to ***UDS Figure 4.2-14*** in the *Drafting Conventions, UDS section 4.2*.



UDS Figure 2.3-3 *Note block.*

Title Block Area

The title block area is that portion of the sheet containing project, client, designer, sheet identification, and sheet management information needed by the user of the sheet. Refer to ***UDS Figure 2.3-4***. The guidelines for the title block area provide criteria for the location of like information shown in data blocks within the title block area for easy and consistent retrieval and filing of drawings. Data blocks include the following:

- Designer Identification Block
- Project Identification Block
- Issue Block
- Management Block
- Sheet Title Block
- Sheet Identification Block

Designer Identification Block

The designer identification block is that portion of the title block area identifying the designer or preparer of the sheet. Refer to

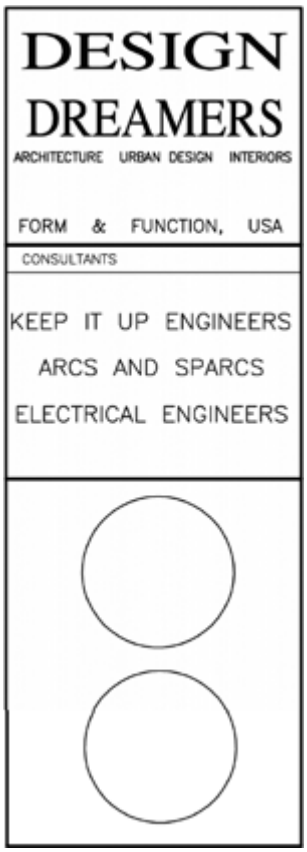
> *Preparer: Registered and unregistered designers, manufacturers, contractors, material suppliers, and others.*

UDS Figure 2.3-5. This block may include information about the preparer including:

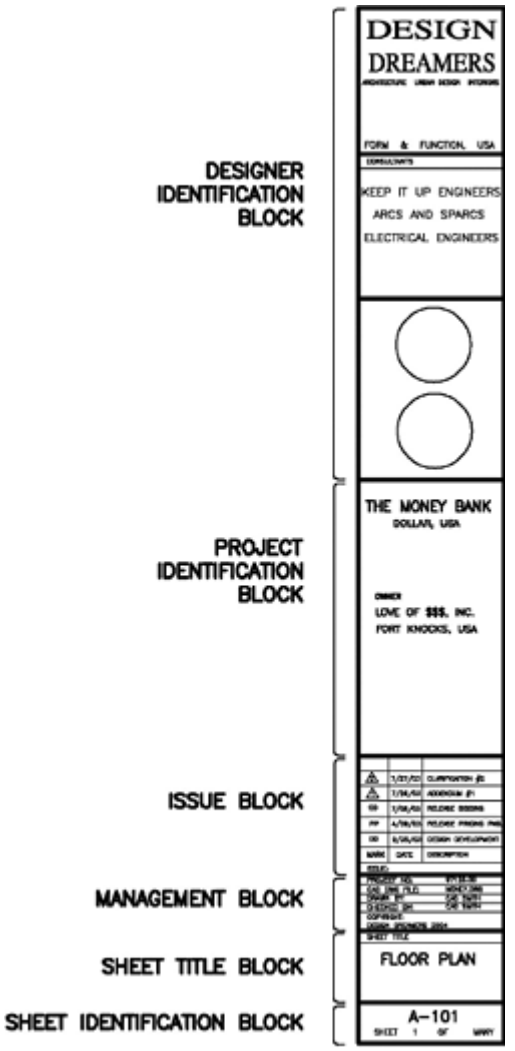
- Name
- Address
- Telephone and fax numbers
- E-mail address or other means of electronic communication

This block may also include the preparer's logo, professional seal(s), certifications, and the names and addresses of consultants. In the case of a design-build project it may include the entire project team.

The requirements for professional seals vary from jurisdiction to jurisdiction. Single seals are required by most states while others require both individual and corporate seals. Drawing preparers should familiarize themselves with the legal requirements for the use of professional seals in the state or jurisdiction of the work.



UDS Figure 2.3-5 *Designer.*



UDS Figure 2.3-4 *Title block.*

Project Identification Block

The project identification block is that portion of the title block area that identifies the project. Refer to ***UDS Figure 2.3-6***. This block may contain information on:

- Project name and address
- Building or facility name
- Construction phase sequence
- Project logo

The address, telephone and fax numbers, and logo of the owner/client may also be included in the project identification block.

UDS Figure 2.3-6 *Project identification block.*

Issue Block

The issue block is the portion of the title block area that shows the chronological issue of, and revisions to, the sheet. Refer to ***UDS Figure 2.3-7***. The issue block has three columns identified as mark, date, and description. The data fields in this block may include:

- Phase issue dates
- Addendum issue dates
- Clarification dates
- Revision issue dates

The number of data field lines is user dependent. The initial entry should be placed at the bottom of the issue block, with subsequent entries placed above each previous entry, allowing for expansion into the project identification block if necessary.

2	7/27/03	CLARIFICATION #2
1	7/26/03	ADDENDUM #1
CD	7/05/03	RELEASE BIDDING
PP	4/09/03	RELEASE PRICING PKG.
DD	2/25/03	DESIGN DEVELOPMENT
MARK	DATE	DESCRIPTION

UDS Figure 2.3-7 *Issue block.*

Management Block

The management block is the portion of the title block area that contains the management information generally used for project filing, record keeping, or other project management information. Refer to ***UDS Figure 2.3-8***. Data fields in this block may include:

- Drawing preparer's project number
- Owner's contract number
- Owner's project number
- File number
- Design/construction phase number
- CAD drawing file number
- Drawn by
- Checked by
- Copyright

PROJECT NO:	97125.00
CAD DWG FILE:	MONEY.DWG
DRAWN BY:	CAD SMITH
CHECKED BY:	CAD SMITH
COPYRIGHT: DESIGN DREAMERS 2004	

UDS Figure 2.3-8 *Management block.*

When projects require space to indicate special management information, such as owner approval, the management block should be expanded to include them.

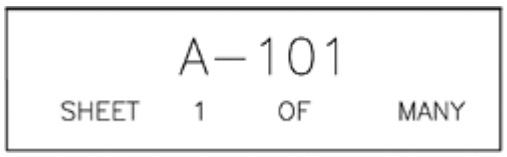
Sheet Title Block

The sheet title block is the portion of the title block area that indicates the type of information presented on the sheet. Refer to ***UDS Figure 2.3-9***. The sheet may contain one or more types of drawings. The title block may only include the major type of information shown on the sheet, or may indicate multiple types of information (e.g., floor plan, schedules, and details).

UDS Figure 2.3-9 *Sheet title block.*

Sheet Identification Block

The sheet identification block is the portion of the title block area that contains the sheet identifier. Refer to ***UDS Figure 2.3-10***. The system for determining the sheet identification and its format is contained in the *Drawing Set Organization UDS section 1.0*. It indicates the discipline designator, sheet type designator, and the sheet sequence number. Optional data as part of the sheet identification block includes a number indicating the sheet count and total number of sheets within the set. The sheet count can be for all sheets in the drawing set, or for the count within each discipline.



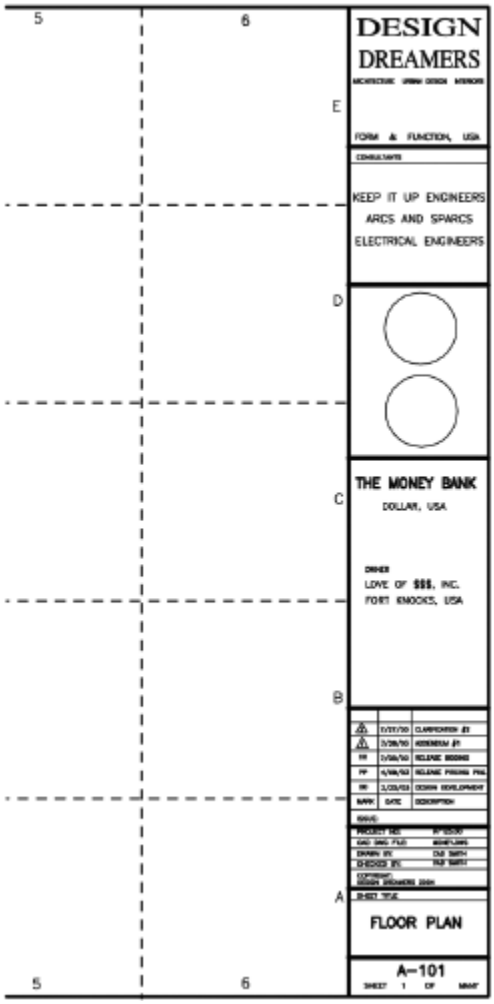
UDS Figure 2.3-10 *Sheet identification block.*

Formats for Title Block Area

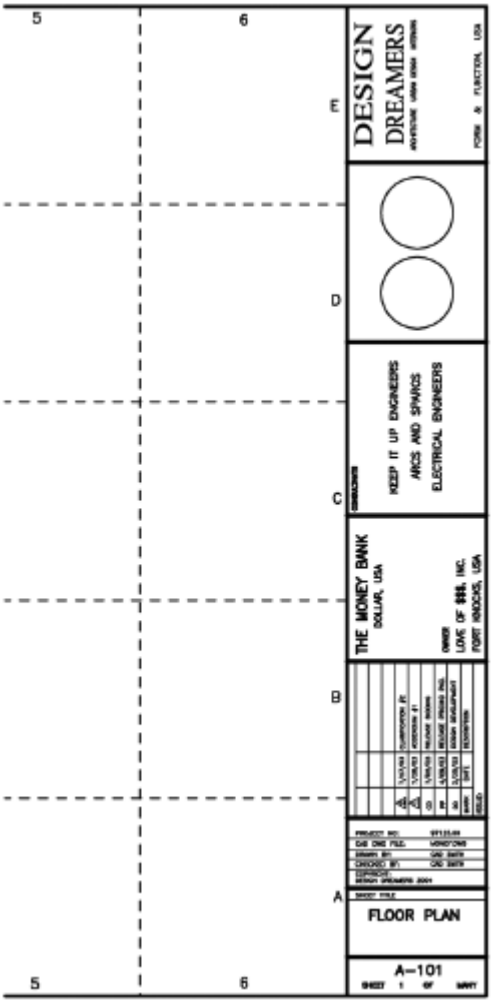
Two standard title block formats have been identified as a part of the sheet organization format—horizontal text format ***UDS Figure 2.3-11*** and vertical text format ***UDS Figure 2.3-12***. In either horizontal or vertical text formats, the sheet identification block, the sheet title block, and the management block are always oriented horizontally.

Horizontal Text Format: Title block text is oriented parallel to the bottom of the sheet.

Vertical Text Format: Title block text is oriented parallel to the right side of the sheet.



UDS Figure 2.3-11 *Horizontal text format.*



UDS Figure 2.3-12 *Vertical text format.*

Production Data Area

The production data area is an optional portion of the sheet that contains information on the production of the sheet. This data is typically covered by the binding strip once the drawing set has been assembled. Because some plotters will not plot in the binding margin, this information may need to be inserted manually or within a preprinted production block. Refer to ***UDS Figure 2.3-13***. The production data area may include the following blocks of information.

Plotter Time and Date Block

The plotter time and date block is the portion of the production data area where the time and date of the plot are located. This information is typically located near the A1 drawing block. The time and date can be automatically inserted by most CAD software.

Production Block

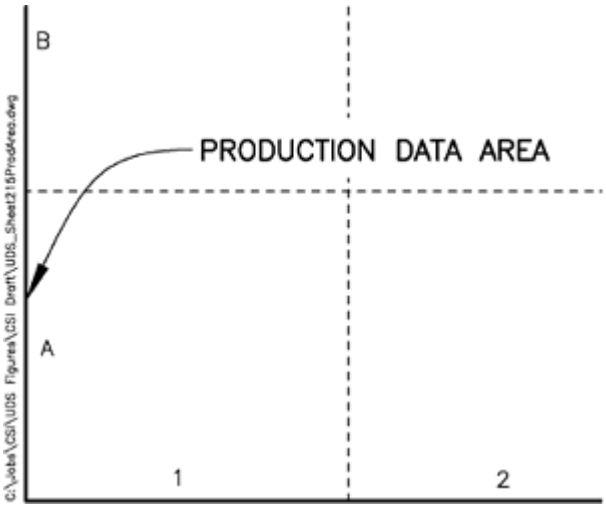
The production block is that portion of the production data area that contains management information concerning the production of the sheet. Data that may be assigned to this block includes:

- File path
- Sheet file name
- Default settings

- Pen assignments
- Printer/plotter commands
- Overlay drafting control data
- Reference file(s)
- Layers plotted
- Production hours

Scanning Scale Block

The scanning scale block contains a graphical scale that may be used if the sheet is to be scanned, photographically reduced, or microfilmed.



UDS Figure 2.3-13 *Production data area.*

Cover Sheet

The cover sheet is unique to the sheet organization format. The cover sheet may identify the project, owner, and other project team members involved in preparing the drawings. The cover sheet may also contain a photograph, rendering of the project, or logo of the owner or preparer.

If the cover sheet contains specific project data such as a list of sheets, a listing of abbreviations, general notes, a building code summary, or a key plan, etc., it should be identified with a sheet identifier containing the discipline designator G for general, sheet type 0, and the sequence number 01 (G-001). Refer to *Drawing Set Organization, UDS section 1.7* for further explanation of the sheet identification format.

Module 2 - Sheet Organization

2.4 MOCK-UP SHEETS

Mock-up sheets are often developed to assist in the layout and production of the drawing set. Individual mock-up sheets are developed as a miniature of each proposed sheet, prior to production. Drawings, schedules, notes, and other data are located on the mock-up sheets within the drawing area modules. Planning with mock-up sheets enables one or more persons to work on a drawing set at the same time, while maintaining a coordinated effort.

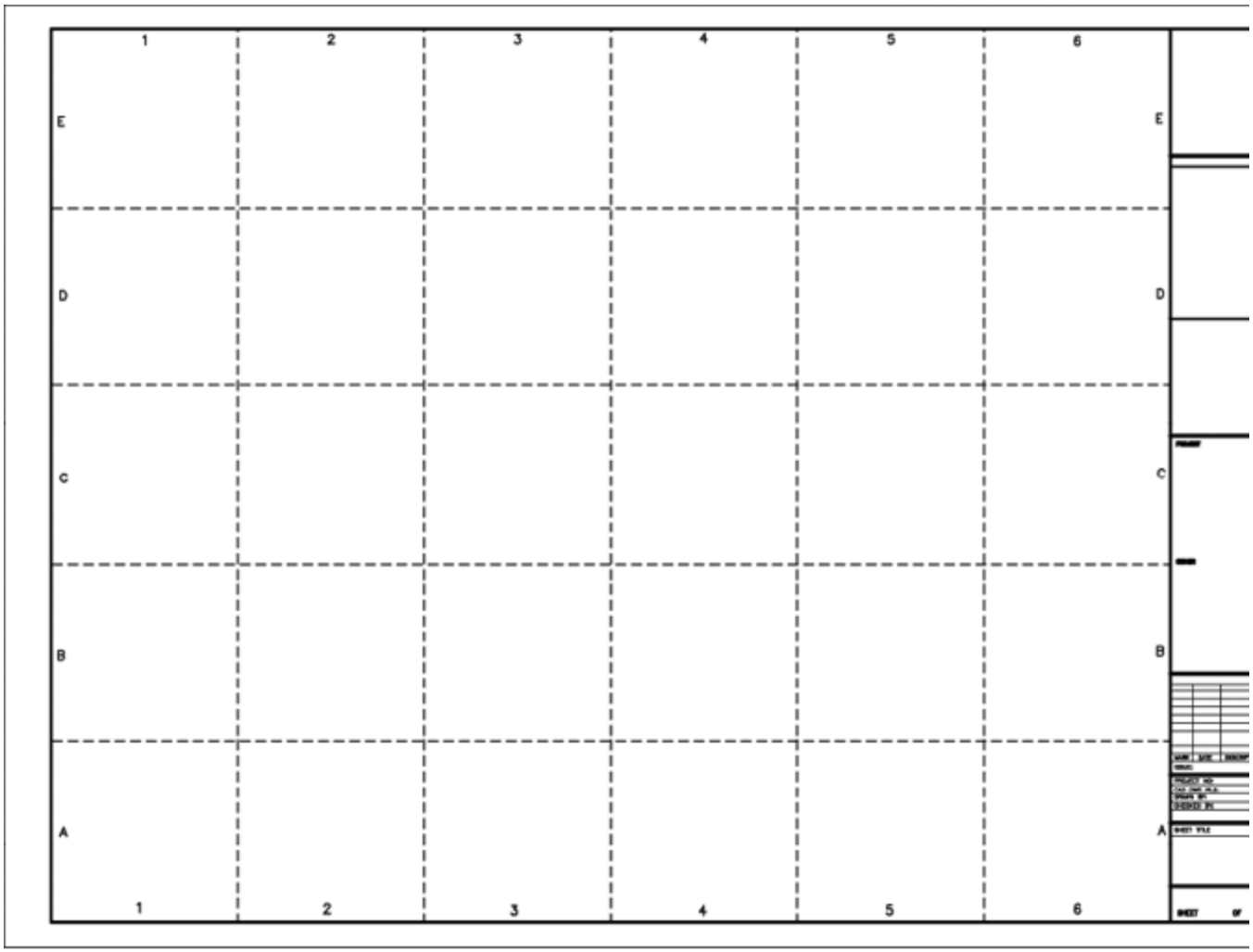
Mock-up sheets are normally 216 mm x 279 mm (8-1/2 inches x 11 inches) or 279 mm x 432 mm (11 inches x 17 inches). A scaling factor is used to determine the size of the drawing or drawings to be located on the completed sheet. The drawing area module grid also assists in placing drawings on the mock-up sheet and determining the number of drawings that will fit on the sheet.

Scale factors for mock-up sheets are:

• Full size scale:	3"	=	1'-0"
• 3" scale:	3/4"	=	1'-0"
• 1-1/2" scale:	3/8"	=	1'-0"
• 1" scale:	1/4"	=	1'-0"
• 3/4" scale:	3/16"	=	1'-0"
• 1/2" scale:	1/8"	=	1'-0"
• 1/4" scale:	1/16"	=	1'-0"
• 1/8" scale:	1/32"	=	1'-0"

- 1/16" scale: 1/64" = 1'-0"

The ***UDS Figure 2.4-1*** is included below for use as a template for preparing scaled mock-up sheets.



UDS Figure 2.4-1 *11" x 17" Mock-up sheet of a full size ANSI D 34" x 44" sheet.*

Module 2 - Sheet Organization

2.5 SUPPLEMENTAL DRAWING SHEETS

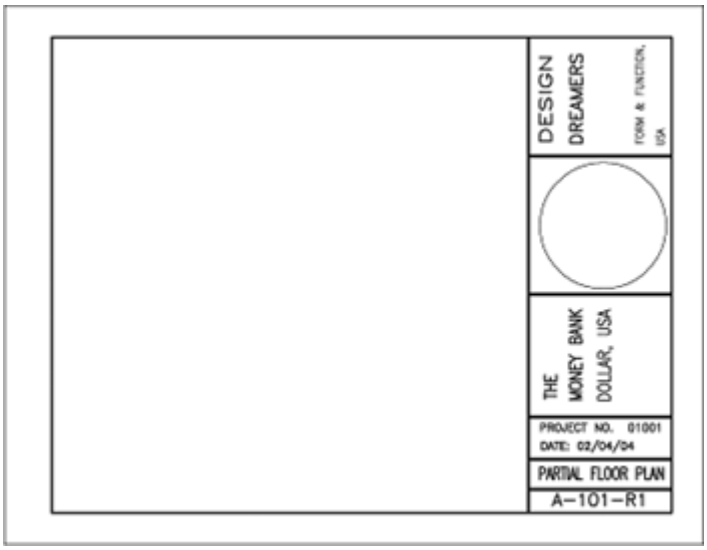
The supplemental drawing sheet format is similar to the standard sheet format, but modified to accommodate the reduced sheet size. This format should be used for project detail books and supplemental drawing sheets. Refer to ***UDS Figure 2.5-1*** for an example of a supplemental drawing sheet.

The practical minimum margins for supplemental drawing sheets are:

- Top and bottom margin: 15 mm (1/2 inch)
- Left and right margin: 15 mm (1/2 inch)

Module 2 - Sheet Organization

2.6 APPENDIX A - ELECTRONIC MEDIA



UDS Figure 2.5-1 *Supplemental drawing sheet.*

SHEET SIZES			
Sheet Type	Mark	mm	inches
ANSI	**A**	216 x 279	8.5 x 11
	B	279 x 432	11 x 17
	C	432 x 559	17 x 22
	D	559 x 864	22 x 34
	E	864 x 1118	34 x 44
ISO	**A4**	210 x 297	8.3 x 11.7
	A3	297 x 420	11.7 x 16.5
	A2	420 x 594	16.5 x 23.4
	A1	594 x 841	23.4 x 33.1
	A0	841 x 1189	33.1 x 46.8
Architectural	**A**	229 x 305	9 x 12
	B	305 x 457	12 x 18
	C	457 x 610	18 x 24
	D	610 x 914	24 x 36
	E	914 x 1219	36 x 48
	F	762 x 1067	30 x 42
Mock-up	**D**	216 x 279	24 x 36 (8.5 x 11)
	F	279 x 432	30 x 42 (11 x 17)

United States National CAD Standard®- V5

a product of the National Institute of Building Sciences buildingSMART alliance℠

Module 3 - Schedules

TABLE OF CONTENTS

Key: = Section contains a downloadable Microsoft Excel document

Module 3 - Schedules

3.1 INTRODUCTION

The objective of the *Schedules Module* is to provide a consistent format for written information in the form of schedules. Formats are provided for typical schedules used in building construction. These formats can be utilized in preparing schedules for construction projects. A system for identifying schedules is provided for filing, organizing, and data retrieval purposes.

The *Schedules Module* provides:

- A consistent schedule format.
- Examples of ready-to-use schedules.
- A system for identifying each schedule type.

The benefits of following the *Schedules Module* are:

- Effective communication for contract document preparers and users.
- Efficient quality control.
- Easier data management.

The *Schedules Module* is limited to schedules used in construction documents.

Purpose of Schedules

Schedules communicate information about a related group of items. In many drawing sets, information has been presented in a schedule format next to the item indicated on a drawing. For example, window descriptions have been compiled into a window schedule, noted on the floor plans, or noted in less detail on the exterior elevations. This practice is optional with small or simple projects.

Some schedules contain only text. These schedules can be developed as computer-generated databases or spreadsheets, and then incorporated into the drawings or specifications. Other schedules are part text and part symbol or diagram. For example, a partition schedule can contain both a graphic wall diagram and descriptive information.

Schedules provide uniform location, format, and information content that facilitates consistency and ease of use.

Definition of a Schedule

A schedule is a grouping of related items with corresponding distinguishing features, with a heading and a minimum of three columns of related information. A schedule formats information into rows and columns in order to more easily present design information.

In its simplest form, a schedule consists of four parts—a subject title (Heading), a column identifying an item (Mark), a column for the description of an item (Item Description), and a column for indicating some notable characteristic (Distinguishing Feature). ***UDS Figure 3.1-1*** illustrates the four parts of a schedule.

HEADING		
MARK	**ITEM DESCRIPTION**	**DISTINGUISHING FEATURE**

UDS Figure 3.1-1 *A basic schedule has a heading and three columns.*

A schedule is more than a list of paired items, such as a legend, key, or index. A list, often used for keynotes or merely to identify an item without distinguishing it from other items, is illustrated in ***UDS Figure 3.1-2*** as two columns of paired information.

LEGEND, KEY, or INDEX	
MARK	**ITEM DESCRIPTION**

UDS Figure 3.1-2 *A list is not considered a schedule.*

Concepts

Consider the following concepts when preparing schedules:

- Consistent terms and abbreviations should be used throughout similar schedules.
- Schedules are space sensitive because information has to fit in available column space. The column title should be as short as possible to adjust for column width variations.
- Computer software can create schedules from information in CAD drawings by extracting data assigned to the various graphic representations of the drawing.
- When schedules are used on drawing sheets, they should be sized to fit within the dimensions of the drawing area module. Refer to *Sheet Organization, UDS section 2.3* for further discussion of the drawing area module.
- Schedules are expandable by adding rows and columns.
- Complex schedules allow horizontal separations by being subdivided into groups of related information, e.g., floor level or building phase.

Module 3 - Schedules

3.2 FORMAT

Information should be organized in every schedule in a similar format. Schedules may be a simple format containing limited information about a subject, or they may be expanded to contain more detailed and specific information depending on the scope of the project.

The format of schedules on drawings is limited by the size of the sheet. Likewise, schedules included in the specifications are limited by the page size of the project manual. Consider the following when determining the format of schedules:

- Client requirements
- Size
  - Drawing block, to fit within the grid of the drawing area
  - Drawing area, if the whole sheet is used for the schedule
  - Project Manual page size
- Method of creation
  - Generated by CAD or other computer software
  - Manually produced

- Reproduction method
- Degree of reduction or enlargement
- Minimum size of text used to remain legible
- End use
  - Office
  - Job site

Parts of a Schedule

Heading

The main subject or title of a schedule is described by the schedule heading.

Mark Column

Schedules have a Mark column as the first identifier column at the far left of the schedule. The mark may be alphanumeric, or can include a graphic symbol relating to the item's use on the drawings. In a large or wide schedule, an additional mark column located on the right side of the schedule can improve readability.

Item Description Column

The item description is the name or identification of each item provided with a separate mark in the schedule.

Distinguishing Feature Column(s)

Distinguishing features are distinct, different, or defining characteristics that specifically describe special information related to the items contained in the schedule. Depending on the schedule's complexity, each schedule may contain multiple distinguishing feature columns.

Notes Column

The notes column is a special type of distinguishing feature column used to locate special remarks about items in the schedule that do not necessarily warrant their own separate column identifier. It is usually located at the far right side of the schedule.

The notes column usually contains a unique or special description about a specific item in the identifier row. A note may be written as a complete sentence or just descriptive words. A note may also be a key letter or number that cross-references a general note located elsewhere. The note can also cross-reference other drawings or specification items. Refer to ***UDS Figure 3.2-1***.

HEADING			
MARK	**ITEM DESCRIPTION**	**DISTINGUISHING FEATURE**	**NOTES**
			1, 2
			3
			5
			2, 3
			4

Notes Legend:
1 Note A
2 Note B
3 Note C
4 Note D
5 Note E

UDS Figure 3.2-1 *Schedule with notes column.*

The advantage of using a key letter or number in the notes column is the reduction in column width. With extensive written remarks, the notes column is often too small or the text becomes confusing when abbreviated or edited to fit within the available width of the column.

All schedules included in *UDS Appendix B - Schedule Formats, UDS section 3.8* include a notes column.

Module 3 - Schedules

3.3 BUILDING A SCHEDULE

A simple schedule can be expanded by including additional distinguishing feature columns for distinctive information. The following discussion illustrates how distinguishing features can expand a simple schedule.

Simple vs. Expanded Schedules

Schedules can be simple or expanded depending on the specific project requirements and information required. A simple schedule can be expanded with the addition of more data, resulting in a complex schedule. An expanded schedule can become a simple schedule by reducing content. In either case, information in the schedule should be located in a logical manner and presented in the format illustrated in ***UDS Figure 3.3-1***.

A							
B	**B**		**B**			**B**	**B**
	C	**C**	**C**	**C**	**C**		
D	**E**	**E**	**E**	**E**	**E**	**E**	**E**

UDS Figure 3.3-1 *Schedule format.*

Heading	A	Contains the subject or title of the schedule.
Column Identifier	B	Contains subject titles that define specific information required for each line item listed in the schedule.
Column Sub-identifier	C	The column sub-identifier lists additional titles for more de-tailed information to be provided under a subject in the column identifier. This level of information can be further divided to allow for triple-tier column identifiers when necessary.
Row Identifier	D	Contains the mark or other identifier of the item (project, material, or assembly). This mark is used as a reference to locate the item on the drawings or in the specifications.
Description Cell	E	Contains specific information required by the column identifier and column sub-identifier related to each item referenced in the row identifier.

Column Identifier Options

The variations in schedules between simple and expanded are related to the amount or complexity of distinguishing features shown by adding distinct column identifiers.

Additional distinguishing features can be subdivisions within a class or subject of a distinguishing feature. These additions are shown by expanding the column identifier with additional column sub-identifiers.

A simple schedule can present distinguishing features using a single-tier column identifier. For example, ***UDS Figure 3.3-2*** illustrates a simple room finish schedule with a single column identifier for the overall category of walls:

ROOM FINISH SCHEDULE						
NO	**ROOM NAME**	**FLOOR**	**BASE**	**WALL**	**CEILING**	**NOTES**
101	Entry			A		

UDS Figure 3.3-2 *Single-tier column identifier.*

A column sub-identifier can be added as a second tier to expand the simple schedule to distinguish the four walls of a room that may receive different treatments, as indicated in ***UDS Figure 3.3-3***.

ROOM FINISH SCHEDULE									
NO	ROOM NAME	FLOOR	BASE	WALLS				CEILING	NOTES
				N	S	E	W		
101	Entry			A	A	A	C		

UDS Figure 3.3-3 *Double-tier column identifier with column sub-identifiers.*

The schedule can further expand the distinguishing features of a wall with more information by adding a third tier of column sub-identifiers for material, finish, and color for each of the four walls. Refer to ***UDS Figure 3.3-4***.

ROOM FINISH SCHEDULE																
NO	ROOM NAME	FLOOR	BASE	WALLS											CLG	NOTES
				N			S			E			W			
				MATL	FIN	CLR	MATL	FIN	CLR	MATL	FIN	CLR	MATL	FIN	CLR	
101	Entry			A	P1	1	A	V	2	A	P1	1	C	P2	3	

UDS Figure 3.3-4 *Triple-tier column identifier with column sub-identifiers.*

The multiple tiers of information in the expanded schedules are somewhat like paragraph levels, presenting new information with the addition of each column sub-identifier.

For each of the previous examples, ***UDS Figure 3.3-5*** illustrates the use of a key to relate additional notes and information to the schedule.

MATERIAL KEY	
A	GYPSUM BOARD
B	CERAMIC TILE
C	CONCRETE MASONRY UNIT
FINISH KEY	
P1	PAINT, SEMI-GLOSS
P2	PAINT, FLAT
V	VINYL WALL COVERING
COLOR KEY	
1	OFF-WHITE
2	GRAY
3	TAN

UDS Figure 3.3-5 *Material key, finish key, and color key.*

Module 3 - Schedules

3.4 CONTENT

Proprietary Schedules

A proprietary schedule provides a format for indicating criteria in a simplified manner by just specifying a manufacturer, product type, or model number, and any specific accessories or options. Generalized performance criteria can be left out of a proprietary schedule.

Proprietary schedules, like proprietary specifications, take less time and effort to prepare. Only one product is identified. Other choices and the determination of which performance criteria to indicate on the schedule are minimized or eliminated. Coordination should occur between specifications and schedules to provide consistency when using proprietary specifications. Refer to *The Project Resource Manual—CSI Manual of Practice* for further discussion of proprietary specifications.

UDS Appendix B - Schedule Formats, UDS section 3.8 contains examples of proprietary schedules that include column identifiers for manufacturer and model number.

Abbreviations

Schedules often use abbreviations because of the limitation of space. As shown in ***UDS Figure 3.4-1***, the services connected to various items of equipment are abbreviated. Many of these abbreviations can be found in *Terms and Abbreviations, UDS section 5.3*.

EQUIPMENT SCHEDULE										
MARK	ITEM DESCRIPTION	SERVICES								NOTES
		MECHANICAL				ELECTRICAL				
		CW	HW	DR	EXH	AMP	V	PH	HP	

UDS Figure 3.4-1 *Schedule abbreviations.*

In this example the abbreviations used for the column sub-identifiers include:

CW Cold Water
HW Hot Water
DR Drain
EXH Exhaust
AMP Ampere
V Volts
PH Phase
HP Horsepower

Module 3 - Schedules

3.5 LOCATION—SPECIFICATIONS OR DRAWINGS?

Certain schedules have traditionally been located in either the specifications or the drawings. The information contained in the schedule should not be repeated somewhere else in a different format. The choice of where to locate the schedule ultimately depends on specific project or client requirements.

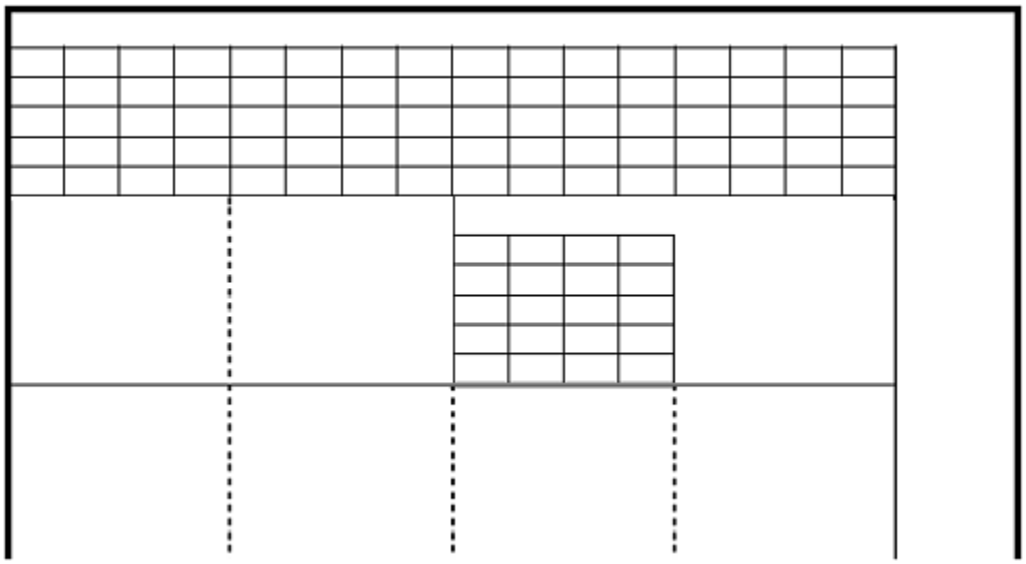
MasterFormat™ allocates locations for scheduled information. In the simplest form, the schedule is included at the end of the specification section for the work involved. Examples include insulation (Section 07 20 00) and sealant (Section 07 90 00) schedules. Schedules cannot always be included in a single specification section because they may include information for multiple specification sections. For example, door schedules include information pertaining to wood doors, metal doors, and building entrances. Refer to *UDS Appendix A - Schedule Content Checklist, UDS section 3.7*, *UDS Appendix B - Schedule Formats, UDS section 3.8*, *MasterFormat*™, and *The Project Resource Manual™—CSI Manual of Practice* for additional information.

Factors to consider when deciding where to locate schedules include:

- Size of schedule.
- How the schedule is produced.
- Ease of coordination of drawings and specifications.
- Use of graphic information to augment the schedule.
- Ease of use of schedules.

Computer-generated schedules are frequently printed during the course of the project for coordination and review purposes. For ease of handling, the schedules are usually printed on 216 mm by 279 mm (8-1/2" by 11") size paper for copying, filing, and distribution. If the schedules are designed to fit letter-size paper, it is often convenient to incorporate the schedules in the specifications.

Schedules may vary in size beyond practical use in the typical specifications format, or even a folded 279 mm by 432 mm (11" by 17") format. Once this limit is reached, locating schedules on drawings allows for a more legible format. When located on drawings, schedules should be sized to fit within the drawing modules of the sheet. If necessary, schedules can be enlarged to fit across the full width of the sheet. Refer to ***UDS Figure 3.5-1***.



UDS Figure 3.5-1 *Fitting a schedule into a drawing module.*

Schedules containing information that changes frequently over time may be considered for inclusion in the specifications (e.g., wall finishes, color schedules). Schedules should be included on the drawings for describing permanent portions of the facility (e.g., doors, windows, partitions).

Schedules may be located in the specifications or on the drawings. It is important to take the items mentioned above into consideration when deciding the appropriate location.

Module 3 - Schedules

3.6 ELECTRONIC APPLICATIONS

Computer-generated schedules are a common feature with current software programs. Schedules are created on word processing software, spreadsheet software, and database software. In addition, schedules can be created directly with the CAD program and plotted as a drawing.

When creating computerized schedules, the structure of the computer files needed to create the final schedule and who needs access to these files should be considered. Structure of computer files means how the files are created and stored to produce the final product. There are several possibilities from simple structures to more complex, multi-file structures:

- A single file produced from a single program.
- A database library used to create the final schedule.
- A file produced by one program and imported into another for final production.
- A file produced by one program and embedded into another for final production.
- A schedule created from extracting elements which are tagged with attributes as part of a CAD file.

Linking Schedules to Drawings

If schedules are created in a spreadsheet application, data can be linked to drawings for ease of extraction and insertion into the schedule.

CAD programs create a database of information as the electronic drawings are created. Drawing data or information can be extracted and electronically linked to a separate spreadsheet or schedule of information. CAD programs used in this way can create schedules, such as door and window schedules, that are updated automatically when the electronically prepared floor plans are revised. The type of data to be contained in the schedule, created from the drawing database, can be customized to the needs of the project. The schedule can be tailored to respond to the client's need for specific information choices or format requirements.

Attributes

When a CAD drawing is generated, it not only generates a graphical database, but also has the capability to store information about specific characteristics of the construction elements (e.g., doors or windows). These characteristics, or attributes, can be identified for later compilation into schedules.

Computer programs provide the ability to sort, search, and extract information from the drawing database. For example, a door schedule can be sorted by door number, by door type, or by hardware set. Fire-rated doors can be extracted from the database and, more specifically, pairs of fire-rated wood doors can be extracted, allowing a quick check of the hardware provided for these doors.

Naming Library Files

Schedules, like drawings, should be identified for filing, data retrieval, and master library organization. As discussed in the

Library File Naming

N	**N**	**N**	**N**	**N**	**N**	**U**	**U**	**U**	.	**E**	**X**	**T**
MasterFormat™						User ID				Extension		

Drawing Set Organization, UDS section 1.4, file naming conventions for library files differ from project file naming conventions.

A numbering system based on *MasterFormat*™ is recommended for naming library schedule files. A numbering system based on *UniFormat*™ can be used for schedules made up of assemblies of materials that otherwise might have multiple *MasterFormat*™ numbers.

A	N	N	N	N	U	U	U	.	E	X	T
UniFormat™					User ID				Extension		

A *= alphabetical character*
N *= numerical character*
U *= user-defined character*
EXT *= file name extension*

Module 3 - Schedules

3.7 APPENDIX A - SCHEDULE CONTENT CHECKLIST

The following is a list of possible schedules that may be generated for a project. The list indicates distinguishing features that can be placed in the Identifier Column and the Sub-identifier Column, as well as a *MasterFormat*™ and *UniFormat*™ number relating to the subject matter of the schedule. Refer to the topic *Building a Schedule, UDS section 3.3* in this module for an explanation of the schedule format.

Systeme International (SI) or metric measurement units are listed first with inch/pound units in parentheses. Select one measurement system. Do not use both.

This list is not intended to be complete. It only suggests examples of potential content of schedules and their most logical location. • indicates example schedules are provided in UDS Appendix B - Schedule Formats, UDS section 3.8.

HEADING	COLUMN IDENTIFIER	COLUMN SUB-IDENTIFIER	UNIFORMAT™
DIV 01—GENERAL REQUIREMENTS			
Survey Layout Data Schedule	Point Number Station Offset Distance		Z1020
Testing and Inspection Schedule			Z1020
Submittals Schedule			Z1020
DIV 02—EXISTING CONDITIONS			
Boring or Test Pit Log Schedule	Test Pit Number Existing Elevation Depth * * * * * * * * * *	 Pit To Ground Water To Bedrock	G1010
DIV 03—CONCRETE			
Concrete Beam Reinforcing Schedule•	Mark Width Depth Reinforcing * * * * * *	 Top Left Bottom Top Right	A1030; B1010

	Stirrups Diagram		
Concrete Slab Reinforcing Schedule•	Mark Thickness Reinforcing * * * * * *	 Bottom Bars Top Bars Temperature Bars	A1030; B1010
Concrete Column Schedule	Floor Level Location Reinforcing		B1010
Concrete Slab Schedule			A1030; B1010
Concrete Shaft Schedule			B1010
Concrete Beam Schedule			B1010
Precast Concrete Panel Schedule			B2010
DIV 04—MASONRY			
Masonry Unit Schedule			B2010
DIV 05—METALS			
Steel Column Schedule			B1010
Steel Beam Schedule			B1010
Steel Bar Joist Schedule			B1010
DIV 06—WOOD, PLASTICS, AND COMPOSITES			
Nailing Schedule			
Wood Beam Schedule			B1010; B1020
Plywood Shear Wall Schedule			B1010
Plywood Web Joist Schedule			B1010; B1020
Wood Truss Schedule			B1010; B1020
DIV 07—THERMAL AND MOISTURE PROTECTION			
Fireproofing Schedule	Structural Component Hourly Rating Testing Agency Design Number		B1010; B1020
Firestopping Schedule	Location Penetration Item Maximum Size Test Agency Design Number T Rating F Rating Detail Location		B1010; B1020
Joint Sealer Schedule			B2010
Expansion Control Schedule	Type Material Location * * * * * * * * * *	 Floor Wall Ceiling	B1010; B2010

	Fire Barrier	Exterior Wall Roof	
DIV 08—OPENINGS			
Door and Frame Schedule•	Door Mark Size * * * * * * * * * * * *	 Width Height Thick	B2030; C1020
	Material Elevation Type Glazing Louver * * * * * * * * * * * *	 Width Height	
	Frame Material Type Glazing Detail * * * * * * * * * * * *	 Head Jamb Sill	
	Fire Rating Label Hardware * * * * * * * *	 Hardware Set Number Keyside Room Number	
Door Schedule	Mark Size of Opening * * * *	 Width Height Thickness	B2030; C1020
	Material Type Glazing Louver Rating * * * * * * * * * * * *	 Fire Rating Acoustic Rating	
	Hardware * * * * * * * *	Hardware Set Number Keyside Room Number Finish	
Frame Schedule	Mark Material Type Glazing Detail * * * * * * * * * * * *	 Head Jamb Sill	B2030; C1020
Window Schedule•	Mark Size * * * * * * * * * * * *	 Width Height	B2020; C1010
	Type Material Glazing Horizontal Muntin Vertical Mullion Detail * * * * * * * * * * * *	 Head	

		Jamb	
	Fire Rating	Sill	
	Notes		
Skylight Schedule			B3020
Door Hardware Schedule	Set Number		B2030; C1020
	Hinges		
	Lockset * * * * * * * * * * *	Access Control	
		Security	
	Closer		
	Exit Device		
	Push / Pull		
	Stop		
	Holder		
	Bolt		
	Kick Plate		
	Threshold		
	Weatherstripping		
Louver and Vent Schedule	Mark		B2010; C1030
	Type		
	Size * * * * * * * * * * * *	Width	
		Height	
	Material		
DIV 09—FINISHES			
Room Finish Schedule•	Room Number		C3010; C3020; C3030
	Room Name		
	Floor		
	Walls * * * * * * * * * * * *	North Wall	
		East Wall	
		South Wall	
		West Wall	
	Wainscot		
	Ceiling * * * * * * * * * * *	Material	
		Height	
	Molding * * * * * * * * * *	Casing Molding	
		Crown Molding	
Paint Schedule			C3010; C3030
DIV 10—SPECIALTIES			
Exterior Signage Schedule•	Mark		G2040
	Sign Type		
	Sign Copy		
	Location		
Interior Signage Schedule•	Mark		C1030
	Sign Type		
	Sign Copy		
	Floor		
	Building		
	Tactile-Braille		
	Symbol Graphics		
	Location		
Toilet, Bath, and Laundry Accessories Schedule	Bath		C1030

DIV 11—EQUIPMENT			
Teller & Service Equipment Schedule			E1010
Food Service Equipment Schedule			E1040
Healthcare Equipment Schedule			E1020
DIV 12—FURNISHINGS			
Window Treatment Schedule			E2010
Manufactured Casework Schedule			E2010
Furnishing Schedule			E2020
DIV 14—CONVEYING EQUIPMENT			
Elevator Equipment Schedule			D1010
Lift Schedule			D1010
DIV 21—FIRE SUPPRESSION			
Fire Suppression Schedule			D4010; D4020
DIV 22—PLUMBING			
Plumbing Pump Schedule•	Mark Type Area Served Size Total Head Pump Speed Efficiency Minimum Motor Power Volts/Phase Suction Pressure		D2020; D2030
Water Heater Schedule•	Mark Manufacturer Model Volts Phase kW (Btu/s) Recovery Rise		D2020
Plumbing Fixture Schedule (Expanded)•	Description Manufacturer Model Supply Fitting Supply Pipe(s) Trim Accessories Drain Trap Connections * * * * * * *	Cold Water Hot Water Waste Vent	D2010
Plumbing Fixture Schedule (Simple)•	Mark		D2010
DIV 23—HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)			
Solar Equipment Schedule			D3070

Heat Pump Schedule	Mark Area Served Manufacturer Model Cooling Capacity Heating Capacity Volts/Phase Amps		D3030
HVAC Pump Schedule	Mark Type Area Served Size Total Head Pump Speed Efficiency Minimum Motor Power Volts/Phase		D3030
Variable / Constant Volume Air Terminal Unit Schedule•	Mark Manufacturer Model Type Size Cooling * * * * * * * * * * * Heating Coil * * * * * * * Noise Criteria Rating	Air Volume Static Pressure Drop Air Volume Entering Air Temperature Leaving Air Temperature Capacity Discharge Entering Water Temperature Leaving Water Temperature Water Pressure Drop Air Pressure Drop Rows	D3050
HVAC (Exhaust) Fan Schedule•	Mark Manufacturer Model Area Served Air Volume Static Pressure Drive Fan Speed Motor * * * * * * * * * * * * Volts/Phase	 Power Speed	D3040
Fan Schedule•	Mark Manufacturer Model Type Air Volume Fan Speed Exterior Static Pressure		D3040

	Wheel * * * * * * * * * *	Type	
		Minimum Diameter	
	Drive		
	Zones		
	Motor * * * * * * * * * * *	Power	
		Voltage	
		Phase	
Diffuser, Register, and Grille Schedule (Expanded)•	Manufacturer		D3040
	Model		
	Type		
	Use * * * * * * * * * * * *	Supply	
		Return	
		Exhaust	
	Mounting		
	Panel Size		
	Neck Size		
	Maximum Air Volume		
	Damper		
	Finish		
	Pattern		
Diffuser, Register, and Grille Schedule (Simple)•	Mark		D3040
Slot Diffuser Schedule	Mark		D3040
	Manufacturer		
	Model		
	Length		
	Slot Size		
	Neck Size		
HVAC Air Cleaning Device Schedule (Air Filter Schedule)•	Mark		D3040
	Manufacturer		
	Pre-Filters * * * * * * *	Type	
		Model	
		Efficiency	
		Initial Static Pressure	
		Final Static Pressure	
		Filters	
		Housing	
	Final Filters * * * * * * *	Type	
		Model	
		Efficiency	
		Initial Static Pressure	
		Final Static Pressure	
		Filters	
		Housing	
Boiler Schedule			D3020
Packaged Water Chiller Schedule			D3030
Centrifugal Water Chiller Schedule			D3030
Water Cooled Reciprocating Chiller Schedule•	Mark		D3030
	Nominal Capacity		
	Chilled Water Side * *	Discharge	
		Entering Water	
		Temperature	
		Leaving Water	

		Temperature	
		Maximum Pressure Drop	
	Condenser Water Side	Discharge	
		Entering Water Temperature	
		Leaving Water Temperature	
		Maximum Pressure Drop	
	Electrical * * * * * * * *	Voltage	
		Phase	
		Maximum kW+C373/Ton	
Packaged Air Cooled Reciprocating Chiller Schedule			D3030
Condensing Unit Schedule			D3030
Packaged Cooling Tower Schedule			D3030
Central Station Air Handling Unit (AHU) Schedule	Mark Manufacturer Model Air Volume Minimum Outside Air Exterior Static Pressure Fan Power Motor Power Electric Heat Total kW/Stage Volts/Phase		D3030
Baseboard Heater Schedule			D3050
Terminal Heat Transfer Unit Schedule			D3050
Unit Heater Schedule			D3050
Packaged Terminal A/C Unit Schedule			D3050
Split System A/C Schedule			D3050
DIV 26—ELECTRICAL			
Equipment Power Connection Schedule	Equipment Full Load Amps kW (hp) Panel Circuit Number Branch Circuit Disconnect Switch		D5020
Transformer Schedule			D5010
Switchboard Schedule			D5010
Distribution Panelboard Schedule•	Circuit Number Trip Area Served Wire & Conduit kW (hp) Phase A Phase B Phase C		D5010

Electrical Panel Schedule (Expanded)•	Poles Amps Frame Load Trip Area Served Phase A Phase B Phase C	D5010
Electrical Panel Schedule (Simple)•	Circuit Number	D5010
Motor Controller Schedule		D5010
Electrical Circuit Schedule•	Panel Circuit Poles Amps	D5010
Wiring Device Schedule		D5020
Lighting Fixture Schedule (Expanded)•	Manufacturer Description Lamps * * * * * * * * * * Type Volts Watts Lens Finish Mounting	
Lighting Fixture Schedule (Simple)•	Mark	D5020, G5020
Lighting Panelboard Schedule	Pole Number Area Served Trip Amp Breaker Pole Wire Ground Wire Conduit Load	D5010
DIV 27—COMMUNICATIONS		
Nurse Call Equipment Schedule		D5030
DIV 28—ELECTRONIC SAFETY AND SECURITY		
Security Access System Schedule	Keypad Sensors Wiring	D5030
Detection and Alarm Schedule		D5030
DIV 31—EARTHWORK		
Backfill Materials Schedule		A2010; G1040
Driven Pile Schedule	Shaft Diameter Vertical Reinforcing Reinforcing Ties	A1020
Caisson Schedule		A1020
Trench Dimension Schedule		A1030
DIV 32—EXTERIOR IMPROVEMENTS		

Pedestrian Walkway Schedule	Ramps * * * * * * * * * Stairs * * * * * * * * * *	Railings Treads Railings	G2030
Retaining Wall Schedule			G2040
Landscape Irrigation Piping Schedule			G2050
Landscape Planting Schedule			G2050
DIV 33—UTILITIES			
Storm Drainage Schedule	Catch Basin Number Manhole Number Rim Elevation Sump Elevation Pipe Inverts * * * * * *	 Inlet Outlet	G3030

• *Indicates example schedule provided in UDS Appendix B - Schedule Formats, UDS section 3.8.*

Module 3 - Schedules

3.8 APPENDIX B - SCHEDULE FORMATS

DOWNLOAD SPREADSHEETS

Examples of schedule formats are presented below. The schedules included are those generally regarded as the most commonly used for building projects. They may be used either on drawings or in specifications depending on project requirements. Schedules are listed by the order of the *MasterFormat* Divisions. They indicate dividing lines for columns and rows. Dividing lines and border lines are optional and may be deleted to meet the requirements of the user. Users may also modify row heights, column widths, and the quantity of columns and rows as needed, provided the schedule includes a heading, a mark column, an item description column, and a distinguishing feature column.

- Div 03 - Concrete Beam Reinforcing Schedule
- Div 03 - Concrete Slab Reinforcing Schedule
- Div 08 - Door and Frame Schedule
- Div 08 - Window Schedule
- Div 09 - Room Finish Schedule
- Div 10 - Exterior Signage Schedule
- Div 10 - Interior Signage Schedule
- Div 22 - Plumbing Pump Schedule
- Div 22 - Water Heater Schedule
- Div 22 - Plumbing Fixture Schedule (Expanded)
- Div 22 - Plumbing Fixture Schedule (Simple)
- Div 23 - Variable / Constant Volume Air Terminal Unit Schedule
- Div 23 - HVAC (Exhaust) Fan Schedule
- Div 23 - Fan Schedule
- Div 23 - Diffuser, Register, and Grille Schedule (Expanded)
- Div 23 - Diffuser, Register, and Grille Schedule (Simple)
- Div 23 - HVAC Air Cleaning Device Schedule (Air Filter Schedule)
- Div 23 - Water Cooled Reciprocating Chiller Schedule
- Div 26 - Distribution Panelboard Schedule
- Div 26 - Electrical Panel Schedule (Expanded)
- Div 26 - Electrical Panel Schedule (Simple)
- Div 26 - Electrical Circuit Schedule
- Div 26 - Lighting Fixture Schedule (Expanded)
- Div 26 - Lighting Fixture Schedule (Simple)

Module 3 - Schedules

3.8 APPENDIX B - SCHEDULE FORMATS

DOWNLOAD SPREADSHEETS

Division 03 - Concrete

Concrete Beam Reinforcing Schedule

CONCRETE BEAM REINFORCING SCHEDULE								
MARK	WIDTH	DEPTH	REINFORCING			STIRRUPS	DIAGRAM	NOTES
			TOP LEFT	BOTTOM	TOP RIGHT			

Concrete Slab Reinforcing Schedule

CONCRETE SLAB REINFORCING SCHEDULE					
MARK	THICKNESS	REINFORCING			NOTES
		BOTTOM BARS	TOP BARS	TEMP BARS	

Module 3 - Schedules

3.8 APPENDIX B - SCHEDULE FORMATS

DOWNLOAD SPREADSHEETS

Division 08 - Openings

Door and Frame Schedule

DOOR AND FRAME SCHEDULE																	
DOOR									FRAME						FIRE RATING LABLE	HARDWARE		NOTES
MARK	SIZE			MATL	EL	GLZ	LOUVER		MATL	EL	GLZ	DETAIL				SET NO	KEYSIDE RM NO	
	W	HT	THK				W	HT				HEAD	JAMB	SILL				

Window Schedule

WINDOW SCHEDULE												
MARK	SIZE		TYPE	MATL	GLZ	FIRE RATING	DETAIL					NOTES
	WIDTH	HEIGHT					HEAD	JAMB	SILL	HORIZ MULL	VERT MULL	

Module 3 - Schedules

3.8 APPENDIX B - SCHEDULE FORMATS

DOWNLOAD SPREADSHEET

Division 09 - Finishes

Room Finish Schedule

ROOM FINISH SCHEDULE									
ROOM NO	ROOM NAME	FLOOR	WALLS				CEILING		NOTES
			N	S	E	W	MATL	HEIGHT	

Module 3 - Schedules

3.8 APPENDIX B - SCHEDULE FORMATS

DOWNLOAD SPREADSHEETS

Division 10 - Specialties

Exterior Signage Schedule

EXTERIOR SIGNAGE SCHEDULE				
MARK	SIGN TYPE	SIGN COPY	LOCATION	NOTES

Interior Signage Schedule

INTERIOR SIGNAGE SCHEDULE								
MARK	SIGN TYPE	SIGN COPY	FLOOR	BUILDING	TACTILE BRAILLE	SYMBOL GRAPHICS	LOCATION	NOTES

Module 3 - Schedules

3.8 APPENDIX B - SCHEDULE FORMATS

DOWNLOAD SPREADSHEETS

Division 22 - Plumbing

- Plumbing Pump Schedule
- Water Heater Schedule
- Plumbing Fixture Schedule (Expanded)
- Plumbing Fixture Schedule (Simple)

Plumbing Pump Schedule

PLUMBING PUMP SCHEDULE										
MARK	TYPE	AREA SERVED	SIZE L/s (GPM)	TOTAL HEAD	PUMP rpm	MIN % EFF	MIN MOTOR W (hp)	VOLTS/PHASE	SUCTION PRESSURE	NOTES

Water Heater Schedule

WATER HEATER SCHEDULE							
MARK	MFR	MODEL	VOLTS	PHASE	kW	RECOVERY @ 21°C (70°F) RISE	NOTES

Plumbing Fixture Schedule (Expanded)

PLUMBING FIXTURE SCHEDULE (Expanded)												
MARK	DESCRIPTION	MFR	MODEL	SUPPLY FITTING	SUPPLY PIPE(S)	DRAIN	TRAP	CONNECTIONS				NOTES
								CW	HW	WASTE	VENT	

Plumbing Fixture Schedule (Simple)

PLUMBING FIXTURE SCHEDULE (Simple)

MARK	DESCRIPTION	MFR	MODEL	CONNECTIONS				NOTES
				CW	HW	WASTE	VENT	

Module 3 - Schedules

3.8 APPENDIX B - SCHEDULE FORMATS

DOWNLOAD SPREADSHEETS

Division 23 - Heating, Ventilation and Air Conditioning (HVAC)

- Variable / Constant Volume Air Terminal Unit Schedule
- HVAC (Exhaust) Fan Schedule
- Fan Schedule
- Diffuser, Register, and Grille Schedule (Expanded)
- Diffuser, Register, and Grille Schedule (Simple)
- HVAC Air Cleaning Device Schedule (Air Filter Schedule)
- Water Cooled Reciprocating Chiller Schedule

Variable / Constant Volume Air Terminal Unit Schedule

VARIABLE/CONSTANT VOLUME AIR TERMINAL UNIT SCHEDULE																		
MARK	MFR	MODEL	TYPE	SIZE	COOLING		HEATING COIL										NC RATING	NOTI
					m^3/s (CFM)	SPD	m^3/s (CFM)	EAT	LAT	W (MBtuH)	L/s (GPM)	EWT	LWT	WPD	APD	ROWS		

HVAC (Exhaust) Fan Schedule

HVAC (Exhaust) FAN SCHEDULE										
MARK	MFR	MODEL	m³/s (CFM)	ST PR	DRIVE	FAN RPM	MOTOR		VOLTS/PHASE	NOTES
							W (HP)	RPM		

Fan Schedule

FAN SCHEDULE													
MARK	MFR	MODEL	TYPE	m³/s (CFM)	RPM	EXT ST PR	WHEEL		DRIVE	ZONES	MOTOR			NOTES
							TYPE	MIN DIA			W (HP)	VOLTS	PHASE	

Diffuser, Register, and Grille Schedule (Expanded)

DIFFUSER, REGISTER, AND GRILLE SCHEDULE (Expanded)														
MARK	MFR	MODEL	TYPE	USE			MTG	PANEL SIZE	NECK SIZE	MAX m³/s (CFM)	DAMPER	FINISH	PATTERN	NOTES
				SPLY	RET	EXH								

Diffuser, Register, and Grille Schedule (Simple)

DIFFUSER, REGISTER, AND GRILLE SCHEDULE (Simple)						
MARK	MANUFACTURER	MODEL	PANEL SIZE	NECK SIZE	USE	NOTES

HVAC Air Cleaning Device Schedule (Air Filter Schedule)

HVAC AIR CLEANING DEVICE SCHEDULE (Air Filter Schedule)															
MARK	MFR	PRE-FILTERS							FINAL FILTERS						
		TYPE	MODEL	EFF	INITIAL ST PR	FINAL ST PR	FILTERS	HOUSING	TYPE	MODEL	EFF	INITIAL ST PR	FINAL ST PR	FILTERS	HOUSING

Water Cooled Reciprocating Chiller Schedule

WATER COOLED RECIPROCATING CHILLER SCHEDULE					
MARK		CHILLED WATER SIDE	CONDENSER WATER SIDE	ELECTRICAL	NOTES

	NOM kW (TONS)	L/s (GPM)	EWT	LWT	MAX PD	L/s (GPM)	EWT	LWT	MAX PD	VOLTS	PHASE	MAX kW/TON	

Module 3 - Schedules

3.8 APPENDIX B - SCHEDULE FORMATS

DOWNLOAD SPREADSHEETS

Division 26 - Electrical

- Distribution Panelboard Schedule
- Electrical Panel Schedule (Expanded)
- Electrical Panel Schedule (Simple)
- Electrical Circuit Schedule
- Lighting Fixture Schedule (Expanded)
- Lighting Fixture Schedule (Simple)

Distribution Panelboard Schedule

DISTRIBUTION PANELBOARD SCHEDULE							
VOLTS / PHASE / WIRE:		PANEL SIZE & TYPE:		MAIN SIZE & TYPE:		CABINET:	MIN SCC:
FEEDER SIZE:			FED FROM:		NOTES:		
NO	TRIP	AREA SERVED	WIRE & CONDUIT	kW (HP)	A	B	C
1							
2							
3							
4							
5							
6							
7							

8							
9							
10							
11							
12							

Electrical Panel Schedule (Expanded)

ELECTRICAL PANEL SCHEDULE (Expanded)											
VOLTS / PHASE / WIRE:		PANEL SIZE & TYPE:	MAIN SIZE & TYPE:			CABINET:			MIN SCC:	FED FROM:	NOTES:
NO	TRIP	AREA SERVED	A	B	C	A	B	C	AREA SERVED	TRIP	NO
1											2
3											4
5											6
7											8
9											10
11											12
13											14
15											16
17											18
19											20
21											22
23											24

Electrical Panel Schedule (Simple)

ELECTRICAL PANEL SCHEDULE (Simple)					
CIRCUIT	POLES	AMPS	FRAME	LOAD	NOTES

Electrical Circuit Schedule

ELECTRICAL CIRCUIT SCHEDULE				
PANEL	**CIRCUIT**	**POLES**	**AMPS**	**NOTES**

Lighting Fixture Schedule (Expanded)

LIGHTING FIXTURE SCHEDULE (Expanded)								
MARK	**DESCRIPTION**	**LAMPS**			**LENS**	**FINISH**	**MOUNTING**	**NOTES**
		TYPE	**VOLTS**	**WATTS**				

Lighting Fixture Schedule (Simple)

LIGHTING FIXTURE SCHEDULE (Simple)				
MARK	**MANUFACTURER**	**DESCRIPTION**	**LAMPS**	**NOTES**

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Module 4 - Drafting Conventions

TABLE OF CONTENTS

Key: = Section contains a downloadable Microsoft Excel document

Module 4 - Drafting Conventions

4.1 INTRODUCTION

The *Drafting Conventions Module* provides a standard format for both graphic and textual information within drawings. This module provides the following:

- Standards for information consistent with both manual and computer-aided drafting (CAD)
- Guidelines for consistent placement of drawings on the sheet
- Guidelines for consistent orientation of dimensions related to drawings
- Line values
- A consistent method of using scale
- A system for creating a mock-up set at the commencement of the project

The *Drafting Conventions Module* sets a clear, concise, comprehensive, and consistent standard for facilitating cross-referencing, retrieval of information, and clear communication for drawing creators and those that use drawings.

Module 4 - Drafting Conventions

4.2 DRAWING STANDARDS

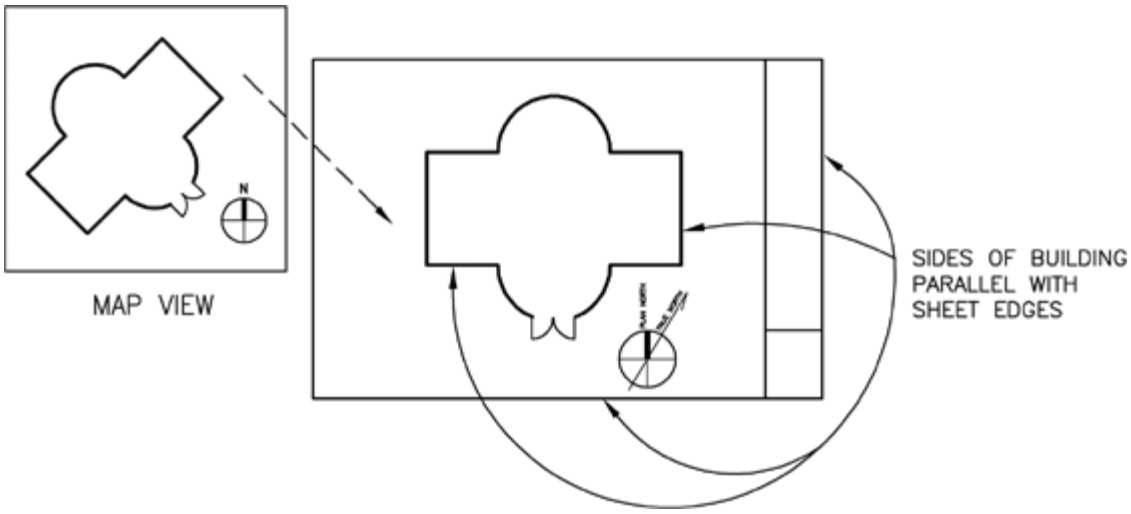
Floor plans are the basis of drawing documentation. From these plans, elevations, sections, and details are developed in an interactive process. When a change occurs in one drawing, it triggers changes in the others. The order of information to be shown on a sheet layout is detailed in *Sheet Organization, UDS section 2.3*.

Drawing standards provide uniform guidelines for producing a set of construction drawings of consistent quality that eliminates duplication of information. These standards address the placement of the drawing grid and north arrow, recommended scales, type of lines used to represent different articles in the drawings, and the proper way to represent different materials graphically and the use of notations.

Drawing Orientation and North Arrow

The orientation of a building's main floor plan sets up the orientation of all floors above and below. Plans may be oriented on a sheet in a variety of ways to display the requirements of the project and the intent of the designer. Ideally, the entire floor plan should be shown on one sheet. If it cannot fit on one sheet, the floor plan should be subdivided into convenient segments with match lines provided to reference where the floor plan is continued. See *Match Lines* below.

Civil plans may orient the drawing in a manner that will allow the site plan to fit within the sheet boundary when drawn at the most appropriate scale. Refer to ***UDS Figure 4.2-1***. It is preferable to orient the site plan in the same manner as the floor plans whenever possible.

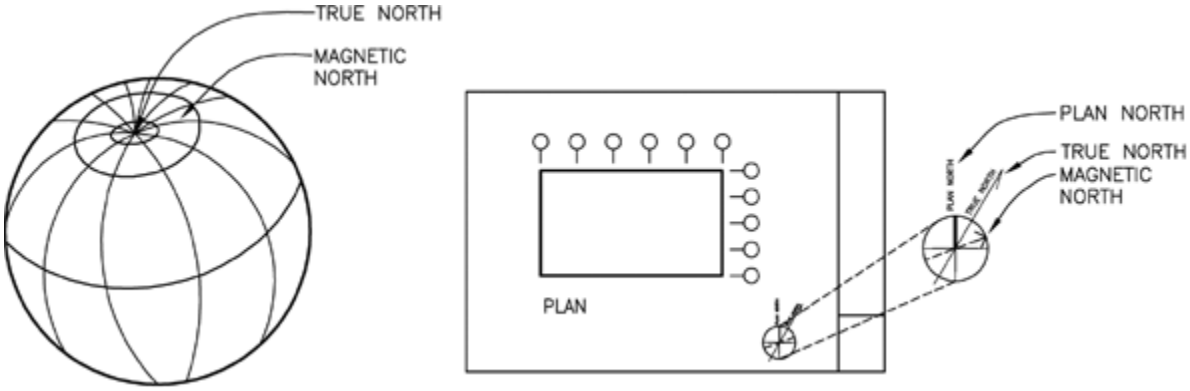


UDS Figure 4.2-1 *Sheet layout orientation.*

The most common orientation of floor plans is one where the plan north arrow points to the top of the drawing block. The true north arrow is adjusted so that the building grid and plan north arrow are parallel to the sheet orientation. This approach follows the customary orientation for maps.

The graphic depiction of the north arrow indicator symbol and the orientation of the plan north arrow should be shown on all plans and should remain consistent throughout the set of drawings. Plan north enables the designer to assign simple names to interior and exterior elevations. *Symbols, UDS section 6.2, Division 1* contains an example of a north arrow indicator symbol.

Three types of north arrows exist: true north, magnetic north, and plan north. True north points to the North Pole, and magnetic north is a compass point deviating slightly from true north and plan north. Magnetic north is rarely indicated and should be combined with true north unless the project is near the North Pole. Plan north provides a reference point parallel to the plan grid. Refer to ***UDS Figure 4.2-2***.



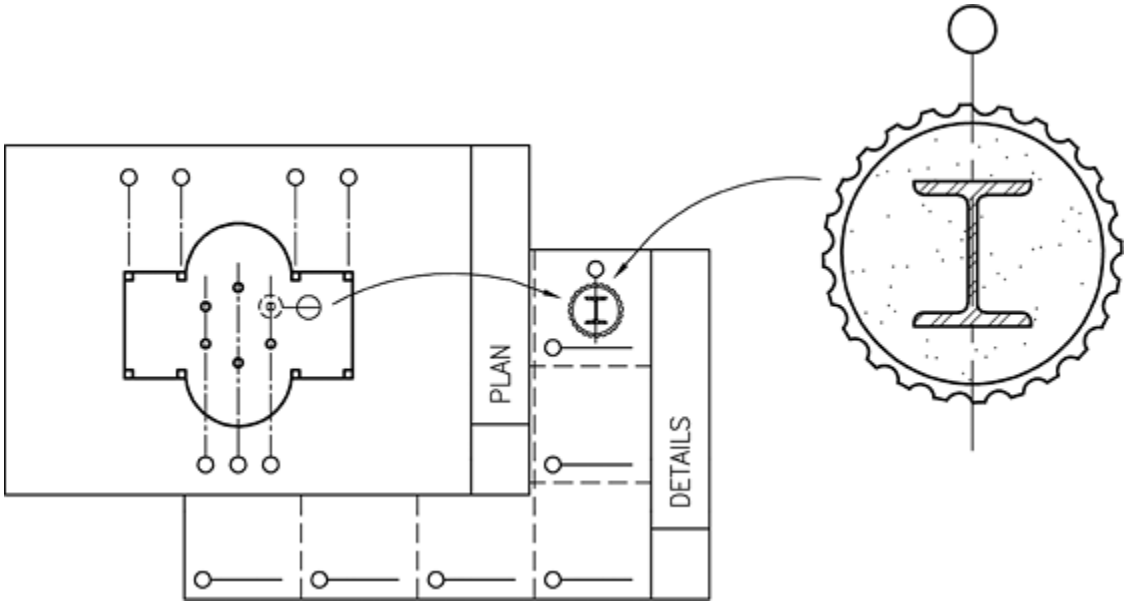
UDS Figure 4.2-2 *Diagrammatic illustration of north arrow.*

Place the north arrow and the plan north arrow in the lower right-hand corner of the drawing block title. Refer to ***UDS Figure 4.2-3***. When north, plan north, or magnetic north are indicated with separate symbols, place them adjacent to each other in the lower right-hand corner of the drawing block, located above the drawing block title symbol.

UDS Figure 4.2-3 *North arrow location in the drawing block title.*

In large or multistory projects, a sheet containing small scale plans for all levels drawn at 1:200 or 1:500 (1/16" or 1/32" = 1'-0") scale or smaller may be included in the set to provide an overview of the project and serve as a quick reference. This sheet is useful if the floor plan is divided into segments to fit in a standard size sheet. It is also useful if the project will be constructed in phases. Consistency of the display of information throughout the set is important. For example, a column plan detail should be shown in the same orientation as it is shown on the floor plan.

Refer to ***UDS Figure 4.2-4***. An enlarged section detail should also have the same orientation as the wall section or building section from which it is derived.

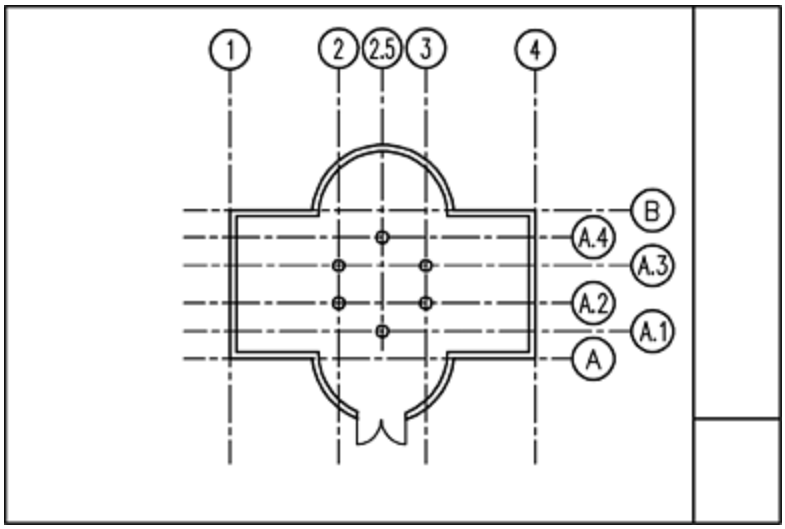


UDS Figure 4.2-4 *Plan detail having the same orientation as the floor plan.*

Grid System Overview

A grid system is used to indicate structural columns, load-bearing walls, shear walls, and other structural elements on the drawings. It is used primarily for reference in schedules of structural data. A grid system is also used if the design of a building is based on a module system, regardless of the structural system. Grid lines are used as a basis for dimensioning. Proper planning and layout of a drawing on the selected sheet size requires the accommodation of alphanumeric grid designations within column indicators. Vertical grid lines should have designators at the top of the grid numbered from left to right. Horizontal grid lines should have designators at the right side of the grid alphabetized from bottom to top. To eliminate confusion with the numerals 0 (zero) and 1 (one), do not use letters O or I.

Grid line and indicator formats should conform to the graphic guidelines under Reference Symbols in the *Symbols Module*. In some cases column indicators may be shown at both ends of the grid line to facilitate reference, especially if a modular grid system is used.

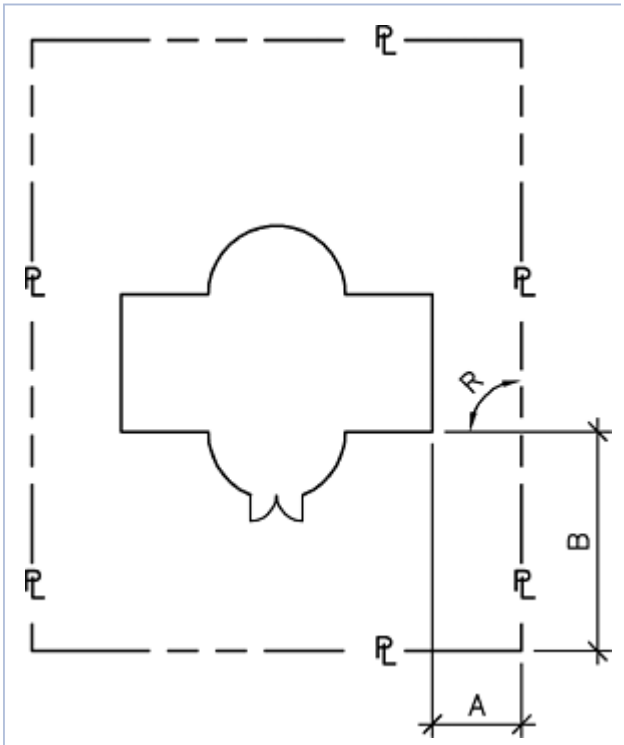


UDS Figure 4.2-5 *Illustration of column grid line.*

Where additional intermediate structural support elements occur between grid lines, a fractional designation is used. For example, a column occurring at mid-point between grid lines 2 and 3 would be designated 2.5. In a similar manner, columns occurring between grid lines A and B would be represented as A.1, A.2, A.3, and A.4. Refer to ***UDS Figure 4.2-5***. While the structural drawings must maintain the grid line number as long as the column is located under the floor, architectural drawings omit the indicator at the level where the column ceases to exist. For example, if a building steps back as it rises in height, unused columns and their associated grid marks are not shown on the architectural plans. Structural drawings will show them because columns below are supporting the floor.

Coordinate System Overview

A coordinate system can be used with baseline dimensioning to locate various components of a building about a fixed point horizontally as well as vertically. To locate the building horizontally, fixed points in the building outline (usually two corners and angle of relevance) are dimensioned to the property lines. Refer to ***UDS Figure 4.2-6***. Alternatively, other fixed points such as the survey benchmark, adjacent street centerlines, easements, natural or man-made landmarks, and the closest longitude and latitude may be used to relate the building to the site. Not all the dimensions shown are necessary to locate the building on the site. Dimensions A and B would be sufficient in locating the building in ***UDS Figure 4.2-6***.

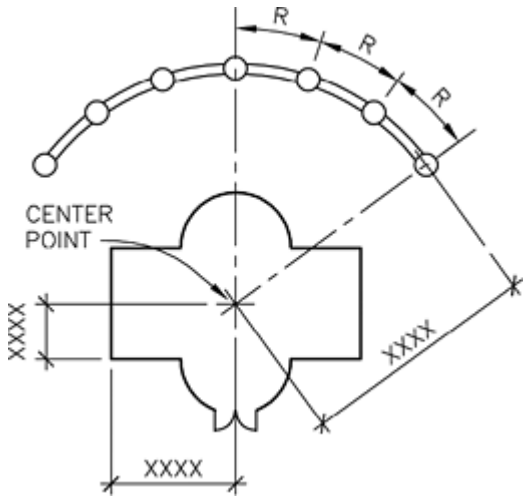


UDS Figure 4.2-6 *Horizontal dimensioning.*

For vertical dimensioning, the ground-floor elevation is set on the site plan at its true relationship to the benchmark used as a survey datum. The benchmark should be referenced to National Geodetic Vertical Datums to coordinate grading, drainage, and utility elevations. For example, if the ground floor elevation is 3.05 m (10'-0") above a datum set at 208.89 m (685'-4"), the ground floor elevation will actually be 211.94 m (695'-4"). To simplify measurements used by the various trades, the ground-floor elevation on the drawings may be set at a hypothetical value such as 100 m in SI units or 100' in U.S. inch/pound units. A note should be added to the site plan stating that the actual ground floor elevation of XXX is represented by 100 m or 100' in the drawings. Setting the datum at 100 m or

100' instead of ±0 eliminates the possibility of points below the ground floor (a basement, for instance) having a minus sign, e.g., -20 m (-65'-7-3/8"), which may confuse some users.

For plans containing arcs, dimensions are determined by the angles radiating from the center of the circle. Refer to ***UDS Figure 4.2-7***.



UDS Figure 4.2-7 *Radial dimensioning.*

Drawing Layout

Using a uniform order to organize the drawings is important. This section provides the framework for organizing drawing components to make them easy to execute and prevent conflicts among the different types of information included in each. The dimensions shown on the illustrations may be the International System of Units (SI) or the U.S. inch/pound system of units and measures. Dimensions on the illustrations are indicated as an XXX. Refer to *Sheet Organization, UDS section 2.3* for information about sheet subdivision and title block organization.

Drawing Title Format

Each drawing block, whether it is a small detail or a large one such as a wall section, should include identifying elements such as the drawing block title, the identifying number, and a scale.

Drawing Areas

The drawing block is subdivided into separate areas to prevent overlapping of different types of information. For example, column grid lines, dimensions, notations, and the leaders connecting them to the drawings can be distributed in a haphazard way. In the absence of this subdivision, CAD can cause some of the information to be superimposed if a different layer is used for each category.

Assigning separate areas for the drawing, the reference column grid line, dimensions, and notations will prevent confusion. The drawings will have an order that is easy to comprehend and follow an orderly logic that can be applied to all the drawings in the set.

Sheet Layout

The drawing area is that portion of the sheet containing drawings, notations, key plans, schedules, and other graphic and text data necessary to illustrate the work. The sheet is divided into modules. Within each module is a drawing block containing graphic and textual information. Locate the most frequently used referenced drawing block at the lowest drawing module adjacent to the title or notation block. Add additional drawings in order of priority, from bottom to top and from right to left. Starting the drawings from the right to the left makes it easier to use partially filled sheets. This eliminates the need to open a heavy set of drawings all the way to the binding to refer to a few details drawn on the left-hand side of the sheets.

Drafting Precision

Pen- or pencil-generated drawings are only as accurate as the thickness of the instrument's point and the person using these tools. CAD-generated drawings, in contrast, can be absolutely accurate. Various people throughout the design, construction, and post-construction phases use these drawings. In-house staff, consultants, contractors, owners, and tenants need to rely on the accuracy of the drawings.

Eliminate over-detailing drawings unless a drawing is specifically being done for a presentation. These drawings may become illegible when plotted. For example, a steel stud thickness may be represented by a double line. Should these studs be drawn at 400 mm (16") on center in a floor plan, the result would be a tremendous amount of useless data. This level of drafting detail is unnecessary and must be avoided.

The following points should be considered when creating any drawing:

- Drawings are abstract representations. They do not have to be realistic to be understood.
- Use the minimum number of lines possible to represent an object.
- Drawings should be large enough to be of appropriate size when plotted. Show only the amount of detail necessary for legibility when plotted at its intended scale.
- If an area of a drawing is to be enlarged when referenced/linked to another drawing, limit additional detail shown to the specific area that will be enlarged.
- Eliminate useless data that can be reproduced endlessly.

Ensure that lines join precisely at their ends. Do not allow them to overlap or fall short. Lines that do not meet precisely will end up causing errors when other items that rely on the precision of the intersections are created or inserted.

Use precise dimensions in Schematic Design Drawings when they are to be converted into Design Development and Construction Documents Drawings. If Schematic Design Drawings are not intended for use in subsequent phases, nominal dimensions may be used. In either case, a note informing the reader of the dimensioning method used should be included in the project notes. For instance, modular dimensions are used for items such as masonry units where the thickness of the joint is included with the length of the masonry unit.

Using the coordinates displayed on the monitor to locate anything will only create inaccuracies. Type in the actual dimensions or coordinates of a specific point in space or use identifiable points such as the intersection of two lines when drawing, copying, moving, offsetting, or inserting items. The following are examples:

- Move a line from its current location to a point exactly 3.15 m (10'-4") to the right.
- Insert a column at the intersection of two structural grid lines.
- Offset a wall line exactly 123.8 mm (4-7/8"), e.g., a nominal 127 mm (5") is also acceptable, to indicate the thickness of a wall composed of 92 mm (3-5/8") steel studs with 16 mm (5/8") gypsum board on each side.
- Establish a 200 mm x 200 mm (8" x 8") grid that the cursor will automatically snap to when initially laying out a masonry building.

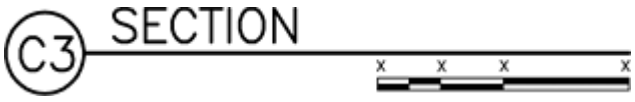
Scale

Scale is the ratio of measuring units expressing a proportional relationship between a drawing and the full-size item it represents. In CAD, drawings are created at full scale and plotted at the selected scale.

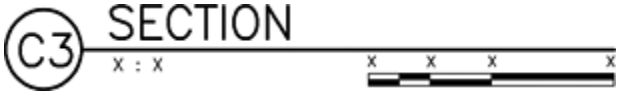
Standards for Use

The selection of the proper scale determines the readability of the drawing. The scale chosen should be large enough to allow the drawing to display its graphic, dimensional, and textual content clearly, without congestion or ambiguity. For example, a window sill detail should be drawn at 1:5 (or 3" = 1'-0") scale to clearly indicate all its wall components, dimensions, and notations. Choosing a lesser scale would make it difficult for readers to understand the intent and may lead to misinterpretation. Clarity should always be considered in selecting a drawing scale.

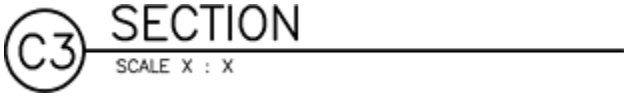
Scale can be expressed numerically and graphically. All drawings or views should indicate the numeric scale at which that view is presented. All drawings that may be reduced or enlarged should include numeric and graphic scales.



UDS Figure 4.2-8 *Graphic scale without numeric scale indication.*



UDS Figure 4.2-9 *Graphic scale and numeric scale with-out the word "scale."*



UDS Figure 4.2-10 *Numeric scale with the word "scale" indication and without graphic scale.*

Reduced drawing sets can render the numeric scale inaccurate. The organizer of the drawings should use a graphic expression of scale for clarity. See *Symbols, UDS section 6.2, Division 1* for graphic scales. Refer to ***UDS Figure 4.2-8***.

The use of the word "scale" is recommended but not required. Refer to ***UDS Figures 4.2-9*** and ***4.2-10***.

Commonly Used Scales

All drawings or views should indicate the numeric scale at which that view is presented. Numeric scale can be expressed in metric, architectural, or engineering as is appropriate to the project. The table *Common Scales* below shows scales commonly used on construction drawings.

COMMON SCALES

Metric	Architectural	Engineering	Typical Uses
—	—	1" = 5000'	Site Plans
—	—	1" = 2500'	Site Plans
—	—	1" = 1250'	Site Plans
—	—	1" = 1000'	Site Plans
1 : 5000	—	1" = 500'	Site Plans
1 : 2500	—	1" = 200'	Site Plans
1 : 1250	—	1" = 100'	Site Plans
1 : 1000	—	1" = 50'	Site Plans
1 : 500	—	1" = 40'	Site Plans
—	1/32" = 1'-0"	1" = 30'	Site Plans
1 : 200	1/16" = 1'-0"	1" = 20'	Floor Plans, Exterior Elevations, Building Sections
—	3/32" = 1'-0"	—	Floor Plans, Exterior Elevations, Building Sections
1 : 100	1/8" = 1'-0"	1" = 10'	Floor Plans, Exterior Elevations, Building Sections
1 : 50	1/4" = 1'-0"	1" = 5'	Floor Plans, Elevations, Sections
1 : 30	3/8" = 1'-0"	—	Interior Elevations
1 : 20	1/2" = 1'-0" 3/4" = 1'-0"	1" = 2'	Enlarged Floor Plans, Wall Sections, Foundation, Footing, Others
1 : 10	1" = 1'-0" 1-1/2" = 1'-0"	1" = 1'	Wall Sections, Foundation, Footing, Intersections of walls and roof to walls, Connections, Others
1 : 5	3" = 1'-0"	—	Door and Window Details, Cabinet Details, Intersections of walls and roof to walls, Connections, Others
1 : 2	Half Full Size	—	Door and Window Details, Cabinet Details, Intersections of roof to walls, Others
1 : 1	Full Size	—	Door and Window Details, Cabinet Details, Intersections of roof to walls, Others

Use of Multiple Scales

It is preferred to keep the same scale for drawings on a single sheet. However, many drawings may require different scaled views on the same sheet to adequately communicate drawing information. The organizer of

CAD drawings should exercise care when planning whether or not to use multiple scales on a single drawing sheet. In all cases, the scale must be shown for each drawing or view.

CAD and Drawing Scale

Manual drafting uses scale to represent large objects, assemblies, and buildings on a relatively small sheet. CAD permits the user to work directly with a full-size model of the building to be constructed.

Graphic elements within the drawings such as notes, leaders, dimensions, and reference bubbles must be sized according to the scale of the final plot. See *Symbols, UDS section 6.2, Division 1* for standard size of these graphic elements for the final plot.

Lines

Line width affects drawing clarity and legibility. Wider lines draw attention to that part of the drawing and place emphasis on certain elements. Screened or half-tone lines de-emphasize drawing elements. Architectural backgrounds used by another discipline as a background reference for their drawing are an example. Screened lines in an elevation may represent a distant wing or an existing building.

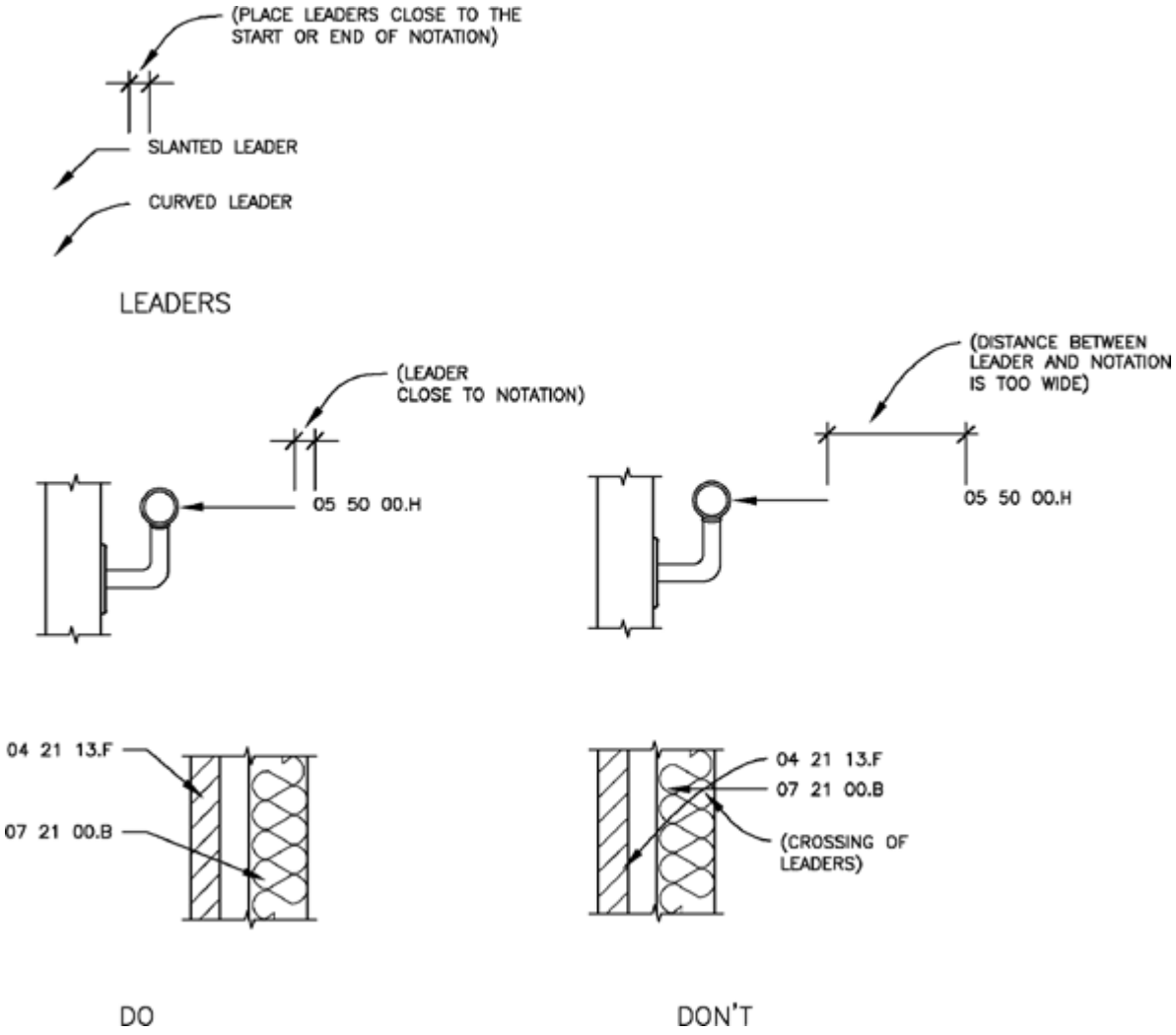
Interrupted lines (i.e., dash or dash-dot combinations) convey a message. Symbol lines representing the fire rating of a partition, match lines, and hidden items, for example, fall under this category. The following table shows line widths for different applications for both manual and CAD-produced drawings.

WIDTH OF LINE IN mm	USE OF LINE
Extra Fine 0.13	Fine detail which cannot be accomplished using a fine (0.18 mm) line.
Fine 0.18	Material indications, surface marks, hatch lines, patterns.
Thin 0.25	Text: 2.5 mm (3/32") to 10 mm (3/8") Dimension lines, leaders, extension lines, break lines, hidden objects, dotted lines, dashed lines, setback lines, center lines, grid lines, schedule grid lines.
Medium 0.35	Text: 4 mm (5/32") to 10 mm (3/8") Object lines, property lines, text, lettering, terminator marks, door and window elevations, schedule grid accent lines.
Wide 0.50	Text: 6 mm (7/32") to 10 mm (3/8") Titles, edges of interior and exterior elevations, profiling. Cut lines, property lines, section cutting plane lines, drawing block borders.
Extra Wide 0.70	Text: 13 mm (1/2") to 25 mm (1") Match lines, large titles, footprints, title block borders, sheet borders, schedule outlines.
XX Wide 1.00	Major title underlining and separating portions of designs.
XXX Wide 1.40*	Border sheet outlines and cover sheet line work. (*ISO 128-20-1996)
XXXX Wide 2.00	Border sheet outlines and cover sheet line work.

Common Line Types

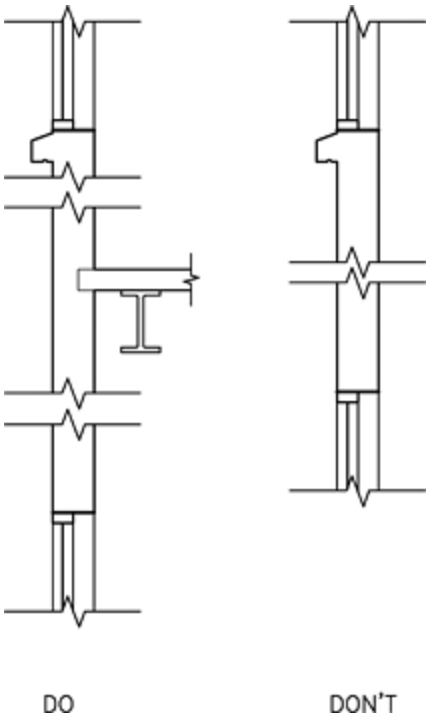
In addition to object lines, the following lines apply to all disciplines and drawing organization:

- **Leaders** are lines that connect notes, dimensions, or symbols to a point or item in a drawing. Leaders terminate with an arrowhead in proximity to the item being described by the notation. Leaders should be drawn in a consistent fashion, either straight or curved throughout the set of drawings. To improve readability, they should be angled so that they may not be confused with lines in the drawing. They should not be allowed to cross dimension lines or each other. Leaders should start at the upper right side or upper left side of the notation. Refer to ***UDS Figure 4.2-11*.**



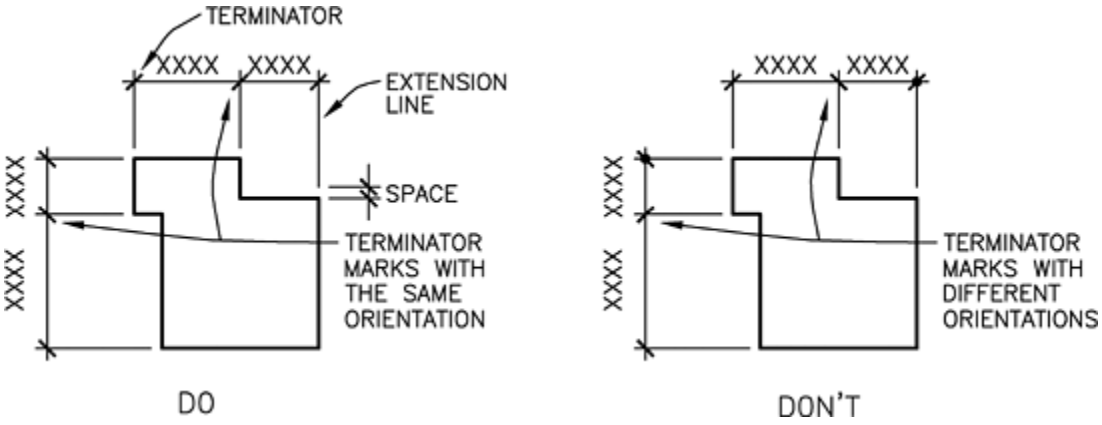
UDS Figure 4.2-11 *Leaders and pointers.*

- **Break Lines** are used to indicate the cut between two parts or levels. Examples include a drawing foreshortened to fit into a detail block or an inclined plane such as a stair or parking ramp connected between two floors. Never foreshorten parts of the drawing that require detailing. Refer to ***UDS Figure 04.2-12***.



UDS Figure 4.2-12 *Break lines.*

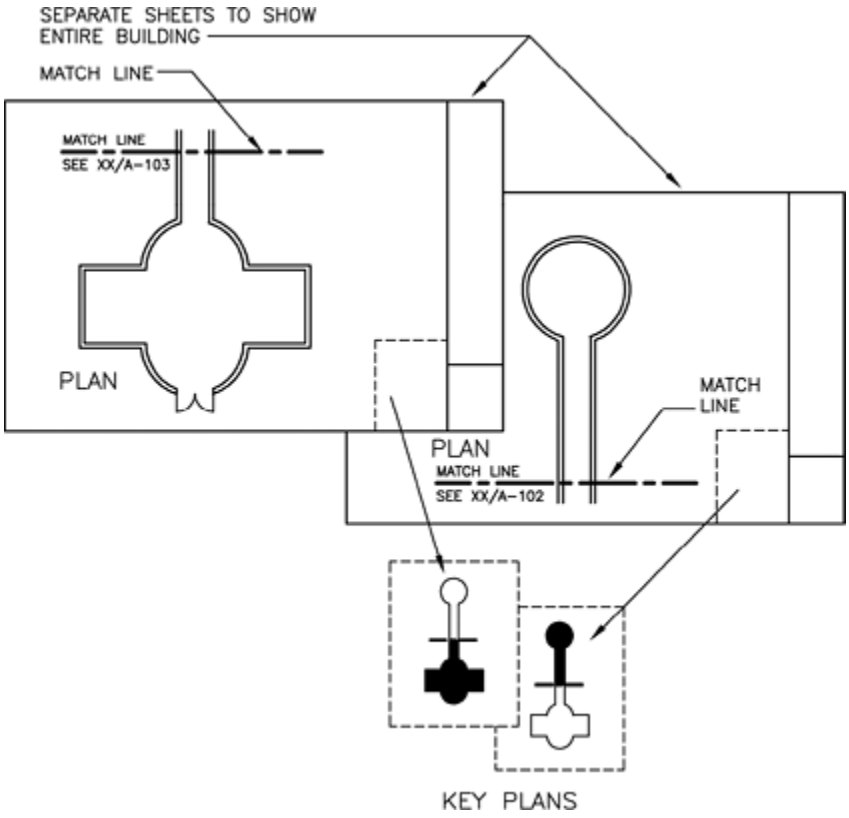
- **Centerlines** are used to indicate the center of a column, beam, wall, or opening. A thin line interrupted at intervals by a dot represents centerlines.
- **Dimension Lines** are represented by a thin line connecting between extension lines defining the beginning and end of the object being dimensioned. A terminator mark identifies the intersection between an extension line and a dimension line. Terminator marks should be angled consistently in the same direction. Refer to ***UDS Figure 4.2-13***.



UDS Figure 4.2-13 *Dimension lines.*

- **Limit of Construction Lines** define the area of work beyond which the contractor is not allowed to execute any work.
- **Match Lines** delineate division between two or more areas of a continuous structure that must be shown on separate sheets because of sheet size limitations. Do not locate match lines on column lines, grid lines, or expansion joints. Locate them instead at the centerline of a wall or corridor. Match lines should be shown at the same location on both sheets containing adjacent segments of the plan at the same location. A portion of plan overlap should be shown beyond the match line to establish the relationship between adjacent plan segments. This overlapped portion may be lightly shaded to avoid duplication during cost estimating. Match lines should extend beyond the area to be matched. Refer to ***UDS Figure 4.2-14***. They may jog to avoid

important elements of the plan. All match lines should be shown on the Key plan. Refer to *Sheet Type 1 - Plans, UDS section 4.3*. The line width for match lines is shown in the table above.



UDS Figure 4.2-14 *Illustration of portion of match line with key plan.*

- **Hidden Lines** represent items obscured from view by another material. Examples include steel lintels, relieving angles in elevations, and items above or below a floor plan. Thin dashed lines represent hidden lines.
- **Property Lines** are represented by a line interrupted by double dots. They indicate the boundary of the site.

Dimensions

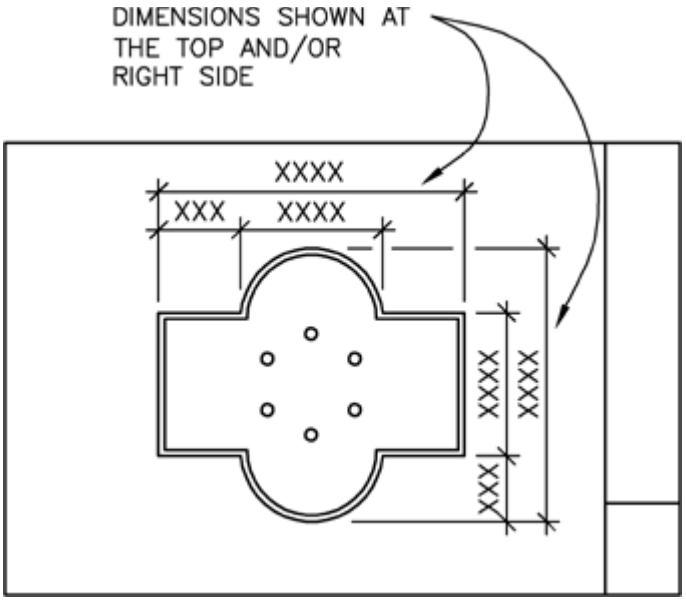
Dimensioning is defined as the act of incorporating numerical values into a drawing as a means of sizing various components and locating parts of a building. Dimensions must be accurate and adequate. Inadequate dimensions require clarifications during construction and possible loss of time.

The purpose of dimensioning is to locate each element of the construction. Each wall or part of a detail must be tied to a fixed point such as a column centerline or an existing or bearing wall. This applies to plans and the enlargements associated with them. For wall sections and their details, the horizontal reference is the floor elevation.

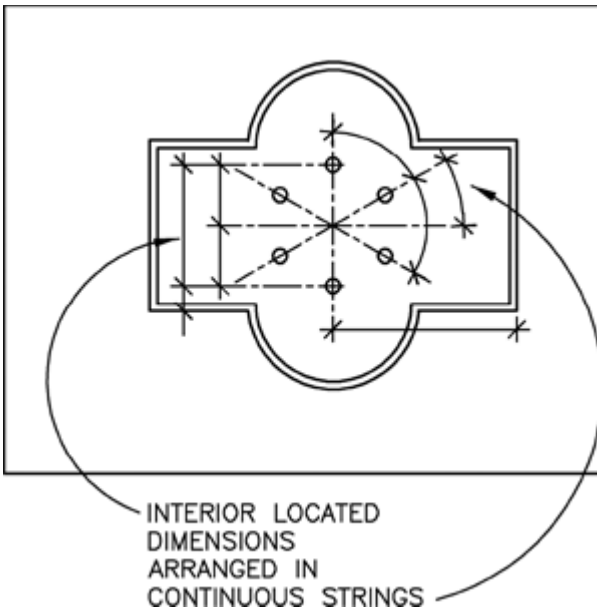
Care must be taken to show a single dimension only once in its proper location. Avoid the tendency to over-dimension.

Graphic Conventions and Indications

- **Location:** Generally, dimensions should be located outside the floor plan or other view being dimensioned. This minimizes clutter and overlap with other graphics. Dimensions outside the view should be located at the top and/or the right side of the plans whenever possible. Offset dimension lines from object lines a minimum of 14.5 mm (9/16") and offset dimension lines from each other 10 mm (3/8"). Refer to ***UDS Figure 4.2-15***. When dimensions must be shown on the interior of a floor plan or other view, the dimensions should be arranged in continuous strings for clarity and consistency. Refer to ***UDS Figure 4.2-16***.

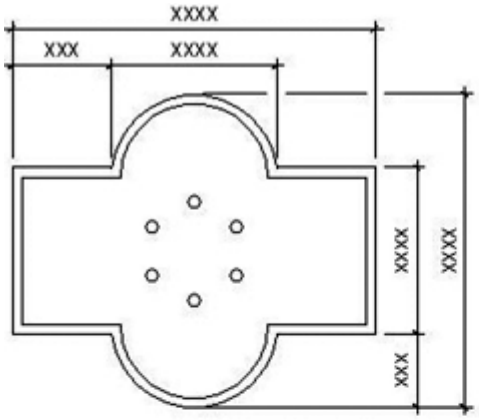


UDS Figure 4.2-15 *Dimensioned floor plan, exterior dimensions.*

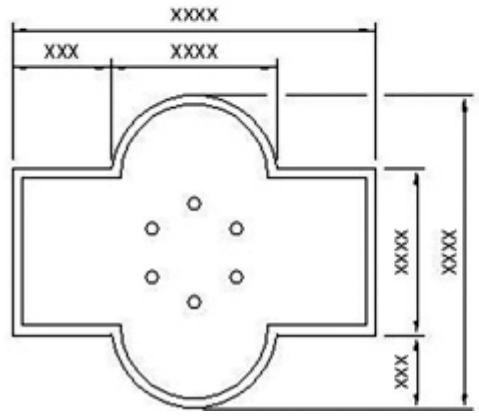


UDS Figure 4.2-16 *Dimensioned floor plan, interior dimension*

- **Types of Terminators:** Terminators define the junction between a dimension line and the extension lines leading to the start and finish of the dimension. These terminators are in the form of either a short, slanted line (slash) or a filled arrowhead. Refer to ***UDS Figure 4.2-17***. Slashes should always be parallel. Dimension terminator selection should be consistent across the entire set of drawings.
- **Numeral Size and Location:** Numeral size should match the size of the text in the drawing. Where possible, the numeral should be placed at the midpoint and on top of the dimension line.



SLASHES



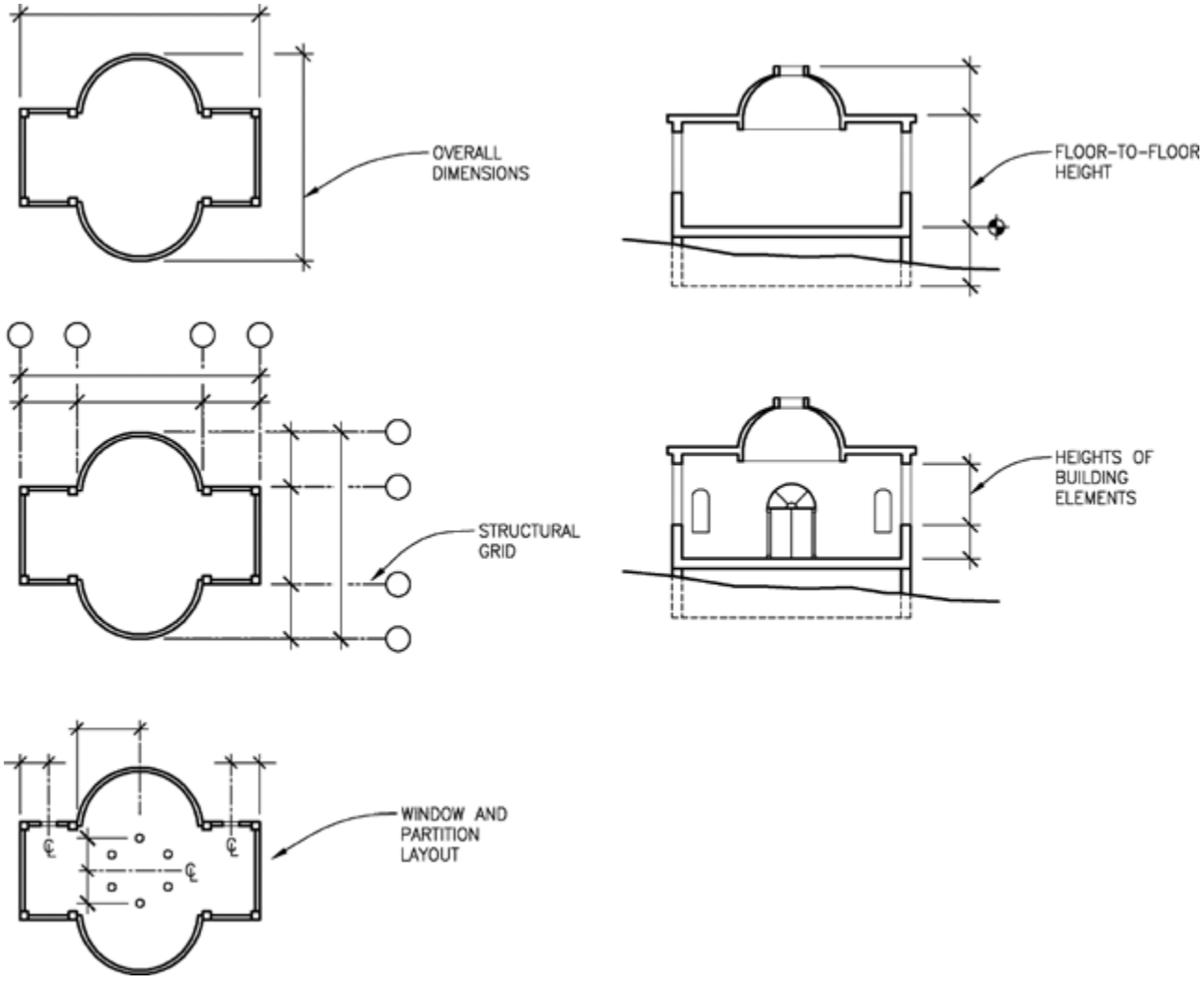
3:1 FILLED ARROWS

UDS Figure 4.2-17 *Examples of dimension line terminators.*

Hierarchy of Dimensions

Arrange dimensions from general to specific. Dimension the overall distances followed by the structural grid or floor-to-floor height. This is followed with more specific information such as window and partition location, or heights of various building components.

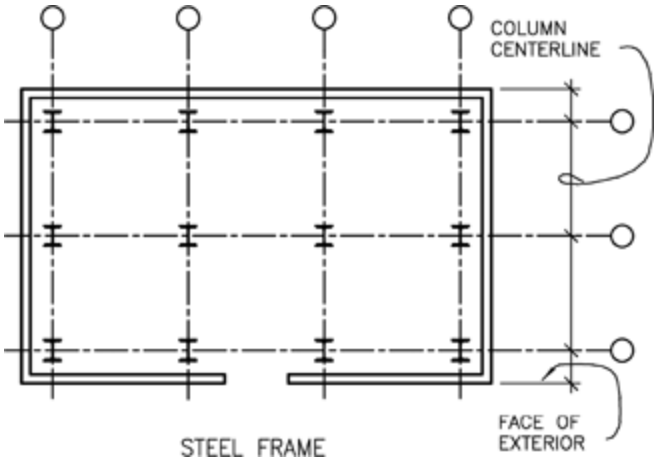
Extension lines leading from the building to the dimension lines may cross the structural grid as shown in ***UDS Figure 4.2-17***. To prevent confusion, interrupt one of the lines as shown in ***UDS Figure 4.2-18***.



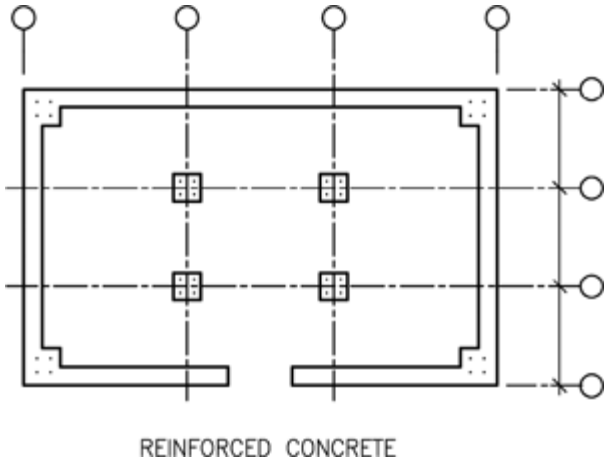
UDS Figure 4.2-18 *Hierarchy of dimensions.*

Plan Dimensions

Dimensioning the Plan: What to dimension from and to depends on the structural system and the sequence and stage of construction of a given building type. Steel frame and rein-forced concrete buildings are normally dimensioned from column centerline to column centerline. This should include an additional dimension to the face of the finished building. Refer to ***UDS Figure 4.2-19***. For concrete framed multistory buildings, perimeter columns may be dimensioned to the face of the column rather than the centerline if the column depth is reduced in upper floors while the building facade remains constant. Refer to ***UDS Figure 4.2-20***.



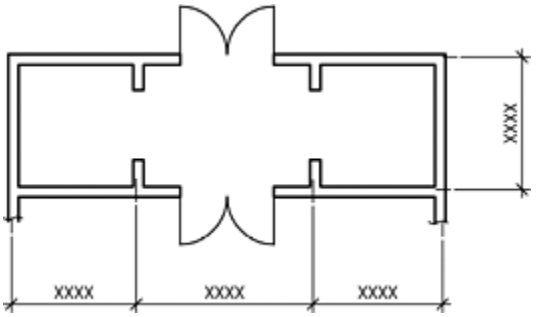
UDS Figure 04.19 *Structural systems dimensioning.*



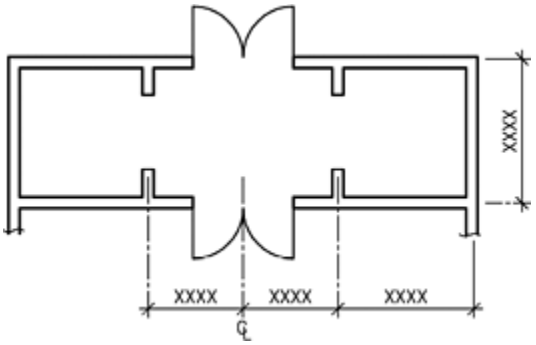
UDS Figure 04.20 *Structural systems dimensioning.*

When dimensioning structural and non-structural walls and partitions, three different methods of dimensioning are in common use:

- **Face of Stud, Concrete or Masonry Unit:** Dimensions should start on the exterior face of the left end or bottom of the plan and proceed continuously to the other side of the plan, ending again on the exterior face. A single dimension in the string may contain a "±" to allow for small variations at the site and to prioritize all other dimensions in the string. Refer to ***UDS Figure 4.2-21***. For masonry construction, dimensions should be the multiple of a masonry module. This minimizes the need for cutting units in the field.
- **Centerline:** This is the most consistent system for some projects when all dimensions (except to exterior face) for walls, partitions, and window and door openings are shown to the centerline of that object. It provides more flexibility when exact sizes of components may change during the course of production drawings or construction. Refer to ***UDS Figure 4.2-22***.
- **Face of Finish:** This is most appropriate for remodeling and interior work where the face of finish is already known or is highly critical. This method requires the installer or contractor to know exactly what the final finish of the walls will be when laying out the wall or partition. It can be used in some situations as reviewed above, but should be used only when required by the project. Refer to ***UDS Figure 4.2-23***.



UDS Figure 4.2-21 *Face of stud, concrete or masonry wall dimensioning.*



UDS Figure 4.2-22 *Centerline of wall dimensioning.*

In some building types, such as hospitals, critical dimensions are designated as "clear." This means that after construction, the actual dimension is the clearance between finished surfaces. The actual dimension may never be less than the clear dimension, but may be greater. Refer to ***UDS Figure 4.2-23***.

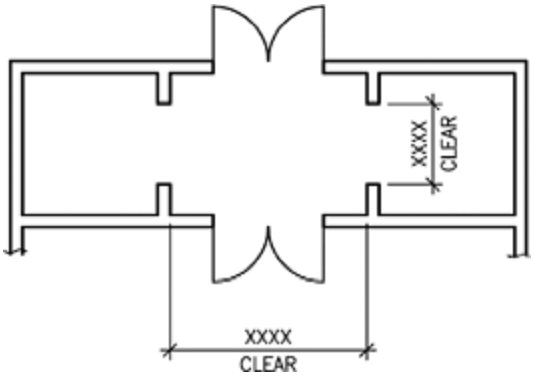
For restoration, remodeling, and renovation plans, the interior string of dimensions should be used to determine the location of new construction only. For that reason, it should not be continuous but rather tie the location of new construction, such as walls and door openings, to the nearest fixed reference (existing wall or column centerline). Where a dimension cannot be determined in the field,

such as a hidden object that will be uncovered after demolition, add **VIF** (Verify In Field) below the dimension.

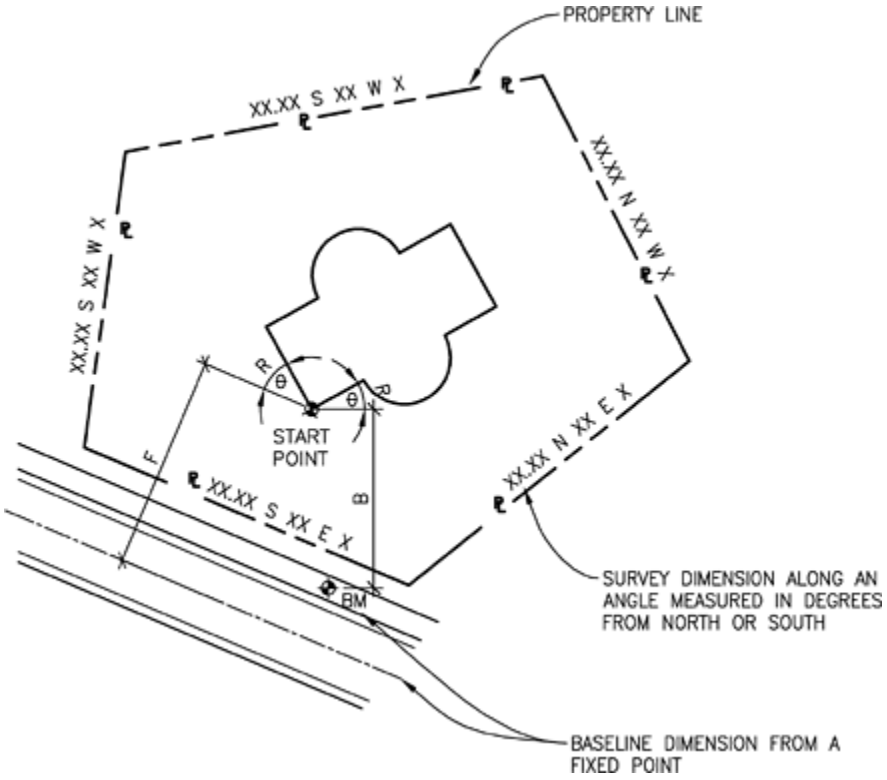
Vertical Dimensions

Vertical dimensions follow a hierarchy similar to the one described under plans progressing from detailed dimensions close to the wall to overall dimensions farthest from it. Eliminate excessive repetition of dimensions from small scale to large scale.

Before the layout of building plans can proceed on site, a start point for vertical dimensioning must be located. In some areas, coast and geodetic datum relative to mean sea level are available and should be shown on the plans and sections. In other areas it is convenient to reference benchmarks or street curb datum as available. Refer to ***UDS Figure 4.2-24***.



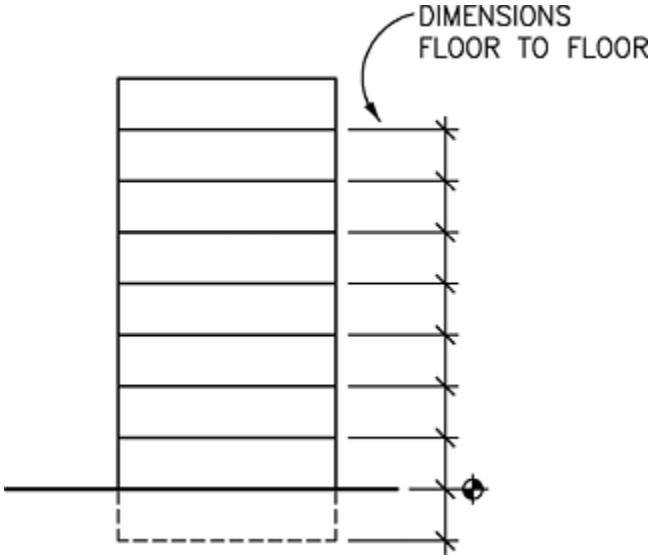
UDS Figure 4.2-23 *Face of finish wall dimensioning.*



UDS Figure 4.2-24 *Layout of building plan.*

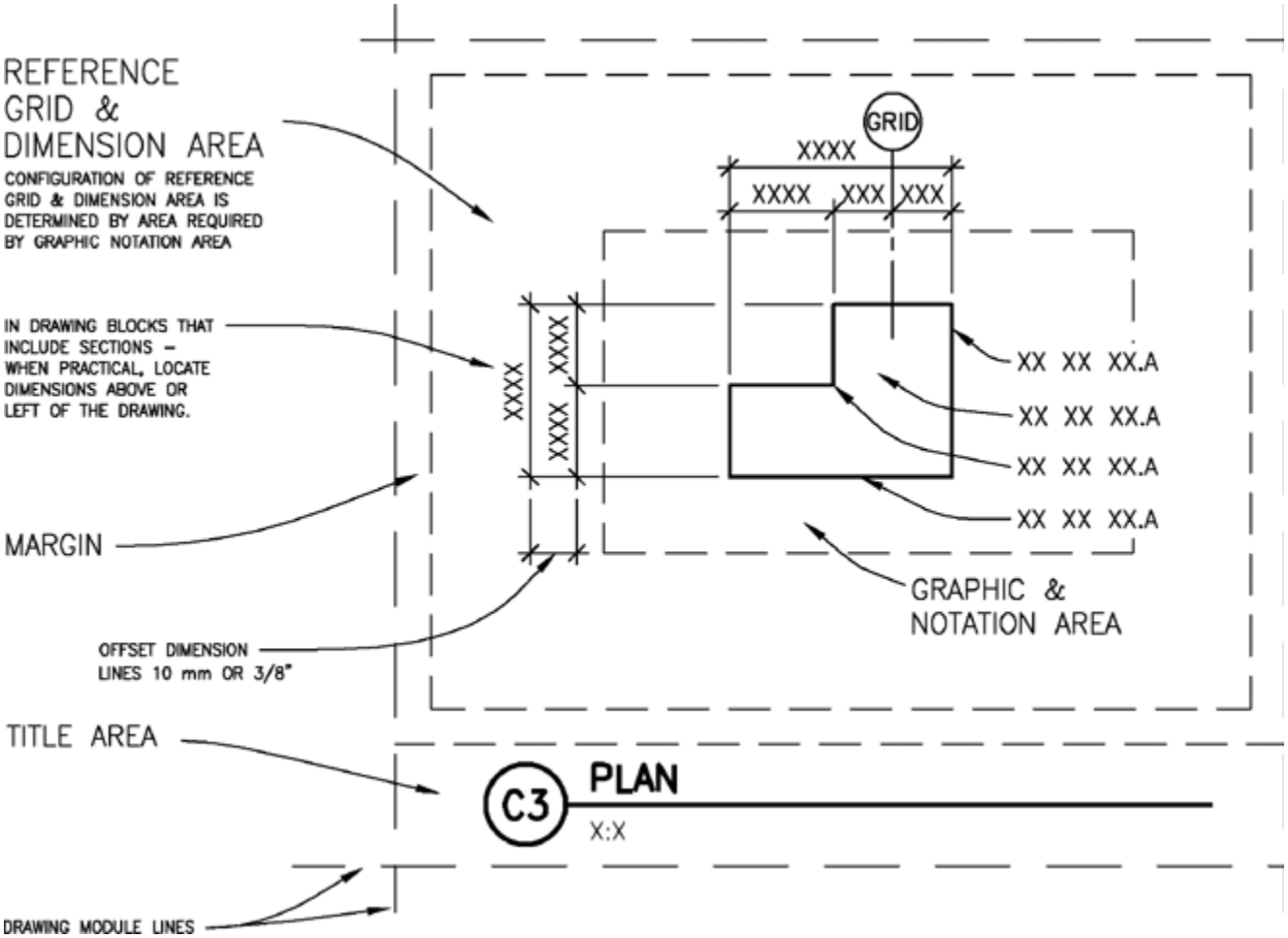
On projects including an existing floor level that will be matched or altered, a reference to the elevation of the intended floor should be included on the plan. In all the above instances, the start point for vertical dimensions is established by criteria appropriate to the project. For convenience this start point can be set to a hypothetical project elevation such as 100 m in SI units or 100' in inch/pound units. Add a note stating that the elevation of 100 units equals **XXX** units (fill in the actual elevation and units from the site survey).

- **Dimensioning Building Sections and Elevations:** Sections and elevations should be consistently dimensioned within the reference grid and dimension area of the drawing. Refer to ***UDS Figure 4.2-26***. Provide an extension line at each subfloor. Provide a continuous dimension string connecting each extension line. All other vertical dimensions are to be shown on the wall sections and section details. Provide the elevation mark at the critical floor only and dimension all other floors and height from the fixed datum. The elevation mark is tied to a fixed datum from the site survey. Refer to ***UDS Figure 4.2-25***.



UDS Figure 4.2-25 *Vertical section or elevation dimensioning.*

- **Dimensioning Wall Sections and Section Details:** Dimension strings for these drawings are usually placed outside the wall within the zone shown in ***UDS Figure 4.2-26***.



UDS Figure 4.2-26 *Typical drawing block format.*

- For wall sections, two main strings of dimensions exist. The one placed closest to the building defines the rough openings and the top of the slab or subfloor. The second string indicates the floor-to-floor heights.

Avoid dimensioning the overall height of the building already shown on the building section. Avoid dimensioning the ceiling height already included in the Room Finish Schedule.

- Variances in ceiling height within a room may be indicated on the Reflected Ceiling Plan and also noted in the remarks column on the Room Finish Schedule. Dimensions for this group of drawings must include masonry coursing or panel joint locations, relieving angles, and masonry ledges locations as well as other wall features.
- For section details provide all the detailed dimensioning not indicated in the drawings described above. This group of drawings should have the same orientation as the wall sections. Refer to ***UDS Figure 4.3-9*** for an example of the hierarchy of dimensions associated with these drawings.

Guidelines

- Dimension fractions should not be less than 1.5 mm (1/16") because accuracy in the field is usually not required to be more precise than that. In cases where an opening width is divided into two equal parts and the original width is 1.58 m (5'-2-1/16"), write the total width on one string and create another string stating EQ (equal) on both sides rather than label each side as 790 mm (2'-7-1/32").
- Where perimeter roof beams are sloped to accommodate drainage, do not tie the dimensions to the top of steel. Tie them instead to the top of the wall.
- Check for superimposed information caused by layering.
- Where the length of dimension lines is too short to accommodate the dimension number, show the number to the side.
- If the drawing is not to scale, note NTS in the drawing title.

Rules for Conversion and Rounding

The rules for conversion and rounding are based on using either exact or approximate values. Correspondence between the accuracy of data and the resulting number of significant digits should be carefully considered with regard to the implied conversion of quantities. Accuracy should never be sacrificed or exaggerated.

A scale having a division of 1/16-inch for making the original measurements is obviously suitable for measuring in SI units with a metric scale having divisions of 1 mm.

It is necessary to determine the intended precision of a measurement before converting. The converted dimension should be rounded to a minimum number of significant digits such that a unit of the last place is equal to or less than the converted precision.

Example:
1-7/8" = 47.625 mm exactly
1-7/8" = 47.6 mm normal rounding
1-7/8" = 47.5 mm +/-
1-7/8" = 48 mm +/-

The exact conversion 1" = 25.4 mm generally produces values containing more decimal places than are required for accuracy. It is usually necessary to round these values to maintain accuracy compatible with those of the original values.

An "approximate" number will be followed with a +/- (plus/minus) symbol after it.

Converted dimension values used in the *Drafting Conventions Module* have been rounded to the minimum number of digits to maintain desired accuracy.

Refer to *ASTM E 380 - Standard Practice for the Use of the International System of Units (SI): The Modernized Metric System* for more information. See the *Introduction, section UDS 0.8*.

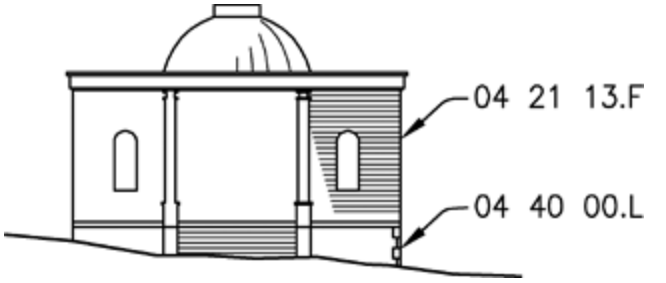
Material Indications

Some material indications are used in drawings to help the viewer understand the use and extent of materials. Symbols should provide identification of material. Refer to *Symbols, UDS section 6.1* for more information. Detailed information about the indicated graphic material should be placed in the specifications.

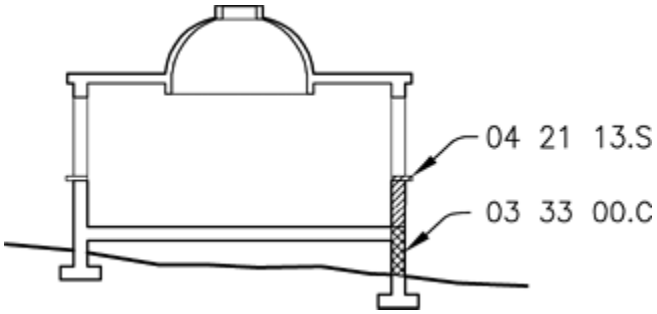
Material indications may define general use if the material covers the entire surface, or a specific pattern such as the coursing and placement of bricks. For clarity, notes calling out the material may be used in addition to the graphic symbol. Material patterns and accents indications should be used sparingly on drawings to identify but not to overly describe.

Unless a specific pattern is being illustrated, it is not necessary to fill the drawing area with the material indication. Show the material around the perimeter of the area or at either end to increase the readability of the drawing. The following is a description of material indications for plans, elevations, and sections:

- **Plans:** While floor plans drawn at 1:100 (1/8" = 1'-0") or 1:50 (1/4" = 1'-0") may not require any material indications for exterior walls, plan details drawn at a larger scale should include a hatch or fill showing the exterior cladding material(s). Surface materials for flooring, countertops, landscape material, and other items may not be indicated if the whole area is constructed of the same material and does not include any patterns. The room finishes schedule and the specifications will provide that information. Where certain areas such as main access halls or other major spaces are paved with stone, tile, terrazzo, or other materials arranged in geometric patterns, an enlarged plan providing detailed information identifying materials and dimensions should be drawn.



UDS Figure 4.2-27 *Elevation material indication.*



UDS Figure 4.2-28 *Section material indication.*

- **Elevations and Sections:** Interior and exterior elevation drawings commonly use material indications to identify the surface materials intended. Refer to ***UDS Figure 4.2-27***. Section drawings use material indication symbols to define the location of specific materials. Refer to ***UDS Figure 4.2-28***.

Scale in Material Indications

Small-scale plans and sections should use simplified versions of the material indication symbol to keep from cluttering the drawing. Large-scale details should use material indication symbols that have enough detail to describe clearly the material and its size.

Hatching

Hatching refers to the patterns of repetitive lines, dots, or figures used to indicate specific types of materials or designate specific areas. Hatching is very useful in making drawings readable. Use it only to indicate specific materials such as a brick wall or specific areas where work is to be done. For example, drawings shown at 1:100 (1/8" = 1'-0") or smaller rarely require any hatching to indicate materials. Use a hatch pattern to indicate a specific area of flooring to be removed within a larger area of flooring to remain.

Limit the area to be hatched. In large areas requiring hatching to make the drawings readable, it is not necessary to hatch the entire area. Select small areas to be hatched that will clearly identify the entire area. Indicate hatching where materials change or terminate.

Notations

The *Notations Module* includes standards for different types of notes on different types of drawings. The purpose of notations associated with construction drawings is to perform the following functions:

- Provide information relevant to the entire set of documents, or individual disciplines, or individual sheets.
- Identify products, materials, components, or assemblies using the same terminology used in the specifications.
- Inform drawing users as to the execution requirements of the design.

Brevity should be a guideline for writing notations. The following are other guidelines for notations:

- Select notes to identify, but not overly describe, the materials, components, and assemblies.
- Use generic terms for products, materials, and components. Refer to *MasterFormat*™. Refer to ***UDS Figure 4.2-29***.

Roofing - Use membrane roofing, not PVC roofing or EPDM single-ply roofing.

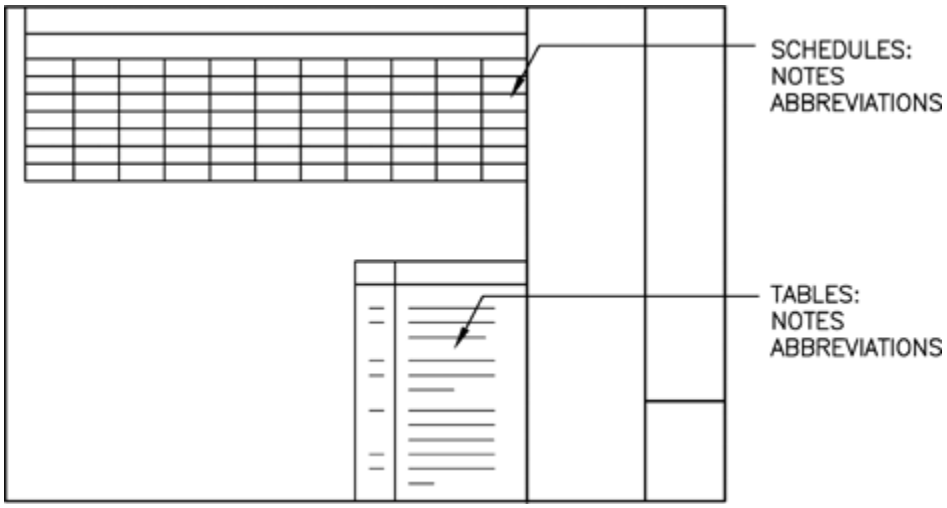
Flashing - Use metal flashing, not hot-dipped galvanized flashing or copper flashing.

UDS Figure 4.2-29

- Minimize use of abbreviations. Refer to the *Terms and Abbreviations Module*.
- Use consistent terminology between drawings and specifications.
- Compose notations without defining a specific contractor to do the work, unless laws require the division of work according to a filed sub-bid. An exception may be multiple prime contracts that may require a defined division of the work.
- Avoid being specific about the sequence of construction.
- Eliminate repetition of notations on a sheet.
- Eliminate broad references to the specifications such as notes that state "per specs" or "refer to specifications."

Tables, Schedules, and Diagrams

Notes used in tables, schedules, and diagrams should be brief. Refer to ***UDS Figure 4.2-30***. Single terms provide a simple, clear, and efficient means of communication.



UDS Figure 4.2-30 *Notes for tables, schedules, and diagrams.*

Identifying Spaces and Objects

Spaces and objects in a building are identified to easily locate and to simplify the preparation of schedules. The identifier is used in drawings, schedules, and specifications to fully describe the space or object in question.

Spaces

Rooms: The first part of a room identifier should match the floor number. Room numbering should start at the most prominent means of access to the floor. For instance, the first room to the right of the major elevator or stair on the third floor would be 301. Number rooms sequentially moving clockwise around the building.

Stairs: The most prominent stair with the largest egress capacity is identified as Stair 1. On the first floor, number the stairs sequentially moving clockwise from the first stair. The stair number remains the same for its entire height. Stairs above or below the first floor that do not connect with the first floor are numbered following those that do. If several prominent stairs with large egress capacity exist, the stairs may be numbered in order of their importance to the main egress point in the building. Additional stairs may be numbered as described above.

Exterior Spaces: Exterior spaces such as balconies, porches, lanais, terraces, and porte-cocheres, if more than one, are numbered.

Elevators: The elevator nearest to the building entrance with the largest access and egress capacity is identified as Elevator 1. Number additional elevators moving clockwise within elevator banks. Use the same sequence and arrangement of numbers on additional banks of elevators if present.

Shafts: The shaft nearest to the building entrance with the largest access and egress capacity is identified as Shaft 1. Number shafts moving clockwise as required.

Objects

Doors: Each door opening in a building must have a unique identifier. If a room has one door opening, the door opening number is the same as the secure side room number. If more than one door opening in a room exists, door openings within that room are identified by the room number followed by an alpha character starting clockwise from the corridor access door opening. For example, in room numbered 105 the corridor access door opening number is 105A, the second door opening would be numbered 105B, and a third door opening 105C. Glass within doors is considered part of the door and not a window. Sidelights are part of the door frame and should be represented in the door frame type. Each door is further described in the door schedule as being a type of door and receiving a hardware set. Refer to *UDS Appendix A - Schedule Content Checklist, UDS section 3.7* and *Symbols, UDS section 6.1*.

Windows: Each type of window must have a unique identifier. Refer to *UDS Appendix A - Schedule Content Checklist, UDS section 3.7* and *Symbols, UDS section 6.2*.

Louver Types: Each type of louver is to have a unique identifier. Louvers are distinguished from windows by the identifying symbol. Refer to *Symbols, UDS section 6.2*.

Furniture, Fixtures, and Equipment: Lab casework, store fixtures, fume hoods, and cranes fall under this category. Industrial projects may require other types of equipment such as lathes, planers, and shearing machines. To identify and reference equipment, alphanumeric designations are placed on the piece of equipment shown in the plan and a legend identifying it.

Graphic Conventions for Text and Notes

The minimum text size is 3.2 mm (1/8") for hand drafting and 2.5 mm (3/32") for CAD. Smaller text size is generally not legible on reduced or one-half size sets. The use of bold, italic, and underline should not be used for notes.

Cross-Referencing

Cross-referencing provides a system for tracking information from the general to the specific within a drawing set. The master drawing for a cross-referencing system is the floor plan. The floor plan should contain references to the building sections, elevations, interior elevations, plan details, and other information necessary to fully describe the project. A properly cross-referenced drawing set does not duplicate information but provides it one time in the expected location.

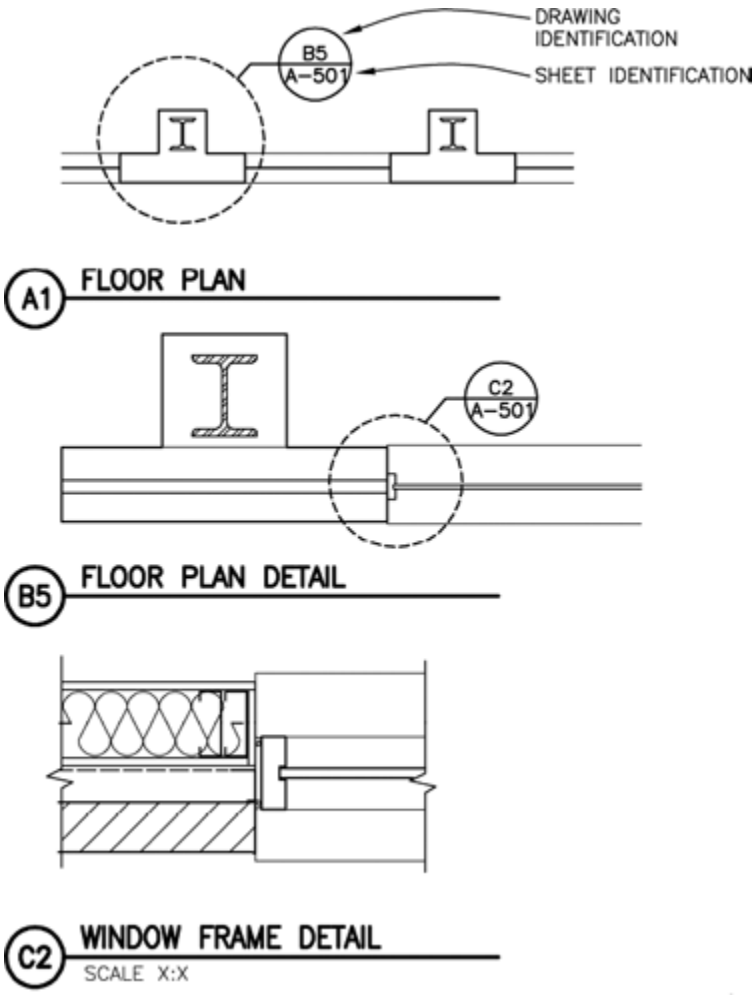
A poorly referenced project is subject to misinterpretation by contractors, owners, architects, engineers, and building officials. It can increase the cost of the drawings and construction due to required addenda, clarifications, and possibly change orders.

Proper cross-referencing does not require any extra effort. The most efficient way to do this while maintaining control over the process is to create a comprehensive and detailed mock-up of the project. Refer to *Mock-Up Drawing Set, UDS section 4.4*.

Drawing Identification

Each drawing should be provided with a unique drawing identification and corresponding sheet identification. Items on a drawing that require additional clarification are provided with a cross-reference to another drawing or view on another sheet.

For example, a section cut shown on a plan refers to a specific drawing on a specific sheet at another place in the drawing set. This drawing may require additional cross-references on other sheets. Refer to ***UDS Figure 4.2 -31***.



UDS Figure 4.2-31 *Drawing identification.*

Symbols

Symbols are graphic representations of an item or materials by association, resemblance, or convention. A symbol often represents a material or object not fully illustrated on the drawings.

Symbol Categories

Symbols used in drawings are classified in terms of type, in six categories:

- **Identity Symbols** are abstract representations of an item. An electrical outlet is an example. These symbols are can be either scale dependent or scale independent.
- **Line Symbols** indicate continuous objects and are either single or double lines. Walls are usually drawn with two lines and ducts with one or two lines based on the scale of the drawing.
- **Material Symbols** portray a material graphically in plan, elevation, or section. A graphic representation of concrete is an example. These symbols are drawn to scale.
- **Object Symbols** represent items such as furniture and toilet fixtures. These symbols are drawn to scale.
- **Reference Symbols** refer the reader to another part of the documentation. Partition type symbol, section cuts, and elevation references are examples.
- **Text Symbols** graphically indicate a word or words and may be used in notations on drawings. For letter symbols, dimensionless numbers, mathematical symbols, and subscript symbols, refer to *ASHRAE Handbook - Fundamentals*.

Module 4 - Drafting Conventions

4.3 SHEET TYPES

Sheet types consist of scaled views and non-scaled views. Scaled views are plans, elevations, sections, large-scale plans, and details. Nonscaled views are diagrams, 3D representations, and schedules. Project sheets are grouped into categories identified by alphanumeric numbers listed and explained in detail in the *1.0 Drawing Set Organization Module*. The following discussion on sheet types includes general guidelines for information necessary for each sheet type. These guidelines are not intended to be comprehensive, but may be used as a basis for establishing a check list for coordination and completeness of the sheets.

Sheet Type 0 - General

General sheets provide information of a general nature that applies to the whole project as well as to each discipline. The first sheet in the set following the cover sheet provides information that includes the list of sheets, code summary, materials and the graphic symbols legend, abbreviations, a small orientation or vicinity map indicating the location of the project, and other relevant information of a general nature. A general information sheet is placed at the beginning of the set of drawings for each discipline to show information of a general nature unique to that discipline.

Many buildings are documented with screened backgrounds of floor plans on which mechanical, plumbing, and electrical layouts are drawn.

Sheet Type 1 - Plans

Typical components of plans include the following information:

- **Drawing Scales:** Indicate scale on plans. Refer to *Scale, UDS section 4.2* for information on scales.
- **Column Grid Lines:** If used (may be omitted on Civil, Landscape, and Site plans).

- **True North Arrow and Plan North Arrow:** If used.
- **Key Plans:** Show clearly the relationship among the elements of complex projects or where the size of one element requires two or more drawings to delineate a level. Include column grids adjacent to match lines and corners; do not label rooms or departments.

The following is a description of requirements for plans generated by each discipline placed in the order of the *Drawing Set Organization, UDS section 1.2*.

Civil Plans

Civil plans include site demolition, site improvement, dimension control, grading, paving, and site utilities plans. Dimension control plans show benchmarks and survey control point locations as well as interrelationships among buildings, streets, parking areas, fences, and utilities. Grading plans define limits of all grading work, provide critical spot elevations, and set controlling grades to assure proper site drainage. Paving plans establish base lines for large paved areas, locate roads, and indicate types of paving. Site utilities plans show the size and location of all new and existing utilities.

Include the north arrow, key plan, match lines (if used), scale, and column grid described at the start of Type 1 Sheets. The following list of items should be included in all Civil plans:

Site Demolition Plans

- Limits of items to be removed from the site including planting, exterior lighting, and paved areas.
- Curbs to be cut as well as trees and plantings to be protected.
- Locations of existing structures and utilities to remain.
- Items to be demolished and removed from site.
- Items to be salvaged and turned over to owner.
- Items to remain undisturbed and be protected.

Dimension Control or Layout Plans

- Base plans showing information from field survey including benchmark and survey control point locations.
- Interrelationships of buildings, streets, parking areas, fences, and utilities.
- Locations for access and egress to facilities.
- Horizontal layout for fencing.
- Location and limits of site improvements.

  Guidelines for Dimension Control or Layout Plans

  - Structures should be located by horizontal coordinates where possible. Reinforced concrete structures should be located relative to face or centerline of wall. Steel structures should be located by grid line.
  - Do not show dimensions or elevations of structures already shown on Architectural or Structural drawings. Adequate dimensions should be provided so that nothing has to be scaled from the drawings. Include inverts for graded (sloped) site utility lines at point of connection to building utilities.

Grading Plans

- Site grading with controlling grades to assure proper drainage. Critical spot elevations must be positioned relative to a survey control point, structure, or road baseline.
- Limits of grading work.
- Sizes of new drainage facilities with controlling grades.
- Modified contours for the new design. Relate them to the building outline to ensure positive drainage to catch basins and other discharge points.
- Spot elevations at corners and points adjacent to building entrances.

Paving Plans

- Large paved areas. Locate by establishing a baseline.
- Roads. Locate based on a centerline horizontal alignment.
- Paving. Indicate types.
- Core lines and expansion, contraction, and control joints. Dimension each item to the nearest fixed point.

Site Utilities Plans

- New or existing utilities to service new facilities. Show sizes, inverts, and location of connection to existing lines.
- Existing site utility structures. Adjust to meet new grading requirements.
- Site utilities. Show extent to within 1.5 m (5'-0") from building. Reference Mechanical and Electrical site utilities plans, if used.

  Guidelines for Site Utilities Plans

  - Ensure that the interface between site and building utilities are at the same location.
  - Check ground-floor elevation against spot elevations adjacent to entrances.
  - Check the location of curb cuts against new driveways.
  - Check elevation of ledges supporting masonry shown on the elevations against grade elevations shown on Civil or Landscape plan.

Landscape Plans

These plans may include site preparation (indicating structures to be demolished and plants to be removed), irrigation, and plant materials plans. Site preparation plans show existing site features to be modified including planting to be removed, curbs to be cut, exterior lighting, paving areas to be removed, and trees to be protected. Irrigation plans dimension layout of the irrigation piping and sprinkler heads and the locations of controllers as well as their power supply. Plant material plans show dimension layout of landscape material, and designate plant types and their quantity.

In addition to the items listed at the start of Type 1 Sheet, the following list of items should be included on all Landscape plans:

Site Preparation Plans

- Outline (at grade) and names of buildings and/or structures.
- Walks, streets, curbs, parking areas, signs, planters, light poles, and other site structures.

Irrigation Plans

- Layout of irrigation items. Dimension to the nearest fixed point.
- Coordinate location of irrigation controllers with architectural, mechanical, and power requirements with Electrical plans.

Plant Materials Plans

- Names of buildings and/or structures. Show outline (at grade).
- Walks, streets, curbs, parking areas, signs, planters, light poles, and other site structures.
- Layout of landscape materials. Dimension to nearest fixed point.
- Show designations, location, spacing, and quantity of materials for planting.
- Schedule of plant materials for each planting plan.

Structural Plans

Structural plans include demolition, foundation, and framing plans. These plans define support and bracing elements (columns and shear walls) of the building. Horizontal support members such as beams, girders, and trusses must be coordinated with other discipline elements passing through or beneath them to eliminate conflict among these disciplines.

In addition to the items listed at the start of Type 1 Sheets, the following list of items should be included in Structural plans:

Foundation Plans and Slab-on-Grade Framing Plans

- Column piers and footings.
- Footings. Indicate top of footing elevations on all spread footings. Also show top of pier elevations.
- Grade beams or walls required under masonry walls.
- Expansion, control, and seismic joints. Label, dimension, and detail each. Indicate thickened edges that will occur on each side of the joint for slabs on grade.
- Top of slab elevation on all plans.
- Slab block-outs. Dimension vertically and horizontally. Dimension boundaries of areas with different slab thickness and/or reinforcing requirements.
- Footings for stairways and shear walls. Dimension in plan and indicate top of footing elevation.
- Stairs and ramps. Dimension in plan and assign a number to each stair. Only overall plan dimensions should be shown. Treads and risers will be dimensioned on large-scale plans and sections.
- Dowels to masonry walls. Identify and show location.
- Floor slopes to drains and spot elevations. Show relative floor elevations.
- Pits, trenches, floor recesses, and tunnels. Show, locate, dimension, and detail each.
- Curbs. Show notes, dimensions, and details.
- Concrete equipment pads.
- Bonding or grounding of structural and/or reinforcing steel for lightning protection.
- Water stops, where required.
- Membrane waterproofing or vapor retarder under soil bearing slabs, pits, and trenches.

Guidelines for Foundation Plans and Slab-on-Grade Framing Plans

- Dimension plans fully for all offsets and provide overall dimensions as required. Dimension to edges of slabs where they occur. Coordinate with Architectural plans and dimensions.
- Footings need not be dimensioned if they are symmetrical about the column grid; otherwise, plan dimensions will be required to show location with respect to column grid. Coordinate with Architectural plans.
- Footings that step in elevation are indicated and dimensioned.

Floor and Roof Framing Plans

- Girders, miscellaneous cast-in-place concrete beams, steel beams, slabs, and channels. Locate dimensionally.
- Edges of slabs. Dimension to nearest gridline or reference point.
- Label all slab block-outs as "open" and dimension, both vertically and horizontally. Indicate method of additional reinforcement around the opening.
- Top of slab elevation on all plans.
- Brackets. Assign a mark number to each but do not dimension.

- Expansion, control, and seismic joints. Label, dimension, and detail each.
- Stairs and ramps. Dimension fully in plan. Stairs should be indicated by stair number. Only overall plan dimensions should be required. Treads and risers will be dimensioned on sections.
- Bracing elements such as shear walls and braced walls. Indicate location and identify.
- Concrete handrails. Indicate location and dimension.
- Dowels to masonry walls, if required. Indicate location and identify.
- All masonry and lintel locations on the plans and in a lintel schedule.

Guidelines for Floor and Roof Framing Plans

- Assign a member identification mark to all framing members.
- Dimension centerlines of all beams. Dimension to edge of spandrels or beams at openings.
- Show spacing of all joists on framing plans and locate all bridging.
- Show floor and roof slopes to drains and spot elevations. Show relative floor and roof elevations.
- Refer to the structural floor plan above the floor being considered when checking for overhead clearances.
- Do not indicate the size of structural members on Architectural drawings.
- Dimension slab openings for skylights, roof hatches, major duct penetrations, depressed slabs, and concrete curbs.

Architectural Plans

Architectural plans include demolition, floor, reflected ceiling, and roof plans.

Floor Plans

All architectural drawings are generated from the plans. Plans provide information about dimensions, partition types, room, and door numbers as well as references to elevations, building sections, wall sections, enlarged plans, details, window types, and schedules. Exterior window types may be shown on the plans or elevations but not on both.

Number the ground floor as the first floor. All occupied floors above the first floor are to be numbered sequentially upward. The floor below the first floor is **B1**. Identify identical floor plans in multistory buildings as "Typical Floor Plan" and identify which floors the typical plan applies. Number mezzanines sequentially (**M1, M2**) for mezzanines with limited size and egress capacity. Number larger mezzanines as part of the floor numbering system.

Reflected Ceiling Plans

Reflected ceiling plans are reflections (as if one is looking at mirrored floors) of the ceilings on the floor plans. All areaways and lower roofs should be deleted from the plans while overhead items, sometimes shown dashed on the floor plan, should be shown with solid lines. Delete door swings and show room numbers.

Plumbing, mechanical, and electrical elements should be shown only in architecturally significant spaces to bring order to the design of these ceilings. Utilitarian spaces such as mechanical, electrical, storage, and other spaces may be covered by a note similar to: "This plan shows the locations of items in architecturally significant spaces only. Refer to Plumbing, Mechanical, and Electrical plans for all items not shown herein."

It is recommended that the ceiling grid background plans be developed at the same time as the floor plan backgrounds so that both may be made available to other disciplines. This enables them to position lighting, registers, diffusers, and other elements of the design in locations conforming to the grid and reduces the amount of changes required by the architectural designer.

Roof Plans

Roof plans should be grouped with the floor plans and drawn at the same scale. Do not show site or building information located below the roofline. Structural grid should be shown only if necessary to locate roof structures or equipment. A partial roof structural plan should be named "Penthouse Plan."

In addition to the information shared by all plan sheets that are listed at the start of Type 1 Sheets, the following list of items should be included on all Architectural floor plans:

Floor Plans

- Room names and numbers.
- Floor plan dimensions. Locate walls and partitions, level changes, and close strings of dimensions from column grid to column grid. Refer to *Dimensions, UDS section 4.2*.
- Partition types. Refer to *Sheet Type 6 - Schedules and Diagrams* below.
- Borrowed light and louver types. Show exterior window types in small projects.
- Exterior and interior wall elevation references.
- Building section references.
- Wall section references.
- Floor plan horizontal detail references.
- Termination of floor materials within a room.
- Floor drain and slope lines of drainage to floor drain. Show extent and direction of slope.
- Plumbing fixtures, fire hose, and extinguisher cabinets.
- Built-in casework, shelving, lockers, benches, kitchen casework, and equipment. See *Classifications of Furniture, Fixtures, and Equipment* definition in Interior plans below.
- Openings in the floor such as elevator and dumbwaiter shafts, mechanical/ plumbing/electrical shafts, atria, stairs, and escalators. Do not show an "X" through a chase unless entire chase is a floor penetration.
- Trenches and other recessed areas needing depressions in the floor, such as recessed floor mats, thickset ceramic tile, and other items. Dimension and detail each.
- References to details and sheet notes.
- Significant overhead features such as balconies, skylights, beams, and roof overhangs. Indicate with a dashed line and add a note describing what that line represents.
- Edge of slabs, ledges, equipment pads, and curbs. Do not show walls and bridges at the next level below, or items that appear on another floor or roof plan. Make sure that the structural drawing set contains the details required to illustrate these items.

Reflected Ceiling Plans

- References to details for ceiling edge conditions, building expansion, control joints, seismic joints, and lighting coves. Do not reference building or wall section cuts.
- Description of exterior soffit materials. Include light fixtures, control joints, and access panels.
- Ceiling material indications. If more than one material is scheduled, show extent of materials. Place the ceiling component legend on the reflected ceiling plans rather than in the general information sheet.
- Light fixtures, exit lights, sprinkler heads, supply and return grilles, smoke detectors, speakers, emergency shower, and other items. Dimension if necessary.
- Ceiling access panels including panels that are furnished by mechanical or electrical trades. Indicate size.
- Rated partitions and other partitions extending through the ceiling plane to the structural deck. Identify rated partitions by a symbol.
- Skylights and roof hatches. Dimension if necessary.
- Plenum barriers where required by code.

- Elements located above ceilings requiring specific locations or construction such as fire-rated horizontal enclosures, catwalks, disappearing stairs, air handling equipment, and other elements.
- Delete door swings and door openings unless opening extends to the ceiling.

Roof Plans

- Extent and direction of slope to roof drains. Show emergency roof overflow drains or scuppers. Include elevations of high points, ridges, low points, drains, and overflows for accurate determination/confirmation of roof slope.
- Penthouse roof plan. Show on the same drawing if possible.
- Roof pavers, walking surfaces, changes in materials, building expansion, and roofing control and seismic joints.
- Antennas and supports, lightning arresters, major roof penetrations, window cleaning equipment, roof-mounted equipment, and screen walls. Coordinate lightning protection locations with Electrical.
- Skylights.
- Size and locate downspouts and gutter expansion joints for buildings with hipped roofs.
- Splash blocks at downspouts that discharge water onto a lower roof level.
- Roof access and ladders to different levels.
- Roof crickets.
- References to details for the items listed above. Do not detail parapets if shown on the wall sections.
- Eliminate conflict between roof penetrations (i.e., vents, exhausts) and roof crickets, flashing, and valleys. Consider relocating penetrations to less visible areas.

Interior Plans

Interior plans include demolition, furniture, furnishings, fixtures, and equipment plans. These plans are usually drawn on the architectural backgrounds without the symbols or dimensions layers. These plans are used by the electrical engineer to locate outlets, power requirements, and lighting.

In addition to the information listed at the beginning of Type 1 Sheets, and usually provided on the screened Architectural background plans, the following list of items should be included on all Interior floor plans:

- Borrowed light and louver openings.
- Interior room elevation references.
- Pertinent tables, schedules, key, and sheet notes.
- Building expansion and seismic joints if they intersect and affect furniture and equipment installations.
- Trenches and other recessed areas with depressions.
- Fire-hose cabinets that contain fire extinguishers, extinguisher cabinets, and wall-mounted extinguishers. Coordinate locations with Architectural and Fire Protection plans.
- Drinking fountains, water coolers, and all other plumbing fixtures.
- Toilet partitions, toilet casework, and toilet accessories.

Guidelines for Interior Plans

- Indicate rooms with equipment or custom furniture or other areas to be enlarged by a dashed line around the area. Reference to enlarged plan. Show furniture and equipment on enlarged plan only. Do not duplicate information shown on smaller scale plans. Show interior elevation references on the enlarged plan.
- Coordinate location of furniture and equipment with lockers, cabinets, chalkboards, tackboards, electrical outlets, thermostats, clock outlets, and other items contained in the Architectural/Engineering documents.

- Identify each item of furniture and equipment by a mark number.

Classifications of Furniture, Fixtures, and Equipment

- **Class 1:** Permanently fixed items with permanent utility connections, such as stoves, dishwashers, steam tables, light fixtures, wall switches, water chillers, air handling units, bridge cranes, pumps, electrical generators, transformers, and switch gear; and large fixed shop equipment such as automatic cutting machines, air compressors, jib cranes, large cleaning and plating tanks, and milling machines.
- **Class 2:** Portable items with flexible or quick-disconnect utility connections, including office and household items such as computers, calculators, electric coffee pots, vacuum cleaners, table lamps, floor lamps, window air conditioning units, household refrigerators, and television sets; and shop equipment such as powered hand drills (electric and pneumatic), powered hand-held saws, air compressors, welding machines, oxyacetylene cutting and welding outfits, and paint sprayers.
- **Class 3:** Movable items without utility connections, including office and household furnishings such as chairs, sofas, stands, desks, tables, rugs, beds, and shop equipment such as tool cabinets, work benches, storage racks, storage bins, storage shelves, bench-mounted vises, hand-powered trucks for handling compressed gas tanks, and A-frame cranes.
- **Class 4:** Expendable and consumable items, including expendables such as window curtains, shower curtains, bed linens, uniforms, clothing, brooms, wall mirrors, wall pictures, tableware, crystal ware, kitchen cutlery, cooking utensils, hand tools (pliers, screwdrivers, wrenches), mechanics' tool kits, test equipment (small battery-powered, hand-held voltmeters and multi-meters), and storage aids (plastic storage bins and shelf separators); and consumables such as products with limited shelf life (medicines, chemicals, paints, and food), household supplies (soaps, cleansers, and ammonia solu-tions), office supplies, shop supplies (nuts, bolts, welding rods, fluxes, electrical tape), janitorial supplies (wiping cloths, paper towels, toilet paper, and oil-absorbent sweeping materials).

Fire Protection and Plumbing Plans

These plans include floor and demolition plans. They define the piping required to connect fixtures, floor and roof drains, fire pumps, fire hose cabinets, sprinkler heads, and other elements of the plumbing system. For some industrial projects such as lab and medical facilities, plans include gas, air, vacuum, and special waste piping.

Plumbing Plans

- Ensure that furring for pipes located in proximity to columns does not conflict with beams and column base plates.
- Size partitions and pipe chases to accommodate the pipes they enclose.
- Group vent pipes at a limited number of locations to minimize penetrations. Design pipes crossing from one side of an expansion joint to the other to accommodate the movement between the two sides.

Mechanical Plans

Mechanical plans showing demolition of existing components of the mechanical system or the duct, pipe, and heating media layout for new construction are overlaid on the architectural background. For better readability of mechanical plans, screen the architectural background to a lighter shade. Mechanical plans must identify same unit designations that appear in schedules, indicate all sections, reference all details, and size louvers and openings.

In addition to the items listed at the beginning of Type 1 Sheets, and usually shown on the backgrounds, the following list of items should be included in all Mechanical plans:

- Exterior and interior louver openings.
- Piping sized in U.S. standard.
- Ductwork sized with clear inside dimensions. Air quantities should be indicated in L/s (CFM).

- Mechanical rooms and other areas to be enlarged. Indicate by a dashed line around the area. Reference to the enlarged plan. Do not duplicate information.
- Turning vanes, splitters, and extractors.
- Fire dampers and control dampers. Coordinate locations with Architectural and Electrical plans.
- Duct connections to kitchen hoods, lab hoods, and other equipment requiring supply or exhaust air.
- Duct-mounted coils.
- Pipe sleeves.
- Thermostat locations and reference unit or zone controls. Coordinate locations with architectural and Interiors.
- Sound attenuators.
- Valves.
- Vibration isolation elements.

Mechanical Room Plans

Confine area of enlargement to that portion referenced on smaller scale plans. Reference all applicable details and diagrams. Make and indicate sufficient section cuts to adequately convey layout to the contractor. Indicate future equipment with dashed lines and note as future. Express all air quantities in L/s (CFM). Also, show the following:

- Equipment by unit designations as contained on the schedules.
- Ductwork with double lines.
- Piping 50 mm (2") and larger with double lines. Piping smaller than 50 mm (2") should be indicated with single lines.
- Other equipment located in mechanical room should be shown with light dashed lines.
- Air handling units complete with motor locations, filter sections, flexible connections, and mixing box sections.
- Air handling unit drain connection and routing to floor drain.
- Equipment pads or applicable support method; coordinate with Architectural and Structural plans.
- Dampers.
- Sound traps and internally lined ductwork.
- Valves.
- Roof plan.
- Roof-mounted equipment and indicate the maximum allowable height for each.

Guidelines for Mechanical Room Plans

- Coordinate locations of all plenum barriers with Architectural plans.
- Coordinate location of motorized dampers with Electrical plans.
- Coordinate location and size of door undercuts and grilles with Architectural plans. Eliminate undercuts or grilles if the door is located in a fire-rated partition.
- Coordinate location and size of outside and combustion air intakes with Architectural plans.
- Coordinate size and location of screen walls and related ventilation requirements for condensing units and cooling towers with Architectural plans.
- Coordinate ductwork routing and diffuser location with other disciplines.
- Coordinate power and control components (i.e., starter and relays) with Electrical plans.
- Indicate coil and fan shaft pull spaces.

- Indicate clear space for pulling boiler tubes.
- Identify major duct intersections and check against the available ceiling to bottom of slab depth. Add the space required for beams, light fixtures, and piping.
- Check mechanical shaft dimensions against the dimensions of ducts and pipes located within them.
- Check fin tube locations against furniture layout, especially if casework is located at the window wall. Verify who is specifying the fin tube enclosure, location, and design.
- Coordinate louver locations and sizes with elevations. Also coordinate supply and return air registers with those shown on the reflected ceiling plans.
- Verify that fire dampers protect ducts passing through rated walls and floors unless the duct is part of a smoke evacuation system.
- Review locations of registers for conflicts on the final reflected ceiling plans.

Electrical Plans

Demolition, lighting, power, and in some cases, communication plans constitute the electrical plans. Lighting plans define the type and location of light fixtures, switches, smoke detectors, exit lights, speakers, and elements of the fire detection and security systems.

Power plans locate all outlets, electrical panels, junction boxes, motors, switch gear, transformers, emergency generators, and other components of the electrical power system. Items associated with communications may be shown on these sheets or on an independent group of sheets depending on the complexity of the project.

In addition to the items listed at the beginning of Type 1 Sheets, the following list of items should be included on all Electrical plans superimposed on Architectural backgrounds:

- Clocks. Coordinate with Architectural and Interiors.
- Telephone locations should be shown on electrical communication plans. For simple projects, they may be included with the Electrical power plans.
- Lighting fixtures, fixture types, and number and size of lamps per fixture. Provide information relative to physical size, material, and finish of lighting fixtures to Architectural and Mechanical for coordination.
- Switches for control of lighting.
- Lighting circuits and associated wiring.
- Receptacles and associated wiring. Receptacles should be identified by appropriate National Electrical Manufacturers Association (NEMA) type.
- Cable trays. Indicate size and location.
- Panel boards. Drawings should clearly indicate location, designation, and the type of mounting required (flush or surface).
- Service entrance (weatherhead, conduit, and main disconnect).
- Exit lights and main exit light switch. Indicate location and designation.
- Fire alarm equipment, and associated wiring including alarm bells, manual stations, control panels, power supply switch, and empty service entrance conduit for connection to fire alarm loop, if applicable. Indicate locations.
- Transformers, motor generator units, rectifiers, primary equipment, primary and secondary bus, and supports. Show the necessary space requirements for each, and location and proper designation including associated wiring.
- Fresh air intake and exhaust, and engine exhaust system for power generators. Indicate locations.
- Switchgear, switchboards, and similar equipment. Indicate size, location, designation, and space requirements.
- Other signal, communication, or alarm system equipment. Indicate location and des-ignation.

- Transformer vaults, transformer pads and enclosing fences, DC generators and rectifiers, and all AC generating equipment. Indicate all unusual grounding requirements, and all grounding.
- Motors or equipment that require electrical service. Indicate location, designation, and rating. Show method of termination and/or connection to motors and/or equipment; show all necessary junction boxes, disconnects, controllers (approximate only), conduit stubs and receptacles required to serve the motor and/or equipment.

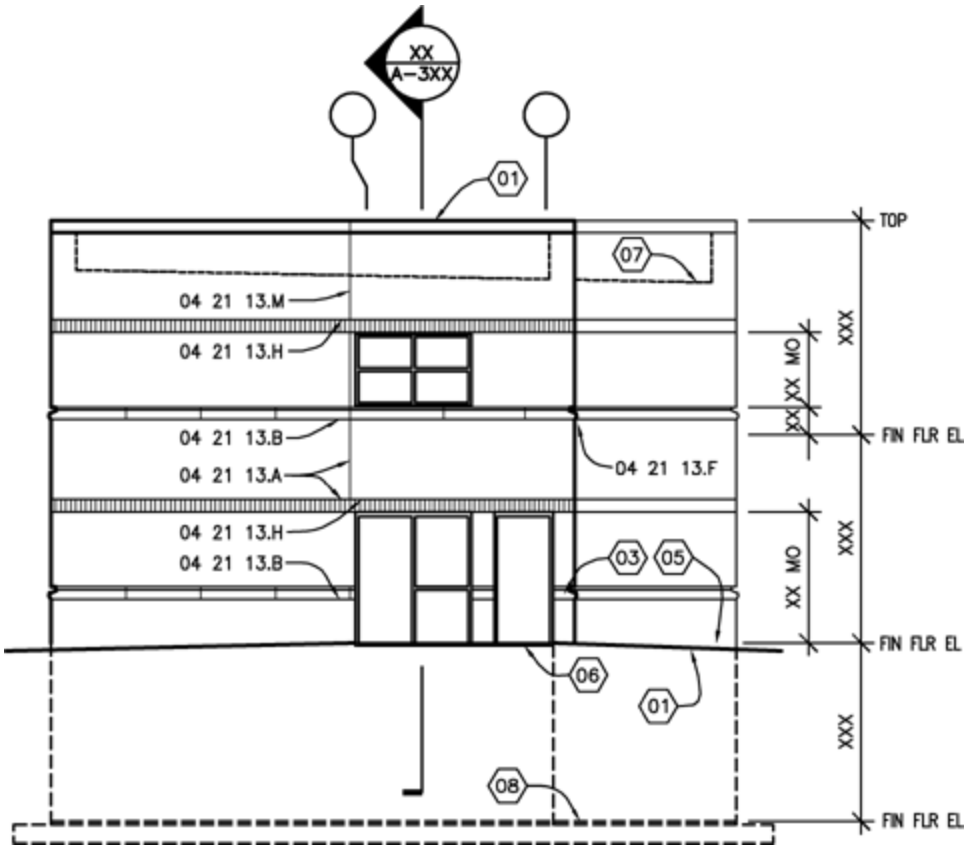
Guidelines for Electrical Plans

- Indicate electrical rooms and other areas to be enlarged to a larger scale by a dashed line around the area. Reference to the enlarged drawing. Do not duplicate information.
- Indicate all sections and reference all details.
- Provide separate lighting plan layout from power plan layout. In small projects drawn at 1:50 (1/4" = 1'-0"), lighting and power may be combined in one plan.
- Identify and designate all electrical fixtures of the same unit designations as contained on the schedules.
- Coordinate the schedule designations for lay-in and surface-mounted fixtures with the reflected ceiling plans.
- Coordinate exterior light fixtures, and weatherproof exterior outlets.
- Show location of undercounter lighting and circuitry.
- Show the number of conductors in each conduit or cable run when the number of conductors required exceeds two. Circuit designations shall be shown for all home runs and feeders. Conduit and wire sizes shall be shown on the floor plans when not shown on panel board schedules and/or riser diagrams.

Sheet Type 2 - Elevations

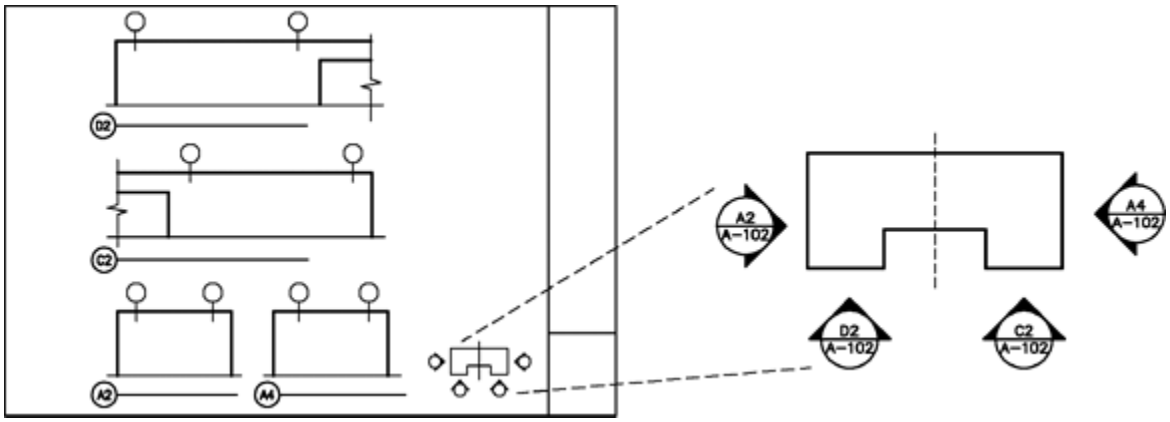
Exterior Elevations

Architectural exterior elevations and partial exterior elevations are developed from the plans from which they are projected. For small projects, window types, building section, and wall section symbols may be shown on the plans. For medium and large projects, wall section and window type symbols may be shown on the elevations. Refer to ***UDS Figure 4.3-1***. Building sections relate more readily to the plans and their section cut symbol should be placed there. All section reference symbols should be shown on either the plans or the elevations—not on both.



UDS Figure 4.3-1 *Example of an elevation showing all symbols.*

If a Key plan is used on the plan sheets, it should also be placed on the elevation sheets with elevation symbols indicating the location of each elevation shown on the sheet. Refer to ***UDS Figure 4.3-2***. Match lines should be set at the same locations as the plans. Grid lines should be placed only at corners and where changes in planes occur.

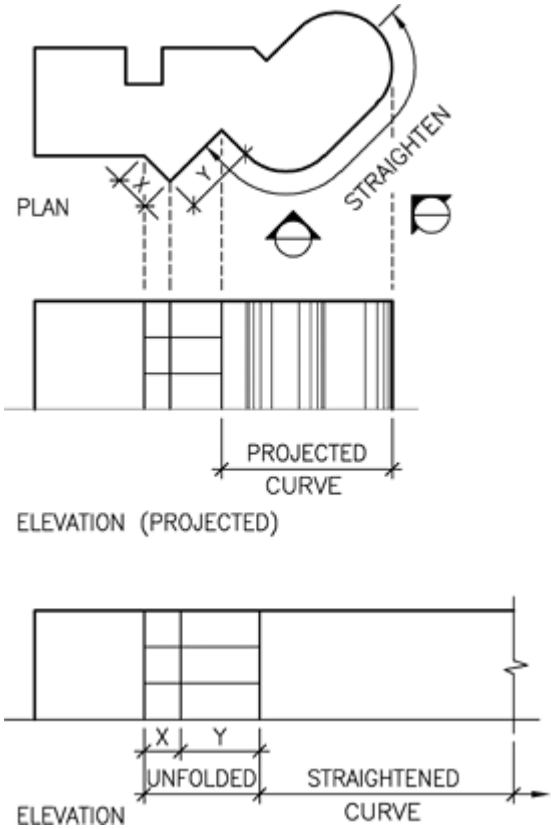


UDS Figure 4.3-2 *Key plan used to identify the location of each elevation.*

All partial elevations must be shown, however small they may be. Special features such as medallions, unusual masonry patterns, rustication, or decorative lintels must be referenced, detailed, and dimensioned. Hidden items such as steel lintels, shelf angles, and other elements should be indicated with a partial dashed line to show extent. Movement joints in masonry and joints in panelized systems must be drawn to provide a uniform basis for pricing as well as clarify the designer's intent. Determining these locations must be based on the standards set by each industry.

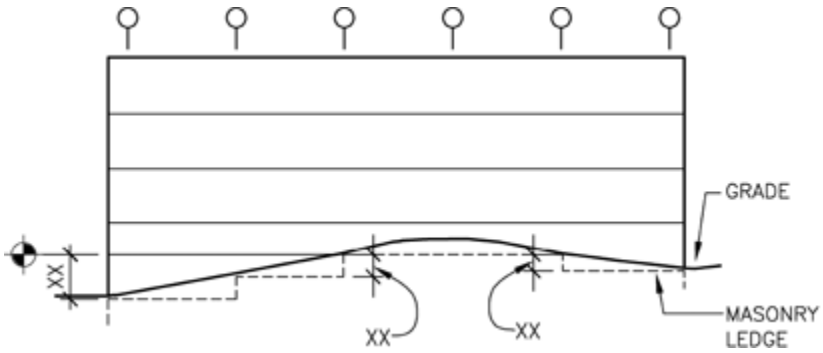
Show materials graphically using hatching at the edges of the area to clarify limits. Refer to ***UDS Figure 4.2-27*** *in UDS section 4.2. All hatching or fill must be dark enough to reproduce well even when the sheet is reproduced at half size.*

Show all elevations as projected. Provide additional elevations to which the viewer is oriented 90 degrees for material takeoffs. Curves are simply noted as such on the elevations. The same approach applies to partial elevations forming an angle to the main elevation. These should be identified as "unfolded." Refer to ***UDS Figure 4.3-3****.*



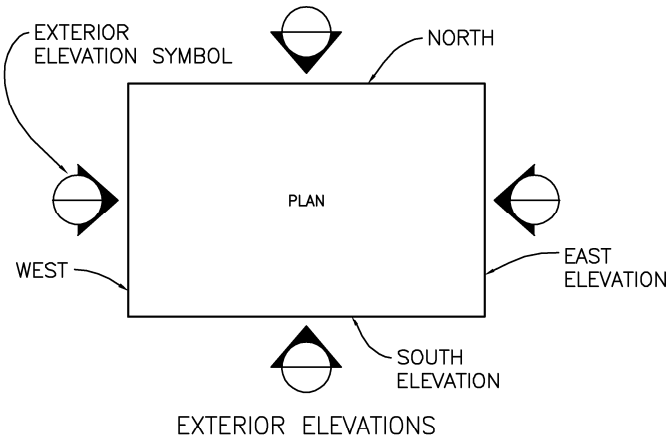
UDS Figure 4.3-3 *How to represent an elevation for curved surfaces.*

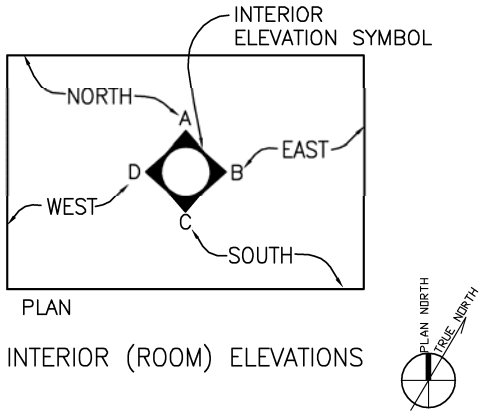
Show the relationship between elevations and the surrounding grade taken from the site plan spot elevations around the building footprint. Where a masonry ledge exists below grade, dimension its elevation and show it dashed and stepped to match the grade. Refer to ***UDS Figure 4.3-4****.*



UDS Figure 4.3-4 *Elevation at grade.*

Reference elevations on the floor plans by using the appropriate symbol for exterior and interior elevations. Refer to Symbols, UDS section 6.2, Division 1. Once the building north is determined, name the elevations accordingly. Refer to ***UDS Figure 4.3-5****.*





UDS Figure 4.3-5 *Naming exterior and interior elevations.*

If design development elevations are upgraded directly from the schematic design drawings, delete all graphics depicting people and cars as well as any shadows and shading that may be shown on the original drawings.

The following list of items should be included on all exterior elevation drawings:

- *Key plan. Indicate locations of exterior elevations.*
- *Column grid lines, and match lines, if used.*
- *Scale. Indicate scale on all architectural exterior elevations (and partial exterior elevations.) Refer to Scale, UDS section 4.2 for information on scales.*
- *Building section references, if not shown on plans.*
- *Wall section references, if required by project complexity.*
- *Typical type and extent of materials, tie holes, and rustication joint patterns, and fenestration.*
- *Floor-to-floor dimensions.*
- *Extent of building elements below grade. Represent with dashed lines.*
- *Gutters, rain leaders or downspouts, and roof scuppers labeled as to function.*

- *All penthouses, skylights, roof-mounted equipment extending above the parapet, mechanical louvers, or equipment screens. Do not indicate size of equipment.*
- *Ladders to roofs.*
- *Building identification graphics.*
- *Handrails and guardrails.*
- *Dock bumpers.*
- *Site adjacency elements such as retaining walls.*
- *Typical and non-typical detail references.*
- *Hidden and partial elevations.*
- *Lintels and shelf angles. Show dashed.*
- *Expansion and control joints for cement plaster and concrete masonry. Show extent of different cement plaster textures.*
- *Extent of different unit masonry bond patterns, colors, and textures.*
- *Movement joints, rustication joints, building expansion joints, and seismic joints. Coordinate with Structural plans.*
- *Form and tie patterns for architectural concrete.*
- *Light fixtures and signage.*

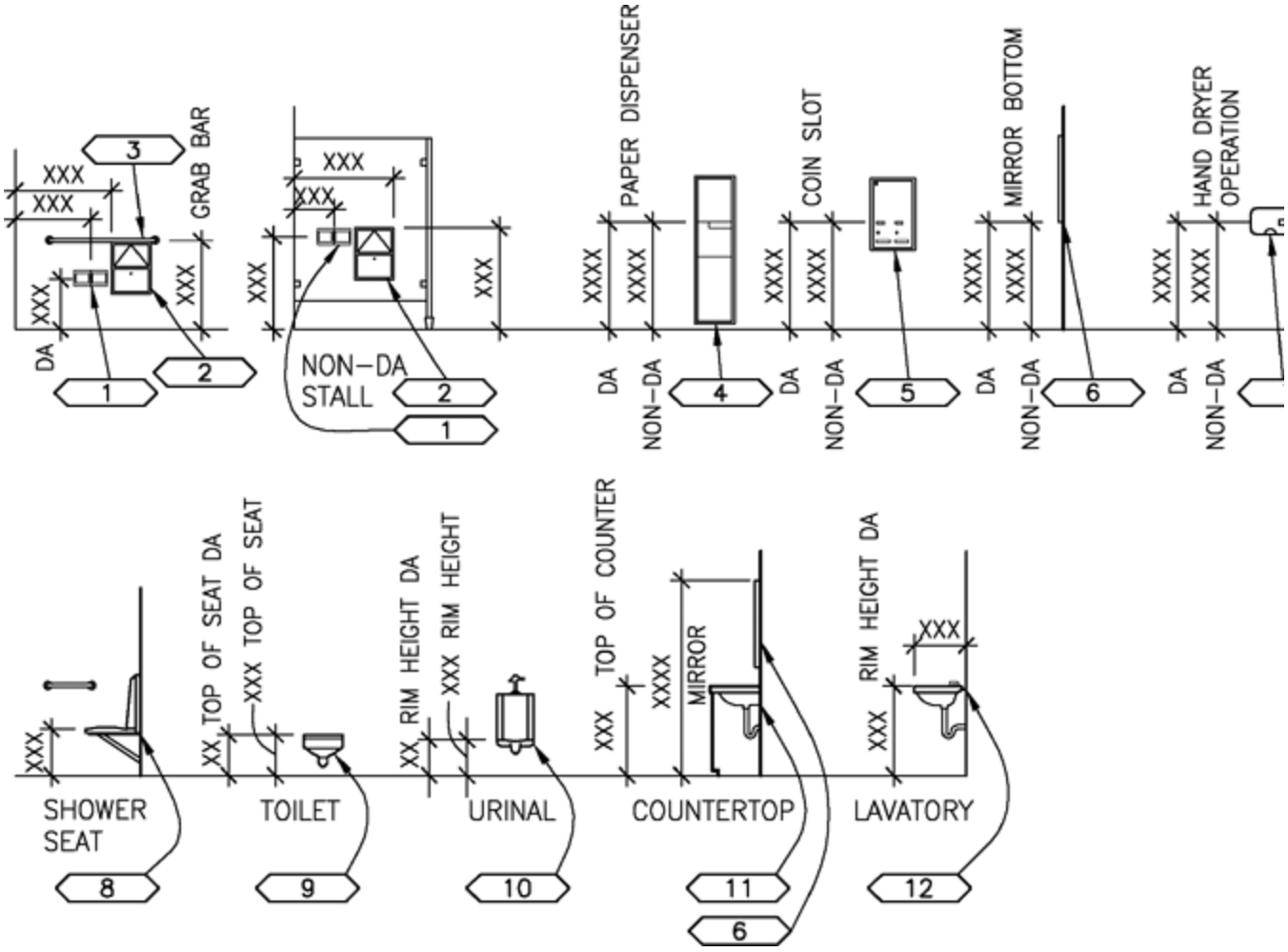
Interior Elevations

Interior elevations are required for kitchens and classrooms (chalkboard and tackboard walls) to show millwork and casework and to indicate the extent of materials where more than one material is scheduled. They are also required for important spaces such as auditoriums, main lobbies, and atria.

If typical mounting height diagrams of wall-mounted equipment are provided and no material changes occur on the wall, an interior elevation of the wall is not required. Refer to Graphic Conventions and Indications, UDS section 4.2 for mounting heights of wall-mounted equipment. Indicate heights, signage, and changes in wall materials.

The following list of items should be included in all interior elevations:

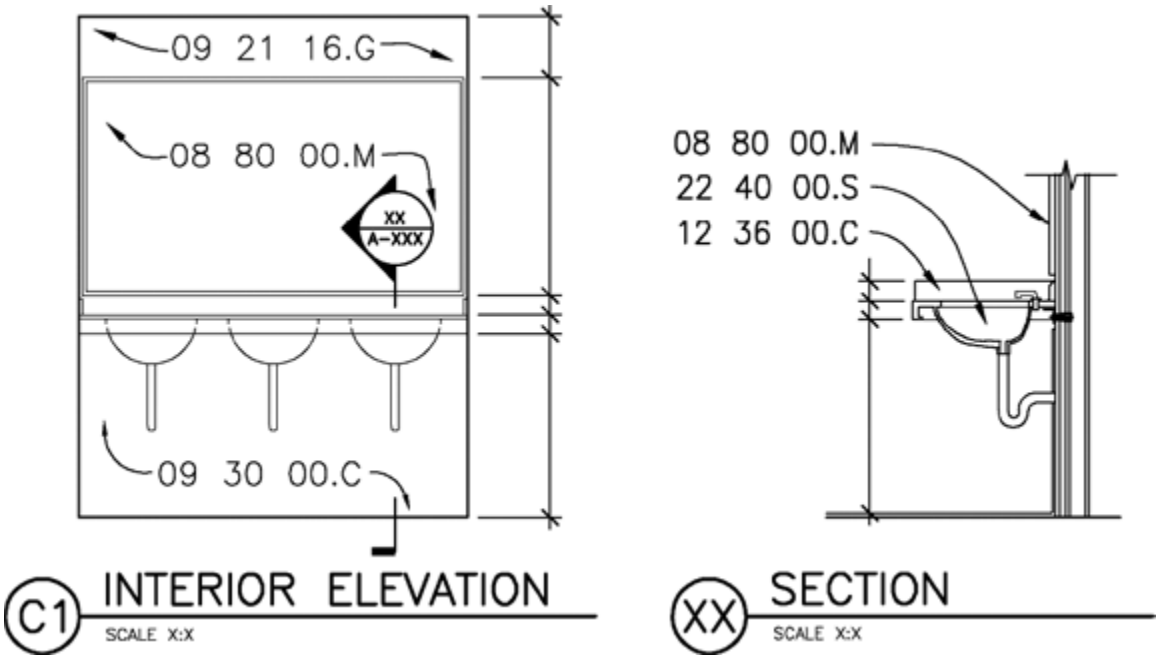
- *Access panels, including those furnished by Mechanical and Electrical plans. Indicate size.*
- *Louvers and grilles. Coordinate sizes with Mechanical plans.*
- *Electrical switchgear and panels.*
- *Large pipe and duct penetrations.*
- *Changes in wall materials, including acoustical applications.*
- *Door and borrowed light heights. Coordinate with coursing of masonry walls.*
- *Vertical dimensions and, in some cases, horizontal dimensions if not shown on the plans. Refer to* ***UDS Figure 4.3-6****.*
- *Power, telephone, data, and other outlets around casework, equipment, furnishings, and other places where the location is critical.*



UDS Figure 4.3-6 *Vertical dimensions.*

Guidelines for Interior Elevations

- *Coordinate extent of cabinets with Interiors and Equipment drawings.*
- *Indicate and locate by dimension expansion, seismic, masonry, and plaster control joints.*
- *If more than one material is scheduled for a room's wall, its extent should be graphically shown and dimensioned. Refer to* ***UDS Figure 4.3-7****.*
- *Indicate and dimension location of wall sconces.*



UDS Figure 4.3-7 *Material indications.*

Sheet Type 3 - Sections

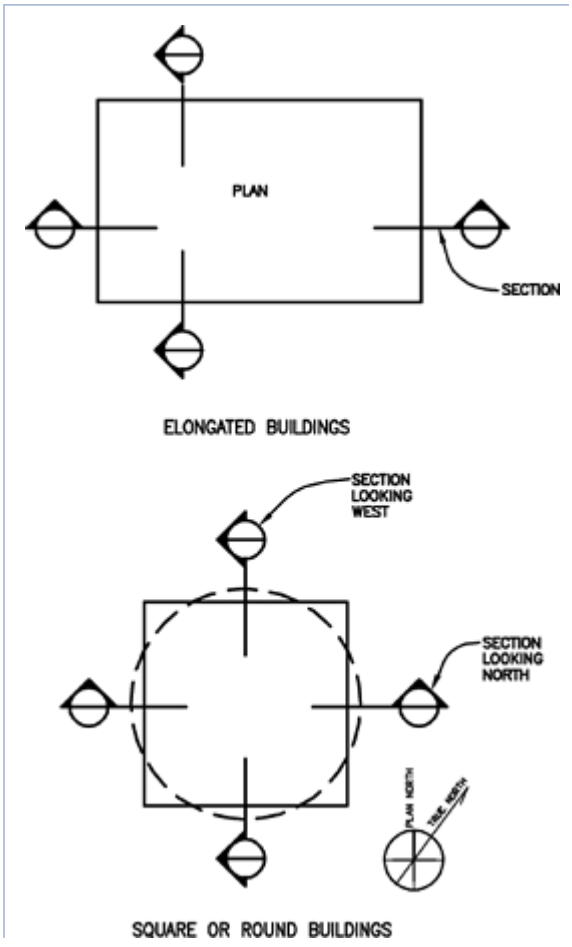
Building Sections

Building sections are usually drawn at the same scale as the floor plans and because of the small scale are used to indicate relationships of major spaces, vertical information, and major detail references.

Show as many sections as are necessary to describe the complexities of the project. Eliminate section details if they are located at exterior walls because these belong in wall sections, which are usually drawn at a larger scale. Also, eliminate duplication of reference to larger details normally referenced from the roof plan. Do not show interior elevations on building sections. Refer to ***UDS Figure 4.3-8****.*

The following list of items should be included in all building section drawings:

- *Key plan showing building section cut lines.*
- *Scale. Indicate scale on all building sections. See Scale, UDS section 4.2 for information on scale.*
- *Column grid lines, if used, should be shown at top of each section.*
- *Match lines, if used.*
- *Other building section references that intersect the building section. The tail of the intersecting building section reference should point in the direction that the section is cut.*
- *Room numbers within the section.*
- *Floor-to-floor dimensions. Do not show floor elevations.*



- *Finish grade.*
- *Ceilings and partitions that are cut in section.*
- *Major materials, symbols, and abbreviations lists. Show only a minimum amount of material indications where changes or termination of materials occurs.*

***UDS Figure 4.3-8** Indicating building sections.*

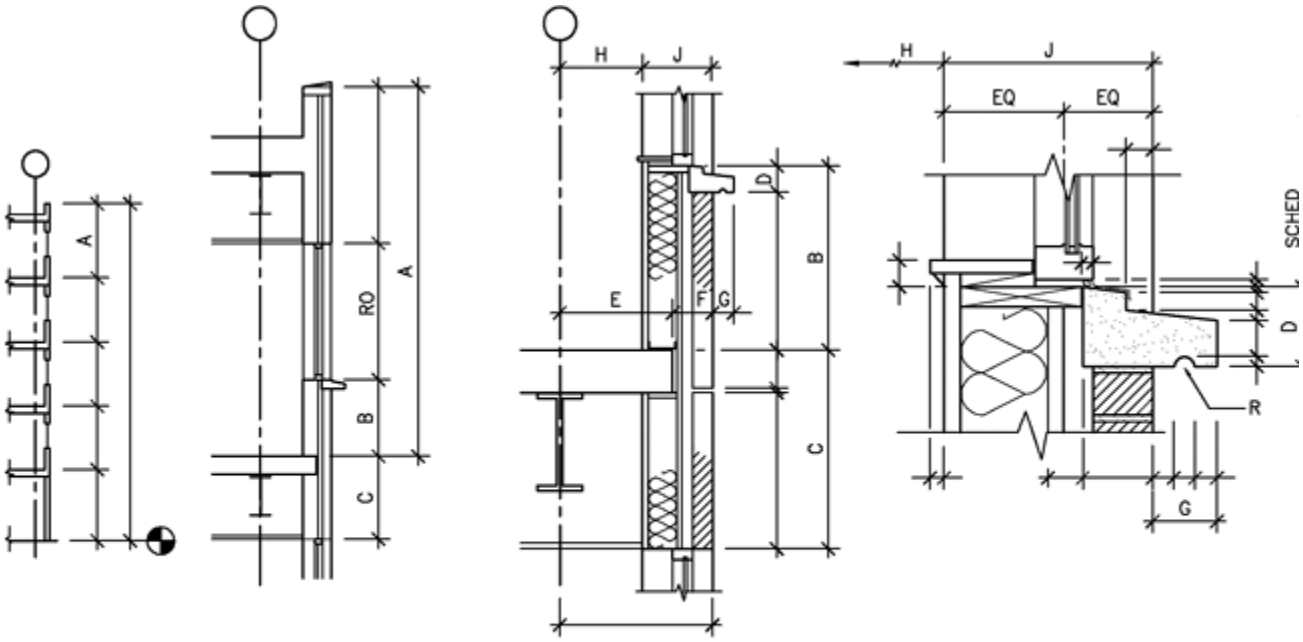
Wall Sections

*Provide wall sections to clearly indicate different wall conditions. Reference larger-scale details of areas such as window head and sill details, soffit and eave edges, parapets, shelf angles, and areas requiring flashing or fire-safing insulation. Do not duplicate information shown on large-scale details on wall sections. When more than one wall section is drawn on a sheet, align floors horizontally. Eliminate repetition of dimensions by observing the hierarchies shown in **UDS Figure 4.3-9**.*

Draw sections of all exterior wall types at a scale that allows the section to be drawn without break lines whenever possible. The following list of items should be included in wall section drawings:

- *Interior and exterior materials and finishes.*
- *Detail references.*
- *Finish grade.*
- *Floor levels, floor-to-floor dimensions. Do not show ceiling heights documented in Finish Schedule or on the reflected ceiling plan, unless it is necessary for clarification.*
- *Profile of built-in equipment against wall.*
- *Louvers. Coordinate with Mechanical.*
- *Masonry coursing relative to the dimensions shown on the section.*

To eliminate unnecessary repetition of information between the building sections, wall sections, and section details, a hierarchy of notations and dimensions should be established.



UDS Figure 4.3-9 *Hierarchy of dimensions.*

Sheet Type 4 - Large-Scale Views

Large-scale views are drawings reproduced at a larger scale to provide more detailed information that cannot be accommodated at the smaller-scaled drawing.

Enlarged Floor Plans

Place a dashed line around areas or rooms to be enlarged to provide more extensive detailing and dimensions. Stairwells, toilet rooms, elevator shafts, kitchens, laboratories, and mechanical and electrical rooms are examples of plans referenced to the enlarged plan. Do not duplicate information on smaller-scale plans, with the exception of room names and numbers, partition types, and column grids used for location references. Indicate overall dimensions of the area to be enlarged to establish the dimension string to be used in the enlarged plan.

Enlarged plans for elevator shafts should include a pit access ladder and the size and location of a sump pit, if one is used.

Auditoriums, kitchens, and laboratories are examples of rooms that usually require large-scale views and, in some cases, interior elevations.

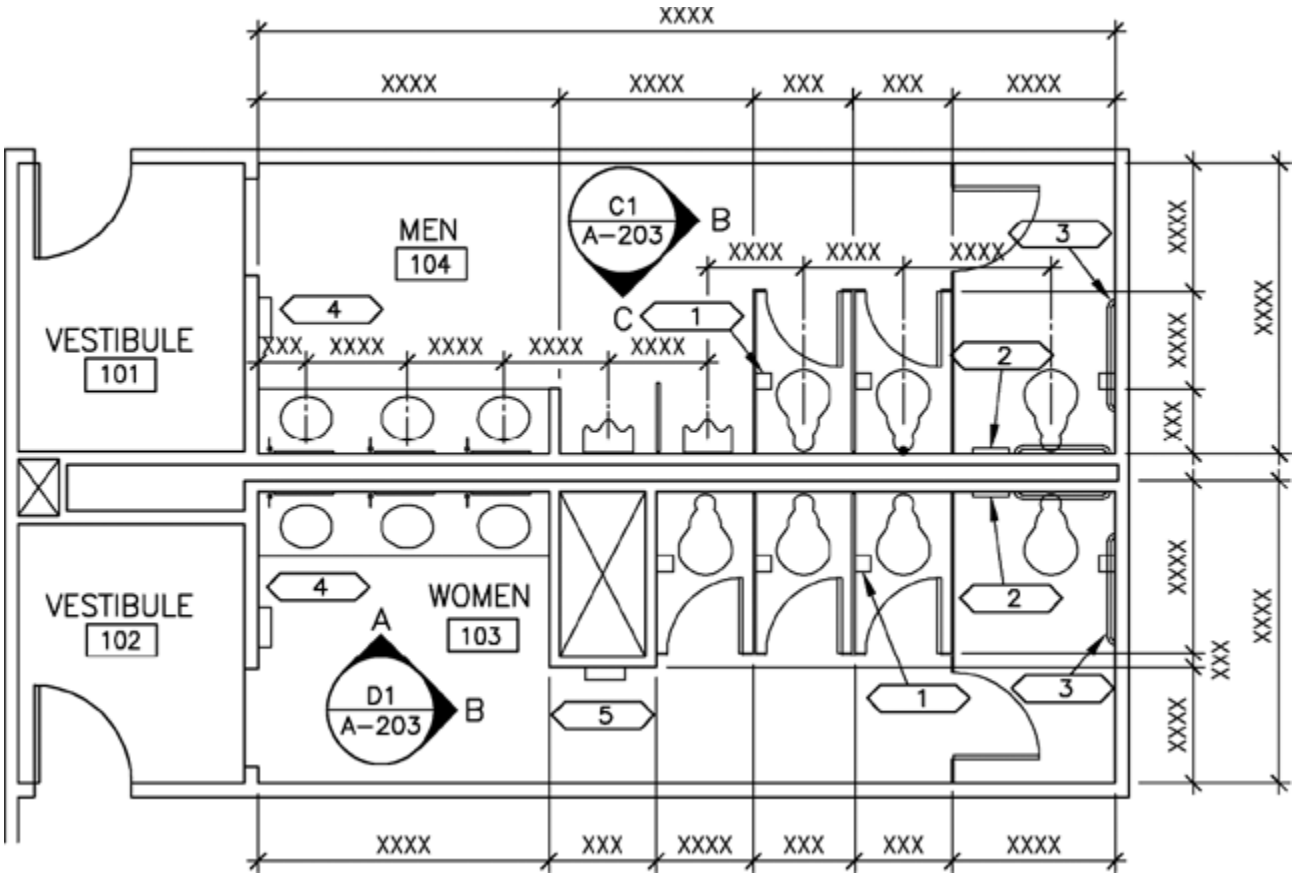
Enlarged plans are required for auditoriums with fixed seats to show the size and number of seats, aisle width, and floor elevations if the floors are stepped or sloped as well as other features such as projection and presentation equipment.

Enlarged kitchen or laboratory plans should indicate wall or overhead cabinets with a dashed line. Add elevation symbols and identify each cabinet with a reference shown on the elevation rather than the plan. Where cabinets change direction or abut walls, include filler panels to facilitate installation.

Toilet Rooms

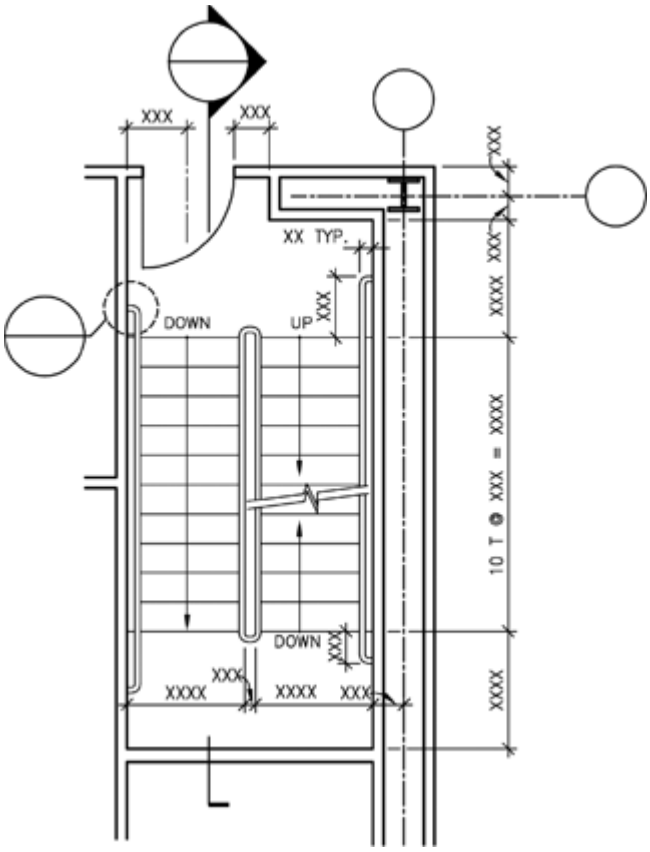
Identify toilet accessories and key to a diagram or schedule. Show dimensions to determine the width and length of toilet compartments and the dimensions of the surrounding walls.

Dimension the centerline of each plumbing fixture and tie all dimensions to a fixed point. Refer to ***UDS Figure 4.3-10****.*



UDS Figure 4.3-10 *Example of a toilet plan showing dimensioning, accessory identification, and reference to elevation.*

Group stair plans for all levels and place them next to the stairwell section. Show overall dimensions, number of treads, width, and length of flights. Refer to ***UDS Figure 4.3-11****. Show location of supports in consultation with the structural engineer.*

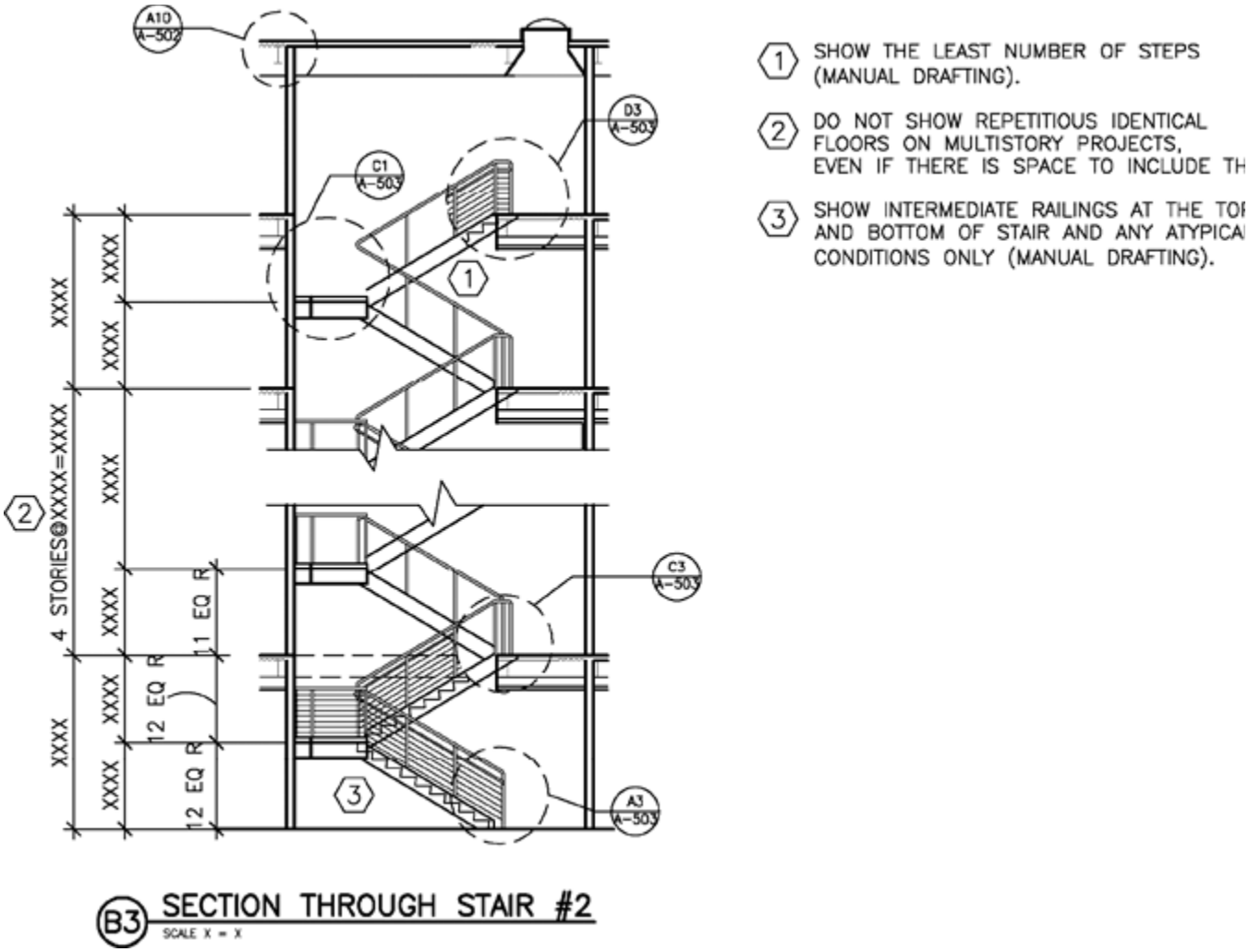


UDS Figure 4.3-11 *Stair plan.*

Stair Sections

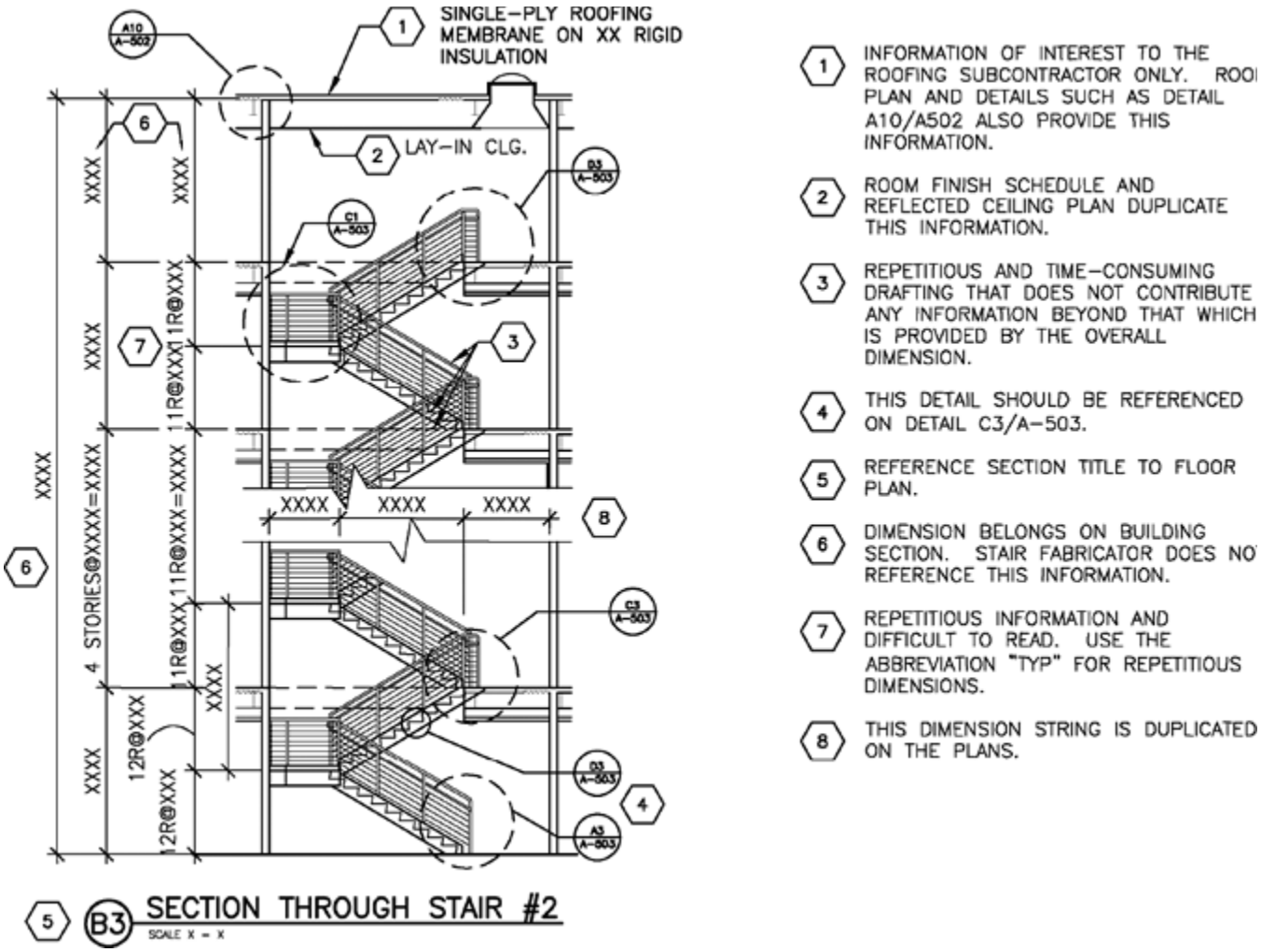
Stair sections should be tied to a reference grid such as a column number. Floor-to-floor heights, number of risers, and reference to enlarged details are also required. If possible, draw these sections adjacent to the plans associated with them. The first-level plan should be placed at the bottom of the sheet with subsequent levels arranged vertically above in an orderly succession. Clearly identify handrails, guardrails, and metal safety nosings.

Stair sections should show the number of risers, headroom dimension, and details for handrails and guardrails. Refer to ***UDS Figure 4.3-12****.*



UDS Figure 4.3-12 *Stair section.*

Caution should be paid to avoid overdrafting. Refer to ***UDS Figure 4.3-13****.*



UDS Figure 4.3-13 *Example of overdrafting.*

The following list of items should be included in stair section drawings:

- *Concrete stairs are detailed by Structural. Unless applied finishes are provided (i.e., terrazzo, granite, and special handrails), eliminate drawing these sections. Reference tread nosings, handrails, and other architectural features from floor plans or building sections.*
- *If fire hose or fire valve cabinets occur in stairs, show these in section and dimension heights and location.*
- *Tie dimensions to the number of risers and observe minimum clearances.*
- *Draw handrails and guardrails in detail.*
- *Draw a detail at slab edge and indicate whether the space below the first landing is enclosed by a furring partition.*
- *Indicate a ladder and roof hatch to access the roof. If roof access is through a stair penthouse, show a curb to raise the doorsill above the adjacent roof to facilitate flashing.*

The architect, in collaboration with the structural engineer, must indicate how the stair is supported. If hanger rods are used, their locations must be indicated in plan as well as on the section. If the enclosure is constructed of concrete masonry units, the locations of points of support must be coordinated with the locations of concrete-filled reinforced masonry cells.

Elevator Shaft Sections

Elevator manufacturers provide information for elevators. If elevator cabs are custom-designed, a set of interior elevations should be included in the elevator detail sheet. The elevator shaft section should show door height, pit ladder, dry sump (if required), and shaft vent. The section should refer to details for door head and sill (typical floor and slab on grade); slab edge at the wall tying the location of the edge to the grid; pit, ladder, and vent detail.

The following list of items should be included in elevator shaft section drawings:

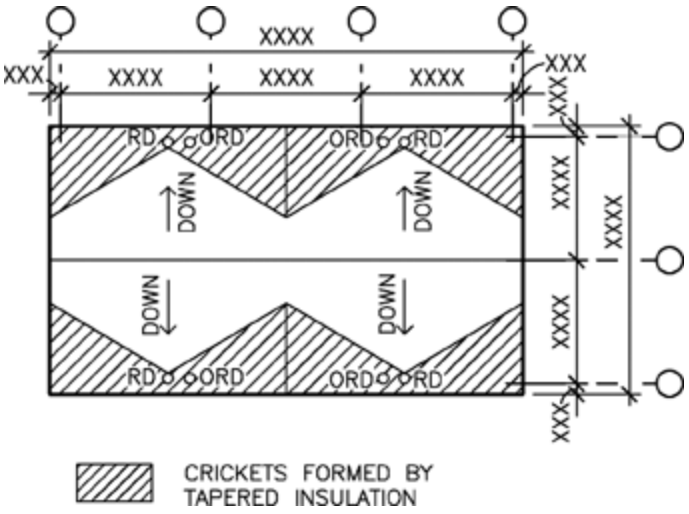
- *Show the elevator pit, ladder, and sills. Refer the latter two to enlarged details.*
- *Show the top of the shaft vent and pump room vent for hydraulic elevators.*
- *Indicate how the guide rails are supported where the floor-to-floor height exceeds the maximum allowable distance between rail supports. This will be based on information from the structural engineer.*
- *Detail door head and sill as well as slab edge for typical floor and sill at the pit.*
- *For traction elevators, show the machine room penthouse, indicate how the shaft is vented, and position the walls with enough clearances around the machine as required by the manufacturer(s).*
- *Where the elevator cab is customized, show interior elevations, finish materials, and dimensions.*

Sheet Type 5 - Details

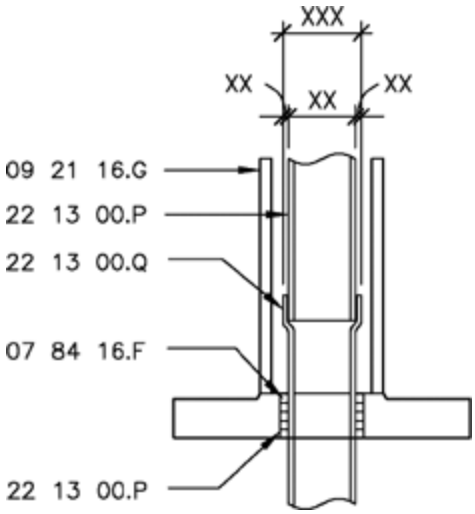
Detail Groups

Manufactured products should be represented by a simplified outline illustrating all the products listed as acceptable in the specifications. Details should take into account tolerances that may be listed in the specifications. Details are divided into three groups—horizontal or plan details, vertical or section details, and 3D details.

- *Horizontal details include column furring, partition type, expansion and control joints, fire hose cabinets, and other elements of the plan. Refer to* ***UDS Figure 4.3-14****.*
- *Vertical details originate either from wall sections, the building section, exterior or interior elevations, and stair or elevator sections. Refer to* ***UDS Figure 4.3-15****.*
- *3D details such as isometric drawings are used to help illustrate conditions that cannot be represented fully by 2D details.*



UDS Figure 4.3-14 *Horizontal details.*



UDS Figure 4.3-15 *Vertical details.*

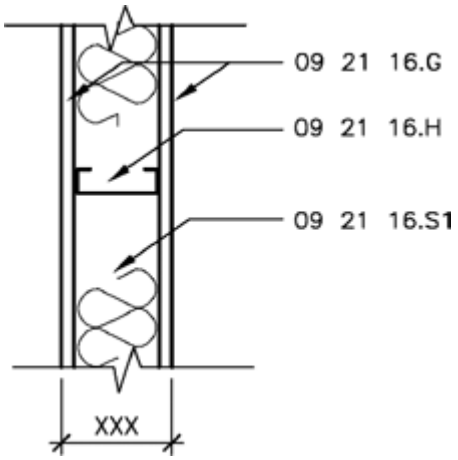
Sheet Type 6 - Schedules and Diagrams

Schedules take a tabular form while diagrams are graphic representations. Both provide a large amount of information in a limited space. Schedules may be placed either in the specifications or on the drawings. The following is a description of each:

Schedules

Schedules provide a consistent format for representing a related group of items. They are keyed to the drawings and, in addition to the headings, are divided into at least three main columns.

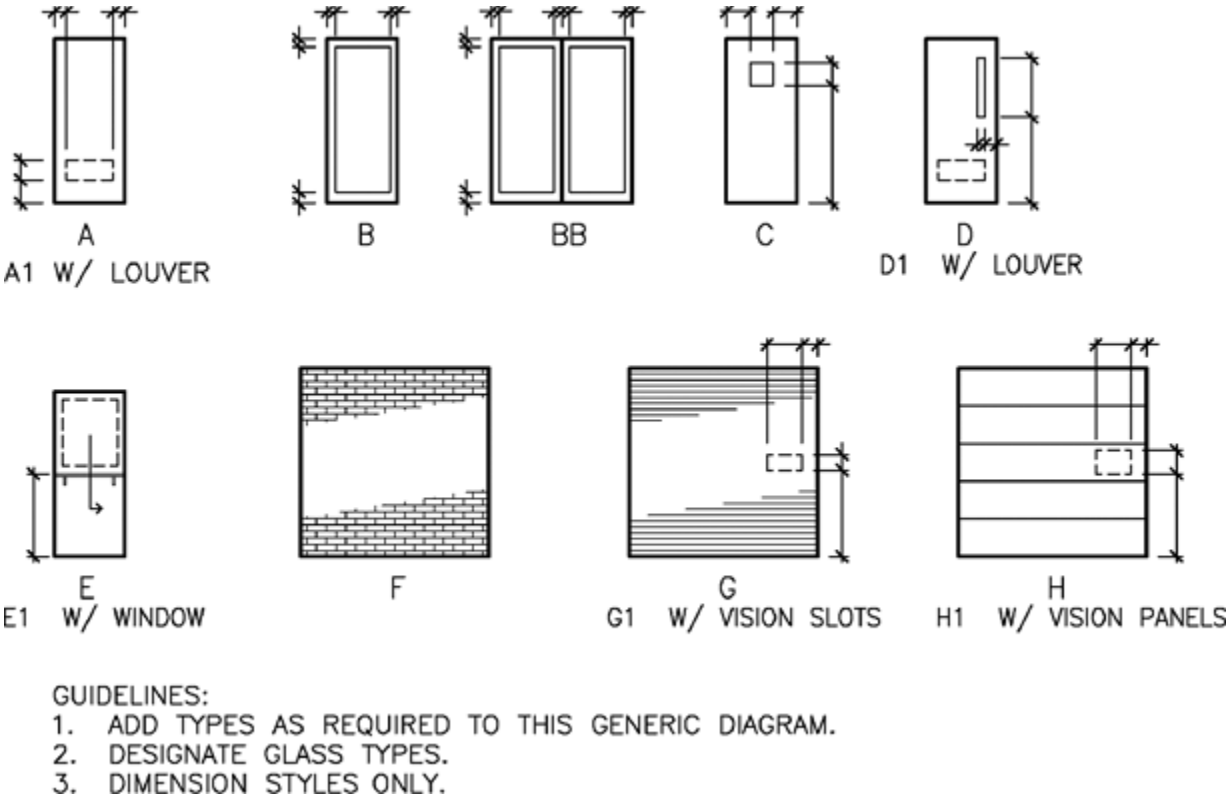
The format, types, and composition of schedules are addressed in detail in Schedule Formats, UDS section 3.8.



***UDS Figure 4.3-16** Partition type.*

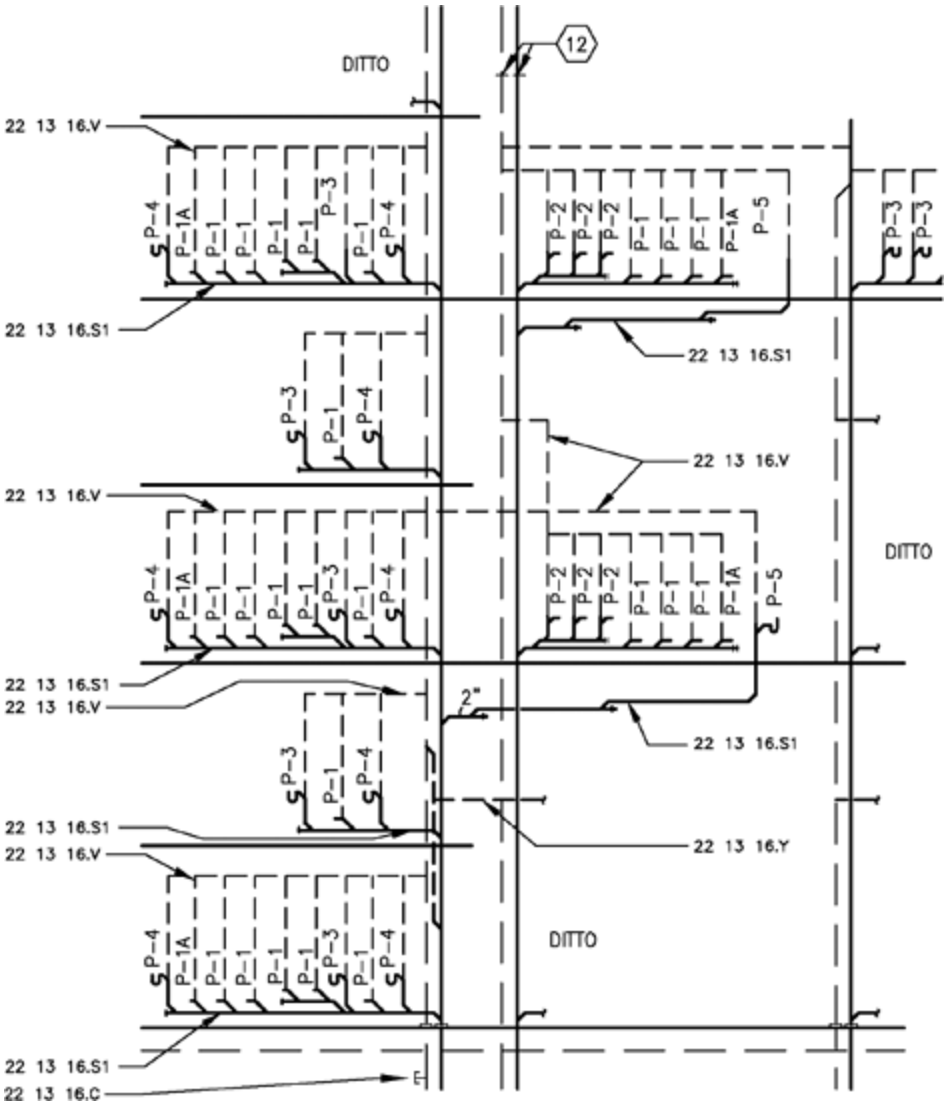
Diagrams

*Diagrams are graphic representations that are usually not drawn to scale but can be noted with dimensions. They may represent a plan of a partition as shown in **UDS Figure 4.3-16**, or an elevation such as a casework, louver, window, or door type. Refer to **UDS Figure 4.3-17**.*



***UDS Figure 4.3-17** Door types.*

*They may be schematic in nature such as mechanical, plumbing, and electrical riser diagrams. Refer to **UDS Figure 4.3-18**.*

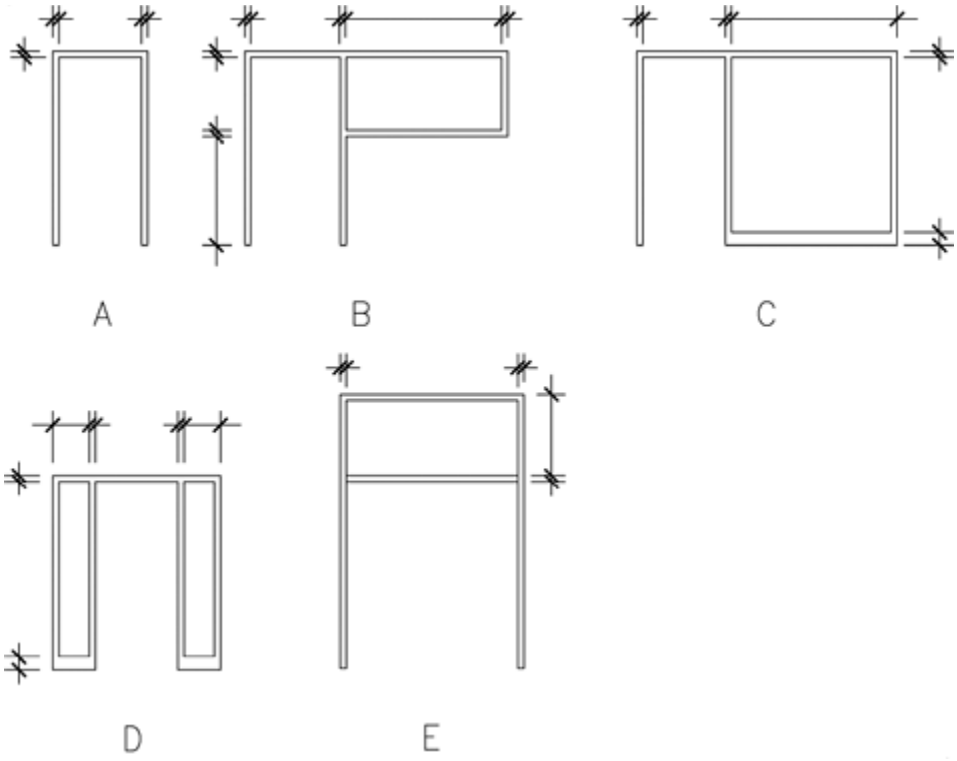


UDS Figure 4.3-18 *Riser diagram.*

Door and Frame Types

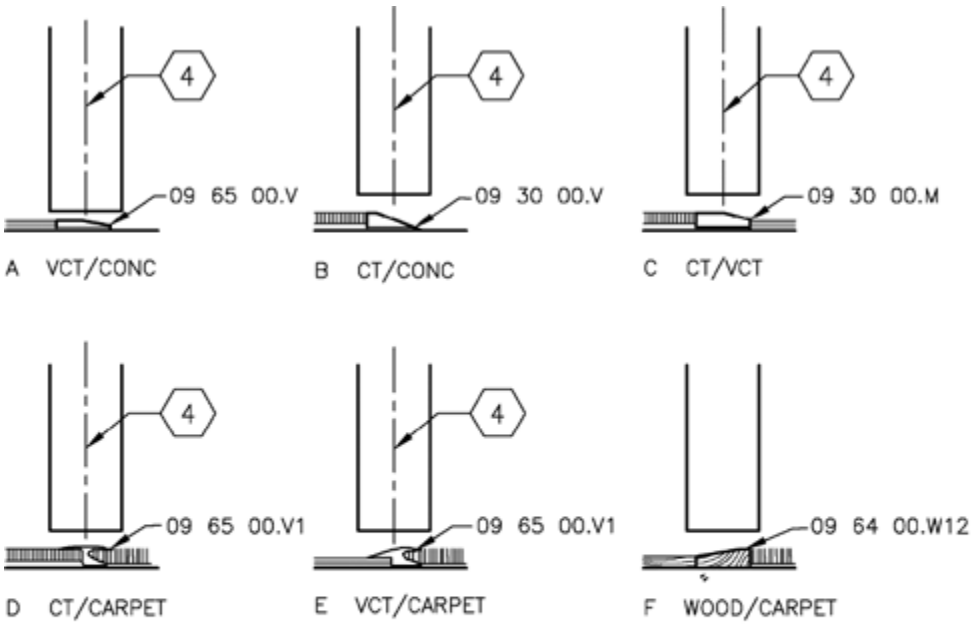
Door types, refer to ***UDS Figure 4.3-17****, like diagrams, may not be drawn to scale because a door elevation may represent doors that look the same but have different dimensions. Types may also represent doors constructed from different materials. The same type may represent a wood or hollow metal door. The door schedule differentiates among these doors by describing the door type, the material, and the dimensions of each. Refer to UDS Appendix B - Schedule Formats, UDS section 3.8.*

In a similar manner, door frame types represent the frame shape. Refer to ***UDS Figure 4.3-19****. If all the frames are similar, the frame type column in the schedule may not be needed. A frame surrounding a single or double door should be the same type because it has the same shape and the door schedule will list the different widths. Other frame types include frames with a sidelight, frames with a sidelight on both sides, smoke barrier door frames, frames containing a door with a transom.*



UDS Figure 4.3-19 *Door frame types with sidelights and transoms.*

Door types may be drawn on a sheet that also includes door frame details, details for exterior thresholds, and interior demarcation between floor materials under the doors, refer to ***UDS Figure 4.3-20****, as well as the door schedule.*



GUIDELINES:

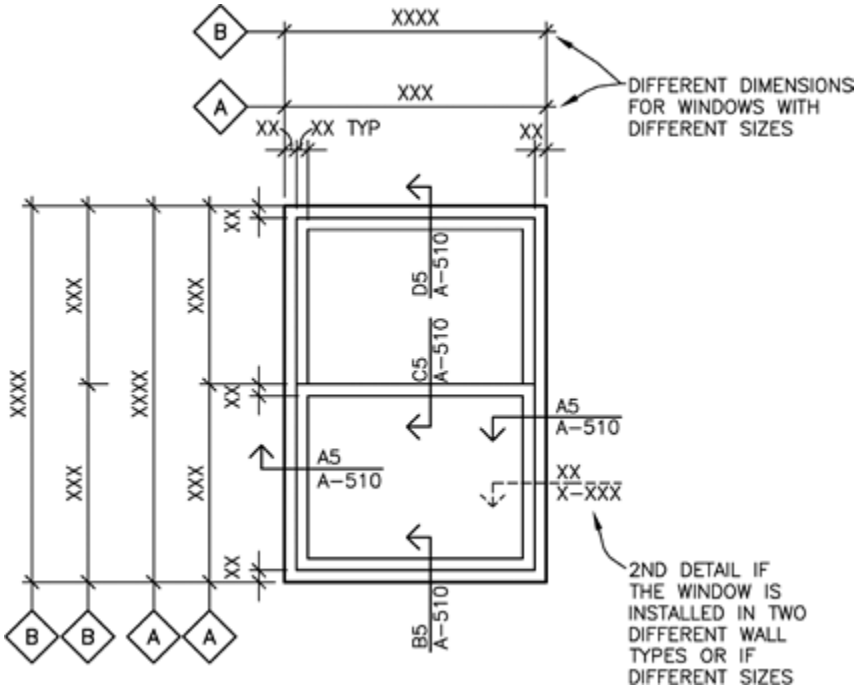
1. ADD DETAILS AS REQUIRED TO THIS GENERIC GROUP OF DETAILS. WRITE "NOT USED" ON DETAILS NOT OCCURRING IN THE PROJECT AT HAND.
2. IN THE DOOR SCHEDULE UNDER THE "THRESHOLD" COLUMN, WRITE THE APPLICABLE DETAIL NUMBER. FOR EXAMPLE, "A2C/A_____" WHERE "A2" IS THE GENERIC DETAIL FOR ALL THRESHOLDS AND "C" IS CT/VCT.

UDS Figure 4.3-20 *Threshold details.*

Alternatively, the schedule may be included in the specifications. Borrowed lights may also be included on this sheet.

Window Type

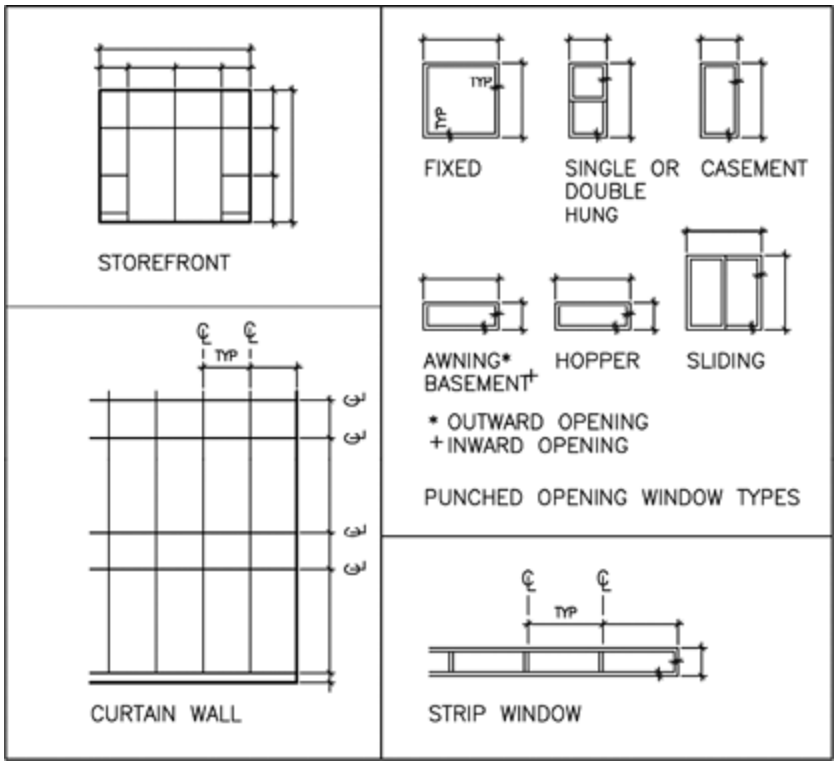
Window types are drawn and either dimensioned, refer to ***UDS Figure 4.3-21*** *or combined with a window schedule. Refer to* *UDS Appendix B - Schedule Formats, UDS section 3.8*.



UDS Figure 4.3-21 *Double-hung window type with dimensions representing two window sizes.*

The actual window frame size dimension should be shown and a general note determining the joint width should be added to the sheet.

It is important to group the windows according to the type of system selected for each opening if the specifications contain descriptions for more than one system. For instance, some projects contain a curtain wall system, a storefront system, and a punched window system. Refer to ***UDS Figure 4.3-22****. Following is a brief description of each type.*

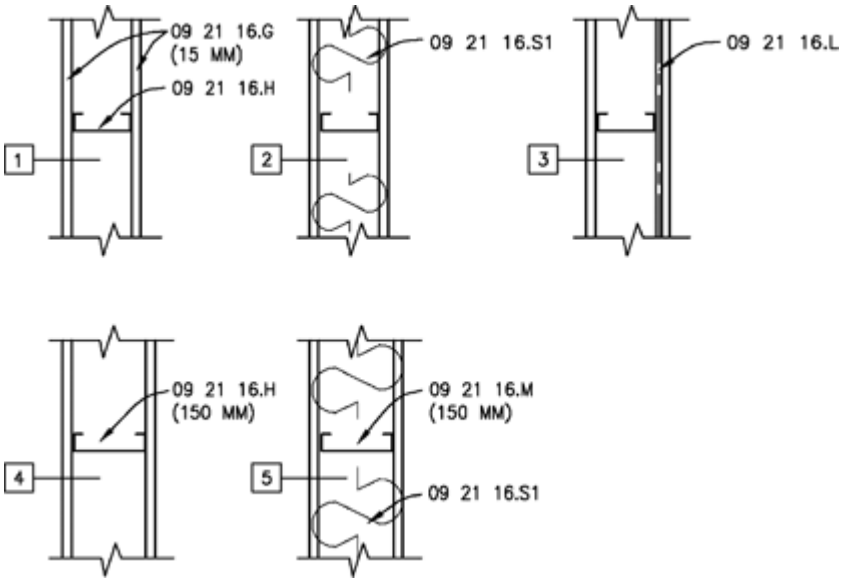


UDS Figure 4.3-22 *Window types.*

Window frame details should be keyed to details placed in the same sheet as the types and schedule (if used). If the same window type is installed in more than one type of exterior wall (e.g., brick veneer and metal-clad walls), place keys for each type to show the different details at each location.

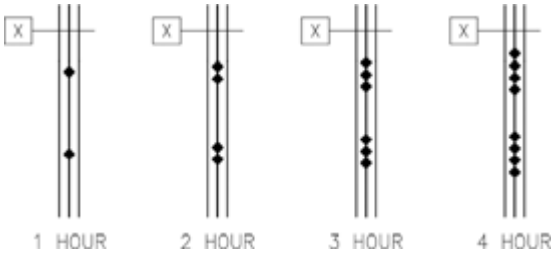
Partitions

Partitions may be represented on the floor plans by a wall-type identifier, refer to Symbols, UDS section 6.2, Division 1, containing a sequential alphanumeric designation. Refer to ***UDS Figure 4.3-23****. Do not add types to indicate finishes.*



UDS Figure 4.3-23 *Examples of modifications to a general purpose partition.*

*A legend similar to **UDS Figure 4.3-24** should be included on all floor plans.*



***UDS Figure 4.3-24** Representation of fire-rated partitions on the floor plan.*

Sheet Types 7 & 8 - User Defined

These series of sheets allow the user to accommodate sheet types that do not fall under any of the types described in this article.

Sheet Type 9 - 3D Representations

3D views consist of axonometric drawings, oblique drawings, perspectives, and photographs. They are used to assist the viewer in comprehending complex 3D relationships of shapes.

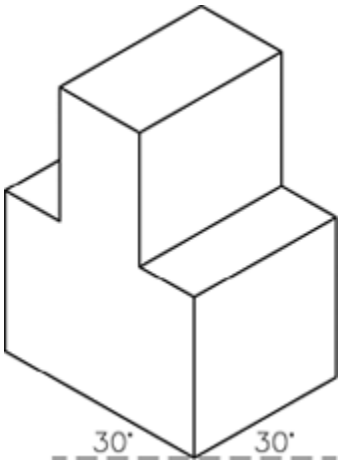
Axonometric Drawings

*Axonometric is a general term used to describe one of three methods of 3D projection: isometric, dimetric, and trimetric. All three methods represent two vertical and one horizontal plane parallel to corresponding established axes at true dimensions. The difference among the three methods is the angles and scales used to execute the drawing. The most commonly used are isometric and dimetric representations. Isometric drawings are drawn with all three axes at 120 degrees relative to each other. Refer to **UDS Figure 4.3-25**.*

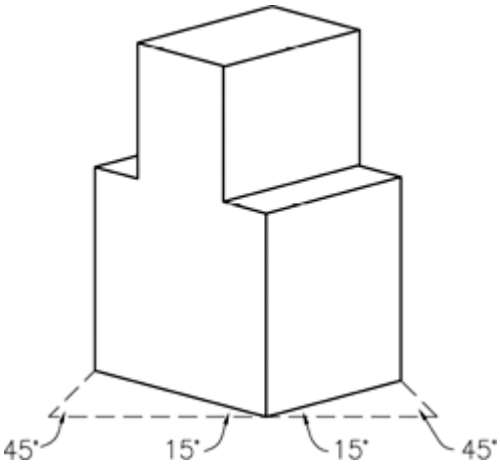
*Dimetric drawings project the three planes at different angles and scales to simulate a true perspective. One of the most commonly used diagrams for producing a dimetric drawing is illustrated in **UDS Figure 4.3-26**.*

Oblique Drawings

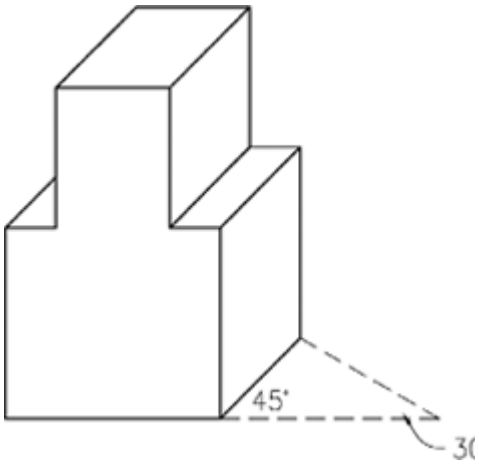
*Oblique drawings are similar to diametric drawings except that one plane is parallel to the drawing plane. Refer to **UDS Figure 4.3-27**.*



***UDS Figure 4.3-25** Axonometric isometric drawing.*



***UDS Figure 4.3-26** Axonometric dimetric drawing.*



***UDS Figure 4.3-27** Oblique drawing.*

Perspectives

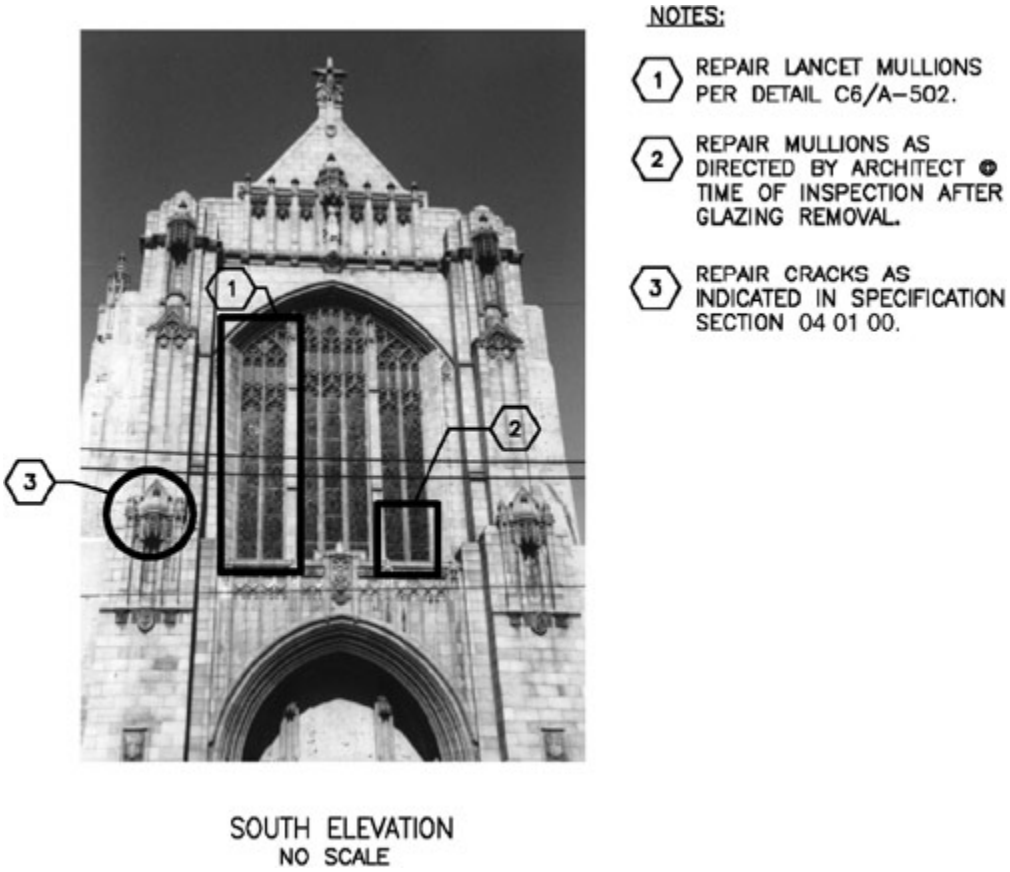
Perspectives, unlike axonometric or oblique drawings, are represented by parallel lines that meet at a vanishing point located at the horizon. This gives the structure a true image similar to a photograph.

Photographs

Generally, photographs are used as a means of delineating new work to be performed on existing conditions. In historic remodeling, it is quite acceptable to use a regular camera to photograph ornate trim work and note on the picture what repair work must be done to restore the original trim. Refer to ***UDS Figure 4.3-28****.*

Photographs are often used in presentations to show an existing site with a proposed building superimposed within the picture. Digitizing the photograph and entering it into a computer program as a background or environment and then overlaying a digitally modeled building in matching perspective is the method used to achieve this representation.

A symbol should be indicated on plans and elevations denoting where and at what angle the photographs were taken. Refer to Symbols, UDS section 6.1, Symbols Classification for symbols types.



UDS Figure 4.3-28 *Photograph.*

Photography may also be used to generate drawings of an existing building using special calibrated camera equipment that superimposes a grid of points on the image. The resulting image is compensated for film and perspective distortion by digitizing the points using special computer software.

Module 4 - Drafting Conventions

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4.4 MOCK-UP DRAWING SET

Mock-Up Set, Cartoon Set, Story Book Set, and Mini-Set are names referring to drawings (or sketches) usually reproduced at 1/4-size representing all the project sheets required for a phase of the construction drawings. The mock-up is either manually sketched or CAD generated.

The mock-up set assists in the planning of the entire drawing set by assigning graphic and textual information to specific sheets in the construction document set. It uses standards provided by Drawing Set Organization, Sheet Organization, and other UDS modules.

It is preferable that this reduced set of drawings be started at the onset of the design devel-opment phase or before. The step-by-step procedures for producing a mock-up follow.

Mock-Up Set Procedures

***Step 1:** Compile a sheet list based on the Sheet Type Designators described in the Drawing Set Organization, UDS section 1.3. Identify each sheet using the designators described under Sheet Identification, UDS section 2.3. Format the sheets as prescribed in the Sheet Organization Module.*

***Step 2:** Create in CAD a blank project sheet at 1/4-size and make a number of copies on which to draw the mock-up.*

***Step 3:** Reduce the drawings from the preceding phase of the project and paste on the sheets either by using CAD or manually. Augment with added drawings from the sheet list.*

***Step 4:** Circle items that require detailing. Eliminate repetition by identifying typical details. Enlarge these circled areas to the appropriate scale, refer to Scale, UDS section 4.2 and place in the subdivided sheets. Add bubbles containing the number of each detail to the sheets from which the details were enlarged.*

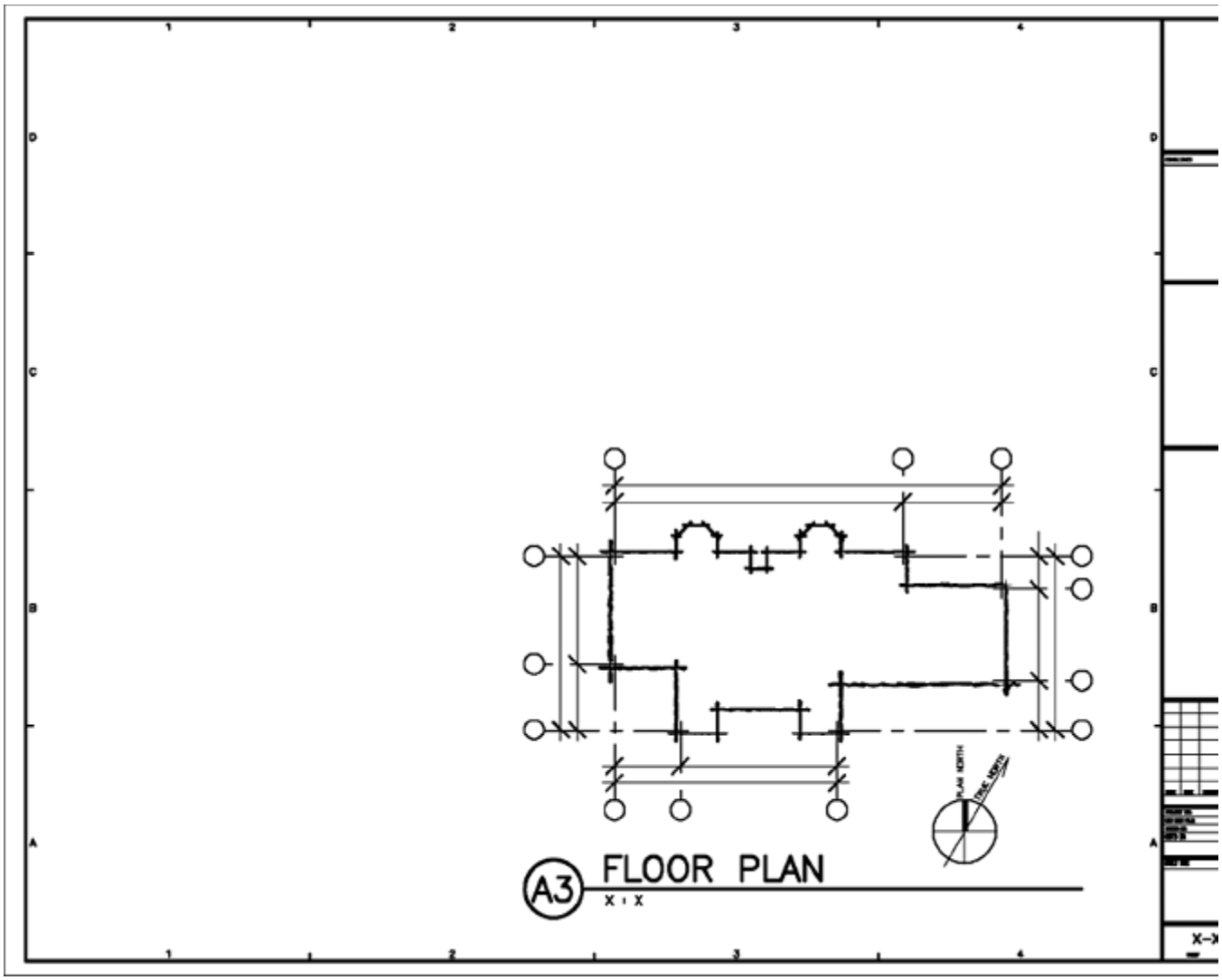
***Step 5:** Identify rooms that require interior elevations using the symbols shown in Symbols. Sketch each elevation on the appointed sheet(s).*

***Step 6:** If the schedules are to be included in the drawings rather than in the specifications, estimate the size of schedules by counting the number of items to be included in them.*

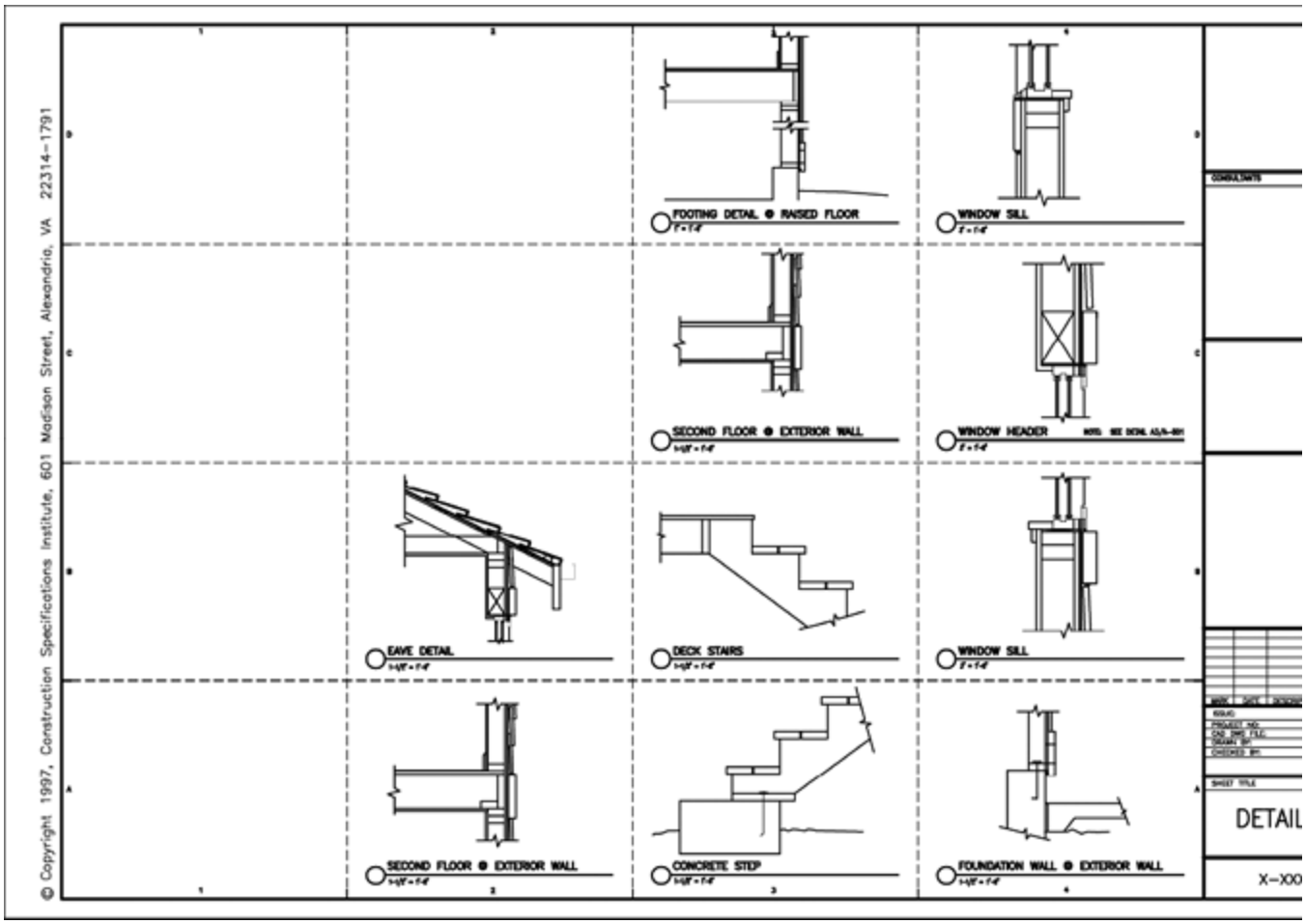
***Step 7:** Sketch diagrams representing partition, door, window, etc. Refer to Sheet Types, UDS section 4.3. The sketching should show only the space requirement at this early stage in the project.*

***Step 8:** Allocate space for 3D representations if required for the project. Also assign one sheet for miscellaneous details.*

*The mock-up must convey as much relevant information to the project team as necessary to show organization, numbering, and outline content. If CAD is used, enlarge or reduce the drawing from the preceding phase to generate details. After the drawing is generated, paste on the detail sheet. Refer to the UDS Appendix C - Influences Table, UDS section 1.8 for sheet groupings, format, subdivisions, and numbering. Also, identify standard details to be retrieved from the firm's standard details library, reduce to 1/4-size, and paste on their respective sheets. Refer to **UDS Figures 4.4-1** and **4.4-2**.*



UDS Figure 4.4-1 *Mock-up of a plan sheet.*



UDS Figure 4.4-2 *Mock-up of a detail sheet.*

Mock-Up Guidelines

The following items should be considered in preparing a mock-up drawing set:

- *Establish minimum standard sheet size from largest unbroken plan footprint, elevation, or section. Use standard sheet sizes as provided in Sheet Organization, UDS section 2.2.*
- *Choose a scale factor for the mock-up set as directed by Sheet Organization, UDS section 2.4.*
- *Develop a comprehensive list of scaled and non-scaled views to be added to drawing sheets. The mock-up worksheet is provided at the send of this section to assist in this tabulation.*
- *Determine the extent of the participation of each of the various disciplines. Use discipline designators as shown in Drawing Set Organization, UDS section 1.3 and UDS Appendix A - Discipline Designators, UDS section 1.6 level one or level two designators as required.*
- *Assign scaled and nonscaled views to appropriate sheets based on Sheet Organization, UDS section 2.4 and Drawing Set Organization, UDS section 1.3.*
- *Review drawing categories to check for completeness.*

Mock-Up Worksheet

A mock-up worksheet is a tool intended to help the drawing organizer estimate the total number of drawings and the total amount of production time required to develop a comprehensive drawing set. Additional space on the back or another sheet may be needed to list the total number of small-scale details and/or schedules the project requires. Refer to the Mock-Up Worksheet below.

MOCK-UP WORKSHEET							
SHEET NUMBER	***SHEET NAME***	***NUMBER OF VIEWS***	***LIST OF VIEWS (Include All Disciplines)***	***SCALED SIZE***	***NUMBER OF HOURS PER SHEET***	***ASSIGNED TO:***	***COST PER SHEET***
						TOTAL COST	

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Module 5 - Terms and Abbreviations

TABLE OF CONTENTS

Key: = Section contains a downloadable Microsoft Excel document

Module 5 - Terms and Abbreviations

5.1 INTRODUCTION

The *Terms and Abbreviations Module* establishes guidelines for consistent terminology used in the construction industry. Consistent terms ensure clear and concise communication among the architect, owner, contractor, and consultants. The purpose of this Module is to provide a standard for construction document terms and abbreviations.

The *Terms and Abbreviations Module* provides the following:

- A consistent standard of communication in construction documents.
- A searchable list of common terms and abbreviations used in the construction industry.
- Consistent spelling of terms and abbreviations.
- Notes on common use and non-preferred terminology.

Uses

The Module provides a standard for the use of terms and abbreviations. A standard gives the professional office an efficient way to quickly determine the proper term and its abbreviation. It also helps intern architects and designers become familiar with the industry standards.

Objectives

The objective of the Module is to provide a standardized resource for construction terms and their abbreviations. It is not the objective of the Module to encourage the use of abbreviations. *The Project Resource Manual - CSI Manual of Practice* states that, whenever possible, terms should be spelled out and abbreviations should be used only to reduce time and space or where appropriate to improve clarity. The increased use of computer-aided drafting (CAD) has reduced the time required for writing text and notes on drawings, and the need for abbreviations. The use of obscure or undefined abbreviations results in a flawed project. When the meaning of an abbreviation is in doubt, spell it out!

Methodology

The terms included in this Module were selected using the following criteria:

- The term has six or more letters. Terms with five letters or fewer should not be abbreviated. However, certain commonly used terms (such as "build" and "center") have been included.
- Trade association acronyms, such as UL, ASTM, and NFPA, have been included if the organization publishes standards likely to be referenced on drawings.
- Common English language terms have not been included. Some examples are "afternoon" (PM) and "Central Standard Time" (CST).
- Abbreviations representing professional licenses, certifications, or memberships associated with a person's name are not included. It is assumed that the professional, whose name is on the documents, will define and control the proper format of his name. American Institute of Architects (AIA), Professional Engineer (PE), and Certified Construction Specifier (CCS) are examples.
- Terms in conflict with industry-accepted terminology do not have abbreviations. The proper term is shown in the "Notes" column and its abbreviation is in the Module.
- Symbols that contain letters are not abbreviations.

Guidelines

- Do not abbreviate words of five letters or fewer, except in schedules. A schedule column heading may need an abbreviation to reduce the size of the column and the overall size of the schedule.
- Avoid the use of abbreviations with more than one meaning. Generally the shared abbreviations in *Abbreviations, UDS section 5.3* are from different disciplines. Therefore, the context or the location within the drawing set should make the intended term obvious. However, if it does not, spell out the term.
- Show the source or a list of abbreviations on the General sheets. Two ways to accomplish this are:
  - Reference the *Terms and Abbreviations* Module.
  - Include a selected list derived from the Terms and Abbreviations Module. The organization and location of the General sheets are included in *UDS Appendix B - Sheet Identification Examples, UDS section 1.7*
- If any doubt or confusion exists about the meaning of the abbreviation, do not use the abbreviation. Clarity is paramount and must not be sacrificed.

Organization of Terms and Abbreviations

Terms and abbreviations are presented in two easily accessible formats. The first format is in alphabetical order by term and the second in order by abbreviation. Terms, and their abbreviations, are listed with any other term that shares the same abbreviation. Terms that should be avoided are also included with a listing of the preferred term in the "Notes" column. These terms do not have an abbreviation because they should not be used.

Module 5 - Terms and Abbreviations

5.2 TERMS

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A B C D E F G H I J K L M N O P Q R S T U V W Y

Term	Abbreviation	Shared Abbreviation	Notes
A			
abandon	ABAN		
abbreviation	ABBRV		
abnormal	ABNL		
above finished counter	AFC	automatic frequency control	
above finished floor	AFF		
above finished grade	AFG		
above finished slab	AFS		
above suspended ceiling	ASC	amps short circuit; asphalt surface course	
abrasive	ABRSV		
abrasive hardness	Ha		
abrasive resistant	ABRSV RES		
absolute	ABS	acrylonitrile butadiene styrene	
absorption	ABSORB		
access door	ACS DR		
access floor	ACS FLR		
access panel	ACS PNL		
accessible	ACC		
ac disconnect	ACD		
acid/alkaline scale	pH		
acid resistant	ACID RES		
acid resistant cast iron	ACID RES CI		
acid resistant pipe	ACID RES P		
acid resistant vent	ACID RES V		
acid resistant waste	ACID RES W		
acid vent	AV	air vent; audio visual	
acid waste	AW	actual weight; architectural woodwork	
acid waste line	AWL		
acoustic	ACST		
acoustic calking	—		acoustic sealant
acoustical ceiling tile	ACT		
acoustical insulation	ACOUS INSUL		
acoustical panel	ACOUS PNL		

acoustical panel ceiling	APC		
acoustical plaster	—		acoustical finish
acoustical tile ceiling	ATC		
acoustical wall treatment	AWT		
across	ACR		
acrylonitrile butadiene styrene	ABS	absolute	
actual weight	AW	acid waste; architectural woodwork	
addendum	ADDM		
additional	ADDL		
adhesive	ADH		
adjacent	ADJ	adjoining; adjustable	
adjoining	ADJ	adjacent; adjustable	
adjustable	ADJ	adjacent; adjoining	
administration	ADMIN		
aggregate	AGGR		
aggregate base course	ABC	Associated Builders and Contractors	
air condition	A/C		
air conditioning unit	A/C UNIT		
air cooled condensing unit	ACCU		
air handling unit	AHU		
air pressure drop	APD		
air pressure return line	APR		
air separator	AS	ammeter switch	
air supply unit	ASU		
air vent	AV	acid vent; audio visual	
air water pump	AWP		
alarm	ALM		
alarm annunciator panel	AAP		
alignment	ALNMT		
allowance	ALLOW		
alteration	ALTRN		
alternate	ALT	altitude	
alternate number	ALT NO		
alternating current	AC	armored cable; asbestos cement; asphaltic concrete	
alternative	—		alternate
altitude	ALT alternate		
aluminum	ALUM		
aluminum cable steel reinforced	ACSR		

ambient	AMB	
American Architectural Manufacturers Association	AAMA	
American Association of Cost Engineers	AACE	
American Concrete Institute	ACI	
American Gas Association	AGA	
American Institute of Architects	AIA	
American Institute of Steel Construction	AISC	
American National Standards Institute	ANSI	
American Plywood Association	APA	
American Society for Testing and Materials	ASTM	
American Society of Civil Engineers	ASCE	
American Society of Heating, Refrigerating, and Air Conditioning Engineers	ASHRAE	
American Society of Mechanical Engineers	ASME	
American Standard Elevator Codes	ASEC	
American steel wire gauge	ASWG	
American Water Works Association	AWWA	
American Welding Society	AWS	
American wire gauge	AWG	
American Wood Preservers' Association	AWPA	
Americans with Disabilities Act	ADA	
ammeter switch	AS	air separator
amount	AMT	
ampere	AMP	
ampere hour	AH	
ampere interrupting capacity	AIC	
amplifier	AMPL	
amplitude modulation	AM	
amps short circuit	ASC	above suspended ceiling; asphalt surface course
anchor	AHR	
anchor bolt	AB	
and so forth	ETC	et cetera
angle	L	liter
angle beam	ANG BM	
angle stop valve	ASV	
annunciator	ANN	

anodize	ANOD		
antenna	ANT		
apartment	APT	Association for Preservation Technology	
appearance	APP	atactic propylene	
appendix	APPX		
apply	—		install
approved	APPD		
approximate	APPROX		
Architect	ARCH		
architect/engineer	A/E		
Architect's Supplemental Instruction	ASI		
architectural finish	ARF		
architectural woodwork	AW	acid waste; actual weight	
Architectural Woodworking Institute	AWI		
area drain	AD		
armored cable	AC	alternating current; asbestos cement; asphaltic concrete	
article	ART		
as-built	—		record drawings
as required	AR		
asbestos	ASB		
asbestos cement	AC	alternating current; armored cable; asphaltic concrete	
asphalt	ASPH		
Asphalt Institute	AI		
asphalt roofing	—		built-up roofing
asphalt surface course	ASC	above suspended ceiling; amps short circuit	
asphaltic concrete	AC	alternating current; armored cable; asbestos cement	
asphaltic concrete paving	ACP	automatic control panel	
assembled cooling unit	ACU		
assembly	ASSY		
Associated Builders and Contractors	ABC	aggregate base course	
Associated General Contractors of America	AGC		
association	ASSN		
Association for Preservation Technology	APT	apartment	
asymmetrical	ASYM		
atactic propylene	APP	appearance	

atmosphere	ATM	automatic teller machine	
attachment	ATCH		
attention	ATTN		
audio frequency	AF		
audio visual	AV	acid vent; air vent	
authority having jurisdiction	AHJ		
auto transformer	AUTO XFMR		
automatic	AUTO		
automatic air damper	AAD		
automatic air vent	AAV		
automatic check valve	ACHKV		
automatic control panel	ACP	asphaltic concrete paving	
automatic control system	ACS		
automatic control valve	ACV		
automatic door closer	ADC		
automatic door seal	ADS		
automatic frequency control	AFC	above finished counter	
automatic sprinkler	ASKLR		
automatic sprinkler drain	ASD		
automatic sprinkler riser	ASR		
automatic teller machine	ATM	atmosphere	
automatic transfer switch	ATS		
auxiliary	AUX		
auxiliary power unit	APU		
avenue	AVE		
average	AVG		
awning window	AWN WDW		
axial flow	AX FL		
azimuth	AZ		

B

back of curb	BC	between centers; bolt circle; bookcase; bottom chord; brick color; building code	
back to back	B/B		
backboard	BKBD		
backdraft damper	BDD		
backflow preventer	BFP		
background	BKGD		
backing	BKG		
backing rope	—		joint backer

baffle	BAF		
baggage	BAG		
balance	BAL		
balcony	BALC		
balestrades	—		railing
ball valve	BV		
ballast	BLST		
balled and burlapped	B&B	bell and bell; grade B or better (lumber)	
bar joists	—		steel joists
base board radiator	BBR		
base line	BL	building line	
base plate	B PL		
baseboard	BB	bulletin board	
basement	BSMT		
basic insulation level	BIL		
bathtub	BT		
batt insulation	—		blanket insulation
batten	BAT	battery	
battery	BAT	batten	
bay window double hung	BAY WDW DH		
beam	BM	benchmark; bending moment	
beam, standard	S BM		
beam, wide flange	WF BM		
bearing	BRG		
bearing plate	BRG PL		
bed joint	BJT		
bedding	BDNG		
bedroom	BR		
bell and bell	B&B	balled and burlapped; grade B or better (lumber)	
bell and flange	B&F		
bell and spigot	B&S		
bell mouth	BL MTH		
below	BLW		
below ceiling	BLW CLG		
below finish floor	BFF		
benchmark	BM	beam; bending moment	
bending moment	BM	beam; benchmark	
better	BTR		

between	BTWN		
between centers	BC	back of curb; bolt circle; bookcase; bottom chord; brick color; building code	
bevel	BEV		
bifolding doors	BI FLD DR		
Birmingham wire gauge	BWG		
bituminous	BITUM		
black steel pipe	BSP		
blackboard	—		chalkboard
blanket	BLKT		
block	—		concrete masonry unit
blowdown	BLWDN		
blower	BLO		
blowoff	BO		
board	BD	butterfly damper	
board feet (foot)	BD FT		
board measure	B/M		
boiler	BLR		
boiler feed booster pump	BFBP		
boiler feedwater	BFW		
boiler feedwater pump	BFWP		
boiler horsepower	BLR HP		
bolt circle	BC	back of curb; between centers; bookcase; bottom chord; brick color; building code	
bonding	BNDG		
bookcase	BC	back of curb; between centers; bolt circle; bottom chord; brick color; building code	
booster	BSTR		
borrowed light	BLT	built	
both faces	BF		
both sides	BS		
both ways	BW		
bottom	BOT		
bottom chord	BC	back of curb; between centers; bolt circle; bookcase; brick color; building code	
bottom face	BOT F		
bottom of steel	BOS		
boulevard	BLVD		
boundary	BDRY		

bracing	BRCG	
bracket	BRKT	
brake horsepower	BHP	
breaker	BRKR	
brick color	BC	back of curb; between centers; bolt circle; bookcase; bottom chord; building code
Brick Institute of America	BIA	
bridging	BRDG	
bridging joist	BRDG JST	
bright annealed	BA	
British thermal unit	Btu	
British thermal unit (thousand)	Mbtu	
British thermal unit per hour	BtuH	
bronze	BRZ	
broom closet	B CL	
buck-boast transformer	BB XFMR	
build	BLD	
Builder's Hardware Manufacturer's Association	BHMA	
building	BLDG	
building automation system	BAS	
building code	BC	back of curb; between centers; bolt circle; bookcase; bottom chord; brick color
building line	BL	
Building Officials and Code Administrators Association International	BOCA	
building paper	BP	
built	BLT	borrowed light
built-in	BLT IN	
built-up	BU	bushel
built-up roofing	BUR	
bulb tee beam	BLB T BM	
bulkhead	BLKHD	
bulletin board	BB	baseboard
bulletproof (bullet-resistant)	BPRF	
bullnose	BN	
burlap	BRLP	
bushel	BU	built-up
butt weld	BT WLD	
butterfly check valve	BCV	

butterfly damper	BD board		
butterfly valve	BFV		
by pass	BYP		
C			
cabinet	CAB		
cabinet unit heater	CUH		
cable	CTV		
calculate	CALC		
calked joint	CLKJ		
calking	—		sealant
calorie	CAL		
camber	CAM		
candela	cd	construction documents; contract documents	
candlepower	CP	concrete pipe; control panel	
canopy	CAN		
cantilever	CANTIL		
canvas	CANV		
capacitor	CAP	capacity	
capacity	CAP	capacitor	
carbon dioxide	CO2		
carbon monoxide	CO	cased opening; Certificate of Occupancy; cleanout; company; cutout	
carpet	CPT	control power transformer	
carpet and pad	C&P		
carriage bolt	CB	catch basin; cement base; ceramic base; combiner box; corner bead	
cased opening	CO	carbon monoxide; Certificate of Occupancy; cleanout; company; cutout	
casement	CSMT		
casement window	CW	chemical waste line; clockwise; cold water piping; cool white	
casework	CSWK		
casing	CSG		
casing bead	—		metal trim
cast concrete	C CONC		
cast-in-place	CIP	cast iron pipe	
cast iron	CI	curb inlet	
cast iron pipe	CIP	cast in place	
cast iron soil pipe	CISP		

cast steel	CSTL		
cast stone	CS	commercial standard; control switch	
catalog	CAT		
catch basin	CB	carriage bolt; cement base; ceramic base; combiner box; corner bead	
catwalk	CATW		
cavity	CAV		
ceiling	CLG		
ceiling attenuation class	CAC		
ceiling diffuser	CLG DIFF		
ceiling duct outlet	CLG DCT OUT		
ceiling grille	CLG GRL		
ceiling height	CLG HT		
ceiling panel	—		acoustical panel
ceiling register	CLG REG		
ceiling tile	—		acoustical tile
Celsius	C	channel	
cement	CEM	cemetery	
cement base	CB	carriage bolt; catch basin; ceramic base; combiner box; corner bead	
cement finish	CEM FIN		
cement floor	CF	contractor furnished	
cement plaster	CEM PLAS		
cement plaster ceiling	CEM PLAS CLG		
cementitious (backer) board	CBB		
cemetery	CEM	cement	
center	CTR	contour; cooling tower return	
center line	CL	class; close	
center matched	CM	construction management	
center of gravity	CG	common ground; corner guard	
center to center	C TO C		
centigrade	—		Celsius
centimeter	cm		
centimeter per second	cm/s		
ceramic	CER		
ceramic base	CB	carriage bolt; catch basin; cement base; combiner box; corner bead	
ceramic glazed structural facing units	CGSFU		

ceramic tile	CT	count; current transformer
ceramic tile base	CTB	
ceramic tile floor	CTF	
Ceramic Tile Institute of America	CTI	
Certificate of Occupancy	CO	carbon monoxide; cased opening; cleanout; company; cutout
certify	CERT	
Chain Link Fence Manufacturers Institute	CLFMI	
chalkboard	CH BD	
chamber	CHMBR	
chamfer	CHFR	
change order request	COR	
channel	C	Celsius
charge	CHG	
check	CHK	
check valve	CHKV	
chemical	CHEM	
chemical waste line	CW	casement window; clockwise; cold water piping; cool white
chilled drinking water	CDW	
chilled drinking water return	CDWR	
chilled drinking water supply	CDWS	
chilled water	CHW	circulating hot water
chilled water primary pump	CHWPP	
chilled water pump	CHWP	
chilled water recirculating pump	CHWRP	
chilled water return	CHWR	
chilled water secondary pump	CHWSP	
chilled water supply	CHWS	
chiller	CH	coat hook
chlorinated polyvinyl chloride	CPVC	
chlorofluorocarbons	CFC	
chrome plated	CHR PL	
circle	CIR	
circuit	CKT	
circuit breaker	CKT BRKR	
circular	CIRC	
circulating hot water	CHW	chilled water
circulating water pump	CWP	condenser water pump

circumference	CRCMF	
cladding	CLDG	
class	CL	center line; close
Class A door	A LABEL	
Class B door	B LABEL	
Class C door	C LABEL	
Class D door	D LABEL	
Class E door	E LABEL	
classification	CLASS	
classroom	CLRM	
cleanout	CO	carbon monoxide; cased opening; Certificate of Occupancy; company; cutout
cleanout to grade	COTG	
clear	CLR	color; cooler
clear wired glass	CLWG	
cleat	CLT	
clockwise	CW	casement window; chemical waste line; cold water piping; cool white
close	CL	centerline; class
closed circuit television	CCTV	
closet	CLO	
closet rod	CR	control relay; control room
closure	CLOS	
clothes dryer	CL D	
coat hook	CH	chiller
coated	CTD	
coating	CTG	
coaxial cable	COAX	
coefficient	COEFF	
coefficient of performance (heating)	COP	coping
coefficient of utilization	CU	cubic; copper
cold-formed metal framing	CFMF	
cold rolled steel	CRS	
cold water piping	CW	casement window; chemical waste line; clockwise; cool white
color	CLR	clear; cooler
color rendering index	CRI	
column	COL	
column line	CLL	contract limit line
combination, combined	COMB	

combiner box	CB	carriage bolt; catch basin; cement base; ceramic base; corner bead	
commercial standard	CS	cast stone; control switch	
common	COM		
common ground	CG	center of gravity; corner guard	
common mode rejection	CMR		
communication	COMM		
community antenna television	CATV		
company	CO	carbon monoxide; cased opening; Certificate of Occupancy; cleanout; cutout	
compartment	COMPT		
complete	COMPL		
component	COMP		
composite	CMPST		
compressible	CPRS		
compressor	COMPR		
computer	CMPTR		
computer floor	—		access flooring
concealed	CNCL		
concentric	CONC	concrete	
concrete	CONC	concentric	
concrete block	—		concrete masonry unit
concrete floor	CONC FLR		
concrete masonry unit	CMU		
concrete opening	CONC OPNG		
concrete pavement	PCCP		
concrete pipe	CP	candlepower; control panel	
Concrete Reinforcing Steel Institute	CRSI		
concrete sewer pipe	CSP		
concrete splash block	CSB	casing bead	
condensate	CNDS		
condensate return pump	CRP		
condensation	CONDN		
condenser	COND	condition	
condenser water pump	CWP	circulating water pump	
condenser water return	CWR		
condenser water supply	CWS		
condition	COND	condenser	
conduit	CND		

conference	CONF		
connect	CONN		
construction	CONSTR		
construction documents	CD	candela; contract documents	
construction joint	CJ	control joint	
construction management	CM	center matched	
Construction Specifications Institute	CSI		
consultant	CONSULT		
contactor	CNTOR		
continue	CONT	controller	
contour	CTR	center; cooling tower return	
contract	CONTR	contractor	
contract change directive	CCD		
contract documents	CD	candela; construction documents	
contract limit line	CLL	column line	
contractor	CONTR	contract	
contractor furnished	CF	cement floor	
contractor furnished equipment	CFE		
contractor furnished/contractor installed	CF/CI		also, provide
contractor furnished/owner installed	CF/OI		
control	CTRL		
control contactor	CCR		
control joint	CJ	construction joint	
control panel	CP	candlepower; concrete pipe	
control power transformer	CPT	carpet	
control relay	CR	closet rod; control room	
control room	CR	closet rod; control relay	
control switch	CS	cast stone; commercial standard	
control valve	CV		
controller	CONT	continue	
convert	CONV		
conveyor	CNVR		
cook top	CK TP		
cool white	CW	casement window; chemical waste line; clockwise; x cold water piping	
cool white deluxe	CWX		
cooler	CLR	color; clear	
cooling coil	C/C		
cooling tower return	CTR	contour; center	

cooling tower supply	CTS		
coordinate	COORD		
coping	COP	coefficient of performance (heating)	
copper	CU	coefficient of utilization; cubic	
cork tackboard	—		tackboard
corkboard	—		tackboard
corner	CNR		
corner bead	CB	carriage bolt; catch basin; cement base; ceramic base; combiner box	
corner guard	CG	center of gravity; common ground	
cornice	CORN		
correct	CORR	corridor	
correspond	CORRES		
corridor	CORR	correct	
corrugated deck	—		steel roof deck
corrugated metal pipe	CMP		
count	CT	ceramic tile; current transformer	
counter	CNTR		
counter sunk	CSK		
counterclockwise	CCW		
counterflashing	CFLG		
coupling	CPLG		
courtyard	CRT YD		
cover	COV	cut off valve	
cover plate	COV PL		
critical path method	CPM		
cross brace	X BRACE		
cross section	X SECT		
crossbracing	XBRA		
crown	CRN		
crushed stone	—		porous fill
cubic	CU	coefficient of utilization; copper	
cubic centimeter	cm3		
cubic feet	CU FT		
cubic feet per minute	CFM		
cubic feet per second	CFS		
cubic inch	CU IN		
cubic meter	m3		
cubic meter per second	m3/s		

cubic millimeter	mm3	
cubic yard	CU YD	
cubicle	CUB	
curb and gutter	C&G	
curb inlet	CI	cast iron
current	CUR	
current limiting fuse	CLF	
current transformer	CT	ceramic tile; count
curtain	CURT	
custodian	CUST	
cut off valve	COV	cover
cut stone	CT STN	
cutout	CO	carbon monoxide; cased opening; Certificate of Occupancy; cleanout; company
cylinder	CYL	
cylinder lock	CYL L	
cylinder locks keyed alike	KA	
cypress	CYP	

D

damage free	DF	diesel fuel; drinking fountain
damper	DMPR	
dampproof course	DPC	
dampproofing	DMPF	
database	DB	dry bulb
datum	DAT	
dc disconnect	DCD	
dead load	DL	
decibel	dB	
decigram	dg	
deciliter	dL	
decimeter	dm	
deep	D	depth; penny (nail)
definition	DEF	
deflection	DFLCT	
defrost	DFR	
degrease	DGR	
degree	DEG	
degrees Celsius	DEG C	

degrees Fahrenheit	DEG F		
deionized water	DIW		
delete	DEL	deliver	
deliver	DEL	delete	
delta	—		*Use symbol (see Symbols (UDS 6))*
demolition	DEMO	demonstration	
demonstration	DEMO	demolition	
demountable partition	DPTN		
density	DENS		
department	DEPT		
depth	D	deep; penny (nail)	
describe	DESCR	description	
description	DESCR	describe	
design	DSGN		
design-build	D-B		
designation	DES		
detach	DTCH		
detail	DET		
detention	DETN		
development	DEV		
dew point	DP		
dew point temperature	DPT	differential pressure transmitter	
diagonal	DIAG	diagram	
diagram	DIAG	diagonal	
diameter	DIA		
diesel fuel	DF	damage free; drinking fountain	
difference	DIFF	differential; diffuser	
differential	DIFF	difference; diffuser	
differential pressure sensor	DPS		
differential pressure transmitter	DPT	dew point temperature	
diffuser	DIFF	difference; differential	
digital	DGTL		
dimension	DIM		
dimmer	DMR		
dimmer control panel	DCP		
dimmer switch	DMR SW		
dining room	DR	door; drain; dressing room; drive	
direct current	DC		

direct digital control	DDC		
direction	DIR		
dirt	—		earth
disable	DSBL		
disabled	DA	drainage area	
discharge	DISCH		
disconnect	DISC		
disconnect switch	DS	double strength (glass); downspout	
dishwasher	DW	distilled water; domestic water	
dispenser	DISP		
display and storage	D&S		
disposal	DSPL		
distance	DIST	district	
distilled water	DW	dishwasher; domestic water	
distribution panel	DISTR PNL		
district	DIST	distance	
divide	DIV	division	
division	DIV	divide	
document	DOC		
domelite	—		plastic skylight
domestic	DOM		
domestic hot water	DHW	double hung windows	
domestic water	DW	dishwasher; distilled water	
domestic water heater	DWH		
domestic water return	DWR	drawer	
domestic water supply	DWS		
door	DR	dining room; drain; dressing room; drive	
door closer	DR CL		
door frame	DR FR		
Door Hardware Institute	DHI		
door holder	DRH		
door louver	DRLV		
door opening	DR OPNG		
door stop	DRST		
door switch	DRSW		
double	DBL		
double acting door	DBL ACT DR		
double extra heavy	XXH		
double glaze	DBL GLZ		

double hung (door, window)	DH		
double hung windows	DHW	domestic hot water	
double joist	DJ		
double pole, double throw	DPDT		
double pole, single throw	DPST		
double strength (glass)	DS	disconnect switch; downspout	
Douglas fir	DOUG FIR		
dovetail	DVTL		
downspout	DS	disconnect switch; double strength (glass)	
dozen	DOZ		
drafting	DFTG		
drain	DR	dining room; door; dressing room; drive	
drain tile	DT		
drain, waste, and vent	DWV		
drainage area	DA	disable	
drawer	DWR	domestic water return	
drawing	DWG		
dressed four sides	D4S		
dressed one side	D1S		
dressed two sides	D2S		
dressing area	DR AREA		
dressing room	DR	dining room; door; drain; drive	
drinking fountain	DF	damage free; diesel fuel	
drinking fountain, wall mounted	DF WL MTD		
drive	DR	dining room; door; drain; dressing room	
drop inlet	DI		
dry bulb	DB	database	
dry bulb temperature	DBT		
dry chemical	D CHEM		
dry film thickness	DFT		
dry standpipe	DSP		
drywall	—		gypsum board
duct access panel	DAP		
duct covering insulation	DCI		
duct liner insulation	DLI		
duct return	DCT/RT		
duct rising, duct riser	DCT/RS		
duct supply	DCT SUP		
ductile iron pipe	DIP		

dumbwaiter	DWTR	
duplex	DX	
duplex outlet	DX OUT	
duplicate	DUPL	
dutch door	DT DR	

E

each	EA	
each end	EE	
each face	EF	exterior finish
each layer	EL	easement line; elevation
each way	EW	
easement	ESMT	
easement line	EL	each layer; elevation
east	E	modulus of elasticity
eccentric	ECC	
eccentric reducer	ECC RDCR	
economizer	ECON	
edge grain	EG	
edge of curb	EC	
edge of pavement (paving)	EP	electrical panel (panelboard)
edge of shoulder	ES	electrostatic
edge of slab	EOS	
effect	EFT	
effective	EFF	efficiency
effective horsepower	EHP	electric heating panel
effective temperature	ET	
efficiency	EFF	effective
elastomeric	ELAST	
electric	ELEC	
electric door opener	ELEC DR OP	
electric hand dryer	EHD	
electric heater	EH	
electric heating panel	EHP	effective horsepower
electric panel board	EPB	
electric water cooler	EWC	
electric water heater	EWH	
electrical metallic tubing	EMT	
electrical nonmetallic tubing	ENT	
electrical outlet	EO	

electrical panel (panelboard)	EP	edge of pavement (paving)	
electrical resistance welding	ERW		
electrically operated valve	EOV		
electro-pneumatic	—		pneumatic electric
electromagnetic	EM	expanded metal	
electromagnetic interference	EMI		
electronic data processing	EDP		
electrostatic	ES	edge of shoulder	
element	ELEM	elementary	
elementary	ELEM	element	
elevation	EL	each layer; easement line	
elevator	ELEV		
elevator cab	—		elevator car
emergency	EMER		
emergency monitoring control panel	EMCP		
emergency power off	EPO		
emergency shower	EMER SHR		
enamel	ENAM		
enclosure	ENCL		
energy	ENGY		
energy efficiency ratio	EER		
energy management system	EMS		
engine	ENG		
engineer	ENGR		
Engineered Wood Association	EWA		
Engineers Joint Contract Documents Committee	EJCDC		
entering air temperature	EAT		
entering dry bulb temperature	EDBT		
entering water temperature	EWT		
entering wet bulb temperature	EWBT		
entrance	ENTR		
environment	ENVIR		
Environmental Protection Agency	EPA		
equal	EQ		
equally spaced	EQL SP		
equipment	EQUIP		
equivalent	EQUIV		
escalator	ESCAL		

escape	ESC	escutcheon
escutcheon	ESC	escape
especially	ESP	
establish	ESTB	
estimate	EST	
et cetera	ETC	and so forth
ethylene propylene diene monomer	EPDM	
evacuate	EVAC	
evaporate	EVAP	
evaporative cooling unit	ECU	
example	EX	
excavate	EXC	
exchanger	EXCH	
exclude	EXCL	
execute	EXEC	
exhaust	EXH	exhibit
exhaust air	EXH A	
exhaust air grille	EXH GR	
exhaust air register	EAR	
exhaust duct	EXH DT	
exhaust fan	EXH FN	
exhaust hood	EXH HD	
exhaust vent	EXHV	
exhibit	EXH	exhaust
existing	EXST	
existing grade	EXST GR	
existing roof drain	ERD	
exit light	EXT LT	
expand	EXP	expansion; exposed
expanded metal	EM	electromagnetic
expanded polystyrene board (insulation)	EPS	
expansion	EXP	expand; exposed
expansion bolt	EXP BT	
expansion joint	EJ	
explosion proof	EPRF	
exposed	EXP	expand; expansion
extension	EXTN	
exterior	EXT	external; extinguisher
exterior finish	EF	each face

exterior finish system	EFS	
exterior grade	EXT GR	
exterior gypsum board	EGB	
exterior gypsum sheathing board	EGSB	
exterior insulation and finish system	EIFS	
external	EXT	exterior; extinguisher
external pipe thread	EPT	
external static pressure	ESP	
extinguisher	EXT	exterior; external
extra large	XL	
extruded polystyrene board (insulation)	XPS	
extrusion	EXTRU	
eye guard	EGRD	
eye wash station	EWS	

F

fabric	FAB	
fabric wallcovering	FWC	
face area	FA	final assembly; fire alarm; fresh air
face brick	FC BRK	
face of concrete	FOC	face of curb
face of curb	FOC	face of concrete
face of finish	FOF	fuel oil return line
face of masonry	FOM	
face of slab	FOS	face of stud; fuel oil supply
face of stud	FOS	face of slab; fuel oil supply
face of wall	FOW	
face to face	F/F	
face velocity	FV	flush valve; foot valve
facial tissue dispenser	FTD	
facility	FACIL	
facsimile	FAX	
factor	FAC	
factory	FCTY	
factory mutual	FM	
Fahrenheit	F	female; fire line
fan coil unit	FCU	
fan powered terminal	FPT	
far face	FF	finish face

far side	FS	Federal Specification; fire station; full scale; full size	
fascia	FAS	fire alarm station	
fascia board	FAS BD		
fastener	FSTNR		
federal	FED		
Federal Energy Administration	FEA		
Federal Highway Adminstration	FHWA		
Federal Housing Administration	FHA		
Federal Specification	FS	far side; fire station; full scale; full size	
federal stock number	FSN		
federal supply classification	FSC		
federal test methods	FTM		
feedback	FDBK		
feeder	FDR	fire door	
feedout	FDO		
feedwater	FDW		
feet	FT	fire treated; foot; fully tempered (glass)	
feet per minute	FPM		
feet per second	FPS		
female	F	Fahrenheit; fire line	
feminine napkin disposal	—		sanitary napkin disposal
feminine napkin vendor	—		sanitary napkin vendor
fence	FN		
fiber insulation	—		rigid insulation
fiber reinforced gypsum	FRG		
fiber reinforced polyester	FRP	fiberglass reinforced plastic	
fiberboard	—		rigid insulation
fiberglass	FGL		
fiberglass reinforced plastic	FRP	fiber reinforced polyester	
field order	FO	finished opening; fuel oil	
figure	FIG		
file cabinet	FC	footcandle	
filler	FLR	floor	
fillet	FIL		
filter	FLTR		
filter water return	FWR		
filter water supply	FWS		

final assembly	FA	face area; fire alarm; fresh air
finger joint	FNGR JT	
finish	FIN	
finish both sides	FIN BS	
finish face	FF	far face
finish floor	FIN FLR	
finish floor elevation	FF EL	
finish four sides	F4S	
finish grade	FIN GR	
finish two sides	F2S	
finish wood	FIN WD	
finished one side	F1S	
finished opening	FO	field order, fuel oil
finned tube radiation	FTR	
fire alarm	FA	face area; final assembly; fresh air
fire alarm annunciator panel	FAAP	
fire alarm bell	FABL	
fire alarm box	FABX	
fire alarm control panel	FACP	
fire alarm station	FAS	fascia
fire blanket	FB	flat bar
fire brick	F BRK	
fire damper	FDMPR	
fire department connection	FDC	
fire department connection cabinet	FDCC	
fire department valve	FDV	
fire door	FDR	feeder
fire extinguisher	FE	
fire extinguisher cabinet	FEC	
fire hose	FH	fire hydrant; flat head; flat head screws
fire hose cabinet	FHC	
fire hose rack	FHR	
fire hydrant	FH	fire hose; flat head; flat head screws
fire line	F	Fahrenheit; female
fire protection	FP	fireproof; flag pole; freezing point
fire protection water supply	FPW	
fire rated assembly	FRA	
fire rating	FR	fire resistant; frame
fire resistant	FR	fire rating; frame

fire retardant treated wood	FRTW	
fire sprinkler head	FSH	
fire standpipe	FSP	
fire station	FS	far side; Federal Specification; full scale; full size
fire treated	FT	feet; foot; fully tempered (glass)
fire wall	FW	flood wall
fireplace	FPL	
fireproof	FP	fire protection; flagpole; freezing point
fixture	FIXT	
flagpole	FP	fire protection; fireproof; freezing point
flammable	FLMB	
flange	FLG	flooring
flared	FLRD	
flashing	FLASH	
flat bar	FB	fire blanket
flat head	FH	fire hose; fire hydrant; flat head screws
flat head machine screw	FHMS	
flat head screws	FH	fire hose; fire hydrant; flat head
flat head wood screw	FHWS	
flexible	FLEX	
float finish concrete	FL FIN CONC	
float glass	FLT GL	
flood wall	FW	fire wall
floodlight	FLT	
floor	FLR	filler
floor area ratio	FAR	
floor cleanout	FCO	
floor drain	FD	
floor finish	FLR FIN	
floor outlet	FL OUT	
floor plate	FLR PL	
floor register	FLR REG	
floor sink	FLR SK	
flooring	FLG	flange
floorline	FL	foot-lambert
flow line	FLL	
flow sensing switch	FSS	
flow switch	FL SW	

flowmeter	F METER		
fluid ounce	FL OZ		
fluorescent	FLUOR		
fluorescent fixture	FLUOR FIX		
fluorescent lighting	LT FLUOR		
flush mount	FLMT		
flush valve	FV	face velocity; foot valve	
flushing rim sink	FR SNK		
fluted concrete masonry unit	FLUT CMU		
fluting	FLUT		
foam backer	—		backer rod
foil backed batt insulation	FF BATT		
foil backed insulation	FF INSUL		
foil faced drywall	—		foil faced gypsum board
foil faced gypsum wallboard	—		foil faced gypsum board
folding	FLDG		
foot	FT	feet; fire treated; fully tempered (glass)	
foot board measure	FBM		
foot valve	FV	face velocity; flush valve	
foot/pound	FT/LB		
foot/pound force	FT/LBF		
footcandle	FC	file cabinet	
footing	FTG		
foot-lambert	FL	floorline	
form board	FMBD		
formica	—		plastic laminate
formwork	FWRK		
foundation	FDTN		
fountain	FOUNT		
four-conductor	4/C		
four-pole double throw	4PDT		
four-pole single throw	4PST		
four-way	4WAY		
four-wire	4W		
frame	FR	fire rating; fire resistant	
framed mirror	FR MIR		
framed mirror and shelf	FR MIR/SHF		

framing	FRMG		
freeway	FRWY		
freezer	FRZ		
freezestat	FSTAT		
freezing point	FP	fire protection; fireproof; flagpole	
freight	FRT		
frequency	FREQ		
fresh air	FA	face area; final assembly; fire alarm	
fresh air inlet (intake)	FAI		
fritted glass	FR GL		
from floor above	FFA		
from floor below	FFB		
frosted glass	FRST GL		
fuel oil	FO	field order; finished opening	
fuel oil pump	FOP		
fuel oil return	FOR		
fuel oil return line	FOF	face of finish	
fuel oil storage tank	FOTK		
fuel oil supply	FOS	face of slab; face of stud	
fuel oil vent	FOV		
full height partition	FHP		
full load amps	FLA		
full scale	FS	far side; Federal Specification; fire station; full size	
full size	FS	far side; Federal Specification; fire station; full scale	
full voltage non-reversing	FVNR		
full voltage reversing	FVR		
fully tempered (glass)	FT	feet; fire treated; foot	
furnace	FURN	furnish; furniture	
furnish	FURN	furnace; furniture	
furnished by owner	—		OF/CI or OF/OI
furniture	FURN	furnace; furnish	
furniture, fixture, and equipment	FF&E		
furring	FURG		
fuse box	—		panelboard
fused switch	FU SW		
fusible link	FUS LINK		
future	FUT		

G

gage	GA	Gypsum Association	
gallon	GAL		
gallons per day	GPD		
gallons per hour	GPH		
Gallons Per Hour, Standard	SGPH		
gallons per minute	GPM		
gallons per second	GPS		
galvanic	GALV	galvanized	
galvanized	GALV	galvanic	
galvanized iron	GI		
galvanized iron pipe	GIP		
galvanized sheet metal	GSM		
galvanized steel	GALV STL		
garbage disposal	G DISP		
garden	GRDN		
gas bibb	GB	grab bar	
gas fired water heater	GWH		
gas line	G LN		
gas pressure regulator	GPR		
gas vent through roof	GVTR		
gasoline vent	GV	gravity vent	
gate valve	GTV		
gauge	—		gage
general	GEN	generator	
general conditions	GEN COND		
general contractor	GC		
general purpose	GEN PURP		
generator	GEN	general	
girder	G	ground; natural gas	
glass	GL	ground level	
glass block	GL BLK		
glass-fiber-reinforced concrete	GFRC		
glass-fiber-reinforced gypsum	GFRG		
glass-fiber-reinforced plaster	GFRP	glass-fiber-reinforced plastic	
glass-fiber-reinforced plastic	GFRP	glass-fiber-reinforced plaster	
glazed concrete masonry unit	GLZ CMU		
glazed structural unit	GSU		
glazed wall tile	GWT		

glazing	GLZ		
globe valve	GLV		
glue	—		adhesive
glued laminated wood	GLU LAM		
government	GOVT		
grab bar	GB	gas bibb	
grade B or better (lumber)	B&B	balled and burlapped; bell and bell	
grade beam	GR BM		
grade C and better	C&BTR		
grade cleanout	GCO		
grade line	GR LN		
gradient	GRAD		
grand master key	GMK		
grand master keyed	GMKD		
granite	GRAN		
grating	GRTG		
gravel	—		porous fill
gravity roof ventilator	GRV	groove	
gravity vent	GV	gasoline vent	
graylite	—		gray sheet glass
grease trap	GT	gross ton; grout	
grille	GRL		
grommet	GROM		
groove	GRV	gravity roof ventilator	
gross	GR		
gross ton	GT	grease trap; grout	
gross weight	GR WT		
ground	G	girder; natural gas	
ground fault circuit interrupter	GFCI		
ground fault interrupter	—		ground fault circuit interrupter
ground floor	GR FL		
ground level	GL	glass	
grounded outlet	GRD OUT		
group	GP		
grout	GT	grease trap; gross ton	
guarantee	GUAR		
guaranteed maximum price	GMP		
guard	GD		

guard rail	GDR		
gutter	GUT		
gymnasium	GYM		
gyplath	—		gypsum lath or metal lath
gypsum	GYP		
Gypsum Association	GA	gage	
gypsum board	GYP BD		
gypsum panel	—		gypsum board
gypsum plaster	GYP PLAS		
gypsum plaster ceiling	GPC		
gypsum sheathing board	GSB		
gypsum wallboard	—		gypsum board

H

hammer	HMR		
hand-off-automatic	HOA		
hand dryer	HD	heavy duty	
hand hole	HH		
hand sink	HS	heat-strengthened (glass); high strength	
handicap	HC	heating coil; heavy commercial; hollow core; hose cabinet	
handicapped	HCP		
handrail	HNDRL		
hanger	HGR		
hardboard	HDBD		
hardener	HDNR		
hardware	HDW		
hardwood	HDWD		
hatch (roof)	H	high	
hazard	HAZ		
hazardous materials	HAZ MAT		
head joint	HD JT		
header	HDR		
headquarters	HQ		
headwall	HDWL		
heat-strengthened (glass)	HS	hand sink; high strength	
heat absorbing glass	HAGL		
heat exchanger	HEX	hexagon	
heat gain	HG		

heat pump	HP	high pressure; horsepower	
heat transfer	Q	rate of flow	
heat transfer coefficient	U		
heat treated (glass)	HT TRD		
heating coil	HC	handicap; heavy commercial; hollow core; hose cabinet	
heating water return	HTWR		
heating water supply	HTWS		
heating, ventilating, and air conditioning	HVAC		
heavy	HVY		
heavy commercial	HC	handicap; heating coil; hollow core; hose cabinet	
heavy duty	HD	hand dryer	
hectare	ha		
hectoliter	hL		
hectometer	hm		
height	HT		
hemlock	HEM		
herculite	—		tempered glass
hertz	Hz		
hexagon	HEX	heat exchanger	
high	H	hatch (roof)	
high density overlay	HDO		
high density polyethylene	HDPE		
high efficiency particulate air (filter)	HEPA		
high frequency	HF		
high intensity discharge	HID		
high power factor	HPF		
high pressure	HP	heat pump; horsepower	
high pressure boiler	HPB		
high pressure drip trap	HPDT		
high pressure gas	HPG		
high pressure plastic laminate	H PLAM		
high pressure return	HPR		
high pressure sodium	HPS	high pressure steam	
high pressure steam	HPS	high pressure sodium	
high pressure trap	HPT		
high strength	HS	hand sink; heat-strengthened (glass)	
high temperature hot water	HTHW		

high velocity diffuser	HVD		
high velocity terminal	HVT		
high voltage	HV	hose valve	
highway	HWY		
hoist	HST		
hold open	HO		
holddown	HLDN		
hollow concrete masonry unit	HCMU		
hollow core	HC	handicap; heating coil; heavy commercial; hose cabinet	
hollow core wood door	HCWD		
hollow metal	HM		
hollow metal door	HMD	humidity	
hollow metal door and frame	HMDF		
hollow metal frame	HMF		
Hollow Metal Manufacturers Association	HMMA		
horizontal	HORIZ		
horizontal sliding window	SLD WDW		
horsepower	HP	heat pump; high pressure	
hose bibb	HB		
hose cabinet	HC	handicap; heating coil; heavy commercial; hollow core	
hose connector	HCONN		
hose gate valve	HGV		
hose valve	HV	high voltage	
hospital	HOSP		
hot and cold water	H&CW		
hot water	HW		
hot water boiler	HWB		
hot water circulating pump	HWCP		
hot water coil	HWC		
hot water heater	—		water heater
hot water line	HWL		
hot water pump	HWP		
hot water return	HWR		
hot water supply	HWS		
hot water tank	HWT		
house	HSE		
housekeeping	HSKPG		

humidistat	HSTAT	
humidity	HMD	hollow metal door
hundred cubic feet	CCF	
hundred weight	CWT	
hydrant	HYD	
hydraulic	HYDR	
hydrochlorofluorocarbons	HCFC	

I

I beam	IB	
identification	ID	inside diameter; inside dimension; interior design
identification number	ID NO	
ignition	IGN	
illumination	ILLUM	
Illumination Engineering Society of North America	IESNA	
illustrate	ILLUS	
immediate	IMED	
impact isolation class	IIC	
impact noise rating	INR	
impulses per minute	IPM	
impulses per second	IPS	international pipe standard; iron pipe size
incandescent	INCAND	
inch-pound	IN-LB	
inch-pound force	IN-LBF	
inches per second	IN/S	
inches, water column	IN WC	
incinerator	INCIN	
included	INCL	
increase	INC	
increment	INCR	
independent	IND	industrial
indoor air quality	IAQ	
industrial	IND	independent
infinite	INF	
information	INFO	
infrared	IR	inside radius
inlet manhole	IMH	
input/output	I/O	

insect screen	IS	island
inside diameter	ID	identification; inside dimension; interior design
inside dimension	ID	identification; inside diameter; interior design
inside face	IF	intake fan
inside face of stud	IFS	
inside radius	IR	infrared
inspect	INSP	
install	INSTL	
instantaneous water heater	IWH	
instrument	INSTR	
insufficient	INSUF	
insulated metal panel	INSUL PNL	
insulation	INSUL	
insurance	INS	
intake fan	IF	inside face
intercommunication	INTERCOM	
interior	INT	
interior design	ID	identification; inside diameter; inside dimension
interlocked amored cable	BX	
intermediate metal conduit	IMC	
international	INTL	
International Building Code	IBC	
international pipe standard	IPS	impulses per second; iron pipe size
International Standards Organization	ISO	isometric
International System of Units	SI	
interrupting capacity	IC	ironing cabinet
interstate (highway)	I	moment of inertia
Intertek Testing Services	ITS	
invert	INV	inverter
invert elevation	INV EL	
inverted roof membrane assembly	IRMA	
inverter	INV	invert
iron pipe	IP	
iron pipe size	IPS	impulses per second; inches per second; international pipe standard
iron pipe threaded	IPT	
ironing cabinet	IC	interrupting capacity

irregular	IRREG		
irrigation water	IW		
island	IS	insect screen	
isolation transformer	IT		
isometric	ISO	International Standards Organization	

J

jalousie	JAL		
janitor	JAN		
janitor closet	JAN CLO		
janitor sink	—		service sink
janitor's sink	JS		
joint filler	—		joint backer
joint stuffer	—		joint backer
junction box	J-BOX		
junior	JR		

K

kalamein door	—		metal clad door
kelvin	K	thousand	
keyway	KWY		
kickplate	KPL		
kiln dried	KD	knocked down	
kilo	k		
kilocalorie	kCAL		
kilogram	kg		
kilohertz	kHz		
kiloliter	kL		
kilometer	km		
kilometers per hour	km/h		
kilometers per second	km/s		
kilpascal	kPa		
kilovolt	kV		
kilovolt ampere	kVA		
kilovolt ampere per hour	kVAh		
kilovolt ampere reactive	kVAR		
kilowatt	kW		
kilowatt hour	kWh		
kilowatt hour meter	kWhm		
kips per lineal foot	KLF		

kips per square foot	KSF		
kips per square inch	KSI		
kitchen	KIT		
kitchen cabinet	KC		
knee brace	KB		
knock out panel	KOP		
knocked down	KD	kiln dried	
knockout	KO		

L

laboratory	LAB		
lacquer	LAQ		
ladder	LAD		
lagging	LAG		
lally column	L COL		
laminate	LAM		
laminated glass	LAM GL		
lamp lumen depreciation	LLD		
landing	LDG		
landmark	LDMK		
landscape	LNDSCP		
lane	LN		
large	LRG		
large scale	LS	lawn sprinkling; lump sum	
latch and lock	L&L		
latent heat	LH	left hand	
latent heat gain	LHG		
latent heat ratio	LHR	left hand reverse	
lateral	LATL		
lath	—		gypsum lath or metal lath
lath and plaster	L&P		
latitude	LAT	lattice; leaving air temperature	
lattice	LAT	lattitude; leaving air temperature	
launch	LANH		
laundry	LAU		
laundry chute	LC		
lavatory	LAV		
lawn sprinkling	LS	large scale; lump sum	
layer	LYR		

layout	LYT		
lead lined	LL	live load; low level; lower left	
lead lined gypsum board	LL GB		
leader	LDR		
leaving air	LA	lightning arrester	
leaving air temperature	LAT	latitude; lattice	
leaving dry bulb temperature	LDBT		
leaving water temperature	LWT		
leaving wet bulb temperature	LWBT		
left hand	LH	latent heat	
left hand reverse	LHR	latent heat ratio	
left hand side	LHS		
lexan	—		plastic glazing
library	LIB		
light	LT		
light emitting diode	LED		
light gage	LT GA		
light pole	LP	lightproof; liquid petroleum; low pressure (mechanical)	
light switch	LT SW		
lighting	LTG		
lighting panel	LTG PNL		
lightning	LTNG		
lightning arrester	LA	leaving air	
lightproof	LP	light pole; liquid petroleum; low pressure (mechanical)	
lightproof louver	LPL		
lightproof vent	LPV		
lightweight	LT WT		
lightweight concrete	LWC		
lightweight concrete masonry unit	LCMU		
lightweight insulating concrete	LWIC		
lightweight plaster	LW PLAS		
limestone	LMST		
limit switch	LIM SW		
limited	LTD		
line ground	LG	liquid gas	
line of sight	LOS		
linear	LIN		

linear ceiling diffuser	LCD		
linear diffuser	LD		
linear feet (foot)	LF		
linen closet	L CL		
linoleum	LINO		
liquid	LIQ	liquor	
liquid gas	LG	line ground	
liquid natural gas	LNG	longitude	
liquid oxygen	LOX		
liquid petroleum	LP	light pole; lightproof; low pressure (mechanical)	
liquid petroleum gas	LPG	low pressure gas	
liquor	LIQ	liquid	
liter	L	angle	
liter per second	L/s		
live load	LL	lead lined; lower left; low level	
living room	LR		
load-bearing	LD BRG		
location	LOC		
lock on	LO	lubricating oil	
locked rotor amps	LRA		
locker	LKR		
locker room	LKR RM		
locknut	LKNT		
lockwasher	LKWASH		
logarithm	LOG		
long leg horizontal	LLH		
long leg vertical	LLV		
longitude	LNG	liquid natural gas	
longitudinal	LONG		
loose cubic meter	LCM		
loose cubic yard	LCY		
loose fill insulation	LF INS		
loudspeaker	—		speaker
louver	LVR		
louver door	LVDR		
louvered	LVD		
louvered roof vent	LRV		
low density polyethylene	LDPE		

low level	LL	lead lined; live load; lower left	
low point	LPT		
low power factor	LPF		
low pressure (mechanical)	LP	light pole; lightproof; liquid petroleum	
low pressure alarm switch	LPAS		
low pressure boiler	LPB		
low pressure condensate return	LPCR		
low pressure drip trap set	LPDT		
low pressure gas	LPG	liquid petroleum gas	
low pressure return	LPR		
low pressure sodium	LPS	low pressure steam	
low pressure steam	LPS	low pressure sodium	
low temperature hot water	LTHW		
low voltage	LV		
low water	LW		
low water cut off	LWCO		
low water mark	LWM		
lower left	LL	lead lined; live load; low level	
lubricate	LUB		
lubricating oil	LO	lock on	
lubricating oil pump	LOP		
lubricating oil vent	LOV		
lucite	—		acrylic sheet
lumber	LBR		
lumen	LM		
lumen dirt depreciation	LDD		
lumens per watt	LPW		
lump sum	LS	large scale; lawn sprinkling	

M

machine	MACH		
machine bolt	MB	mail box; mixing box	
machine room	MACH RM		
machine screw	MS	mop sink; motor starter	
magnet	MAG		
magnetic north	MN		
mahogany	MAHOG		
mail box	MB	machine bolt; mixing box	
mail chute	MCH		
main circuit breaker	MCB	metal corner bead	

main combiner box	MNCB		
maintenance	MAINT		
make up air unit	MAU		
male pipe thread	MPT		
management	MGT		
manhole	MH		
manhole cover	MC	mechanical contractor; medicine cabinet; metal-clad; moisture content; moment connection	
manual	MAN		
manual air vent	MAV		
manual damper	MD	metal deck	
manual transfer switch	MTS		
manual volume damper	MVD		
manufactured	MFD		
manufacturer	MFR	mass flow rate	
manufacturer's recommendation	MFR REC		
manufacturing	MFG		
Maple Flooring Manufacturers Association	MFMA	Metal Framing Manufacturers Association	
marble base	MRB		
marble floor	MRF		
Marble Institute of America	MIA		
marble threshold	MRT		
marker	MKR		
masonite	—		hardboard
masonry opening	MO	motor operated	
mass flow rate	MFR	manufacturer	
master antenna television system	MATV		
master bedroom	MBR	member	
master switch	MSW		
masterkeyed	MKD		
masthead	MHD		
mastic	—		adhesive
mastic floor	MF	mill finish	
material	MATL		
materials list	ML	metal lath; monolithic	
matrix	MTX		
maximum	MAX		
maximum overcurrent protection	MOCP		

mean sea level	MSL	
mean temperature difference	MTD	mounted
measure	MEAS	
mechanical	MECH	
mechanical contractor	MC	manhole cover; medicine cabinet; metal-clad; moisture content; moment connection
mechanical engineer	ME	
mechanical room	MECH RM	
medical	MED	medium
medicine cabinet	MC	manhole cover; mechanical contractor; metal-clad; moisture content; moment connection
medium	MED	medical
medium density overlay	MDO	
medium pressure	MP	
medium pressure gas	MPG	miles per gallon
medium pressure return	MPR	
medium pressure steam	MPS	
medium temperature hot water	MTHW	
meeting	MTG	mounting
megahertz	MHz	
megavolt-ampere	MVA	
megawatt	MW	microwave
megawatt hour	MWh	
melamine	MEL	
member	MBR	master bedroom
membrane	MEMB	
membrane waterproofing	MWP	
memorandum	MEMO	
mercury	Hg	
meridian	MER	
metal	MTL	
metal-clad	MC	manhole cover; mechanical contractor; medicine cabinet; moisture content moment connection
metal base	MTLB	
metal corner bead	MCB	main circuit breaker
metal deck	MD	manual damper
metal door	MTLD	
metal flashing	MTLF	

Metal Framing Manufacturers Association	MFMA	Maple Flooring Manufacturers Association	
metal lath	ML	materials list; monolithic	
metal lath and plaster	ML&P		
metal nosing	—		abrasive nosing
metal oxide semiconductor	MOS		
metal partition	MTLP		
metal roof	MTLR		
metal threshold	MT	mount	
meter	m		
meters per second	m/s		
methyl ethyl ketone	MEK		
mezzanine	MEZZ		
microphone	MIC		
microwave	MW	megawatt	
middle	MID		
miles per gallon	MPG	medium pressure gas	
miles per hour	MPH		
military standard	MIL STD		
mill finish	MF	mastic floor	
milliampere	mA		
millimeter	mm		
million gallons per day	MGD		
millisecond	ms		
millivolt	mV		
milliwatt	mW		
millwork	MLWK		
minimum	MIN	minute	
minimum circuit amps	MCA		
minute	MIN	minimum	
mirror	MIRR		
mirror glass	—		reflective glass
miscellaneous	MISC		
miscellaneous metal	—		metal fabrications
miter	MIT		
mixed air	MA		
mixed air temperature	MAT		
mixing box	MB	machine bolt; mail box	
model	MOD	modify; module; motor operated damper	
modified bitumen	MOD BIT		

modify	MOD	model; module; motor operated damper
modulator-demodulator	MODEM	
module	MOD	model; modify; motor operated damper
modulus of elasticity	E	east
modulus of section	Z	
moisture	MSTRE	
moisture content	MC	manhole cover; mechanical contractor; medicine cabinet; metal-clad; moment connection
moisture resistant	MR	
molding (moulding)	MLDG	
moment	M	
moment connection	MC	manhole cover; mechanical contractor; medicine cabinet; metal-clad; moisture content
moment of inertia	I	interstate (highway)
monitor	MON	monument
monolithic	ML	materials list; metal lath
monument	MON	monitor
mop rack	MOPR	
mop service basin	MSB	
mop sink	MS	machine screw; motor starter
mop/broom holder	MBH	
motor	MOT	
motor control center	MCC	
motor direct connect	MDC	
motor generator	MG	
motor operated	MO	masonry opening
motor operated damper	MOD	model; modify; module
motor operated valve	MOV	
motor starter	MS	machine screw; mop sink
mount	MT	metal threshold
mounted	MTD	mean temperature difference
mounting	MTG meeting	
movable	MVBL	
mullion	MULL	
multiple	MULT	
multizone	MZ	
municipal	MUNIC	

N

nameplate	NPL	nickel plated
narrow	NAR	
narrow stile	NS	near side; no scale
national	NATL	
National Association of Architectural Metal Manufacturers	NAAMM	
National Building Code	NBC	
National Bureau of Standards	NBS	
National Electrical Code	NEC	
National Electrical Manufacturers Association	NEMA	
National Fenestration Rating Council	NFRC	
National Fire Code	NFC	
National Fire Protection Association	NFPA	
National Institute of Building Sciences	NIBS	
National Institute of Standards and Technology	NIST	
National Paint and Coatings Association	NPCA	
National Roofing Contractors Association	NRCA	
natural	NAT	
natural gas	G	girder; ground
near face	NF	
near side	NS	narrow stile; no scale
negative	NEG	
negotiated	NEGTD	
net weight	NT WT	
neutral	NEUT	
newton	N	north
nickel	NKL	
nickel copper	NICOP	
nickel copper alloy	NCA	
nickel plated	NPL	nameplate
nickel silver	NI SIL	
night light	NL	
no paint	NP	
no scale	NS	narrow stile; near side
noise criteria	NC	normally closed
noise isolation class	NIC	not in contract
noise reduction	NR	
noise reduction coefficient	NRC	

nominal	NOM		
non-metallic	NM		
non-reinforced concrete pipe	NRCP		
non-slip stair nosing	—		abrasive nosing
noncombustible	NCOMBL		
nonflammable	NONFLMB		
nonfused	NFSD		
nonloadbearing	NLB		
nonmagnetic	NMAG		
nonremovable	NRP		
nonstandard	NON STD		
normal	NORM		
normally closed	NC	noise criteria	
normally open	NO	number	
north	N	newton	
not applicable	NA		
not exceeding	NE		
not in contract	NIC	noise isolation class	
not to scale	NTS		
notice of clarification	NOC		
notice to proceed	NTP		
number	NO	normally open	
numeral	NUM		

O

obscure glass	OGL		
obscure wired glass	OWGL		
observation window	OBW		
Occupational Safety and Health Adminstration	OSHA		
occupy	OCC		
octagon	OCT		
office	OFF		
oil circuit breaker	OCB		
oil circuit recloser	OCR		
oil gage	OGA		
oil level	OLVL		
oil pressure	OPRS		
oil proof	OP		
oil seal	OSL		

oil switch	OS		
oil temperature gauge	OTG		
on center	OC		
one thousand gallons per hour	MGPH		
one thousand square feet	MSF		
one-way	1WAY		
opaque	OPQ		
open web steel joists	—		steel joists
opening	OPNG		
operable	OPR		
operating room	OR	outside radius	
operating steam pressure	OSP		
opposite	OPP		
opposite hand	OPH		
optimum	OPT	optional	
optional	OPT	optimum	
ordnance	ORD	overflow roof drain	
organic	ORG		
original	ORIG		
ornamental	ORN		
ounce	OZ		
out to out	O/O		
outlet	OUT		
outside air	OA	overall	
outside air damper	OAD		
outside air grille	OAG		
outside air intake	OAI		
outside diameter	OD	outside dimension	
outside dimension	OD	outside diameter	
outside face	OF		
outside face of studs	OFS		
outside radius	OR	operating room	
over	O/		
overall	OA	outside air	
overcurrent	OVC		
overflow	OVFL		
overflow drain	OFD		
overflow roof drain	ORD	ordnance	
overhang	OH		

overhead (coiling) door	OH DR	
overload	OL	
override	OVRD	
owner furnished/contractor installed	OF/CI	
owner furnished/owner installed	OF/OI	
oxygen	O	
P		
package	PKG	
packaged terminal air conditioner	PTAC	
paint	PT	pipe thread; pneumatic tube; post-tensioned; pressure treated
painted base	PB	panelboard; panic bar; pull box; pushbutton
painted metal	PMTL	
Painting and Decorating Contractors of America	PDCA	
pair	PR	pipe rail; pumped return
panel	PNL	
panel point	PP	polypropylene (plastic); push/pull
panelboard	PB	painted base; panic bar; pull box; pushbutton
panic bar	PB	painted base; panelboard; pull box; pushbutton
panic bolt	PANB	
paper cup dispenser	PCD	
paper towel dispenser	PTD	printed
paper towel dispenser and receptacle	PTDR	
paper towel receptacle	PTR	
paragraph	PARA	
parallel	PAR	parapet
parapet	PAR	parallel
parenthesis	PAREN	
parging	PARG	
parking	PRKG	
parking garage	PK GAR	
parking lot	PK LOT	
parkway	PKWY	
part number	PN	
partial	PART	
particleboard	PBD	

partition	PTN		
parts per milllion	PPM		
pascal	Pa		
pass-through window	—		counter shutter or sliding window
pass window	PW		
passenger	PASS		
paste	—		adhesive
pattern	PAT		
paved	PV	photovoltaic	
paved road	PV RD		
pavement	—		paving
paving	PVG		
pedestal	PED		
pegboard	PGBD		
pendant	PEND		
penetrate	PEN		
penny (nail)	D	deep; depth	
penthouse	PH	phase	
percent	PCT		
perforated	PERF	perform	
perform	PERF	perforated	
perimeter	PERIM		
period	PER		
permanent	PERM		
perpendicular	PERP		
petroleum	PETRO		
pharmacy	PHAR		
phase	PH	penthouse	
phase meter	PM		
phillips head screw	PHS		
photoelectric	PE	pneumatic electric	
photoelectric cell	PEC		
photograph	PHOTO		
photovoltaic	PV	paved	
piece	PC	point of curve; polycarbonate; portland cement	
pilaster	PIL		
piling	PLG		

pipe anchor	PA	power amplifier; public address	
pipe rail	PR	pair; pumped return	
pipe sleeve	PSL		
pipe thread	PT	paint; pneumatic tube; post-tensioned; pressure treated	
pitch pocket	—		sealant pocket
pivoted	PIV	post indicator valve	
place	PLC		
plant mix bituminous concrete	PMBC		
plaster	PLAS	plastic	
plaster wall	PLST WL		
plastic	PLAS	plaster	
plastic laminate	PLAM		
plate glass	PL GL		
platform	PLAT		
plexiglass	—		acrylic sheet
plumb	PLB		
plumbing	PLBG		
plywood	PLYWD		
pneumatic	PNEU		
pneumatic electric	PE	photoelectric	
pneumatic tube	PT	paint; pipe thread; post tensioned; pressure treated	
point of common coupling	POCC		
point of curve	PC	piece; polycarbonate; portland cement	
point of interconnection	POI		
point of intersection	PI		
pole	P	pump	
polished	POL		
polished plate glass	PPGL		
polycarbonate	PC	piece; point of curve; portland cement	
polychlorinated biphenyl	PCB		
polyethylene (plastic)	POLY		
polyisobutylene (plastic)	PIB		
polypropylene (plastic)	PP	panel point; push/pull	
polystyrene (plastic)	PS	pull station	
polyvinyl acetate	PVA		
polyvinyl chloride (plastic)	PVC		
polyvinyl fluoride (plastic)	PVF		

porcelain	PORC		
portable	PORT		
portland cement	PC	piece; point of curve; polycarbonate	
Portland Cement Association	PCA		
portland cement plaster	PCP		
position	POS	positive	
positive	POS	position	
post indicator valve	PIV	pivoted	
post office	PO	purchase order	
post-tensioned	PT	paint; pipe thread; pneumatic tube; pressure treated	
post-tensioned concrete	PT CONC		
potable water	POTW		
pound	LB		
pound-force	LBF		
pound-force per cubic foot	LBF/CF		
pound-force per foot	LBF/FT		
pound-force per horsepower	LBF/HP		
pound-force per hour	LBF/H		
pound-force per inch	LBF/IN		
pound-force per minute	LBF/MIN		
pound-force per square foot	LBF/SF		
pound-force per square inch	LBF/SI		
pounds per cubic foot	PCF		
pounds per linear foot	PLF		
pounds per square foot	PSF		
pounds per square inch	PSI		
pounds per square inch absolute	PSIA		
pounds per square inch, gage	PSIG		
pour	—		place
poured in place	—		cast in place
power	PWR		
power amplifier	PA	pipe anchor; public address	
power conditioning unit	PCU		
power factor	PF		
power line	POW LN		
power panel	—		panelboard
power pole	—		utility pole
power roof exhaust	PRE		

power roof ventilator	PRV	pressure reducing valve; pressure regulator valve; pressure relief valve	
pre-fit	—		factory fit
pre-trimmed	—		factory fit
precast	PRCST		
precast concrete	PCC	precool coil	
Precast/Prestressed Concrete Institute	PCI		
precool coil	PCC	precast concrete	
precut	—		factory fit
prefabricate	PREFAB		
preference	PREF		
prefinish	PREFIN		
preformed	PREFMD		
preheat coil	PHC		
preliminary	PRELIM		
premolded	PRMLD		
premolded expansion joint	PEJ		
preparation	PREP		
pressure	PRESS		
pressure drop or difference	PD		
pressure gage	PG	profile grade	
pressure reducing station	PRS		
pressure reducing valve	PRV	power roof ventilator; pressure regulator valve; pressure relief valve	
pressure regulator valve	PRV	power roof ventilator; pressure reducing valve; pressure relief valve	
pressure relief valve	PRV	power roof ventilator; pressure reducing valve; pressure regulator valve	
pressure switch	PRESS SW		
pressure temperature relief valve	PTRV		
pressure treated	PT	paint; pipe thread; pneumatic tube; post tensioned	
prestressed concrete	PS CONC		
previous	PREV		
primary	PRI		
primary hot water return	PHWR		
primary hot water supply	PHWS		
prime coat	—		shop coat
primer	—		shop coat
principal	PRIN		

printed	PTD	paper towel dispenser
probable maximum flood	PMF	
probable maximum precipitation	PMP	
production	PROD	
profile grade	PG	pressure gage
project	PROJ	
property	PROP	
property line	PL	
provisional	PROV	
PSF absolute	PSFA	
PSF gage	PSFG	
public address	PA	pipe anchor; power amplifier
pull box	PB	painted base; panelboard; panic bar; pushbutton
pull station	PS	polystyrene (plastic)
pump	P	pole
pump discharge	PDISCH	
pump suction	PMPSCT	
pumped return	PR	pair; pipe rail
purchase order	PO	post office
purlins	PUR	
purse shelf	PSH	
push rod	PRD	
push/pull	PP	panel point; polypropylene (plastic)
push/pull plate	PP PL	
pushbutton	PB	painted base; panelboard; panic bar; pull box

Q

quadrangle	QUAD	quadrant
quadrant	QUAD	quadrangle
quadruple receptacle outlet	4OUT	
quality	QUAL	
quality assurance	QA	
quality control	QC	
quality control review	QCR	
quality management	QM	
quantity	QTY	
quarry	QRY	
quarry tile	QT	

quarry tile base	QTB	
quarry tile floor	QTF	
quarter	QTR	
quotation	QUOT	

R

rabbeted	RAB	
radian	RAD	radiator; return air duct
radiation	RADN	
radiation hazard	RAD HAZ	
radiator	RAD	radian; return air duct
radio frequency	RF	resilient flooring
radius	R	range; riser; thermal resistance
railing	RLG	
railroad	RR	roll roofing
rain water leader	RWL	
range	R	radius; riser; thermal resistance
rapid start	RS	rough sawn
rate of flow	Q	heat transfer
rating	RTG	
reactive kilovolt amperes	RKVA	
received	RECD	
receiver	RCVR	
receptacle	RECPT	
reception	RCPTN	
recessed	REC	
recessed waste receptacle	RWR	
reciprocal	RECIP	
recirculate	RECIRC	
recreation room	REC ROOM	
rectangle	RECT	
reducer	RDC	
redwood	RWD	
reference	REF	refrigerator
reflect	REFL	
reflected ceiling plan	RCP	reinforced concrete pipe
refractory	REFR	refrigeration
refrigerant	RFGT	
refrigerant discharge	RD	road; roof drain
refrigerant hot gas	RHG	

refrigerant liquid line	RLL		
refrigerant suction line	RSL		
refrigeration	REFR	refractory	
refrigerator	REF	reference	
register	REG	regulation	
regulation	REG	register	
reheat coil	RHC		
reheat valve	RHV		
reinforce	REINF		
reinforced brick masonry	RBM		
reinforced concrete	RC	remote control	
reinforced concrete box	RCB		
reinforced concrete culvert pipe	RCCP		
reinforced concrete pipe	RCP	reflected ceiling plan	
reinforcement	—		reinforcing
reinforcing bar	—		reinforcing
reinforcing steel	RST		
reinforcing steel bars	REBAR		
relative humidity	RH	right hand; roof hatch	
relief valve	RV	roof vent; roof ventilator	
remodel	—		alter or finish
remote control	RC	reinforced concrete	
removable	REM		
repair	REP		
replace	REPL		
reproduce	REPRO		
request for information	RFI		
request for proposal	RFP		
require	REQ		
required	REQD		
research and development	R&D		
resilient	RESIL		
resilient base	RB	rubber base	
resilient flooring	RF	radio frequency	
restroom	REST		
return	RET		
return air	RA		
return air duct	RAD	radian; radiator	
return air fan	RA FAN		

return air grille	RA GR		
return air temperature	RAT		
reveal	RVL		
reverse	RVS		
revision	REV	revolutions	
revolutions	REV	revision	
revolutions per minute	RPM		
revolutions per second	RPS		
rheostat	RHEO		
right	RT		
right hand	RH	relative humidity; roof hatch	
right hand reverse	RHR		
right of way	ROW		
rigid insulation, solid	RDG INS		
riser	R	radius; range; thermal resistance	
road	RD	refrigerant discharge; roof drain	
roadway	RW		
robe hook	RB HK		
rocklath	—		gypsum lath or metal lath
roll roofing	RR	railroad	
rolling steel door	RSD		
roof drain	RD	refrigerant discharge; road	
roof hatch	RH	relative humidity; right hand	
roof leader	RL		
roof top unit	RTU		
roof vent	RV	relief valve; roof ventilator	
roof ventilator	RV	relief valve; roof vent	
roofing	RFG		
room	RM		
room air conditioner	RAC		
room monitor system	RMS	root mean square	
root mean square	RMS	room monitor system	
rough opening	RO		
rough sawn	RS	rapid start	
round	RND		
round head machine screw	RHMS		
round head wood screw	RHWS		
rubber	RBR		

rubber base	RB	resilient base	
rubber tile floor	RTF		
runway	RWY		
rusting steel	—		weathering steel
S			
saddle	SDL		
safety factor	SF	square foot (feet); supply fan	
safety nosing	—		abrasive nosing
safety valve	SV	sheet vinyl	
salvage	SALV		
sample	SAMP		
sand	—		porous fill
sandblast	SDBL		
sanitary	SAN		
sanitary napkin dispenser	SND		
sanitary napkin disposal unit	SNDU		
sanitary sewer	SS	service sink; standing seam (roof); steam supply; storm sewer	
saturate	SAT	suspended acoustical tile	
schedule	SCHED		
schedule of values	SOV	shut off valve	
schematic	SCHEM		
school	SCH		
scored joint	SJ	slip joint	
screen	SCRN		
scupper	SCP		
scuttle	—		roof hatch
sea level	SL	spot light	
sealant	SLNT		
seamless	SMLS		
seat cover dispenser	SCD		
secondary hot water return	SHWR		
secondary hot water supply	SHWS		
section	SECT		
segment	SEG		
select	SEL		
semiconductor controlled rectifier	SCR	shower curtin rod	
sensible heat	SH	shingles; single hung (window)	
sensible heat gain	SHG		

sensible heat ratio	SHR	shower	
sensor	SNSR		
separate	SEP		
septic tank	SEP TNK		
service	SVCE		
service sink	SS	sanitary sewer; standing seam (roof); steam supply; storm sewer	
sewage	SWG		
sewer	SWR		
shading coefficient	SC	solid core	
shaft	SHT	sheet	
shaft (elevator)	SHFT		
shaft horsepower	SFT HP		
sheathing	SHTHG		
sheet	SHT	shaft	
sheet metal	SM	silty sand; small; smooth	
sheet metal (flashing)	SHT MTL FLASH		
sheet vinyl	SV	safety valve	
sheeting	—		sheathing
shelving	SHV		
shingles	SH	sensible heat; single hung (window)	
shop drawings	SD	smoke detector; soap dispenser; storm drain; supply duct	
short circuit capacity	SCC		
shoulder	SHLDR		
shower	SHR	sensible heat ratio	
shower curtain rod	SCR	semiconductor controlled rectifier	
shower drain	SHRD		
shower head	SHR HD		
shut off valve	SOV	schedule of values	
shutter	SHTR		
sidewalk	SW	switch	
siding	SDG		
signal	SIG		
silty gravel	GM		
silty sand	SM	sheet metal; small; smooth	
similar	SIM		
single	SGL		
single hung (window)	SH	sensible heat; shingles	

single acting (door)	SA	supply air	
single-phase	1PH		
single pole	1P		
single pole, double throw	SPDT		
single pole, single throw	SPST		
single receptacle floor outlet	FLOUTS		
single receptacle outlet	SOUT		
single throw	ST	stairs; street	
sink	—		lavatory
sketch	SK		
skydome	—		skylight
skylight	SKLT		
skylite	—		skylight
sleeve	SLV		
sliding	SLDG		
sliding glass door	SGD		
slip joint	SJ	scored joint	
slop sink	—		service sink
small	SM	sheet metal; silty sand; smooth	
smoke	SMK		
smoke damper	SDMPR		
smoke detector	SD	shop drawings; soap dispenser; storm drain; supply duct	
smooth	SM	sheet metal; silty sand; small	
soap dispenser	SD	shop drawings; smoke detector; storm drain; supply duct	
Society of American Registered Architects	SARA		
softwood	SFTWD		
solder	SLDR		
solenoid valve	SOLV		
solid concrete masonry unit	SCMU		
solid core	SC	shading coefficient	
solid core wood door	SCWD		
solid plastic	SP	standpipe; sump pit	
solution	SOLN		
solvent	SLVT		
sound insulation	SND INS		
sound transmission class	STC		
south	S		

Southern Building Code Congress International	SBCCI	
space heater	SPH	
speaker	SPKR	
special	SPCL	
special finish	SP FIN	
specific gravity	SP GR	
specification	SPEC	
splash block	SB	
spline	SPL	
spot elevation	SP EL	
spot light	SL	sea level
sprinkler	SPKLR	
sprinkler line	SPR	
spruce-pine-fir	SPF	
square	SQ	
square bar	SQ BR	
square centimeter; centimeter squared	cm2	
square foot (feet)	SF	safety factor; supply fan
square inch	SQ IN	
square kilometer	km2	
square meter	m2	
square millimeter	mm2	
square yard	SQ YD	
staggered	STAG	
stained glass	ST GL	
stainless	STNLS	
stainless steel	SST	
stainless steel pipe	SSP	
stairs	ST	single throw; street
standard	STD	
standard cubic feet per minute	SCFM	
standard cubic feet per second	SCFS	
standard temperature and pressure	STP	
standing seam (roof)	SS	sanitary sewer; service sink; steam supply; storm sewer
standpipe	SP	solid plastic; sump pit
start/stop	S/S	
static pressure	ST PR	

station	STA	
steam	STM	
steam gage	SG	
steam generator	ST GEN	
steam manhole	SMH	
steam return	SR	
steam supply	SS	sanitary sewer; service sink; standing seam (roof); storm sewer
steam working pressure	STWP	
Steel Deck Institute	SDI	Steel Door Institute
Steel Door Institute	SDI	Steel Deck Institute
steel joist	STL JST	
Steel Joist Institute	SJI	
steel lintel	STL LNTL	
steel plate	STL PL	
steel roof deck	STL RF DK	
steel truss	STL TR	
steel tube	STL TB	
Steel Window Institute	SWI	
stepping	STPG	
stiffener	STIF	
stirrup	STIR	
storage	STOR	
storeroom	STRM	
storm drain	SD	shop drawings; smoke detector; soap dispenser; supply duct
storm drain manhole	SDMH	
storm sewer	SS	sanitary sewer; service sink; standing seam (roof); steam supply
storm water	ST W	
straight	STR	strike; stringers
strainer	STN	
street	ST	single throw; stairs
strike	STR	straight; stringers
stringers	STR	straight; strike
strobe	STRB	
strobe/horn	STRB/HRN	
structural	STRUCT	
structural clay tile	SCT	
structural engineer	SE	

structural steel	STRUCT STL		
stucco	—		cement plaster
styrene butadien styrene	SBS		
subfloor	SUB FL		
subparagraph	SUBPAR		
subsoil drain	SSD		
substitute	SUB		
substrate	SBSTR		
suction	SUCT		
sufficient	SUF		
summary	SUM		
sump pit	SP	solid plastic; standpipe	
sump pump	SMP		
sump tank	SUTK		
supervisor	SUPVR		
supplement	SUPPL		
supplementary	SUP		
supply	SPLY		
supply air	SA	single acting (door)	
supply air grille	SAG		
supply duct	SD	shop drawings; smoke detector; soap dispenser; storm drain	
supply fan	SF	safety factor; square foot (feet)	
support	SPRT		
suppression	SUPN		
surface	SURF		
surfaced four sides	S4S		
surfaced one side	S1S		
surfaced two sides	S2S		
surround	SURR		
surveillance camera	SURV CAM		
surveillance equipment	SURV EQUIP		
surveillence monitor	SURV MON		
survey	SURV		
suspend	SUSP		
suspended acoustical plaster ceiling	SAPC		
suspended acoustical tile	SAT	saturate	
suspended acoustical tile ceiling	SATC		
suspended ceiling	SUSP CLG		

suspended plaster ceiling	SPC		
suspended unit heater	SUH		
swing door	SWDR		
switch	SW	sidewalk	
switchboard	SWBD		
switchgear	SWGR		
symbol	SYM		
symmetrical	SYMM		
synthetic	SYNTH		
system	SYS		

T

table of content	TOC	top of concrete; top of curb	
tabulate	TAB		
tackboard	TK BD		
tangent	TAN		
tar	—		pitch
technical	TECH		
telephone	TEL		
telephone control panel	TCP	temperature control panel; traffic control plan	
telephone equipment room	TER	terrazzo	
telephone floor outlet	FOUTT		
telephone jack	TEL JK		
telephone outlet	TEL OUT		
telephone pole	TP	total pressure; twisted pair	
telephone terminal board	TTB		
television	TV		
television outlet	TVOUT		
temperature	TEMP	temporary	
temperature and pressure valve	T&P VALVE		
temperature control panel	TCP	telephone control panel; traffic control plan	
temperature control valve	TCV		
temperature difference	TD	towel dispenser; trench drain	
tempered	TMPD		
tempered glass	TMPD GL		
tempered hardboard	TEMP HDBD		
temporary	TEMP	temperature	
temporary benchmark	TBM		
tensile strength	TS	tube steel	

terminal	TERM		
terminal unit controller	TUC		
terra cotta	TC		
terrazzo	TER	telephone equipment room	
yest boring-xx (e.g. TB-01)	TB-xx		
thermal	THERM		
thermal conductance	C VALUE		
thermal conductivity	K VALUE		
thermal resistance	R	radius; range; riser	
thermopane	—		insulating glass
thermostat	TSTAT		
thickness	THK		
thousand	K	kelvin	
thousand board feet	MBF		
thousand Btu	MBtu		
thousand Btu per hour	MBtuH		
thousand cubic feet	MCF		
thousand feet board measure	MBM		
thousand foot/pounds	KIP FT		
thousand pounds	KIP		
thread	THD		
three-conductor	3/C		
three-phase	3PH		
three-ply	3PLY		
three-way	3WAY		
threshold	THRES		
through	THRU		
through bolt	TB	towel bar	
throughout	THRUOUT		
Tile Council of America	TCA		
time and materials	T&M		
to floor above	TFA		
to floor below	TFB		
toilet (plumbing fixture)	—		water closet
toilet paper dispenser	TPD		
toilet paper holder	TPH		
tolerance	TOL		
tongue and groove	T&G		
top and bottom	T&B		

top elevation	TE		
top of ___	TO		
top of beam	TOB		
top of concrete	TOC	table of content; top of curb	
top of concrete footing	TOC FTG		
top of concrete wall	TOC WALL		
top of curb	TOC	table of content; top of concrete	
top of finish floor	TFF		
top of floor	TOF	top of footing; top of frame	
top of footing	TOF	top of floor; top of frame	
top of foundation	TO FDN		
top of frame	TOF	top of floor; top of footing	
top of joist	TOJ		
top of manhole	TMH		
top of masonry	TOM		
top of parapet	TOP	top of pavement	
top of pavement	TOP	top of parapet	
top of rim	TR	towel rack	
top of slab	TOS	top of steel	
top of steel	TOS	top of slab	
top of truss	TOT		
top of wall	TOW		
topography	TOPO		
total dynamic head	TDH		
total pressure	TP	telephone pole; twisted pair	
total quality management	TQM		
towel bar	TB	through bolt	
towel dispenser	TD	temperature difference; trench drain	
towel dispenser/receptacle	TDR		
towel rack	TR	top of rim	
towel shelf	TSH		
tower water return	—		condenser water
tower water supply	—		condenser water
traffic control plan	TCP	telephone control panel; temperature control panel	
transfer	XFER		
transfer grille	TG		
transformer	XFMR		
transom	TRANS	transparent	

transparent	TRANS	transom	
transparent wood finish	TRANS WD FIN		
transverse expansion joint	TEJ		
tread	T		
treated	TRTD		
treated water return	TWR		
treated water supply	TWS		
trench drain	TD	temperature difference; towel dispenser	
true north	TN		
tub/shower	T/S		
tube steel	TS	tensile strength	
tunnel	TNL		
turnbuckle	TRNBKL		
turnpike	TNPK		
twindow	—		insulating glass
twist lock	TL		
twisted pair	TP	telephone pole; total pressure	
twisted pair shielded	TPS		
two-conductor	2/C		
two-way	2WAY		
typical	TYP		

U

ultimate	ULT		
ultraviolet	UV		
undercut	UC		
undercut door	UCD		
underfloor duct	UFD		
underground	UGND		
Underwriters Laboratories	UL		
unexcavated	UNEX		
unfinish	UNFIN		
uniform	UNIF		
Uniform Building Code	UBC		
Uniform Fire Code	UFC		
Uniform Mechanical Code	UMC		
Uniform Plumbing Code	UPC		
uninterruptible power supply	UPS		
unit heater	UH		

unit of sound level	dBA		
unit weight	UWT		
universal	UNIV		
unless noted	UN		
unless noted otherwise	UNO		
unless otherwise noted	UON		
unpaved road	UNPV RD		
untwisted pair	UTP		
urinal	UR		
utility	UTIL		
utility pole	UP		

V

V joint	VJ		
vacuum	VAC	vacuum line	
vacuum breaker	VB	valve box; vinyl base	
vacuum cleaner outlet	VCO		
vacuum line	VAC	vacuum	
vacuum pump	VP	vanishing point; vapor pressure; velocity pressure; veneer plaster	
vacuum return pump	VRP		
valve box	VB	vacuum breaker; vinyl base	
vanishing point	VP	vacuum pump; vapor pressure; velocity pressure; veneer plaster	
vanity	VAN		
vapor barrier	—		vapor retarder
vapor pressure	VP	vacuum pump; vanishing point; velocity pressure; veneer plaster	
vapor proof	VAP PRF		
vapor retarder	VR	voltage regulator	
variable air volume	VAV		
variable frequency	VF		
variable frequency drive	VFD		
variation	VAR	varies; volt ampere reactive	
varies	VAR	variation; volt ampere reactive	
vehicle	VEH		
velocity	VEL		
velocity pressure	VP	vacuum pump; vanishing point; vapor pressure; veneer plaster	
veneer	VNR		

veneer plaster	VP	vacuum pump; vanishing point; vapor pressure; velocity pressure	
vent stack	VS	voltmeter switch	
vent through roof	VTR		
ventilation	VENT	ventilator	
ventilator	VENT	ventilation	
veranda	VRNDA		
verify	VRFY		
verify in field	VIF		
vertical	VERT		
vertical curve	VC		
vertical grain	VG		
vertical unit heater	VUH		
very high frequency	VHF		
very high output	VHO		
vestibule	VEST		
vibration	VIB		
vicinity	VIC		
video	VID		
video amplifier	VIDAMP		
video integration	VINT		
village	VIL		
vinyl base	VB	vacuum breaker; valve box	
vinyl composition tile	VCT	vitrified clay tile	
vinyl faced acoustical tile	VFAT		
vinyl tile	—		resilient tile
vinyl wall covering	VWC		
vinyl wall fabric	VWF		
viscosity	VISC		
visqueen	—		vapor retarder
visual	VIS		
vitreous	VIT		
vitrified clay tile	VCT	vinyl composition tile	
volatile organic compound	VOC		
volt	V		
volt-ammeter	VAM		
volt ampere	VA		
volt ampere reactive	VAR	variation; varies	
voltage	VOLT		

voltage drop	VD	volume damper	
voltage regulator	VR	vapor retarder	
voltage relay	VRLY		
voltmeter switch	VS	vent stack	
volume	VOL		
volume damper	VD	voltage drop	
volumeric flow rate	VFR		

W

wainscot	WSCT		
wall ash urn	WAU		
wall board	—		gypsum board
wall cabinets	W CAB		
wall cleanout	WCO		
wall covering	WC	water closet; water column	
wall fabric	WFAB		
wall hung	WH	wall hydrant; water heater; weep hole	
wall hydrant	WH	wall hung; water heater; weep hole	
wall to wall	W/W		
warehouse	WHSE		
warm white	WW	wastewater; wireway	
warm white deluxe	WWX		
Warnock Hershey International	—		Intertek Testing Services
warranty	WARR		
wash fountain	WF	wide flange	
waste	W	watt; west; wide	
waste disposer	WDSP		
waste water	WW	warm white; wireway	
water	WTR		
water chiller	WCHR		
water closet	WC	wall covering; water column	
water closet, wall hung	WC WL HNG		
water column	WC	wall covering; water closet	
water cooled	WCLD		
water cooler	WCLR		
water cooler, wall hung	WCL WL MTD		
water cooling tower	—		cooling tower
water elevation	WT EL		
water gage	WG		

water hammer arrestor	WHA		
water heater	WH	wall hung; wall hydrant; weep hole	
water jacket	WJ		
water line	WL	wind load	
water meter	WM	wire mesh	
water pressure drop	WPD		
water pump	WP	waterproofing; weatherproof; working point	
water repellent	WR	weather resistant; wire rope	
water table	WT	watertight; weight	
waterproof membrane	WPM		
waterproofing	WP	water pump; weatherproof; working point	
watertight	WT	water table; weight	
watt	W	waste; west; wide	
watthour meter	WHM		
weather	WEA		
weather resistant	WR	water repellent; wire rope	
weather seal	WSL		
weatherproof	WP	water pump; waterproofing; working point	
weatherstrip	WS		
weep hole	WH	wall hung; wall hydrant; water heater	
weight	WT	water table; watertight	
welded	WLD		
Δ			
welded wire reinforcement	WWR		
west	W	waste; watt; wide	
wet bulb	WB	wood base	
wet bulb temperature	WBT		
where occurs	WO	work order	
wide	W	waste; watt; west	
wide flange	WF	wash fountain	
wind load	WL	water line	
window	WDW		
Window and Door Manufacturers Association	WDMA		
window unit	WU		
wire glass	—		wired glass
wire mesh	WM	water meter	
wire rope	WR	water repellant; weather resistant	
wired glass	WGL		

wireway	WW	warm white; waste water
with	W/	
without	W/O	
wood	WD	wood door
wood base	WB	wet bulb
wood blocking	WBL	
wood door	WD	wood
wood door and frame	WDF	
wood frame	WFR	
wood furring strips	WFS	
wood louvers	WD LOUV	
wood panelling	WDP	
work order	WO	where occurs
working point	WP	water pump; waterproofing; weatherproof
working pressure	WPR	
working steam pressure	WSP	
wrought brass	WBS	
wrought iron	WI	

Y		
yard	YD	yard drain; yard drainage pipe
yard cleanout	YCO	
yard drain	YD	yard; yard drainage pipe
yard drainage pipe	YD	yard; yard drain
yard hydrant	YH	
yard inlet	YI	
year	YR	

Module 5 - Terms and Abbreviations

5.3 ABBREVIATIONS

DOWNLOAD SPREADSHEET

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Abbreviation	Term	Shared Abbreviation
1PH	single-phase	
1P	single pole	
1WAY	one-way	
2/C	two-conductor	
2WAY	two-way	
3/C	three-conductor	

3PH	three-phase	
3PLY	three-ply	
3WAY	three-way	
4/C	four-conductor	
4OUT	quadruple receptacle outlet	
4PDT	four-pole double throw	
4PST	four-pole single throw	
4W	four-wire	
4WAY	four-way	
A		
A LABEL	Class A door	
A/C	air condition	
A/C UNIT	air conditioning unit	
A/E	architect/engineer	
AACE	American Association of Cost Engineers	
AAD	automatic air damper	
AAMA	American Architectural Manufacturers Association	
AAP	alarm annunciator panel	
AAV	automatic air vent	
AB	anchor bolt	
ABAN	abandon	
ABBRV	abbreviation	
ABC	aggregate base course	Associated Builders and Contractors
ABC	Associated Builders and Contractors	aggregate base course
ABNL	abnormal	
ABRSV	abrasive	
ABRSV RES	abrasive resistant	
ABS	absolute	acrylonitrile butadiene styrene
ABS	acrylonitrile butadiene styrene	absolute
ABSORB	absorption	
AC	alternating current	armored cable; asbestos cement; asphaltic concrete
AC	armored cable	alternating current; asbestos cement; asphaltic concrete
AC	asbestos cement	alternating current; armored cable; asphaltic concrete
AC	asphaltic concrete	alternating current; armored cable; asbestos cement
ACC	accessible	
ACCU	air cooled condensing unit	
ACD	ac disconnect	
ACHKV	automatic check valve	
ACI	American Concrete Institute	

ACID RES	acid resistant	
ACID RES CI	acid resistant cast iron	
ACID RES P	acid resistant pipe	
ACID RES V	acid resistant vent	
ACID RES W	acid resistant waste	
ACOUS INSUL	acoustical insulation	
ACOUS PNL	acoustical panel	
ACP	asphaltic concrete paving	automatic control panel
ACP	automatic control panel	asphaltic concrete paving
ACR	across	
ACS	automatic control system	
ACS DR	access door	
ACS FLR	access floor	
ACS PNL	access panel	
ACSR	aluminum cable steel reinforced	
ACST	acoustic	
ACT	acoustical ceiling tile	
ACU	assembled cooling unit	
ACV	automatic control valve	
AD	area drain	
ADA	Americans with Disabilities Act	
ADC	automatic door closer	
ADDL	additional	
ADDM	addendum	
ADH	adhesive	
ADJ	adjacent	adjoining; adjustable
ADJ	adjoining	adjacent; adjustable
ADJ	adjustable	adjacent; adjoining
ADMIN	administration	
ADS	automatic door seal	
AF	audio frequency	
AFC	above finished counter	automatic frequency control
AFC	automatic frequency control	above finished counter
AFF	above finished floor	
AFG	above finished grade	
AFS	above finished slab	
AGA	American Gas Association	
AGC	Associated General Contractors	
AGGR	aggregate	

AH	ampere hour	
AHJ	authority having jurisdiction	
AHR	anchor	
AHU	air handling unit	
AI	Asphalt Institute	
AIA	American Institute of Architects	
AIC	ampere interrupting capacity	
AISC	American Institute of Steel Construction	
ALLOW	allowance	
ALM	alarm	
ALNMT	alignment	
ALT	alternate	altitude
ALT	altitude	alternate
ALT NO	alternate number	
ALTRN	alteration	
ALUM	aluminum	
AM	amplitude modulation	
AMB	ambient	
AMP	ampere	
AMPL	amplifier	
AMT	amount	
ANG BM	angle beam	
ANN	annunciator	
ANOD	anodize	
ANSI	American National Standards Institute	
ANT	antenna	
APA	American Plywood Association	
APC	acoustical panel ceiling	
APD	air pressure drop	
APP	appearance	atactic propylene
APP	atactic propylene	appearance
APPD	approved	
APPROX	approximate	
APPX	appendix	
APR	air pressure return line	
APT	apartment	Association for Preservation Technology
APT	Association for Preservation Technology	apartment
APU	auxiliary power unit	
AR	as required	

ARCH	Architect	
ARF	architectural finish	
ART	article	
AS	air separator	ammeter switch
AS	ammeter switch	air separator
ASB	asbestos	
ASC	above suspended ceiling	amps short circuit; asphalt surface course
ASC	amps short circuit	above suspended ceiling; asphalt surface course
ASC	asphalt surface course	above suspended ceiling; amps short circuit
ASCE	American Society of Civil Engineers	
ASD	automatic sprinkler drain	
ASEC	American Standard Elevator Codes	
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers	
ASI	Architect's Supplemental Instruction	
ASKLR	automatic sprinkler	
ASME	American Society of Mechanical Engineers	
ASPH	asphalt	
ASR	automatic sprinkler riser	
ASSN	association	
ASSY	assembly	
ASTM	American Society for Testing and Materials	
ASU	air supply unit	
ASV	angle stop valve	
ASWG	American steel wire gauge	
ASYM	asymmetrical	
ATC	acoustical tile ceiling	
ATCH	attachment	
ATM	atmosphere	automatic teller machine
ATM	automatic teller machine	atmosphere
ATS	automatic transfer switch	
ATTN	attention	
AUTO	automatic	
AUTO XFMR	auto transformer	
AUX	auxiliary	
AV	acid vent	air vent; audio visual
AV	air vent	acid vent; audio visual
AV	audio visual	acid vent; air vent
AVE	avenue	

AVG	average	
AW	acid waste	actual weight; architectural woodwork
AW	actual weight	acid waste; architectural woodwork
AW	architectural woodwork	acid waste; actual weight
AWG	American wire gauge	
AWI	Architectural Woodworking Institute	
AWL	acid waste line	
AWN WDW	awning window	
AWP	air water pump	
AWPA	American Wood Preservers' Association	
AWS	American Welding Society	
AWT	acoustical wall treatment	
AWWA	American Water Works Association	
AX FL	axial flow	
AZ	azimuth	

B

B CL	broom closet	
B LABEL	Class B door	
B PL	base plate	
B&B	balled and burlapped	bell and bell; grade B or better (lumber)
B&B	bell and bell	balled and burlapped; grade B or better (lumber)
B&B	grade B or better (lumber)	balled and burlapped; bell and bell
B&F	bell and flange	
B&S	bell and spigot	
B/B	back to back	
B/M	board measure	
BA	bright annealed	
BAF	baffle	
BAG	baggage	
BAL	balance	
BALC	balcony	
BAS	building automation system	
BAT	batten	battery
BAT	battery	batten
BAY WDW DH	bay window double hung	
BB	baseboard	bulletin board
BB	bulletin board	baseboard
BB XFMR	buck-boast transformer	
BBR	base board radiator	

BC	back of curb	between centers; bolt circle; bookcase; bottom chord; brick color; building code
BC	between centers	back of curb; bolt circle; bookcase; bottom chord; brick color; building code
BC	bolt circle	back of curb; between centers; bookcase; bottom chord; brick color; building code
BC	bookcase	back of curb; between centers; bolt circle; bottom chord; brick color; building code
BC	bottom chord	back of curb; between centers; bolt circle; bookcase; brick color; building code
BC	brick color	back of curb; between centers; bolt circle; bookcase; bottom chord; building code
BC	building code	back of curb; between centers; bolt circle; bookcase; bottom chord; brick color
BCV	butterfly check valve	
BD	board	butterfly damper
BD	butterfly damper	board
BD FT	board feet (foot)	
BDD	backdraft damper	
BDNG	bedding	
BDRY	boundary	
BEV	bevel	
BF	both faces	
BFBP	boiler feed booster pump	
BFF	below finish floor	
BFP	backflow preventer	
BFV	butterfly valve	
BFW	boiler feedwater	
BFWP	boiler feedwater pump	
BHMA	Builder's Hardware Manufacturer's Association	
BHP	brake horsepower	
BI FLD DR	bifolding doors	
BIA	Brick Institute of America	
BIL	basic insulation level	
BITUM	bituminous	
BJT	bed joint	
BKBD	backboard	
BKG	backing	
BKGD	background	
BL	base line	building line
BL	building line	base line

BL MTH	bell mouth	
BLB T BM	bulb tee beam	
BLD	build	
BLDG	building	
BLKHD	bulkhead	
BLKT	blanket	
BLO	blower	
BLR	boiler	
BLR HP	boiler horsepower	
BLST	ballast	
BLT	borrowed light	built
BLT	built	borrowed light
BLT IN	built-in	
BLVD	boulevard	
BLW	below	
BLW CLG	below ceiling	
BLWDN	blowdown	
BM	beam	benchmark; bending moment
BM	benchmark	beam; bending moment
BM	bending moment	beam; benchmark
BN	bullnose	
BNDG	bonding	
BO	blowoff	
BOCA	Building Officials and Code Administrators Association International	
BOS	bottom of steel	
BOT	bottom	
BOT F	bottom face	
BP	building paper	
BPRF	bulletproof (bullet-resistant)	
BR	bedroom	
BRCG	bracing	
BRDG	bridging	
BRDG JST	bridging joist	
BRG	bearing	
BRG PL	bearing plate	
BRKR	breaker	
BRKT	bracket	
BRLP	burlap	

BRZ	bronze	
BS	both sides	
BSMT	basement	
BSP	black steel pipe	
BSTR	booster	
BT	bathtub	
BT WLD	butt weld	
BTR	better	
Btu	British thermal unit	
BtuH	British thermal unit per hour	
BTWN	between	
BU	built-up	bushel
BU	bushel	built-up
BUR	built-up roofing	
BV	ball valve	
BW	both ways	
BWG	Birmingham wire gauge	
BX	interlocked amored cable	
BYP	by pass	

C

C	Celsius	channel
C	channel	Celsius
C CONC	cast concrete	
C LABEL	Class C door	
C TO C	center to center	
C VALUE	thermal conductance	
C&BTR	grade C and better	
C&G	curb and gutter	
C&P	carpet and pad	
C/C	cooling coil	
CAB	cabinet	
CAC	ceiling attenuation class	
CAL	calorie	
CALC	calculate	
CAM	camber	
CAN	canopy	
CANTIL	cantilever	
CANV	canvas	
CAP	capacitor	capacity

CAP	capacity	capacitor
CAT	catalog	
CATV	community antenna television	
CATW	catwalk	
CAV	cavity	
CB	carriage bolt	catch basin; cement base; ceramic base; combiner box; corner bead
CB	catch basin	carriage bolt; cement base; ceramic base; combiner box; corner bead
CB	cement base	carriage bolt; catch basin; ceramic base; combiner box; corner bead
CB	ceramic base	carriage bolt; catch basin; cement base; combiner box; corner bead
CB	combiner box	carriage bolt; catch basin; cement base; ceramic base; corner bead
CB	corner bead	carriage bolt; catch basin; cement base; ceramic base; combiner box
CBB	cementitious (backer) board	
CC	cubic centimeter	
CCD	contract change directive	
CCF	hundred cubic feet	
CCR	control contactor	
CCTV	closed circuit television	
CCW	counterclockwise	
cd	candela	construction documents; contract documents
CD	construction documents	candela; contract documents
CD	contract documents	candela; construction documents
CDW	chilled drinking water	
CDWR	chilled drinking water return	
CDWS	chilled drinking water supply	
CEM	cement	cemetery
CEM	cemetery	cement
CEM FIN	cement finish	
CEM PLAS	cement plaster	
CEM PLAS CLG	cement plaster ceiling	
CER	ceramic	
CERT	certify	
CF	cement floor	contractor furnished
CF	contractor furnished	cement floor
CF/CI	contractor furnished/contractor installed	

CF/OI	contractor furnished/owner installed	
CFC	chlorofluorocarbons	
CFE	contractor furnished equipment	
CFLG	counterflashing	
CFM	cubic feet per minute	
CFMF	cold-formed metal framing	
CFS	cubic feet per second	
CG	center of gravity	common ground; corner guard
CG	common ground	center of gravity; corner guard
CG	corner guard	center of gravity; common ground
CGSFU	ceramic glazed structural facing units	
CH	chiller	coat hook
CH	coat hook	chiller
CH BD	chalkboard	
CHEM	chemical	
CHFR	chamfer	
CHG	charge	
CHK	check	
CHKV	check valve	
CHMBR	chamber	
CHR PL	chrome plated	
CHW	chilled water	circulating hot water
CHW	circulating hot water	chilled water
CHWP	chilled water pump	
CHWPP	chilled water primary pump	
CHWR	chilled water return	
CHWRP	chilled water recirculating pump	
CHWS	chilled water supply	
CHWSP	chilled water secondary pump	
CI	cast iron	curb inlet
CI	curb inlet	cast iron
CIP	cast-in-place	cast iron pipe
CIP	cast iron pipe	cast in place
CIR	circle	
CIRC	circular	
CISP	cast iron soil pipe	
CJ	construction joint	control joint
CJ	control joint	construction joint
CK TP	cook top	

CKT	circuit	
CKT BRKR	circuit breaker	
CL	center line	class; close
CL	class	center line; close
CL	close	center line; class
CL D	clothes dryer	
CLASS	classification	
CLDG	cladding	
CLF	current limiting fuse	
CLFMI	Chain Link Fence Manufacturers Institute	
CLG	ceiling	
CLG DCT OUT	ceiling duct outlet	
CLG DIFF	ceiling diffuser	
CLG GRL	ceiling grille	
CLG HT	ceiling height	
CLG REG	ceiling register	
CLKJ	calked joint	
CLL	column line contract limit line	
CLL	contract limit line column line	
CLO	closet	
CLOS	closure	
CLR	clear	color; cooler
CLR	color	clear; cooler
CLR	cooler	clear; color
CLRM	classroom	
CLT	cleat	
CLWG	clear wired glass	
cm	centimeter	
cm^2	square centimeter; centimeter squared	
cm^3	cubic centimeter	
CM	center matched	construction management
CM	construction management	center matched
cm/s	centimeter per second	
CMP	corrugated metal pipe	
CMPST	composite	
CMPTR	computer	
CMR	common mode rejection	
CMU	concrete masonry unit	
CNCL	concealed	

CND	conduit	
CNDS	condensate	
CNR	corner	
CNTOR	contactor	
CNTR	counter	
CNVR	conveyor	
CO	carbon monoxide	cased opening; Certificate of Occupancy; cleanout; company; cutout
CO	cased opening	carbon monoxide; Certificate of Occupancy; cleanout; company; cutout
CO	Certificate of Occupancy	carbon monoxide; cased opening; cleanout; company; cutout
CO	cleanout	carbon monoxide; cased opening; Certificate of Occupancy; company; cutout
CO	company	carbon monoxide; cased opening; Certificate of Occupancy; cleanout; cutout
CO	cutout	carbon monoxide; cased opening; Certificate of Occupancy; cleanout; company
CO_2	carbon dioxide	
COAX	coaxial cable	
COEFF	coefficient	
COL	column	
COM	common	
COMB	combination, combined	
COMM	communication	
COMP	component	
COMPL	complete	
COMPR	compressor	
COMPT	compartment	
CONC	concentric	concrete
CONC	concrete	concentric
CONC FLR	concrete floor	
CONC OPNG	concrete opening	
COND	condenser	condition
COND	condition	condenser
CONDN	condensation	
CONF	conference	
CONN	connect	
CONSTR	construction	
CONSULT	consultant	
CONT	continue	controller

CONT	controller	continue
CONTR	contract	contractor
CONTR	contractor	contract
CONV	convert	
COORD	coordinate	
COP	coefficient of performance (heating)	coping
COP	coping	coefficient of performance (heating)
COR	change order request	
CORN	cornice	
CORR	correct	corridor
CORR	corridor	correct
CORRES	correspond	
COTG	cleanout to grade	
COV	cover	cut off valve
COV	cut off valve	cover
COV PL	cover plate	
CP	candlepower	concrete pipe; control panel
CP	concrete pipe	candlepower; control panel
CP	control panel	candlepower; concrete pipe
CPLG	coupling	
CPM	critical path method	
CPRS	compressible	
CPT	carpet	control power transformer
CPT	control power transformer	carpet
CPVC	chlorinated polyvinyl chloride	
CR	closet rod	control relay; control room
CR	control relay	closet rod; control room
CR	control room	closet rod; control relay
CRCMF	circumference	
CRI	color rendering index	
CRN	crown	
CRP	condensate return pump	
CRS	cold rolled steel	
CRSI	Concrete Reinforcing Steel Institute	
CRT YD	courtyard	
CS	cast stone	commercial standard; control switch
CS	commercial standard	cast stone; control switch
CS	control switch	cast stone; commercial standard
CSB	concrete splash block	

CSG	casing	
CSI	Construction Specifications Institute	
CSK	counter sunk	
CSMT	casement	
CSP	concrete sewer pipe	
CSTL	cast steel	
CSWK	casework	
CT	ceramic tile	count; current transformer
CT	count	ceramic tile; current transformer
CT	current transformer	ceramic tile; count
CT STN	cut stone	
CTB	ceramic tile base	
CTD	coated	
CTF	ceramic tile floor	
CTG	coating	
CTI	Ceramic Tile Institute of America	
CTR	center	contour; cooling tower return
CTR	contour	center; cooling tower return
CTR	cooling tower return	center; contour
CTRL	control	
CTS	cooling tower supply	
CTV	cable television	
CU	coefficient of utilization	copper; cubic
CU	copper	coefficient of utilization; cubic
CU	cubic	coefficient of utilization; copper
CU FT	cubic feet	
CU IN	cubic inch	
CU YD	cubic yard	
CUB	cubicle	
CUH	cabinet unit heater	
CUR	current	
CURT	curtain	
CUST	custodian	
CV	control valve	
CW	casement window	chemical waste line; clockwise; cold water piping; cool white
CW	chemical waste line	casement window; clockwise; cold water piping; cool white
CW	clockwise	casement window; chemical waste line; cold water piping; cool white

CW	cold water piping	casement window; chemical waste line; clockwise; cool white
CW	cool white	casement window; chemical waste line; clockwise; cold water piping
CWP	circulating water pump	condenser water pump
CWP	condenser water pump	circulating water pump
CWR	condenser water return	
CWS	condenser water supply	
CWT	hundred weight	
CWX	cool white deluxe	
CYL	cylinder	
CYL L	cylinder lock	
CYP	cypress	

D		
D	deep	depth; penny (nail)
D	depth	deep; penny (nail)
D	penny (nail)	deep; depth
D CHEM	dry chemical	
D LABEL	Class D door	
D&S	display and storage	
D1S	dressed one side	
D2S	dressed two sides	
D4S	dressed four sides	
DA	disabled	drainage area
DA	drainage area	disable
DAP	duct access panel	
DAT	datum	
dB	decibel	
DB	database	dry bulb
DB	dry bulb	database
D-B	design-build	
dBA	unit of sound level	
DBL	double	
DBL ACT DR	double acting door	
DBL GLZ	double glaze	
DBT	dry bulb temperature	
DC	direct current	
DCB	disconnecting combiner box	
DCD	dc disconnect	

DCI	duct covering insulation	
DCP	dimmer control panel	
DCT SUP	duct supply	
DCT/RS	duct rising, duct riser	
DCT/RT	duct return	
DDC	direct digital control	
DEF	definition	
DEG	degree	
DEG C	degrees Celsius	
DEG F	degrees Fahrenheit	
DEL	delete	deliver
DEL	deliver	delete
DEMO	demolition	demonstration
DEMO	demonstration	demolition
DENS	density	
DEPT	department	
DES	designation	
DESCR	describe	description
DESCR	description	describe
DET	detail	
DETN	detention	
DEV	development	
DF	damage free	diesel fuel; drinking fountain
DF	diesel fuel	damage free; drinking fountain
DF	drinking fountain	damage free; diesel fuel
DF WL MTD	drinking fountain, wall mounted	
DFLCT	deflection	
DFR	defrost	
DFT	dry film thickness	
DFTG	drafting	
dg	decigram	
DGR	degrease	
DGTL	digital	
DH	double hung (door, window)	
DHI	Door Hardware Institute	
DHW	domestic hot water	double hung windows
DHW	double hung windows	domestic hot water
DI	drop inlet	
DIA	diameter	

DIAG	diagonal	diagram
DIAG	diagram	diagonal
DIFF	difference	differential; diffuser
DIFF	differential	difference; diffuser
DIFF	diffuser	difference; differential
DIM	dimension	
DIP	ductile iron pipe	
DIR	direction	
DISC	disconnect	
DISCH	discharge	
DISP	dispenser	
DIST	distance	district
DIST	district	distance
DISTR PNL	distribution panel	
DIV	divide	division
DIV	division	divide
DIW	deionized water	
DJ	double joist	
dL	deciliter	
DL	dead load	
DLI	duct liner insulation	
dm	decimeter	
DMPF	dampproofing	
DMPR	damper	
DMR	dimmer	
DMR SW	dimmer switch	
DOC	document	
DOM	domestic	
DOUG FIR	Douglas fir	
DOZ	dozen	
DP	dew point	
DPC	dampproof course	
DPDT	double pole, double throw	
DPS	differential pressure sensor	
DPST	double pole, single throw	
DPT	dew point temperature	differential pressure transmitter
DPT	differential pressure transmitter	dew point temperature
DPTN	demountable partition	
DR	dining room	door; drain; dressing room; drive

DR	door	dining room; drain; dressing room; drive
DR	drain	dining room; door; dressing room; drive
DR	dressing room	dining room; door; drain; drive
DR	drive	dining room; door; drain; dressing room
DR AREA	dressing area	
DR CL	door closer	
DR FR	door frame	
DR OPNG	door opening	
DRH	door holder	
DRLV	door louver	
DRST	door stop	
DRSW	door switch	
DS	disconnect switch	double strength (glass); downspout
DS	double strength (glass)	disconnect switch; downspout
DS	downspout	disconnect switch; double strength (glass)
DSBL	disable	
DSGN	design	
DSP	dry standpipe	
DSPL	disposal	
DT	drain tile	
DT DR	dutch door	
DTCH	detach	
DUPL	duplicate	
DVTL	dovetail	
DW	dishwasher	distilled water; domestic water
DW	distilled water	dishwasher; domestic water
DW	domestic water	dishwasher; distilled water
DWG	drawing	
DWH	domestic water heater	
DWR	domestic water return	drawer
DWR	drawer	domestic water return
DWS	domestic water supply	
DWTR	dumbwaiter	
DWV	drain, waste, and vent	
DX	duplex	
DX OUT	duplex outlet	

E		
E	east	modulus of elasticity
E	modulus of elasticity	east

E LABEL	Class E door	
EA	each	
EAR	exhaust air register	
EAT	entering air temperature	
EC	edge of curb	
ECC	eccentric	
ECC RDCR	eccentric reducer	
ECON	economizer	
ECU	evaporative cooling unit	
EDBT	entering dry bulb temperature	
EDP	electronic data processing	
EE	each end	
EER	energy efficiency ratio	
EF	each face	exterior finish
EF	exterior finish	each face
EFF	effective	efficiency
EFF	efficiency	effective
EFS	exterior finish system	
EFT	effect	
EG	edge grain	
EGB	exterior gypsum board	
EGRD	eye guard	
EGSB	exterior gypsum sheathing board	
EH	electric heater	
EHD	electric hand dryer	
EHP	effective horsepower	electric heating panel
EHP	electric heating panel	effective horsepower
EIFS	exterior insulation and finish system	
EJ	expansion joint	
EJCDC	Engineers Joint Contract Documents Committee	
EL	each layer	easement line; elevation
EL	easement line	each layer; elevation
EL	elevation	each layer; easement line
ELAST	elastomeric	
ELEC	electric	
ELEC DR OP	electric door opener	
ELEM	element	elementary
ELEM	elementary	element
ELEV	elevator	

EM	electromagnetic	expanded metal
EM	expanded metal	electromagnetic
EMCP	emergency monitoring control panel	
EMER	emergency	
EMER SHR	emergency shower	
EMI	electromagnetic interference	
EMS	energy management system	
EMT	electrical metallic tubing	
ENAM	enamel	
ENCL	enclosure	
ENG	engine	
ENGR	engineer	
ENGY	energy	
ENT	electrical nonmetallic tubing	
ENTR	entrance	
ENVIR	environment	
EO	electrical outlet	
EOS	edge of slab	
EOV	electrically operated valve	
EP	edge of pavement (paving)	electrical panel (panelboard)
EP	electrical panel (panelboard)	edge of pavement (paving)
EPA	Environmental Protection Agency	
EPB	electric panel board	
EPDM	ethylene propylene diene monomer	
EPO	emergency power off	
EPRF	explosion proof	
EPS	expanded polystyrene board (insulation)	
EPT	external pipe thread	
EQ	equal	
EQL SP	equally spaced	
EQUIP	equipment	
EQUIV	equivalent	
ERD	existing roof drain	
ERW	electrical resistance welding	
ES	edge of shoulder	electrostatic
ES	electrostatic	edge of shoulder
ESC	escape	escutcheon
ESC	escutcheon	escape
ESCAL	escalator	

ESMT	easement	
ESP	especially	
ESP	external static pressure	
EST	estimate	
ESTB	establish	
ET	effective temperature	
ETC	and so forth	et cetera
ETC	et cetera	and so forth
EVAC	evacuate	
EVAP	evaporate	
EW	each way	
EWA	Engineered Wood Association	
EWBT	entering wet bulb temperature	
EWC	electric water cooler	
EWH	electric water heater	
EWS	eye wash station	
EWT	entering water temperature	
EX	example	
EXC	excavate	
EXCH	exchanger	
EXCL	exclude	
EXEC	execute	
EXH	exhaust	exhibit
EXH	exhibit	exhaust
EXH A	exhaust air	
EXH DT	exhaust duct	
EXH FN	exhaust fan	
EXH GR	exhaust air grille	
EXH HD	exhaust hood	
EXHV	exhaust vent	
EXST	existing	
EXP	expand	expansion; exposed
EXP	expansion	expand; exposed
EXP	exposed	expand; expansion
EXP BT	expansion bolt	
EXST GR	existing grade	
EXT	exterior	external; extinguisher
EXT	external	exterior; extinguisher
EXT	extinguisher	exterior; external

EXT GR	exterior grade	
EXT LT	exit light	
EXTN	extension	
EXTRU	extrusion	
F		
F	Fahrenheit	female; fire line
F	female	Fahrenheit; fire line
F	fire line	Fahrenheit; female
F BRK	fire brick	
F METER	flowmeter	
F/F	face to face	
F1S	finished one side	
F2S	finish two sides	
F4S	finish four sides	
FA	face area	final assembly; fire alarm; fresh air
FA	final assembly	face area; fire alarm; fresh air
FA	fire alarm	face area; final assembly; fresh air
FA	fresh air	face area; final assembly; fire alarm
FAAP	fire alarm annunciator panel	
FAB	fabric	
FABL	fire alarm bell	
FABX	fire alarm box	
FAC	factor	
FACIL	facility	
FACP	fire alarm control panel	
FAI	fresh air inlet (intake)	
FAR	floor area ratio	
FAS	fascia	fire alarm station
FAS	fire alarm station	fascia
FAS BD	fascia board	
FAX	facsimile	
FB	fire blanket	flat bar
FB	flat bar	fire blanket
FBM	foot board measure	
FC	file cabinet	footcandle
FC	footcandle	file cabinet
FC BRK	face brick	
FCO	floor cleanout	
FCTY	factory	

FCU	fan coil unit	
FD	floor drain	
FDBK	feedback	
FDC	fire department connection	
FDCC	fire department connection cabinet	
FDMPR	fire damper	
FDO	feedout	
FDR	feeder	fire door
FDR	fire door	feeder
FDTN	foundation	
FDV	fire department valve	
FDW	feedwater	
FE	fire extinguisher	
FEA	Federal Energy Administration	
FEC	fire extinguisher cabinet	
FED	federal	
FF	far face	finish face
FF	finish face	far face
FF BATT	foil backed batt insulation	
FF EL	finish floor elevation	
FF INSUL	foil backed insulation	
FF&E	furniture, fixture, and equipment	
FFA	from floor above	
FFB	from floor below	
FGL	fiberglass	
FH	fire hose	fire hydrant; flat head; flat head screws
FH	fire hydrant	fire hose; flat head; flat head screws
FH	flat head	fire hose; fire hydrant; flat head screws
FH	flat head screws	fire hose; fire hydrant; flat head
FHA	Federal Housing Administration	
FHC	fire hose cabinet	
FHMS	flat head machine screw	
FHP	full height partition	
FHR	fire hose rack	
FHWA	Federal Highway Adminstration	
FHWS	flat head wood screw	
FIG	figure	
FIL	fillet	
FIN	finish	

FIN BS	finish both sides	
FIN FLR	finish floor	
FIN GR	finish grade	
FIN WD	finish wood	
FIXT	fixture	
FL	floorline	foot-lambert
FL	foot-lambert	floorline
FL FIN CONC	float finish concrete	
FL OUT	floor outlet	
FL OZ	fluid ounce	
FL SW	flow switch	
FLA	full load amps	
FLASH	flashing	
FLDG	folding	
FLEX	flexible	
FLG	flange	flooring
FLG	flooring	flange
FLL	flow line	
FLMB	flammable	
FLMT	flush mount	
FLOUTS	single receptacle floor outlet	
FLR	filler	floor
FLR	floor	filler
FLR FIN	floor finish	
FLR PL	floor plate	
FLR REG	floor register	
FLR SK	floor sink	
FLRD	flared	
FLT	floodlight	
FLT GL	float glass	
FLTR	filter	
FLUOR	fluorescent	
FLUOR FIX	fluorescent fixture	
FLUT	fluting	
FLUT CMU	fluted concrete masonry unit	
FM	factory mutual	
FMBD	form board	
FN	fence	
FNGR JT	finger joint	

FO	field order	finished opening; fuel oil
FO	finished opening	field order; fuel oil
FO	fuel oil	field order; finished opening
FOC	face of concrete	face of curb
FOC	face of curb	face of concrete
FOF	face of finish	fuel oil return line
FOF	fuel oil return line	face of finish
FOM	face of masonry	
FOP	fuel oil pump	
FOR	fuel oil return	
FOS	face of slab	face of stud; fuel oil supply
FOS	face of stud	face of slab; fuel oil supply
FOS	fuel oil supply	face of slab; face of stud
FOTK	fuel oil storage tank	
FOUNT	fountain	
FOUTT	telephone floor outlet	
FOV	fuel oil vent	
FOW	face of wall	
FP	fire protection	fireproof; flagpole; freezing point
FP	fireproof	fire protection; flagpole; freezing point
FP	flagpole	fire protection; fireproof; freezing point
FP	freezing point	fire protection; fireproof; flagpole
FPL	fireplace	
FPM	feet per minute	
FPS	feet per second	
FPT	fan powered terminal	
FPW	fire protection water supply	
FR	fire rating	fire resistant; frame
FR	fire resistant	fire rating; frame
FR	frame	fire rating; fire resistant
FR GL	fritted glass	
FR MIR	framed mirror	
FR MIR/SHF	framed mirror and shelf	
FR SNK	flushing rim sink	
FRA	fire rated assembly	
FREQ	frequency	
FRG	fiber reinforced gypsum	
FRMG	framing	
FRP	fiber reinforced polyester	fiberglass reinforced plastic

FRP	fiberglass reinforced plastic	fiber reinforced polyester
FRST GL	frosted glass	
FRT	freight	
FRTW	fire retardant treated wood	
FRWY	freeway	
FRZ	freezer	
FS	far side	Federal Specification; fire station; full scale; full size
FS	Federal Specification	far side; fire station; full scale; full size
FS	fire station	far side; Federal Specification; full scale; full size
FS	full scale	far side; Federal Specification; fire station; full size
FS	full size	far side; Federal Specification; fire station; full scale
FSC	federal supply classification	
FSH	fire sprinkler head	
FSN	federal stock number	
FSP	fire standpipe	
fSS	flow sensing switch	
FSTAT	freezestat	
FSTNR	fastener	
FT	feet	fire treated; foot; fully tempered (glass)
fT	fire treated	feet; foot; fully tempered (glass)
FT	foot	feet; fire treated; fully tempered (glass)
FT	fully tempered (glass)	feet; fire treated; foot
FT/LB	foot/pound	
FT/LBF	foot/pound force	
FTD	facial tissue dispenser	
FTG	footing	
FTM	federal test methods	
FTR	finned tube radiation	
FU SW	fused switch	
FURG	furring	
FURN	furnace	furnish; furniture
FURN	furnish	furnace; furniture
FURN	furniture	furnace; furnish
FUS LINK	fusible link	
FUT	future	
FV	face velocity	flush valve; foot valve
FV	flush valve	face velocity; foot valve
FV	foot valve	face velocity; flush valve
FVNR	full voltage non-reversing	

FVR	full voltage reversing	
FW	fire wall	flood wall
FW	flood wall	fire wall
FWC	fabric wallcovering	
FWR	filter water return	
FWRK	formwork	
FWS	filter water supply	

G

G	girder	ground; natural gas
G	ground	girder; natural gas
G	natural gas	girder; ground
G DISP	garbage disposal	
G LN	gas line	
GA	gage	Gypsum Association
GA	Gypsum Association	gage
GAL	gallon	
GALV	galvanic	galvanized
GALV	galvanized	galvanic
GALV STL	galvanized steel	
GB	gas bibb	grab bar
GB	grab bar	gas bibb
GC	general contractor	
GCO	grade cleanout	
GD	guard	
GDR	guard rail	
GEN	general	generator
GEN	generator	general
GEN COND	general conditions	
GEN PURP	general purpose	
GFCI	ground fault circuit interrupter	
GFRC	glass-fiber-reinforced concrete	
GFRG	glass-fiber-reinforced gypsum	
GFRP	glass-fiber-reinforced plaster	glass-fiber-reinforced plastic
GFRP	glass-fiber-reinforced plastic	glass-fiber-reinforced plaster
GI	galvanized iron	
GIP	galvanized iron pipe	
GL	glass	ground level
GL	ground level	glass
GL BLK	glass block	

GLU LAM	glued laminated wood	
GLV	globe valve	
GLZ	glazing	
GLZ CMU	glazed concrete masonry unit	
GM	silty gravel	
GMK	grand master key	
GMKD	grand master keyed	
GMP	guaranteed maximum price	
GOVT	government	
GP	group	
GPC	gypsum plaster ceiling	
GPD	gallons per day	
GPH	gallons per hour	
GPM	gallons per minute	
GPR	gas pressure regulator	
GPS	gallons per second	
GR	gross	
GR BM	grade beam	
GR FL	ground floor	
GR LN	grade line	
GR WT	gross weight	
GRAD	gradient	
GRAN	granite	
GRD OUT	grounded outlet	
GRDN	garden	
GRL	grille	
GROM	grommet	
GRTG	grating	
GRV	gravity roof ventilator	groove
GRV	groove	gravity roof ventilator
GSB	gypsum sheathing board	
GSM	galvanized sheet metal	
GSU	glazed structural unit	
GT	grease trap	gross ton; grout
GT	gross ton	grease trap; grout
GT	grout	grease trap; gross ton
GTV	gate valve	
GUAR	guarantee	
GUT	gutter	

GV	gasoline vent	gravity vent
GV	gravity vent	gasoline vent
GVTR	gas vent through roof	
GWH	gas fired water heater	
GWT	glazed wall tile	
GYM	gymnasium	
GYP	gypsum	
GYP BD	gypsum board	
GYP PLAS	gypsum plaster	

H

H	hatch (roof)	high
H	high	hatch (roof)
H PLAM	high pressure plastic laminate	
H&CW	hot and cold water	
Ha	abrasive hardness	
ha	hectare	
HAGL	heat absorbing glass	
HAZ	hazard	
HAZ MAT	hazardous materials	
HB	hose bibb	
HC	handicap	heating coil; heavy commercial; hollow core; hose cabinet
HC	heating coil	handicap; heavy commercial; hollow core; hose cabinet
HC	heavy commercial	handicap; heating coil; hollow core; hose cabinet
HC	hollow core	handicap; heating coil; heavy commercial; hose cabinet
HC	hose cabinet	handicap; heating coil; heavy commercial; hollow core
HCFC	hydrochlorofluorocarbons	
HCMU	hollow concrete masonry unit	
HCONN	hose connector	
HCP	handicapped	
HCWD	hollow core wood door	
HD	hand dryer	heavy duty
HD	heavy duty	hand dryer
HD JT	head joint	
HDBD	hardboard	
HDNR	hardener	
HDO	high density overlay	
HDPE	high density polyethylene	
HDR	header	

HDW	hardware	
HDWD	hardwood	
HDWL	headwall	
HEM	hemlock	
HEPA	high efficiency particulate air (filter)	
HEX	heat exchanger	hexagon
HEX	hexagon	heat exchanger
HF	high frequency	
HG	heat gain	
Hg	mercury	
HGR	hanger	
HGV	hose gate valve	
HH	hand hole	
HID	high intensity discharge	
hL	hectoliter	
HLDN	holddown	
hm	hectometer	
HM	hollow metal	
HMD	hollow metal door	humidity
HMD	humidity	hollow metal door
HMDF	hollow metal door and frame	
HMF	hollow metal frame	
HMMA	Hollow Metal Manufacturers Association	
HMR	hammer	
HNDRL	handrail	
HO	hold open	
HOA	hand-off-automatic	
HORIZ	horizontal	
HOSP	hospital	
HP	heat pump	high pressure; horsepower
HP	high pressure	heat pump; horsepower
HP	horsepower	heat pump; high pressure
HPB	high pressure boiler	
HPDT	high pressure drip trap	
HPF	high power factor	
HPG	high pressure gas	
HPR	high pressure return	
HPS	high pressure sodium	high pressure steam
HPS	high pressure steam	high pressure sodium

HPT	high pressure trap	
HQ	headquarters	
HS	hand sink	heat-strengthened (glass); high strength
HS	heat-strengthened (glass)	hand sink; high strength
HS	high strength	hand sink; heat-strengthened (glass)
HSE	house	
HSKPG	housekeeping	
HST	hoist	
HSTAT	humidistat	
HT	height	
HT TRD	heat treated (glass)	
HTHW	high temperature hot water	
HTWR	heating water return	
HTWS	heating water supply	
HV	high voltage	hose valve
HV	hose valve	high voltage
HVAC	heating, ventilating, and air conditioning	
HVD	high velocity diffuser	
HVT	high velocity terminal	
HVY	heavy	
HW	hot water	
HWB	hot water boiler	
HWC	hot water coil	
HWCP	hot water circulating pump	
HWL	hot water line	
HWP	hot water pump	
HWR	hot water return	
HWS	hot water supply	
HWT	hot water tank	
HWY	highway	
HYD	hydrant	
HYDR	hydraulic	
Hz	hertz	

I		
I	interstate (highway)	moment of inertia
I	moment of inertia	interstate (highway)
I/O	input/output	
IAQ	indoor air quality	
IB	I beam	

IBC	International Building Code	
IC	interrupting capacity	ironing cabinet
IC	ironing cabinet	interrupting capacity
ID	identification	inside diameter; inside dimension; interior design
ID	inside diameter	identification; inside dimension; interior design
ID	inside dimension	identification; inside diameter; interior design
ID	interior design	identification; inside diameter; inside dimension
ID NO	identification number	
IESNA	Illumination Engineering Society of North America	
IF	inside face	intake fan
IF	intake fan	inside face
IFS	inside face of stud	
IGN	ignition	
IIC	impact isolation class	
ILLUM	illumination	
ILLUS	illustrate	
IMC	intermediate metal conduit	
IMED	immediate	
IMH	inlet manhole	
IN WC	inches, water column	
INC	increase	
INCAND	incandescent	
INCIN	incinerator	
INCL	included	
INCR	increment	
IND	independent	industrial
IND	industrial	independent
INF	infinite	
INFO	information	
IN-LB	inch-pound	
IN-LBF	inch-pound force	
INR	impact noise rating	
INS	insurance	
IN/S	inches per second	
INSTL	install	
INSTR	instrument	
INSUF	insufficient	
INSUL	insulation	
INSUL PNL	insulated metal panel	

INT	interior	
INTERCOM	intercommunication	
INTL	international	
INV	invert	inverter
INV	inverter	invert
INV EL	invert elevation	
IP	iron pipe	
IPM	impulses per minute	
IPS	impulses per second	international pipe standard; iron pipe size
IPS	international pipe standard	impulses per second; iron pipe size
IPS	iron pipe size	impulses per second; international pipe standard
IPT	iron pipe threaded	
IR	infrared	inside radius
IR	inside radius	infrared
IRMA	inverted roof membrane assembly	
IRREG	irregular	
IS	insect screen	island
IS	island	insect screen
ISO	International Standards Organization	isometric
ISO	isometric	International Standards Organization
IT	isolation transformer	
ITS	Intertek Testing Services	
IW	irrigation water	
IWH	instantaneous water heater	

J

JAL	jalousie	
JAN	janitor	
JAN CLO	janitor closet	
J-BOX	junction box	
JR	junior	
JS	janitor's sink	

K

k	kilo	
K	kelvin	thousand
K	thousand	kelvin
K VALUE	thermal conductivity	
KA	cylinder locks keyed alike	
KB	knee brace	

KC	kitchen cabinet	
kCAL	kilocalorie	
KD	kiln dried	knocked down
KD	knocked down	kiln dried
kg	kilogram	
kHz	kilohertz	
KIP	thousand pounds	
KIP FT	thousand foot/pounds	
KIT	kitchen	
kL	kiloliter	
KLF	kips per lineal foot	
km	kilometer	
km^2	square kilometer	
km/h	kilometer per hour	
km/s	kilometer per second	
KO	knockout	
KOP	knock out panel	
kPa	kilopascal	
KPL	kickplate	
KSF	kips per square foot	
KSI	kips per square inch	
kV	kilovolt	
kVA	kilovolt ampere	
kVAh	kilovolt ampere per hour	
kVAR	kilovolt ampere reactive	
kW	kilowatt	
kWh	kilowatt hour	
kWhm	kilowatt hour meter	
KWY	keyway	

L		
L	angle	liter
L	liter	angle
L CL	linen closet	
L COL	lally column	
L&L	latch and lock	
L&P	lath and plaster	
L/s	liter per second	
LA	leaving air	lightning arrester
LA	lightning arrester	leaving air

LAB	laboratory	
LAD	ladder	
LAG	lagging	
LAM	laminate	
LAM GL	laminated glass	
LANH	launch	
LAQ	lacquer	
LAT	latitude	lattice; leaving air temperature
LAT	lattice	latitude; leaving air temperature
LAT	leaving air temperature	latitude; lattice
LATL	lateral	
LAU	laundry	
LAV	lavatory	
LBF	pound-force	
LBF/FT	pound-force per foot	
LBF/SF	pound-force per square foot	
LBF/CF	pound-force per cubic foot	
LBF/HP	pound-force per horsepower	
LBF/H	pound-force per hour	
LBF/IN	pound-force per inch	
LBF/SI	pound-force per square inch	
LBF/MIN	pound-force per minute	
LBR	lumber	
LBS	pound	
LC	laundry chute	
LCD	linear ceiling diffuser	
LCM	loose cubic meter	
LCMU	lightweight concrete masonry unit	
LCY	loose cubic yard	
LD	linear diffuser	
LD BRG	load-bearing	
LDBT	leaving dry bulb temperature	
LDD	lumen dirt depreciation	
LDG	landing	
LDMK	landmark	
LDPE	low density polyethylene	
LDR	leader	
LED	light emitting diode	
LF	linear feet (foot)	

LF INS	loose fill insulation	
LG	line ground	liquid gas
LG	liquid gas	line ground
LH	latent heat	left hand
LH	left hand	latent heat
LHG	latent heat gain	
LHR	latent heat ratio	left hand reverse
LHR	left hand reverse	latent heat ratio
LHS	left hand side	
LIB	library	
LIM SW	limit switch	
LIN	linear	
LINO	linoleum	
LIQ	liquid	liquor
LIQ	liquor	liquid
LKNT	locknut	
LKR	locker	
LKR RM	locker room	
LKWASH	lockwasher	
LL	lead lined	live load; low level; lower left
LL	live load	lead lined; low level; lower left
LL	low level	lead lined; live load; lower left
LL	lower left	lead lined; live load; low level
LL GB	lead lined gypsum board	
LLD	lamp lumen depreciation	
LLH	long leg horizontal	
LLV	long leg vertical	
LM	lumen	
LMST	limestone	
LN	lane	
LNDSCP	landscape	
LNG	liquid natural gas	longitude
LNG	longitude	liquid natural gas
LO	lock on	lubricating oil
LO	lubricating oil	lock on
LOC	location	
LOG	logarithm	
LONG	longitudinal	
LOP	lubricating oil pump	

LOS	line of sight	
LOV	lubricating oil vent	
LOX	liquid oxygen	
LP	light pole	lightproof; liquid petroleum; low pressure (mechanical)
LP	lightproof	light pole; liquid petroleum; low pressure (mechanical)
LP	liquid petroleum	light pole; lightproof; low pressure (mechanical)
LP	low pressure (mechanical)	light pole; lightproof; liquid petroleum
LPAS	low pressure alarm switch	
LPB	low pressure boiler	
LPCR	low pressure condensate return	
LPDT	low pressure drip trap set	
LPF	low power factor	
LPG	liquid petroleum gas	low pressure gas
LPG	low pressure gas	liquid petroleum gas
LPL	lightproof louver	
LPR	low pressure return	
LPS	low pressure sodium	low pressure steam
LPS	low pressure steam	low pressure sodium
LPT	low point	
LPV	lightproof vent	
LPW	lumens per watt	
LR	living room	
LRA	locked rotor amps	
LRG	large	
LRV	louvered roof vent	
LS	large scale	lawn sprinkling; lump sum
LS	lawn sprinkling	large scale; lump sum
LS	lump sum	large scale; lawn sprinkling
LT	light	
LT FLUOR	fluorescent lighting	
LT GA	light gage	
LT SW	light switch	
LT WT	lightweight	
LTD	limited	
LTG	lighting	
LTG PNL	lighting panel	
LTHW	low temperature hot water	
LTNG	lightning	
LUB	lubricate	

LV	low voltage	
LVD	louvered	
LVDR	louver door	
LVR	louver	
LW	low water	
LW PLAS	lightweight plaster	
LWBT	leaving wet bulb temperature	
LWC	lightweight concrete	
LWCO	low water cut off	
LWIC	lightweight insulating concrete	
LWM	low water mark	
LWT	leaving water temperature	
LYR	layer	
LYT	layout	

M		
m	meter	
m^2	square meter	
m^3	cubic meter	
m^3/s	cubic meter per second	
m/s	meter per second	
M	moment	
mA	milliampere	
MA	mixed air	
MACH	machine	
MACH RM	machine room	
MAG	magnet	
MAHOG	mahogany	
MAINT	maintenance	
MAN	manual	
MAT	mixed air temperature	
MATL	material	
MATV	master antenna television system	
MAU	make up air unit	
MAV	manual air vent	
MAX	maximum	
MB	machine bolt	mail box; mixing box
MB	mail box	machine bolt; mixing box
MB	mixing box	machine bolt; mail box
MBF	thousand board feet	

MBH	mop/broom holder	
MBM	thousand feet board measure	
MBR	master bedroom	member
MBR	member	master bedroom
MBtu	thousand British thermal unit	
MBtuH	thousand Btu per hour	
MC	manhole cover	mechanical contractor; medicine cabinet; metal-clad; moisture content; moment connection
MC	mechanical contractor	manhole cover; medicine cabinet; metal-clad; moisture content; moment connection
MC	medicine cabinet	manhole cover; mechanical contractor; metal-clad; moisture content; moment connection
MC	metal-clad	manhole cover; mechanical contractor; medicine cabinet; moisture content; moment connection
MC	moisture content	manhole cover; mechanical contractor; medicine cabinet; metal-clad; moment connection
MC	moment connection	manhole cover; mechanical contractor; medicine cabinet; metal-clad; moisture content
MCA	minimum circuit amps	
MCB	main circuit breaker	metal corner bead
MCB	metal corner bead	main circuit breaker
MCC	motor control center	
MCF	thousand cubic feet	
MCH	mail chute	
MD	manual damper	metal deck
MD	metal deck	manual damper
MDC	motor direct connect	
MDO	medium density overlay	
ME	mechanical engineer	
MEAS	measure	
MECH	mechanical	
MECH RM	mechanical room	
MED	medical	medium
MED	medium	medical
MEK	methyl ethyl ketone	
MEL	melamine	
MEMB	membrane	
MEMO	memorandum	
MER	meridian	
MEZZ	mezzanine	
MF	mastic floor	mill finish

MF	mill finish	mastic floor
MFD	manufactured	
MFG	manufacturing	
MFMA	Maple Flooring Manufacturers Association	Metal Framing Manufacturers Association
MFMA	Metal Framing Manufacturers Association	Maple Flooring Manufacturers Association
MFR	manufacturer	mass flow rate
MFR	mass flow rate	manufacturer
MFR REC	manufacturer's recommendation	
MG	motor generator	
MGD	million gallons per day	
MGPH	one thousand gallons per hour	
MGT	management	
MH	manhole	
MHD	masthead	
MHz	megahertz	
MIA	Marble Institute of America	
MIC	microphone	
MID	middle	
MIL STD	military standard	
MIN	minimum	minute
MIN	minute	minimum
MIRR	mirror	
MISC	miscellaneous	
MIT	miter	
MKD	masterkeyed	
MKR	marker	
ML	materials list	metal lath; monolithic
ML	metal lath	materials list; monolithic
ML	monolithic	materials list; metal lath
ML&P	metal lath and plaster	
MLDG	molding (moulding)	
MLWK	millwork	
mm	millimeter	
mm^2	square millimeter	
mm^3	cubic millimeter	
MN	magnetic north	
MNCB	main combiner box	
MO	masonry opening	motor operated
MO	motor operated	masonry opening

MOCP	maximum overcurrent protection	
MOD	model	modify; module; motor operated damper
MOD	modify	model; module; motor operated damper
MOD	module	model; modify; motor operated damper
MOD	motor operated damper	model; modify; module
MOD BIT	modified bitumen	
MODEM	modulator-demodulator	
MON	monitor	monument
MON	monument	monitor
MOPR	mop rack	
MOS	metal oxide semiconductor	
MOT	motor	
MOV	motor operated valve	
MP	medium pressure	
MPG	medium pressure gas	miles per gallon
MPG	miles per gallon	medium pressure gas
MPH	miles per hour	
MPR	medium pressure return	
MPS	medium pressure steam	
MPT	male pipe thread	
MR	moisture resistant	
MRB	marble base	
MRF	marble floor	
MRT	marble threshold	
MS	machine screw	mop sink; motor starter
MS	mop sink	machine screw; motor starter
MS	motor starter	machine screw; mop sink
ms	millisecond	
MSB	mop service basin	
MSF	one thousand square feet	
MSL	mean sea level	
MSTRE	moisture	
MSW	master switch	
MT	metal threshold	mount
MT	mount	metal threshold
MTD	mean temperature difference	mounted
MTD	mounted	mean temperature difference
MTG	meeting	mounting
MTG	mounting	meeting

MTHW	medium temperature hot water	
MTL	metal	
MTLB	metal base	
MTLD	metal door	
MTLF	metal flashing	
MTLP	metal partition	
MTLR	metal roof	
MTS	manual transfer switch	
MTX	matrix	
MULL	mullion	
MULT	multiple	
MUNIC	municipal	
mV	millivolt	
MVA	megavolt-ampere	
MVBL	movable	
MVD	manual volume damper	
mW	milliwatt	
MW	megawatt	microwave
MW	microwave	megawatt
MWh	megawatt hour	
MWP	membrane waterproofing	
MZ	multizone	

N

N	newton	north
N	north	newton
NA	not applicable	
NAAMM	National Association of Architectural Metal Manufacturers	
NAR	narrow	
NAT	natural	
NATL	national	
NBC	National Building Code	
NBS	National Bureau of Standards	
NC	noise criteria	normally closed
NC	normally closed	noise criteria
NCA	nickel copper alloy	
NCOMBL	noncombustible	
NE	not exceeding	
NEC	National Electrical Code	

NEG	negative	
NEGTD	negotiated	
NEMA	National Electrical Manufacturers Association	
NEUT	neutral	
NF	near face	
NFC	National Fire Code	
NFPA	National Fire Protection Association	
NFRC	National Fenestration Rating Council	
NFSD	nonfused	
NI SIL	nickel silver	
NIBS	National Institute of Building Sciences	
NIC	noise isolation class	not in contract
NIC	not in contract	noise isolation class
NICOP	nickel copper	
NIST	National Institute of Standards and Technology	
NKL	nickel	
NL	night light	
NLB	nonloadbearing	
NM	non-metallic	
NMAG	nonmagnetic	
NO	normally open	number
NO	number	normally open
NOC	notice of clarification	
NOM	nominal	
NON STD	nonstandard	
NONFLMB	nonflammable	
NORM	normal	
NP	no paint	
NPCA	National Paint and Coatings Association	
NPL	nameplate	nickel plated
NPL	nickel plated	nameplate
NR	noise reduction	
NRC	noise reduction coefficient	
NRCA	National Roofing Contractors Association	
NRCP	non-reinforced concrete pipe	
NRP	nonremovable	
NS	narrow stile	near side; no scale
NS	near side	narrow stile; no scale
NS	no scale	narrow stile; near side

NT WT	net weight	
NTP	notice to proceed	
NTS	not to scale	
NUM	numeral	
O		
O/	over	
O/O	out to out	
O	oxygen	
OA	outside air	overall
OA	overall	outside air
OAD	outside air damper	
OAG	outside air grille	
OAI	outside air intake	
OBW	observation window	
OC	on center	
OCB	oil circuit breaker	
OCC	occupy	
OCR	oil circuit recloser	
OCT	octagon	
OD	outside diameter	outside dimension
OD	outside dimension	outside diameter
OF	outside face	
OF/CI	owner furnished/contractor installed	
OFD	overflow drain	
OFF	office	
OF/OI	owner furnished/owner installed	
OFS	outside face of studs	
OGA	oil gage	
OGL	obscure glass	
OH	overhang	
OH DR	overhead (coiling) door	
OL	overload	
OLVL	oil level	
OP	oil proof	
OPH	opposite hand	
OPNG	opening	
OPP	opposite	
OPQ	opaque	
OPR	operable	

OPRS	oil pressure	
OPT	optimum	optional
OPT	optional	optimum
OR	operating room	outside radius
OR	outside radius	operating room
ORD	ordnance	overflow roof drain
ORD	overflow roof drain	ordnance
ORG	organic	
ORIG	original	
ORN	ornamental	
OS	oil switch	
OSHA	Occupational Safety and Health Adminstration	
OSL	oil seal	
OSP	operating steam pressure	
OTG	oil temperature gauge	
OUT	outlet	
OVC	overcurrent	
OVFL	overflow	
OVRD	override	
OWGL	obscure wired glass	
OZ	ounce	

P

P	pole	pump
P	pump	pole
Pa	pascal	
PA	pipe anchor	power amplifier; public address
PA	power amplifier	pipe anchor; public address
PA	public address	pipe anchor; power amplifier
PANB	panic bolt	
PAR	parallel	parapet
PAR	parapet	parallel
PARA	paragraph	
PAREN	parenthesis	
PARG	parging	
PART	partial	
PASS	passenger	
PAT	pattern	
PB	painted base	panelboard; panic bar; pull box; pushbutton
PB	panelboard	painted base; panic bar; pull box; pushbutton

PB	panic bar	painted base; panelboard; pull box; pushbutton
PB	pull box	painted base; panelboard; panic bar; pushbutton
PB	pushbutton	painted base; panelboard; panic bar; pull box
PBD	particleboard	
PC	piece	point of curve; polycarbonate; portland cement
PC	point of curve	piece; polycarbonate; portland cement
PC	polycarbonate	piece; point of curve; portland cement
PC	portland cement	piece; point of curve; polycarbonate
PCA	Portland Cement Association	
PCB	polychlorinated biphenyl	
PCC	precast concrete	precool coil
PCC	precool coil	precast concrete
PCCP	concrete pavement	
PCD	paper cup dispenser	
PCF	pounds per cubic foot	
PCI	Precast/Prestressed Concrete Institute	
PCP	portland cement plaster	
PCT	percent	
PCU	power conditioning unit	
PD	pressure drop or difference	
PDCA	Painting and Decorating Contractors of America	
PDISCH	pump discharge	
PE	photoelectric	pneumatic electric
PE	pneumatic electric	photoelectric
PEC	photoelectric cell	
PED	pedestal	
PEJ	premolded expansion joint	
PEN	penetrate	
PEND	pendant	
PER	period	
PERF	perforated	perform
PERF	perform	perforated
PERIM	perimeter	
PERM	permanent	
PERP	perpendicular	
PETRO	petroleum	
PF	power factor	
PG	pressure gage	profile grade
PG	profile grade	pressure gage

PGBD	pegboard	
pH	acid/alkaline scale	
PH	penthouse	phase
PH	phase	penthouse
PHAR	pharmacy	
PHC	preheat coil	
PHOTO	photograph	
PHS	phillips head screw	
PHWR	primary hot water return	
PHWS	primary hot water supply	
PI	point of intersection	
PIB	polyisobutylene (plastic)	
PIL	pilaster	
PIV	pivoted	post indicator valve
PIV	post indicator valve	pivoted
PK GAR	parking garage	
PK LOT	parking lot	
PKG	package	
PKWY	parkway	
PL	property line	
PL GL	plate glass	
PLAM	plastic laminate	
PLAS	plaster	plastic
PLAS	plastic	plaster
PLAT	platform	
PLB	plumb	
PLBG	plumbing	
PLC	place	
PLF	pounds per linear foot	
PLG	piling	
PLST WL	plaster wall	
PLYWD	plywood	
PM	phase meter	
PMBC	plant mix bituminous concrete	
PMTL	painted metal	
PMF	probable maximum flood	
PMP	probable maximum precipitation	
PMPSCT	pump suction	
PN	part number	

PNEU	pneumatic	
PNL	panel	
PO	post office	purchase order
PO	purchase order	post office
POCC	point of common coupling	
POI	point of intersection	
POL	polished	
POLY	polyethylene (plastic)	
PORC	porcelain	
PORT	portable	
POS	positive	position
POS	position	positive
POTW	potable water	
POW LN	power line	
PP	panel point	polypropylene (plastic); push/pull
PP	polypropylene (plastic)	panel point; push/pull
PP	push/pull	panel point; polypropylene (plastic)
PP PL	push/pull plate	
PPGL	polished plate glass	
PPM	parts per milllion	
PR	pair	pipe rail; pumped return
PR	pipe rail	pair; pumped return
PR	pumped return	pair; pipe rail
PRCST	precast	
PRD	push rod	
PRE	power roof exhaust	
PREF	preference	
PREFAB	prefabricate	
PREFIN	prefinish	
PREFMD	preformed	
PRELIM	preliminary	
PREP	preparation	
PRESS	pressure	
PRESS SW	pressure switch	
PREV	previous	
PRI	primary	
PRIN	principal	
PRKG	parking	
PRMLD	premolded	

PROD	production	
PROJ	project	
PROP	property	
PROV	provisional	
PRS	pressure reducing station	
PRV	power roof ventilator	pressure reducing valve; pressure regulator valve; pressure relief valve
PRV	pressure reducing valve	power roof ventilator; pressure regulator valve; pressure relief valve
PRV	pressure regulator valve	power roof ventilator; pressure reducing valve; pressure relief valve
PRV	pressure relief valve	power roof ventilator; pressure reducing valve; pressure regulator valve
PS	polystyrene (plastic)	pull station
PS	pull station	polystyrene (plastic)
PS CONC	prestressed concrete	
PSF	pounds per square foot	
PSFA	PSF absolute	
PSFG	PSF gage	
PSH	purse shelf	
PSI	pounds per square inch	
PSIA	pounds per square inch absolute	
PSIG	pounds per square inch, gage	
PSL	pipe sleeve	
PT	paint	pipe thread: pneumatic tube; post tensioned; pressure treated
PT	pipe thread	paint; pneumatic tube; post tensioned; pressure treated
PT	pneumatic tube	paint; pipe thread; post tensioned; pressure treated
PT	post tensioned	paint; pipe thread; pneumatic tube; pressure treated
PT	pressure treated	paint; pipe thread; pneumatic tube; post tensioned
PT CONC	post-tensioned concrete	
PTAC	packaged terminal air conditioner	
PTD	paper towel dispenser	printed
PTD	printed	paper towel dispenser
PTDR	paper towel dispenser and receptacle	
PTN	partition	
PTR	paper towel receptacle	
PTRV	pressure temperature relief valve	
PUR	purlins	
PV	paved	photovoltaic

PV	photovoltaic	paved
PV RD	paved road	
PVA	polyvinyl acetate	
PVC	polyvinyl chloride (plastic)	
PVF	polyvinyl fluoride (plastic)	
PVG	paving	
PW	pass window	
PWR	power	
Q		
Q	heat transfer	rate of flow
Q	rate of flow	heat transfer
QA	quality assurance	
QC	quality control	
QCR	quality control review	
QM	quality management	
QRY	quarry	
QT	quarry tile	
QTB	quarry tile base	
QTF	quarry tile floor	
QTR	quarter	
QTY	quantity	
QUAD	quadrangle	quadrant
QUAD	quadrant	quadrangle
QUAL	quality	
QUOT	quotation	
R		
R	radius	range; riser; thermal resistance
R	range	radius; riser; thermal resistance
R	riser	radius; range; thermal resistance
R	thermal resistance	radius; range; riser
R&D	research and development	
RA	return air	
RA FAN	return air fan	
RA GR	return air grille	
RAB	rabbeted	
RAC	room air conditioner	
RAD	radian	radiator; return air duct
RAD	radiator	radian; return air duct

RAD	return air duct	radian; radiator
RAD HAZ	radiation hazard	
RADN	radiation	
RAT	return air temperature	
RB	resilient base	rubber base
RB	rubber base	resilient base
RB HK	robe hook	
RBM	reinforced brick masonry	
RBR	rubber	
RC	reinforced concrete	remote control
RC	remote control	reinforced concrete
RCB	reinforced concrete box	
RCCP	reinforced concrete culvert pipe	
RCP	reflected ceiling plan	reinforced concrete pipe
RCP	reinforced concrete pipe	reflected ceiling plan
RCPTN	reception	
RCVR	receiver	
RD	refrigerant discharge	road; roof drain
RD	road	refrigerant discharge; roof drain
RD	roof drain	refrigerant discharge; road
RDC	reducer	
RDG INS	rigid insulation, solid	
REBAR	reinforcing steel bars	
REC	recessed	
REC ROOM	recreation room	
RECD	received	
RECIP	reciprocal	
RECIRC	recirculate	
RECPT	receptacle	
RECT	rectangle	
REF	reference	refrigerator
REF	refrigerator	reference
REFL	reflect	
REFR	refractory	refrigeration
REFR	refrigeration	refractory
REG	register	regulation
REG	regulation	register
REINF	reinforce	
REM	removable	

REP	repair	
REPL	replace	
REPRO	reproduce	
REQ	require	
REQD	required	
RESIL	resilient	
REST	restroom	
RET	return	
REV	revision	revolutions
REV	revolutions	revision
RF	radio frequency	resilient flooring
RF	resilient flooring	radio frequency
RFG	roofing	
RFGT	refrigerant	
RFI	request for information	
RFP	request for proposal	
RH	relative humidity	right hand; roof hatch
RH	right hand	relative humidity; roof hatch
RH	roof hatch	relative humidity; right hand
RHC	reheat coil	
RHEO	rheostat	
RHG	refrigerant hot gas	
RHMS	round head machine screw	
RHR	right hand reverse	
RHV	reheat valve	
RHWS	round head wood screw	
RKVA	reactive kilovolt amperes	
RL	roof leader	
RLG	railing	
RLL	refrigerant liquid line	
RM	room	
RMS	room monitor system	root mean square
RMS	root mean square	room monitor system
RND	round	
RO	rough opening	
ROW	right of way	
RPM	revolutions per minute	
RPS	revolutions per second	
RR	railroad	roll roofing

RR	roll roofing	railroad
RS	rapid start	rough sawn
RS	rough sawn	rapid start
RSD	rolling steel door	
RSL	refrigerant suction line	
RST	reinforcing steel	
RT	right	
RTF	rubber tile floor	
RTG	rating	
RTU	roof top unit	
RV	relief valve	roof vent; roof ventilator
RV	roof vent	relief valve; roof ventilator
RV	roof ventilator	relief valve; roof vent
RVL	reveal	
RVS	reverse	
RW	roadway	
RWD	redwood	
RWL	rain water leader	
RWR	recessed waste receptacle	
RWY	runway	
S		
S	south	
S BM	beam, standard	
S/S	start/stop	
S1S	surfaced one side	
S2S	surfaced two sides	
S4S	surfaced four sides	
SA	single acting (door)	supply air
SA	supply air	single acting (door)
SAG	supply air grille	
SALV	salvage	
SAMP	sample	
SAN	sanitary	
SAPC	suspended acoustical plaster ceiling	
SARA	Society of American Registered Architects	
SAT	saturate	suspended acoustical tile
SAT	suspended acoustical tile	saturate
SATC	suspended acoustical tile ceiling	
SB	splash block	

SBCCI	Southern Building Code Congress International	
SBS	styrene butadien styrene	
SBSTR	substrate	
SC	shading coefficient	solid core
SC	solid core	shading coefficient
SCC	short circuit capacity	
SCD	seat cover dispenser	
SCFM	standard cubic feet per minute	
SCFS	standard cubic feet per second	
SCH	school	
SCHED	schedule	
SCHEM	schematic	
SCMU	solid concrete masonry unit	
SCP	scupper	
SCR	semiconductor controlled rectifier	shower curtin rod
SCR	shower curtain rod	semiconductor controlled rectifier
SCRN	screen	
SCT	structural clay tile	
SCWD	solid core wood door	
SD	shop drawings	smoke detector; soap dispenser; storm drain; supply duct
SD	smoke detector	shop drawings; soap dispenser; storm drain; supply duct
SD	soap dispenser	shop drawings; smoke detector; storm drain; supply duct
SD	storm drain	shop drawings; smoke detector; soap dispenser; supply duct
SD	supply duct	shop drawings; smoke detector; soap dispenser; storm drain
SDBL	sandblast	
SDG	siding	
SDI	Steel Deck Institute	Steel Door Institute
SDI	Steel Door Institute	Steel Deck Institute
SDL	saddle	
SDMH	storm drain manhole	
SDMPR	smoke damper	
SE	structural engineer	
SECT	section	
SEG	segment	
SEL	select	
SEP	separate	

SEP TNK	septic tank	
SF	safety factor	square foot (feet); supply fan
SF	square foot (feet)	safety factor; supply fan
SF	supply fan	safety factor; square foot (feet)
SFT HP	shaft horsepower	
SFTWD	softwood	
SG	steam gage	
SGD	sliding glass door	
SGL	single	
SGPH	Gallons Per Hour, Standard	
SH	sensible heat	shingles; single hung (window)
SH	shingles	sensible heat; single hung (window)
SH	single hung (window)	sensible heat; shingles
SHFT	shaft (elevator)	
SHG	sensible heat gain	
SHLDR	shoulder	
SHR	sensible heat ratio	shower
SHR	shower	sensible heat ratio
SHR HD	shower head	
SHRD	shower drain	
SHT	shaft	sheet
SHT	sheet	shaft
SHT MTL FLASH	sheet metal (flashing)	
SHTHG	sheathing	
SHTR	shutter	
SHV	shelving	
SHWR	secondary hot water return	
SHWS	secondary hot water supply	
SI	International System of Units	
SIG	signal	
SIM	similar	
SJ	scored joint	slip joint
SJ	slip joint	scored joint
SJI	Steel Joist Institute	
SK	sketch	
SKLT	skylight	
SL	sea level	spot light
SL	spot light	sea level

SLD WDW	horizontal sliding window	
SLDG	sliding	
SLDR	solder	
SLNT	sealant	
SLV	sleeve	
SLVT	solvent	
SM	sheet metal	silty sand; small; smooth
SM	silty sand	sheet metal; small; smooth
SM	small	sheet metal; silty sand; smooth
SM	smooth	sheet metal; silty sand; small
SMH	steam manhole	
SMK	smoke	
SMLS	seamless	
SMP	sump pump	
SND	sanitary napkin dispenser	
SND INS	sound insulation	
SNDU	sanitary napkin disposal unit	
SNSR	sensor	
SOLN	solution	
SOLV	solenoid valve	
SOUT	single receptacle outlet	
SOV	schedule of values	shut off valve
SOV	shut off valve	schedule of values
SP	solid plastic	standpipe; sump pit
SP	standpipe	solid plastic; sump pit
SP	sump pit	solid plastic; standpipe
SP EL	spot elevation	
SP FIN	special finish	
SP GR	specific gravity	
SPC	suspended plaster ceiling	
SPCL	special	
SPDT	single pole, double throw	
SPEC	specification	
SPF	spruce-pine-fir	
SPH	space heater	
SPKLR	sprinkler	
SPKR	speaker	
SPL	spline	
SPLY	supply	

SPR	sprinkler line	
SPST	single pole, single throw	
SQ	square	
SQ BR	square bar	
SQ IN	square inch	
SQ YD	square yard	
SR	steam return	
SS	sanitary sewer	service sink; standing seam (roof); steam supply; storm sewer
SS	service sink	sanitary sewer; standing seam (roof); steam supply; storm sewer
SS	standing seam (roof)	sanitary sewer; service sink; steam supply; storm sewer
SS	steam supply	sanitary sewer; service sink; standing seam (roof); storm sewer
SS	storm sewer	sanitary sewer; service sink; standing seam (roof); steam supply
SSD	subsoil drain	
SSP	stainless steel pipe	
SST	stainless steel	
ST	single throw	stairs; street
ST	stairs	single throw; street
ST	street	singlethrow; stairs
ST GEN	steam generator	
ST GL	stained glass	
ST PR	static pressure	
ST W	storm water	
STA	station	
STAG	staggered	
STC	sound transmission class	
STD	standard	
STIF	stiffener	
STIR	stirrup	
STL JST	steel joist	
STL LNTL	steel lintel	
STL PL	steel plate	
STL RF DK	steel roof deck	
STL TB	steel tube	
STL TR	steel truss	
STM	steam	
STN	strainer	

STNLS	stainless	
STOR	storage	
STP	standard temperature and pressure	
STPG	stepping	
STR	straight	strike; stringers
STR	strike	straight; stringers
STR	stringers	straight; strike
STRB	strobe	
STRB/HRN	strobe/horn	
STRM	storeroom	
STRUCT	structural	
STRUCT STL	structural steel	
STWP	steam working pressure	
SUB	substitute	
SUB FL	subfloor	
SUBPAR	subparagraph	
SUCT	suction	
SUF	sufficient	
SUH	suspended unit heater	
SUM	summary	
SUP	supplementary	
SUPN	suppression	
SUPPL	supplement	
SUPT	support	
SUPVR	supervisor	
SURF	surface	
SURR	surround	
SURV	survey	
SURV CAM	surveillance camera	
SURV EQUIP	surveillance equipment	
SURV MON	surveillence monitor	
SUSP	suspend	
SUSP CLG	suspended ceiling	
SUTK	sump tank	
SV	safety valve	sheet vinyl
SV	sheet vinyl	safety valve
SVCE	service	
SW	sidewalk	switch
SW	switch	sidewalk

SWBD	switchboard	
SWDR	swing door	
SWG	sewage	
SWGR	switchgear	
SWI	Steel Window Institute	
SWR	sewer	
SYM	symbol	
SYMM	symmetrical	
SYNTH	synthetic	
SYS	system	

T		
T	tread	
T&B	top and bottom	
T&G	tongue and groove	
T&M	time and materials	
T&P VALVE	temperature and pressure valve	
T/S	tub/shower	
TAB	tabulate	
TAN	tangent	
TB	through bolt	towel bar
TB	towel bar	through bolt
TBM	temporary benchmark	
TB-xx	test boring-xx (e.g., TB-01)	
TC	terra cotta	
TCA	Tile Council of America	
TCP	telephone control panel	temperature control panel; traffic control plan
TCP	temperature control panel	telephone control panel; traffic control plan
TCP	traffic control plan	telephone control panel; temperature control panel
TCV	temperature control valve	
TD	temperature difference	towel dispenser; trench drain
TD	towel dispenser	temperature difference; trench drain
TD	trench drain	temperature difference; towel dispenser
TDH	total dynamic head	
TDR	towel dispenser/receptacle	
TE	top elevation	
TECH	technical	
TEJ	transverse expansion joint	
TEL	telephone	
TEL JK	telephone jack	

TEL OUT	telephone outlet	
TEMP	temperature	temporary
TEMP	temporary	temperature
TEMP HDBD	tempered hardboard	
TER	telephone equipment room	terrazzo
TER	terrazzo	telephone equipment room
TERM	terminal	
TFA	to floor above	
TFB	to floor below	
TFF	top of finish floor	
TG	transfer grille	
THD	thread	
THERM	thermal	
THK	thickness	
THRES	threshold	
THRU	through	
THRUOUT	throughout	
TK BD	tackboard	
TL	twist lock	
TMH	top of manhole	
TMPD	tempered	
TMPD GL	tempered glass	
TN	true north	
TNL	tunnel	
TNPK	turnpike	
TO	top of ___	
TO FDN	top of foundation	
TOB	top of beam	
TOC	table of content	top of concrete; top of curb
TOC	top of concrete	table of content; top of curb
TOC	top of curb	table of content; top of concrete
TOC FTG	top of concrete footing	
TOC WALL	top of concrete wall	
TOF	top of floor	top of footing; top of frame
TOF	top of footing	top of floor; top of frame
TOF	top of frame	top of floor; top of footing
TOJ	top of joist	
TOL	tolerance	
TOM	top of masonry	

TOP	top of parapet	top of pavement
TOP	top of pavement	top of parapet
TOPO	topography	
TOS	top of slab	top of steel
TOS	top of steel	top of slab
TOT	top of truss	
TOW	top of wall	
TP	telephone pole	total pressure; twisted pair
TP	total pressure	telephone pole; twisted pair
TP	twisted pair	telephone pole; total pressure
TPD	toilet paper dispenser	
TPH	toilet paper holder	
TPS	twisted pair shielded	
TQM	total quality management	
TR	top of rim	towel rack
TR	towel rack	top of rim
TRANS	transom	transparent
TRANS	transparent	transom
TRANS WD FIN	transparent wood finish	
TRNBKL	turnbuckle	
TRTD	treated	
TS	tensile strength	tube steel
TS	tube steel	tensile strength
TSH	towel shelf	
TSTAT	thermostat	
TTB	telephone terminal board	
TUC	terminal unit controller	
TV	television	
TVOUT	television outlet	
TWR	treated water return	
TWS	treated water supply	
TYP	typical	

U		
U	heat transfer coefficient	
UBC	Uniform Building Code	
UC	undercut	
UCD	undercut door	
UFC	Uniform Fire Code	

UFD	underfloor duct	
UGND	underground	
UH	unit heater	
UL	Underwriters Laboratories	
ULT	ultimate	
UMC	Uniform Mechanical Code	
UN	unless noted	
UNEX	unexcavated	
UNFIN	unfinish	
UNIF	uniform	
UNIV	universal	
UNO	unless noted otherwise	
UNPV RD	unpaved road	
UON	unless otherwise noted	
UP	utility pole	
UPC	Uniform Plumbing Code	
UPS	uninterruptible power supply	
UR	urinal	
UTIL	utility	
UTP	untwisted pair	
UV	ultraviolet	
UWT	unit weight	

V

V	volt	
VA	volt ampere	
VAC	vacuum	vacuum line
VAC	vacuum line	vacuum
VAM	volt-ammeter	
VAN	vanity	
VAP PRF	vapor proof	
VAR	variation	varies; volt ampere reactive
VAR	varies	variation; volt ampere reactive
VAR	volt ampere reactive	variation; varies
VAV	variable air volume	
VB	vacuum breaker	valve box; vinyl base
VB	valve box	vacuum breaker; vinyl base
VB	vinyl base	vacuum breaker; valve box
VC	vertical curve	
VCO	vacuum cleaner outlet	

VCT	vinyl composition tile	vitrified clay tile
VCT	vitrified clay tile	vinyl composition tile
VD	voltage drop	volume damper
VD	volume damper	voltage drop
VEH	vehicle	
VEL	velocity	
VENT	ventilation	ventilator
VENT	ventilator	ventilation
VERT	vertical	
VEST	vestibule	
VF	variable frequency	
VFAT	vinyl faced acoustical tile	
VFD	variable frequency drive	
VFR	volumeric flow rate	
VG	vertical grain	
VHF	very high frequency	
VHO	very high output	
VIB	vibration	
VIC	vicinity	
VID	video	
VIDAMP	video amplifier	
VIF	verify in field	
VIL	village	
VINT	video integration	
VIS	visual	
VISC	viscosity	
VIT	vitreous	
VJ	V joint	
VNR	veneer	
VOC	volatile organic compound	
VOL	volume	
VOLT	voltage	
VP	vacuum pump	vanishing point; vapor pressure; velocity pressure; veneer plaster
VP	vanishing point	vacuum pump; vapor pressure; velocity pressure; veneer plaster
VP	vapor pressure	vacuum pump; vanishing point; velocity pressure; veneer plaster
VP	velocity pressure	vacuum pump; vanishing point; vapor pressure; veneer plaster

VP	veneer plaster	vacuum pump; vanishing point; vapor pressure; velocity pressure
VR	vapor retarder	voltage regulator
VR	voltage regulator	vapor retarder
VRFY	verify	
VRLY	voltage relay	
VRNDA	veranda	
VRP	vacuum return pump	
VS	vent stack	voltmeter switch
VS	voltmeter switch	vent stack
VTR	vent through roof	
VUH	vertical unit heater	
VWC	vinyl wall covering	
VWF	vinyl wall fabric	

W

W	waste	watt; west; wide
W	watt	waste; west; wide
W	west	waste; watt; wide
W	wide	waste; watt; west
W CAB	wall cabinets	
W/	with	
W/O	without	
W/W	wall to wall	
WARR	warranty	
WAU	wall ash urn	
WB	wet bulb	wood base
WB	wood base	wet bulb
WBL	wood blocking	
WBS	wrought brass	
WBT	wet bulb temperature	
WC	wall covering	water closet; water column
WC	water closet	wall covering; water column
WC	water column	wall covering; water closet
WC WL HNG	water closet, wall hung	
WCHR	water chiller	
WCL WL MTD	water cooler, wall hung	
WCLD	water cooled	
WCLR	water cooler	
WCO	wall cleanout	

WD	wood	wood door
WD	wood door	wood
WD LOUV	wood louvers	
WDF	wood door and frame	
WDMA	Window and Door Manufacturers Association	
WDP	wood panelling	
WDSP	waste disposer	
WDW	window	
WEA	weather	
WF	wash fountain	wide flange
WF	wide flange	wash fountain
WF BM	beam, wide flange	
WFAB	wall fabric	
WFR	wood frame	
WFS	wood furring strips	
WG	water gage	
WGL	wired glass	
WH	wall hung	wall hydrant; water heater; weep hole
WH	wall hydrant	wall hung; water heater; weep hole
WH	water heater	wall hung; wall hydrant; weep hole
WH	weep hole	wall hung; wall hydrant; water heater
WHA	water hammer arrestor	
WHM	watthour meter	
WHSE	warehouse	
WI	wrought iron	
WJ	water jacket	
WL	water line	wind load
WL	wind load	water line
WLD	welded	
WM	water meter	wire mesh
WM	wire mesh	water meter
WO	where occurs	work order
WO	work order	where occurs
WP	water pump	waterproofing; weatherproof; working point
WP	waterproofing	water pump; weatherproof; working point
WP	weatherproof	water pump; waterproofing; working point
WP	working point	water pump; waterproofing; weatherproof
WPD	water pressure drop	
WPM	waterproof membrane	

WPR	working pressure	
WR	water repellent	weather resistant; wire rope
WR	weather resistant	water repellent; wire rope
WR	wire rope	water repellent; weather resistant
WS	weatherstrip	
WSCT	wainscot	
WSL	weather seal	
WSP	working steam pressure	
WT	water table	watertight; weight
WT	watertight	water table; weight
WT	weight	water table; watertight
WT EL	water elevation	
WTR	water	
WU	window unit	
WW	warm white	waste water; wireway
WW	waste water	warm white; wireway
WW	wireway	warm white; waste water
Δ		
WWR	welded wire reinforcement	
WWX	warm white deluxe	

X		
X BRACE	cross brace	
X SECT	cross section	
XBRA	crossbracing	
XFER	transfer	
XFMR	transformer	
XL	extra large	
XPS	extruded polystyrene board (insulation)	
XXH	double extra heavy	

Y		
YCO	yard cleanout	
YD	yard	yard drain; yard drainage pipe
YD	yard drain	yard; yard drainage pipe
YD	yard drainage pipe	yard; yard drain
YH	yard hydrant	
YI	yard inlet	
YR	year	

Z		

Z	modulus of section

Module 5 - Terms and Abbreviations

5.4 PREFERRED TERMS

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Non-Preferred Terms	Preferred Terms
acoustical plaster	acoustical finish
alternative	alternate
apply	install
as-built	record drawings
asphalt roofing	built-up roofing
backing rope	joint backer
balestrades	railing
bar joists	steel joists
batt insulation	blanket insulation
blackboard	chalkboard
block	concrete masonry unit
calking	sealant
casing bead	metal trim
ceiling panel	acoustical panel
ceiling tile	acoustical tile
centigrade	Celsius
computer floor	access flooring
concrete block	concrete masonry unit
cork tackboard	tackboard
corkboard	tackboard
corrugated deck	steel roof deck
crushed stone	porous fill
delta	*Use symbol (see Symbols (UDS 6))*
dirt	earth
domelite	plastic skylight
drywall	gypsum board
electro-pneumatic	pneumatic electric
elevator cab	elevator car
feminine napkin disposal	sanitary napkin disposal
fiber insulation	rigid insulation
fiberboard	rigid insulation
foam backer	backer rod

foil faced drywall	foil faced gypsum board
foil faced gypsum wallboard	foil faced gypsum board
formica	plastic laminate
furnished by owner	OF/CI or OF/OI
fuse box	panelboard
gauge	gage
glue	adhesive
gravel	porous fill
graylite	gray sheet glass
ground fault interrupter	ground fault circuit interrupter
gyplath	gypsum lath or metal lath
gypsum panel	gypsum board
gypsum wallboard	gypsum board
herculite	tempered glass
hot water heater	water heater
janitor sink	service sink
joint filler	joint backer
joint stuffer	joint backer
kalamein door	metal clad door
lath	gypsum lath or metal lath
lexan	plastic glazing
loudspeaker	speaker
lucite	acrylic sheet
masonite	hardboard
mastic	adhesive
metal nosing	abrasive nosing
mirror glass	reflective glass
miscellaneous metal	metal fabrications
non-slip stair nosing	abrasive nosing
open web steel joists	steel joists
pass-through window	counter shutter or sliding window
paste	adhesive
pavement	paving
pitch pocket	sealant pocket
plexiglass	acrylic sheet
pour	place
poured in place	cast-in-place
power panel	panelboard
power pole	utility pole

pre-fit	factory fit
pre-trimmed	factory fit
precut	factory fit
prime coat	shop coat
primer	shop coat
reinforcement	reinforcing
reinforcing bar	reinforcing
remodel	alter or refinish
rocklath	gypsum lath or metal lath
rusting steel	weathering steel
safety nosing	abrasive nosing
sand	porous fill
scuttle	roof hatch
sheeting	sheathing
sink	lavatory
skydome	skylight
skylite	skylight
slop sink	service sink
stucco	cement plaster
tar	pitch
thermopane	insulating glass
toilet (plumbing fixture)	water closet
tower water return	condenser water
tower water supply	condenser water
window	insulating glass
vapor barrier	vapor retarder
vinyl tile	resilient tile
visqueen	vapor retarder
wall board	gypsum board
Warnock Hershey International	Intertek Testing Services
water cooling tower	cooling tower
wire glass	wired glass

United States National CAD Standard® - V5

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Module 6 - Symbols

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Key: = Section contains downloadable DWG files

Div 44 - Pollution Control Equipment

6.3 Symbols Index

Module 6 - Symbols

6.1 INTRODUCTION

The *Symbols Module* compiles a full range of standard symbols used throughout the construction industry. Covered in this Module are standard symbols, their graphic representation, and their role in creating, understanding, and fulfilling the intent of construction documents. Standard symbols ensure clear and concise communication among the architect, owner, contractor, and consultants. This Module is a joint effort of CSI and the CADD/GIS Technology Center.

The *Symbols Module* provides:

- Symbols for use in drawings.
- Graphic representations of symbols.
- Organization of symbols for drawings by *MasterFormat*™ and further classification by symbol type.
- Standardization of symbols.

The benefits of the *Symbols Module* are as follows:

- Defines symbols used on drawings.
- Presents symbols in a consistent graphic representation.

Objective

The objective of the Module is to provide a standardized resource for construction symbols, with emphasis on the benefits of consistent graphic representation. The increased use of computer-aided drafting (CAD) has assisted in reducing the time required for managing and creating construction documents and the symbols used. The *Symbols Module* is suitable for manual drafting and CAD creators and those that use construction documents.

Organization of Symbols

Symbols are a graphic representation of an object or of a material that represents something else by:

- Association
- Resemblance
- Convention

Symbols used in drawings are scale dependent, independent, or both.

- **Scale Dependent:** Actual printed size of the symbol depends on the scale of the drawing or view of the model.
- **Scale Independent:** Actual printed size of the symbol is consistent no matter what the drawing scale. The size is related only to clarity and interpretation.

Symbols used in drawings are constructed of various line widths. The following list is an example of standardized line weights of symbols:

- Existing objects and material symbols are drawn with a thin line.

- New objects are drawn with a medium line.
- Objects to be demolished or removed are drawn with a medium dashed line.

Refer to *Common Line Types, UDS section 4.2*.

Symbols Classification

Symbols used in drawings are classified in terms of type:

- **Identity.** Identy symbols indicate individual objects and are generally used in mechanical and electrical drawings. Such symbols are valves fire alarms, light fixtures, and electrical outlets. These symbols may be either scale dependent or independent.
- **Line.** Line symbols indicate continuous objects and are either single or double lines. Walls are usually drawn with two lines and ducts may be drawn with one or two lines based on the scale of the drawing. Site and building utilities are drawn with one line with breaks in the line for a letter(s) to identify the utility line. Some lines are solid, some are dashed, and some are a combination of both. These symbols are scale independent.
- **Material.** Material symbols graphically indicate certain materials and are used to help the reader differentiate one material from another. These symbols may be in elevation, vertical, or horizontal section. These symbols should be used as necessary but not overdone and used where a material begins and ends or changes direction. Such symbols are used to designate earth, concrete, stone, steel, wood, and insulation. Symbols are drawn in an appropriate size and scale of the drawn object. A material symbol may change based on the scale used or the view presented of the object. These symbols can be either scale dependent or independent.
- **Object.** Object symbols resemble the actual objects being symbolized. Such symbols are doors, some with the direction of swing indicated, windows, toilet fixtures, and furniture. These symbols are scale dependent.
- **Reference.** Reference symbols refer the reader to information in another area of the set of drawings or give basic information regarding the drawing or data on the drawing. Such symbols are exterior and interior elevation indicators, building section indicators, partial building section indicators, and detail indicators. Included with these symbols are drawing block titles, graphic scales, north indicator, room identifiers, door/borrowed lite identifiers, window type identifiers, louver type identifiers, wall type identifiers, furniture, fixture and equipment identifiers, identification device (sign) identifiers, key note identifiers, leaders, dimension lines with terminators, match lines, and revision clouds with identifiers. These symbols are scale independent.
- **Text.** Text symbols graphically indicate a word or words that may be used in notations on drawings. The text symbols provided are commonly used. For letter symbols, dimensionless numbers, mathematical symbols, and subscript symbols see the *ASHRAE Handbook - Fundamentals*.

Symbol Organization

Symbols are organized by the following hierarchy:

- *MasterFormat*™ Division and Number
  - Symbol Type
    - Alphabetical order of the symbol description

For example, a bathtub is listed in *MasterFormat*™ Division 22, Plumbing, Section 22 40 00, Plumbing Fixtures. Although the bathtub may be shown on Architectural floor plans, the bathtub is listed in Division 22, Plumbing.

The actual layout of the symbols in the table that follows is:

- *MasterFormat*™ Division and Number
  - Symbol Description (alphabetized)
    - Symbol Type (alphabetized)
      - Symbol

Module 6 - Symbols

6.2 SYMBOLS

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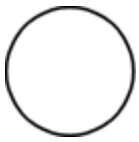
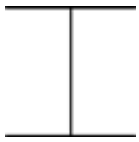
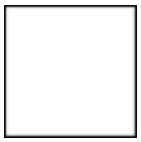
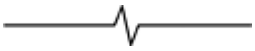
-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

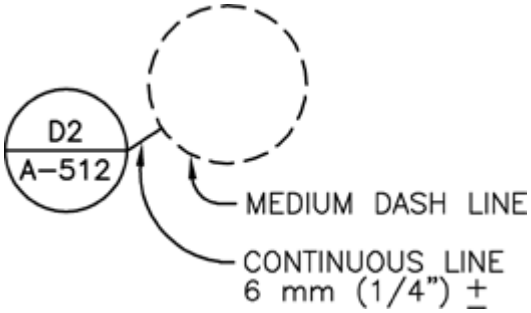
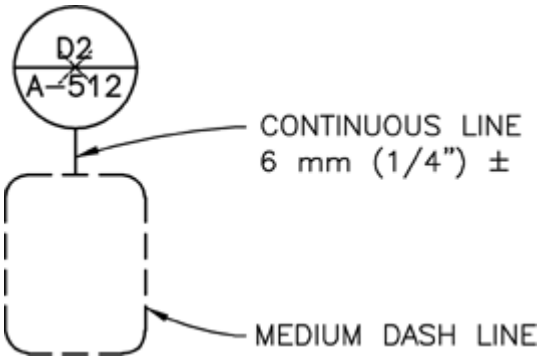
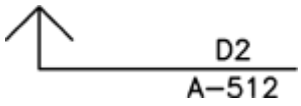
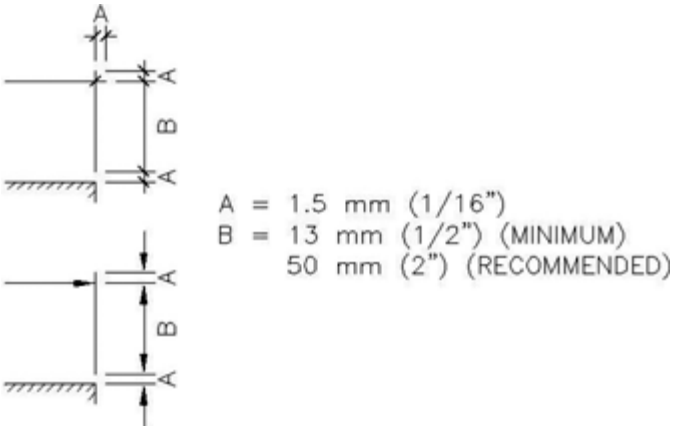
Division 01 - General Requirements

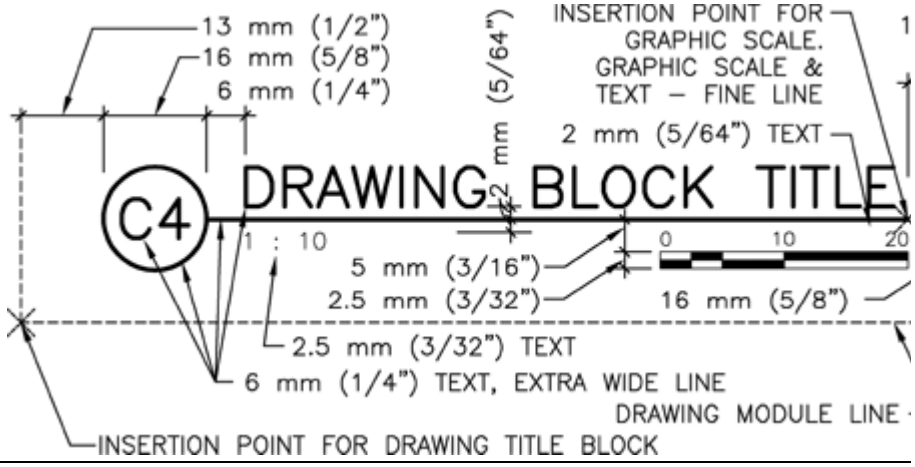
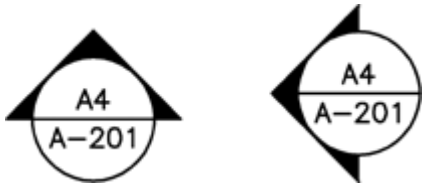
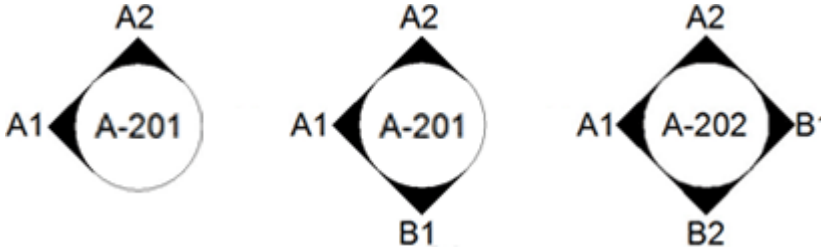
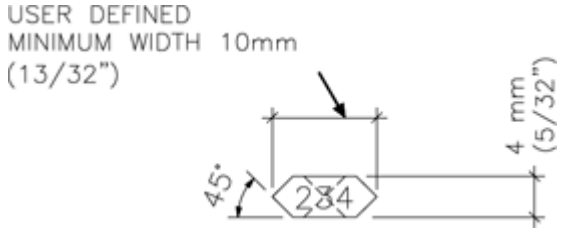
MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 01	**GENERAL REQUIREMENTS**		
01 00 00	column, circular symbol	O	
01 00 00	column, I beam symbol	O	
01 00 00	column, square symbol	O	
01 00 00	and	T	&
01 00 00	at	T	@
01 00 00	center line	T	℄
01 00 00	degree(s)	T	X°
01 00 00	divide by, per	T	/
01 00 00	dollar (USD)	T	$
01 00 00	equals, equal to	T	=
01 00 00	foot, feet	T	X’
01 00 00	greater than	T	>
01 00 00	greater than or equal to	T	≥
01 00 00	inch(es)	T	X”
01 00 00	less than	T	<
01 00 00	less than or equal to	T	≤
01 00 00	minus	T	–
01 00 00	multiply by, by	T	X
01 00 00	number, pound	T	#
01 00 00	percent	T	%
01 00 00	plus	T	+
01 00 00	plus or minus	T	+/– or ±

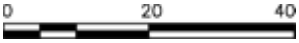
01 00 00	property line	T	
01 40 00	elevation indicator, fine line, 4mm (5/32") diameter with lines extending 1mm (1/32") beyond circle	I	
01 40 00	quality requirements, boring indicator	I	
01 40 00	quality requirements, elevation indicator, finish	I	
01 40 00	quality requirements, monument indicator	I	
01 40 00	quality requirements, property corner indicator, existing, 5 mm (3/16") diameter, typical	I	
01 40 00	quality requirements, property corner indicator, new	I	
01 40 00	quality requirements, temporary ground point indicator, existing, 4 mm (5/32") square, typical	I	
01 40 00	quality requirements, temporary ground point indicator, new	I	
01 42 00	center line indicator; thin line, 2 mm (5/64") dash, 2 mm (5/64") space	L	
01 42 00	contract limit line; wide line with dot, 1 mm (1/16") diameter dot, 3 mm (1/8") space	L	
01 42 00	demolition line; medium line, 4 mm (5/32") dash, 2 mm (5/64") space	L	
01 42 00	existing to remain line; thin line	L	
01 42 00	features above line indicator; thin dashed line	L	
01 42 00	fire resistive rated line, 1 hour; fine line, 2.5 mm (3/32") diamond, 14 mm (9/16") repeat	L	
01 42 00	fire resistive rated line, 2 hour; fine line,	L	

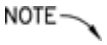
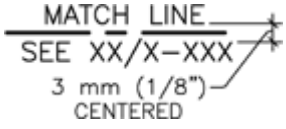
	2.5 mm (3/32") diamond, 12 mm (29/64") repeat		
01 42 00	fire resistive rated line, 3 hour; fine line, 2.5 mm (3/32") diamond, 8 mm (21/64") repeat	L	
01 42 00	fire resistive rated line, 4 hour; fine line, 2.5 mm (3/32") diamond, 7 mm (9/32") repeat	L	
01 42 00	fire-rated, smoke barrier line, 1 hour; fine line, 2.5 mm (3/32") diamond, 2.5 mm (3/32") text, 3.2 mm (1/8") space, 14 mm (9/16") repeat	L	
01 42 00	fire-rated, smoke barrier line, 2 hour; fine line, 2.5 mm (3/32") diamond, 2.5 mm (3/32") text, 3.2 mm (1/8") space, 12 mm (29/64") repeat	L	
01 42 00	fire-rated, smoke barrier line, 3 hour; fine line, 2.5 mm (3/32") diamond, 2.5 mm (3/32") text, 3.2 mm (1/8") space, 8 mm (21/64") repeat	L	
01 42 00	fire-rated, smoke barrier line, 4 hour; fine line, 2.5 mm (3/32") diamond, 2.5 mm (3/32") text, 3.2 mm (1/8") space, 7 mm (9/32") repeat	L	
01 42 00	hidden features line; thin line	L	
01 42 00	new line; medium line	L	
01 42 00	property line; wide line, 5 mm (3/16") dash, 3 mm (1/8") space	L	
01 42 00	smoke barrier line; fine line, 2.5 mm (3/32") text, 14 mm (9/16") repeat	L	
01 42 00	break, round (user defines size)	R	

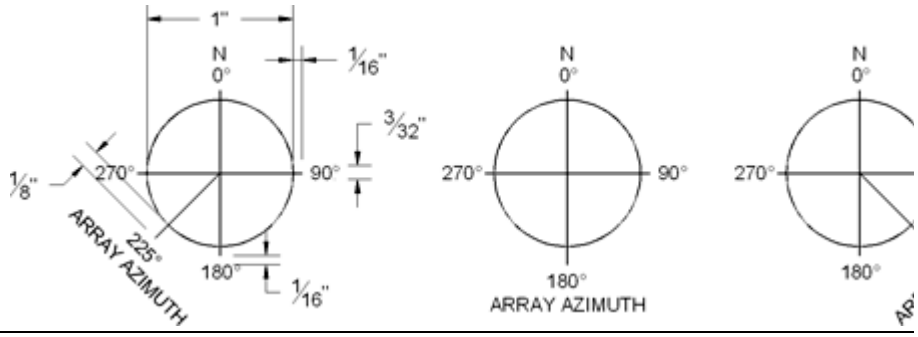
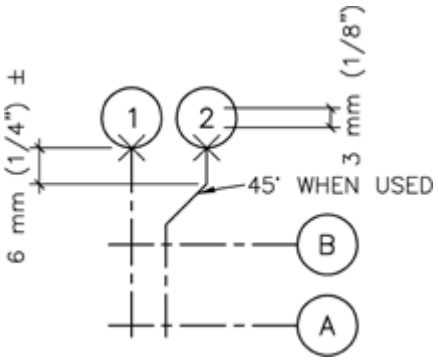
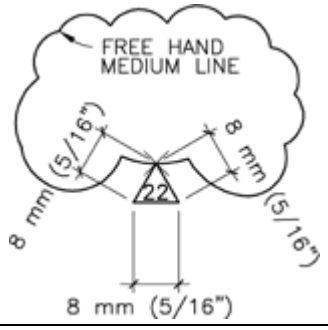
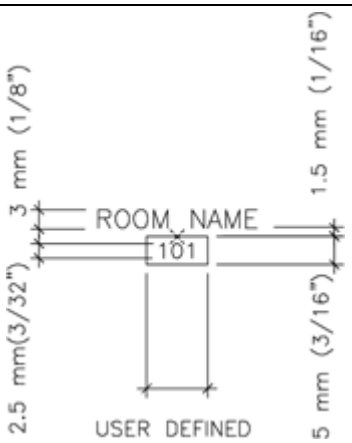
01 42 00	break, straight (see section indicators, building, with break standards)	R	

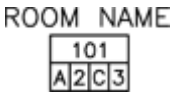
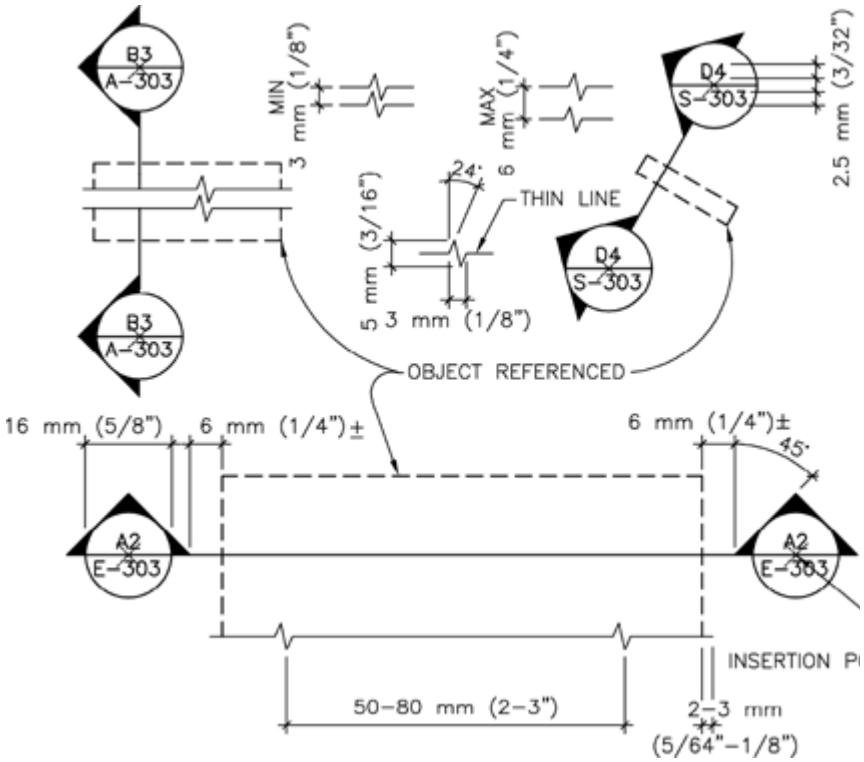
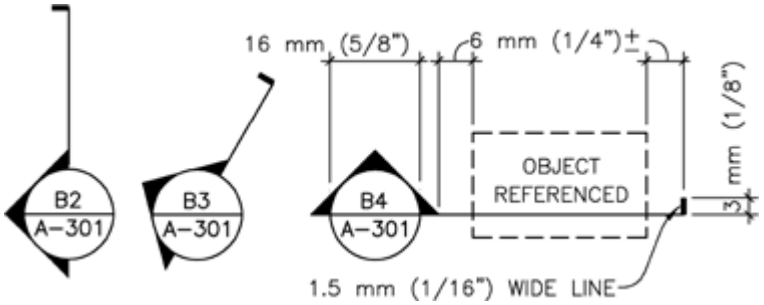
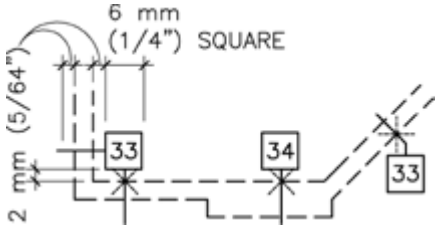
MF NO	DESCRIPTION	TYPE	SYMBOL
01 42 00	detail indicator, dashed circle, 2.5 mm (3/32") text, typical	R	
01 42 00	detail indicator, dashed rectangle, 2.5 mm (3/32") text, typical	R	
01 42 00	detail indicator for small conditions, 45 degree arrow, 2.5 mm (3/32") text, medium line	R	
01 42 00	dimension line: continuous, thin line with medium line for terminator	R	
01 42 00	dimension line: continuous, thin line with medium line for slash terminator or thin line with 3:1 filled arrows for arrow terminators, typical	R	
01 42 00	door opening/borrowed light identifier, 2.5 mm (3/32") text,	R	

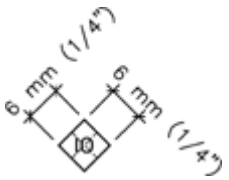
	medium line, typical		
01 42 00	drawing block title, typical	R	
01 42 00	elevation indicator, exterior, 16 mm (5/8") diameter	R	
01 42 00	elevation indicator, interior, multiple view, 16 mm (5/8") diameter; for two, three or four views	R	
01 42 00	elevation indicator, interior, single view, 16 mm (5/8") diameter	R	
01 42 00	furniture, fixture, & equipment indicator, medium line, typical	R	
01 42 00	graphic scale, 1:5000	R	
01 42 00	graphic scale, 1:2000	R	
01 42 00	graphic scale, 1:1000	R	
01 42 00	graphic scale, 1:500	R	
01 42 00	graphic scale, 1:200	R	

01 42 00	graphic scale, 1:100	R	
01 42 00	graphic scale, 1:50	R	
01 42 00	graphic scale, 1:30	R	
01 42 00	graphic scale, 1:20	R	
01 42 00	graphic scale, 1:10	R	
01 42 00	graphic scale, 1:5	R	
01 42 00	graphic scale, 1:2	R	
01 42 00	graphic scale, 1:1	R	
01 42 00	graphic scale, 1" = 1000'-0"	R	
01 42 00	graphic scale, 1" = 500'-0"	R	
01 42 00	graphic scale, 1" = 200'-0"	R	
01 42 00	graphic scale, 1" = 100'-0"	R	
01 42 00	graphic scale, 1" = 50'-0"	R	
01 42 00	graphic scale, 1" = 40'-0"	R	
01 42 00	graphic scale, 1" = 30'-0"	R	
01 42 00	graphic scale, 1" = 20'-0"	R	
01 42 00	graphic scale, 1" = 10'-0"	R	
01 42 00	graphic scale, 1/16" = 1'-0"	R	
01 42 00	graphic scale, 3/32" = 1'-0"	R	
01 42 00	graphic scale, 1/8" = 1'-0"	R	
01 42 00	graphic scale, 1/4" = 1'-0"	R	
01 42 00	graphic scale, 3/8" = 1'-0"	R	
01 42 00	graphic scale, 1/2" = 1'-0"	R	
01 42 00	graphic scale, 3/4" = 1'-0"	R	

01 42 00	graphic scale, 1" = 1'-0"	R	
01 42 00	graphic scale, 1 ½" = 1'-0"	R	
01 42 00	graphic scale, 3" = 1'-0"	R	
01 42 00	graphic scale, 6" = 1'-0"	R	
01 42 00	graphic scale, 1" = 1"	R	
01 42 00	identification device indicator, 2 mm (5/64") text, 3 mm (1/8") sides	R	
01 42 00	insertion point, 4 mm (5/32") wide/high hidden line	R	
01 42 00	keynote indicator, 2.5 mm (3/32") text, 60 degree angles, 6 mm (1/4") high, medium line	R	
01 42 00	leader, curved, 3:1 filled arrow, 3 mm (1/8") text, medium line	R	
01 42 00	leader, straight, 3:1 filled arrow, 3 mm (1/8") text, medium line	R	
01 42 00	louver type identifier, L = louver, 3 = type, similiar to window type identifier, medium line	R	
01 42 00	match line indicator, extra wide center line, 3 mm (1/8") text, medium line, typical	R	

01 42 00	north indicator, user-defined diameter (optional symbol may be replaced by user-defined north indicator symbol or north arrow)	R	
01 42 00	azimuth indicator, 1 inch diameter, medium line, 2.5 mm (3/32) text	R	
01 42 00	reference grid indicator with reference grid lines, medium line, typical	R	
01 42 00	revision indicator (shown with revision cloud), typical	R	
01 42 00	room identifier with room name and number, medium line, typical	R	

01 42 00	room identifier with room name and number, optional finishes A = floor finish type 2 = base finish type C = wall finish type 3 = ceiling finish type	R	
01 42 00	section indicators for building with break standards, typical	R	
01 42 00	section indicators for partial building, typical	R	
01 42 00	wall type indicator, medium line, typical	R	

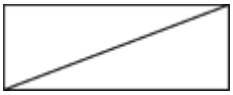
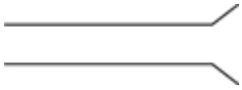
01 42 00	window type identifier, 2.5 mm (3/32") text, medium line, typical	R	

Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 02 - Existing Conditions

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 02	**EXISTING CONDITIONS**		
02 30 00	subsurface investigation, trench exploration completed	I	
02 30 00	subsurface investigation, trench exploration proposed	I	
02 30 00	subsurface investigation, tunnel exploration completed	I	
02 30 00	subsurface investigation, tunnel exploration proposed	I	
02 50 00	site remediation, storage container agent	I	

Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 03 - Concrete

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 03	**CONCRETE**		

03 30 00	concrete, cast in place	M	
03 41 00	beam, precast, double T shape	O	
03 48 00	precast concrete, communications vault	I	
03 48 00	precast concrete, electrical vault	I	
03 48 00	precast concrete, fuel oil vault	I	
03 48 00	precast concrete, manhole, transformer vault	I	
03 48 00	precast concrete, telephone vault	I	
03 48 00	precast concrete, transformer pad	I	
03 48 00	precast concrete, vault, natural gas valve	I	
03 50 00	concrete, lightweight	M	

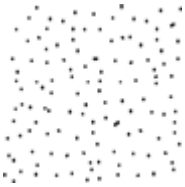
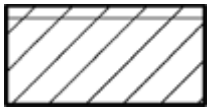
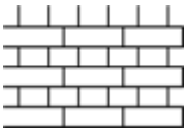
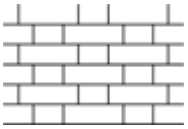
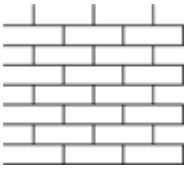
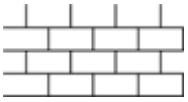
IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

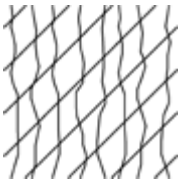
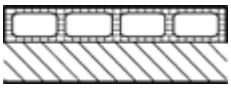
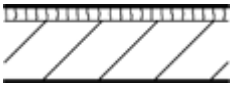
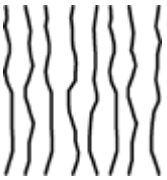
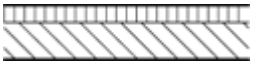
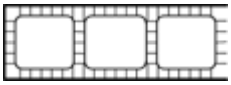
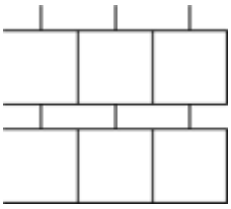
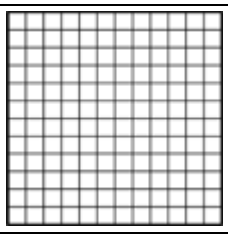
Module 6 - Symbols

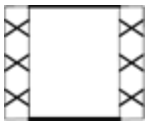
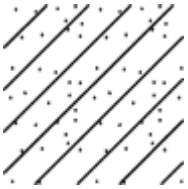
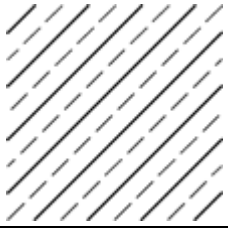
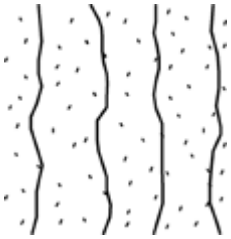
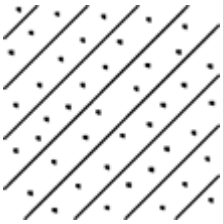
6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 04 - Masonry

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 04	**MASONRY**		
04 05 00	grout	M	
04 21 00	brick, common/face	M	
04 21 00	brick, glazed	M	
04 21 00	brick elevation, English bond	M	
04 21 00	brick elevation, Flemish bond	M	
04 21 00	brick elevation, running bond	M	
04 21 00	brick elevation, stack bond	M	
04 21 00	structural clay tile, glazed	M	
04 21 00	terra cotta, elevation	M	

04 21 00	terra cotta, glazed	M	
04 21 00	terra cotta, glazed one face, large scale	M	
04 21 00	terra cotta, hollow	M	
04 21 00	terra cotta, large scale	M	
04 21 00	terra cotta, small scale	M	
04 21 00	terra cotta, unglazed	M	
04 21 00	terra cotta, veneer	M	
04 21 00	terra cotta quarry, large scale	M	
04 21 00	tile, structural clay	M	
04 21 00	tile, structural floor units	M	
04 22 00	brick/concrete masonry unit, coursed elevation	M	
04 22 00	concrete masonry unit, 45 degree diagonal lines	M	
04 22 00	concrete masonry unit, bond beam lintel	M	
04 22 00	concrete masonry unit, elevation	M	

04 22 00	concrete masonry unit, end	M	
04 22 00	concrete masonry unit, glazed or faced	M	
04 22 00	concrete masonry unit, with cells	M	
04 23 00	glass block, large scale	M	
04 23 00	glass block, small scale	M	
04 24 00	adobe rammed earth	M	
04 40 00	marble stone	M	
04 40 00	stone, ashler	M	
04 40 00	stone, cut	M	
04 40 00	stone, rubble	M	
04 40 00	stone, squared elevation	M	
04 50 00	fire brick	M	

04 72 00	stone, cast	M	

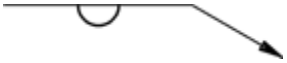
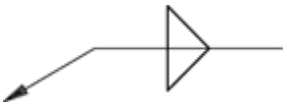
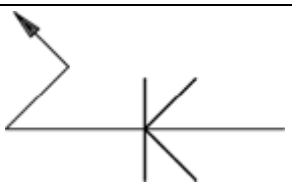
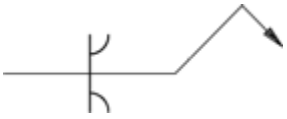
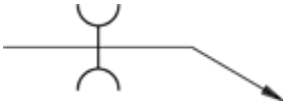
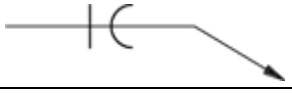
IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

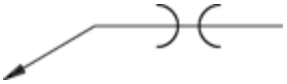
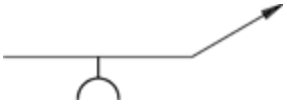
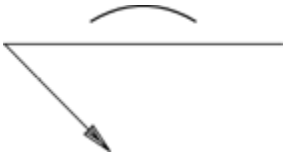
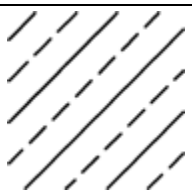
Module 6 - Symbols

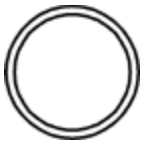
6.2 SYMBOLS

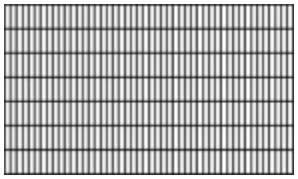
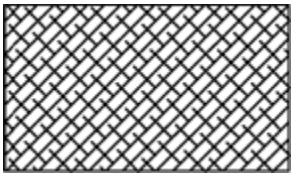
-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 05 - Metals

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 05	**METALS**		
05 05 00	weld, basic back, arrow side	I	
05 05 00	weld, basic fillet, arrow side	I	
05 05 00	weld, basic fillet, both sides	I	
05 05 00	weld, basic plug or slot, arrow side	I	
05 05 00	weld, double bevel fillet, both sides	I	
05 05 00	weld, double J groove, both sides	I	
05 05 00	weld, double U groove, both sides	I	
05 05 00	weld, double V groove, both sides	I	
05 05 00	weld, flare bevel, arrow side	I	
05 05 00	weld, flare bevel, both sides	I	

05 05 00	weld, groove flare V, arrow side	I	
05 05 00	weld, groove flare V, both sides	I	
05 05 00	weld, single bevel groove, arrow side	I	
05 05 00	weld, single J groove, arrow side	I	
05 05 00	weld, single U groove, arrow side	I	
05 05 00	weld, single V groove, arrow side	I	
05 05 00	weld, square groove, arrow side	I	
05 05 00	weld, square groove, both sides	I	
05 05 00	weld, supplementary, all around	I	
05 05 00	weld, supplementary concave	I	
05 05 00	weld, supplementary convex	I	
05 05 00	weld, supplementary field	I	
05 05 00	weld, supplementary flush	I	
05 05 00	aluminum	M	
05 05 00	bronze brass	M	

05 05 00	steel and other metals	M	
05 10 00	beam, structural steel, HP shape	O	
05 10 00	beam, structural steel, M shape	O	
05 10 00	beam, structural steel, S shape	O	
05 10 00	beam, structural steel, W shape	O	
05 10 00	C channel, metal light-gage	O	
05 10 00	pipe standard	O	
05 10 00	steel angle	O	
05 10 00	structural steel tee, ST shape	O	
05 10 00	structural steel tee, WT shape	O	
05 10 00	structural steel, Z shape	O	

05 10 00	structural tubing, steel	O	
05 20 00	bar joist double, steel	O	
05 20 00	bar joist single, steel	O	
05 30 00	metal deck, corrugated	O	
05 30 00	metal deck, form	O	
05 30 00	metal deck, hi-form	O	
05 30 00	metal deck, ribbed	O	
05 50 00	sheet metal and all metals	M	
05 53 00	grating, plan	M	
05 53 00	grating, section	M	
05 54 00	checker plate, plan	M	

IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 06 - Wood, Plastics, and Composites

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 06	**WOOD, PLASTICS, and COMPOSITES**		
06 05 00	wood, hardboard	M	

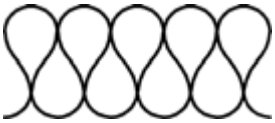
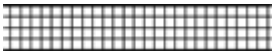
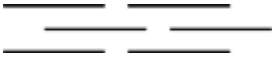
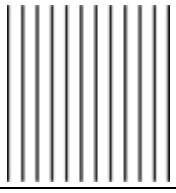
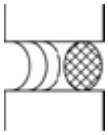
06 10 00	board, oriented strand	M	
06 10 00	particleboard	M	
06 10 00	plywood	M	
06 10 00	wood blocking or shim	M	
06 10 00	wood framing, continuous	M	
06 10 00	wood, glued-laminated	M	
06 20 00	plastic on plywood	M	
06 20 00	wood finish	M	
06 40 00	particleboard woodwork, architectural	M	

Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 07 - Thermal and Moisture Protection

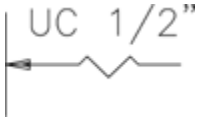
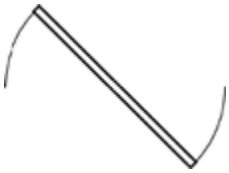
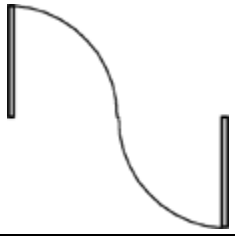
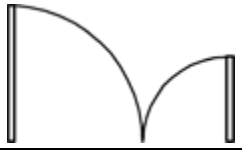
MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 07	**THERMAL and MOISTURE PROTECTION**		
07 21 00	insulation	M	
07 21 00	insulation, loose fill or blanket	M	
07 21 00	insulation, rigid board	M	
07 31 00	wood shingles siding	M	
07 40 00	sheet metal	M	
07 92 00	sealant and backer rod	M	

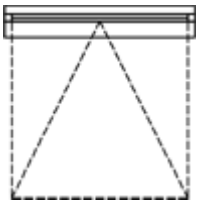
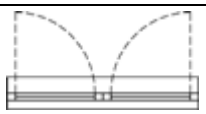
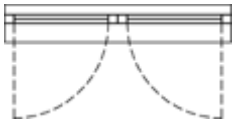
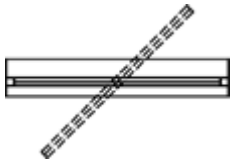
Module 6 - Symbols

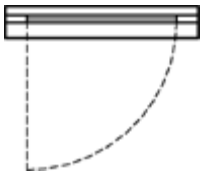
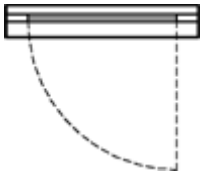
6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 08 - Openings

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 08	**OPENINGS**		
08 10 00	door, undercut	I	
08 10 00	door, bifolding	O	
08 10 00	door, center pivot	O	
08 10 00	door, double	O	
08 10 00	door, double egress	O	
08 10 00	door, double swing	O	
08 10 00	door, double uneven	O	
08 10 00	door, pocket	O	
08 10 00	door, single full swing	O	
08 10 00	door, single hinged or pivot	O	

08 10 00	door, sliding	O	
08 10 00	door, sliding surface	O	
08 33 00	door, coiling	O	
08 34 00	door, revolving dark room	O	
08 36 00	door, overhead	O	
08 42 00	door, revolving	O	
08 50 00	window, awning	O	
08 50 00	window, double casement (inswing)	O	
08 50 00	window, double casement (outswing)	O	
08 50 00	window, fixed	O	
08 50 00	window, jalousie	O	
08 50 00	window, pivot	O	
08 50 00	window, projected bay with casement windows	O	
08 50 00	window, projected bow	O	
08 50 00	window, projected box	O	
08 50 00	window, single, double, or triple hung	O	

08 50 00	window, single casement left jamb hinge	O	
08 50 00	window, single casement right jamb hinge	O	
08 50 00	window, sliding right operating sash	O	
08 70 00	door, hardware, electric opener	I	
08 71 00	threshold	O	
08 80 00	glass	M	
08 80 00	glass elevation	M	

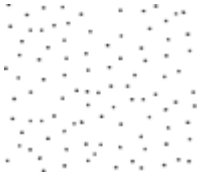
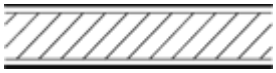
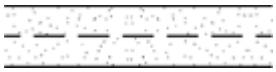
IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

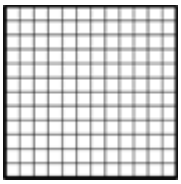
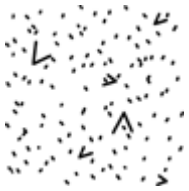
Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 09 - Finishes

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 09	**FINISHES**		
09 05 00	plaster, gypsum or portland cement	M	
09 20 00	gypsum board or plaster finish	M	
09 20 00	plaster finish with metal lath	M	
09 20 00	plaster on masonry	M	
09 20 00	plaster with lath	M	

09 22 00	furring channel, metal support assembly	O	
09 22 00	furring hat channel, metal support assembly	O	
09 29 00	gypsum board finish	M	
09 30 00	tile, ceramic elevation	M	
09 50 00	tee suspension, ceiling assemblies	O	
09 51 00	tile, acoustical ceiling	M	
09 64 00	wood flooring	M	
09 66 00	terrazzo finish	M	
09 68 00	carpet and pad	M	
09 68 00	carpet without pad	M	

IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

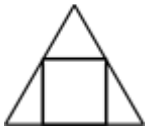
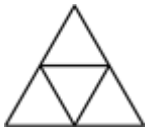
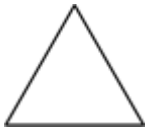
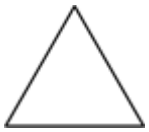
Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 10 - Specialties

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 10	**SPECIALTIES**		
10 13 00	directory, wall mounted	O	

10 17 00	telephone booth	O	
10 44 00	fire protection, extinguisher, carbon dioxide	I	
10 44 00	fire protection, extinguisher, dry chemical, for fires of all types, except metals	I	
10 44 00	fire protection, extinguisher, dry chemical, for liquid, gas, or electrical fires	I	
10 44 00	fire protection, extinguisher, foam	I	
10 44 00	fire protection, extinguisher, for metal fires	I	
10 44 00	fire protection, extinguisher, halon or clean agent	I	
10 44 00	fire protection, extinguisher, portable	I	
10 44 00	fire protection, extinguisher, water	I	

IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 11 - Equipment

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 11	**EQUIPMENT**		

11 00 00	can washer	O	
11 00 00	range	O	
11 00 00	refrigerator	O	
11 12 00	parking control equipment, traffic arm, mechanical, swing	I	
11 12 00	parking control equipment, traffic arm with card reader	I	
11 48 00	dishwasher	O	
11 52 00	screen, projection ceiling-mounted	O	
11 59 00	easel	O	
11 62 00	instrumental equipment, bell	I	
11 74 00	lavatory, dental	O	

IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

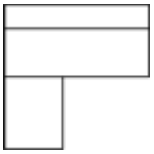
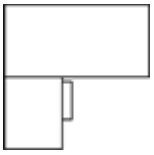
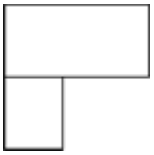
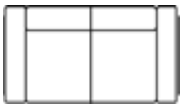
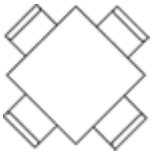
Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 12 - Furnishings

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 12	**FURNISHINGS**		
12 22 00	curtains and drapes	O	
12 40 00	table lamp	O	
12 50 00	chair, classroom	O	

12 50 00	chair with arms	O	
12 50 00	chair without arms	O	
12 50 00	credenza	O	
12 50 00	desk, console	O	
12 50 00	desk, L unit left return	O	
12 50 00	desk, left return	O	
12 50 00	desk, secretarial left return	O	
12 50 00	file, lateral, four drawer	O	
12 50 00	shelving equipment	O	
12 50 00	sofa, chair	O	
12 50 00	sofa, three cushion	O	
12 50 00	sofa, two cushion	O	
12 50 00	table	O	
12 50 00	table, square with armless chairs	O	
12 92 00	plant, interior or artificial	O	

Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 13 - Special Construction

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 13	**SPECIAL CONSTRUCTION**		
13 17 00	bath, hydrotherapy arm	O	
13 17 00	bath, hydrotherapy hubbard	O	
13 17 00	bath, hydrotherapy leg	O	
13 17 00	bath, institutional	O	
13 17 00	bath, whirlpool	O	
13 48 00	vibration control	I	

IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

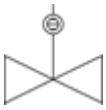
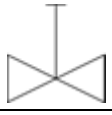
Module 6 - Symbols

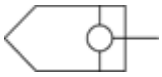
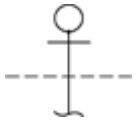
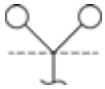
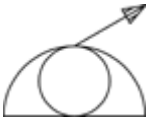
6.2 SYMBOLS

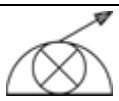
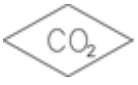
-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

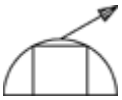
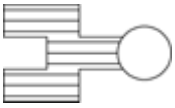
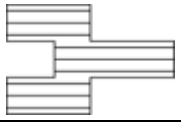
Division 21 - Fire Suppression

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 21	**FIRE SUPPRESSION**		
21 10 00	fire suppression, fire department key box	I	
21 10 00	fire suppression, sprinkler branch heads	I	
21 10 00	fire suppression, sprinkler with guard	I	

21 10 00	fire line = F; thin line, 2.5 mm (3/32") text	L	
21 10 00	fire protection sprinkler line = SP; thin line, 2.5 mm (3/32") text	L	
21 10 00	fire protection sprinkler line, main supply = S; thin line, 2.5 mm (3/32") text	L	
21 10 00	standpipe line, combination = CSP; thin line, 2.5 mm (3/32") text	L	
21 10 00	standpipe line, dry = DSP; thin line, 2.5 mm (3/32") text	L	
21 10 00	standpipe line, wet = WSP; thin line, 2.5 mm (3/32") text	L	
21 11 00	detector switch, tamper position	I	
21 11 00	fire suppression, butterfly valve, indicating	I	
21 11 00	fire suppression, control valve	I	
21 11 00	fire suppression, deluge valve	I	
21 11 00	fire suppression, domestic water shutoff	I	
21 11 00	fire suppression, flush mounted sprinkler heads	I	
21 11 00	fire suppression, indicator post valve	I	
21 11 00	fire suppression, key operated valve	I	
21 11 00	fire suppression, meter (CFM)	I	
21 11 00	fire suppression, meter (GPM)	I	
21 11 00	fire suppression, nippled upright sprinkler	I	
21 11 00	fire suppression, non-indicating, non-rising stem valve	I	

21 11 00	fire suppression, nozzle, charged monitor	I	
21 11 00	fire suppression, nozzle, special spray	I	
21 11 00	fire suppression, outside sprinkler	I	
21 11 00	fire suppression, pendant head sprinklers	I	
21 11 00	fire suppression, post indicator valve	I	
21 11 00	fire suppression, pre-action valve	I	
21 11 00	fire suppression, pressure switch	I	
21 11 00	fire suppression, pressure tank	I	
21 11 00	hydrant, private housed two-hose outlet	I	
21 12 00	fire department connection, one-way	I	
21 12 00	fire department connection, siamese free standing	I	
21 12 00	fire department connection, two-way siamese	I	
21 12 00	fire suppression, fire hose connection, inspector's test	I	
21 12 00	fire suppression, hose cabinet or connection	I	
21 12 00	standpipe, dry hose station	I	
21 12 00	standpipe, hose cabinet, charged	I	
21 13 00	fire suppression, automatic actuated wet extinguishing system	I	
21 13 00	fire suppression, dry automatic actuated	I	

21 13 00	fire suppression, dry manually actuated	I	
21 13 00	fire suppression, dry pipe, quick open valve	I	
21 13 00	fire suppression, dry pipe, valve	I	
21 13 00	fire suppression, foam automatic actuated	I	
21 13 00	fire suppression, foam manually actuated	I	
21 13 00	fire suppression, foam station reel	I	
21 13 00	fire suppression, foam system	I	
21 13 00	fire suppression, manual foam station	I	
21 13 00	fire suppression, manually actuated wet extinguishing system	I	
21 13 00	fire suppression, nozzle, dry monitor	I	
21 13 00	fire suppression, sprinkler heads, sidewall pendant	I	
21 13 00	fire suppression, sprinkler heads, sidewall upright	I	
21 13 00	fire suppression, sprinkler riser	I	
21 13 00	fire suppression, switch, pressure detector	I	
21 13 00	fire suppression, test header	I	
21 21 00	fire protection, manual carbon dioxide station	I	
21 21 00	fire suppression, extinguisher, carbon dioxide automatic actuated	I	
21 21 00	fire suppression, extinguisher, carbon dioxide system	I	

21 21 00	fire suppression, reel carbon dioxide station	I	
21 22 00	fire suppression, automatic actuated halon	I	
21 22 00	fire suppression, halon control panel	I	
21 22 00	fire suppression, halon manually actuated extinguisher	I	
21 22 00	fire suppression, halon system	I	
21 22 00	fire suppression, manual halon station	I	
21 23 00	fire suppression, manual wet chemical station	I	
21 23 00	fire suppression, wet chemical system	I	
21 24 00	fire suppression, dry chemical system	I	
21 24 00	fire suppression, extinguisher, dry chemical station reel	I	
21 24 00	fire suppression, extinguisher, manually actuated dry chemical	I	
21 30 00	fire suppression, fire pump test header, freestanding	I	
21 30 00	fire suppression, fire pump test header, wall mounted	I	
21 30 00	fire suppression, fire pump with drives	I	
21 41 00	storage tank, fire suppression water	I	

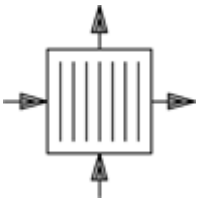
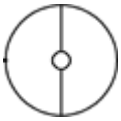
IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

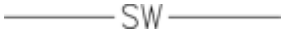
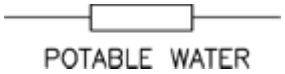
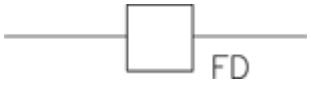
Module 6 - Symbols

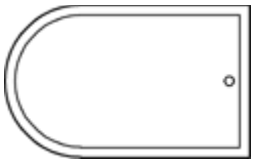
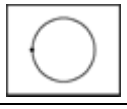
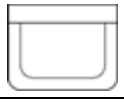
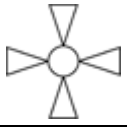
6.2 SYMBOLS

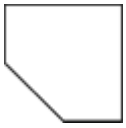
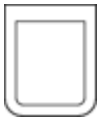
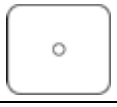
-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

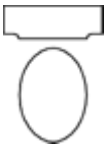
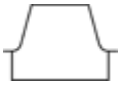
Division 22 - Plumbing

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 22	**PLUMBING**		
22 05 00	piping, air heater (plate or tubular)	I	
22 05 00	piping, air heater (rotating type)	I	
22 11 00	piping, air eliminator	I	
22 11 00	piping, air separator	I	
22 11 00	utility, water regulator valve	I	
22 11 00	water main, private	I	
22 11 00	drain line = D; thin line, 2.5 mm (3/32") text	L	
22 11 00	drain line, indirect = IW; thin line, 2.5 mm (3/32") text	L	
22 11 00	pipe line, cast iron = CI; thin line, 2.5 mm (3/32") text	L	
22 11 00	pipe line, clay tile = CT; thin line, 2.5 mm (3/32") text	L	
22 11 00	pipe line, ductile iron = DI; thin line, 2.5 mm (3/32") text	L	
22 11 00	waste line, sanitary soil (above floor) = SS; thin line, 2.5 mm (3/32") text	L	
22 11 00	waste line, sanitary soil (below floor = SS); thin line, 2.5 mm (3/32") text	L	
22 11 00	waste line and vent, combination = SV; thin line, 2.5 mm (3/32") text	L	
22 11 00	water line, cold; thin line, 5 mm (3/16") dash, 2 mm (5/64") space	L	

22 11 00	water line, drinking return = DWR; thin line, 2.5 mm (3/32") text	L	
22 11 00	water line, drinking supply = WS; thin line, 2.5 mm (3/32") text	L	
22 11 00	water line, soft = SW; thin line, 2.5 mm (3/32") text	L	
22 11 00	water line, tempered return = TWR; thin line, 2.5 mm (3/32") text	L	
22 11 00	water line, tempered supply = TWS; thin line, 2.5 mm (3/32") text	L	
22 12 00	storage tank, potable water	I	
22 13 00	drain, floor	I	
22 13 00	piping, grease trap	I	
22 14 00	piping, drain, open funnel	I	
22 14 00	drain line, storm (above floor); thin line, 2.5 mm (3/32") text	L	
22 14 00	drain line, storm (below floor); thin line, 2.5 mm (3/32") text	L	
22 14 00	pipe line, reinforced concrete = RCP; thin line, 2.5 mm (3/32") text	L	
22 15 00	compressed air line = A; thin line, 2.5 mm (3/32") text	L	
22 31 00	utility, water softener	I	
22 40 00	plumbing fixtures, shower, overhead gang	I	
22 40 00	bath, emergency	O	

22 40 00	bath, foot	O	
22 40 00	bath, infant	O	
22 40 00	bath, recessed	O	
22 40 00	bath, rimmed	O	
22 40 00	bath, sitz	O	
22 40 00	bidet	O	
22 40 00	laundry, single tray	O	
22 40 00	lavatory, accessible	O	
22 40 00	lavatory, corner	O	
22 40 00	lavatory, countertop	O	
22 40 00	lavatory, integral countertop	O	
22 40 00	lavatory, medical manicure	O	
22 40 00	lavatory, wall hung	O	
22 40 00	shower, pedestal gang	O	

22 40 00	shower head	O	
22 40 00	shower stall	O	
22 40 00	sink, circular wash type	O	
22 40 00	sink, floor	O	
22 40 00	sink, flushing rimmed clinical	O	
22 40 00	sink, general	O	
22 40 00	sink, laundry	O	
22 40 00	sink, semi-circular wash	O	
22 40 00	sink, service, cast iron enameled	O	
22 40 00	sink, service, metal	O	
22 40 00	sink, two compartment type	O	
22 40 00	sink, two compartment with left & right drainboards	O	
22 40 00	sink with drainboard	O	
22 40 00	sink with garbage disposal	O	
22 40 00	sink with left & right drain board	O	
22 40 00	urinal, corner type	O	

22 40 00	urinal, floor mounted	O	
22 40 00	urinal, trough type	O	
22 40 00	urinal, wall hung	O	
22 40 00	water cooler, freestanding electric	O	
22 40 00	water cooler, wall hung electric	O	
22 40 00	water closet, flush valve floor outlet	O	
22 40 00	water closet, flush valve wall hung	O	
22 40 00	water closet, integral tank	O	
22 40 00	water closet, tank type	O	
22 40 00	water closet, wall hung tank	O	
22 43 00	sink, surgeon scrub	O	
22 47 00	drinking fountain, projecting type	O	
22 47 00	drinking fountain, recessed type	O	
22 47 00	drinking fountain, semi-recessed type	O	
22 62 00	vacuum air line = VAC; thin line, 2.5 mm (3/32") text	L	
22 62 00	vacuum cleaning line = VC; thin line, 2.5 mm (3/32") text	L	
22 62 00	vacuum pump discharge line = VPD; thin line, 2.5 mm (3/32") text	L	

22 63 00	liquid oxygen line = LOX; thin line, 2.5 mm (3/32") text	L	
22 63 00	nitrous oxide line = NO; thin line, 2.5 mm (3/32") text	L	
22 63 00	oxygen line = O; thin line, 2.5 mm (3/32") text	L	

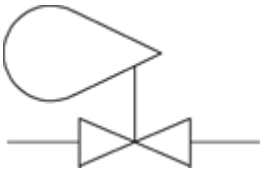
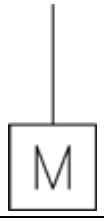
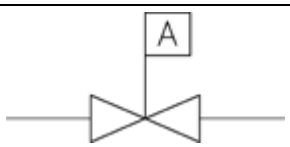
IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

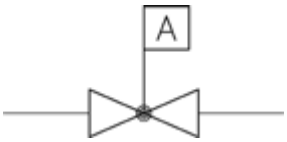
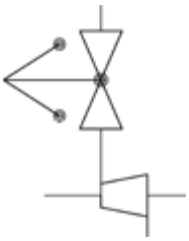
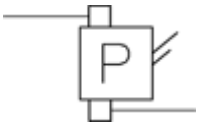
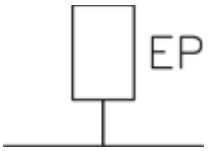
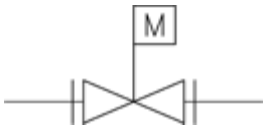
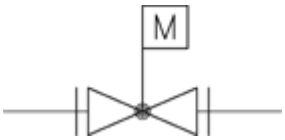
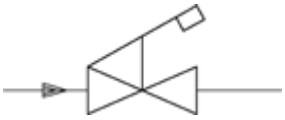
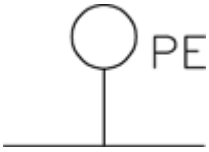
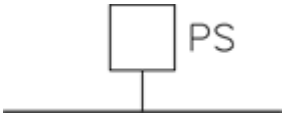
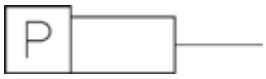
Module 6 - Symbols

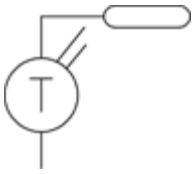
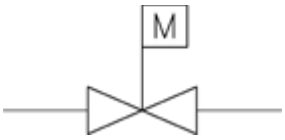
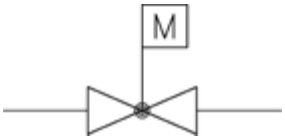
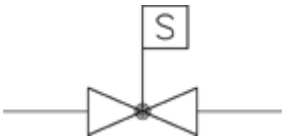
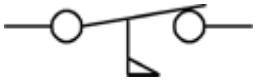
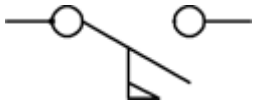
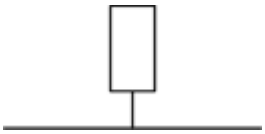
6.2 SYMBOLS

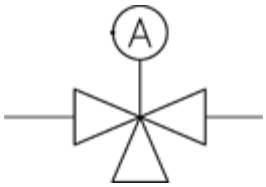
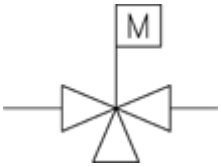
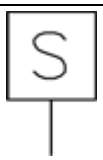
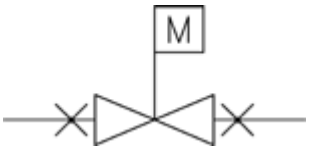
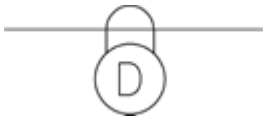
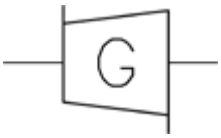
-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

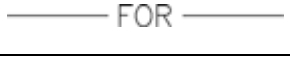
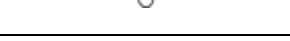
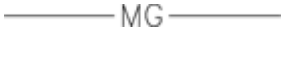
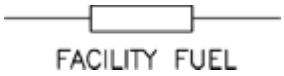
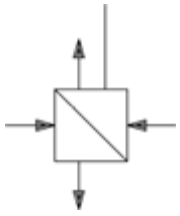
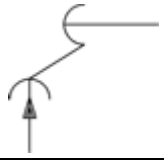
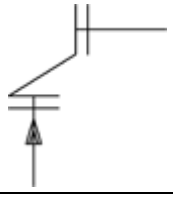
Division 23 - Heating, Ventilating, and Air Conditioning

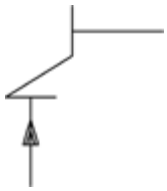
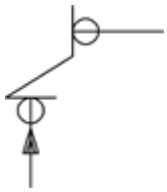
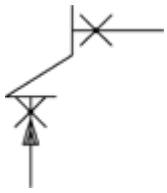
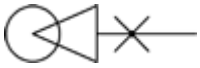
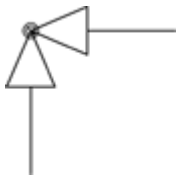
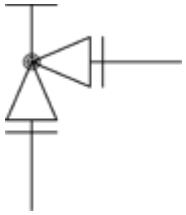
MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 23	**HEATING, VENTILATING, and AIR CONDITIONING**		
23 09 00	air distribution, controller, liquid level	I	
23 09 00	air distribution, damper control, electric operated	I	
23 09 00	air distribution, duct detector	I	
23 09 00	air distribution, pneumatic operated damper control	I	
23 09 00	control panel for heating, ventilating and air conditioning	I	
23 09 00	HVAC control, air motor controlled gate valve	I	

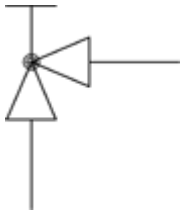
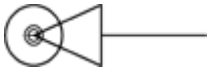
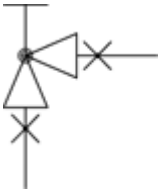
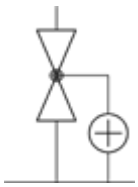
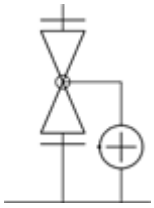
23 09 00	HVAC control, air motor controlled globe valve	I	
23 09 00	HVAC control, automatic governor operated valve	I	
23 09 00	HVAC control, differential oil pressure switch	I	
23 09 00	HVAC control, dual pressure switch	I	
23 09 00	HVAC control, electric pneumatic control	I	
23 09 00	HVAC control, flanged motor operated gate valve	I	
23 09 00	HVAC control, flanged motor operated globe valve	I	
23 09 00	HVAC control, fusible link quick valve	I	
23 09 00	HVAC control, pneumatic electric control	I	
23 09 00	HVAC control, pressure stat	I	
23 09 00	HVAC control, pressure switch, type 1	I	
23 09 00	HVAC control, pressure switch, type 2	I	
23 09 00	HVAC control, pressure switch with high pressure cutout	I	

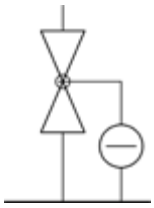
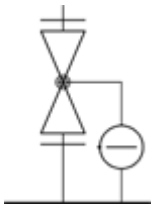
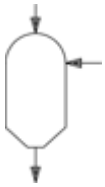
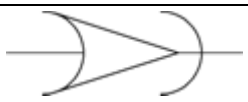
23 09 00	HVAC control, remote bulb thermostat	I	
23 09 00	HVAC control, screwed motor operated gate valve	I	
23 09 00	HVAC control, screwed motor operated globe valve	I	
23 09 00	HVAC control, self-contained thermostat	I	
23 09 00	HVAC control, solenoid valve	I	
23 09 00	HVAC control, spring check valve	I	
23 09 00	HVAC control, switch, normally closed flow	I	
23 09 00	HVAC control, switch, normally open flow	I	
23 09 00	HVAC control, thermal bulb	I	
23 09 00	HVAC control, thermometer	I	
23 09 00	HVAC control, thermometer well	I	
23 09 00	HVAC control, thermostat, electric	I	
23 09 00	HVAC control, thermostat, pneumatic	I	
23 09 00	HVAC control, thermostat, self-contained	I	

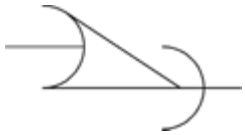
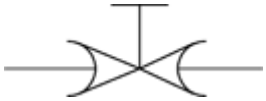
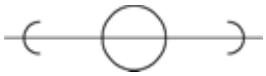
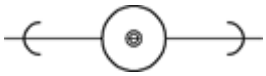
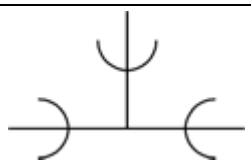
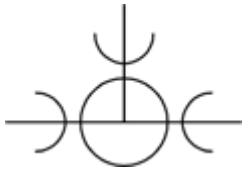
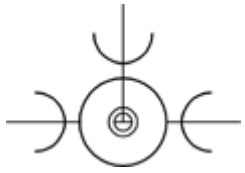
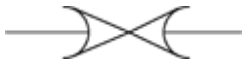
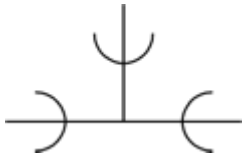
23 09 00	HVAC control, three-way air motor controlled valve	I	
23 09 00	HVAC control, three-way electric motor controlled valve	I	
23 09 00	HVAC control, valve actuator electric motor	I	
23 09 00	HVAC control, valve actuator electric solenoid	I	
23 09 00	HVAC control, valve actuator pneumatic motor	I	
23 09 00	HVAC control, valve actuator pneumatic motor diaphragm	I	
23 09 00	HVAC control, vapor regulated suction valve	I	
23 09 00	HVAC control, welded motor operated gate valve	I	
23 10 00	piping, engine (indicate fuel)	I	
23 10 00	piping, gas turbine	I	
23 11 00	fire suppression, LP gas shutoff	I	
23 11 00	fire suppression, natural gas shutoff	I	

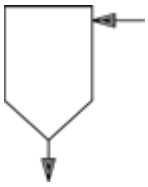
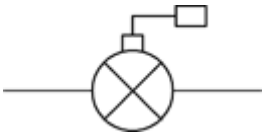
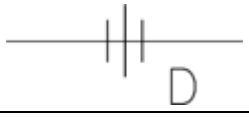
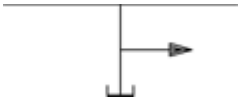
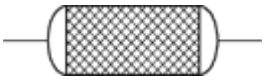
23 11 00	fuel oil, discharge line = FOD; thin line, 2.5 mm (3/32") text	L	
23 11 00	fuel oil, flow line = FOF; thin line, 2.5 mm (3/32") text	L	
23 11 00	fuel oil, gauge line = FOG; 2.5 mm (3/32") text	L	
23 11 00	fuel oil, return line = FOR; thin line, 2.5 mm (3/32") text	L	
23 11 00	fuel oil, suction supply line = FOS; thin line, 2.5 mm (3/32") text	L	
23 11 00	fuel oil, tank vent line = FOV; thin line, 2.5 mm (3/32") text	L	
23 11 00	gas line, high pressure = HG; thin line, 2.5 mm (3/32") text	L	
23 11 00	gas line, liquid petroleum = LPG; thin line, 2.5 mm (3/32") text	L	
23 11 00	gas line, low pressure = G; thin line, 2.5 mm (3/32") text	L	
23 11 00	gas line, medium pressure = MG; thin line, 2.5 mm (3/32") text	L	
23 13 00	storage tank, facility fuel storage	I	
23 20 00	heater, live steam superheater	I	
23 20 00	piping, anchor intermediate	I	
23 20 00	piping, anchor main	I	
23 20 00	piping, angle check valve, bell & spigot	I	
23 20 00	piping, angle check valve, flanged	I	

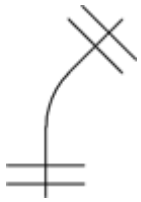
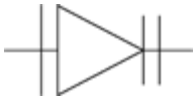
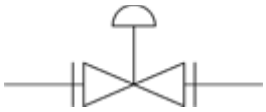
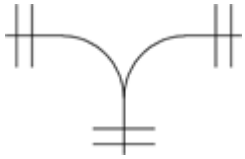
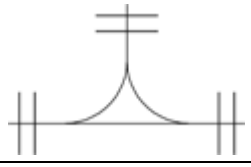
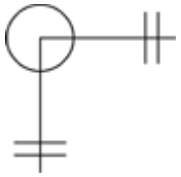
23 20 00	piping, angle check valve, screwed	I	
23 20 00	piping, angle check valve, soldered	I	
23 20 00	piping, angle check valve, welded	I	
23 20 00	piping, angle gate valve, flanged (elevation)	I	
23 20 00	piping, angle gate valve, flanged (plan)	I	
23 20 00	piping, angle gate valve, screwed (elevation)	I	
23 20 00	piping, angle gate valve, screwed (plan)	I	
23 20 00	piping, angle gate valve, welded (elevation)	I	
23 20 00	piping, angle gate valve, welded (plan)	I	
23 20 00	piping, angle globe valve (elevation)	I	
23 20 00	piping, angle globe valve, flanged (elevation)	I	
23 20 00	piping, angle globe valve, flanged (plan)	I	

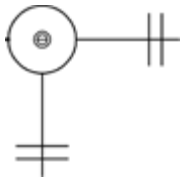
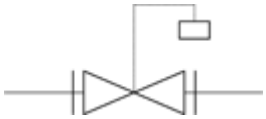
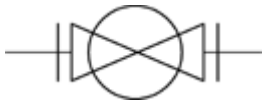
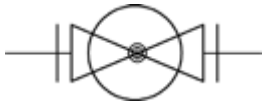
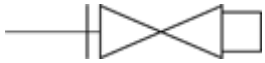
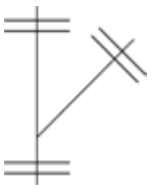
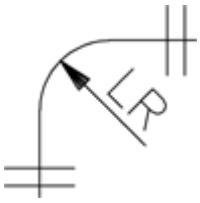
23 20 00	piping, angle globe valve, screwed (elevation)	I	
23 20 00	piping, angle globe valve, screwed (plan)	I	
23 20 00	piping, angle globe valve, soldered (plan)	I	
23 20 00	piping, angle globe valve, welded (elevation)	I	
23 20 00	piping, angle globe valve, welded (plan)	I	
23 20 00	piping, angle hose valve	I	
23 20 00	piping, automatic air vent	I	
23 20 00	piping, automatic bypass valve	I	
23 20 00	piping, automatic bypass valve, flanged	I	
23 20 00	piping, automatic expansion valve	I	
23 20 00	piping, automatic governor operated valve, flanged	I	

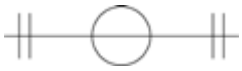
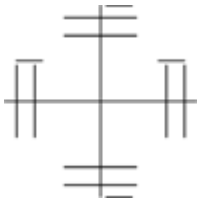
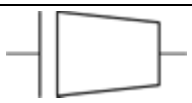
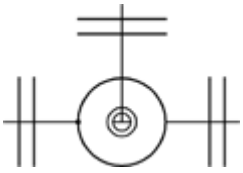
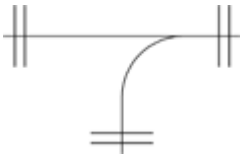
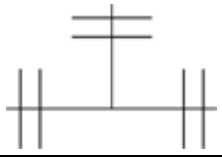
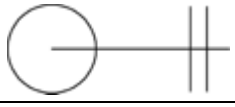
23 20 00	piping, automatic reducing valve	I	
23 20 00	piping, automatic reducing valve, flanged	I	
23 20 00	piping, ball joint	I	
23 20 00	piping, ball valve	I	
23 20 00	piping, barometric condenser	I	
23 20 00	piping, base elbow, screwed	I	
23 20 00	piping, bell & spigot 45 degree elbow	I	
23 20 00	piping, bell & spigot 90 degree elbow	I	
23 20 00	piping, bell & spigot bull plug	I	
23 20 00	piping, bell & spigot cap	I	
23 20 00	piping, bell & spigot concentric reducer	I	
23 20 00	piping, bell & spigot connecting pipe joint	I	
23 20 00	piping, bell & spigot crossover	I	

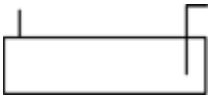
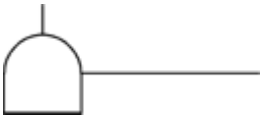
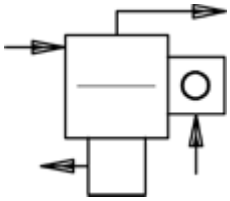
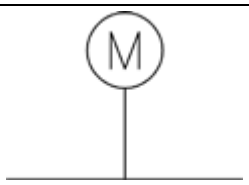
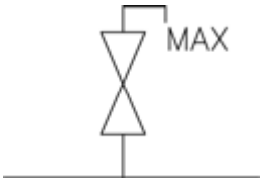
23 20 00	piping, bell & spigot eccentric reducer	I	
23 20 00	piping, bell & spigot expansion bell joint	I	
23 20 00	piping, bell & spigot gate valve (elevation)	I	
23 20 00	piping, bell & spigot globe valve (elevation)	I	
23 20 00	piping, bell & spigot outlet down tee	I	
23 20 00	piping, bell & spigot outlet up tee	I	
23 20 00	piping, bell & spigot pipe plug	I	
23 20 00	piping, bell & spigot reducing tee	I	
23 20 00	piping, bell & spigot safety valve	I	
23 20 00	piping, bell & spigot side outlet down tee	I	
23 20 00	piping, bell & spigot side outlet tee	I	
23 20 00	piping, bell & spigot sleeve	I	
23 20 00	piping, bell & spigot stop valve	I	
23 20 00	piping, bell & spigot straight size tee	I	
23 20 00	piping, bell & spigot turned down elbow	I	

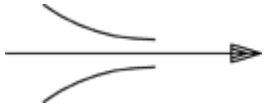
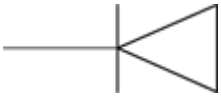
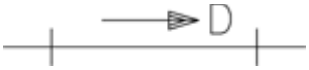
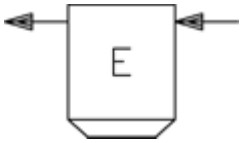
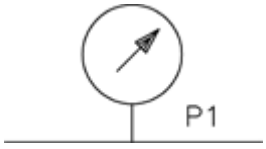
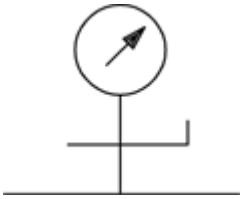
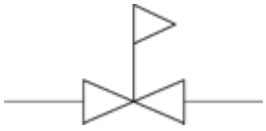
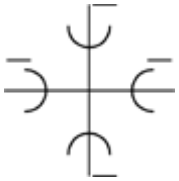
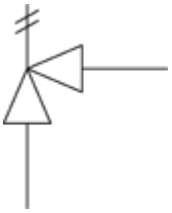
23 20 00	piping, bell & spigot turned up elbow	I	
23 20 00	piping, blind flange	I	
23 20 00	piping, blow off strainer	I	
23 20 00	piping, boiler return trap	I	
23 20 00	piping, bushing bell & spigot	I	
23 20 00	piping, butterfly valve	I	
23 20 00	piping, capillary tube	I	
23 20 00	piping, cock bell & spigot	I	
23 20 00	piping, condenser jet	I	
23 20 00	piping, condenser water regulating valve	I	
23 20 00	piping, dielectric union	I	
23 20 00	piping, drain hose end	I	
23 20 00	piping, duplex strainer	I	
23 20 00	piping, expansion hand valve	I	
23 20 00	piping, expansion joint	I	
23 20 00	piping, expansion loop	I	
23 20 00	piping, filter and strainer line	I	

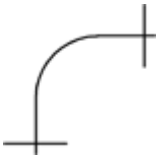
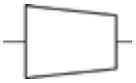
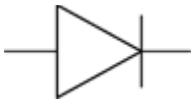
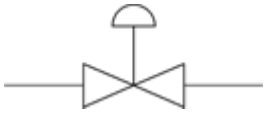
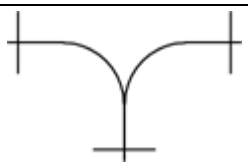
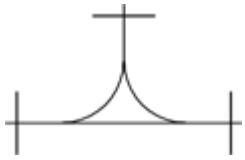
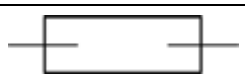
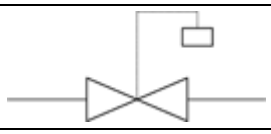
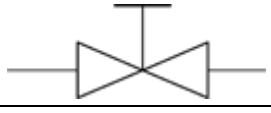
23 20 00	piping, flanged 45 degree elbow	I	
23 20 00	piping, flanged 90 degree elbow	I	
23 20 00	piping, flanged base elbow	I	
23 20 00	piping, flanged bull plug	I	
23 20 00	piping, flanged cock	I	
23 20 00	piping, flanged concentric reducer	I	
23 20 00	piping, flanged connecting pipe joint	I	
23 20 00	piping, flanged diaphragm valve	I	
23 20 00	piping, flanged double branch elbow	I	
23 20 00	piping, flanged double sweep tee	I	
23 20 00	piping, flanged eccentric reducer	I	
23 20 00	piping, flanged elbow side outlet, down	I	

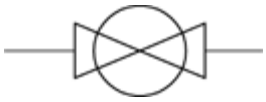
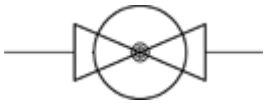
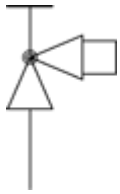
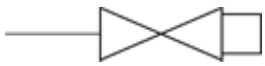
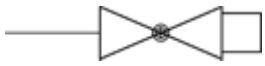
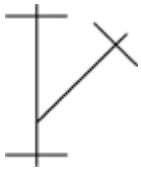
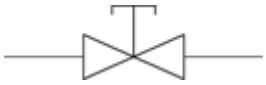
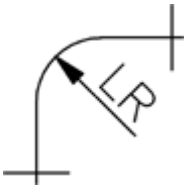
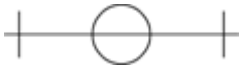
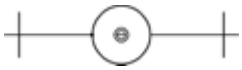
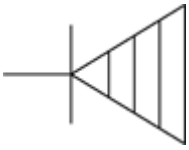
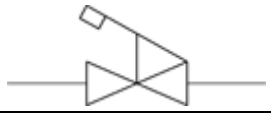
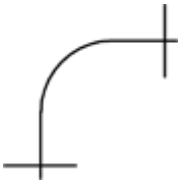
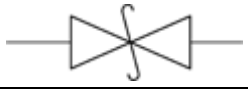
23 20 00	piping, flanged elbow side outlet, up	I	
23 20 00	piping, flanged expansion joint	I	
23 20 00	piping, flanged float valve	I	
23 20 00	piping, flanged gate valve (elevation)	I	
23 20 00	piping, flanged gate valve (plan)	I	
23 20 00	piping, flanged globe valve (elevation)	I	
23 20 00	piping, flanged globe valve (plan)	I	
23 20 00	piping, flanged hose angle valve	I	
23 20 00	piping, flanged hose gate valve	I	
23 20 00	piping, flanged hose globe valve	I	
23 20 00	piping, flanged lateral	I	
23 20 00	piping, flanged lock shield valve	I	
23 20 00	piping, flanged long radius elbow	I	
23 20 00	piping, flanged orifice flange	I	

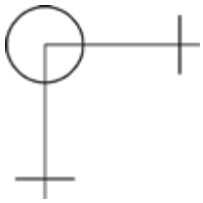
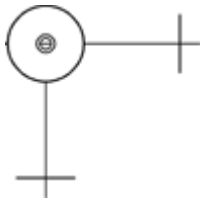
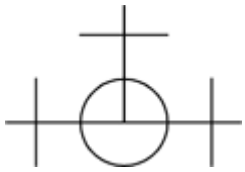
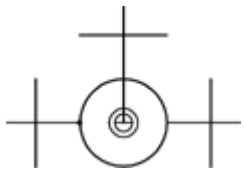
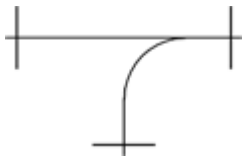
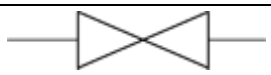
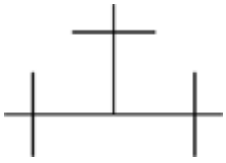
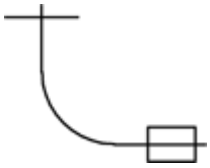
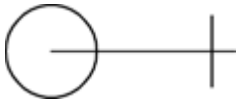
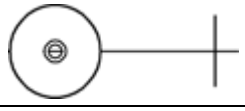
23 20 00	piping, flanged outlet down tee	I	
23 20 00	piping, flanged outlet up tee	I	
23 20 00	piping, flanged quick opening valve	I	
23 20 00	piping, flanged reducing cross	I	
23 20 00	piping, flanged reducing flange	I	
23 20 00	piping, flanged safety valve	I	
23 20 00	piping, flanged side outlet tee	I	
23 20 00	piping, flanged side outlet up tee	I	
23 20 00	piping, flanged single sweep tee	I	
23 20 00	piping, flanged sleeve	I	
23 20 00	piping, flanged spool piece	I	
23 20 00	piping, flanged stop valve	I	
23 20 00	piping, flanged straight size tee	I	
23 20 00	piping, flanged turned down elbow	I	
23 20 00	piping, flanged turned up elbow	I	

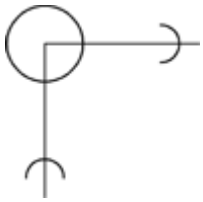
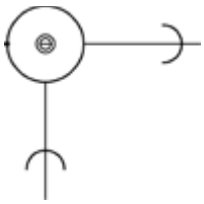
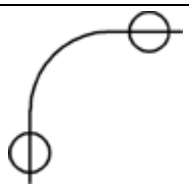
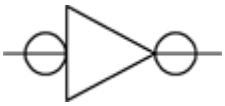
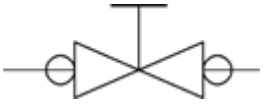
23 20 00	piping, flanged union	I	
23 20 00	piping, float and thermostatic trap	I	
23 20 00	piping, float trap	I	
23 20 00	piping, heat, liquid exchanger	I	
23 20 00	piping, heat, transfer surface	I	
23 20 00	piping, high pressure horizontal receiver	I	
23 20 00	piping, high pressure vertical receiver	I	
23 20 00	piping, high side float valve	I	
23 20 00	piping, hose globe valve	I	
23 20 00	piping, lateral bell & spigot	I	
23 20 00	piping, low pressure receiver	I	
23 20 00	piping, low side float valve	I	
23 20 00	piping, magnetic stop valve	I	
23 20 00	piping, manual air vent	I	

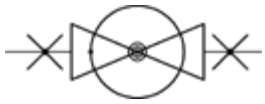
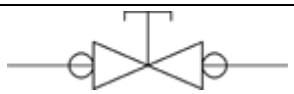
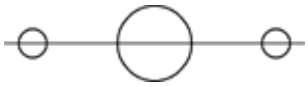
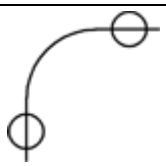
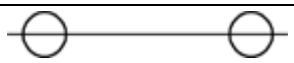
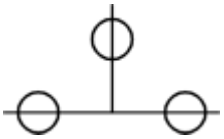
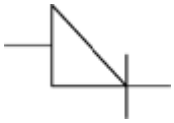
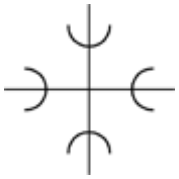
23 20 00	piping, needle valve	I	
23 20 00	piping, nozzle flow	I	
23 20 00	piping, pipe plug	I	
23 20 00	piping, pitch or pipe drop	I	
23 20 00	piping, pitch or pipe rise	I	
23 20 00	piping, plug valve	I	
23 20 00	piping, precipitator	I	
23 20 00	piping, pressure gage	I	
23 20 00	piping, pressure gage and cock	I	
23 20 00	piping, pressure reducing valve	I	
23 20 00	piping, reducing bell & spigot cross	I	
23 20 00	piping, relief or safety valve	I	
23 20 00	piping, rupture disc	I	

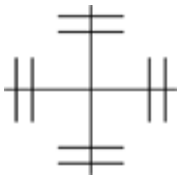
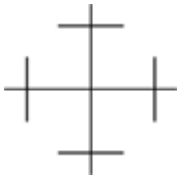
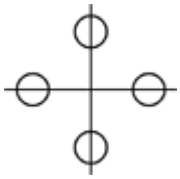
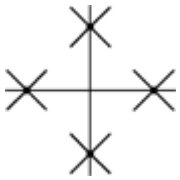
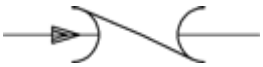
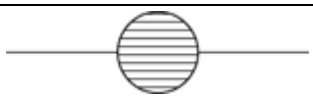
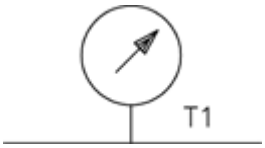
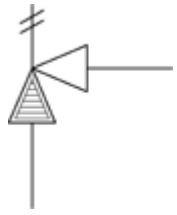
23 20 00	piping, screwed 45 degree elbow	I	
23 20 00	piping, screwed 90 degree elbow	I	
23 20 00	piping, screwed bushing	I	
23 20 00	piping, screwed cap	I	
23 20 00	piping, screwed cock	I	
23 20 00	piping, screwed concentric reducer	I	
23 20 00	piping, screwed connecting pipe joint	I	
23 20 00	piping, screwed crossover	I	
23 20 00	piping, screwed diaphragm valve	I	
23 20 00	piping, screwed double branch elbow	I	
23 20 00	piping, screwed double sweep tee	I	
23 20 00	piping, screwed eccentric reducer	I	
23 20 00	piping, screwed expansion joint	I	
23 20 00	piping, screwed float valve	I	
23 20 00	piping, screwed gate valve (elevation)	I	

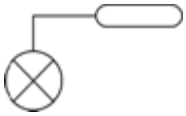
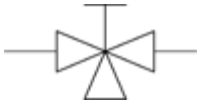
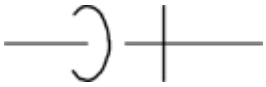
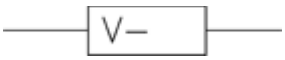
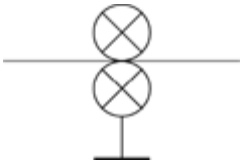
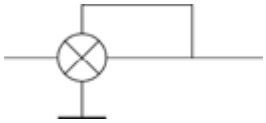
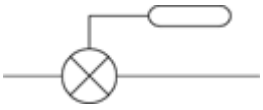
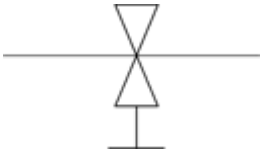
23 20 00	piping, screwed gate valve (plan)	I	
23 20 00	piping, screwed globe valve (elevation)	I	
23 20 00	piping, screwed globe valve (plan)	I	
23 20 00	piping, screwed hose angle valve	I	
23 20 00	piping, screwed hose gate valve	I	
23 20 00	piping, screwed hose globe valve	I	
23 20 00	piping, screwed lateral	I	
23 20 00	piping, screwed lock shield valve	I	
23 20 00	piping, screwed long radius elbow	I	
23 20 00	piping, screwed outlet down tee	I	
23 20 00	piping, screwed outlet up tee	I	
23 20 00	piping, screwed pipe plug	I	
23 20 00	piping, screwed quick opening valve	I	
23 20 00	piping, screwed reducing elbow	I	
23 20 00	piping, screwed safety valve	I	

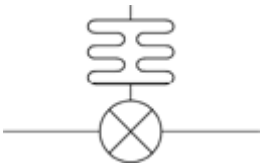
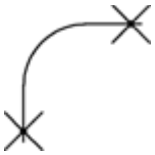
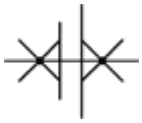
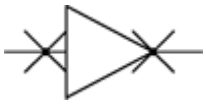
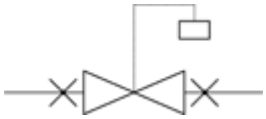
23 20 00	piping, screwed side outlet elbow, down	I	
23 20 00	piping, screwed side outlet elbow, up	I	
23 20 00	piping, screwed side outlet tee	I	
23 20 00	piping, screwed side outlet up tee	I	
23 20 00	piping, screwed single sweep tee	I	
23 20 00	piping, screwed sleeve	I	
23 20 00	piping, screwed stop valve	I	
23 20 00	piping, screwed straight size tee	I	
23 20 00	piping, screwed street elbow	I	
23 20 00	piping, screwed turned down elbow	I	
23 20 00	piping, screwed turned up elbow	I	
23 20 00	piping, screwed union	I	

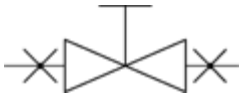
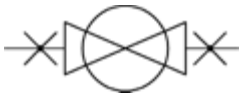
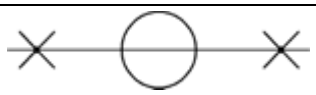
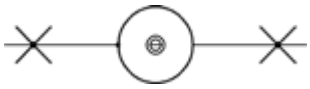
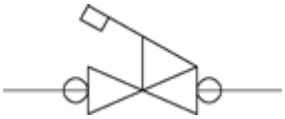
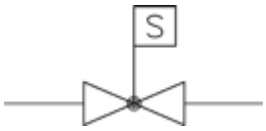
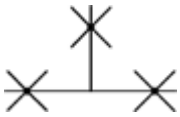
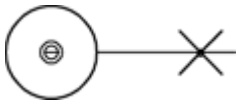
23 20 00	piping, side outlet elbow, bell & spigot, outlet down	I	
23 20 00	piping, side outlet elbow, bell & spigot, outlet up	I	
23 20 00	piping, sight glass	I	
23 20 00	piping, sleeve	I	
23 20 00	piping, soldered 45 degree elbow	I	
23 20 00	piping, soldered 90 degree elbow	I	
23 20 00	piping, soldered bushing	I	
23 20 00	piping, soldered cock	I	
23 20 00	piping, soldered concentric reducer	I	
23 20 00	piping, soldered connecting pipe joint	I	
23 20 00	piping, soldered eccentric reducer	I	
23 20 00	piping, soldered expansion joint	I	
23 20 00	piping, soldered gate valve	I	
23 20 00	piping, soldered globe valve (elevation)	I	

23 20 00	piping, soldered globe valve (plan)	I	
23 20 00	piping, soldered lock shield valve	I	
23 20 00	piping, soldered outlet down tee	I	
23 20 00	piping, soldered outlet up tee	I	
23 20 00	piping, soldered quick opening valve	I	
23 20 00	piping, soldered reducing elbow	I	
23 20 00	piping, soldered safety valve	I	
23 20 00	piping, soldered sleeve	I	
23 20 00	piping, soldered stop valve	I	
23 20 00	piping, soldered straight size tee	I	
23 20 00	piping, soldered turned down elbow	I	
23 20 00	piping, soldered turned up elbow	I	
23 20 00	piping, soldered union	I	
23 20 00	piping, square head cock	I	
23 20 00	piping, steam trap (indicate type)	I	
23 20 00	piping, straight crown eccentric reducer	I	
23 20 00	piping, straight size bell & spigot cross	I	

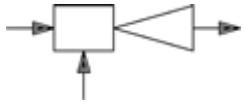
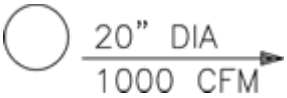
23 20 00	piping, straight size flanged cross	I	
23 20 00	piping, straight size screwed cross	I	
23 20 00	piping, straight size soldered cross	I	
23 20 00	piping, straight size welded cross	I	
23 20 00	piping, straight way bell & spigot check valve	I	
23 20 00	piping, straight way flanged check valve	I	
23 20 00	piping, straight way screwed check valve	I	
23 20 00	piping, straight way soldered check valve	I	
23 20 00	piping, straight way welded check valve	I	
23 20 00	piping, strainer	I	
23 20 00	piping, strainer (plan)	I	
23 20 00	piping, swing gate check valve	I	
23 20 00	piping, temperature gage	I	
23 20 00	piping, temperature pressure relief valve	I	

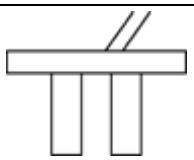
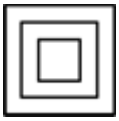
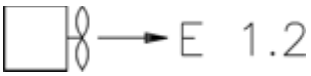
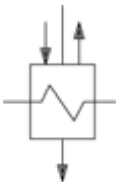
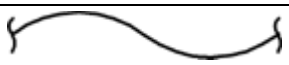
23 20 00	piping, thermostatic blast trap	I	
23 20 00	piping, thermostatic expansion valve	I	
23 20 00	piping, thermostatic trap	I	
23 20 00	piping, three-way manual valve	I	
23 20 00	piping, trap scale	I	
23 20 00	piping, turned down 45 degree elbow	I	
23 20 00	piping, unclassified valve	I	
23 20 00	piping, valve, constant pressure suction	I	
23 20 00	piping, valve, evaporative pressure, regular snap action	I	
23 20 00	piping, valve, evaporative pressure, regular throttling	I	
23 20 00	piping, valve, evaporative pressure, regular throttling evaporator	I	
23 20 00	piping, valve, refrigerant reversing	I	
23 20 00	piping, valve, snap action	I	
23 20 00	piping, valve, thermosuction	I	
23 20 00	piping, valve actuator manual gear	I	

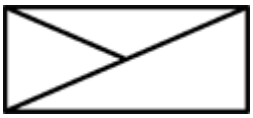
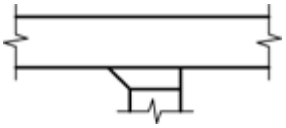
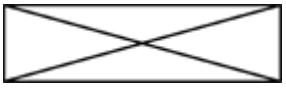
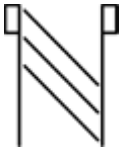
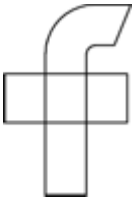
23 20 00	piping, valve actuator manual lever	I	
23 20 00	piping, valve actuator manual non-rise stem	I	
23 20 00	piping, valve actuator manual out stem/yoke	I	
23 20 00	piping, valve compressor suction pressure	I	
23 20 00	piping, water valve	I	
23 20 00	piping, welded 45 degree elbow	I	
23 20 00	piping, welded 90 degree elbow	I	
23 20 00	piping, welded bushing	I	
23 20 00	piping, welded cock	I	
23 20 00	piping, welded concentric reducer	I	
23 20 00	piping, welded connecting pipe joint	I	
23 20 00	piping, welded eccentric reducer	I	
23 20 00	piping, welded expansion joint	I	
23 20 00	piping, welded float valve	I	

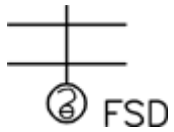
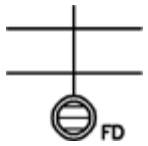
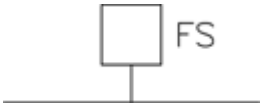
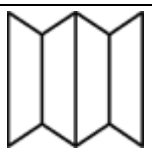
23 20 00	piping, welded gate valve (elevation)	I	
23 20 00	piping, welded gate valve (plan)	I	
23 20 00	piping, welded globe valve	I	
23 20 00	piping, welded outlet down tee	I	
23 20 00	piping, welded outlet up tee	I	
23 20 00	piping, welded quick opening valve	I	
23 20 00	piping, welded safety valve	I	
23 20 00	piping, welded sleeve	I	
23 20 00	piping, welded stop valve	I	
23 20 00	piping, welded straight size tee	I	
23 20 00	piping, welded turned down elbow	I	
23 20 00	piping, welded turned up elbow	I	
23 20 00	piping, welded union	I	
23 20 00	air relief line = ATV; thin line, 2.5 mm (3/32") text	L	
23 20 00	boiler blow down line = BBD; thin line, 2.5 mm (3/32") text	L	
23 20 00	condensate line = C; thin line, 2.5 mm (3/32") text	L	
23 20 00	drain line, condensate (below floor) = ST; thin line, 5 mm (3/16") dash, 3 mm space, 2.5 mm (3/32") text	L	
23 20 00	humidification line = H; thin line, 2.5 mm (3/32") text	L	

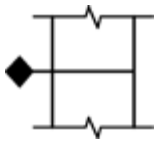
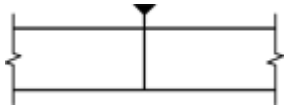
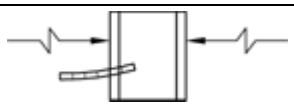
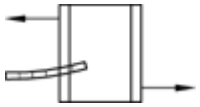
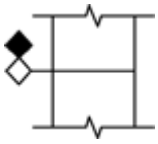
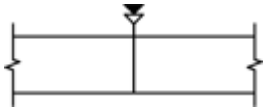
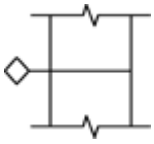
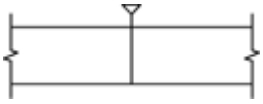
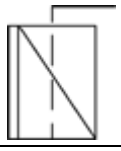
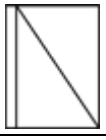
23 20 00	pumped condensate line = PC; thin line, 2.5 mm (3/32") text	L	PC
23 20 00	return line, brine = BR; thin line, 2.5 mm (3/32") text	L	BR
23 20 00	return line, condenser water = CR; thin line, 2.5 mm (3/32") text	L	CR
23 20 00	return line, dual temperature = DTR; thin line, 2.5 mm (3/32") text	L	DTR
23 20 00	return line, glycol heating = GHR; thin line, 2.5 mm (3/32") text	L	GHR
23 20 00	return line, high pressure condensate = HPC; thin line, 2.5 mm (3/32") text	L	HPC
23 20 00	return line, high temperature hot water = HTWR; thin line, 2.5 mm (3/32") text	L	HTWR
23 20 00	return line, low pressure condensate = LPC; thin line, 2.5 mm (3/32") text	L	LPC
23 20 00	return line, low temperature hot water = HWR; thin line, 2.5 mm (3/32") text	L	HWR
23 20 00	return line, medium pressure condensate = MPC; thin line, 2.5 mm (3/32") text	L	MPC
23 20 00	return line, medium temperature hot water = MTWR; thin line, 2.5 mm (3/32") text	L	MTWR
23 20 00	steam line, low pressure = LPS; thin line, 2.5 mm (3/32") text	L	LPS
23 20 00	steam line, medium pressure = MPS; thin line, 2.5 mm (3/32") text	L	MPS
23 20 00	supply line, brine = B; thin line, 2.5 mm (3/32") text	L	B
23 20 00	supply line, dual temperature = DTS; thin line, 2.5 mm (3/32") text	L	DTS
23 20 00	supply line, glycol heating = GHS; thin line, 2.5 mm (3/32") text	L	GHS

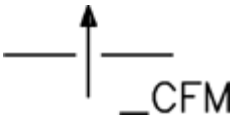
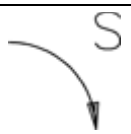
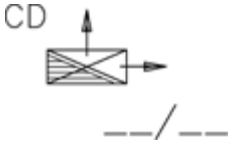
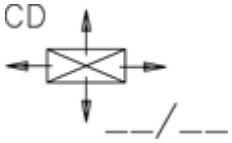
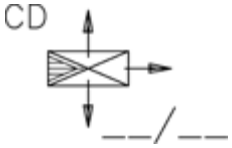
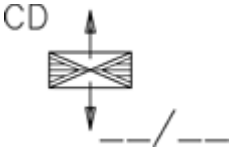
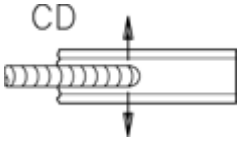
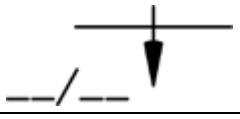
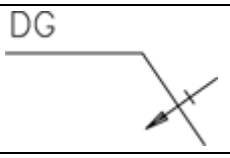
23 20 00	supply line, high pressure steam = HPS; thin line, 2.5 mm (3/32") text	L	
23 20 00	supply line, low temperature hot water = HWS; thin line, 2.5 mm (3/32") text	L	
23 20 00	supply line, medium temperature hot water = MTWS; thin line, 2.5 mm (3/32") text	L	
23 20 00	water line, condenser flow = C; thin line, 2.5 mm (3/32") text	L	
23 20 00	water line, hot; thin line, 5 mm (3/16") dash, 2 mm (5/64") space	L	
23 20 00	water line, make up = MU; thin line, 2.5 mm (3/32") text	L	
23 21 00	piping, condensing steam turbine	I	
23 21 00	piping, dynamic pump	I	
23 21 00	piping, pump (plan) (indicate use)	I	
23 21 00	piping, pump (schematic) (indicate use)	I	
23 21 00	piping, steam turbine	I	
23 23 00	refrigerant discharge line = RD; thin line, 2.5 mm (3/32") text	L	
23 23 00	refrigerant liquid line = RL; thin line, 2.5 mm (3/32") text	L	
23 23 00	refrigerant suction line = RS; thin line, 2.5 mm (3/32") text	L	
23 30 00	air distribution, ceiling spout outlet	I	
23 30 00	air distribution, supply outlet, wall	I	

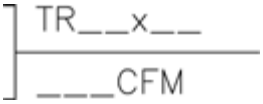
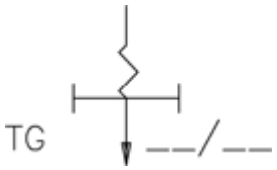
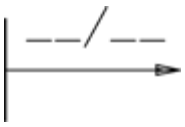
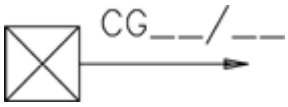
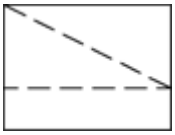
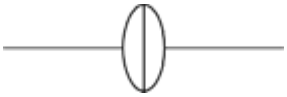
23 30 00	damper, manual volume	I	
23 30 00	damper heater, duct, electric	I	
23 30 00	duct section, change in static pressure rating tag	I	
23 30 00	duct section, static pressure rating tag	I	
23 30 00	fan, blower	I	
23 30 00	fan, exhaust roof vent	I	
23 30 00	fan, intake roof vent	I	
23 30 00	fan, louvered roof vent	I	
23 30 00	fan, propeller	I	
23 30 00	heater, feed with air outlet	I	
23 31 00	access door (AD) or access panel (AP)	I	
23 31 00	air distribution, flexible connector	I	
23 31 00	air distribution, transition	I	
23 31 00	duct, flexible	I	

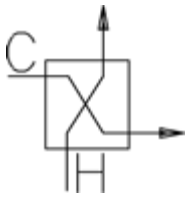
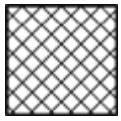
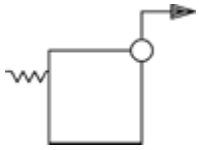
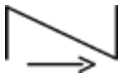
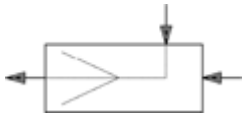
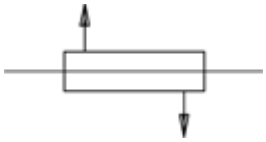
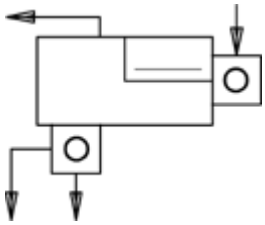
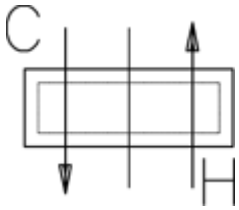
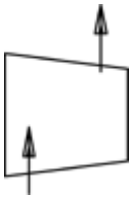
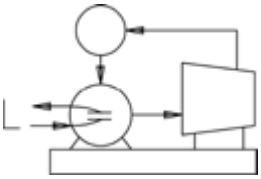
23 31 00	duct section, exhaust air down	I	
23 31 00	duct section, exhaust air up	I	
23 31 00	duct section, return air	I	
23 31 00	duct section, return air down	I	
23 31 00	duct section, standard branch for supply and return	I	
23 31 00	duct section, supply air	I	
23 31 00	duct section, supply air down	I	
23 31 00	duct section, wye junction	I	
23 31 00	ductwork, change in elevation	I	
23 33 00	air distribution, adjustable blank off damper	I	
23 33 00	air distribution, adjustable damper plaque	I	
23 33 00	air distribution, barometric damper	I	
23 33 00	air distribution, ductwork cowl (gooseneck)	I	

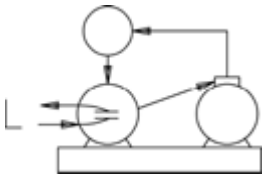
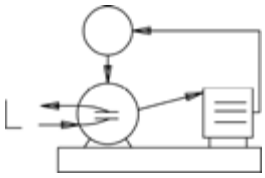
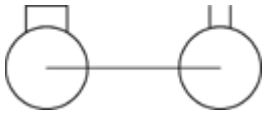
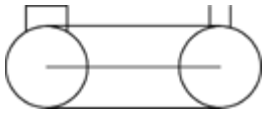
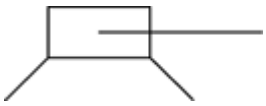
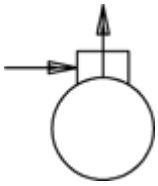
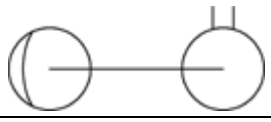
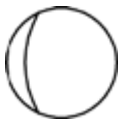
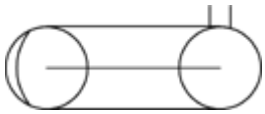
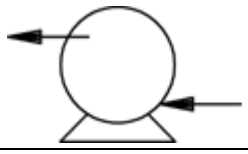
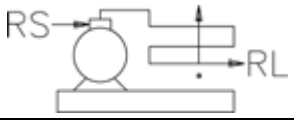
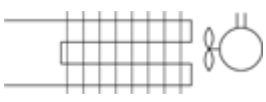
23 33 00	air distribution, ductwork sound attenuator	I	
23 33 00	air distribution, fire and smoke damper	I	
23 33 00	air distribution, fire damper	I	
23 33 00	air distribution, flow switch	I	
23 33 00	air distribution, orifice flowmeter	I	
23 33 00	air distribution, smoke damper	I	
23 33 00	air distribution, turning vane in ductwork	I	
23 33 00	air distribution, venturi flowmeter	I	
23 33 00	air distribution, water heater direct contact feed	I	
23 33 00	damper, back draft	I	
23 33 00	damper, fire	I	
23 33 00	ductwork, direction of flow	I	
23 33 00	ductwork, flexible connector	I	

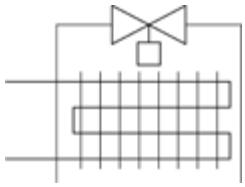
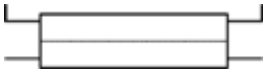
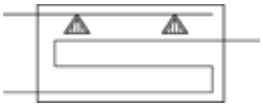
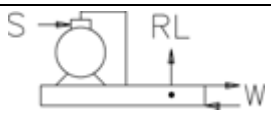
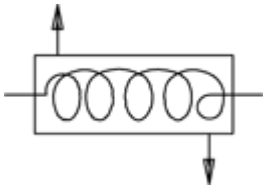
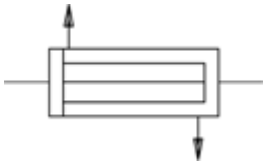
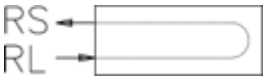
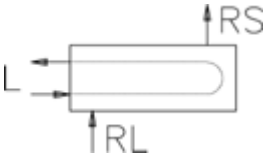
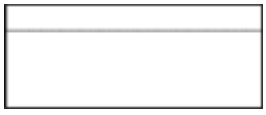
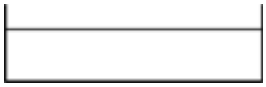
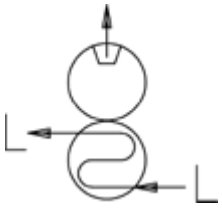
23 33 00	fire damper (horizontal orientation in rectangular duct)	I	
23 33 00	fire damper (vertical orientation in rectangular duct)	I	
23 33 00	heat stop, fire-rated ceiling	I	
23 33 00	light troffer inlet, return air	I	
23 33 00	light troffer outlet, supply air	I	
23 33 00	smoke and fire damper (horizontal orientation in rectangular duct)	I	
23 33 00	smoke and fire damper (vertical orientation in rectangular duct)	I	
23 33 00	smoke damper (horizontal orientation in rectangular duct)	I	
23 33 00	smoke damper (vertical orientation in rectangular duct)	I	
23 33 00	spin-in with volume damper	I	
23 33 00	spin-in without volume damper	I	
23 34 00	air distribution, centrifugal fan pump	I	
23 34 00	air distribution, duct fan	I	
23 34 00	air distribution, fan	I	
23 34 00	fan, axial flow	I	

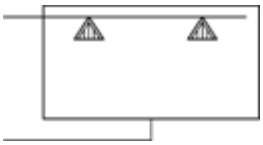
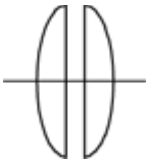
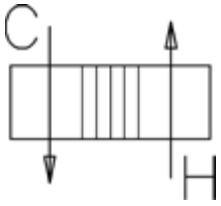
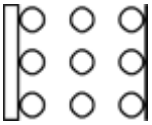
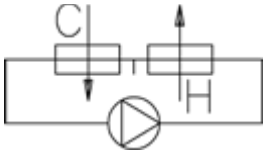
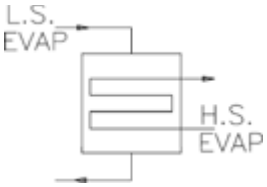
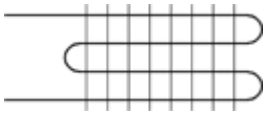
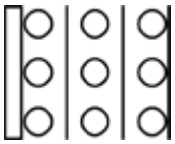
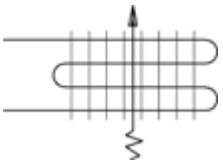
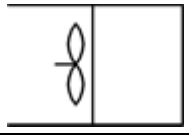
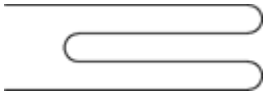
23 37 00	air distribution, ventilation openings	I	
23 37 00	damper, standard branch, return	I	
23 37 00	damper, standard branch, supply	I	
23 37 00	diffuser, ceiling, corner blow	I	
23 37 00	diffuser, ceiling, four-way, rectangular or square	I	
23 37 00	diffuser, ceiling, round	I	
23 37 00	diffuser, ceiling, three-way rectangular or square	I	
23 37 00	diffuser, ceiling, two-way, rectangular or square	I	
23 37 00	diffuser, ceiling, with combination light	I	
23 37 00	diffuser, linear	I	
23 37 00	diffuser, linear slot supply	I	
23 37 00	diffuser, side wall supply	I	
23 37 00	door grille	I	

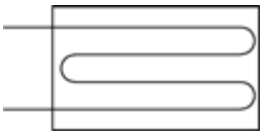
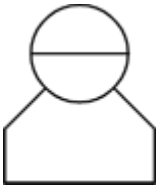
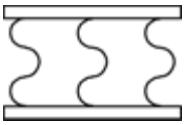
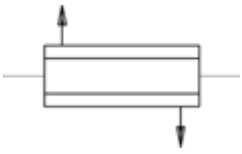
23 37 00	ductwork, ceiling	I	
23 37 00	ductwork, exhaust inlet wall	I	
23 37 00	ductwork, return air ceiling	I	
23 37 00	ductwork, supply air ceiling	I	
23 37 00	grille, transfer	I	
23 37 00	louver, door or wall opening	I	
23 37 00	louver, intake and screen	I	
23 37 00	register grille, ceiling supply	I	
23 37 00	register grille, side wall supply	I	
23 37 00	return air grille with sound boot	I	
23 40 00	air distribution, automatic filter panel	I	
23 40 00	air distribution, filter and dehumidifier	I	
23 40 00	air distribution, filter line	I	
23 50 00	heater, flue gas reheater	I	
23 50 00	piping, flat plate heat exchanger	I	

23 50 00	piping, plate fin cross flow	I	
23 52 00	equipment, boiler	I	
23 52 00	generator, steam	I	
23 52 00	heat-generation equipment, check valve	I	
23 55 00	heater, desuperheater	I	
23 57 00	HVAC equipment, heat exchanger	I	
23 57 00	HVAC equipment, intercooler desuperheater	I	
23 57 00	piping, pipe heat	I	
23 61 00	refrigeration equipment, centrifugal compressor	I	
23 61 00	refrigeration equipment, chilling centrifugal unit	I	

23 61 00	refrigeration equipment, chilling reciprocating unit	I	
23 61 00	refrigeration equipment, chilling rotary screw unit	I	
23 61 00	refrigeration equipment, compressor, motor enclosed, reciprocating	I	
23 61 00	refrigeration equipment, compressor, motor sealed, reciprocating	I	
23 61 00	refrigeration equipment, compressor, open crankcase, reciprocating	I	
23 61 00	refrigeration equipment, compressor, reciprocating	I	
23 61 00	refrigeration equipment, compressor, rotary motor encased	I	
23 61 00	refrigeration equipment, compressor, rotary motor enclosed with crank belt	I	
23 61 00	refrigeration equipment, compressor, rotary motor sealed	I	
23 61 00	refrigeration equipment, open crankcase, reciprocating	I	
23 61 00	refrigeration equipment, rotary compressor	I	
23 63 00	refrigeration equipment, air-cooled condensing unit	I	
23 63 00	refrigeration equipment, air-cooled fin condenser, forced air	I	

23 63 00	refrigeration equipment, air-cooled fin condenser, static	I	
23 63 00	refrigeration equipment, condenser surface	I	
23 63 00	refrigeration equipment, double bundle condenser	I	
23 63 00	refrigeration equipment, evaporative condenser	I	
23 63 00	refrigeration equipment, water cooled condenser	I	
23 63 00	refrigeration equipment, water cooled condensing unit	I	
23 63 00	refrigeration equipment, water cooled shell/coil condenser	I	
23 63 00	refrigeration equipment, water cooled shell/tube condenser	I	
23 64 00	chiller, liquid direct expansion	I	
23 64 00	chiller, liquid flooded	I	
23 64 00	chiller tank, closed, liquid	I	
23 64 00	chiller tank, open, liquid	I	
23 64 00	refrigeration equipment, chilling absorption unit	I	

23 65 00	refrigeration equipment, cooling tower	I	
23 70 00	HVAC equipment, drive fluid	I	
23 72 00	HVAC control, rotary heat wheel	I	
23 76 00	refrigeration equipment, bare tube gravity air evaporator	I	
23 76 00	refrigeration equipment, coil loop	I	
23 76 00	refrigeration equipment, condenser evaporator cascade system	I	
23 76 00	refrigeration equipment, evaporator, finned circular ceiling	I	
23 76 00	refrigeration equipment, evaporator, finned coil natural convection	I	
23 76 00	refrigeration equipment, evaporator, finned gravity air	I	
23 76 00	refrigeration equipment, evaporator, forced convection	I	
23 76 00	refrigeration equipment, evaporator, forced convection cool unit	I	
23 76 00	refrigeration equipment, evaporator, pipe coil	I	

23 76 00	refrigeration equipment, evaporator, plate coil	I	
23 76 00	refrigeration equipment, immersion cool unit	I	
23 76 00	refrigeration equipment, plate coil head or manifold evaporator	I	
23 76 00	refrigeration equipment, water cooled concentric tube condenser	I	
23 80 00	electrical, heater, electric resistance	I	
23 81 00	HVAC equipment, room air conditioning equipment	I	
23 82 00	heating, mixing terminal unit	I	
23 82 00	heating, reheat terminal unit	I	
23 82 00	heating, unit (indicate type)	I	
23 82 00	heating, variable volume terminal unit, reheat	I	
23 84 00	dehumidifier	I	

IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 25 - Integrated Automation

MF NO	DESCRIPTION	TYPE	SYMBOL

DIV 25	INTEGRATED AUTOMATION		
25 00 00	control instrumentation, generic annunciation device	I	
25 30 00	control panel, building equipment	I	

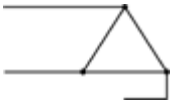
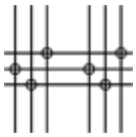
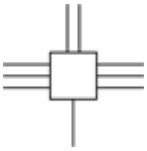
IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

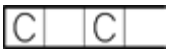
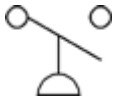
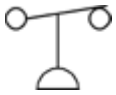
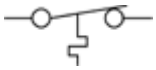
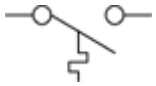
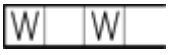
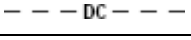
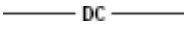
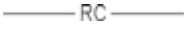
Module 6 - Symbols

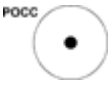
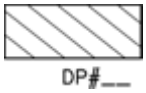
6.2 SYMBOLS

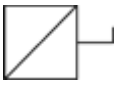
-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

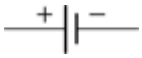
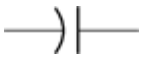
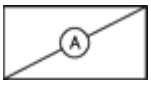
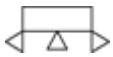
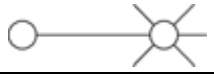
Division 26 - Electrical

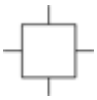
MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 26	**ELECTRICAL**		
26 00 00	electrical, delta connection	I	
26 00 00	electrical, motor, single-phase	I	
26 00 00	electrical, motor, three-phase	I	
26 00 00	electrical, transformer, one-line diagram	I	
26 00 00	electrical, transformer, plan	I	
26 00 00	electrical, wye connection	I	
26 05 00	electrical, duct, cell floor header	I	
26 05 00	electrical, duct, trolley	I	
26 05 00	electrical, duct, underfloor junction box	I	
26 05 00	electrical, earth ground	I	
26 05 00	electrical, junction box	I	

26 05 00	electrical, ladder cable tray	I	
26 05 00	electrical, panelboard, home run to (arrowheads indicate the number of circuits)	I	
26 05 00	electrical, pressure switch-close on increase	I	
26 05 00	electrical, pressure switch-open on increase	I	
26 05 00	electrical, pull box	I	
26 05 00	electrical, switch, multiposition	I	
26 05 00	electrical, switch, normally closed float	I	
26 05 00	electrical, switch, normally closed foot operated	I	
26 05 00	electrical, switch, normally closed limit	I	
26 05 00	electrical, switch, normally closed temperature activated	I	
26 05 00	electrical, switch, normally closed time delay	I	
26 05 00	electrical, switch, normally open float	I	
26 05 00	electrical, switch, normally open limit	I	
26 05 00	electrical, switch, normally open temperature activated	I	
26 05 00	electrical, switch, normally open time delay	I	
26 05 00	electrical, switch, single break	I	
26 05 00	electrical, wireway	I	
26 05 00	direct current underground = DC; thin dash line, 2.5mm (3/32") text	L	
26 05 00	direct current aboveground = DC; thin line, 2.5mm (3/32") text	L	
26 05 00	rigid conduit line = RC; thin line, 2.5 mm (3/32") text	L	
26 09 00	electrical, meter	I	
26 10 00	electrical, substation	I	

26.11.00	electrical, interconnection with substation, aboveground	I	
26.11.01	electrical, interconnection with substation, underground	I	
26 20 00	electrical, busway	I	
26 20 00	electrical, floor outlet, data communication	I	
26 20 00	electrical, fuse with rating	I	
26 20 00	electrical, normally closed relay contact	I	
26 20 00	electrical, normally open relay contact	I	
26 20 00	electrical, outlet, data communication	I	
26 20 00	electrical, push button	I	
26 24 00	electrical, distribution panel	I	
26 24 00	electrical, lighting panel	I	
26 24 00	electrical, panelboard cabinet, flush mounted	I	
26 24 00	electrical, panelboard cabinet, surface mounted	I	
26 24 00	electrical, power panel	I	
26 27 00	electrical, receptacle, clock hanger	I	
26 27 00	electrical, receptacle, duplex	I	
26 27 00	electrical, receptacle, duplex on emergency power	I	
26 27 00	electrical, receptacle, duplex with ground fault circuit interrupter	I	
26 27 00	electrical, receptacle, quadraplex	I	
26 27 00	electrical, receptacle, single	I	
26 27 00	electrical, receptacle, single with switch	I	

26 27 00	electrical, receptacle, special purpose	I	
26 27 00	electrical, receptacle, switched duplex	I	
26 27 00	electrical, switch, ceiling mounted pull	I	
26 27 00	electrical, switch, double pole	I	
26 27 00	electrical, switch, four-way	I	
26 27 00	electrical, switch, key operated	I	
26 27 00	electrical, switch, lamp holder pole	I	
26 27 00	electrical, switch, low voltage master	I	
26 27 00	electrical, switch, single pole	I	
26 27 00	electrical, switch, three-way	I	
26 27 00	electrical, switch, timer operated	I	
26 27 00	electrical, switch with pilot light	I	
26 28 00	electrical, circuit breaker	I	
26 28 00	electrical, disconnect switch, fused	I	
26 28 00	electrical, disconnect switch, unfused	I	
26 28 00	electrical, fused switch	I	
26 28 00	electrical, fusible link	I	
26 29 00	electrical, starter, combination with disconnect switch	I	
26 29 00	electrical, starter or motor controller	I	
26 29 00	electrical, time clock	I	
26 31 00	electrical, photovoltaic, power	I	
26 32 00	electrical, generator, power	I	

26 33 00	electrical, battery	I	
26 35 00	electrical, capacitor	I	
26 41 00	lightning arrestor	I	
26 42 00	rectifier, cathodic protection sanitary	I	
26 50 00	lighting, incandescent ceiling mounted	I	
26 51 00	electrical, light fixture, recessed fluorescent A, 600 mm x 1200 mm (2x4)	I	
26 51 00	electrical, light fixture, recessed fluorescent B, 300 mm x 1200 mm (1x4)	I	
26 51 00	electrical, light fixture, recessed fluorescent C, 300 mm x 2400 mm (1x8)	I	
26 51 00	electrical, light fixture, surface mounted fluorescent A, 600 mm x 1200 mm (2x4)	I	
26 51 00	electrical, light fixture, surface mounted fluorescent B, 300 mm x 1200 mm (1x4)	I	
26 51 00	electrical, light fixture, surface mounted fluorescent C, 300 mm x 2400 mm (1x8)	I	
26 52 00	electrical, exit sign, wall mounted light	I	
26 52 00	electrical, light fixture, fluorescent emergency	I	
26 52 00	lighting, one emergency battery power	I	
26 52 00	lighting, three emergency battery power	I	
26 56 00	electrical, street light with bracket	I	
26 56 00	light post, one arm, one head	I	
26 56 00	light post, two arms, two heads	I	
26 56 00	light post without arm	I	
26 56 00	lighting, airfield runway	I	

26 56 00	lighting, airfield taxiway	I	
26 56 00	lighting, exterior building	I	
26 56 00	lighting, runway	I	

IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 27 - Communications

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 27	**COMMUNICATIONS**		
27 00 00	power line = P; thin line, 2.5 mm (3/32") text	L	
27 05 00	outlet, combination telephone/data communication	I	
27 10 00	cable television line = CATV; thin line, 2.5 mm (3/32") text	L	
27 10 00	closed circuit television line = CCTV; thin line, 2.5 mm (3/32") text	L	
27 10 00	fiberoptics line = FO; thin line, 2.5 mm (3/32") text	L	
27 30 00	electrical, floor receptacle, telephone	I	
27 30 00	telephone, wall mounted	I	
27 30 00	telephone line = T; thin line, 2.5 mm (3/32") text	L	
27 40 00	electrical, speaker, ceiling mounted, "X" indicates the type, provide schedule on legend	I	
27 40 00	electrical, speaker, wall mounted, "X" indicates the type, provide schedule on legend	I	
27 51 00	intercom line = I; thin line, 2.5 mm (3/32") text	L	

27 51 00	sound line = S; thin line, 2.5 mm (3/32") text	L	S
27 52 00	nurse call line = NC; thin line, 2.5 mm (3/32") text	L	NC

IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 28 - Electronic Safety and Security

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 28	**ELECTRONIC SAFETY and SECURITY**		
28 10 00	audio device M = mount C - ceiling D - desk F - flush H - hidden M - mullion P - pedestal R - rack S - surface T - turnstile W - wall T = technology/type (specific to device) B - bell C - chime H - horn K - klaxon L - listen-in M - microphone S - sounder S - speaker Z - buzzer 6mm (1/4") diameter, 2.5 mm (3/32") text *(reproduced with permission of the Security Industry Association www.siaonline.org)*	I	
28 10 00	bi-static beam sensor M = mount C - ceiling D - desk F - flush H - hidden M - mullion P - pedestal R - rack S - surface T - turnstile W - wall T = technology/type (specific to device) I - infrared M - microwave F = function RX - receive TX - transmit 6mm (1/4") sides, 2.5 mm (3/32") text *(reproduced with permission of the Security Industry Association www.siaonline.org)*	I	
28 10 00	biometrics access control device M = mount C - ceiling D - desk F - flush H - hidden M - mullion P - pedestal R - rack S - surface T - turnstile W - wall	I	

T = technology/type (specific to device)

F - finger print H - hand geometry I - eye iris R - eye retina V - voice

6 mm (1/4") sides, 2. 5mm (3/32") text

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card access reader

M = mount

C - ceiling D - desk F - flush H - hidden M - mullion

P - pedestal R - rack S - surface T - turnstile W - wall

28 10 00 T = technology/type (specific to device) I

B - barcode F - elevator floor call H - elevator hall call M - mag strip P - proximity

S - smart card T - token W - weigand

6 mm (3/8") x 13 mm (1/2"), 2.5 mm (3/32") text

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card reader with keypad

M = mount

C - ceiling D - desk F - flush H - hidden M - mullion

28 10 00 P - pedestal R - rack S - surface T - turnstile W - wall I

10 mm (3/8") x 13 mm (1/2"), 2.5 mm (3/32") text

(reproduced with permission of the Security Industry Association www.siaonline.org)

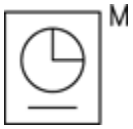
---

card reader with time and attendance

M = mount

C - ceiling D - desk F - flush H - hidden M - mullion

28 10 00 P - pedestal R - rack S - surface T - turnstile W - wall I



10 mm (3/8") x 13 mm (1/2"), 2.5 mm (3/32") text

(reproduced with permission of the Security Industry Association www.siaonline.org)

---

central processing unit

28 10 00 5 mm (3/16") x 8 mm (5/16"), 2.5 mm (3/32") text I

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---

control panel

M = mount

C - ceiling D - desk F - flush H - hidden M - mullion

28 10 00 P - pedestal R - rack S - surface T - turnstile W - wall I

T = technology/type (specific to device)

B - burglar D - door F - fire P - perimeter

6 mm (1/4") sides, 2.5 mm (3/32") text

(reproduced with permission of the Security Industry Association www.siaonline.org)

---

electronic lock

M = mount

C - ceiling D - desk F - flush H - hidden M - mullion

P - pedestal R - rack S - surface T - turnstile W - wall

28 10 00 T = technology/type (specific to device) I

D - deadbolt H - hybrid L - latch set M - magnetic S - strike

6 mm (1/4") sides, 2.5 mm (3/32") text

(reproduced with permission of the Security Industry Association www.siaonline.org)

---

exit device

T = technology/type (specific to device)

28 10 00 D - delayed egress E - electrified M - mechanical X - high security I

10 mm (3/8") x 3 mm (1/8"), 2.5 mm (3/32") text

(reproduced with permission of the Security Industry Association www.siaonline.org)

---

fiber optic module

M = mount

C - ceiling D - desk F - flush H - hidden M - mullion

P - pedestal R - rack S - surface T - turnstile W - wall

28 10 00 T = technology/type (specific to device) I

R - receiver T - transceiver Tx - transmitter

6 mm (1/4") sides, 2.5 mm (3/32") text

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---

field panel

M = mount

C - ceiling D - desk F - flush H - hidden M - mullion

P - pedestal R - rack S - surface T - turnstile W - wall

28 10 00 T = technology/type (specific to device) I

A - alarm C - card reader

6 mm (1/4") sides, 2.5 mm (3/32") text

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---

glass breakage sensor

M = mount

28 10 00 C - ceiling D - desk F - flush H - hidden M - mullion I

P - pedestal R - rack S - surface T - turnstile W - wall

T = technology/type (specific to device)

A - audio S - shock

6 mm (1/4") sides, 2.5 mm (3/32") text

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---

intercom

M = mount

C - ceiling D - desk F - flush H - hidden M - mullion

P - pedestal R - rack S - surface T - turnstile W - wall

28 10 00 T = technology/type (specific to device) I

M - master S - substation

6 mm (1/4") sides, 2.5 mm (3/32") text

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---

keyboard

28 10 00 10 mm (3/8") x 5 mm (3/16"), 2.5 mm (3/32") text I

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---

keypad device

M = mount

C - ceiling D - desk F - flush H - hidden M - mullion

28 10 00 P - pedestal R - rack S - surface T - turnstile W - wall I

6 mm (1/4") sides, 2.5 mm (3/32") text

(reproduced with permission of the Security Industry Association www.siaonline.org)

---

monitor

M = mount

C - ceiling D - desk F - flush H - hidden M - mullion

P - pedestal R - rack S - surface T - turnstile W - wall

28 10 00 T = technology/type (specific to device) I

D - data G - graphic M - multiscreen V - video

6 mm (1/4") sides, 2.5 mm (3/32") text

(reproduced with permission of the Security Industry Association www.siaonline.org)

---

motion detector

M = mount

C - ceiling D - desk F - flush H - hidden M - mullion

28 10 00 P - pedestal R - rack S - surface T - turnstile W - wall I

T = technology/type (specific to device)

D - dual technology IR - infrared M - microwave U - ultrasonic

X - request-for-exit

6 mm (1/4") sides, 2.5 mm (3/32") text

(reproduced with permission of the Security Industry Association www.siaonline.org)

---

push button

M = mount

C - ceiling	D - desk	F - flush	H - hidden	M - mullion
P - pedestal	R - rack	S - surface	T - turnstile	W - wall

T = technology/type (specific to device)

B - bell push	D - duress	P - panic	R - door release

X - request-for-exit

6 mm (1/4") sides, 2.5 mm (3/32") text

(reproduced with permission of the Security Industry Association www.siaonline.org)

28 10 00 I

---

recorder

M = mount

C - ceiling	D - desk	F - flush	H - hidden	M - mullion
P - pedestal	R - rack	S - surface	T - turnstile	W - wall

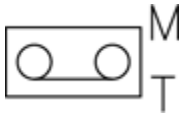
T = technology/type (specific to device)

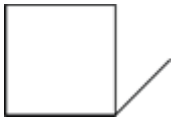
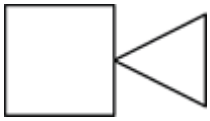
A - audio	D - digital	V - video

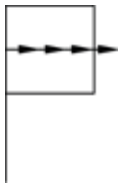
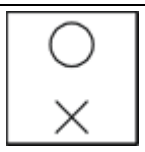
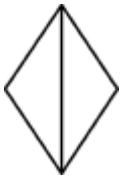
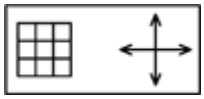
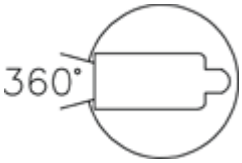
10 mm (3/8") x 5 mm (3/16"), 2.5 mm (3/32") text

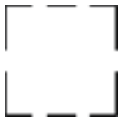
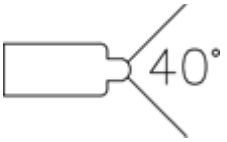
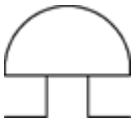
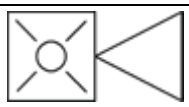
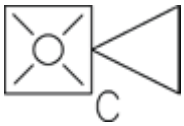
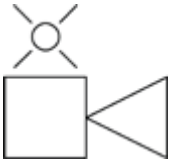
(reproduced with permission of the Security Industry Association www.siaonline.org)

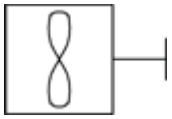
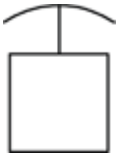
28 10 00 I



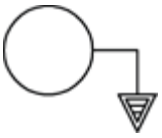
MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 28	ELECTRONIC SAFETY and SECURITY		
28 10 00	security access, annunciator panel	I	
28 10 00	security access, buzzer	I	
28 10 00	security access, control unit with closed circuit television camera	I	
28 10 00	security access, generic "X" indicates the type, provide schedule or legend	I	
28 10 00	security access, horn or siren	I	

28 10 00	security access, outdoor microwave transmission unit	I	
28 10 00	security access, panic alarm	I	
28 10 00	security access, video camera with lens, motion detector with pan and zoom	I	
28 10 00	security access, volumetric sensor	I	
28 10 00	security screen with alarm T = technology/type (specific to device) B - blind S - shade 6 mm (1/4") sides, 2.5 mm (3/32") text *(reproduced with permission of the Security Industry Association www.siaonline.org*	I	
28 10 00	security window screen T = technology/type (specific to device) B - blind 6 mm (1/4") sides, 2.5 mm (3/32") text *(reproduced with permission of the Security Industry Association www.siaonline.org*	I	
28 10 00	video control keyboard 10 mm (3/8") x 5 mm (3/16") *(reproduced with permission of the Security Industry Association www.siaonline.org*	I	
28 10 00	video motion detector 6 mm (1/4") sides *(reproduced with permission of the Security Industry Association www.siaonline.org*	I	
28 13 00	security access, panning camera traverse angle	I	

28 13 00	security access, sensor, buried vehicular	I	
28 13 00	security access, switch, balanced magnetic control	I	
28 13 00	security access, telephone handset	I	
28 13 00	security access, video camera with lens	I	
28 13 00	security access, video camera with lens, angle of view	I	
28 13 00	security access, video camera with lens, motion detector with pan, tilt and zoom	I	
28 30 00	alarm, check valve	I	
28 30 00	alarm, fire, communicator	I	
28 30 00	alarm, fire, control panel	I	
28 30 00	alarm, fire, manual pull station	I	
28 30 00	alarm, gong	I	
28 30 00	alarm, horn/light, one assembly	I	
28 30 00	alarm, horn/light, one assembly with chime	I	
28 30 00	alarm, horn/light, separate assembly	I	

28 30 00	alarm, lamp light, signal light, strobe	I	
28 30 00	alarm, manual control	I	
28 30 00	alarm, master control panel	I	
28 30 00	alarm, mini horn	I	
28 30 00	alarm, sprinkler system water flow bell	I	
28 30 00	alarm, tamper switch	I	
28 30 00	alarm, transponder or transmitter	I	
28 30 00	alarm, voice communication panel	I	
28 30 00	detection, gas	I	
28 30 00	detection, smoke control and pressure panel	I	
28 30 00	detection switch, abort	I	
28 30 00	detection switch, valve tamper	I	
28 30 00	detector, flame flicker	I	
28 30 00	detector, flow switch	I	

28 30 00	detector, heat	I	
28 30 00	detector, heat, combination	I	
28 30 00	detector, heat, fixed temperature	I	
28 30 00	detector, heat, rate compensation	I	
28 30 00	detector, heat, rate of rise	I	
28 30 00	detector, heat smoke	I	
28 30 00	detector, ionization, photoelectric, and heat smoke	I	
28 30 00	detector, ionization and heat smoke	I	
28 30 00	detector, ionization and photoelectric smoke	I	
28 30 00	detector, ionization smoke	I	
28 30 00	detector, photoelectric and heat smoke	I	
28 30 00	detector, photoelectric smoke	I	
28 30 00	detector, smoke	I	
28 30 00	detector, smoke, for duct	I	

28 30 00	detector, switch level	I	
28 30 00	fire alarm annunciator panel	I	
28 30 00	fire alarm station, manual pull	I	
28 31 00	fire alarm line = FA; thin line, 2.5 mm (3/32") text	L	

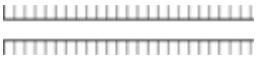
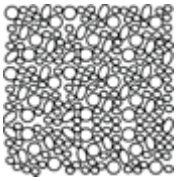
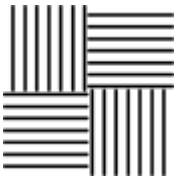
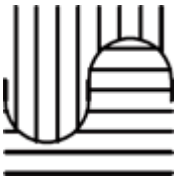
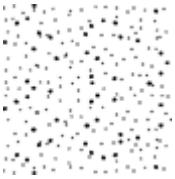
IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

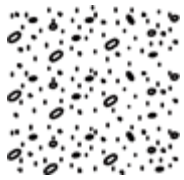
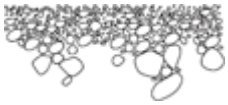
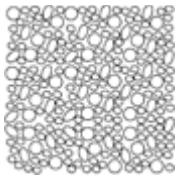
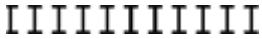
Module 6 - Symbols

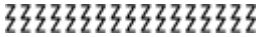
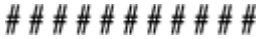
6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 31 - Earthwork

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 31	**EARTHWORK**		
31 20 00	earthwork, ditch and berm barrier	I	
31 20 00	earth, crushed rock gravel	M	
31 20 00	earth, undisturbed	M	
31 20 00	earthwork, compacted fill	M	
31 20 00	earthwork, rock	M	
31 20 00	sand	M	

31 20 00	sand clay gravel	M	
31 23 00	earthwork, gravel, porous fill	M	
31 25 00	erosion and sedimentation control, filtration bed	M	
31 35 00	geobar line; wide line, 2.5 mm (3/32") high x 2.5 mm (3/32") wide slash, fine line, 3.2 mm (1/8") repeat	L	
31 35 00	geoblanket line; thin line, 2.5 mm (3/32") high x 7.2 mm (9/32") wide, 7.2 mm (9/32") repeat	L	
31 35 00	geocell line; thin line, 2.5 mm (3/32") high x 1.2 mm (3/64") wide "I" symbol, 2.5 mm (3/32") repeat	L	
31 35 00	geocomposite clay liner line; thin line, 2.5 mm (3/32") high x 2.5 mm (1/16") wide "/" symbol, 2.5 mm (3/32") repeat 1.2 mm (3/64") dash, 0.4 mm (1/64") space	L	
31 35 00	geocomposite drain line; thin line, 2.5 mm (3/32") high x 4.8 mm (3/16") wide "V" symbol, 4.8 mm (3/32") repeat 1.6 mm (1/16") dash, 0.8 mm (1/32") space	L	
31 35 00	geogrid line; wide line, 1.6 mm (1/16") diameter filled dots, 14.4 mm (9/16") repeat	L	
31 35 00	geomat line; thin line, 2.5 mm (3/32") high x 4.8 mm (3/16") wide symbol, 4.8 mm (3/16") repeat	L	
31 35 00	geomattress line; medium line, 2.5 mm (3/32") high	L	
31 35 00	geomembrane line; wide line	L	
31 35 00	geonet line; thin line, 2.5 mm (3/32") high x	L	

	2.5 mm (3/32") wide "X" symbol, 3.2 mm (1/8") repeat		
31 35 00	geospacer line; thin line, 2.5 mm (3/32") high x 4.8 mm (3/16") wide symbol, 4.8 mm (3/16") repeat	L	
31 35 00	geostrip line; wide line, 0.8 mm (1/32") dia. filled dots, 14.4 mm (9/16") repeat	L	
31 35 00	geosynthetic, electrokinetic line; thin line, 2.5 mm (3/32") high x 0.8 mm (1/32") wide symbol, 1.6 mm (1/16") repeat	L	
31 35 00	geosynthetic, surficial erosion control line; thin line, 2.5 mm (3/32") high x 2.0 mm (5/64") wide "#" symbol, 2.5 mm (3/32") repeat	L	
31 35 00	geotextile line; wide line, 2.5 mm (3/32") dash, 0.8 mm (1/32") space	L	
31 37 00	riprap	M	

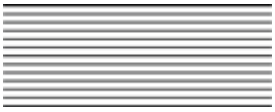
IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

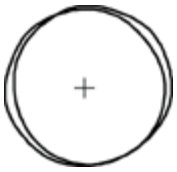
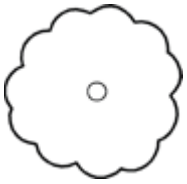
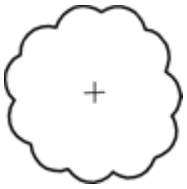
Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 32 - Exterior Improvements

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 32	**EXTERIOR IMPROVEMENTS**		
32 10 00	asphalt, section	M	
32 31 00	fence; thin line, medium line X	L	
32 93 00	tree, deciduous existing	M	

32 93 00	tree, deciduous new	M	
32 93 00	tree, generic existing	M	
32 93 00	tree, generic new	M	

IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

Module 6 - Symbols

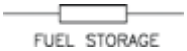
6.2 SYMBOLS

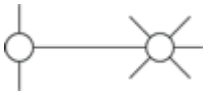
-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 33 - Utilities

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 33	**UTILITIES**		
33 05 00	utility services, manhole	I	
33 11 00	piping, thrust block	I	
33 11 00	utility, water handhole	I	
33 11 00	utility, water manhole	I	
33 11 00	utility, water meter	I	
33 11 00	utility, water meter station	I	
33 11 00	utility, water plant	I	

33 11 00	utility, water station pump	I	
33 11 00	utility, water tank	I	
33 11 00	utility, water valve vault	I	
33 11 00	return line, chilled water = CWR; thin line, 2.5 mm (3/32") text	L	
33 11 00	supply line, chilled water = CWS; thin line, 2.5 mm (3/32") text	L	
33 11 00	water line, cold = CW; thin line, 2.5 mm (3/32") text	L	
33 11 00	water line, hot = HW; thin line, 2.5 mm (3/32") text	L	
33 11 00	water line, public main = PW; thin line, 2.5 mm (3/32") text	L	
33 12 00	hydrant, fire	I	
33 12 00	hydrant, one hose outlet	I	
33 12 00	hydrant, two hose outlet	I	
33 12 00	hydrant, wall	I	
33 12 00	hydrant, wall two hose outlet	I	
33 12 00	hydrant pan, fire	I	
33 12 00	utility, utility pole	I	
33 16 00	storage tank, water utility	I	
33 30 00	utility, sanitary manhole	I	
33 30 00	utility, sanitary meter	I	
33 30 00	utility, sanitary pressure vessel	I	

33 30 00	utility, sanitary sewer lift station	I	
33 31 00	sanitary sewer force line = SS; thin line, 2.5 mm (3/32") text	L	
33 36 00	utility, septic tank	I	
33 39 00	utility, sanitary cleanout	I	
33 39 00	utility, sanitary valve vault	I	
33 42 00	pipe line, culvert = CP; thin continuous line, 2.5 mm (3/32") text	L	
33 44 00	drainage, catch basin	I	
33 44 00	drainage, catch basin, round	I	
33 46 00	drainage, open tile drain	I	
33 47 00	drainage, spray pond	I	
33 49 00	utility, storm drainage manhole	I	
33 50 00	utility, gas plant	I	
33 51 00	piping, gas shutoff	I	
33 51 00	piping, natural gas receiver	I	
33 51 00	utility, manhole, natural gas	I	
33 51 00	utility, meter, natural gas	I	
33 51 00	utility, natural gas trap	I	
33 56 00	storage tank, fuel storage	I	
33 70 00	electrical, guy wire	I	

33 70 00	electrical, handhole	I	
33 70 00	electrical, transformer, current	I	
33 71 00	electrical, aerial service weather head	I	
33 71 00	light post, one arm in power pole	I	
33 71 00	utility, distribution switch or switching station	I	
33 71 00	utility, electrical manhole	I	
33 71 00	utility, primary electrical handhole	I	
33 71 00	electric line, 2-phase primary overhead = 2ØOP; thin line, 2.5 mm (3/32") text	L	
33 71 00	electric line, 2-phase primary underground = 2ØUP; thin line, 2.5 mm (3/32") text	L	
33 71 00	electric line, 2-phase secondary overhead = 2ØOS; thin line, 2.5 mm (3/32") text	L	
33 71 00	electric line, 2-phase secondary underground = 2ØUS; thin line, 2.5 mm (3/32") text	L	
33 71 00	electric line, 3-phase primary overhead = 3ØOP; thin line, 2.5 mm (3/32") text	L	
33 71 00	electric line, 3-phase primary underground = 3ØUP; thin line, 2.5 mm (3/32") text	L	
33 71 00	electric line, 3-phase secondary overhead = 3ØOS; thin line, 2.5 mm (3/32") text	L	
33 71 00	electric line, 3-phase secondary underground = 3ØUS; thin line, 2.5 mm (3/32") text	L	
33 71 00	electric line, single phase primary overhead = 1ØOP; thin line, 2.5 mm (3/32") text	L	

33 71 00	electric line, single phase primary underground = 1ØUP; thin line, 2.5 mm (3/32") text	L	
33 71 00	electric line, single phase secondary overhead = 1ØOS; thin line, 2.5 mm (3/32") text	L	
33 71 00	electric line, single phase secondary underground = 1ØUS; thin line, 2.5 mm (3/32") text	L	
33 81 00	utility, communications manhole	I	
33 81 00	utility, telephone manhole	I	

IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 40 - Process Integration

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 40	**PROCESS INTEGRATION**		
40 13 00	argon line = AR; thin line, 2.5 mm (3/32") text	L	
40 13 00	helium line = HE; thin line, 2.5 mm (3/32") text	L	
40 13 00	liquid nitrogen line = LN; thin line, 2.5 mm (3/32") text	L	
40 13 00	nitrogen line = N; thin line, 2.5 mm (3/32") text	L	
40 14 00	hydrogen line = H; thin line, 2.5 mm (3/32") text	L	
40 20 00	fill line = FILL; thin line 2.5 mm (3/32") text	L	
40 20 00	pipe line, chemical supply = CS; thin line, 2.5 mm (3/32") text	L	
40 23 00	return line, industrial hot water = IHR; thin line, 2.5 mm (3/32") text	L	

40 23 00	supply line, industrial hot water = IHW; thin line, 2.5 mm (3/32") text	L	
40 23 00	waste line, industrial = INW; thin line, 2.5 mm (3/32") text	L	
40 23 00	water line, industrial cold = ICW; thin line, 2.5 mm (3/32") text	L	
40 25 00	waste line, acid = ACID; thin line, 2.5 mm (3/32") text	L	

IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

Module 6 - Symbols

6.2 SYMBOLS

-by *MasterFormat*™ 2004 Numbers (MF NO) & Symbol Type (Type)

Division 44 - Pollution Control Equipment

MF NO	DESCRIPTION	TYPE	SYMBOL
DIV 44	**POLLUTION CONTROL EQUIPMENT**		
44 42 00	equipment, oil separator	I	
44 42 00	fluid waste treatment, grit-collecting chamber	I	

IDENTITY (I), LINE (L), MATERIAL (M), OBJECT (O), REFERENCE (R), AND TEXT (T) SYMBOLS

Module 6 - Symbols

6.3 SYMBOLS INDEX

-B-

-C-

curtains and drapes

-D-

damper, back draft

damper, fire

damper, manual volume

damper, standard branch, return

damper, standard branch, supply

damper heater, duct, electric

degree(s)

dehumidifier

demolition line

desk, console

desk, L unit left return

desk, left return

desk, secretarial left return

detail indicator, dashed circle

detail indicator, dashed rectangle

detail indicator for small conditions

detection, gas

detection, smoke control and pressure panel

detection switch, abort

detection switch, valve tamper

detector, flame flicker

detector, flow switch

detector, heat

detector, heat, combination

detector, heat, fixed temperature

detector, heat, rate compensation

detector, heat, rate of rise

detector, heat smoke

detector, ionization, photoelectric, and heat smoke

-E-

-F-

-G-

graphic scale, 1" = 500'-0"

graphic scale, 1" = 200'-0"

graphic scale, 1" = 100'-0"

graphic scale, 1" = 50'-0"

graphic scale, 1" = 40'-0"

graphic scale, 1" = 30'-0"

graphic scale, 1" = 20'-0"

graphic scale, 1" = 10'-0"

graphic scale, 1/16" = 1'-0"

graphic scale, 3/32" = 1'-0"

graphic scale, 1/8" = 1'-0"

graphic scale, 1/4" = 1'-0"

graphic scale, 3/8" = 1'-0"

graphic scale, 1/2" = 1'-0"

graphic scale, 3/4" = 1'-0"

graphic scale, 1" = 1'-0"

graphic scale, 1-1/2" = 1'-0"

graphic scale, 3" = 1'-0"

graphic scale, 6" = 1'-0"

graphic scale, 1" = 1"

graphic scale, 1:5000

graphic scale, 1:2000

graphic scale, 1:1000

graphic scale, 1:500

graphic scale, 1:200

graphic scale, 1:100

graphic scale, 1:50

graphic scale, 1:30

graphic scale, 1:20

graphic scale, 1:10

graphic scale, 1:5

-H-

HVAC control, flanged motor operated globe valve

HVAC control, fusible link quick valve

HVAC control, pneumatic electric control

HVAC control, pressure stat

HVAC control, pressure switch, type 1

HVAC control, pressure switch, type 2

HVAC control, pressure switch, with high pressure cutout

HVAC control, remote bulb thermostat

HVAC control, rotary heat wheel

HVAC control, screwed motor operated gate valve

HVAC control, screwed motor operated globe valve

HVAC control, self-contained thermostat

HVAC control, solenoid valve

HVAC control, spring check valve

HVAC control, switch, normally closed flow

HVAC control, switch, normally open flow

HVAC control, thermal bulb

HVAC control, thermometer

HVAC control, thermometer well

HVAC control, thermostat, electric

HVAC control, thermostat, pneumatic

HVAC control, thermostat, self-contained

HVAC control, three-way air motor controlled valve

HVAC control, three-way electric motor controlled valve

HVAC control, valve actuator electric motor

HVAC control, valve actuator electric solenoid

HVAC control, valve actuator pneumatic motor

HVAC control, valve actuator pneumatic motor diaphragm

HVAC control, vapor regulated suction valve

HVAC control, welded motor operated gate valve

HVAC equipment, drive fluid

-I-

-K-

-L-

-M-

-N-

-O-

-P-

-Q-

-R-

refrigeration equipment, compressor, rotary motor enclosed with crank belt

refrigeration equipment, compressor, rotary motor sealed

refrigeration equipment, condenser evaporator cascade system

refrigeration equipment, condenser surface

refrigeration equipment, cooling tower

refrigeration equipment, double bundle condenser

refrigeration equipment, evaporative condenser

refrigeration equipment, evaporator, finned circular ceiling

refrigeration equipment, evaporator, finned coil natural convection

refrigeration equipment, evaporator, finned gravity air

refrigeration equipment, evaporator, forced convection

refrigeration equipment, evaporator, forced convection cool unit

refrigeration equipment, evaporator, pipe coil

refrigeration equipment, evaporator, plate coil

refrigeration equipment, immersion cool unit

refrigeration equipment, open crankcase, reciprocating

refrigeration equipment, plate coil head or manifold evaporator

refrigeration equipment, rotary compressor

refrigeration equipment, water cooled concentric tube condenser

refrigeration equipment, water cooled condenser

refrigeration equipment, water cooled condensing unit

refrigeration equipment, water cooled shell/coil condenser

refrigeration equipment, water cooled shell/tube condenser

refrigerator

register grille, ceiling supply

register grille, side wall supply

return air grille with sound boot

return line, brine = BR

return line, chilled water = CWR

return line, condenser water = CR

return line, dual temperature = DTR

-S-

-T-

-U-

-V-

-W-

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Module 7 - Notations

TABLE OF CONTENTS

Module 7 - Notations

7.1 INTRODUCTION

The *Notations Module* establishes guidelines for the systematic presentation of textual information on drawings.

The *Notations Module*:

- Establishes note formats.
- Provides guidelines facilitating the creation and use of notes.
- Establishes note location standards.

> *Notations:* A drawing note; textual information on drawings.

The benefits of note standards are:

- Improved drawing clarity, readability, and consistency.
- Improved coordination among drawings, specifications, and other documents.
- Improved note terminology.

- Enhanced communication between drawing preparers and users.
- Improved quality through use of an industry standard.
- Easier data management.
- Consistent note format and content among design disciplines.

Module 7 - Notations

7.2 NOTATIONS

Purpose of Notes

Construction documents include both drawings and specifications, which are meant to be complementary documents. Drawings convey design intent and may show multiple views, either of the whole project or its parts. Specifications provide detailed information and instructions concerning the project by setting requirements for the physical qualities, chemical properties, performance requirements, and standards of workmanship associated with the manufacture and installation of systems, assemblies, and components.

Drawings: Graphic and textual information organized on a two-dimensional surface for the purpose of conveying data about a specific portion of a project.

Specifications: Define the qualitative requirements for products, materials, and workmanship on which the construction contract is based.

To more fully understand the drawings, text—in the form of notes—is added to the illustrations. The notes may provide:

- information
- identification
- instruction

Drawing notes, as part of the contract documents, have important legal consequences. Just as in creating a specification section, care must be taken to ensure that drawing notes do not establish a subdivision of the work; assign portions of the work to subcontractors; or create unintended obligations between the parties to the design and construction of the work. Terms used within notes should be consistent with terms used within the specifications. Notes should not include vague references such as "SEE SPECIFICATIONS." They should be specific as discussed later under Reference Keynotes.

Historical Progression

Drawings produced during the late 19th and early 20th centuries were primarily graphic. These graphics used notes sparingly to identify building components and provide general instruction while requiring the designing architect or engineer to provide supplemental instruction in the field. This "master builder" method of practice has changed rapidly over the years and today has been replaced by the use of highly detailed and specific construction contract documents.

Drawing Blocks: Drawing modules containing graphic or textual information. Refer to Sheet Organization, UDS section 2.3 for additional information.

During the post World War II era, "keying" became a standard method for improving drawing clarity through text reduction within the drawing block. A "keyed" note consisted of an alphanumeric indicator symbol and leader line with a legend of those symbols and the full text notes located elsewhere on the drawing sheet. The keying legend provided users with a single reference point for keyed notes and allowed a single note, written once, to be used in multiple drawing locations through repetition of the alphanumeric keyed symbols. As the information required on drawings became denser, the use of keyed notes improved drafting efficiency, resulting in clearer, more concise drawings.

"Keynoting" developed into a technique for "tieing" keyed drawing notes to related specification sections more closely. While these "keynotes" might be organized by *MasterFormat™*, there was little consistency among design firms or the documents produced by those firms.

MasterFormat™: A master list of numbers and titles classified by work results or construction practices that is primarily used to organize project manuals and detailed cost information, and relate drawing notations to specifications.

Module 7 - Notations

7.3 TYPES OF NOTES

Notes are text elements on a drawing that provide information concerning the work, design discipline, or sheet; identification of the drawing's graphic representations; and instruction concerning the use of the drawing or execution requirements for the work that is not otherwise specified.

Note Hierarchy:

- *General*
- *General Discipline*
- *General Sheet*

There are five types of notes: general notes, general [discipline] notes, general sheet notes, reference keynotes, and sheet keynotes. General notes, general [discipline] notes, and general sheet notes do not directly correspond to a graphic representation and are not directly "linked" by symbol (or other identifier) to other drawings or specifications. Should these three types of notes appear on the same sheet, they are listed in the following hierarchical order:

- General Notes
- General [Discipline] Notes (such as General Architectural Notes)
- General Sheet Notes

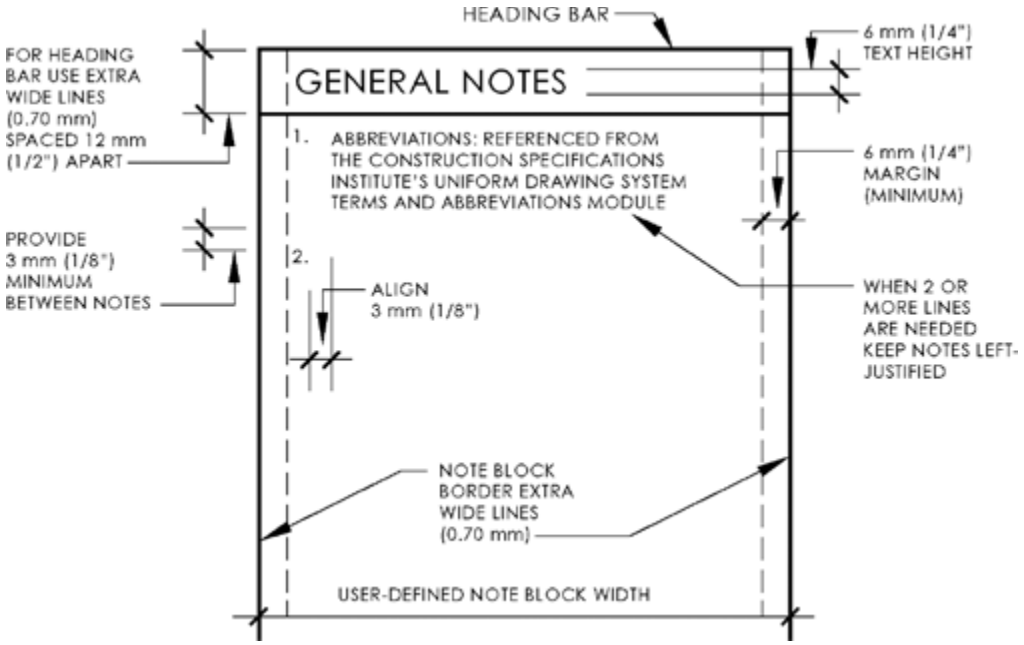
General Notes

General Notes: Notes that apply to the entire work. As such, general notes apply equally to all disciplines and to all sheets within the drawing set.

General notes are located within the G-Series, General Drawings sheet types.

General notes apply to the entire work and it is neither necessary nor desirable to repeat them on subsequent sheets or at other locations within the drawing set. Likewise, general notes do not repeat specification content on the drawings nor are they repeated within the specifications. Carefully coordinate general notes with the contents of the project manual and Division 01 specification sections in particular. As with the Division 01 sections, the content and requirements expressed by the general notes should be prepared by the lead designer, then communicated and coordinated with other participating design disciplines to avoid repetitive or contradictory language within the notes and specifications. Refer to ***UDS Figure 7.3-1*** for a typical layout of the notes block.

> **Example:** ABBREVIATIONS: REFERENCED FROM THE CONSTRUCTION SPECIFICATIONS INSTITUTE'S UNIFORM DRAWING SYSTEM TERMS AND ABBREVIATIONS MODULE



UDS Figure 7.3-1 *General notes.*

General [Discipline] Notes

General [Discipline] Notes: Notes that apply only to a particular design discipline. Users should provide a heading for these notes by replacing the [discipline] place holder with the name of the particular design discipline as in the following examples:

General Architectural Notes
General Structural Notes
General Mechanical Notes
General Interior Design Notes

General [discipline] notes appear on the first or 0-Series sheets within a particular design discipline and apply to all subsequent sheets within that discipline. For example, general civil notes appear on sheet C-001 and apply to all civil sheets within the drawing set.

Because general [discipline] notes apply to drawings of the discipline, they should not be repeated on other sheets within the discipline. These notes typically provide instruction concerning discipline-specific drafting conventions or other use of that discipline's drawings. General [discipline] notes do not replicate general notes. Coordination is necessary to ensure general [discipline] notes are coordinated with the project information, project requirements, and drafting conventions established within the general notes and may be presented in more detail elsewhere within the drawings or specifications. Refer to ***UDS Figures 7.3-1*** and ***7.3-2***.

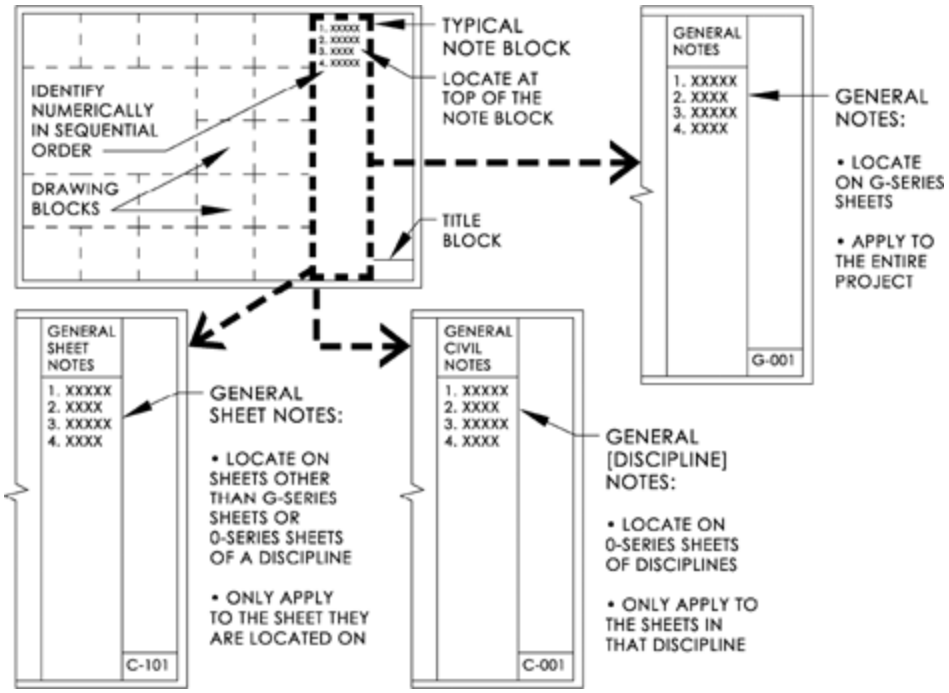
Example: TOP OF STEEL ELEVATIONS INDICATED ARE BASED ON A FINISH FLOOR ELEVATION OF 30M (100'-0")—SEE SHEET C-101 FOR ACTUAL DATUM AND BENCHMARK INFORMATION

General Sheet Notes

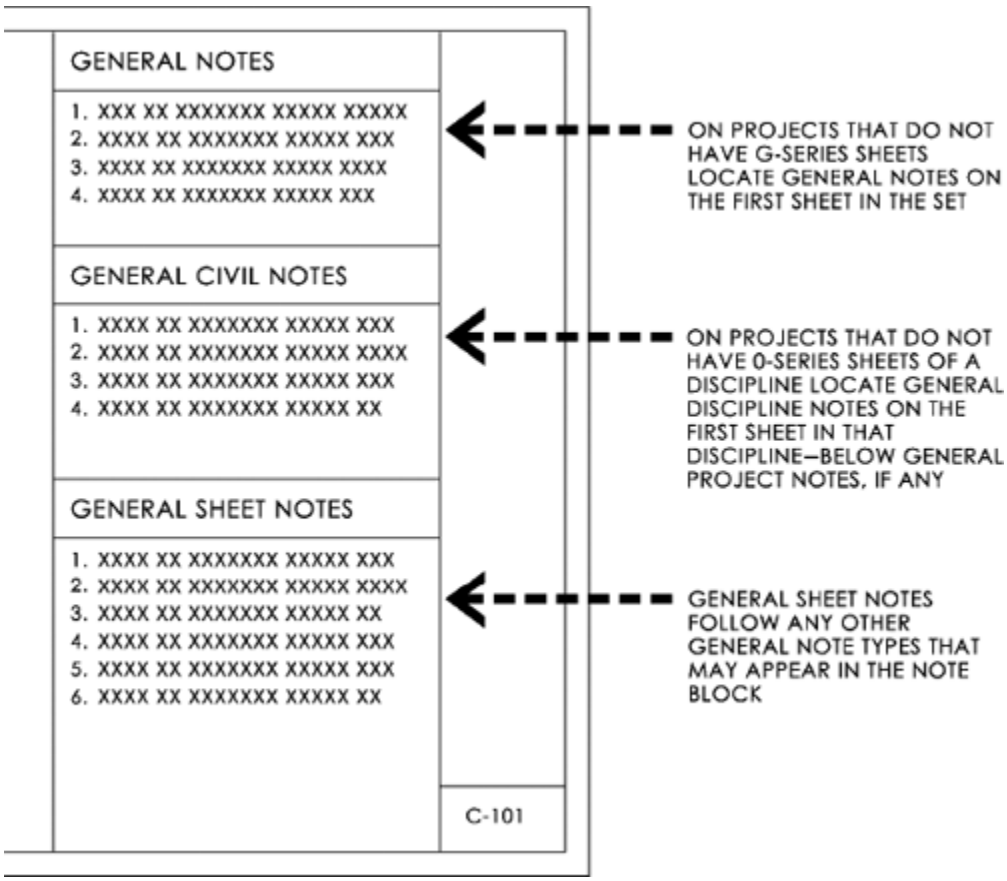
General Sheet Notes: Notes that apply only to the particular sheet on which they appear.

General sheet notes are used to communicate sheet-specific information or instructions. General sheet notes are tabulated sequentially within the note block. General sheet notes follow the other types of general notes (general notes or general [discipline] notes) and precede any reference keynotes that may appear in the note block. Refer to ***UDS Figures 7.3-2*** and ***7.3-3***. General sheet notes should be written in the imperative mood and in a streamlined format similar to the preferred specification language presented in *The Project Resource Manual—CSI Manual of Practice* (PRM).

Example: DIMENSIONS (ON THIS SHEET ONLY) DRAWN TO PARTITION WALLS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE



UDS Figure 7.3-2 *Three types of general notes—general notes, general sheet notes, and general [discipline] notes.*



UDS Figure 7.3-3 *Hierarchy of general note types when sheet C-101 is the first sheet in the set. Notes should not include vague references such as "See Specifications." Notes should be specific as discussed under Reference Keynotes.*

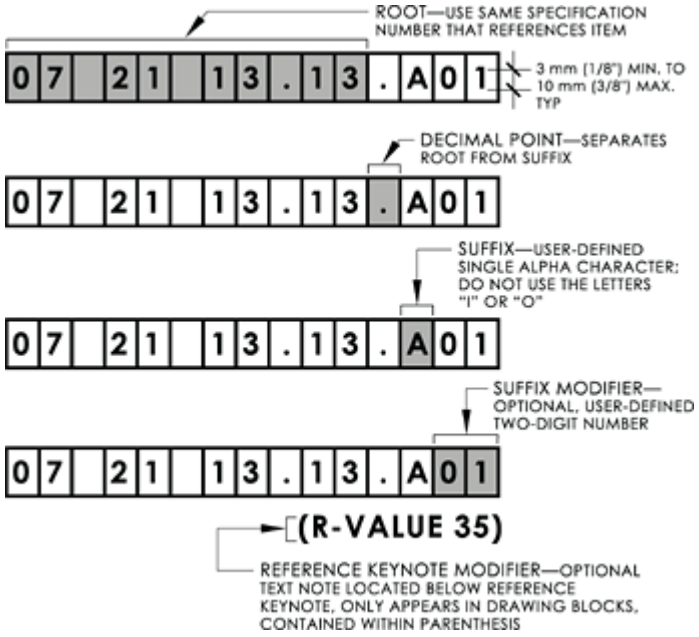
Reference Keynotes

Reference keynotes may be used to identify graphic representations of items and directly reference them to specific sections in the specifications. Reference keynotes can identify General or Execution requirements from a specification section and can convey Division 01 requirements.

Reference Keynotes: Identify graphic representations of items and directly reference them to specific sections in the specifications.

Example: 01 56 00.A01-TEMPORARY DUST BARRIER TYPE 1

Reference keynote symbols are located within the graphic and notation area of the drawing block. They consist of an identifier and are connected to the graphic by a leader. Each symbol that appears on the sheet is listed in the sheet's note block along with a brief, generic text note that describes the graphic. For clarity and more exacting identification, a given reference keynote is unique to the object or material it identifies. If an object or material is shown repetitively on the drawing sheet or elsewhere within the set of drawings, the same unique keynote should be used as a consistent identifier. Refer to ***UDS Figure 4.2-26*** of *Drafting Conventions, UDS section 4.2* for a typical drawing block format.



UDS Figure 7.3-4 *Components of reference keynotes.*

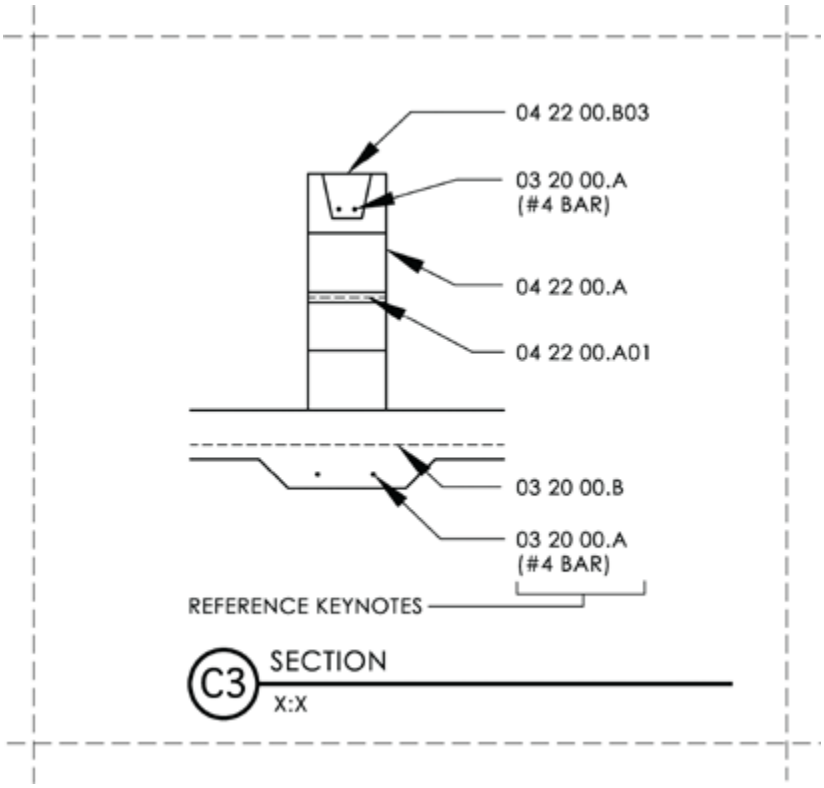
Reference keynote symbols consist of the following components, as shown in ***UDS Figure 7.3-4***:

- **Root:** The specification section number corresponding to the section number location where the object or material is specified.
- **Decimal Point:** A place holder separating the root from the modifying suffix.
- **Suffix:** A capital letter following the decimal point, which allows multiple keynotes to reference the same specification section. The letters I and 0 should not be used as they may be visually confused with the numbers 1 and 0. Reference keynotes always have a suffix.
- **Suffix Modifiers:** Optional numeric characters following the suffix allow creation of numerous unique reference keynotes that would otherwise be limited to the available letters of the alphabet. They can be customized as needed to further differentiate among related or similar items with different attributes (size, color, thickness, etc.). Suffix modifiers, when used, should always include two numerical characters, e.g., 07 70 00.A01.
- **Reference Keynote Modifiers:** Optional, user-defined descriptive text. These notes, when used, appear underneath the reference keynote symbol only in the drawing block. These modifiers serve to reduce the amount of unique keynotes required to identify variations in the size, number, spacing, or other feature of an object or material where that object or material might be shown elsewhere on the drawing in different configurations.

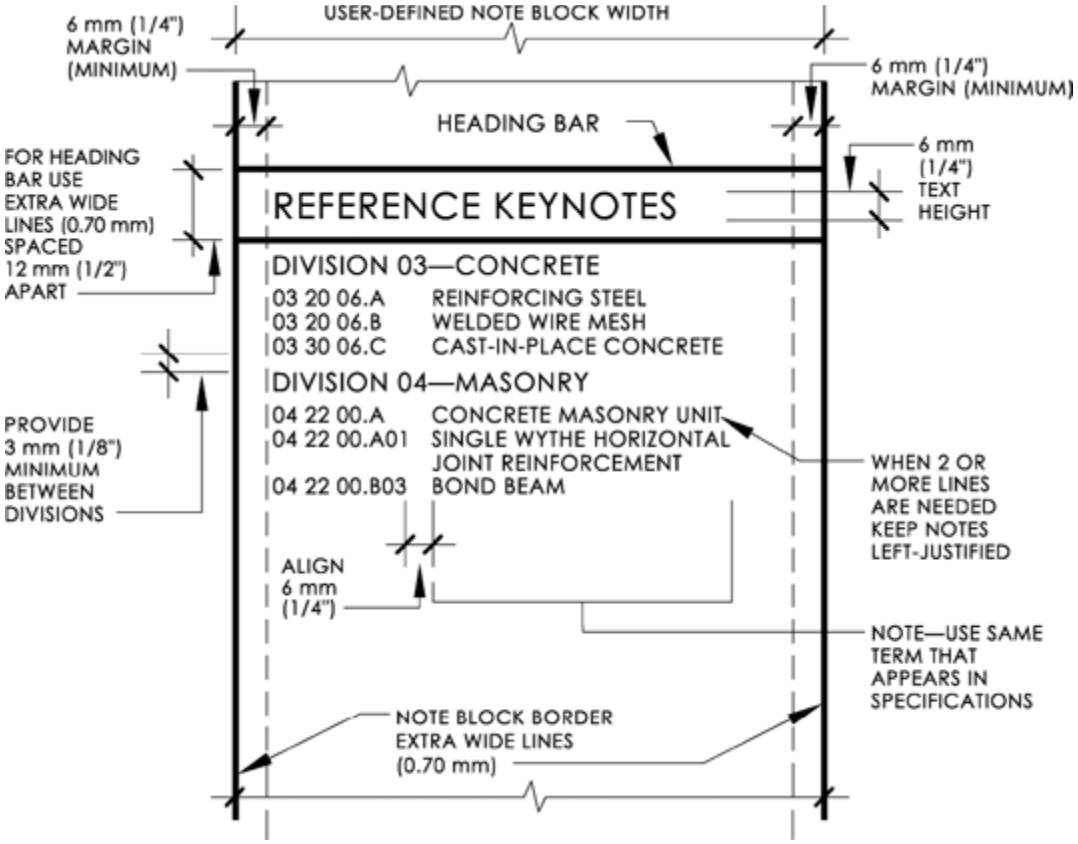
Reference keynotes are tabulated sequentially within the note block along with a brief generic text description to identify the item within the specifications. Reference keynotes follow any general notes (general notes, general [discipline] notes, or general sheet notes) that may appear in the note block. Reference keynotes that appear in the note block are formatted to include

- The full reference keynote symbol including the root, decimal point, suffix, and any suffix modifiers.
- The brief generic text describing the object or material with the same terminology used within the specifications. To ensure clarity and proper coordination among documents, avoid abbreviations, non-preferred terms, and terms that deviate from the specifications. Do not include any reference keynote modifiers that appear only in the drawing blocks.

- The note block may be formatted with optional headings identifying specification divisions and/or subheadings identifying specification section titles. These headings and subheadings provide drawing users with easier visual navigation of the reference keynotes and serve as an organizing aid for preparing the note block. It is essential that the reference keynote identifiers in the note block be carefully checked to ensure they are the same as those drawn within the graphic and notation areas of the drawing block. The text information following the symbol should be concise, consistent with the terminology contained in the specifications, and accurately identify the item. Likewise, the terminology used in the notes should reflect that of the specifications for ease of coordination and consistent communication of information.
- Refer to ***UDS Figures 7.3-5*** and ***7.3-6***.



UDSFigure 7.3-5 *Reference keynotes in a drawing block.*

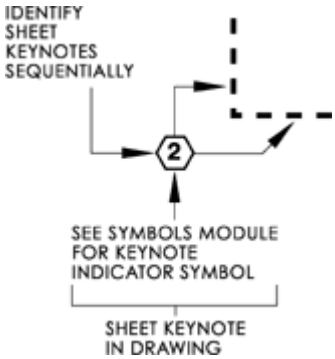


UDS Figure 7.3-6 *Typical reference keynotes in a note block.*

Sheet Keynotes

Sheet Keynotes: Identify, inform, and instruct without reference to the specifications.

Sheet keynotes are noted within the graphic and notation areas of the drawing block. They are drawn with a hexagonal symbol containing a numeral with leader(s) from the hexagon to the identified item. The bottom of the hexagonal symbol should always be drawn parallel to the bottom of the drawing sheet. The numeral for each symbol that appears on the sheet is listed in the sheet's note block along with a text note that describes the graphic. A unique numeral must be assigned for each identified item, and the keynotes tabulated sequentially within the note block. The numerals may begin with 1, followed by 2, 3, 4, 5, etc., or other sequential orders (i.e., 7 followed by 12, 31, 33, 45, etc.) Refer to ***UDS Figures 7.3-7*** and ***7.3-8***.



UDS Figure 7.3-7 *Keynote indicator.*

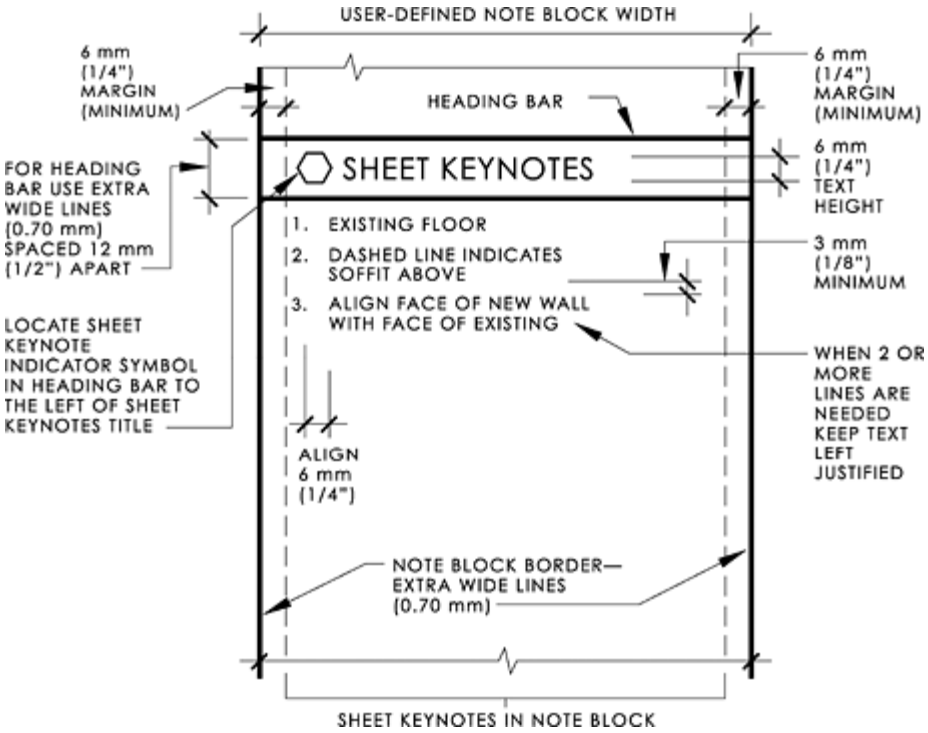


Figure 7.3-8 *Sheet keynotes.*

Sheet keynotes follow the listing of any reference keynotes within the note block. Each numeric identifier is listed in sequential order in the note block with the full text of the note. Sheet keynotes should not be used to identify items referenced in the specifications.

Note Block Hierarchy

> *Note Block: Module or modules where general notes, keynotes, and key plans are located. Refer to Sheet Organization, UDS section 2.3.*

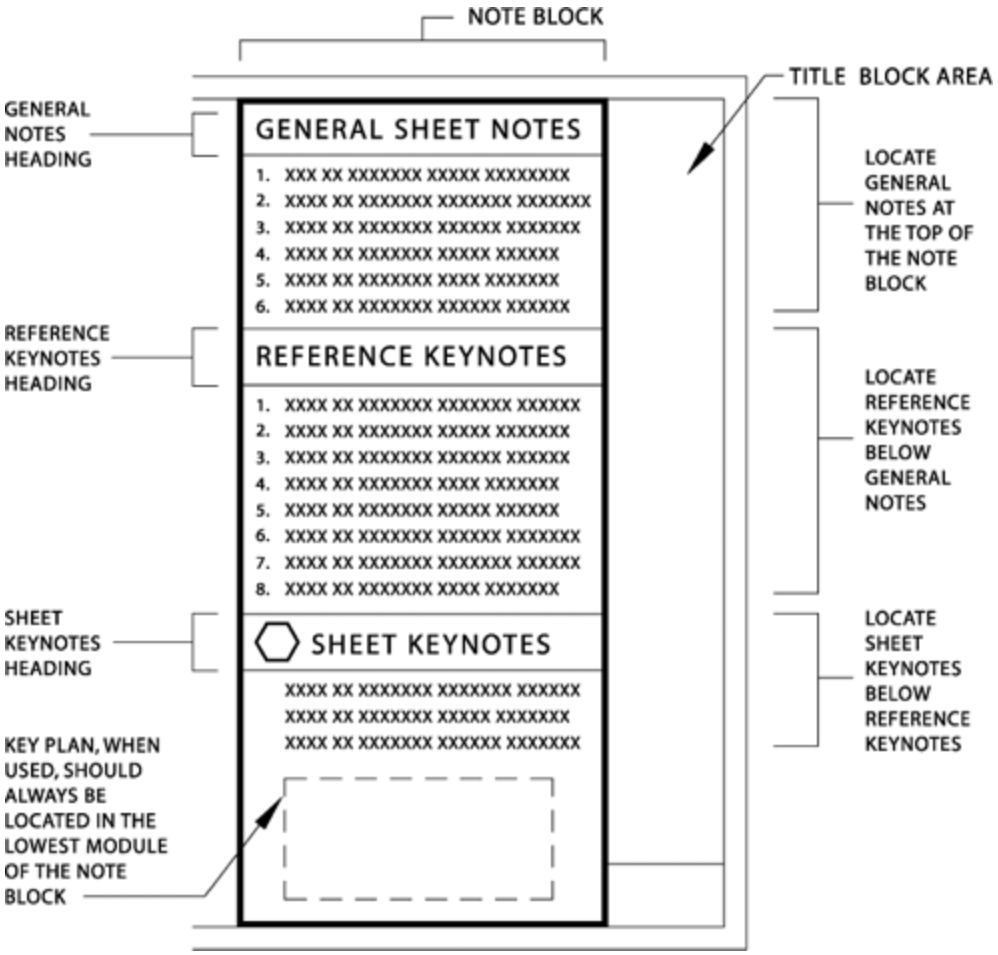
The placement of notes within the note block is shown in ***UDS Figure 7.3-9***. If a certain note type is not required, do not indicate a heading for that note type. Shift the note types upward that would normally be located beneath the (unused) notes. When laying out note blocks, users should consider the space required at the bottom of the note block, which is reserved for any applicable key plans. (See *Drafting Conventions, UDS section 4.2* and *Sheet Organization, UDS section 2.3* for recommended key plan location.) Generally, the note block would be formatted as a single column of notes.

On a small project, the general notes would appear on the first drawing sheet within the set followed by general [discipline] notes, and general sheet notes. As hierarchical information, the general notes always appear as the first notes within their note blocks. Refer to ***UDS Figure 7.3-9***.

If more notes are required than will fit in a sheet's single-column note block, the note block should expand to the left and be formatted to allow multiple columns of notes. Refer to ***UDS Figure 7.3-10***.

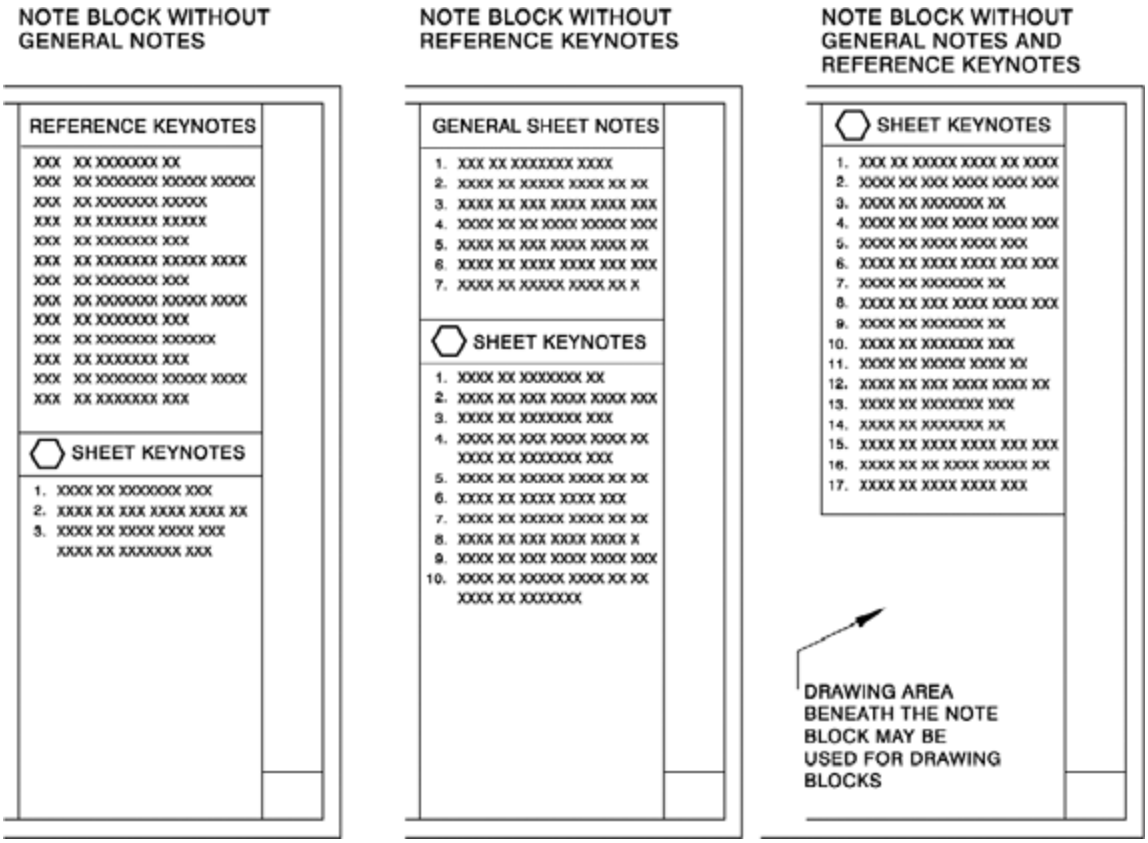
On the applicable 0-Series sheets as defined in *Module 1 - Drawing Set Organization* where they appear, the general [discipline] notes are the first notes within the sheet's note block(s). An exception to this rule is on drawing sheets for small projects on which general [discipline] notes follow any general notes and precede any general sheet notes.

General sheet notes appear at the top of a sheet's note block(s) except for **G**-Series (e.g., G-001) and 0-Series (e.g., C-001) sheets where they follow any general notes or general [discipline] notes that may be on those sheets. Refer to ***UDS Figure 7.3-2***. General sheet notes are numbered sequentially as they are developed.

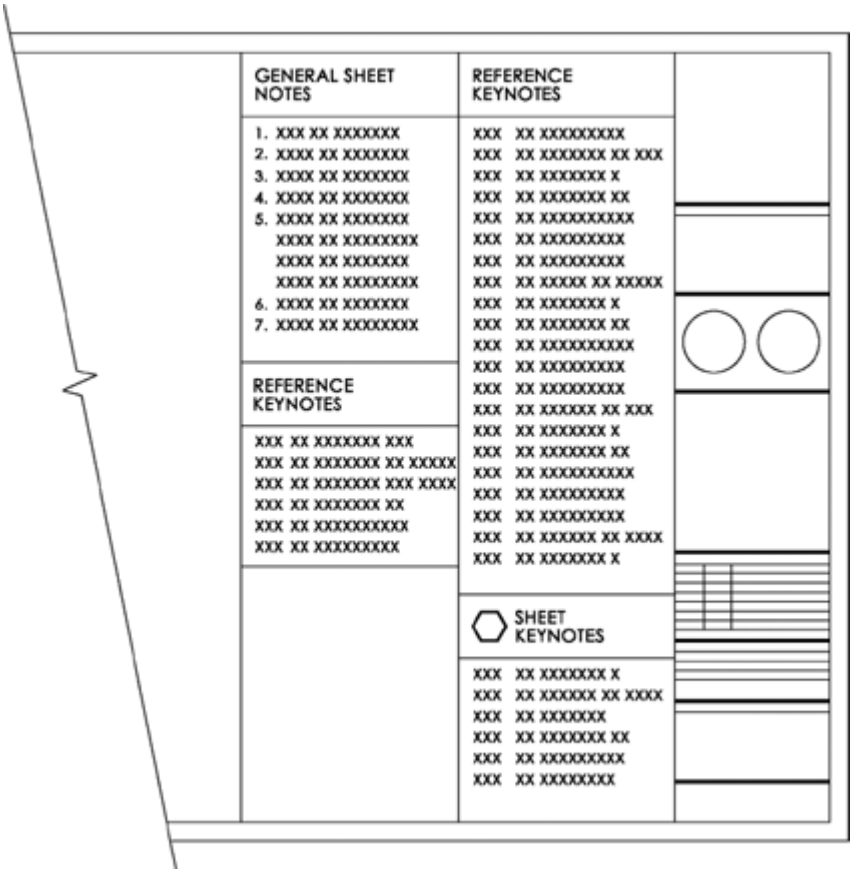


UDS Figure 7.3-9 *Note block hierarchy-order of notes that appear in the note block.*

If general sheet notes are not required for a sheet, locate reference keynotes at the top of the note block. Shift sheet keynotes upward, below reference keynotes. Refer to ***UDS Figures 7.3-10*** and ***7.3-11***.



UDS Figure 7.3-10 *Hierarchy of notes in note block.*



UDS Figure 7.3-11 *Additional note blocks-an example using full and partial note columns.*

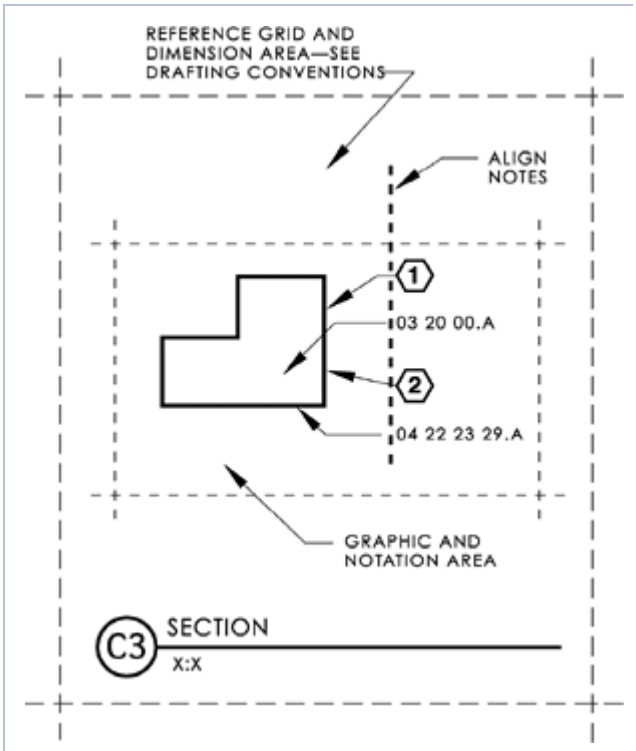
Module 7 - Notations

7.4 USERS' GUIDE

The development and production of drawings requires discipline, organization, and the management of those elements that make up the drawings. Just as an office must "manage" a bank of reference details or a CAD layering scheme, attention must be paid to managing the notes that become part of the drawings.

Similarly, a firm should collect and save examples of good detailing into a library for later customization and reuse on future projects. They should do the same with reference notes—collect and develop them into an "office master." While most collected reference notes must be customized for a specific project, they provide a point of departure for developing project specific notes. A good set of standard notes can incorporate proper language and note structure while communicating the firm's "best practice" in terms of project procedures, requirements for the work, and coordination with the other construction documents.

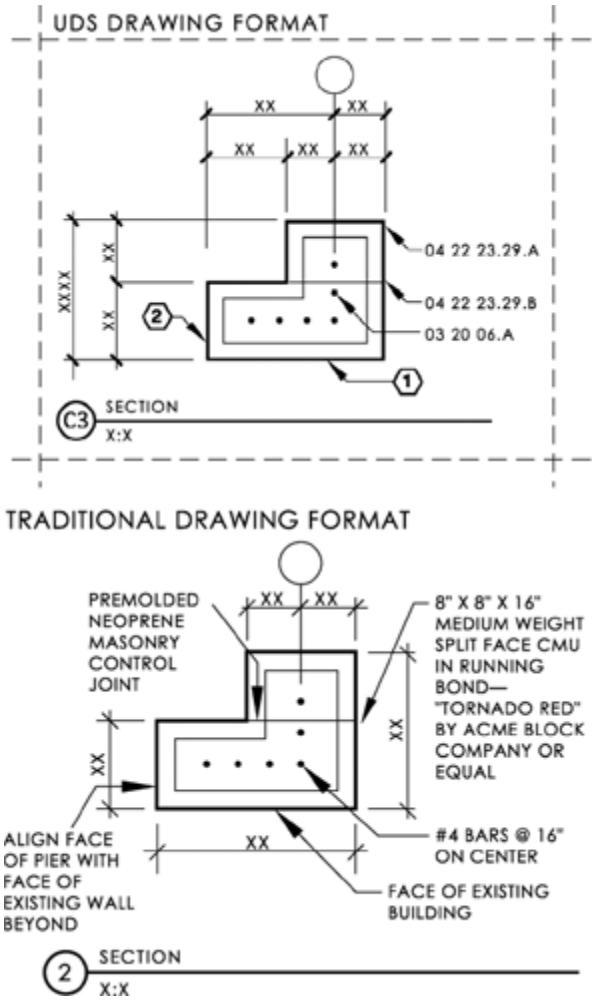
The drawings, and their notes, must be complete and accurate. They must also effectively communicate the project to the drawing user in the simplest, most efficient manner possible. The placement of notes within the drawing block should comply with the drawing block format requirements as described in *Drafting Conventions, UDS section 4.2*. Refer to ***UDS Figure 7.4-1***.



UDS Figure 7.4-1 *Typical UDS drawing block format.*

Following are some guidelines for proper development of more efficient notes:

- Generic terminology should be based on a well-known, commonly available source(s) such as *Terms and Abbreviations, UDS section 5.2*.
- Drawing notes should match the terminology in the specifications. Names of materials and products appearing on the drawings should be identical to the generic names used to identify those products found within the specifications. It is not good practice to repeat proprietary names, model numbers, or other detailed information within drawing notes because these may change during the process of design, bidding, construction, and facilities management. Identify objects and materials on the drawings with generic terminology and a description adequate to distinguish among similar products.
- Text reduction is one of the more obvious benefits of good notes practice. Refer to ***UDS Figures 7.4-2*** and ***7.4-3*** for illustration of benefits.



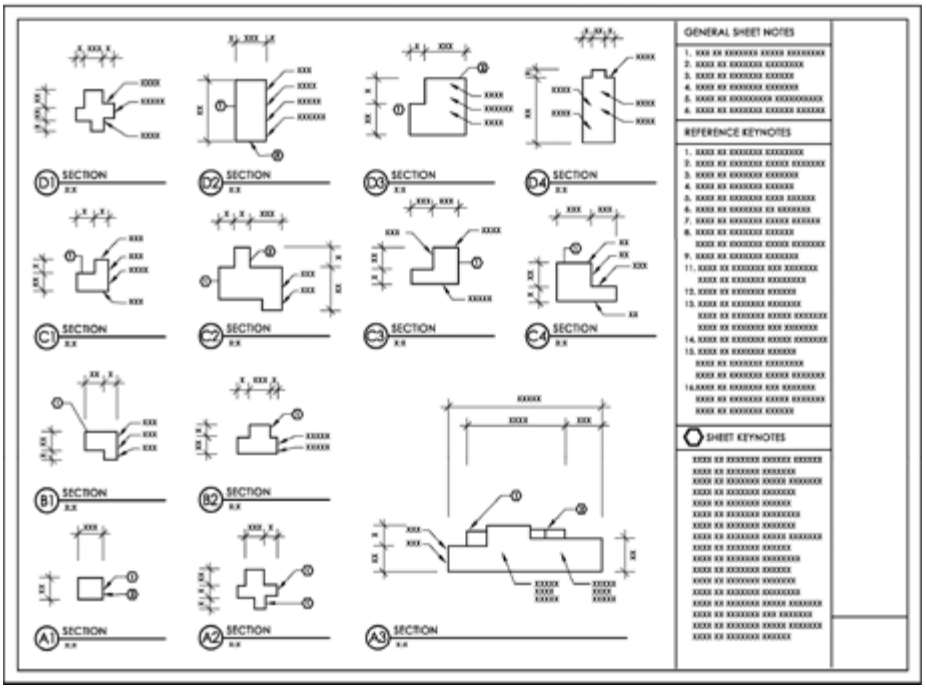
UDS Figure 7.4-2 *Benefits of UDS in drawing blocks.*

Developments in drafting technology and CAD systems have made the preparation of notes less burdensome but have also made it easier to draft longer notes—sometimes without regard for efficient communication. Clearly, reference keynotes or sheet keynotes reduce drawing text by eliminating repetitious text and replacing it with a simple symbol and legend. *The Project Resource Manual—CSI Manual of Practice* offers "streamlining" and the "imperative mood" as additional means to reduce and clarify specification language. These same principles apply to drawing notes, as illustrated below:

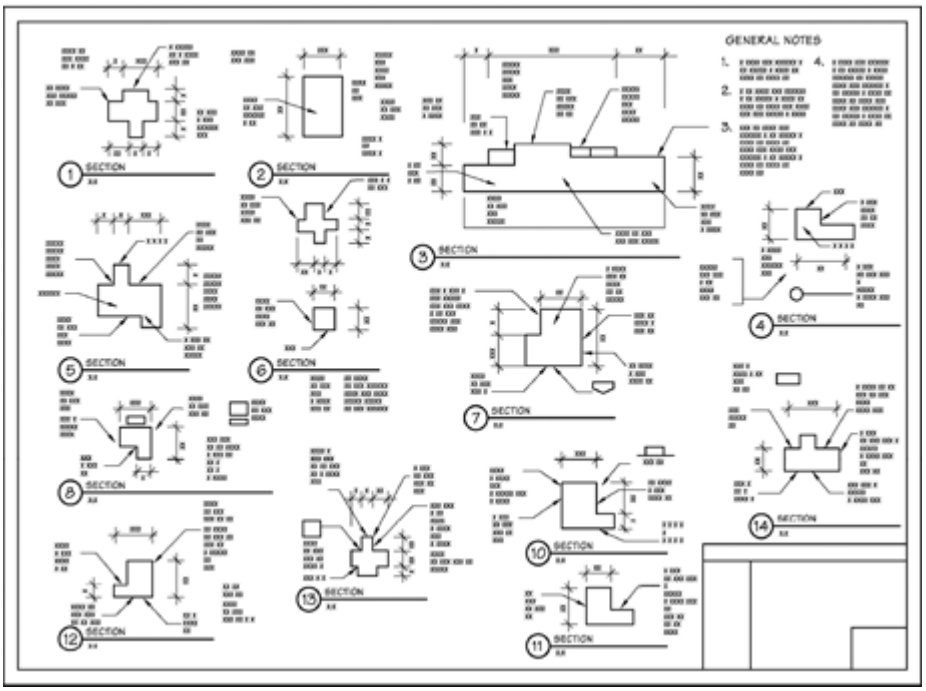
Indicative mood note language to be avoided: CONTRACTOR SHALL NOT SCALE DRAWINGS

Preferred streamlined note language: DRAWINGS: DO NOT SCALE

UDS SHEET FORMAT

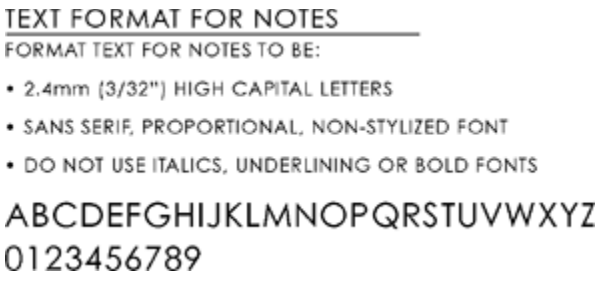


TRADITIONAL SHEET FORMAT



UDS Figure 7.4-3 *Benefits of UDS in sheets.*

- Fonts should be capitalized, proportional, sans-serif, and non-stylized. Do not use italics, underlining, bold, or other highlighting techniques. Refer to ***UDS Figure 7.4-4***.



UDS Figure 7.4-4 *Text format for notes.*

- Write notes using complete terminology and avoid the use of abbreviations. Where an abbreviation is essential, the user should coordinate the use of abbreviations throughout the drawings and specifications to ensure consistency and proper use. Refer to *Terms and Abbreviations, UDS sections 5.2 and 5.3* for preferred terms and abbreviations of commonly used terms.
- Avoid broad references to the specifications such as PER SPECS or REFER TO SPECIFICATIONS. References to the specifications should provide the reader with a 12 exact reference location within the project manual: SEE SPECIFICATION SECTION 09 25 13.13.
- Avoid broad references to drawings in the drawing set such as REFER TO STRUCTURAL DRAWINGS. References to drawings should provide the reader with a more exact reference location within the drawing set such as: REFER TO STRUCTURAL FOUNDATION PLAN or REFER TO SHEET S-101.

Module 7 - Notations

7.5 LINKING

One advantage of using reference keynotes is the opportunity to link project information such as drawings and specifications. Other linkages can be created as reference keynotes from unique descriptors applicable to drawings, specifications, cost estimates, construction schedules, product data, detail libraries, facilities management, and other design and construction documentation. Using embedded information attributes, CAD drawings can store information about each of the products that make up the illustrated assembly along with associated costs, execution requirements, manufacturers, and almost any other information pertinent to the constituent products. The reference keynote provides the common identifier for related specifications, spreadsheets, databases, and word processing files.

> *UniFormat™: An arrangement of construction information based on physical parts of a facility called systems and assemblies. Refer to CSI's UniFormat™—A Uniform Classification of Construction Systems and Assemblies.*

Reference keynotes are a useful organizing tool throughout the design and construction process. One example of reference keynotes' usefulness in the early design phases can be found in the development and use of reference detailing. A list of reference details can be developed into a library and identified using *UniFormat™*. Likewise, database tables can be developed that establish the detail's *UniFormat™* designation and the listing of its component reference keynotes. As the project's designers consider preliminary selections of systems and assemblies, the reference details they select can establish preliminary product lists, specifications, and cost data through the information joined through the database linkages.

Process

To be effective, reference keynotes should be established and shared among all participating disciplines in uniform ways. This requires a standardized method for managing, producing, and using reference keynotes.

While reference keynotes should be selected and, perhaps, customized for a specific project, it is important that the user establish a standard library of keynotes to maintain consistency among projects and to

maximize production efficiency as the drawings are produced. The reference keynote office master is a comprehensive standard listing of reference keynotes established by the user. It provides:

Reference Keynote Office Master:
A comprehensive standard listing of reference keynotes established by the user.

- a complete listing of reference keynotes coordinated with items specified by the user and the user's master specification system
- a flexible system of documentation for incorporating new reference keynotes as new or different products are specified by the user (each project should provide opportunities to expand the system as project information is refined and drawn into the user's experience)
- a method for assigning reference keynote suffixes for products listed within each specification system
- a system that is understood, available, shared, and used by all members of the project team (as the reference keynote is the common link among many project activities and documents, it should become the common language of project team members)

A number of resources should be invested into the development of the reference keynote office master. Uniform methods by which the office master becomes an edited, accurate part of a project's construction contract documents should be established. The benefits of a reference keynoting system can include

- increased clarity of project information resulting from greater exchange and coordination of project information by project team members
- more concise project documents as repetitive text is reduced to a set of commonly understood symbols
- more consistent terminology within and among the drawings, specifications, cost estimates, and other project documents
- greater ease of placing and relocating information as lengthy blocks of text are reduced to keynote symbols, resulting in a less crowded drawing, refer to ***UDS Figure 7.4-2*** and ***UDS Figure 7.4-3***
- facilitation of reference details using reference keynotes provides simpler drawings that are less resource intensive to maintain, update, and, in the case of CAD documents, store
- more comprehensive quality control opportunities as the reference keynote project list can be used as a checklist to verify:
  - specification sections with the reference keynotes root as noted in the project manual
  - terms in specifications and drawings match
  - specification sections contain referenced products and materials
  - items specified as indicated on the drawings

United States National CAD Standard® - V5

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Module 8 - Code Conventions

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Key: = Section contains a downloadable Microsoft Excel document

Module 8 - Code Conventions

8.1 INTRODUCTION

The *Code Conventions Module* establishes guidelines for consistency in identifying necessary regulatory information to be shown in the construction documents. This is needed to facilitate both the design process and the permit application process.

The *Code Conventions Module*:

- Identifies the information necessary for code research during design.
- Identifies the type of general regulatory information that should appear in the construction documents.
- Identifies the location of the general regulatory information in the drawing set and on specific individual sheets.
- Provides standard graphic conventions for incorporation in the drawing portion of the construction documents.
- Facilitates and expedites the building permit (plan review) application process.

The *Code Conventions Module* provides the framework necessary to understand the complexities of the project cycle relative to regulatory requirements. The identification of regulatory issues is integrally tied to all phases of the project cycle, including Planning, Design, Bidding, Construction, and Post Construction (Occupancy and Use of the completed project). The planning and design phases are especially important as this is when critical regulatory information must be identified and located in the construction documents. Inclusion of this information facilitates the permit application process, as well as identification of the necessary information to be submitted for a plan review.

It is important to note that codes are only a part of the regulatory requirements for which the design professional must maintain compliance. Accordingly, this module includes aspects of regulatory compliance such as zoning, environmental (e.g., EPA), and federal (e.g., ADA), in addition to code compliance. The relevant information is presented as follows:

- Identification of regulatory information in the construction documents.
  - Type of information to be included in the construction documents
  - Location and format of information in the construction documents
- The plan review process.
- Overview of regulatory information.
- The design process.

Module 8 - Code Conventions

8.2 IDENTIFICATION OF REGULATORY INFORMATION

DOWNLOAD SPREADSHEET

Building codes include anywhere from 3,300 to 5,000 sections of code requirements. It is very difficult to identify and evaluate compliance with each and every section in the drawing set. This portion of the module identifies some of the key criteria to be included in the construction documents to facilitate the design process, which will expedite the plan review. The efficiency of a plan review, like any other repeated process, may be improved if a consistent system or technique is established. To this end, the design professional must provide the necessary information in the construction documents and present the information so it is readily identifiable. A standardized presentation will expedite the plan review process and, ultimately, the issuance of the building permit.

Local jurisdictions often establish their own policy regarding regulatory items that must be shown in the construction documents. Unique local jurisdictional amendments may also emphasize the importance of certain code criteria over other criteria. However, this section of the module will provide a generic framework regarding:

- what regulatory issues will be provided.
- where this information should be located.
- how it should be presented.

The codes cover myriad requirements. It is often necessary to group these requirements by category to determine the best location for the information as well as how to present it. Included in these categories are specific relationships among regulatory issues. It is important to note these relationships as they may impact the placement of information on the drawings. Additionally, the size and complexity of the project may dictate the placement of the regulatory information. For example, a small stand-alone grocery store will probably not have a dedicated drawing regarding code requirements (such as GI-102 Code Summary), while one may be included in a multistory office building. Therefore, it is necessary to determine which drawing(s) should include this information.

Type of Information

The organization of information related to the determination of regulatory compliance within construction documents is grouped in 12 categories, as follows:

Category Group	Brief Description
1-General	Items related to the overall project, including: owner and project identification; site location and jurisdiction; design professional identification; contractor identification; synopsis of applicable construction regulations; and effective dates.
2-Site	Items related to the project site, including: distances to lot lines; site grading; flood control; environmental impact statements; deed restrictions; and zoning information. Zoning includes: zoning use classification;

	site coverage data; floor area ratio (FAR) data; parking data; signage data; fire districts; and historical preservation.
3-Building	Items related to the overall building design, including: identification of use groups (occupancy); type of construction; and building height and area. An overview of site-specific structural considerations relative to seismic and wind design are often included.
4-Life Safety-Egress	Items related to means of egress, including: occupant loads; identification of exit access from rooms and spaces; exit travel distance; number and capacity of exits for each floor; stair and door details; and egress and exit lighting.
5-Fire Protection-Passive	Items related to built-in-place (passive) fire protection, including: fire-resistance ratings of various components and assemblies; identification of mixed uses; opening protectives (e.g., fire doors); penetrations; and interior finish.
6-Accessibility	Items related to making sites, facilities, buildings, and elements accessible to and usable by persons with physical disabilities, including: interior and exterior accessible route requirements; detectable warnings and signage; elevator details; clear floor space; and plumbing fixtures.
7-Energy	Items related to overall energy conservation, including: envelope thermal performance; glazing areas and fenestration R-values; mechanical and electrical equipment loads and efficiencies; service water heating details; and air infiltration.
8-Structural	Items related to structural design criteria, including: applicable design loads; structural system description; soil data; material design standards; and special inspections.
9-Fire Protection-Active	Items related to type(s) of fire protection systems (active), including: fire suppression systems; standpipes; fire alarm and detection; smoke control; fire extinguishers; and high-hazard abatement.
10-Plumbing	Items related to plumbing requirements, including: number of plumbing fixtures; water distribution; plumbing riser diagram; water usage data; protection of potable water; cleanout locations; storm water drainage; and piping materials and connections.
11-Mechanical	Items related to mechanical requirements, including: ventilation requirements; combustion air; duct construction and layout; fire damper locations; exhaust and intake locations; and listing and labeling of equipment.
12-Electrical	Items related to electrical requirements, including: equipment listing and installation; wiring methods; single- line diagrams; service load calculations; lighting protection; minimum light levels; and standby/emergency power.

The information on the drawings requires coordination with the requirements indicated within the other construction documents to avoid duplication or contradiction. This information provides either an overview to supplement detailed project information contained elsewhere in the construction documents (e.g., summary of applicable structural design loads), or a means of summarizing information spread throughout the construction documents.

Location and Format of Information

Identification of the necessary information coupled with its presentation on the drawings is key to facilitating the life cycle of the project. This includes both the initial cycle of design, construction, and occupancy as well as subsequent cycles where the project is altered through changes and additions. This information is also key to expediting the plan review phase of the permit application process. It may not be practical to include all of the information related to these 12 categories in one location. Often this information is provided in separate locations related to its discipline because information from the different disciplines is often evaluated by different reviewers. The location of the relevant regulatory information is a function of the complexity of the project. As stated in *Drawing Set Organization, UDS section 1.3*, two levels of sheet identification are used to recognize the wide variance in project complexity. Level 1 offers the simplest identification format and is suitable for all but the most complex projects. Level 2 provides guidance for complex or special types of projects.

In more complex projects or special types of projects where regulatory information must be summarized for a particular discipline, this information would be placed on the 0 sheet type within the discipline. Such summary information might involve the identification of rated assembly penetrations that could appear on the M-0 sheets. The inclusion of discipline-specific code summary sheets may also be desirable, or even required, when the drawing set will be subdivided by a regulatory agency for review by different discipline specialists.

The information located on the code summary sheets should include only general conceptual information. Specific graphic information should be located elsewhere in the drawing set on the proper sheet type. For example, the code summary would indicate the building fire-rated partitions and their hourly ratings. However, the specifics of the wall location and construction would be located on the floor plan sheets and on either the Type 4 (large-scale sections) or Type 5 (detail) sheets. See *UDS Appendix K - Fire Area Key Plans, UDS section 8.16* for illustrative examples of graphic information concerning building-specific hourly ratings, to be located elsewhere in the drawing set.

Outline of Regulatory Information Based on Category Group

The following tables include general guidelines for information necessary for use on each sheet. These guidelines are not intended to be comprehensive, but may be used as a basis for establishing a checklist for coordination and completeness of the sheets.

The following outline identifies by category group

- regulatory information to include on the drawings
- location (coordinated with Module 1 - Drawing Set Organization)
- presentation format (text and/or graphic)

Category Group	Regulatory Information	Drawing Location		Suggested Format
		Level 1 Project	Level 2 Project	
1-General	**Project identification** ***Project name and owner identification***			
	Project address *Street address, city, and state*	PM/G-001	PM/GI001	Text
	Project location map	G-0xx	GI0xx	Graphic
	Professional design firm(s) identification	G-001	GI001	Text
	Contractor name(s)	G-001	GI001	Text
	Design professional name(s)	G-001	GI001	Text
	Design professional address(es)	G-001	GI001	Text
	Design professional phone/fax number(s)	G-001	GI001	Text
	Design professional e-mail/website	G-001	GI001	Text
	Design professional license number and seal	G-001	GI001	Text
	See *UDS Appendix A - Summary of Governing Regulations, UDS section 1.6*	**G-0xx**	**GI0xx**	**Text**
	Listing of applicable codes (titles and edition)	G-0xx	GI0xx	Text
	Accessibility	G-0xx	GI0xx	Text
	Building	G-0xx	GI0xx	Text
	Electrical	G-0xx	GI0xx	Text
	Energy conservation	G-0xx	GI0xx	Text

	Fire	G-0xx	GI0xx	Text
	Fuel/gas	G-0xx	GI0xx	Text
	Mechanical	G-0xx	GI0xx	Text
	Plumbing	G-0xx	GI0xx	Text
	Private sewage disposal	G-0xx	GI0xx	Text
	Property maintenance	G-0xx	GI0xx	Text
	Residential	G-0xx	GI0xx	Text
	Zoning	G-0xx	GI0xx	Text
	Other	G-0xx	GI0xx	Text
	Listing of applicable local ordinances and jurisdictions	G-0xx	GI0xx	Text
	Local amendments	G-0xx	GI0xx	Text
	Zoning	G-0xx	GI0xx	Text
	Signage	G-0xx	GI0xx	Text
	Other	G-0xx	GI0xx	Text
2-Site	**Site-Related Design Criteria**			
	Location on site (distances to lot lines/existing buildings)	C-1xx	CS1xx	Graphic
	Site grading/water run-off	C-1xx	CG1xx	Graphic
	Irrigation	L-1xx	LI1xx	Graphic
	Erosion control details	C-5xx	CG5xx	Graphic
	Environmental impact statements	PM	PM	Text
	Zoning drawings	G-0xx	GI0xx	Text
	Zoning use (allowable/actual)	G-0xx	GI0xx	Text
	Site coverage (allowable/actual)	G-0xx	GI0xx	Text
	Building height (allowable/actual)	G-0xx	GI0xx	Text
	Parking/loading requirements (required/actual)	G-0xx	GI0xx	Text
	Signage type, area, and height (allowable/actual)	G-0xx	GI0xx	Text
	Fire districts	G-0xx	GI0xx	Text
	Historical preservation	G-0xx	GI0xx	Text
		G-0xx	GI0xx	Text
3-Building	**Building Design Criteria**			
	See *UDS Appendix B - General Building Summary, UDS 8.7*	G-0xx	GI0xx	Text
	Use group (occupancy) classification(s)	G-0xx	GI0xx	Text
	Type of construction	G-0xx	GI0xx	Text
	Building area (allowable/actual)	G-0xx	GI0xx	Text
	Building height (allowable/actual)	G-0xx	GI0xx	Text
	Special use and occupancy (e.g., covered mall, high rise)	G-0xx	GI0xx	Text
	Seismic design category	G-0xx	GI0xx	Text
	Design wind speed	G-0xx or PM	GI0xx	Graphic or Text

4-Life Safety-Egress	**Means of Egress Design Criteria**			
	See *UDS Appendix C - Room-by-Room Egress, UDS section 8.8*	G-1xx or G-0xx	GI0xx or GI1xx	Graphic or Text
	See *UDS Appendix D - Floor-by-Floor Egress, UDS section 8.9*	G-1xx or G-0xx	GI0xx or GI1xx	Graphic or Text
	Occupant load(s)	A-1xx	GI0xx or GI1xx	Graphic or Text
	Building exits per floor (arrangement; required/actual)	G-1xx or G-0xx	GI0xx or GI1xx	Graphic or Text
	Exit capacity per floor	G-1xx or G-0xx	GI0xx or GI1xx	Graphic or Text
	Travel distance (allowable/actual)	G-1xx or G-0xx	GI0xx or GI1xx	Graphic or Text
	Means of egress lighting	E-1xx or PM	EL1xx	Graphic
	Interior finish classification (allowable/actual)	A-0xx/PM	GI0xx/PM or AF0xx	Text
	Corridor, stair, and door details	A-5xx	AE5xx	Graphic
5-Fire Protection-Passive	**Passive Fire Protection Design Criteria** ***Provides the design framework used in conjunction with the building design criteria regarding assemblies required to be fire-resistance rated.***			
	See *UDS Appendix E - Fire-Resistance Ratings, UDS section 8.10*	G-0xx	GI0xx	Text or Graphic
	Fire-resistance ratings of building elements, including tested de-sign number (required/actual)	Z-5xx	Z5xx	Graphic
	Firestopping shop drawings, including tested design number	G-1xx	GI1xx	Graphic
	Mixed use (occupancy) separations	G-1xx	GI1xx	Graphic
	Fire-resistive assembly location plan	PM	PM	Text
	Firestopping, including tested design number	PM	PM	Text
	Plastics	PM	PM	Text
6-Accessibility	**Accessibility Design Criteria** ***Provides the design framework for the site and architectural drawing disciplines. Federal, state, and local requirements may impact design considerations.***			
	See *UDS Appendix F - Accessibility, UDS section 8.11*	C-1xx	GI1xx	Graphic
	Exterior accessible routes, including parking	C-1xx	GI1xx	Graphic
	Location of public facilities on site	C-1xx	GI1xx	Graphic
	Accessible entrances	A-1xx	GI1xx	Graphic
	Interior accessible routes	A-4xx	AE4xx	Graphic
	Clear floor space/maneuverability clearances	C-1xx	GI1xx	Graphic
	Detectable warnings and signage (exterior)	A-1xx	AE1xx	Graphic
	Detectable warnings and signage (interior)	A-4xx	AE4xx	Graphic

	Toilet and bathing facilities	A-4xx	AE4xx	Graphic
	Elevator and area of rescue assistance details	A-1xx	AE1xx	Graphic
	Occupancy-specific accessible features (e.g., assembly, residential dwelling units)	A-1xx	AE1xx	Graphic
7-Energy	**Energy Design Criteria** ***Provides the design framework for the architectural and drawing disciplines as well as mechanical and electrical construction documents. Energy-related information is often located in the project manual. Often requires supporting energy envelope calculations.***			
	Design conditions (temperatures)	G-0xx	GR0xx	Text
	Envelope systems analysis	G-0xx	GR0xx	Text
	Envelope insulation levels	G-0xx	GR0xx	Text
	Air leakage/infiltration, sealing	G-0xx	GR0xx	Text
	Glazing type (fenestration) and areas	G-0xx	GR0xx	Text
	Mechanical equipment sizing, loads, and efficiencies	G-0xx	GR0xx	Text
	Electrical equipment sizing, loads, and efficiencies	G-0xx	GR0xx	Text
	Electrical lighting power budget	G-0xx	GR0xx	Text
	Service water heating sizing, loads, and efficiencies	G-0xx	GR0xx	Text
	Duct and hot water piping insulation	G-0xx	GR0xx	Text
	Energy trade-offs	G-0xx	GR0xx	Text
	Temperature controls	G-0xx	GR0xx	Text
	Water conservation	G-0xx	GR0xx	Text
8-Structural	**Structural Criteria**			
	Design dead loads (actual)	S-0xx	S0xx	Text
	Design live loads (required)	S-0xx	S0xx	Text
	Design snow loads (required)	S-0xx	S0xx	Text
	Design wind loads (required)	S-0xx	S0xx	Text
	Design seismic loads (required)	S-0xx	S0xx	Text
	Soil data (frost depth; allowable foundation type/loads)	R-0xx	RS0xx	Text
	Description of structural system	S-0xx	S0xx	Text
	Structural details	S-5xx	S5xx	Graphic
	Special inspections	PM	PM	Text
	Identification of applicable material design standards (title/edition)	PM	PM	Text
	Structural shop drawings	Z-0xx	ZS0xx	Graphic
9-Fire Protection-Active	**Active Fire Protection Criteria** ***Provides the design framework for the fire protection drawing disciplines. Identification of the type of system(s) required versus provided is necessary. This information is often located on shop drawings. Often requires supporting design calculations.***			
	Fire suppression *Include floor plan identifying the different types of systems (e.g., wet,*	P-1xx	FX1xx	Graphic

	dry, pre-action, foam), water supply, backflow protection, spacing of fire protection devices, and remote area.			
	Fire department connections	P-1xx	FX1xx	Graphic
	Fire extinguishers	A-1xx	FX1xx	Graphic
	Standpipes	P-1xx	FX1xx	Graphic
	Fire alarms, automatic and manual	E-1xx	FA1xx	Graphic
	Single-station smoke detectors	E-1xx	FA1xx	Graphic
	Smoke control	M-1xx	FX1xx	Graphic
	High-hazard abatement	PM	H1xx	Graphic or Text
	Identification of applicable design standards (title/edition)	PM	PM	Text
	Fire suppression system shop drawings	Z-1xx	ZF1xx	Graphic
10-Plumbing	**Plumbing Design Criteria**			
	Required vs. provided fixtures and distribution (male vs. female)	G-0xx	GI0xx	Text
	See *UDS Appendix H - Plumbing Fixture Schedule, UDS section 8.13*	P-0xx or PM	PL0xx or PM	Text
	Water distribution sizing criteria	P-6xx	PL6xx	Graphic
	Plumbing riser diagram	P-5xx	PL5xx	Graphic
	Drain, waste, and vent system details	P-1xx	PL1xx	Graphic
	Cleanout locations	P-1xx	PL1xx	Graphic
	Indirect waste connections	P-1xx	PL1xx	Graphic
	Water heater location	P-1xx	PL1xx	Graphic
	Backflow preventors	P-1xx	PL1xx	Graphic
	Roof storm water drainage	P-6xx	PL6xx	Text
	Piping hanger schedule	P-5xx	PL5xx	Graphic
	Penetration details	P-1xx	PL1xx	Graphic
	Interceptors and separators	P-1xx	PL1xx	Graphic
	Special systems (gas, air, vacuum, etc.)	PM	PM	Text
	Identification of applicable fixture and pipe standards (title/edition)	PM	PM	Text
11-Mechanical	**Mechanical Design Criteria**			
	Equipment installation and listing	PM	PM	Text
	Specific appliance details (e.g., unit heaters)	M-5xx	MH5xx	Graphic
	Duct construction	PM	PM	Text
	Piping support	M-5xx	MP5xx	Graphic or Text
	Ventilation schedule	M-6xx	MH6xx	Graphic
	See *UDS Appendix G - Ventilation Schedule, UDS section 8.12*	M-6xx or PM	MH6xx or PM	Text
	Exhaust and intake locations	M-1xx	MH1xx	Graphic
	Kitchen exhaust and suppression	M-4xx	MH4xx	Graphic

	Fire dampers	M-1xx	MH1xx	Graphic
	Combustion air	M-1xx	MH1xx	Graphic
	Chimneys, flues, and vents	M-1xx	MH1xx	Graphic
	Boilers and water schedule	P-6xx	PL6xx	Text or Graphic
	Fuel/gas piping materials	PM	PM	Text
	Refrigerant piping materials	PM	PM	Text
	Hydronic piping materials	PM	PM	Text
	Controls	M-6xx	MI6xx	Graphic or Text
	Identification of applicable mechanical standards (title/edition)	PM	PM	Text
12-Electrical	**Electrical Design Criteria**			
	Equipment installation and listing	PM	PM	Text
	Wiring methods and materials	PM	PM	Text
	Single-line diagram	E-6xx	EP6xx	Graphic
	Over current protection	E-6xx	EP6xx	Graphic
	Grounding details	E-5xx	EP5xx	Graphic
	Service details	E-5xx	EP5xx	Graphic
	Transformers	E-1xx	EP1xx	Graphic
	Emergency power/standby systems	E-1xx	EP1xx	Graphic
	Disconnects	E-1xx	EP1xx	Graphic
	Identification of electrical equipment standards (title/edition)	PM	PM	Text

Module 8 - Code Conventions

8.3 THE PLAN REVIEW PROCESS

An efficient, carefully executed plan review is vital to maintain health, safety, and public welfare. Maintaining these standards, however, requires a combined effort of the local jurisdiction as well as the design professional. To perform a review of the construction documents, the documents must show the necessary information. The design professional's responsibility is to identify what is required and how it is to be shown in the construction documents.

The plan review process can be more effective and efficient if a formal procedure is followed. In addition, a preliminary review involving an informal meeting is always helpful to set the stage for an efficient procedure. Correctly completed application forms and construction documents (including supporting data such as structural calculations) will expedite the process.

The following indicates the general milestones of the regulatory process:

- Construction documents and permit applications received.
- Applicable regulations identified.
- Compliance with regulations verified.
- Construction documents approved.
- Permit issued.

- Project inspected.
- Certificate of Occupancy/Completion issued.

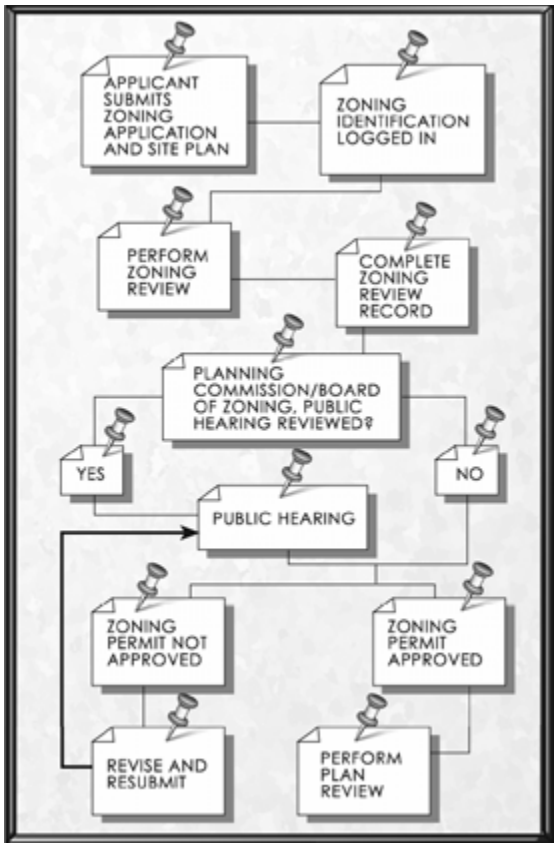
The appropriate application forms and construction documents are typically filed on behalf of the owner. For the design professional to evaluate the requirements of the local jurisdiction, it is important to understand the plan review process. With increases in technology, some jurisdictions are employing an electronic code review process. This is intended to expedite the process by enabling the information to be transmitted directly to the reviewer. This process also allows for real-time responses to be transmitted from the reviewer to the design professional. The viability of an electronic review process should be coordinated in advance with the local jurisdiction. Additionally, third-party plan review services, such as those offered by the model code groups, are often used to expedite the process whenever the authority having jurisdiction does not have the expertise or staff to perform such reviews. It is important to note that the final authority to approve the construction documents and issue the permit rests with the local authority.

Depending on the scope and complexity of the project, it may be more expeditious to use a phased series of reviews. This typically takes the form of an early review where the drawings are still in progress but are of sufficient detail for a partial permit such as a foundation permit. This process includes a review of the building occupancy, height and area, fire protection requirements, and preliminary egress considerations. It also includes a review of the foundation drawings, including the applicable structural loading criteria needed to design and detail the foundation. This partial permit, in turn, allows for the excavation and foundation construction to proceed while the final construction documents are being finished. Once completed, the final construction documents would be submitted for a final building review.

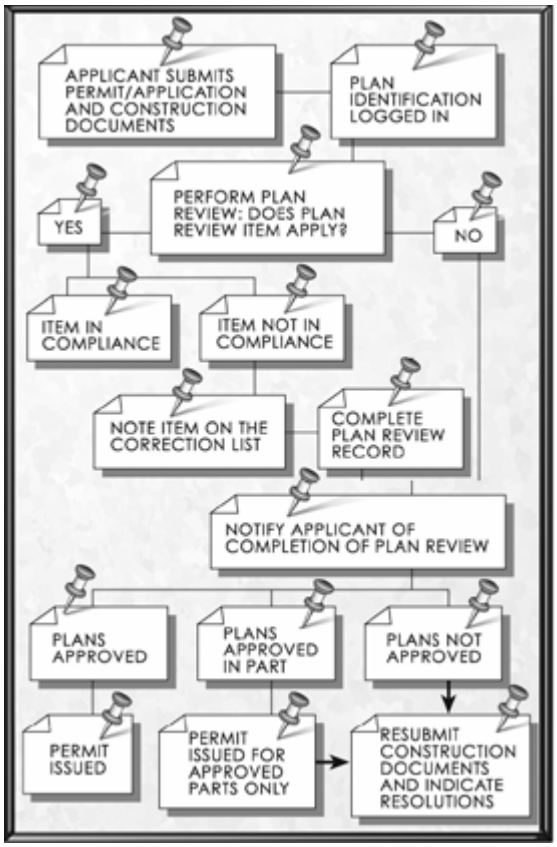
The review of shop drawings is another type of phased review. This procedure results in a separate review, often after the building permit is issued. Such reviews are necessary because the preparation of construction documents can be fragmented and may not provide some necessary detailed information to ascertain code compliance. Roof truss drawings are a good example. The construction drawings may indicate a certain type of truss, but the detailed drawings are developed by the contractor as part of a separate review package that occurs while the project proceeds.

> *The building permit will typically not be issued until construction documents have been reviewed and approved for regulatory compliance. This includes phased permits.*

The flow charts in ***UDS Figures 8.3-1*** and ***8.3-2*** illustrate the general review process for zoning and building.

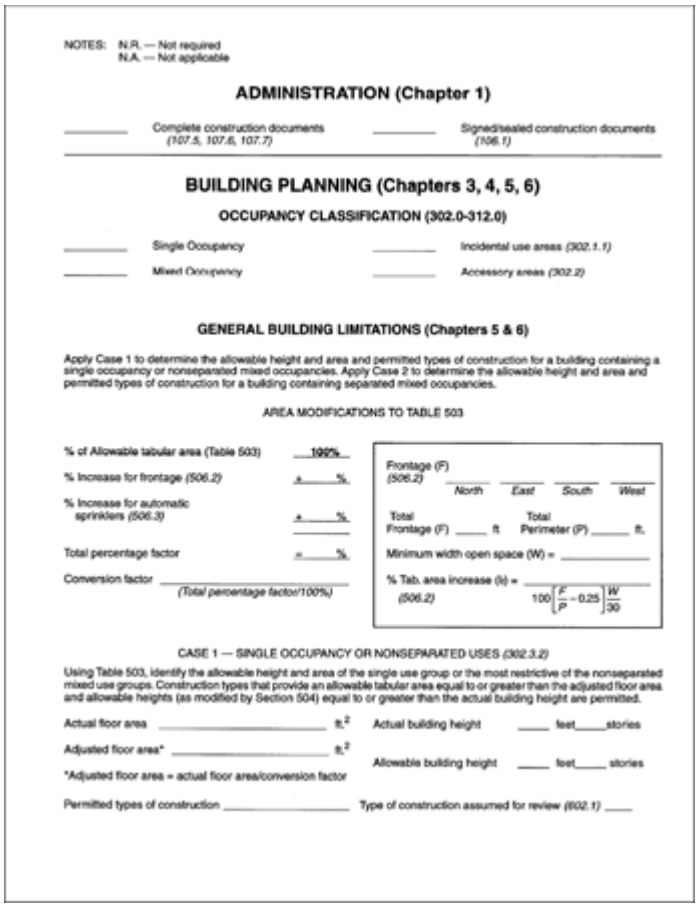


UDS Figure 8.3-1 *The zoning review process.*



UDS Figure 8.3-2 *The building plan review process.*

Often, the process entails the use of a checklist that identifies specific sections in the code. The plan reviewer evaluates each section against the submitted construction documents. This often results in a correction list that identifies the deficiencies noted in the review. Once resolved, the permit can be issued. The following is an example of a partially completed plan review record form along with the correction list. Refer to ***UDS Figures 8.3 -3*** and ***8.3-4***



NOTES: N.R. — Not required
N.A. — Not applicable

ADMINISTRATION (Chapter 1)

_____ Complete construction documents *(107.5, 107.6, 107.7)* _____ Signed/sealed construction documents *(106.1)*

BUILDING PLANNING (Chapters 3, 4, 5, 6)

OCCUPANCY CLASSIFICATION (302.0-312.0)

_____ Single Occupancy _____ Incidental use areas *(302.1.1)*

_____ Mixed Occupancy _____ Accessory areas *(302.2)*

GENERAL BUILDING LIMITATIONS (Chapters 5 & 6)

Apply Case 1 to determine the allowable height and area and permitted types of construction for a building containing a single occupancy or nonseparated mixed occupancies. Apply Case 2 to determine the allowable height and area and permitted types of construction for a building containing separated mixed occupancies.

AREA MODIFICATIONS TO TABLE 503

% of Allowable tabular area (Table 503) 100%

% Increase for frontage *(506.2)* + ____ %

% Increase for automatic sprinklers *(506.3)* + ____ %

Total percentage factor = ____ %

Conversion factor _____ *(Total percentage factor/100%)*

Frontage (F) *(506.2)* North ____ East ____ South ____ West ____

Total Frontage (F) ____ ft. Total Perimeter (P) ____ ft.

Minimum width open space (W) = _____

% Tab. area increase (Ia) = _____ *(506.2)* $100\left[\frac{F}{P} - 0.25\right]\frac{W}{30}$

CASE 1 — SINGLE OCCUPANCY OR NONSEPARATED USES *(302.3.2)*

Using Table 503, identify the allowable height and area of the single use group or the most restrictive of the nonseparated mixed use groups. Construction types that provide an allowable tabular area equal to or greater than the adjusted floor area and allowable heights (as modified by Section 504) equal to or greater than the actual building height are permitted.

Actual floor area _____ $ft.^2$ Actual building height ____ feet____stories

Adjusted floor area* _____ $ft.^2$ Allowable building height ____ feet____ stories

*Adjusted floor area = actual floor area/conversion factor

Permitted types of construction _____ Type of construction assumed for review *(602.1)* ____

UDS Figure 8.3-3 *Partially completed plan review record form.*

2000 INTERNATIONAL BUILDING CODE PLAN REVIEW RECORD

Plan Review # _____
Date: _____
Valuation: _____
Fee: _____

JURISDICTION: _____
(City, County, Township, etc.)

BUILDING LOCATION: _____
(Street address)

BUILDING DESCRIPTION: _____

REVIEWED BY: _____

Numerals indicated in parenthesis are applicable code sections of the 2000 International Building Code. The plan review accomplished as indicated in th limited to those code sections specifically identified herein. This record references commonly applicable code sections. It does not reference all code which may be applicable to specific buildings. This record is designed to be used only by those who are knowledgeable and capable of exercising judgement in evaluating construction documents for code compliance.

CORRECTIONS LIST

No.	DESCRIPTION

UDS Figure 8.3-4 *Corrections list.*

The plan reviewer is responsible for evaluating construction documents with respect to a code and noting the plan's deficiencies or code violations (with the appropriate code sections). It is not the plan reviewer's function to recommend design changes to secure code compliance. However, an informal discussion of the plan examination results, with an interpretation of particular code provisions, will improve the dialogue between the building department and the design professional. Matters of interpretation should be documented as part of the permit process to create a comprehensive record for approval or rejection of the construction documents. Occasionally, matters of interpretation can become contentious. When this occurs, local code officials may seek the opinion of third-party agencies, such as the model code groups. Again, the authority to enforce and interpret the code rests ultimately with the local authority. Matters of dispute are sometimes forwarded to the local board of appeals for resolution. Where boards of appeal do not exist, state boards or agencies may resolve disputes. Final resolution may be through the judicial system.

Plan Review and Inspections

The applicant is legally obligated to correct the situation if the field inspector discovers a code violation, even if the violation is apparent on the approved construction documents. This again points out the need for a competent and thorough plan examination coupled with adequate information on the drawings. To expect, or even anticipate, that code violations will be discovered in the field places an unnecessary burden on the inspector. Resolving field problems often causes construction delays and increased costs. There may also be penalties incurred for some code violations. The time to find nonconformity with the code is in the plan review stage.

A frequently overlooked aspect of a plan review is that of the special inspection. It is both a plan review item as well as an inspection item. The special inspection provisions in the codes identify additional third-party inspections for which the owner is responsible. Inspection of fabricators is an example. The building inspector

relies on third-party inspection reports for those items that are not constructed on the site. However, it is during the plan review stage of the project where those items for which special inspections will be performed and the agency responsible must be identified.

Module 8 - Code Conventions

8.4 OVERVIEW OF REGULATORY INFORMATION

Historical Overview

The purpose of codes is to preserve the health, safety, and welfare of the general public. One of the earliest and most rudimentary of building codes was developed in the Babylonian Empire around 2000 B.C. and was attributed to King Hammurabi. The law provided that

> If a builder built a house for a man and completed it, that man shall pay him two shekels of silver per say (approximately 12 square feet) of house as his wage. If a builder has built a house for a man and his work is not strong, and if the house he builds falls in and kills the householder, that builder shall be slain. If the child of the householder should be killed, the child of that builder shall be slain. If the slave of the householder should be killed, he shall give slave to the householder. If goods have been destroyed, and because the house was not made strong, and it has fallen in, he shall restore the fallen house out of his own material. If a builder has built a house for a man, and his work is not done properly and a wall shifts, then that builder shall make that wall good with his own silver.

This extreme viewpoint has been tempered by the development of codes. In Rome, in approximately 27 A.D., the governing body enacted regulations for the safety of public places. This was in response to the collapse of an amphitheater, which killed or injured approximately 50,000 people. In London, the Assize of Buildings was promulgated by Mayor Henry Fitz-Elwyne in 1189. This law regulated the construction of party walls. This was followed by the London Building Act in 1666, which followed the great fire of London. In 1871, the most infamous fire in the United States occurred, the Chicago fire. It lasted for almost two days, killed 250 people, and destroyed 17,000 buildings. In 1875, the city enacted a building code and a fire prevention code.

Development of Model Codes in the United States

A model code is a written set of regulations that provides the means for exercising reasonable control over construction and is available for adoption by cities, counties, states, or countries, with such changes as may be desirable or legal for local needs. In 1905, the National Board of Fire Underwriters (now the American Insurance Association) published the National Building Code. Since then four model code agencies have formed. The following are significant milestones in the development of the four model codes

1915 Building Officials Conference of America (BOCA) established to provide a forum for the exchange of knowledge and ideas concerning building safety and construction regulations. In 1950, BOCA, now Building Officials and Code Administrators International, Inc., published the *BOCA Basic Building Code* (now called the *BOCA National Building Code*). The BOCA National Codes are used predominately in the midwestern and northeastern United States.

1927 Adoption of the *Uniform Building Code* by the Pacific Coast Building Officials Conference, now the International Conference of Building Officials (ICBO). The Uniform Codes are used predominately in the western United States.

1945 Publication of the *Standard Building Code* by Southern Building Code Congress International (SBCCI). The Standard Codes are used predominately in the southeastern United States.

1995 Publication of the *International Plumbing Code* by the International Code Council, Inc. (ICC). The ICC is an umbrella organization of representatives from BOCA, ICBO, and SBCCI, which was organized in 1994 to develop, maintain, publish, and provide support services for a single set of comprehensive, coordinated model codes. Prior to 1994, the Council of American Building Officials (CABO) served as the umbrella organization of the three model code groups.

2000 Publication of a single set of comprehensive, coordinated codes by the ICC, entitled the *International Codes*, including the following: Building, Electrical, Energy Conservation, Fire, Fuel Gas, Mechanical, Plumbing, Private Sewage Disposal, Property Maintenance, Residential, and Zoning Codes. These codes are intended for adoption across the United States.

The model codes are minimum requirements intended to ensure public safety, health, and welfare. The model code groups share a fundamental tenet: ease the burden of state and local governments through the development and maintenance of standardized regulations. Absent such model codes, it is the responsibility of state and local governments to develop their own regulations. Even with model codes, states make amendments that result in different requirements within the model codes. The enforcement authority rests with the jurisdiction that formally adopts the respective code.

The model codes are developed and maintained through a democratic public hearing and revision procedure that allows all interested parties the opportunity to both propose changes to code provisions and testify regarding such change proposals. Change proposals are either accepted or rejected by vote of the respective organizations' eligible voting members. In the case of the ICC, this includes the eligible voters of BOCA, ICBO, and SBCCI. In recent years the three codes promulgated by BOCA, ICBO, and SBCCI have undergone a three-year revision cycle. With the development of the ICC International Codes, the three groups have individually ceased the development of their respective codes. The International Codes, with the comprehensive inaugural edition in 2000, is slated for a three-year revision cycle. The code development activity between editions typically consists of at least two phases, each phase being a complete code change cycle.

In Canada, the *National Building Code*, which pertains primarily to the needs of health and safety, has received wide use as the basis for provincial codes and municipal bylaws. Liaison with provincial and territorial code authorities is maintained through the Provincial/Territorial Committee on Building Standards.

Referenced Standards

A model code establishes minimum quality and performance criteria for the materials and methods regulated by the code. For many materials and methods, the code relies on referenced standards to provide these criteria. The referenced standards are an enforceable extension of the code. Standards supplement the code by setting forth conditions or requirements that a material or method must meet, thereby providing an acceptable level of safety for building occupants. To comply with the provisions of the model code, a material or method must meet the requirements of the referenced standard. Material referenced standards are often used as the basis by which a product is labeled. This label, which is identified on the product, includes information such as name of the manufacturer, function of the product, and name of the approved agency that conducted the applicable tests.

A standard is a published technical document that represents an industry consensus on how a material or assembly is to be designed, manufactured, tested, or installed so that a specific level of performance is obtained. Standards are primarily developed by industry organizations and professional associations incorporating the views of interested parties. A standard is developed in response to an identified need and typically contains information based on many years of testing and research.

A standard is not intended to be used as primary law but as a secondary authoritative reference. While a model code becomes law when it is adopted by a jurisdiction, a standard only becomes law to the extent to which it is referenced in a model code.

Standards can generally be grouped into four categories:

- Materials
- Design
- Installation
- Testing

The following is an example of each of the four types of standards. The list includes the type of standard, the standard writing organization, and the scope and application of the standard.

Material: American National Standards Institute
ANSI A208.1, Particleboard
The standard includes definitions, dimensional tolerances, and physical and mechanical property requirements for different grades of particleboard.

Design: International Code Council
ICC A117.1, Accessible and Usable Buildings and Facilities
The standard includes technical design criteria for making sites, facilities, buildings, and elements accessible to those with disabilities.

Installation: National Fire Protection Association
NFPA 13, Installation of Sprinkler Systems
The standard includes the installation requirements for automatic fire sprinkler systems.

Testing: American Society for Testing and Materials
ASTM E119, Test Methods for Fire Tests of Building Construction and Materials
This standard is a fire-test response standard intended to register the fire performance of a given assembly for a period of fire exposure.

A referenced standard becomes an enforceable part of the code to the extent and scope as referenced in the text of the code itself. The listing of applicable standards, along with their specific edition, title, and the sections that reference the standard are typically included in the code's last chapter, prior to any appendices.

State/Local Codes and Amendments

The model codes were developed to ease the burdens of state and local governments by providing a set of regulations readily available for adoption. Most states have adopted a model code without modifications. Other states and local jurisdictions have adopted a model code with modifications; still others have chosen to develop their own unique set of regulations. When this occurs, the amendments are often centered on the administrative provisions of the code. Typically, this is a response to local administrative procedures, which may be unique to a jurisdiction and, therefore, are not covered in the model code. Technical changes to the model codes may also occur through the amendment process. For example, jurisdictions with limited fire-fighting capabilities may modify the sprinkler requirements in the code to gain the benefits of sprinkler protection in a building that would otherwise not require sprinklers.

Federal Regulations

There are numerous federal agencies, each with a specified mission and rule-making authority. Some of the regulations affect building design and others do not. The design professional must be cognizant of regulations other than those published in the adopted code. The following are examples of regulations that may impact the project.

- **ADA:** In 1990, Congress passed the **Americans with Disabilities Act (ADA)**. This act covers employment discrimination, public transportation, public accommodations, and telecommunications. Of particular interest to design professionals is Title III and the ADA Accessibility Guidelines (ADAAG) developed by the U.S. Architectural and Transportation Barriers Compliance Board (USATBCB—The Access Board). The ADAAG includes building construction requirements for places of public accommodation and commercial facilities

relative to making such structures accessible for persons with disabilities. As civil rights legislation, the ADA is enforced through the U.S. Department of Justice in response to civil suits.

- **CPSC:** The Consumer Product Safety Act is an example of federal legislation that impacts building materials viewed as potential hazards to consumers. The **Consumer Product Safety Commission (CPSC)** is an independent regulatory commission consisting of five commissioners. The commission has the power to create standards relative to consumer products, which are intended to abate hazards to consumers. Probably the most recognizable standard to design professionals is CPSC 16 CFR; 1201, Safety Standard for Architectural Glazing, which includes requirements for safety glazing in hazardous locations and is referenced in the codes.
- **EPA:** In 1970, the **Environmental Protection Agency (EPA)** was established, with a mission to protect human health and safeguard the natural environment: air, water, and land. One of the first acts was the Clean Air Act of 1970, which is a comprehensive federal law that regulates emissions from area, stationary, and mobile sources. In addition, EPA issued a new ruling to the Clean Air Act, which provides for National Volatile Organic Compound (VOC) emission standards for architectural coatings.
- **FHAA:** The residential counterpart to the ADA, the **Fair Housing Amendments Act (FHAA)**, enacted in 1988, covers accessibility issues for multiple-family housing of four units or more on a site. In response to this act, the U.S. Department of Housing and Urban Development (HUD) developed the Fair Housing Accessibility Guidelines (FHAG). The FHAA is administered and enforced by HUD.
- **NFIP:** The National Flood Insurance Act of 1968 was enacted by the Housing and Urban Development Act of 1968 to provide flood insurance protection to property owners in flood-prone areas. The **National Flood Insurance Program (NFIP)**, administered by the Federal Emergency Management Agency (FEMA), includes requirements for elevating structures above the base flood elevation and otherwise maintaining the structure as flood resistant. The basis for the flood potential of a given locality is the Flood Insurance Rate Map published by FEMA.
- **OSHA:** Congress established the **Occupational Safety and Health Administration (OSHA)** in 1970. Among OSHA's many missions is to eliminate workplace injuries. This indirectly affects design professionals because OSHA is occasionally asked to inspect and evaluate working conditions at building construction sites to determine whether the construction is progressing safely.
- **USACE:** The **United States Army Corps of Engineers (USACE)** has been in place for over two centuries. Its three broad missions include: Civil, Military, and Support for Others. The Civil works programs involve the planning, design, construction management, operation, and maintenance of water resources projects to abate flood and storm damage. The Support for Others mission includes work done for other federal agencies such as the Department of Energy, EPA, and FEMA.

A listing of additional agencies that may impact regulatory compliance can be found on the web at ARCAT.com.

Zoning Ordinances and Zoning Codes

A zoning ordinance is a system that regulates the use and development of property within a municipality or county. The objectives of zoning are environmental, economic, efficient land use and a well-blended community of buildings where the uses are complementary.

Most zoning ordinances and codes divide the municipality or county into districts. Within each district, certain types of uses are permitted. For example, in a general system of zoning regulation, there might only be five districts: agricultural (A), residential (R), commercial (C), commercial/residential (CR), and factory/industrial (FI). These districts, in turn, may be further subdivided into divisions (e.g., R-1, C-2, etc.). By their very names, the districts may or may not indicate what types of land uses are permitted within the boundaries of those districts. This would be a function of the amount of subdividing that is incorporated into the district. For example, an R-1 district may include other uses such as fire station or public park. Besides defining these permitted uses, zoning ordinances control the height, area, and volume of buildings, as well as setbacks and location of open spaces within districts. Zoning ordinances and codes may also include administrative provisions regarding the creation of planning commissions, boards of appeal/adjustment, hearing procedures, and general provisions regarding off-street parking, locations of accessory buildings, and landscaping provisions.

Generally, zoning issues are local. However, there may be state mandates that affect local zoning. Compliance with local zoning ordinances is typically one of the first evaluations that must be performed by the design professional regarding the planning/predesign and design phases of the project cycle.

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8.5 THE DESIGN PROCESS

Identification of the applicable regulatory issues is an integral part of the planning/predesign and design phase of the project. When determining the viability of a project for a given site or site selection, the zoning ordinances and codes must be reviewed to decide if the project complies with the local authority's planning objectives for development. Federal agencies such as FEMA (e.g., flooding considerations) or the EPA (e.g., environmental emissions) may have specific legislation that governs the project.

The type of project may also impact design considerations. In fact, the project may be beyond the scope and enforceability of the local jurisdiction. For example, projects being designed for the federal government (e.g., post offices, military bases, government offices, Native American jurisdictions) are exempt from local regulations. However, these projects must comply with local zoning requirements. With a common goal of protecting the public safety, the federal government often requires that projects be designed in conformance with applicable local codes, even though the projects are not subject to enforcement by local authorities. Such projects often occur with the local jurisdiction given the opportunity to be involved in the project, but with limited input. Ultimately, the applicable governing authority sets the project regulations.

On the building side of the project, identification of the applicable code(s) and their respective editions must occur as part of the design of the building. This applies to both new construction and additions, alterations, and changes of occupancy relative to existing buildings. Identification of local amendments that affect the design is also important. As is discussed in the Plan Review Process section of this Module, some jurisdictions may use an electronic plan review process, which may impact how the design professional packages and submits the construction documents.

Identification of the applicable regulations may require a review of not only the applicable regulations of the building department but other jurisdictions as well. Coordination among the building department, fire department, water and sewer utilities, and the design professional is crucial to determine if there is any regulatory overlap among departments that may affect the design. Similarly, the design and enforcement may be governed by multiple agencies such as a board of education (schools), board of health (hospitals), historical preservation, environmental requirements, or local utility.

In all cases, the design professional is encouraged to contact the local authority(ies) in the early design phases of the project to determine local regulatory requirements.

The final goal in the development of construction documents is the completion of the project coupled with the issuance of the certificate of occupancy (sometimes called the certificate of completion). The issuance of the certificate of occupancy is the last stage of the regulatory process. The first stage in the regulatory process is identification and analysis of applicable regulations. The second stage is implementation of applicable regulations into the construction documents. These two stages lead to an application for permission to construct (referred to as a building permit). One of the most critical, time-sensitive aspects of the process is reviewing the construction documents for code compliance.

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8.6 APPENDIX A - SUMMARY OF GOVERNING REGULATIONS

Jurisdiction	Local	State	Remarks

Code-Enforcement Jurisdiction			
Zoning Jurisdiction			
Code	**Title**	**Edition**	**Local Amendment (Y/N)**
Building Code	International Building Code	2000	No
Accessibility Code	ANSI A117.1	1998	No
Mechanical Code	International Mechanical Code	2000	No
Electrical Code	International Electrical Code	2000	No
Plumbing Code	International Plumbing Code	2000	No
Fire Prevention Code	International Fire Prevention Code	2000	No
Zoning Code	International Zoning Code	2000	Yes
Insert other applicable ordinances or codes	National Flood Insurance Program	1990	No

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8.7 APPENDIX B - GENERAL BUILDING SUMMARY

Height and Area								
Building(1)	**Occupancy Group(s)**	**Type of Construction**	**Sprinkler System(2)**	**Building Area (sq ft)**		**Building Height (ft/# of stories)**		**Remarks**
				Actual	**Allowable**	**Actual**	**Allowable**	
A								
B								
C								

Mixed Occupancy(3)							
Separate Uses		**Y or N**	**Nonseparated Uses**		**Y or N**		
Fire Area	**Occ. Groups**	**Fire Area**	**Occ. Groups**	**Fire Area**	**Occ. Groups**	**Fire Area**	**Occ. Groups**
A		C	E		G		
B		D	F		H		

Special Uses and Occupancy(4)		
Conditions Applicable	**Y or N**	**Special Use**

(1) Fill in Buildings A, B, C, etc. where multiple buildings are created with fire walls. See Fire Area Key Plan Example 3A for fire wall locations.

(2) Identify type of system (e.g., NFPA 13 or 13R system).

(3) See Fire Area Key Plan Examples 2, 3A, 3B, 3C, and 3D for mixed occupancy separation location.

(4) Identify if a special use or occupancy is present and the type (e.g., covered mall, high rise, atrium, high-hazard materials).

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8.8 APPENDIX C - ROOM-BY-ROOM EGRESS

Floor Level	Room Name	Room Number	Floor Area (sq ft)	Travel Distance in Room (ft)	Egress Capacity from Room (# occ)		# Means of Egress from Room		Remarks
					Actual	Required	Actual	Required	
Lower level 2									
Lower level 1									
1									
2									
3									
4									
5									

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8.9 APPENDIX D - FLOOR-BY-FLOOR EGRESS

Floor Level	Travel Distance (ft)		# Exits		Exit Capacity (# occ)		Remarks
	Actual	Allowable	Actual	Required	Actual	Required	
Lower level 2							
Lower level 1							
1							
2							
3							
4							
5							

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8.10 APPENDIX E - FIRE-RESISTANCE RATINGS

Element	Rating(s)	Design Number(s)	Remarks
Fire Walls			
Exterior Bearing Walls			
Exterior Nonbearing Walls			

Fire Barriers(1)
Fire Partitions(2)
Smoke Barriers
Columns
Floors
Roof

(1) Exits, shafts, incidental use areas, mixed occupancies

(2) Corridors, dwelling/tenant/guestroom separations

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8.11 APPENDIX F - ACCESSIBILITY

Parking		Guestrooms(1)		Dwelling Units(1)		Assembly Occupancies		Remarks
Total	Accessible Spaces	Total Number	Number Accessible	Total Number	Number Accessible and Type	Total Seating	Number of Wheelchair Spaces	

(1) Table can be expanded to include other categories such as patient rooms, jail cells, etc.

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8.12 APPENDIX G - VENTILATION SCHEDULE

Location	Floor Area (sq ft)	Occupant Load Rate	Calculated Occupant Load	Outdoor Air Rate (cfm/person unless noted)	Required Outdoor Air (cfm)	Provided Outdoor Air (cfm)	Remarks

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8.13 APPENDIX H - PLUMBING FIXTURE TABULATION(1)

Fixture	Number Required		Number Provided		Remarks
	Female	Male	Female	Male	
Water Closet					
Urinals					
Lavatories					
Bathtubs/Showers					
Drinking Fountains					
Service Sinks					
Kitchen Sinks					
Clothes Washer					
Connection					

(1) Per building or floor, as applicable

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8.14 APPENDIX I - LOCATION OF INFORMATION BASED ON CATEGORY GROUP CATEGORY

Category Group	Regulatory Information	Location	Remarks
1-General	**Project identification**		
	Project address *Street address, city, and state*		
	Project location map		
	Professional design firm(s) identification		
	Contractor name(s)		
	Design professional name(s)		
	Design professional address(es)		
	Design professional phone/fax number(s)		
	Design professional e-mail/website		
	Design professional license number and seal		
	Listing of applicable codes (titles and edition)		
	Accessibility		
	Building		
	Electrical		
	Energy conservation		

	Fire
	Fuel/gas
	Mechanical
	Plumbing
	Private sewage disposal
	Property maintenance
	Residential
	Zoning
	Other
	Listing of applicable local ordinances and jurisdictions
	Local amendments
	Zoning
	Signage
	Other

2-Site	**Site-Related Design Criteria**
	Location on site (distances to lot lines/existing buildings)
	Site grading/water run-off
	Irrigation
	Erosion control details
	Environmental impact statements
	Zoning drawings
	Zoning use (allowable/actual)
	Site coverage (allowable/actual)
	Building height (allowable/actual)
	Parking/loading requirements (required/actual)
	Signage type, area, and height (allowable/actual)
	Fire districts
	Historical preservation

3-Building	**Building Design Criteria**
	Use group (occupancy) classification(s)
	Type of construction
	Building area (allowable/actual)
	Building height (allowable/actual)
	Special use and occupancy (e.g., covered mall, high rise)
	Seismic design category
	Design wind speed

4-Life Safety-Egress	**Means of Egress Design Criteria**
	Occupant load(s)
	Building exits per floor (arrangement; required/actual)
	Exit capacity per floor
	Travel distance (allowable/actual)
	Means of egress lighting
	Interior finish classification (allowable/actual)

5-Fire Protection-Passive	**Passive Fire Protection Design Criteria**
	Fire resistance ratings of building elements, including tested design number (required/actual)
	Firestopping shop drawings, including tested design number
	Mixed use (occupancy) separations
	Fire resistive assembly location plan
	Firestopping, including tested design number
	Plastics

6-Accessibility	**Accessibility Design Criteria**
	Exterior accessible routes, including parking
	Location of public facilities on site
	Accessible entrances
	Interior accessible routes
	Clear floor space/maneuverability clearances
	Detectable warnings and signage (exterior)
	Detectable warnings and signage (interior)
	Toilet and bathing facilities
	Elevator and area of rescue assistance details
	Occupancy-specific accessible feature (e.g., assembly, residential dwelling units)

7-Energy	**Energy Design Criteria**
	Design conditions (temperatures)
	Envelope systems analysis
	Envelope insulation levels
	Air leakage/infiltration, sealing
	Glazing type (fenestration) and areas
	Mechanical equipment sizing, loads, and efficiencies
	Electrical equipment sizing, loads, and efficiencies
	Electrical lighting power budget

	Service water heating sizing, loads, and efficiencies
	Duct and hot water piping insulation
	Energy trade-offs
	Temperature controls
	Water conservation

8-Structural	**Structural Criteria**
	Design dead loads (actual)
	Design live loads (required)
	Design snow loads (required)
	Design wind loads (required)
	Design seismic loads (required)
	Soil data (frost depth; allowable foundation type/loads)
	Description of structural system
	Structural details
	Special inspections
	Identification of applicable material design standards (title/edition)
	Structural shop drawings

9-Fire Protection-Active	**Active Fire Protection Criteria**
	Fire suppression
	Fire department connections
	Fire extinguishers
	Standpipes
	Fire alarms, automatic and manual
	Single-station smoke detectors
	Smoke control
	High-hazard abatement
	Identification of applicable design standards (title/edition)
	Fire suppression system shop drawings

10-Plumbing	**Plumbing Design Criteria**
	Required vs. provided fixtures and distribution (male vs. female)
	Water distribution sizing criteria
	Plumbing riser diagram
	Drain, waste, and vent system details
	Cleanout locations
	Indirect waste connections

	Water heater location
	Backflow preventors
	Roof storm water drainage
	Piping hanger schedule
	Penetration details
	Interceptors and separators
	Special systems (gas, air, vacuum, etc.)
	Identification of applicable fixture and pipe standards (title/edition)

11-Mechanical	**Mechanical Design Criteria**
	Equipment installation and listing
	Specific appliance details (e.g., unit heaters)
	Duct construction
	Piping support
	Ventilation schedule
	Exhaust and intake locations
	Kitchen exhaust and suppression
	Fire dampers
	Combustion air
	Chimneys, flues, and vents
	Boilers and water schedule
	Fuel/gas piping materials
	Refrigerant piping materials
	Hydronic piping materials
	Controls
	Identification of applicable mechanical standards (title/edition)

12-Electrical	**Electrical Design Criteria**
	Equipment installation and listing
	Wiring methods and materials
	Single-line diagram
	Over current protection
	Grounding details
	Service details
	Transformers
	Emergency power/standby systems
	Disconnects

Identification of applicable electrical equipment standards (title/edition)

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8.15 APPENDIX J - SAMPLE CODE SUMMARY SHEETS

G-001 List of Sheets
G-002 Symbols and Abbreviations
G-003 Site Location Map
G-004 Site Regulatory Summary Sheet
G-005 Building Regulatory Summary Sheet

A-001 General Architectural Notes
A-002 Egress Plans

F-001 General Fire Protection Notes
F-002 Symbols and Abbreviations
F-003 Fire Area Plans

Below is a list of regulatory information that may appear on the Site and Building Regulatory Summary Sheet (G-004 and G-005). This list is not exhaustive, but includes information typically required for most projects. Users of this module must verify specific requirements for each project and with each agency having approval authority over each project.

Category Group 1 - General

Category Group 2 - Site (partial)
- Zoning information

Category Group 3 - Building

Category Group 4 - Life Safety-Egress (partial)
- Occupant load
- Number of exits
- Exit capacity
- Travel distance

Category Group 5 - Fire Protection-Passive (partial)
- Location of mixed use (occupancy) separations

Category Group 6 - Accessibility (partial)
- Interior accessible routes

Category Group 9 - Fire Protection-Active (partial)
- Identification of fire protection systems provided

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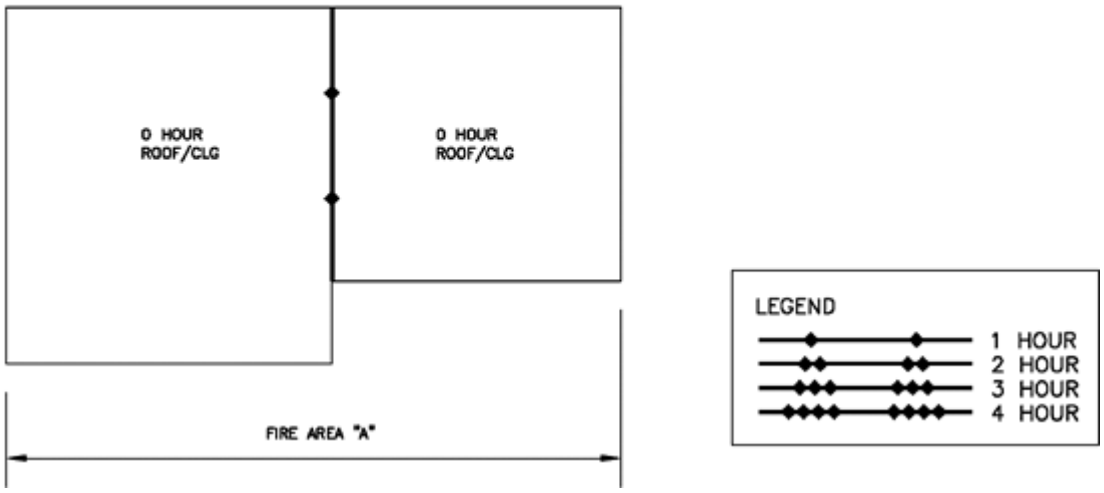
8.16 APPENDIX K - FIRE AREA KEY PLANS

ONE-STORY BUILDING – SINGLE OCCUPANCY

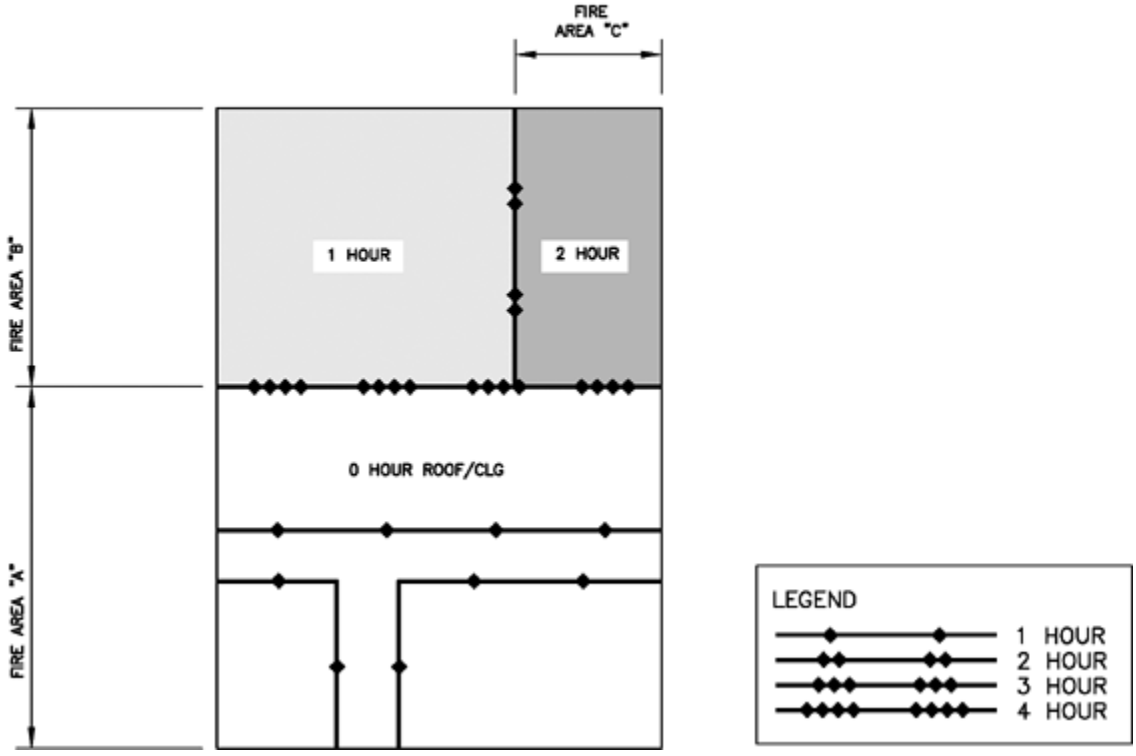
FIRST LEVEL



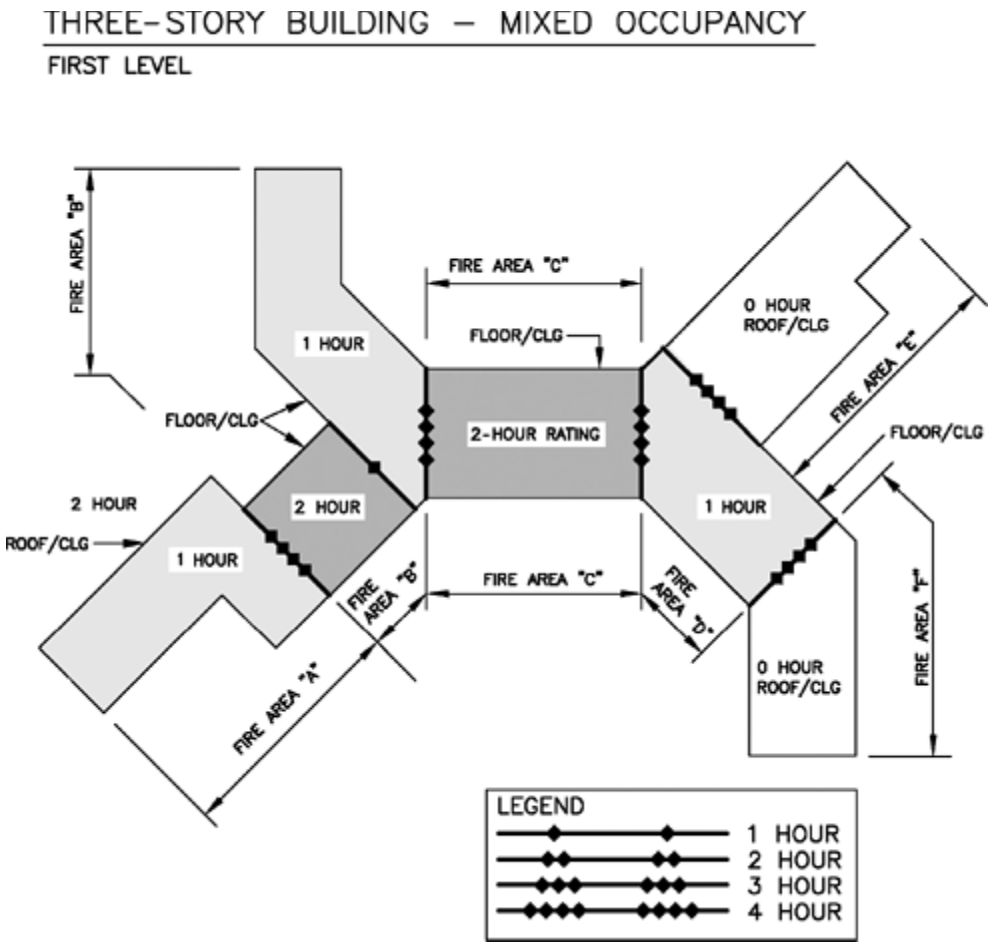
Example 1

ONE-STORY BUILDING – MIXED OCCUPANCY

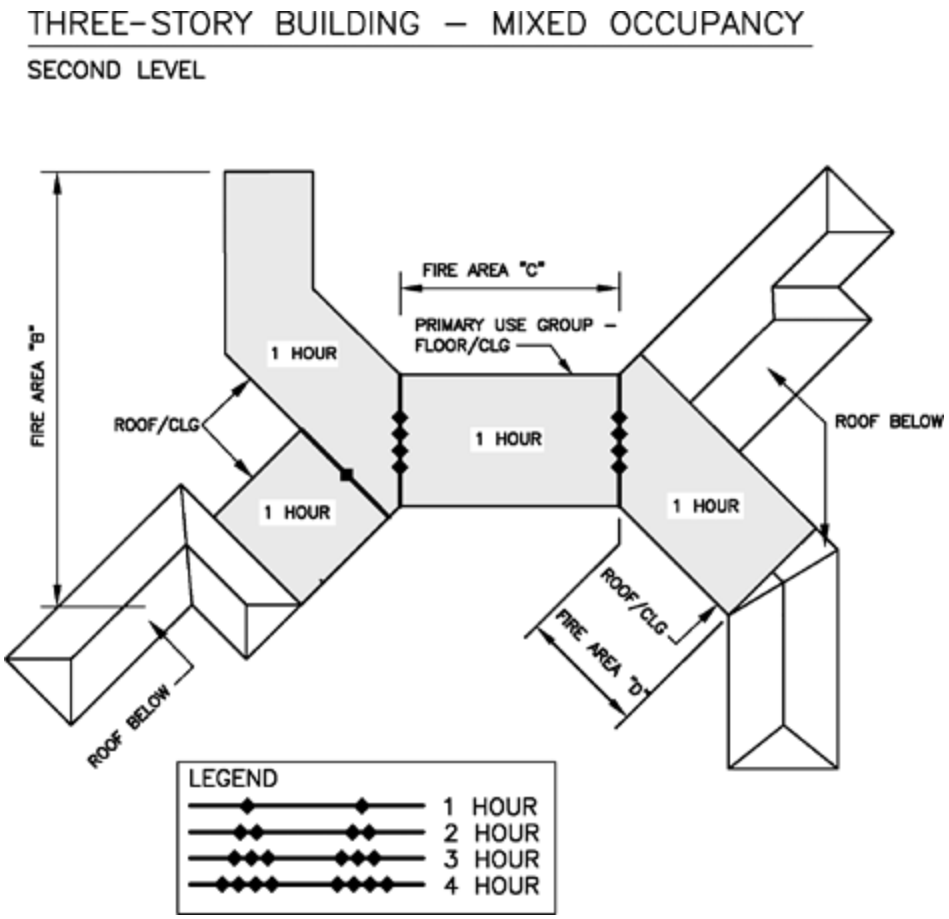
FIRST LEVEL



Example 2


THREE-STORY BUILDING – MIXED OCCUPANCY
FIRST LEVEL
FIRE AREA "G"
FIRE AREA "C"
1 HOUR
FLOOR/CLG
0 HOUR
ROOF/CLG
FIRE AREA "E"
FLOOR/CLG
2-HOUR RATING
FLOOR/CLG
2 HOUR
2 HOUR
1 HOUR
ROOF/CLG
1 HOUR
FIRE AREA "B"
FIRE AREA "C"
FIRE AREA "D"
FIRE AREA "F"
FIRE AREA "A"
0 HOUR
ROOF/CLG
LEGEND
1 HOUR
2 HOUR
3 HOUR
4 HOUR

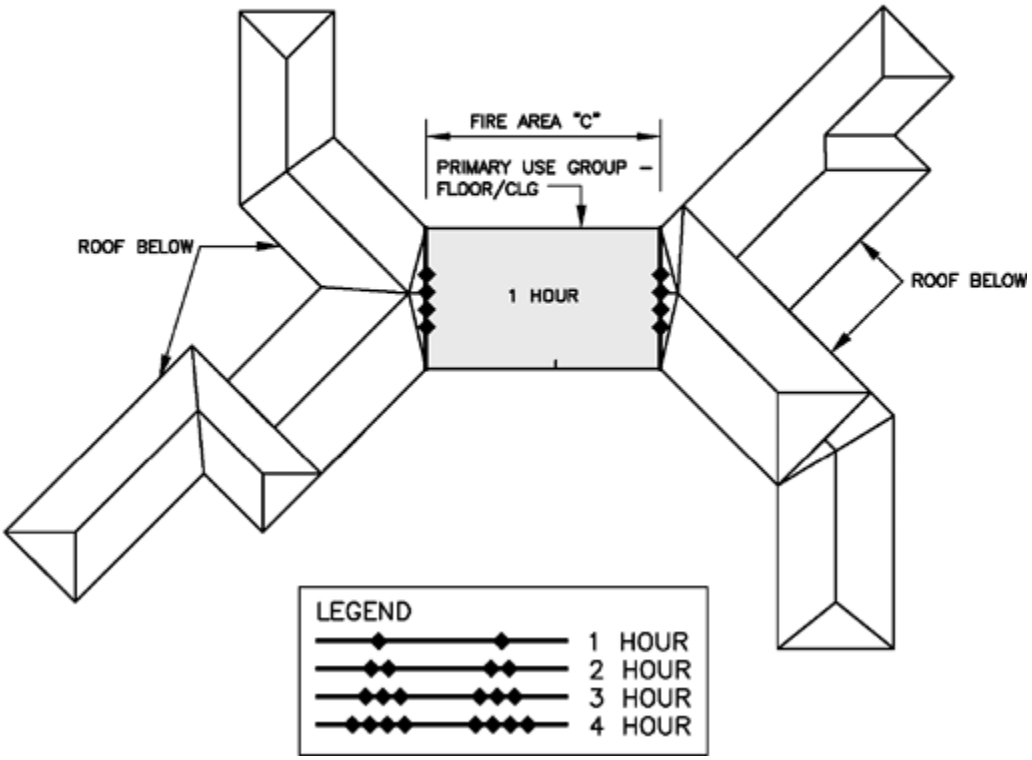
Example 3A


THREE-STORY BUILDING – MIXED OCCUPANCY
SECOND LEVEL
FIRE AREA "B"
FIRE AREA "C"
PRIMARY USE GROUP – FLOOR/CLG
1 HOUR
ROOF/CLG
1 HOUR
1 HOUR
1 HOUR
ROOF BELOW
ROOF/CLG
FIRE AREA "D"
ROOF BELOW
LEGEND
1 HOUR
2 HOUR
3 HOUR
4 HOUR

Example 3B

THREE-STORY BUILDING — MIXED OCCUPANCY

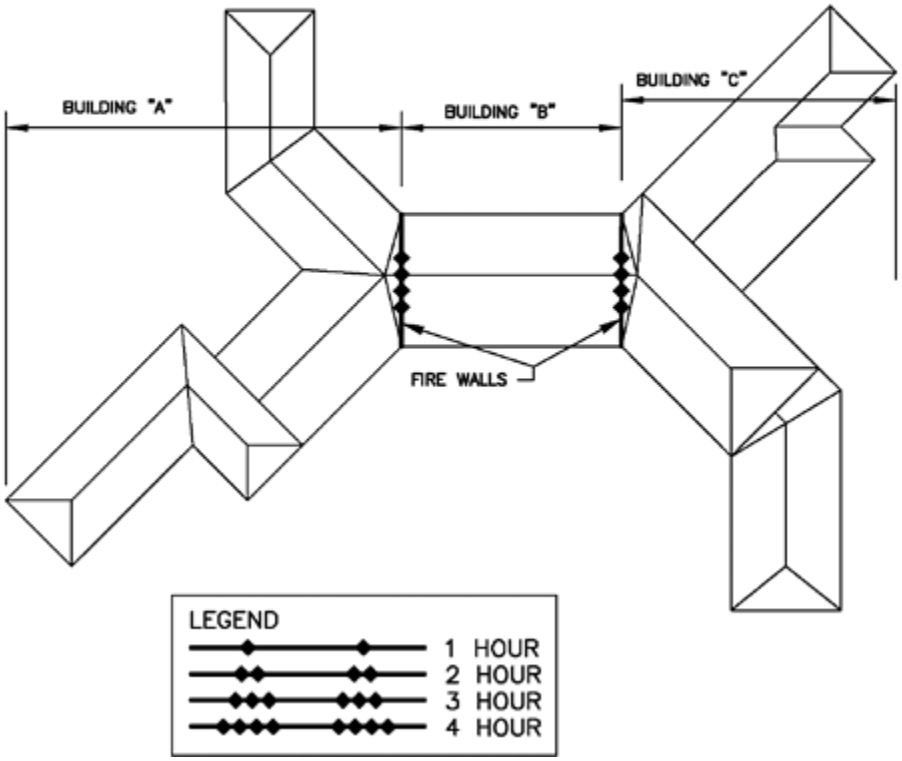
THIRD LEVEL



Example 3C

ONE–STORY OR MULTILEVEL STORY BUILDING – MIXED OCCUPANCY

ROOF LEVEL



Example 3D