# FACILITIES CONFIGURATION MANAGEMENT

# ENGINEERING DRAWING REQUIREMENTS

# DRQ-293006

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| | | | |

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# CHAPTER 1. TECHNICAL DRAWING INFORMATION

## 1.1 PURPOSE

This chapter establishes the technical drawing requirements for all drawings prepared for use in construction projects, general plant operations, including Design Information Summary (DIS), work order (WO), and Construction Contract (COC) packages.

## 1.2 SCOPE

This chapter provides technical guidance for BWXT Pantex drafting technicians, managers, engineers, architects, and architect/engineering (AE) firms or subcontractors to BWXT Pantex that provide facility drawings to Configuration Control.

All technical drawings submitted to BWXT Pantex Configuration Control are to be in the most current version of MicroStation and are created according to the criteria set forth in this manual.

## 1.3 CONTENT, LAYOUT AND SEQUENCING FOR NEW DRAWINGS

This section describes content, layout and sequencing of architectural, engineering and site drawings. The sequencing section specifies information that is typically included in the drawing set.

### 1.3.1 General Drawing Content

Drawings show complete information of the intended construction, modification or current condition of the drawing subject. Drawings are to be as accurate as reasonably possible and include all dimensions, sizes, shapes, materials, locations, elevations, routing, finishes, etc. The drawings, along with the project specifications and other supporting data, shall completely and accurately define all construction requirements. Written information in the specifications should not be duplicated on the drawings unless necessary for clarification. Specifications should only be referenced on the affected drawing sheets.

All record drawings shall be drawn to fit within a 24" x 36" D-size sheet. All record drawings shall incorporate the standard BWXT Pantex title block (See Chapter 1, Section 1.6.), contractor company logo and information is to be placed to the left of BWXT Pantex title block information (See Appendix D).

All Design Information Summary (DIS) sketches (500), WO drawings and engineering sketches shall be drawn to fit within the BWXT 11" X 17" B-size or 8 1/2" X 11" A-size title block as appropriate (See Appendix N.), and adhere to requirements specified in MNL-00054, *"System Engineering and Configuration Management Program" ,Chapter 10, Class 4 Non-CM Uncontrolled Balance of Plant (BOP) Drawings.*

All structures, systems, and components identification and labeling shall follow MNL-00014, *Labeling Manual,* guidelines.

All drawings that pertain to a classified or potentially classified area shall be reviewed by an derivative classifier (DC). See WI 02.02.04.10.02 Managing BWXT Classification Programs and Conducting Classified Activities. Classification and security markings shall be "noted" on affected drawings per WI 02.20.04.02.02 How to Mark Classified Matter and Containers.

Provide a graphic scale (See Appendix K.) for each scale used on a drawing immediately to the left of the title block of the drawing (See Appendix D, Figure 4.). Drawing scales shall be selected to promote visual interpretation and understanding of drawing content as well as maximize space utilization at a level that supports clarity.

Information that cannot be represented on a single drawing at the desired scale may appear on multiple drawings. Match lines (line code/LC=6, line weight/WT=4) shall link the separated information. Label the match line on each drawing to indicate the drawing where the continuation of the information can be found. A key plan, on affected drawings, will be provided for cases where match lines are necessary.

Separate buildings shall not be combined on one drawing. Preferably, segregate buildings within a project into subsets allowing each building and associated drawings to be autonomous.

All separate items (sections, details, elevations, etc.) on each drawing shall have individual, distinct titles and shall have the scale noted as part of the title (See Appendix D, Figure 2.).

Only industry standard graphic symbols are to be used on drawings. The Pantex Standard Cell Libraries (reference Chapter 1, Section 1.7 and Appendixes J - T) shall be created and maintained using industry standard graphic symbols as defined by the following agencies and institutions. This list is not intended to be all inclusive, however, these documents shall serve as guidelines for all graphic symbols used in BWXT Pantex drawings.

(1) Construction Specifications Institution (CSI)

(2) American National Standards Institution (ANSI)

(3) American Institute of Architects (AIA)

(4) American Society of Heating Refrigerating and Air Conditioning Engineers (ASHRAE)

(5) American Welding Society (AWS)

(6) American Society of Mechanical Engineers (ASME)

(7) American Standards Association (ASA)

(8) Institute of Electrical and Electronic Engineers (IEEE).

**TABLE 1-1 - STANDARD GRAPHIC SYMBOL REFERENCE TABLE**

| STANDARD GRAPHIC SYMBOL REFERENCE TABLE | |
|---|---|
| **Discipline** | **Reference** |
| Electrical Symbols (A Collection) | ANSI/IEE Y32E, ANSI Y32.2-1975 |
| Electronics (A Collection) | ANSI Y32E, ANSI/IEEE 91, 200, 315, 623 |
| Fire Protection | Fire Protection Design Criteria Document, DCD-001 ~~MNL00008~~<br>(NOTE: If a symbol is not found in the DCD-001, please reference NFPA 170, Standard for Fire Safety Symbols.) |
| Fluid Power (Graphics Symbols) | ASME Y32-10-1967, JIC (Hydraulics), ANSI Y32.18-1972, ASME Y1.1-Z94.12 |
| HVAC System | ANSI/Z32.2.4-1949 ® 1953 ASHRAE (latest edition), ASA Z32.2.3-1949, ASA 232.2.3-1949 |
| Illumination | ANSI Y10.18 ® 1977 |
| Instrumentation | ANSI/ISA S5.1-1973 ® Y32.20 |
| Lightning Protection | Thompson Lightning Protection Catalog |
| Line Convention and Lettering | ANSI 14.2-1973 |
| Logic Diagrams | ANSI Y32.14-1973, IEEE Std. 91-1973 |
| Mechanical and Acoustical | ANSI Y32.18-1972 ® 1978 ASHRAE (latest edition), ASME Y1.1-Z94.12-1982 |
| Pipe Fittings | ANSI/Z32.2.3 ® 1953 |
| Plumbing Fixtures | ANSI Y32.4 ® 1977 |
| Railroad Maps | ANSI Y32.7 ® 1979 |
| Welding and Non-Destructive Testing | ANSI/AWS A2.4-79 |

When revising an existing drawing every attempt must be made to update information contained on the drawing to current standards, including symbology. However, in instances where updating the legacy symbology would create confusion, then the use of legacy symbols may be granted. The use of legacy symbology will be considered on a case-by-case basis. Before approval to take this approach can be granted, there must be concurrence between Engineering and Configuration Control management.

No work directly involving security systems shall be referenced as security systems, but left generic and identify only the requirements to construct the work.

1.3.2 General Drawing Layout

All general notes shall be grouped together on the right side above the title block on each sheet (see Appendix D, Figure 4), and shall be titled with the standard GENERAL NOTES title. If there is not adequate room, the general notes may be continued along the bottom of the sheet with the title GENERAL NOTES CONTINUED.

If a legend of symbols is used on the individual sheets (see Section 4.4), it shall be located on the right side above the title block on each sheet directly below the General Notes. Title the legend of symbols with the standard LEGEND title (See Appendix D.).

A reference drawing list shall be included on each sheet titled with the standard title REFERENCE DRAWINGS. The list shall be located on the right side above the title block on each sheet and directly below the General Notes (or Legend). A reference drawing shall be defined as a drawing that affects, or is affected by the contents of another drawing in the set. Any drawings within a set that are linked by common information shall list the title and drawing number of the other drawings. ALL drawings shall list the project cover index sheet.

| **NOTE** |
| --- |
| This is not to be confused with the Computer Aided Drafting and Design (CADD) file referencing. |

| |
| --- |
| **EXAMPLE**: A floor plan would reference elevation, section and detail drawings. Each of these drawings would reference back to the floor plan. |

Dimensions shall be parallel to the dimension line and readable from the bottom or right side of the sheet. Use feet and inches for dimensions equal or greater than 12", except for pipe diameters and reinforcing bar spacing. Refer to Section 4 for details on dimension settings and attributes.

Leader lines from multiple lines of text should originate at the beginning of the first line of text (pointing to the left) or at the end of the last line of text (pointing to the right).

The use of abbreviations should be avoided if possible. If necessary because of drawing space constraints, abbreviations used shall be defined in the drawing legend, refer to DESKAID-0037, *Pantex Standard Acronyms, Abbreviations and Glossary*.

North arrows shall be provided on all plans and shall point up or to the left. The location of the north arrow shall be to the lower right of the plan view or immediately to the left of the title block information. Building orientations shall be the same on the site plan as on the plan view if practical. The north arrow shall indicate true north on all drawings. For example, if a floor plan is rotated 15° to show the building correctly on the drawing, then the north arrow should be rotated to point true north in respect to the building orientation on the drawing. The standard north arrow shall be located as a graphic cell in standard Pantex title block model files.

Elevations, sections and details shall not be randomly placed within the drawing package. When practical, elevations, sections and details shall be shown on separate drawings grouped by similarity within each discipline.

(1) When making the elevations, sections and details on the plan drawing, the first elevation, section or detail of each Discipline (Table 1-2) shall begin with the letter "A" and progress accordingly through the alphabet excluding "I," "O" and "Q." Each designator shall only be used once per drawing, and is not to be continued on subsequent disciplines in the set. The lower half of the bubble symbol shall indicate the drawing number where the elevation, section or detail is shown (See Appendix D, Figure 2.). Only the standard symbols and titles for elevations, sections and details shall be used (See Appendix D.).

(2) When the elevations, sections and details are placed on the appropriate drawing, they shall be ordered consecutively from left to right and top to bottom on drawing. Each elevation, section and detail shall have the appropriate title and letter designation. The lower half of the bubble symbol on the title of each elevation, section or detail shall indicate the drawing number from which it is taken. If an elevation, section or detail is common to more than one drawing in the set, it shall be ordered on the drawing according to the first drawing from which it was taken. In these circumstances, the elevation, section or detail shall have a separate bubble symbol referencing each drawing. The first marking bubble will be on the left with each additional bubble placed to the immediate right.

(3) Details should always use the same orientation as the object(s) they are referencing. If the detail needs to be in a different orientation, state the orientation in the detail title.

1.3.3 Sequence

The following sequence, content and scale of drawings shall be a guide for preparing drawings. Deviation from this procedure requires approval from Configuration Control Manager before implementation. Information, relating to each of the categories in the sequence, shall not be intermingled between categories.

(1) General

[a] Title Drawing:

- Title information
- An index of drawings with BWXT drawing numbers, sheet numbers and descriptions
- Vicinity and Contractor access maps
- This information shall be shown on a single drawing if possible. If the information cannot be clearly shown on one drawing, it shall be broken out into two or more individual drawings.
- The title drawing and information is shown in the BWXT Pantex standard CADD file COVERSHT.CVR. (See Appendix D, Figures 5, 6 and 7)
- Index of Drawings - An index shall be provided of drawings contained in the package, including BWXT drawing numbers and sheet numbers. If the project is of a size to allow consolidation onto the title sheet, this information shall be

shown as part of the title sheet.

- Vicinity and Contractor Access Maps - A vicinity map showing Pantex's location to Amarillo and a contractor's access map showing key buildings (Plant fire station for equipment inspections, etc.), routes and access points shall be provided. Basic plant maps will be provided electronically for editing. The location of borrow areas, dump sites, equipment lay down areas and salvage areas shall be shown. If the project is of a size to allow consolidation onto the title sheet, this information may be shown on the title sheet.

[b] Legend of Symbols - A legend of symbols used shall be provided. The position of the legend within the package is at the option of the engineer and coordinated with the drafting technician. Symbols may be identified on a separate drawing sheet at the beginning of the drawings set, on individual sheets where the symbols are used or on a separate drawing sheet at the beginning of each discipline's drawings.

(2) Civil

All civil and general site related work shall be a part of this section. These drawings shall contain existing and final topography, site features for site work and associated details. Above ground and underground utilities, both new and existing, shall indicate depth (if possible) and horizontal location from existing aboveground features. All survey information shall be tied to the North American Datim (NAD) 83 State Plan Coordinate System. All elevations shall be tied to one of the established benchmarks already at the Plant. All site features shall be shown including structures above and below ground. Features to be constructed as part of a project and considered to be permanent, are to be shown with NAD 83 State Plan Coordinates. All civil drawings shall be drawn in the appropriate engineering scale.

Preferred scales are as follows:

- Site plans - 10', 20', 50', 100' = 1"
- Details - 3/4", 1-1/2", 3" or as required.

| NOTE |
| --- |
| Civil drawings may have special exaggerated scales for profiles in order to emphasize the small changes in the vertical elevations. Vertical scale ratios are typically from a 5:1 through a 10:1 multiple of the horizontal scale. For example, 1"=50' horizontal and 1"=5' vertical. |

(3) Landscape

All work generally related to landscaping and not covered under the civil section shall be a part of this section.

Preferred scales are the same as civil.

(4) Structural

All work generally related to the basic structural elements of a design shall be a part of this section as applicable to the specific project, foundation plans, framing plans and specific construction or fabrication details relating to structural components of a design are included.

Preferred scales are as follows:

- Foundation plans, roof framing plan and wall sections (same as Architectural Floor Plan)
- Roof framing, foundation and general details - 3/4", 1-1/2" or 3" or as required.

(5) Architectural

All architectural related work shall be a part of this section. These drawings shall contain existing and final designs and details as applicable to the specific project: demolition plans, floor plans, roof plans, elevations, reflected ceiling plans, sections and schedules. Floor plans shall have each room numbered, labeled and shall have complete dimensions. All openings and sleeves required for penetration of foundations, walls, floors and roofs shall be located and detailed. All architectural drawings shall be drawn using the appropriate architectural scale.

Preferred scales are as follows:

- Floor plans, roof plans, reflected ceiling plans, building sections, elevations - 1/8" preferred, 1/4" or 1/16"
- Interior elevations - 1/4" preferred, 1/8"
- Cabinet details and elevations, wall sections - 3/4" preferred, 1/2"
- Details - 1-1/2", 3" or as required.

(6) Equipment

All work related to process equipment, office layout and furnishing plans are part of this section.

Preferred scales are the same as architectural.

(7) Fire Protection

All work related to fire protection (fire alarm and detection systems and fire suppression systems) shall be part of this section. These may contain plans, elevations and details to include flow diagrams, instrument and control diagrams, fixture, piping and equipment schedules.

Scales will vary depending on the type of fire protection system being shown. Follow the preferred scales of the section most closely relating to the system being shown.

(8) Plumbing

All work related to plumbing shall be part of this section. Generally, piping (including process piping systems), drainage and sanitary systems.

Preferred scales are the same as the mechanical.

(9) Mechanical

All work related to climate control, process equipment and mechanical utilities and services within a facility shall be a part of this section. As applicable to the specific project, ducting, compressed air and gas systems, steam and condensate systems, vacuum systems, ventilation and climate control systems and conveyance systems, such as hoists and automatic retrieval systems. These generally include plans, elevations and details in addition to flow diagrams, instrument and control diagrams, fixture, piping and equipment schedules.

Preferred scales are as follows:

- Site plans and details (covered in civil)
- Mechanical heating ventilating and air conditioning (HVAC), mechanical plumbing/piping (same as architectural floor plan)
- Mechanical HVAC, mechanical plumbing/piping details - 3/4", 1-1/2" or 3" or as required.

(10) Electrical

All work related to general electrical, including building and site power, is covered in this section. General site plans shall be incorporated into and shown on site utility plans. One-line diagrams, power plans, lighting plans, control diagrams, panel layouts, schematics, lightning protection and other related schedules and systems are included.

Preferred scales are as follows:

- Site Plan and Site Details (covered in civil)
- Special Wiring Plans (scale same as Architectural Floor Plan)
- Special Wiring Details - 3/4", 1-1/2" or 3" or as required.

(11) Electronic

All work related to security alarm systems, such as Radiation Alarm Monitoring (RAMS), Remote Alarm Gathering (RAG) and Automated Energy Management (AEMS), etc.

(12) Contractor/Shop Drawings

All drawings not developed by BWXT Pantex personnel.

## 1.4 CADD FILE CREATION AND PARAMETERS

1.4.1 New File Creation

Seed files (see Section 1.4.2) shall be utilized in the creation of ***ALL*** new drawings. The drafting technician shall utilize the appropriate discipline code (Table 1-2) seed file in developing requested drawings.

1.4.2 General Settings

Seed files shall be maintained that include the following general settings in addition to the level settings defined in Appendix A and Appendix B.

Seed files shall have all Pantex standard title blocks attached as reference files with the display turned OFF.

All seed files shall have the Pantex standard color table and line resource file attached.

With the exception of some site and civil drawing files (see Site and Utility Working Unit settings below), the working units for all two dimensional (2D) and three dimensional (3D) files shall be as follows:

- Working Unit Parameters
- Unit Names
- Master Units: ‘-
- Sub Units: “
- Unit Type: Distance
- Resolution: 96,000 per foot.

Site and utility file Working Unit settings for all 2D and 3D files shall be as follows:

- Working Unit Parameters
- Unit Names
- Master Units: ‘
- Sub Units: _ (Leave blank)
- Resolution: 10,000 per foot.

1.4.3 File Properties

Upon opening an existing file or creating a new file, the drafting technician shall open the file properties menu box, select the summary tab and enter information for title, and subject.

Drafting technicians shall initiate the Design History before ANY modifications are made to the drawing file. Drafting technicians will go to WORKSPACE/PREFERENCES/OPERATION and turn off the default to save settings on exit. Drafting Technicians(s) will then need to use CTRL>F to save settings before or after sending plot and/or exiting file.

BEFORE exiting the file the Drafting Technician shall commit to changes in the DESIGN HISTORY with appropriate comments, and then exit file.

1.4.4 View Attributes

View Attributes for see files and finished drawings shall be as outlined below.

The following View Attributes for View Number 1 shall remain toggled ON. All others typically remain OFF.

- Dimensions
- Dynamics
- Fill
- Line Styles
- Line Weights
- Patterns
- Text.

View attribute settings in the remaining views are at the discretion of the drafting technician.

View Number 1 shall be the only view from which drawings are plotted and shall be configured to produce the finished drawing. All drawing files shall have the settings saved so that View Number 1 is prominently displayed when the file is opened. The configuration of the other view windows is at the discretion of the drafting technician.

(1) Dimensioning and Leader Lines

Dimension line settings and attributes.

[a] All leader lines, dimension lines and extension lines shall be a weight of 0 and placed on the appropriate level in the CADD file.

[b] Terminators shall be a filled arrowhead size proportionate to the general text size.

[c] Dimension text shall be a line weight of 1, MicroStation Font 0, positioned above the dimension line and centered if possible. If it is not possible to center the dimension text, the dimension line shall be extended to the side where the text can most clearly be read.

[d] The color of all dimensions, leader lines and associated text shall be color 0 (white).

(2) Level assignments and level symbology shall be assigned according to the model file and drawing file level assignment tables in Appendix A and Appendix B.

1.4.5 Text

All text shall be capitalized MicroStation font 0 and color 0 (white). General text height and width shall be 1/8" on the plotted drawings. For text sizes of titles see Appendix D.

1.4.6 Line Standards

Line levels, colors, weights and types may be determined by referring to Appendices A, B and E.

The line standard resource file PXLSTYLE.RSC shall be used for all model and drawing files.

Standard plotted line weights 0 through 30 are defined in Appendix I.

1.4.7 Plotting

The standard drawing size for Pantex is an Architectural 36" x 24". Special sizes may be plotted upon request.

All drawings will be plotted in black and white unless requested otherwise. Drawings that are plotted for the purpose of becoming controlled or record drawings or for the purpose of microfilming or scanning must be plotted in black and white.

Custom color plots may be made if requested. If the standard line colors are not acceptable for plotting the finished drawing, the output color shall be manipulated by changing the level symbology settings in MicroStation. The standard line colors are not to be changed in the model or sheet file.

Standard plot drivers shall be maintained for the HP650C InkJet plotter and HP5000 InkJet Plotter. These drivers are PX650BW.plt, PX650COL.plt, PX5KBW.plt, and PX5KCOL.PLT. Refer to Appendix F for the configuration of the drivers.

1.4.8 Color Tables

The standard color table for Pantex is PXCOLOR.TBL. Refer to Appendix G for the RGB codes for each color.

## 1.5 TYPES OF CADD FILES

Four types of CADD files are referred to in this manual: model files, drawing files, raster files and raster/vector hybrid files.

| NOTE |
| --- |
| Generally, model and raster files are always referenced by other files, while drawing and raster/vector hybrid files are never referenced by other files. |

A model file contains the physical components of a site or structure. An example would be the floor plan model file of a particular building. The floor plan model file would contain columns, walls, doors, windows, etc. Information in a model file should never be duplicated in another file. Model files are intended to be a “sole source” of information. Any time information from a model file is needed, it shall be referenced from the model file, it is never to be copied.

The drawing file is the combination of referenced model files with drawing-specific text and symbols to create a final ready-to-plot CADD file. An example of a drawing file would be a HVAC plan view drawing that references the model floor plan, the model HVAC plan and the correct title block. All of the dimensions, notes, symbols, graphic scales, title block information, etc., are placed within the drawing file.

Raster files are drawings that consist of raster or pixel data instead of the vector data of a normal CADD file. Raster files are typically created by scanning drawings that are not available in a vector CADD file format. Whenever possible, the use of raster files shall be avoided.

Raster/vector hybrid files are created when raster files, such as scanned photographs, maps or drawings, are referenced into drawing files.

1.5.1 Raster File Creation and Use

The resolution or dots per inch (DPI), of the raster image shall not be greater then the minimum necessary for the information to be plotted clearly at the desired scale.

The preferred raster file format for scanned drawing information is Tagged Image File (TIF). The preferred raster file format for picture and map data is Joint Photographic Experts Group (JPEG).

When use of a raster file is necessary for the completion of a drawing, the raster file is to be attached as reference file into the drawing file. The raster files shall not be imported into the drawing file as a graphic or inserted as an object (OLE linking).

The physical dimensions of the scanned image shall be the same as the original document. For example, if a 36" x 24" drawing is scanned, the border of the raster file shall remain 36" x 24." This is necessary for scaling purposes. The border size of the raster file may be changed if the information is not to scale. For example, a photograph or a diagram without a particular scale.

Raster files containing scanned drawing information (TIF files) are to be white on a black background only. Color raster files are to be used only for those drawings that are to be plotted in color.

Files containing raster files shall be plotted using MicroStation's HPGLRT.PLT plot driver.

1.5.2 CADD File Orientation

Site files shall be drawn to the true orientation of the area with regard to the survey coordinates.

Individual model file plans, such as floor plans, shall be drawn with the orientation as they are to be depicted on the finished drawing. For example, if the actual orientation of a building is 15E from true north and the drawing is to show the building with north to the top of the drawing, the floor plan shall be drawn in the X and Y axis of the CADD file so that it is straight with the title block. The actual orientation of the building will be shown with the north arrow. In this example, any site files that are referenced shall be scaled and rotated to fit the floor plan.

Site files that reference individual model files shall scale and rotate the model file to fit the true orientation of the site.

1.5.3 Scaling of CADD Reference Files

When referencing CADD files with differing working unit parameters (WUP), set the scale ratio of design file master units equal to the reference file master units. For example, when referencing a model file with 96,000 WUP's into a site file with 12,000 WUP's, the scale factor for the reference file will have to be set one to one (1:1).

| NOTE |
| --- |
| When the reference file is scaled, the orientation point to scale reference about must be the same in both files in order to maintain the correct coordinate settings. This may also necessitate the rotation of the reference file to maintain the correct orientation. |

## 1.6 TITLE BLOCK – NEW AND REVISED DRAWINGS

All drawings shall be produced using the appropriate BWXT Pantex title block. Any drawings revised or redrawn that do not have the appropriate Pantex title block shall incorporate the appropriate standard Pantex title block. All applicable information from the old title block shall be incorporated into the new title block.

No modifications to the form or function of the BWXT Pantex title blocks will be allowed without approval of Configuration Control Manager.

The title block is to be placed in the drawing file as a reference file and scaled to the appropriate size. The title block is to remain a reference file and should not be copied into the drawing file.

(1) Placement - The following steps detail how the BWXT Pantex title blocks are to be incorporated into the drawing file. The D-size title block CADD file *\TTL\PXTB_D.DGN* and cell *PXTB_D* in PX-G.CEL are used in this example. Refer to Chapter 1, Section 1.7 for the standard cell libraries. After opening the drawing file in which the title block file is to be attached as a reference, follow these steps:

Step 1 Attach reference file *\TTL\PXTB_D.DGN*

Step 2 Clip bound *\TTL\PXTB_D.DGN* (place fence outside of all displayed information)

Step 3 Scale reference file *\TTL\PXTB_D.DGN* according to Table C-1 in Appendix C

Step 4 Move the reference file *\TTL\PXTB_D.DGN* to the desired position

Step 5 Attach Cell Library *\CELL\PX_G.CEL*

Step 6 Set Active Cell equal to *PXTB_D* (set active scale according to Table C-1 in Appendix C)

Step 7 Place the active cell by snapping to the lower left corner of the referenced title block

Step 8 Drop Complex Status of the cell *PXTB_D*

Step 9 Display the Data Fields by toggling the Data Fields to ON (under View Attributes)

Step 10 Enter the necessary title block information

Step 11 Turn the Data Fields display OFF (under View Attributes) before plotting the drawing.

(2) Title Block Files - The following is the name and description of the approved BWXT Pantex title block CADD drawing files. These files shall be maintained and located on the drafting server in a subdirectory labeled P:\TTL\.

PXTB_A.DGN - Standard A size "For Information Only" title block

PXTB_B.DGN - Standard B size "For Information Only" title block

PXTB_D.DGN - Standard D size title block

COVERSHT.CVR - Standard D size title block for the Index of Drawings

PXTB_DMP.DGN - Standard D size title block for the Vicinity and Contractor Access Maps sheet (includes instructions for creating the Vicinity and Contractor Access Maps)

PXTB_DIO.DGN - Standard D size "For Information Only" title block

(3) Standard Drawing Symbols - The following items are included outside of the title block border in each standard title block file. These items are created as cells and shall be of the size, line weight and color matching the standard set forth in Appendix D. To use these items, they must be copied into the working drawing file. When a drawing is complete, the referenced title block file shall be clip bound to the outside border. No information is to be shown outside of the title block.

Standard text sizes for general text and notes (font 0).

Titles for general notes, keyed notes, notes, legend and reference drawings.

Drawing titles for floor plan (can be copied and modified for any title, such as piping plan, reflected ceiling plan, etc.), elevation, section and detail.

General symbols for sections, details, elevations, keyed notes and revision deltas.

Standard north arrow.

1.6.1 CADD File Numbering Scheme

The following numbering scheme shall be used to number all model files, drawing files and raster files created after the first issuance of this manual.

| NOTE |
| --- |
| When transferring files through a program such as e-mail that will not handle file names of more than eight (8) characters, the CADD files shall be compressed into a single file using WinZip. |

(1) Model files shall be numbered in the following manner. The file extension shall be .MOD on all

model files.

[a] General Pantex site model files shall be numbered/named logically according to content. All Pantex site files numbers/names shall begin with the prefix PX. For example, the file that contains the general site information for the plant site, such as roads, fences and building outlines, shall be named PXSITE.MOD.

[b] Building model files shall be numbered according to building number, discipline (refer to the Table 1-2 Standard Discipline Codes in Section 6.2) and file type (refer to Table 1-4 Model File Type Codes in Section 6.2). For example, the architectural plan for the first floor model file for Building 12-5 shall be numbered 12005AX01.MOD. There shall only be one model file per discipline per building. Any time the information from a particular building is required, the model file shall be updated and referenced as necessary.

(2) CADD drawing files shall be numbered in the following manner.

[a] Drawing files for building drawings shall be numbered according to drawing type (refer to Table 1-3 - Drawing Type Designator Codes in Section 6.2), building number, discipline (refer to Table 1-2 - Standard Discipline Codes in Section 6.2) and sheet number with sheet number being the file extension. For example, the electrical plan for the first floor of Building 12-5 shall be numbered 112005E.100, with 100 being the sheet number assigned by the Configuration Change Control coordinator.

[b] Drawings that are not associated with a particular building shall be numbered in relation to Zone and/or assigned number from the Configuration Change Control Coordinator. For example, a drawing for Zone 12 Electrical Distribution System would be numbered D0-0E256 with 256 being the sheet number assigned by the Configuration Change Control coordinator.

(3) The raster file numbering scheme shall be the same as the drawing file except an R shall be placed in front of the number instead of the drawing type. For example, if drawing 112005E.100 is scanned, the raster file shall be numbered R12005E.100.

[a] Raster files created from information other than drawings shall be named logically beginning with R and ending with a file extension of the type of raster file, such as RLE, JPG or PCX, (or with a numerical series if necessary). For example, a photo of the north elevation of Building 12-5 could be named R12005N.JPG.

1.6.2 Drawing Sheet Numbering

The following numbering system shall be used to indicate the sheet number in the title block on all drawings. The number shall consist of the discipline code followed by the numeric position of that drawing in the discipline. For example, the first sheet of the civil drawings shall be numbered C1, the first sheet of the architectural drawings shall be numbered A1 and so on. This is the only information that should appear in the Sheet Number section of the title block. For example, do not number the sheets A1 of 15, the total number of sheets can be determined from the Index of Drawings.

| NOTE |
|---|
| The sheet number is not to be confused with the CADD file number or the drawing number. |

(1) Discipline Codes

**TABLE 1-2 - STANDARD DISCIPLINE CODES**

| STANDARD DISCIPLINE CODES | |
|---|---|
| **Discipline** | **Character** |
| General | G |
| Civil | C |
| Landscape | L |
| Structural | S |
| Architectural | A |
| Equipment | Q |
| Fire Protection | F |
| Plumbing | P |
| Mechanical | M |
| Electrical | E |
| Electronic | X |
| Contractor/Shop Drawings | Z |

**TABLE 1-3 – DRAWING TYPE DESIGNATOR CODES**

| DRAWING TYPE DESIGNATOR CODES | |
|---|---|
| 0 | General (symbols, legend, notes, etc.) |
| 1 | Plans (horizontal views) |
| 2 | Elevations (vertical views) |
| 3 | Sections (sectional views) |
| 4 | Large Scale (plans, elevations, sections that are not details) |
| 5 - 9 | See Table 1-5 for Discipline Specific Type Designators |

**TABLE 1-4 – MODEL OR COMPOSITE FILE TYPE CODES**

| MODEL OR COMPOSITE FILE TYPE CODES | | | |
|---|---|---|---|
| **Building Disciplines** | | | |
| # = Floor Designators or Phasing | | | |
| R | Roof | | |
| 01 | Above grade floor (01, 02, etc.) | | |
| B1 | Below grade floor (B1, B2, etc.) | | |
| 00 | Foundation | | |
| LO# | Lighting Plan multiple floors (L00, L01, L02, etc.) | | |
| PO# | Power Plan multiple (P00, P01, P02, etc.) | | |
| SO# | Signal Plans multiple floors (S00, S01, S02, etc.) | | |
| S | Site dimension layout | I | Irrigation |
| G | Excavation, grading, drainage, erosion and sediment control | P | Planting |
| U | Utilities (water, sewer, storm drainage) | | |
| Reference/Model File modifiers used along with Discipline Designator | | | |
| X | All Reference Files – Reference files are not listed in Index of Drawings | | |
| RX | Resource (Raster Images) – Can be used only with single-character Discipline Designator | | |
| Reference file status modifier | | | |
| D | Demolition – Shared Discipline Designator – Location of demo in the Index of Drawings will depend on the complexity of the project and will be coordinated by the design team and approved by PM. | | |
| E | Existing | | |
| N | New | | |
| # | Phasing (where # is a number between 1-9) | | |

1.6.3 Title Block Title Information Fields

| NOTE 1 |
|---|
| Refer to Appendix H. |

| NOTE 2 | |
|---|---|
| * | Indicates the information shall be supplied by the requester. |
| ** | Indicates the information shall be supplied by the Facility Configuration Control (FCC). |
| *** | Indicates the information shall be supplied by the Drafting Technician. |

**TABLE 1-5 – DISCIPLINE SPECIFIC**

| DRAWING TYPE DESIGNATOR CODES | |
|---|---|
| Civil – Sheet Type Designator | |
| 5 | Details |
| 6 | |
| 7 | |
| 8 | |
| 9 | Images |
| Architectural – Sheet Type Designator | |
| 5 | Reflected Ceiling Plans |
| 6 | Details |
| 7 | Schedules and Diagrams |
| 8 | Millwork Details |
| 9 | 3D Views (isometric, perspectives or photographs) |
| Structural – Sheet Type Designator | |
| 5 | Schedules |
| 6 | Truss Details |
| 7 | |
| 8 | |
| 9 | Images |
| Mechanical – Sheet Type Designator | |
| 5 | Details |
| 6 | Schematics |
| 7 | Temperature Controls and Sequences |
| 8 | |
| 9 | Images |
| Electrical – Sheet Type Designator | |
| 5 | Details |
| 6 | Diagrams |
| 7 | Schedulers |
| 8 | |
| 9 | Images |

(1) Company Name

(2) PassPort ® Unit*

[a] Description of the building or project.
Example: 12005

(3) Drawing Type*

[a] Specific description of drawing information.
Example: Legend, Schedules

(4) System Name and IDT*

[a] Description of the type of system and code.
Example: HVAC System HVA001

(5) Free Form Information Text***

[a] Specific description of the drawing contents.
Example: FLOOR PLAN - AREA A

(6) System Type Codes **

[a] Provided by System Engineering on PX-3870, "Drafting Request" (refer to MNL-00014, *Labeling Manual*)

(7) Scale ***

[a] Drawings may have multiple scales used on different objects. In these circumstances, the most common scale will be indicated in this block. A graphic scale (bar scale) shall be placed on the drawing for each scale used. If the drawing is for information only and not drawn to a particular scale, the block shall read NOT TO SCALE.

(8) Engineering Data transmittal Number ** (Eng. Data Transmittal No.)

[a] Provided by Configuration Control on PX-3780 or on redlined drawing.

(9) Drawing Number **

[a] Assigned by FCC (refer to MNL-00054, *System Engineering and Configuration Management Program*)

(10) CADD File Number ***

[a] Assigned by Drafting Technician as per standard format defined in Section 1.6.1.

(11) Sheet Number ***

[a] Assigned by Configuration Control as per standard format defined in Section 1.6.2.

(12) Approval/Review List

[a] All signatures, initials, and badge numbers must be dated in the block provided (refer to MNL-00054, Appendix F).

(13 - 18) Provided by Configuration Control Section,

(19) Drafter

[a] Architectural or engineering firm responsible for creating finished drawing. BWXT drafting technicians shall mark signature area as N/A.

(20) Drafting Checker

[a] Individual responsible for verifying the accuracy of the drawing (not the design) and adherence to the drafting standards set forth in this manual.

1.6.4 Revision Blocks

The revision comment area of the title block indicates the reason for the creation or modification of the drawing and reference supporting information for the changes, such as a project number, design change proposal (DCP) number, engineering data transmittal (EDT) number, work order (W/O) number, etc. (Refer to MNL-00054 Appendix F,) The following are typical revision comments.

(1) Construction Drawings

[a] REVIEW ONLY

[b] RELEASED FOR BID

[c] RELEASED FOR CONSTRUCTION

[d] AS-BUILT.

(2) Modification of Configuration Control (CM) controlled

[a] CURRENT CONDITION PER EDT # ___ - ___ (System Code)

[b] REVISED PER DCP # ___ - ___ (System Code).

- This information should be supplied by the requester on the PX-3870.

(3) Drawings created from hand drawn originals, drawings where no CADD file was available or substantially from an existing BWXT drawing.

[a] CREATED FROM DRAWING # ___, (add description of modification if necessary)

[b] CREATED FROM “VENDOR NAME” DRAWING # ___, (add description of modification if necessary)

(4) Drawings intended for reproduction or for information only created or scanned from vendor drawings, hand drawn originals or any drawings where no CADD file was available.

[a] FOR INFORMATION ONLY

[b] FOR CADD REPRESENTATION ONLY

(5) Revision Note

[a] If a revision cannot be adequately explained in the allotted space, a note may be placed directly above the title block and labeled REVISION # NOTE: and then the text of the note. In the revision space it should read SEE REVISION NOTE ABOVE.

[b] The revision number area of the title block indicates the latest modification to the drawing.

[c] Revision numbers shall be sequential alpha or numeric characters only.

- Drawings developed for complex construction projects that will be reviewed and changed several times before the project is complete shall have alpha designators in the revision number space. These shall start with the letter "A" and progress alphabetically with each revision.

- When a drawing is completed, the as-built revision number shall be "0" (zero) and all previous revision notes and deltas shall be removed. No alpha character shall be used once a drawing is completed as an “as-built.”

- Revisions to as-built drawings shall be numbered sequentially beginning with the last approved revision number. Revision "0" may also indicate the information is the requester’s original design or data gathered from the field.

- Drawings for projects where there will not be an extensive review or changes before the as-built drawing is created, can be numbered with a revision "0." Revision "0" shall also be used to show the source of the information represented on the drawing when the drawing is created from information such as vendor drawings or existing BWXT Pantex drawings.

[d] No more than one revision per issue of a drawing shall be shown. For example: If there are two drafting requests for modifications to the same drawing, one revision number may incorporate both requests.

[e] When a drawing is redrawn or scanned from an existing numbered Pantex drawing (because there is no CADD file available) the new drawing will take the next sequential revision number and the revision comment shall indicate the source of the drawing information.

[f] The number of revisions shown on the title block shall not exceed three. The first permanent revision number and comment (typically, revision number 0) and the original drawing signatures and dates shall remain on the drawing as a record of the origination of the drawing. Subsequent revisions, initials and dates shall be added in the spaces provided. When a revision is required and there are no spaces remaining, the revision above the original issue shall be removed (deleted) from the drawing. The associated revision deltas and validation notes shall also be removed at this time. After the removal of this revision, associated revision deltas, the two latest revisions, initials, dates, deltas and validation notes are to be moved to accommodate the new revision, initials and dates and validation notes.

| NOTE |
| --- |
| If for some reason information is needed about one of the revisions that has been removed, this information may be retrieved by accessing the archived copy of that revision of the drawing through Configuration Change Control Section. |

[g] Revision Deltas and Clouded Areas

- Revision deltas shall be placed on drawings at the site of any change or modification to the drawings. These deltas shall remain on the drawing until the associated revision comment is removed. The number placed in the delta shall be the same as the current revision number of the drawing. The delta and number shall be placed in the drawing file on level 7 with a color of 0 (white). See Appendix D Figure 3 for more information. *Except As Built drawings, which require no clouds.

Clouds are to be placed around groups of items or areas that are to be revised as indicated by the drawing requester. If the requester has not indicated cloud location, then the clouds will be placed at the discretion of the drafting technician. Clouds shall be placed in the drawing file on level 7, with a line weight of 4 and a color of 0 (white). A revision delta with the appropriate revision number shall be placed in the clouded area, and in proximity of drawing change. The previous revision clouds shall be removed with the next revision of the drawing. The delta shall remain until it is removed according to the criteria above (less line weights allowed in congested areas).

1.6.5 Configuration Control (CM) Boundaries

CM Boundaries shall be denoted on drawings, which are controlled under the CM program by enclosing all components of a system with the Control Boundary (CB) line. If the CB line cannot fully enclose the components, a match line shall be used and the drawing sheet number where the boundary is continued shall be referenced. If more than one CM system is shown on a drawing, the 3 digit PassPort ® system code (refer to MNL-00014) shall be located within the boundary line on the lower right hand side. If it is impractical to enclose the component with a CB line, a note shall placed on the drawing defining the extent of the CM system involved. The CB line style is a custom line style located in PXLSTYLE.RSC. (Reference Appendix E, Figure 1).

1.6.6 Validation Notes

The following validation note shall be incorporated when revising CSS/SS drawings, which are controlled under the Configuration Control (CM) program:

- THE SAFETY SYSTEM CONFIGURATION SHOWN ON THIS DRAWING WAS FIELD VALIDATED ON (month/day/year) USING A TYPE (I, II or III) VALIDATION.

The information for the validation note shall be supplied by the requester or the system engineer. Refer to MNL-00054, *System Engineering and Configuration Management Program*, for information on the use of validation notes and descriptions of the various types of inspection and validation.

The validation note shall be located on the drawing directly above the title block or to the left along border.

A revision delta with the current revision number shall be placed to the immediate left of the validation note.

The validation note and associated revision delta shall be removed when the revision comment is removed.

## 1.7 CELL LIBRARIES AND CELLS

Cell Libraries shall be located on the drafting computer server in directory P:\CELL\. All cells shall be drawn at a scale of 1" = 1' and shall follow the level and symbology standards defined for each discipline in Appendixes A and B. The following is a listing of the cell libraries that shall be maintained and used for all Pantex drawings.

| NOTE |
|---|
| No modifications, additions or deletions to these cell libraries shall be made without the prior approval of Configuration Control Manager. Appendices J - T shall be updated as necessary to reflect any changes to the cell libraries. |

| | |
|---|---|
| PX_A.CEL | Architectural related cells, reference Appendix J. |
| PX_C.CEL | Civil and Site related cells, reference Appendix K. |
| PX_E.CEL | Electrical related cells, reference Appendix L. |
| PX_F.CEL | Fire Protection related cells, reference Appendix M and -DCD-001, *Fire Protection Design Criteria Document*, reference Appendix D. |
| PX_G.CEL | General drawing and miscellaneous cells. Includes cells for title block information. Reference Appendix N. |
| PX_L.CEL | Landscape related cells, reference Appendix O. |
| PX_M.CEL | Mechanical related cells, reference Appendix P. |

PX_P.CEL Plumbing related cells, reference Appendix Q.

PX_S.CEL Structural related cells, reference Appendix R.

PX_U.CEL Utilities related cells, reference Appendix S.

Cell libraries and cells created temporarily for individual projects are to be placed in the appropriate project directory and deleted when the project is complete. If it is recognized that a particular cell is necessary for future projects, the cell may be added to the appropriate cell library with Configuration Control Manager approval.

## 1.8 DRAWING DISTRIBUTION MARKINGS

All drawings are marked above the title block and on front covers of specifications, to reflect the stage of the project. Drafting requests should be completed to indicate the required markings. Markings shall be placed at 30° angle (default from library) and at a scale equal to title block scale (reference Appendix N). The following markings shall be used:

| | |
|---|---|
| Review Only | For all packages up to time of bidding. |
| Bid Set | Only for bidding. |
| For Construction | Packages issued to the successful bidder for use in construction. |
| As Builts | Drawings marked up and/or drafted to reflect the as installed condition at end of construction. |

## 1.9 CADD FILE LOCATIONS

The general directory structure of the drafting server shall follow these guidelines.

(1) Regardless of the network path to the CADD files on the drafting server, the root directory shall be mapped as a drive letter P:\ in order to maintain the path settings of the older MicroStation reference files.

(2) Generally, with the exception of the site files, title block files, seed files and cell libraries, all CADD files for a given building or project shall be grouped in the same directory. If necessary for clarity, subdirectories may be used to separate special projects within a building or project directory.

(3) Building directories shall be divided by zone number. For example, buildings in Zone 12 shall be located in a directory P:\ZONE12\. Each zone directory shall have subdirectories with the actual building number. For example, all drawing files for Building 12-5 shall be located in a directory P:\ZONE12\12-5\.

(4) Drawing files that cannot be associated with a single building or a particular zone, shall be located in the P:\PROJECTS\ directory. The name given to the subdirectory shall be clearly related to the project and not ambiguous.

(5) Model drawing files that are site/utility related shall be located in P:\SITE\.

(6) All standard cell libraries shall be located in P:\CELL\.

(7) All standard title block files shall be located in P:\TTL\.

(8) All standard 2D and 3D seed files shall be located in P:\V8\SEEDFILES\.

(9) Other directories may be added as necessary with the approval of Configuration Control Manager.

# CHAPTER 2. DRAFTING PROCESS

## 2.1 PURPOSE

This chapter establishes the processes by which requests for drafting services are processed.

## 2.2 SCOPE

This chapter provides procedural guidance for drafting technicians, managers, engineers, architects, AE firms and subcontractors to BWXT Pantex who will be requesting drafting services.

## 2.3 DRAFTING INTERFACES

### 2.3.1 Service Availability

Drafting service by the BWXT Drafting Technicians is available for any funded Pantex activity. When scheduling conflicts arise, priorities will be assigned by the BWXT Drafting Technicians immediate supervisor.

### 2.3.2 Points of Contact

The primary point of contact for questions about the status of submitted drafting requests or the availability of drafting services shall be the BWXT Drafting Technicians immediate supervisor. After a drafting request is assigned to a drafting technician and the technician has contacted the requester, the requester may use the technician as the primary point of contact until the work is completed.

The priority of drafting request shall be assigned only by the BWXT Drafting Technicians immediate supervisor or assignee. Requesters, or any others outside of the BWXT Drafting Technicians immediate supervisor, are not allowed to shift work priorities.

Any concerns regarding drawing quality or job performance shall be brought to the immediate attention of the BWXT Drafting Technicians immediate supervisor.

## 2.4 DRAFTING REQUEST PROCESS

(1) In order for drafting services to be requested, a PX-3870, "Drafting Request," (see Appendix T) must be filled out and submitted to the Configuration Control Drawing Administrator (refer to MNL-00054).

(2) The requester shall be responsible for the following:

[a] Completing all necessary information on the PX-3870 and delivering it along with all design information (that is to be included on the drawings or deliverables) to the configuration control drawing administrator. Incomplete and/or illegible information will

not be accepted.

[b] Verifying the charge code number is valid and open to the appropriate BWXT Drafting Technician before the drafting request is submitted.

[c] Communicating all changes in design, schedule or funding to Configuration Control, assigned BWXT Drafting Technician, or BWXT Drafting Technicians immediate supervisor.

(3) Upon the receipt of the PX-3870 the Configuration Control Drawing Administrator and/or Configuration Control Drafting Checker shall:

[a] Review the request and associated information.

[b] Validate all required drawing information is complete. At the Configuration Control Drawing Administrator and/or Configuration Control Drafting Checker discretion, it may be determined to be cost effective to utilize existing electronic sketches that may not meet the drafting manual requirements. Noted exceptions will be indicated under the "Drafting Notes" section of the PX-3870.

[c] Validate completeness of EDT and DCP documentation and Authorization (reference Drafting Request, Section 1.5.3.)

[d] Assign the PX-3870 to one or more BWXT Drafting Technicians.

(4) The BWXT Drafting Technician shall:

[a] Review the package.

[b] Communicate directly with the requester or designated point of contact, any questions or concerns about the assigned work.

[c] Complete the work and inform the Configuration Control Drawing Administrator and the requester of status through the duration of the work.

[d] Request periodic reviews by the requester or designated point of contact. This may include printing or plotting check prints for the requester.

[e] Check the work using the PX-4829, "Drafting Quality Assurance Checklist," (see Appendix T) (reference Quality Assurance, Section 2.6).

[f] Sign the drawings as Drafter.

[g] Submit the finished package to the Configuration Control Drawing Administrator for review.

(5) The Configuration Control Drafting Checker shall:

[a] Check the work using the PX-4829, "Drafting Quality Assurance Checklist," (reference

Quality Assurance, Section 2.6).

[b] Sign the drawings as Drafting Checker.

- If errors are found, the reviewer shall return the drawings to the BWXT Drafting Technician for correction. After the BWXT Drafting Technician makes the corrections and the reviewer verifies them, the reviewer shall sign the drawings as Drafting Checker.

[c] Log the request into the logbook (or data base) as being finished.

[d] Deliver the signed package to the Configuration Control Drawing Administrator for tracking. All information delivered with the drafting request, such as red marked drawings, notes, sketches, photos and calculations, shall be returned along with the PX-3870 and the PX-4829.

[e] Routing of the drawings for review and signatures (other than Drafter and Drafting Checker) shall be handled by the Configuration Control Drawing Administrator.

[f] If the requester stops the drafting work for an individual review of drawings, other scheduled Drafting Requests will be started. Unless special arrangements are made with the BWXT Drafting Technician or immediate supervisor, if 5 working days pass and the requester does not return comments from the review, the Drafting Request shall be closed as complete and any subsequent work will have to be resubmitted with a new PX-3870.

[g] Any mistakes, errors or omissions made by the BWXT Drafting Technician shall be corrected as soon as possible and shall not require a PX-3870 from the requester.

[h] Any additions or changes to finished work after the Drafting Request has been completed shall require a new PX-3870 to be submitted.

[i] Because of the volume and disperse areas of service, the BWXT Drafting Technician, or Configuration Control will not pick up or deliver Drafting Requests, drawings for review, finished drawings or any other information or materials unless special arrangements are made.

## 2.5 DRAFTING REQUEST, PX-3870

The following is a brief explanation of the information that shall be included on the PX-3870.

(1) General Information

[a] Requester Information

- Requester’s name, Pantex badge number, Pantex phone number and date the request is submitted to the Configuration Control Drawing Administrator.

[b] Work Requested

- A brief description of the type and quantity of work being requested. Multiple drawings may be revised on 1 drafting request if sufficient title information is provided.

[c] Work to be performed for department number.

- This is to be the department number of the department the work is being done for and funded by, not necessarily the requester's department.

[d] Project number.

- This is the three digit number assigned to all outside Pantex construction projects.

[e] Charge Code Budget By Task (BBT)

- The requester is to verify that this number is open for the BWXT Drafting Technician before the PX-3870 is submitted as is to the Configuration Control Drawing Administrator.

[f] Final Drawing Size

- Indicates the desired final drawing size. The standard size for Pantex record drawings is 36" x 24." If more than one size is requested, indicate by checking all of the desired sizes and also make note of the size and quantities in the work requested area.

[g] Due Date for Drafting Completion

- This is the date that the finished work is to be picked up by the requester. Any in-progress reviews should be prior to this date.

(2) Title Block Information

[a] This section is fairly self explanatory. If additional information is needed, refer to Chapter 1, Section 1.6.3, Title Block Information Fields.

(3) For Systems under Configuration Control ONLY

[a] This section does not need to be filled out unless the drawings are a result of a walkdown or drawing is for a~~n~~ ~~SDD~~ DIS. Refer to MNL-00054 for further information regarding the EDT and DCP numbers.

(4) Drafting Use Only

[a] As stated, this section is for Configuration Control, the Drafting Technicians, and immediate supervisors only. The requester does not fill in any information in this area.

[b] The information requested is self explanatory. Any questions should be directed to the Configuration Control Drawing Administrator and/or Configuration Control Drafting Checker.

## 2.6 QUALITY ASSURANCE

It is the responsibility of the BWXT Drafting Technician and the Configuration Control Drafting Checker to verify that all applicable drafting standards are adhered to and that all supplied information is incorporated into the drawings. Engineering and design is not the responsibility of Configuration Control Section.

To facilitate the creation of accurate drawings and CADD files, the BWXT Drafting Technician, and Configuration Control Drafting Checker shall check all drafting, using checklist PX-4829 (reference Section ~~1~~2.4 Drafting Request Process). The checklist will be filed with the completed PX-3870.

## 2.7 UPDATING DRAWINGS

(1) Facilities and Site Changes

[a] Because of the dynamic nature of the Pantex Plant, facilities and site information are constantly being modified, every effort shall be made by the BWXT Drafting Technicians to keep the Pantex Plant drawings current and accurate. However, the responsibility to identify drawings that need to be updated lies external to the Drafting Section. Project Engineers, Facility Managers and process owners have the primary responsibility for identifying those drawings that will be affected by the requested change. The drawings that are affected by changes are not always immediately obvious. For example, a simple removal of a section of wall not only affects the floor plan, but every drawing in the set that shows the floor plan. These additional drawing changes should be identified and planned for during scheduling and budgeting for projects.

[b] Changes to the site CADD model files will affect more drawings than can reasonably be updated. Drawings that reference the site model files will be considered on a case by case basis. As a general rule, drawings that reference site file information that have been modified shall not be updated, signed and reissued until funded projects require those drawings.

(2) Revision/Correction Procedures

[a] “Marked” drawings submitted with drafting requests shall adhere to the following guide lines.

- Drawing originals shall not be used for red/green markings purposes. Copies, plots or microfilm prints of original drawings shall be used for mark ups.

- Red marks shall be made with a red pencil or non-bleeding red ink only.
- Green marks shall be made with a green pencil or non-bleeding green ink only.
- Red will be used for corrections/additions only.
- Green will be used for deletion purposes only.
- Only the red/green marks on the drawings shall be incorporated by the Drafting Technician. Pencil or ink marks of any color other then red/green will be considered the requester's personal notes or calculations.
- White out shall never be used on a drawing submitted to Configuration Control Manager. Areas that have white out over the graphics are easily over looked by the Drafting Technician. Areas that are to be removed from the drawing shall be circled in red and the word REMOVE or DELETE written in or by the circled area.
- All handwritten notes, directions and comments shall be printed and clearly legible.
- Typed notes, tables, comments and directions are preferred and shall be submitted in electronic format if available.
- When cut and paste techniques are used, the source of the information, such as Drawing Number, CADD file number or catalog name, shall always be included.

[b] As part of the quality assurance process, Drafting Technicians shall indicate the incorporation of red/green marks into the drawing by marking the area with a blue check or by shading the change with a blue pencil or highlighting pen. No other colors shall be used.

# CHAPTER 3. SUBMITTAL REQUIREMENTS

## 3.1 PURPOSE

This chapter outlines submittal requirements for those outside entities performing drafting tasks for the Pantex Plant and establishes the level of information and direction supplied to those outside entities by the Configuration Control Section.

## 3.2 SCOPE

This chapter provides guidance for Drafting Technicians, Managers, Engineers, Architects, AE firms and subcontractors to BWXT Pantex who will be supplying services to BWXT Pantex.

## 3.3 INFORMATION FROM PANTEX

Configuration Control, after obtaining a security classification from Pantex Classification Office (see WI 02.02.04.10.02), shall supply to subcontractors the following:

(1) One copy of DRQ-293006.

(2) Electronic copies in the most current version of MicroStation of any necessary CADD files and cell libraries required for the project. These may include, but are not limited to the following:

[a] Pantex standard cell libraries.

[b] Pantex standard title block files.

[c] Pantex standard site files.

- The above files will be supplied on a Compact Disc (CD) or via Internet e-mail.

(3) A copy of MNL-00054.

(4) A copy of WI 02.02.04.10.02 Managing BWXT Classification Programs and Conducting Classified Activities.

## 3.4 DELIVERABLES TO PANTEX

All drawings submitted to Pantex shall be in the most current version of MicroStation. No other CADD formats will be accepted.

All drawings shall be created or modified as prescribed by this document.

All drawings shall be delivered in both electronic and a signed hard copy format or as outlined in the associated contract documents or specifications.

Hard copies of the drawings shall be submitted on better quality bond paper (as a minimum).

Electronic copies shall be submitted on a CD compatible with the current computer systems at Pantex. Configuration Control Manager shall be contacted if the computer system information is not known.

Any special information or data such as cells, special model files, MicroStation Development Language (MDL) programs and the like, shall be submitted on the same CD but placed in a separated different directory.

Generally, no modifications of existing site files or model files shall be made. If modifications are necessary, special notations shall be made within the CADD file to indicate the changes. These changes will then be made on the master CADD files at Pantex.

When errors are detected, the errors will be marked in red on hard copy and returned to the Contractor by mail. Corrections will be made and re-submitted to BWXT Pantex for verification within 15 days of receipt at the expense of the Contractor.

BWXT Pantex reserves the right to require any and all electronic media, manuals, copies of drawings and any other information or data related to the contract in any way to be completely destroyed during or after the contract period without additional cost to BWXT Pantex.

All information (hard copy and electronic data) related to the contracted work shall be handled according to WI 02.02.04.10.02 Managing BWXT Classification Programs and Conducting Classified Activities

Use of the Drafting Quality Control Check List is not mandated but recommended.

# CHAPTER 4. REFERENCES

## 4.1 GOVERNING DOCUMENTS

(1) DOE-STD-1073-2000, Configuration Management, Section 3 Design Requirements, Sub-Section 3.9 Assuring A Smooth Turnover From Design And Construction

(2) 10 CFR 830, Nuclear Safety Management, Section 121, Quality Assurance Program (QAP)

(3) 10 CFR 830, Nuclear Safety Management, Section 122, Quality Assurance Criteria

(4) Q9001-2000 American National Standard – Quality Management Systems

(5) ASME NQA-1-2004 Quality Assurance Requirements for Nuclear Facility Application:

- Requirement 3 Design Control, Section 600 Change Control, Sub-Section 601.9 Configuration Management of Operating Facilities
- Requirements 5 Instructions, Procedures, and Drawings, Section 100 Basic
- Requirements 6 Document Control, Section 200 Document Control

(6) National Cad Standard Version 3.1 (where applicable)

## 4.2 RELATED DOCUMENTS

(1) MNL-00054, System Engineering and Configuration Management Program

(2) MNL-00014, Labeling Manual

(3) DCD-001, Fire Protection Design Criteria Document

(4) WI 02.02.04.10.02 Managing BWXT Classification Programs and Conducting Classified Activities

(5) WI 02.20.04.02.02 How to Mark Classified Matter and Containers

# APPENDIX A
# MODEL FILE LEVEL ASSIGNMENT TABLES

| TABLE A-1 FLOOR PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **FLOOR INFORMATION** | | | |
| 5 | A-FLOR-FIXT | Floor mounted/Free standing miscellaneous fixtures (not including toilet fixtures) | 0 | 1 | 2 |
| 6 | A-FLOR-IDEN | Room name, space identification text | 0 | 3 | 7 |
| 7 | A-FLOR-LEVL | Level changes, shafts, ramps, pits, breaks in construction, and depressions | 0 | 2 | 5 |
| 8 | A-FLOR-NUMB | Room/space identification number and symbol | 0 | 3 | 7 |
| 9 | A-FLOR-OTLN | Floor outline/perimeter/building footprint | 0 | 2 | 5 |
| 10 | A-FLOR-PATT | Material patterns (e.g., paving, tile, carpet) | 0 | 0 | 9 |
| 11 | A-FLOR-RAIS | Access (raised) flooring | 0 | 1 | 2 |
| 12 | A-FLOR-RPRM | Room perimeter shape (Interior walls) | 0 | 2 | 4 |
| 13 | A-FLOR-SIGN | Signage | 0 | 1 | 3 |
| 14 | A-FLOR-SPCL | Architectural specialties, toilet room accessories (floor mounted only), display cases | 0 | 1 | 2 |
| | | **COLUMNS** | | | |
| 15 | A-COLS-ENCL | Column enclosures/fire protection | 0 | 3 | 7 |
| | | **WALLS** | | | |
| 20 | A-WALL-CAVI | Cavity wall lines | 0 | 2 | 4 |
| 21 | A-WALL-CNTR | Wall centerlines | 7 | 0 | 1 |
| 22 | A-WALL-CWMG | Curtain wall mullions and glass | 0 | 1 | 3 |
| 23 | A-WALL-EXTR | Exterior full height walls | 0 | 2 | 4 |
| 24 | A-WALL-FIRE | Fire wall designators (patterning) | 0 | 2 | 4 |
| 25 | A-WALL-IDEN | Wall identification/type text or tags | 0 | 3 | 7 |
| 26 | A-WALL-INTR | Interior full height walls | 0 | 2 | 5 |
| 27 | A-WALL-MOVE | Moveable walls/partitions | 0 | 0 | 1 |
| 28 | A-WALL-PATT | Material pattern (e.g., insulation, hatching, and fill) | 0 | 0 | 9 |
| 29 | A-WALL-PRHT | Partial height walls (do not appear on Reflected Ceiling Plan) | 0 | 1 | 3 |
| 30 | A-WALL-SPCL | Wall-hung/attached specialties (e.g., fixtures, grab bars, telephone booths, toilet accessories, etc.) see A-FLOR-PFIX for toilet fixtures | 0 | 1 | 3 |
| | | **OPENINGS** | | | |
| 31 | A-GLAZ-SILL | Window sills | 0 | 3 | 7 |
| 32 | A-WALL-HEAD | Door and window headers (appear on Reflected Ceiling Plan) | 0 | 3 | 7 |

| TABLE A-1 FLOOR PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 33 | A-WALL-JAMB | Door and window jambs (do not appear on Reflected Ceiling Plan) | 0 | 3 | 7 |
| | | **DOORS** | | | |
| 35 | A-DOOR-FULL | Full height (to ceiling) door: swing and leaf | 0 | 2 | 5 |
| 36 | A-DOOR-IDEN | Door number and symbol, hardware group, etc. | 0 | 2 | 5 |
| 37 | A-DOOR-PRHT | Partial height door: swing and leaf | 0 | 2 | 5 |
| 38 | A-DOOR-SYMB | Miscellaneous door symbols (e.g., overhead, bifold, pocket, etc.) | 0 | 1 | 3 |
| | | **WINDOWS** | | | |
| 40 | A-GLAZ-FULL | Full height glazed walls and partitions (see A-WALL-CWMG for curtain walls) | 0 | 1 | 3 |
| 41 | A-GLAZ-IDEN | Window number and symbol | 0 | 2 | 5 |
| 42 | A-GLAZ-PRHT | Windows and partial height glazed partitions | 0 | 1 | 3 |
| | | **PLUMBING FIXTURES** | | | |
| 45 | A-FLOR-PFIX | Plumbing fixtures (use only when Plumbing Piping Plan: P-SANR-FIXT is not available) | 0 | 2 | 5 |
| 46 | A-FLOR-TPTN | Toilet partitions and handicap grab bars | 0 | 1 | 3 |
| | | **ELEVATORS** | | | |
| 50 | A-FLOR-EVTR | Elevator cars and equipment | 0 | 2 | 4 |
| | | **STAIRS** | | | |
| 52 | A-FLOR-STRS | Stair risers/treads, escalators, ladders | 0 | 2 | 4 |
| | | **RAILINGS** | | | |
| 53 | A-FLOR-HRAL | Stair and balcony handrails, guard rails (except handicap grab bars) | 0 | 1 | 3 |
| | | **WOODWORK** | | | |
| 55 | A-FLOR-CASE | Casework (manufactured cabinets) | 0 | 1 | 2 |
| 56 | A-FLOR-WDWK | Architectural woodwork (field built cabinets and counters) | 0 | 1 | 2 |
| | | **CEILING PENETRATIONS** | | | |
| 60 | A-FLOR-OVHD | Overhead items (skylights, overhangs etc.) | 2 | 0 | 9 |

| TABLE A-2 REFLECTED CEILING PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **CEILING INFORMATION** | | | |
| 5 | A-CLNG-ACCS | Access panels, ceiling penetrations (see also A-FLOR-OVHD in Model File Type: Floor Plan) | 0 | 2 | 5 |
| 6 | A-CLNG-CONT | Ceiling control joints | 0 | 2 | 4 |
| 7 | A-CLNG-GRID | Ceiling grid | 0 | 1 | 3 |
| 8 | A-CLNG-OPEN | Ceiling/roof penetrations | 0 | 0 | 9 |
| 9 | A-CLNG-PATT | Ceiling patterns (e.g., gypsum, plaster, user defined) | 0 | 0 | 9 |
| 10 | A-CLNG-TEES | Main tees | 0 | 0 | 1 |
| 11 | A-CLNG-SUSP | Suspended elements, ceiling mounted specialties (e.g., clocks, fans, etc.) | 0 | 0 | 1 |
| | | **LIGHTS** | | | |
| 15 | A-LITE-CLNG | Ceiling recessed lights (use only when Electrical lighting symbols are unavailable) | 0 | 3 | 7 |
| 16 | A-LITE-EMER | Emergency lights (use only when Electrical lighting symbols are unavailable) | 0 | 1 | 3 |
| 17 | A-LITE-SURF | Surface mounted lights (pendant, etc.) | 0 | 3 | 7 |
| 18 | A-LITE-WALL | Wall mounted lights (use only when Electrical lighting symbols are unavailable) | 0 | 3 | 7 |
| | | **DIFFUSERS** | | | |
| 20 | A-HVAC-ODFF | Other inlets and outlets (use only when Mechanical HVAC symbols are unavailable) see M-HVAC-ODFF | 0 | 1 | 2 |
| 21 | A-HVAC-RDFF | Ceiling return inlets (use only when Mechanical HVAC symbols are unavailable) see M-HVAC-RDFF | 0 | 0 | 1 |
| 22 | A-HVAC-SDFF | Ceiling supply diffusers (use only when Mechanical HVAC symbols are unavailable) see M-HVAC-SDFF | 0 | 3 | 7 |

| TABLE A-3 ROOF PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **ROOF INFORMATION** | | | |
| 5 | A-ROOF-CRTS | Crickets flow arrows flow info | 0 | 2 | 4 |
| 6 | A-ROOF-DRNS | Roof drains | 0 | 1 | 3 |
| 7 | A-ROOF-EDGE | Roof internal gutters | 0 | 2 | 4 |
| 8 | A-ROOF-EXPN | Expansion joints | 0 | 2 | 4 |
| 9 | A-ROOF-HRAL | Stair handrails, nosings, guard rails | 0 | 1 | 3 |
| 10 | A-ROOF-LEVL | Level changes | 0 | 0 | 1 |
| 11 | A-ROOF-OTLN | Roof perimeter/edge, roof geometry | 0 | 3 | 7 |
| 12 | A-ROOF-PATT | Roof surface patterns, hatching | 0 | 0 | 9 |
| 13 | A-ROOF-SPCL | Roof specialties, accessories, access hatches | 0 | 1 | 2 |
| 14 | A-ROOF-STRS | Stair risers/treads, ladders | 0 | 2 | 4 |
| 15 | A-ROOF-WALK | Roof walkways | 0 | 1 | 2 |

| TABLE A-4 EQUIPMENT PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **AREA INFORMATION** | | | |
| 1 | A-EQPM-ACCS | Equipment access | 0 | 2 | 5 |
| 2 | A-EQPM-CLNG | Ceiling mounted or suspended equipment | 0 | 2 | 5 |
| 3 | A-EQPM-FIXD | Fixed equipment | 0 | 3 | 7 |
| 4 | A-EQPM-IDEN | Equipment identification numbers | 0 | 2 | 5 |
| 5 | A-EQPM-MOVE | Moveable equipment | 0 | 2 | 5 |
| | | **MACHINE DESIGN** | | | |
| 6 | A-MACH-BASE | Machinery bases | 0 | 2 | 4 |
| 7 | A-MACH-COMP | Miscellaneous machinery parts and components | 0 | 2 | 4 |
| 8 | A-MACH-EXST | Existing machinery | 0 | 2 | 5 |
| 9 | A-MACH-FAST | Fasteners, nuts, and bolts | 0 | 2 | 4 |
| 10 | A-MACH-LROT | Large rotating machinery (turbine and pump outlines) | 0 | 2 | 5 |
| 11 | A-MACH-MOTR | Machinery motors | 0 | 2 | 5 |
| | | **EQUIPMENT** | | | |
| 15 | A-EQPM-ACS | Equipment access | 2 | 0 | 9 |
| 16 | A-EQPM-CHLD | Child development (play toys, teaching rugs, play forms) | 0 | 2 | 4 |
| 17 | A-EQPM-CLG | Ceiling mounted and suspended equipment | 0 | 1 | 2 |
| 18 | A-EQPM-COPY | Copiers, fax machines, office equipment | 0 | 2 | 4 |
| 19 | A-EQPM-FIXED | Fixed equipment | 0 | 0 | 1 |
| 20 | A-EQPM-IDENT | Equipment identification numbers | 0 | 1 | 3 |
| 21 | A-EQPM-MOV | Moveable equipment | 2 | 0 | 1 |
| 22 | A-EQPM-NICN | Not in contract equipment | 1 | 0 | 9 |
| 23 | A-EQPM-STOR | High density storage, specialty storage | 0 | 2 | 4 |
| | | **FREE STANDING FURNITURE** | | | |
| 25 | A-FURN-ACCS | Accessories (vestibule matts, partitions, draperies, clocks, trash cans, lecturns, lamps, etc.) | 0 | 1 | 3 |
| 26 | A-FURN-ADPC | Automated Data Processing Components | 0 | 2 | 4 |
| 27 | A-FURN-ARTW | Artwork | 0 | 2 | 4 |
| 28 | A-FURN-CASE | Case goods (desks, credenzas, beds, dressers, nightstands, wardrobes, etc.) | 0 | 2 | 5 |
| 29 | A-FURN-FLOR | Flooring (carpet, rugs, etc.) | 0 | 2 | 4 |

| TABLE A-4 EQUIPMENT PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 30 | A-FURN-FREE | Free-standing desks and tables (conference, classroom, coffee, end, etc.) | 0 | 2 | 5 |
| 31 | A-FURN-IDEN | Furniture code identification | 0 | 1 | 2 |
| 32 | A-FURN-MEDI | Medical (exam beds, dental chairs, etc.) | 0 | 2 | 4 |
| 33 | A-FURN-MISC | Miscellaneous furniture | 0 | 2 | 4 |
| 34 | A-FURN-PLNT | Plants | 0 | 1 | 3 |
| 35 | A-FURN-SEAT | Chairs, sofas, etc. | 0 | 2 | 4 |
| 36 | A-FURN-STOR | File cabinets, high density storage, shelving, storage cabinets | 0 | 2 | 4 |
| | | **MODULES** | | | |
| 40 | A-FURN-GRID | Planning grid/modular outline | 0 | 3 | 7 |
| | | [a] | | | |
| 45 | A-SYST-FURN | Furniture | 0 | 0 | 4 |
| 46 | A-SYST-IDEN | Code identification | 0 | 1 | 3 |
| 47 | A-SYST-LITE | Lighting components | 0 | 3 | 7 |
| 48 | A-SYST-PATT | Patterns | 0 | 0 | 9 |
| 49 | A-SYST-PNLS | Panels | 0 | 2 | 4 |
| 50 | A-SYST-POWR | Power, communication components | 0 | 3 | 7 |
| 51 | A-SYST-STOR | Storage components | 0 | 2 | 4 |
| 52 | A-SYST-WALL | Systems furniture partition walls | 0 | 2 | 4 |
| 53 | A-SYST-WKSF | Work surface components | 0 | 2 | 4 |
| | | **SIGNAGE** | | | |
| 55 | A-FLOR-SIGN | Directory signage | 0 | 2 | 5 |

| TABLE A-5 SURVEY | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **COORDINATE GRID** | | | |
| 5 | V-GRID-TICS | Coordinate grid tics and text | 0 | 2 | 3 |
| | | **SURVEY LINES** | | | |
| 10 | V-SURV-LINE | Survey and control line | 2 | 3 | 7 |
| 11 | V-SURV-IDEN | Survey and control line annotation | 0 | 1 | 5 |
| | | **PROPERTY** | | | |
| 15 | V-PROP-BRNG | Bearings and distance labels | 0 | 5 | 0 |
| 16 | V-PROP-ESMT | Easements with annotation | 3 | 3 | 7 |
| 17 | V-PROP-LINE | Property lines with annotation | 6 | 3 | 7 |
| 18 | V-PROP-RWAY | Right of ways with annotation | 3 | 5 | 0 |
| | | **EMBANKMENTS** | | | |
| 20 | V-EMBK-CNTL | Embankment centerlines | 7 | 1 | 2 |
| 21 | V-EMBK-EDGE | Embankment edge and object lines | 0 | 0 | 1 |
| 22 | V-EMBK-IDEN | Embankment annotation | 0 | 1 | 3 |
| | | **STORM DRAINAGE SYSTEM** | | | |
| 25 | C-STRM-CULV | Culverts, drainage inlets, storm drains | 0 | 3 | 7 |
| 26 | C-STRM-CURB | Storm drain inlets - curb | 0 | 1 | 2 |
| 27 | C-STRM-DTCH | Ditches with annotation | 0 | 2 | 4 |
| 28 | C-STRM-EROS | Erosion control | 0 | 3 | 7 |
| 29 | C-STRM-HDWL | Storm drainage head walls | 0 | 1 | 2 |
| 30 | C-STRM-IDEN | Culverts, head walls, drainage inlets - annotation | 0 | 2 | 4 |
| 31 | C-STRM-MNHL | Storm drain manholes | 0 | 1 | 2 |
| 32 | C-STRM-POND | Ponds with annotation | 0 | 2 | 5 |
| 33 | C-STRM-UNDR | Storm drainage pipe-underground | 3 | 2 | 4 |
| | | **BORROW AREAS** | | | |
| 35 | C-BORW-LINE | Borrow/Spoil area | 2 | 2 | 4 |
| 36 | C-BORW-IDEN | Borrow/Spoil area annotation | 0 | 2 | 4 |
| | | **TOPOGRAPHY** | | | |
| 40 | C-TOPO-BKLN | Topo breaklines | 0 | 1 | 2 |
| 41 | C-TOPO-BORE | Soil boring layout | 0 | 2 | 4 |

| TABLE A-5 SURVEY | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 42 | C-TOPO-COOR | Coordinates | 0 | 1 | 3 |
| 43 | C-TOPO-MAID | Major contours - annotation | 0 | 3 | 7 |
| 44 | C-TOPO-MAJR | Major contours | 0 | 3 | 7 |
| 45 | C-TOPO-MIID | Minor contours - annotation | 0 | 2 | 4 |
| 46 | C-TOPO-MINR | Minor contours | 0 | 2 | 4 |
| 47 | C-TOPO-RTWL | Retaining wall | 0 | 1 | 3 |
| 48 | C-TOPO-SLID | Cut/fill slopes - annotation | 0 | 2 | 4 |
| 49 | C-TOPO-SLOP | Cut/fill slopes | 0 | 2 | 4 |
| 50 | C-TOPO-SPOT | Spot elevations | 0 | 3 | 7 |
| 53 | C-TOPO-DATA | Survey data points | | | |
| 54 | C-TOPO-DATA2 | Survey data points | | | |
| 55 | C-TOPO-DATA3 | Survey data points | | | |
| 56 | C-TOPO-DATA4 | Survey data points | | | |
| 57 | C-TOPO-DATA5 | Survey data points | | | |
| 58 | C-TOPO-DATA6 | Survey data points | | | |
| 59 | C-TOPO-DATA7 | Survey data points | | | |
| 60 | C-TOPO-DATA8 | Survey data points | | | |
| 61 | C-TOPO-DATA9 | Survey data points | | | |
| 62 | C-TOPO-DATA10 | Survey data points | | | |
| 63 | C-TOPO-DATA11 | Survey data points | | | |

| TABLE A-6 SITE PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **BUILDING AND PRIMARY STRUCTURES** | | | |
| 5 | C-BLDG-IDEN | Building annotation | 0 | 2 | 4 |
| 6 | C-BLDG-OTLN | Building and primary structures – outline | 0 | 3 | 7 |
| | | **SITE** | | | |
| 10 | C-SITE-FENC | Fences | 0 | 2 | 5 |
| 11 | C-SITE-HRAL | Handrails | 0 | 1 | 3 |
| 12 | C-SITE-IDEN | Site annotation | 0 | 2 | 5 |
| 13 | C-SITE-IMPR | Site improvements | 0 | 2 | 5 |
| 14 | C-SITE-RAMP | Ramps | 0 | 2 | 4 |
| 15 | C-SITE-SIGN | Signs | 0 | 3 | 7 |
| 16 | C-SITE-STRS | Stairs | 0 | 2 | 5 |
| 17 | C-SITE-WALK | Walks and trails | 0 | 1 | 2 |
| | | **ROADS** | | | |
| 20 | C-ROAD-CNID | Centerline annotation | 0 | 2 | 5 |
| 21 | C-ROAD-CNTR | Centerlines | 7 | 1 | 3 |
| 22 | C-ROAD-CURB | Curbs with annotation | 0 | 2 | 5 |
| 23 | C-ROAD-GARD | Guardrails with annotation | 0 | 2 | 5 |
| 24 | C-ROAD-IDEN | Road – annotation | 0 | 2 | 5 |
| 25 | C-ROAD-OTLN | Road – outlines | 0 | 2 | 4 |
| | | **PARKING LOTS AND MINOR ROADS** | | | |
| 30 | C-PKNG-CARS | Graphic illustration of cars | 0 | 2 | 4 |
| 31 | C-PKNG-CNID | Centerline annotation | 0 | 2 | 5 |
| 32 | C-PKNG-CNTR | Centerlines | 7 | 1 | 3 |
| 33 | C-PKNG-CURB | Curbs with annotation | 0 | 2 | 5 |
| 34 | C-PKNG-DRAN | Parking lot drainage slope indications | 0 | 0 | 1 |
| 35 | C-PKNG-IDEN | Parking lots and minor roads – annotation | 0 | 2 | 5 |
| 36 | C-PKNG-ISLD | Parking islands | 0 | 2 | 4 |
| 37 | C-PKNG-OTLN | Parking lots and minor roads – outlines | 0 | 2 | 4 |
| 38 | C-PKNG-PVMK | Pavement markings | 0 | 2 | 4 |
| 39 | C-PKNG-STRP | Parking lot striping, handicapped symbols | 0 | 2 | 4 |
| | | **RAILROADS** | | | |

| TABLE A-6 SITE PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 45 | C-RAIL-CNID | Centerline annotation | 0 | 2 | 5 |
| 46 | C-RAIL-CNTR | Centerlines | 7 | 1 | 3 |
| 47 | C-RAIL-IDEN | Railroad – annotations | 0 | 2 | 5 |

| TABLE A-7 POWER AND LIGHTING PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **LIGHTING** | | | |
| 48 | C-RAIL-OTLN | Railroad – outlines | 0 | 2 | 4 |
| | | **PAVEMENT** | | | |
| 50 | C-PAVE-JOIN | Pavement joint | 0 | 2 | 5 |
| 51 | C-PAVE-IDEN | Pavement joint annotation | 0 | 1 | 3 |
| 1 | E-LITE-CLNG | Ceiling mounted fixtures | 0 | 2 | 5 |
| 2 | E-LITE-EMER | Emergency fixtures | 0 | 1 | 3 |
| 3 | E-LITE-EXIT | Exit fixtures | 0 | 2 | 5 |
| 4 | E-LITE-FLOR | Floor mounted fixtures (e.g., stage, etc.) | 0 | 2 | 5 |
| 5 | E-LITE-IDEN | Light fixture identifier tags | 0 | 1 | 3 |
| 6 | E-LITE-OTLN | Lighting outline for background (optional) | 0 | 2 | 5 |
| 7 | E-LITE-ROOF | Roof lighting | 0 | 2 | 4 |
| 8 | E-LITE-SITE | Site lighting (see also Utilities discipline) | 0 | 2 | 4 |
| 9 | E-LITE-SPCL | Special fixtures | 0 | 2 | 5 |
| 10 | E-LITE-WALL | Wall mounted fixtures | 0 | 2 | 5 |
| | | **ELECTRICAL EQUIPMENT** | | | |
| 15 | E-POWR-EQPM | Physical outline of electrical equipment (e.g., MCC switchboards, panel boards, etc.) | 0 | 3 | 7 |
| 16 | E-POWR-OTLN | Power outline for backgrounds | 0 | 2 | 5 |
| 17 | E-POWR-PANL | Power panels/distribution equipment | 0 | 2 | 5 |
| | | **JUNCTION BOXES** | | | |
| 20 | E-POWR-JBOX | Junction boxes | 0 | 1 | 2 |
| | | **SWITCHES** | | | |
| 25 | E-POWR-SWBD | Power switchboards | 0 | 2 | 5 |
| 26 | E-POWR-SWCH | Switches, motor starters, contactors, disconnect switches, etc. - symbols | 0 | 1 | 5 |
| | | **POWER** | | | |
| 30 | E-POWR-BUSW | Busways | 0 | 2 | 5 |
| 31 | E-POWR-CABL | Cable trays | 0 | 2 | 5 |
| 32 | E-POWR-CLNG | Ceiling receptacles and devices | 0 | 1 | 2 |
| 33 | E-POWR-FEED | Feeders | 0 | 1 | 2 |
| 34 | E-POWR-ROOF | Roof power | 0 | 1 | 2 |

| TABLE A-7 POWER AND LIGHTING PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 35 | E-POWR-SITE | Site power (see also utilities disciplines) | 0 | 1 | 2 |
| 36 | E-POWR-URAC | Underfloor raceways | 3 | 1 | 5 |
| 37 | E-POWR-WALL | Wall outlets and receptacles | 0 | 1 | 2 |
| | | **MOTORS/GENERATORS** | | | |
| 40 | E-POWR-MOTR | Motors and utilization equipment symbols | 0 | 3 | 7 |
| 41 | E-POWR-GENR | Generators and utilization equipment symbols | 0 | 2 | 4 |
| | | **CIRCUIT LINES** | | | |
| 45 | E-POWR-CIRC | Power circuits | 0 | 2 | 5 |
| 46 | E-POWR-CTCF | Power circuits concealed in floor and conduit | 3 | 2 | 2 |
| 47 | E-POWR-CTCW | Concealed wiring and conduit | 4 | 1 | 2 |
| 48 | E-POWR-CTID | Circuit identifiers (e.g., panel circuits, wire/conduit size, tags, etc.) | 0 | 1 | 3 |
| 49 | E-POWR-CTXW | Exposed wiring and conduit | 2 | 2 | 5 |
| 50 | E-POWR-HASH | Power circuits - hash marks | 0 | 1 | 3 |
| 51 | E-POWR-HOME | Power circuit home run arrows | 0 | 1 | 3 |
| 52 | E-POWR-NUMB | Power circuit numbers | 0 | 2 | 5 |
| 53 | E-POWR-UCPT | Under carpet wiring | 0 | 1 | 2 |
| | | **GROUND SYSTEM** | | | |
| 55 | E-GRND-CIRC | Circuits | 0 | 3 | 7 |
| 56 | E-GRND-DIAG | Ground system diagram | 0 | 2 | 4 |
| 57 | E-GRND-EQUI | Equipotential ground system | 0 | 1 | 2 |
| 58 | E-GRND-REFR | Reference ground system | 0 | 1 | 3 |
| 59 | E-GRND-GBUS | Grounding systems - lightning protection | 0 | 3 | 7 |

| TABLE A-8 SPINKLER PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **CO2 SPRINKLER SYSTEM** | | | |
| 5 | F=CO2S-EQPM | Equipment | 0 | 2 | 5 |
| 6 | F-CO2S-PIPE | CO2 piping, including discharge nozzles | 0 | 2 | 4 |
| | | **AQUEOUS FILM FORMING FOAM SYSTEM** | | | |
| 10 | F-AFFF-EQPM | Equipment | 0 | 2 | 5 |
| 11 | F-AFFF-PIPE | Piping, including discharge nozzles | 0 | 2 | 4 |
| | | **GASEOUS SUPPRESSION SYSTEM** | | | |
| 15 | F-HALN-EQPM | Gaseous Suppression equipment | 0 | 1 | 3 |
| 16 | F-HALN-PIPE | Gaseous Suppression piping | 0 | 1 | 3 |
| | | **INERT GAS** | | | |
| 20 | F-IGAS-EQPM | Inert gas equipment | 0 | 1 | 2 |
| 21 | F-IGAS-PIPE | Inert gas piping, including discharge nozzles | 0 | 1 | 2 |
| | | **SPRINKLER SYSTEM** | | | |
| 25 | F-SPRN-COMB | Combination system | 0 | 1 | 3 |
| 26 | F-SPRN-OTHR | Sprinkler - other | 0 | 1 | 3 |
| 27 | F-SPRN-PEND | Sprinkler – pendant | 0 | 1 | 2 |
| 28 | F-SPRN-PIPE | Sprinkler – piping | 0 | 2 | 4 |
| 29 | F-SPRN-UPRT | Sprinkler – upright | 0 | 1 | 2 |
| | | **FIRE PROTECTION/SUPPRESSION SYSTEM** | | | |
| 30 | F-PROT-EXTN | Equipment (fire extinguisher) | 0 | 2 | 4 |
| 31 | F-PROT-HOSE | Equipment (fire hose cabinet) | 0 | 2 | 4 |
| | | **FIRE ALARM SYSTEM** | | | |
| 35 | F-ALRM-DTCT | Smoke detectors, heat sensors, ultraviolet detectors, manual fire alarm pull stations and manual deluge switches | 0 | 1 | 2 |

| TABLE A-9 TITLE BLOCK | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **GENERAL INFORMATION** | | | |
| 1 | G-ANNO-TTLB | Border and title block line work | 0 | V | 3 |
| 5 | G-ANNO-NOTE | General notes and general remarks | 0 | V | 3 |
| 6 | V-ANNO-SYMB | Miscellaneous symbols | V | V | 3 |

| TABLE A-10 LANDSCAPE PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **IRRIGATION SYSTEM** | | | |
| 1 | L-IRRG-COVR | Irrigation coverage, spray distribution patterns | 0 | 2 | 5 |
| 2 | L-IRRG-EQPM | Equipment (e.g., controllers, valves, RPBPs, etc.) | 0 | 2 | 4 |
| 3 | L-IRRG-IDEN | Annotation | 0 | 2 | 5 |
| 4 | L-IRRG-PIPE | Piping | 0 | 2 | 5 |
| 5 | L-IRRG-SHPT | Shrub location for drip/sprinkler heads | 3 | 2 | 5 |
| 6 | L-IRRG-SPKL | Sprinklers | 0 | 2 | 5 |
| 7 | L-IRRG-TRPT | Tree location for drip/sprinkler heads | 3 | 2 | 5 |
| 8 | L-IRRG-TURF | Irrigation head for turf | 0 | 2 | 3 |
| | | **SITE IMPROVEMENTS** | | | |
| 10 | L-SITE-BRDG | Bridges | 0 | 0 | 1 |
| 11 | L-SITE-DECK | Decks | 0 | 1 | 2 |
| 12 | L-SITE-FENC | Fencing | 0 | 2 | 4 |
| 13 | L-SITE-FURN | Site furnishings | 0 | 1 | 2 |
| 14 | L-SITE-IDEN | Annotation | 0 | 0 | 1 |
| 15 | L-SITE-PLAY | Play structures | 0 | 2 | 4 |
| 16 | L-SITE-POOL | Pools | 0 | 2 | 4 |
| 17 | L-SITE-ROCK | Boulders and cobble | 0 | 2 | 4 |
| 18 | L-SITE-SPRT | Sports fields | 0 | 2 | 4 |
| 19 | L-SITE-STEP | Steps | 0 | 2 | 4 |
| 20 | L-SITE-WALL | Walls | 0 | 2 | 4 |
| | | **LANDSCAPE PLANTS** | | | |
| 21 | L-PLNT-BEDS | Rock, bark, and other landscaping beds | 0 | 1 | 2 |
| 22 | L-PLNT-GRND | Groundcover and vines | 0 | 0 | 1 |
| 23 | L-PLNT-IDEN | Annotation | 0 | 0 | 1 |
| 24 | L-PLNT-PLAN | Planting plants | 0 | 1 | 2 |
| 25 | L-PLNT-SHLN | Shrub Line | V | 1 | 2 |
| 26 | L-PLNT-SHRB | Shrubs (e.g., evergreen, deciduous) | 0 | 0 | 1 |
| 27 | L-PLNT-TRLN | Tree Line | V | 1 | 2 |
| 28 | L-PLNT-TREE | Trees (e.g., evergreen, deciduous, etc.) | 0 | 0 | 1 |
| | | **WALKS** | | | |

| TABLE A-10 LANDSCAPE PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 30 | L-WALK-OTLN | Walks and steps | 0 | 1 | 3 |
| 31 | L-WALK-PATT | Walks and steps - patterning/hatching | 0 | 0 | 9 |
| | | **HYDROSEEDING** | | | |
| 35 | L-HYDR-GENL | Hydroseeding | 0 | 0 | 1 |
| 36 | L-HYDR-SEED | Hydroseeding, Seed | 0 | 1 | 3 |
| 37 | L-HYDR-SODS | Hydroseeding, Sod | 0 | 2 | 4 |
| 38 | L-HYDR-SPRG | Hydroseeding, Sprigs | 0 | 2 | 5 |
| 39 | L-HYDR-SDSD | Hydroseeding, Seed, Sod | 0 | 1 | 2 |
| 40 | L-HYDR-SDSG | Hydroseeding, Seed, Sprig | 0 | 3 | 7 |
| 41 | L-HYDR-SSSG | Hydroseeding, Seed, Sod, Sprig | 0 | 1 | 3 |
| | | **TURFING** | | | |
| 42 | L-TURF-IDEN | Annotation | 0 | 0 | 1 |
| 43 | L-TURF-MLCH | Mulching outlines | 0 | 0 | 1 |
| | | **TURF** | | | |
| 47 | L-SEED-GENL | Seed | 0 | 0 | 1 |
| 48 | L-SEED-SDSD | Seed, sod | 0 | 1 | 2 |
| 49 | L-SEED-SDSG | Seed, Sprig | 0 | 2 | 4 |
| 50 | L-SEED-SODS | Sod | 0 | 2 | 5 |
| 51 | L-SEED-SSSG | Seed, sod, sprig | 0 | 1 | 3 |

| | | TABLE A-11 HVAC PLAN | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **DUCTWORK AND EQUIPMENT** | | | |
| 5 | M-HVAC-DOOR | Equipment access doors | 0 | 1 | 2 |
| 6 | M-HVAC-EQPM | Air system equipment | 0 | 2 | 4 |
| 7 | M-HVAC-OTHR | Other ductwork | 0 | 2 | 5 |
| 8 | M-HVAC-RETN | Return ductwork | 0 | 2 | 5 |
| 9 | M-HVAC-SUPP | Supply ductwork | 0 | 2 | 4 |
| | | **DIFFUSERS** | | | |
| 15 | M-HVAC-CDFF | Ceiling diffusers | 0 | 2 | 5 |
| 16 | M-HVAC-IDEN | Diffuser tags | 0 | 2 | 5 |
| 17 | M-HVAC-ODFF | Other diffusers | 0 | 2 | 5 |
| 18 | M-HVAC-RDFF | Return air diffusers | 0 | 2 | 5 |
| 19 | M-HVAC-SDFF | Supply diffusers | 0 | 2 | 5 |
| | | **EXHAUST** | | | |
| 25 | M-EXHS-CDFF | Exhaust air ceiling diffusers | 0 | 2 | 5 |
| 26 | M-EXHS-DUCT | Ductwork | 0 | 2 | 5 |
| 27 | M-EXHS-EQPM | Equipment | 0 | 2 | 4 |
| | | **INDUSTRIAL EXHAUST** | | | |
| 35 | M-INEX-CDFF | Industrial exhaust air ceiling diffusers | 0 | 2 | 5 |
| 36 | M-INEX-DUCT | Ductwork | 0 | 2 | 5 |
| 37 | M-INEX-EQPM | Equipment | 0 | 2 | 4 |
| | | **CONTROLS** | | | |
| 40 | M-CONT-INST | Controls, instrumentation, sensors, and equipment | 0 | 2 | 4 |
| 41 | M-CONT-THER | Thermostats | 0 | 2 | 4 |
| 42 | M-CONT-WIRE | Low voltage wiring | 0 | 2 | 4 |

| TABLE A-12 PIPING PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **CHILLED WATER SYSTEM** | | | |
| 1 | P-CWTR-EQPM | Equipment | 0 | 2 | 5 |
| 2 | P-CWTR-PIPE | Piping (includes fittings, valves, instrumentation) | 0 | 1 | 2 |
| | | **HOT WATER HEATING SYSTEM** | | | |
| 5 | P-HWTR-EQPM | Equipment | 0 | 2 | 4 |
| 6 | P-HWTR-PIPE | Piping (includes fittings, valves, instrumentation) | 0 | 2 | 5 |
| | | **DUAL TEMPERATURE SYSTEM** | | | |
| 8 | P-DUAL-EQPM | Equipment | 0 | 2 | 4 |
| 9 | P-DUAL-PIPE | Piping (includes fittings, valves, instrumentation) | 0 | 1 | 3 |
| | | **STEAM SYSTEM** | | | |
| 12 | P-STEM-CONP | Condensate piping (includes fittings, valves, instrumentation) | 0 | 0 | 1 |
| 13 | P-STEM-EQPM | Equipment | 0 | 2 | 4 |
| 14 | P-STEM-HPIP | High pressure piping (includes fittings, valves, instrumentation) | 0 | 1 | 3 |
| 15 | P-STEM-LPIP | Low pressure piping (includes fittings, valves, instrumentation) | 0 | 1 | 2 |
| 16 | P-STEM-MPIP | Medium pressure piping (includes fittings, valves, instrumentation) | 0 | 2 | 5 |
| | | **REFRIGERATION SYSTEM** | | | |
| 19 | P-REFG-EQPM | Equipment | 0 | 3 | 4 |
| 20 | P-REFG-PIPE | Piping (includes fittings, valves, instrumentation) | 0 | 3 | 5 |
| | | **ENERGY RECOVERY SYSTEM** | | | |
| 23 | P-RCOV-EQPM | Equipment | 0 | 2 | 4 |
| 24 | P-RCOV-PIPE | Piping (includes fittings, valves, instrumentation) | 0 | 2 | 5 |
| | | [b] | | | |
| 27 | P-FUEL-EQPM | Equipment | 0 | 2 | 4 |
| 28 | P-FUEL-GGEP | Fuel gas general piping (includes fittings, valves, instrumentation) | 0 | 2 | 5 |
| 29 | P-FUEL-GPRP | Fuel gas process piping (includes fittings, valves, instrumentation) | 0 | 2 | 5 |
| 30 | P-FUEL-OGEP | Fuel oil general piping (includes fittings, valves, instrumentation) | 0 | 1 | 2 |
| 31 | P-FUEL-OPRP | Fuel oil process piping (includes fittings, valves, instrumentation) | 0 | 1 | 2 |
| | | **CONTROLS** | | | |
| 34 | P-CONT-INST | Controls, instrumentation, sensors, and equipment | 0 | 2 | 4 |
| 35 | P-CONT-THER | Thermostats | 0 | 2 | 4 |

| TABLE A-12 PIPING PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 36 | P-CONT-WIRE | Low Voltage Wiring | 0 | 2 | 4 |
| | | **DOMESTIC WATER PIPING SYSTEM** | | | |
| 39 | P-DOMW-CPIP | Domestic cold water piping (includes fittings, valves, risers, etc.) | 0 | 1 | 2 |
| 40 | P-DOMW-EQPM | Hot and cold water equipment | 0 | 3 | 7 |
| 41 | P-DOMW-FPIP | Domestic filtered water piping | 0 | 1 | 2 |
| 42 | P-DOMW-HPIP | Domestic hot water piping (includes fittings, valves, risers, etc.) | 0 | 1 | 3 |
| 43 | 15 P-DOMW-RISR | Domestic hot and cold water risers | 2 | 1 | 2 |
| 44 | P-DOMW-RPIP | Domestic hot water recirculation piping | 0 | 1 | 3 |
| | | **SANITARY DRAINAGE PIPING** | | | |
| 47 | P-SANR-FIXT | Plumbing fixtures | 0 | 2 | 5 |
| 48 | P-SANR-EQPM | Equipment (sand/oil/water separators) | 0 | 3 | 7 |
| 49 | P-SANR-FLDR | Floor drains and cleanouts | 0 | 2 | 5 |
| 50 | P-SANR-PIPE | Piping | 0 | 2 | 5 |
| 51 | P-SANR-RISR | Sanitary risers | 2 | 2 | 5 |
| 52 | P-SANR-VENT | Vent piping | 2 | 2 | 5 |
| | | **STORM DRAINAGE PIPING** | | | |
| 55 | P-STRM-PIPE | Storm drain piping | 0 | 2 | 4 |
| 56 | P-STRM-RFDR | Roof drains | 0 | 2 | 4 |
| 57 | P-STRM-RISR | Storm drain risers | 2 | 2 | 4 |
| 58 | P-STRM-RPIP | Roof drain piping | 0 | 2 | 4 |

| TABLE A-13 SPECIALTY PIPING AND EQUIPMENT PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **BRINE SYSTEMS** | | | |
| 1 | M-BRIN-EQPM | Brine system equipment | 0 | 2 | 5 |
| 2 | M-BRIN-PIPE | Brine system piping | 0 | 2 | 4 |
| | | **DENTAL PIPING** | | | |
| 3 | M-DENT-EQPM | Equipment | 0 | 2 | 5 |
| 4 | M-DENT-PIPE | Piping | 0 | 2 | 4 |
| | | **FUEL DISTRIBUTION PIPING** | | | |
| 5 | M-FUEL-EQPM | Fuel distribution equipment | 0 | 2 | 5 |
| 6 | M-FUEL-RPIP | Fuel distribution return piping | 0 | 2 | 4 |
| 7 | M-FUEL-SPIP | Fuel distribution supply piping | 0 | 2 | 4 |
| | | **HIGH PRESSURE COMPRESSED AIR** | | | |
| 10 | M-CMPH-EQPM | High pressure equipment | 0 | 2 | 5 |
| 11 | M-CMPH-PIPE | Governor or high pressure brake lines | 0 | 2 | 4 |
| | | **LOW PRESSURE COMPRESSED AIR** | | | |
| 12 | M-CMPL-EQPM | Shop and control air equipment | 0 | 2 | 5 |
| 13 | M-CMPL-PIPE | Shop and control air piping | 0 | 2 | 4 |
| | | **HYDRAULIC SYSTEMS** | | | |
| 14 | M-HYDR-EQPM | Hydraulic system equipment | 0 | 2 | 5 |
| 15 | M-HYDR-RPIP | Hydraulic system return piping | 0 | 2 | 4 |
| 16 | M-HYDR-SPIP | Hydraulic system supply piping | 0 | 2 | 4 |
| | | **INDUSTRIAL WASTE PIPING** | | | |
| 20 | M-ACID-EQPM | Acid, alkaline, and oil waste equipment | 0 | 2 | 5 |
| 21 | M-ACID-PIPE | Acid, alkaline, and oil waste piping | 0 | 2 | 4 |
| 22 | M-ACID-VENT | Acid, alkaline, and oil waste vent piping | 2 | 2 | 4 |
| | | **INSULATING (TRANSFORMER) OIL** | | | |
| 23 | M-INSL-EQPM | Insulating oil equipment | 0 | 2 | 5 |
| 24 | M-INSL-RPIP | Insulating oil return piping | 0 | 2 | 4 |
| 25 | M-INSL-SPIP | Insulating oil supply piping | 0 | 2 | 4 |
| | | **LABORATORY PIPING** | | | |
| 26 | M-LGAS-EQPM | Equipment | 0 | 2 | 5 |
| 27 | M-LGAS-PIPE | Piping | 0 | 2 | 4 |

| TABLE A-13 SPECIALTY PIPING AND EQUIPMENT PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **LUBRICATION OIL** | | | |
| 30 | M-LUBE-EQPM | Lubrication oil equipment | 0 | 2 | 5 |
| 31 | M-LUBE-RPIP | Lubrication oil return piping | 0 | 2 | 4 |
| 32 | M-LUBE-SPIP | Lubrication oil supply piping | 0 | 2 | 4 |
| | | **MEDICAL GAS PIPING** | | | |
| 35 | M-MDGS-EQPM | Equipment | 0 | 2 | 5 |
| 36 | M-MDGS-PIPE | Piping | 0 | 2 | 4 |
| | | **NATURAL GAS (OR LIQUID PETROLEUM) PIPING** | | | |
| 37 | M-NGAS-EQPM | Equipment | 0 | 2 | 5 |
| 38 | M-NGAS-PIPE | Piping | 0 | 2 | 4 |
| | | **PROCESS PIPING** | | | |
| 40 | M-PROC-EQPM | Equipment | 0 | 2 | 5 |
| 41 | M-PROC-PIPE | Process piping | 0 | 2 | 4 |
| 42 | M-PROC-RPIP | Return piping | 0 | 2 | 4 |
| 43 | M-PROC-SPIP | Supply piping | 0 | 2 | 4 |
| | | **RAW WATER PIPING** | | | |
| 45 | M-RWTR-EQPM | Raw water equipment | 0 | 2 | 5 |
| 46 | M-RWTR-PIPE | Raw water piping | 0 | 2 | 4 |
| | | **STATION DRAINAGE** | | | |
| 50 | M-STDN-EQPM | Station drainage equipment | 0 | 2 | 5 |
| 51 | M-STDN-PIPE | Station drainage piping | 0 | 2 | 4 |

| TABLE A-14 SECURITY PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| | | **ACCESS CONTROL** | | | |
| 5 | QSACCC-EXTR | Exterior mounted access control devices | 0 | 1 | 2 |
| 6 | QSACCC-PANL | Access control unit/panel | 0 | 1 | 2 |
| 7 | QSACCC-WALL | Wall mounted (interior) access control devices | 0 | 1 | 2 |
| | | **ANNUNCIATION** | | | |
| 10 | QSANCN-PANL | Annunciation equipment control unit/panel | 0 | 1 | 2 |
| 11 | QSANCN-RESN | Remote station | 0 | 1 | 2 |
| | | **BARRIERS** | | | |
| 15 | QSBARR-FENC | Fences/gates | 0 | 2 | 5 |
| 16 | QSBARR-SENS | Sensors | 0 | 1 | 2 |
| 17 | QSBARR-WALL | Walls | 0 | 2 | 5 |
| | | **COMMUNICATIONS** | | | |
| 20 | QSCOMM-CLNG | Ceiling mounted communication equipment | 0 | 1 | 2 |
| 21 | QSCOMM-INTC | Intercoms/speakers | 0 | 1 | 2 |
| 22 | QSCOMM-PANL | Communication panel | 0 | 1 | 2 |
| 23 | QSCOMM-WALL | Wall mounted communication equipment | 0 | 1 | 2 |
| | | **SWITCHES/CONTACTS** | | | |
| 25 | QSSWCH-FLSH | Flush mounted switches/contacts | 0 | 1 | 2 |
| 26 | QSSWCH-SURF | Surface mounted switches/contacts | 0 | 1 | 2 |
| | | **SENSORS** | | | |
| 30 | QSSENS-BURD | Buried sensor | 2 | 1 | 2 |
| 31 | QSSENS-CLNG | Ceiling mounted sensor | 0 | 1 | 2 |
| 32 | QSSENS-FLOR | Floor mounted sensor | 0 | 1 | 2 |
| 33 | QSSENS-GLAS | Glass/foil mounted sensor | 0 | 1 | 2 |
| 34 | QSSENS-PANL | Sensor control unit | 0 | 1 | 2 |
| 35 | QSSENS-WALL | Wall mounted sensor | 0 | 1 | 2 |
| | | **ASSESSMENT/CLOSED CIRCUIT TELEVISION** | | | |
| 40 | QSCCTV-CLNG | Ceiling mounted CCTV | 0 | 1 | 2 |
| 41 | QSCCTV-WALL | Wall mounted CCTV | 0 | 1 | 2 |
| | | **SECURITY DEDICATED LIGHTING** | | | |

| TABLE A-14 SECURITY PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 45 | QSLITE-CLNG | Ceiling mounted security lighting | 0 | 1 | 2 |
| 46 | QSLITE-POLE | Pole mounted security lighting | 0 | 1 | 2 |
| 47 | QSLITE-WALL | Wall mounted security lighting | 0 | 1 | 2 |
| | | **LOCKING DEVICES** | | | |
| 50 | QSLOCK-ELEC | Electric device | 0 | 1 | 2 |
| 51 | QSLOCK-MANL | Manual device | 0 | 1 | 2 |
| 55 | QSWIRE-SYST | Security wiring/circuits | 0 | 0 | 1 |

| TABLE A-15 FOUNDATION PLAN | | | | | |
|---|---|---|---|---|---|
| **LV=** | **Level Name** | **Level Description** | **LC=** | **WT=** | **CO=** |
| | | **FOUNDATION** | | | |
| 5 | S-FNDN-FTNG | Footing | 2 | 2 | 4 |
| 6 | S-FNDN-GRBM | Grade beams | 2 | 2 | 4 |
| 7 | S-FNDN-IDEN | Component identification numbers | 0 | 2 | 4 |
| 8 | S-FNDN-PILE | Piles (steel sheet, concrete, wood), piers, caisson piers, drilled piers | 2 | 2 | 4 |
| 9 | S-FNDN-RBAR | Foundation reinforcing | 0 | 2 | 4 |
| | | **GRADING** | | | |
| 13 | S-GRAD-ELEV | Elevated grading | 3 | 2 | 9 |
| 14 | S-GRAD-FLOR | Floor grading | 3 | 2 | 9 |
| | | **FLOOR GRADING** | | | |
| 16 | S-SLAB-EDGE | Slab outline | 0 | 2 | 4 |
| 17 | S-SLAB-JOIN | Slab control joints | 0 | 2 | 4 |
| 18 | S-SLAB-RBAR | Slab reinforcing | 0 | 2 | 4 |
| | | **GRATING** | | | |
| 22 | S-GRAT-ELEV | Elevated grating (catwalks) | 0 | 1 | 2 |
| 23 | S-GRAT-FLOR | Floor grating | 0 | 1 | 2 |
| | | **JOINTS** | | | |
| 27 | S-JOIN-CNST | Construction joints | 0 | 1 | 2 |
| 28 | S-JOIN-CTRL | Control/expansion joints | 3 | 0 | 1 |
| | | **MISCELLANEOUS SUPPORTS** | | | |
| 32 | S-SPPT-MISC | Miscellaneous fasteners, anchor bolts, supports | 0 | 2 | 4 |
| 36 | S-STRS-JOIN | Stair control joints | 0 | 1 | 2 |
| 37 | S-STRS-LADD | Ladders, ladder handrails, safety guard, grab bars | 0 | 1 | 2 |
| 38 | S-STRS-RBAR | Stair reinforcing | 0 | 1 | 2 |
| | | **WALLS** | | | |
| 42 | S-WALL-CONC | Concrete walls | 0 | 2 | 4 |
| 43 | S-WALL-LOAD | Load bearing CMU walls | 0 | 2 | 4 |
| 44 | S-WALL-NONL | Non-load bearing CMU walls | 0 | 2 | 4 |
| 45 | S-WALL-PCST | Precast walls | 0 | 2 | 4 |
| 46 | S-WALL-STUD | Steel stud walls | 0 | 2 | 4 |

| TABLE A-16 STRUCTURAL FRAMING PLAN | | | | | |
|---|---|---|---|---|---|
| **LV=** | **Level Name** | **Level Description** | **LC=** | **WT=** | **CO=** |
| | | **BEAMS** | | | |
| 5 | S-BEAM-CNTR | Beam centerlines | | | |
| 6 | S-BEAM-PRIM | Primary beams, girders | | | |
| 7 | S-BEAM-SCND | Secondary beams, girders | | | |
| | | **BRACING** | | | |
| 10 | S-BRAC-LATL | Lateral bracing | | | |
| 11 | S-BRAC-SHEA | Shear walls | | | |
| 12 | S-BRAC-VERT | Vertical bracing | | | |
| | | **DECK** | | | |
| 15 | S-DECK-FLOR | Floor deck | | | |
| 16 | S-DICK-OPEN | Openings and penetrations | | | |
| 17 | S-DECK-ROOF | Roof deck | | | |
| | | **ELEVATORS** | | | |
| 20 | S-EVTR-FRAM | Elevator framing | | | |
| | | **MISCELLANEOUS METAL** | | | |
| 25 | S-METL-MISC | Miscellaneous metal | | | |
| | | **MISCELLANEOUS SUPPORTS** | | | |
| 30 | S-SPPT-MISC | Miscellaneous fasteners, anchor bolts, supports | | | |
| | | **OPEN WEB JOISTS** | | | |
| 35 | S-JOIS-BRDG | Bridging | | | |
| 36 | S-JOIS-PRIM | Primary joists | | | |
| 37 | S-JOIS-SCND | Secondary joists | | | |
| | | **TRUSSES** | | | |
| 40 | S-TRUS-UNIT | Trusses | | | |
| 41 | S-WELD | Welding | | | |
| 42 | S-WELD-SYMB | Welding symbols | | | |
| | | **MATERIAL HANDLING** | | | |
| 45 | S-MATL-CRAN | Bridge cranes, jib cranes, and monorails | | | |
| 46 | S-MATL-HOIS | Hoists and hooks | | | |
| 47 | S-MATL-LIEQ | Miscellaneous lifting equipment | | | |

| TABLE A-16 STRUCTURAL FRAMING PLAN | | | | | |
|---|---|---|---|---|---|
| **LV=** | **Level Name** | **Level Description** | **LC=** | **WT=** | **CO=** |
| | | **GRID LINES** | | | |
| 50 | S-GRID-DIMS | Column grid dimensions | | | |
| 51 | S-GRID-HORZ | Horizontal grid lines | | | |
| 52 | S-GRID-IDEN | Column tags | | | |
| 53 | S-GRID-VERT | Vertical grid lines | 7 | 0 | 1 |
| | | **COLUMNS** | | | |
| 55 | S-COLS-CNTR | Column centerlines | 7 | 0 | 1 |
| 56 | S-COLS-PRIM | Primary columns | 0 | 2 | 5 |
| 57 | S-COLS-SCND | Secondary columns | 0 | 2 | 4 |

| TABLE A-17 UTILITIES PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 1 | U-SITE-OHEP | Overhead Electrical - Primary | OHEP | 2 | 86 |
| 2 | U-SITE-OHES | Overhead Electrical - Secondary | OHES | 2 | 86 |
| 3 | U-SITE-OHEE | Overhead Electrical Structures: Poles, guy wires, etc. | 0 | 1 | V |
| 4 | U-SITE-UGEP | Underground Electrical - Primary | UGEP | 2 | 3 |
| 5 | U-SITE-UGES | Underground Electrical - Secondary | UGES | 2 | 3 |
| 6 | U-SITEUGEE | Underground Electrical Structures: Manholes, pullboxes, etc. | 0 | 2 | V |
| 7 | U-SITE-DEVC | Transformers, capacitors, voltage regulators, motors, buses, generators, meters, grounds, etc. | 0 | 1 | V |
| 8 | U-SITE-DUCT | Ductbanks | 2 | 1 | 2 |
| 9 | U-SITE-ABDU | Abandoned Utilities | ABD | 2 | 157 |
| 10 | U-SITE-ABDE | Abandoned manholes, pullboxes, valves, etc. | 0 | 2 | 157 |
| 11 | U-SITE-AEMS | AEMS System | AEMS | 2 | 143 |
| 12 | U-SITE-AMESE | AEMS Manholes, pullboxes, etc. | 0 | 2 | 143 |
| 13 | U-SITE-CP | Cathodic Protection | CP | 2 | 250 |
| 14 | U-SITE-CPE | CP Manholes, pullboxes, etc. | 0 | 2 | 250 |
| 15 | U-SITE-CWS | Chill Water Supply | CWS | 2 | 29 |
| 16 | U-SITE-CHR | Chill Water Return | CWR | 2 | 27 |
| 17 | U-SITE-CHE | Chill Water Manholes, pullboxes, valves, etc. | 0 | 2 | 27 |
| 18 | U-SITE-CC | Communications Cable | CC | 2 | 5 |
| 19 | U-SITE-CCE | Communications Cable manholes, pullboxes, etc. | 0 | 2 | 5 |
| 20 | U-SITE-CA | Compressed Air | CA | 2 | 136 |
| 21 | U-SITE-CAE | Compressed Air Manholes, pullboxes, valves, etc. | 0 | 2 | 136 |
| 22 | U-SITE-COND | Condensate | C | 2 | 100 |
| 23 | U-SITE-CONDE | Condensate Manholes, pullboxes, valves, etc. | 0 | 2 | 100 |
| 24 | U-SITE-DC | Data Cable | D | 2 | 7 |
| 25 | U-SITE-DCE | Data Cable manholes, pullboxes, etc. | 0 | 2 | 7 |
| 26 | U-SITE-FOC | Fiber Optic Cable | FOP | 2 | 34 |
| 27 | U-SITE-FOCE | Fiber Optic Cable manholes, pullboxes, etc. | 0 | 2 | 34 |
| 28 | U-SITE-FA | Fire Alarm | FA | 2 | 51 |
| 29 | U-SITE-FAE | Fire Alarm manholes, pullboxes, etc. | 0 | 2 | 51 |

| TABLE A-17 UTILITIES PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 30 | U-SITE-FO | Fuel Oil | FO | 2 | 114 |
| 31 | U-SITE-FOE | Fuel Oil manholes, pullboxes, etc. | 0 | 2 | 114 |
| 32 | U-SITE-HPFL | High Pressure Fire Loop | HPF | 2 | 31 |
| 33 | U-SITE-HPFLE | High Pressure Fire manhole, pullbox, valve, PIV, etc. | 0 | 2 | 31 |
| 34 | U-SITE-HWR | Hot Water Return, Supply | HW | 2 | 230 |
| 35 | U-SITE-HWRE | Hot Water Return, Supply manholes, pullboxes, valves, etc. | 0 | 2 | 230 |
| 36 | U-SITE-LP | Lightning Protection | LP | 2 | 190 |
| 37 | U-SITE-LPE | Lightning Protection manholes, pullboxes, etc. | 0 | 2 | 190 |
| 38 | U-SITE-NGAS | Natural Gas | G | 2 | 4 |
| 39 | U-SITE-NGASE | Natural Gas manholes, pullboxes, valves, etc. | 0 | 2 | 4 |
| 40 | U-SITE-PS | Paging System | PA | 2 | 152 |
| 41 | U-SITE-PSE | Paging System manholes, pullboxes, etc. | 0 | 2 | 152 |
| 42 | U-SITE-PDS | Protected Distribution system | PDS | 2 | 160 |
| 43 | U-SITE-PDSE | Protected Distribution system manholes, pullboxes, etc. | 0 | 2 | 160 |
| 44 | U-SITE-LANW | Pantex Local Area Network | PLAN | 2 | 123 |
| 45 | U-SITE-LANWE | Pantex Local Area Network manholes, pullboxes, etc. | 0 | 2 | 123 |
| 46 | U-SITE-PT | Pneumatic Tube | PT | 2 | 7 |
| 47 | U-SITE-PTE | Pneumatic Tube manholes, pullboxes, etc. | 0 | 2 | 7 |
| 48 | U-SITE-SS | Sanitary Sewer | SS | 2 | 90 |
| 49 | U-SITE-SSE | Sanitary Sewer manholes, pullboxes, etc. | 0 | 2 | 90 |
| 50 | U-SITE-SCADA | SCADA Cable | SDA | 2 | 222 |
| 51 | U-SITE-SCADAE | SCADA Cable manholes, pullboxes, etc. | 0 | 2 | 222 |
| 52 | U-SITE-SA | Security Alarm | SA | 2 | 240 |
| 53 | U-SITE-SAE | Security Alarm manholes, pullboxes, etc. | 0 | 2 | 240 |
| 54 | U-SITE-STM | Steam | ST | 2 | 175 |
| 55 | U-SITE-STME | Steam manholes, pullboxes, valves | 0 | 2 | 175 |
| 56 | U-SITE-STSWR | Storm Sewer | STS | 2 | 29 |
| 57 | U-SITE-STSWRE | Storm Sewer manholes, etc. | 0 | 2 | 29 |
| 58 | U-SITE-TEL | Telephone | T | 2 | 6 |
| 59 | U-SITE-TELE | Telephone manholes, pullboxes, etc. | 0 | 2 | 6 |
| 60 | U-SITE-VID | Video | V | 2 | 189 |

| TABLE A-17 UTILITIES PLAN | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 61 | U-SITE-VIDE | Video manholes, pullboxes, etc. | 0 | 2 | 189 |
| 62 | U-SITE-DW | Domestic Water | W | 2 | 1 |
| 63 | U-SITE-DWE | Domestic Water manholes, valves, etc. | 0 | 2 | 1 |

# APPENDIX B
# DRAWING FILE LEVEL ASSIGNMENT TABLES

| TABLE B-1 ATRCHITECTURAL | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 1 | A-ANNO-DIMS | Witness/extension lines, dimension arrowheads/dots/slashes, dimension text | 0 | V | 0 |
| 2 | A-ANNO-KEYN | Keynotes with associated leaderlines and arrowheads | 0 | V | 0 |
| 3 | A-ANNO-NOTE | General notes and general remarks | 0 | V | 0 |
| 4 | A-ANNO-NPLT | Construction lines, reference targets, area calculations | 0 | 0 | 1 |
| 5 | A-ANNO-PATT | Miscellaneous patterning, cross-hatching, poche | 0 | 0 | 9 |
| 6 | A-ANNO-SYMB | Miscellaneous symbols | V | 2 | 5 |
| 7 | A-ANNO-TEXT | Miscellaneous text and callouts with associated leaderlines and arrowheads | 0 | V | 0 |
| | | **ELEVATIONS** | | | |
| 10 | A-ELEV-CASE | Wall-mounted casework | 0 | 1 | 2 |
| 11 | A-ELEV-FIXT | Miscellaneous fixtures | 0 | 2 | 4 |
| 12 | A-ELEV-FNSH | Finishes, woodwork, trim | 0 | 1 | 2 |
| 13 | A-ELEV-IDEN | Component identification numbers | 0 | 2 | 4 |
| 14 | A-ELEV-OTLN | Building outlines | 0 | 2 | 5 |
| 15 | A-ELEV-PATT | Textures and hatch patterns | 0 | 0 | 9 |
| 16 | A-ELEV-PFIX | Plumbing fixtures | 0 | 2 | 5 |
| 17 | A-ELEV-SIGN | Signage | 0 | 1 | 3 |
| | | **FINISH PATTERNS** | | | |
| 20 | A-FURN-PATT | Furniture finish patters | 0 | 1 | 9 |
| 21 | A-TILE-PATT | Tile finish patterns | 0 | 1 | 9 |
| | | **SECTIONS** | | | |
| 25 | A-SECT-IDEN | Component identification numbers | 0 | 2 | 4 |
| 26 | A-SECT-MBND | Material beyond section cut | 0 | 0 | 1 |
| 28 | A-SECT-PATT | Textures and hatch patterns | 0 | 1 | 9 |
| | | **DETAIL INFORMATION** | | | |
| 30 | A-DETL-GENF | General features (miscellaneous items) | 0 | V | V |
| 31 | A-DETL-BLCK | Blocking, furring and spacers | 0 | 0 | 1 |
| 32 | A-DETL-CABS | Cabinets | 0 | 2 | 4 |
| 33 | A-DETL-CALK | Caulking and sealant | 0 | 0 | 9 |

| TABLE B-1 ATRCHITECTURAL | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 34 | A-DETL-CEIL | Ceiling materials | 0 | 2 | 5 |
| 35 | A-DETL-EXTR | Extrusions and formed shapes | 0 | 1 | 3 |
| 36 | A-DETL-EXWL | Exterior wall materials | 0 | 2 | 5 |
| 37 | A-DETL-FAST | Fastener | 0 | 0 | 1 |
| 38 | A-DETL-FLOR | Floor materials | 0 | 2 | 4 |
| 39 | A-DETL-FLSH | Flashing | 0 | 3 | 2 |
| 40 | A-DETL-GLAZ | Glazing | 0 | 0 | 1 |
| 41 | A-DETL-GRLS | Grilles and louvers | 0 | 1 | 2 |
| 42 | A-DETL-HDWR | Hardware | 0 | 2 | 5 |
| 43 | A-DETL-INSL | Insulation | 0 | 0 | 9 |
| 44 | A-DETL-ITWL | Interior wall materials | 0 | 0 | 1 |
| 45 | A-DETL-MASY | Masonry | 0 | 1 | 2 |
| 46 | A-DETL-PIPE | Piping | 0 | 2 | 5 |
| 47 | A-DETL-ROOF | Roof materials | 0 | 1 | 2 |
| 48 | A-DETL-STRC | Structural features | 0 | 1 | 3 |
| 49 | A-DETL-TRIM | Trim | 0 | 1 | 2 |

| TABLE B-2 CIVIL/SITE | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 1 | C-ANNO-DIMS | Witness/extension lines, dimension arrowheads/dots/slashes, dimension text | 0 | V | 0 |
| 2 | C-ANNO-KEYN | Keynotes with associated leaderlines and arrowheads | 0 | V | 0 |
| 3 | C-ANNO-NOTE | General notes and general remarks | 0 | V | 0 |
| 4 | C-ANNO-NPLT | Construction lines, reference targets, area calculations | 0 | 0 | 1 |
| 5 | C-ANNO-PATT | Miscellaneous patterning, cross-hatching, poche | 0 | 0 | 9 |
| 6 | C-ANNO-SYMB | Miscellaneous symbols | V | 2 | 5 |
| 7 | C-ANNO-TEXT | Miscellaneous text and callouts with associated leaderlines and arrowheads | 0 | V | 0 |
| | | **SECTIONS** | | | |
| 10 | C-SECT-IDEN | Component identification numbers | 0 | 2 | 4 |
| 11 | C-SECT-MBND | Material beyond section cut | 0 | 0 | 1 |
| 12 | C-SECT-MCUT | Material cut by section | 0 | 3 | 7 |
| 13 | C-SECT-PATT | Textures and hatch patterns | 0 | 0 | 9 |
| | | **DETAIL INFORMATION** | | | |
| 20 | C-DETL-GENF | General features (miscellaneous items) | 0 | V | V |
| 21 | C-DETL-ACCS | Accessories | 0 | 1 | 2 |
| 22 | C-DETL-CONC | Concrete | 0 | 2 | 5 |
| 23 | C-DETL-FILL | Fill/cover material | 0 | 0 | 1 |
| 24 | C-DETL-MEMB | Membrane/netting | 2 | 1 | 3 |
| 25 | C-DETL-PIPE | Pipe and conduit | 0 | 2 | 5 |
| 26 | C-DETL-PUMP | Pumps | 0 | 2 | 4 |
| 27 | C-DETL-STRC | Structural features | 0 | 2 | 5 |
| 28 | C-DETL-TANK | Tanks | 0 | 2 | 4 |
| 29 | C-DETL-VLVE | Valves and fittings | 0 | 2 | 4 |
| 30 | C-DETL-WIRE | Wiring | 0 | 2 | 4 |

| TABLE B-3 ELECTRICAL | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 1 | E-ANNO-DIMS | Witness/extension lines, dimension arrowheads/dots/slashes, dimension text | 0 | V | 0 |
| 2 | E-ANNO-KEYN | Keynotes with associated leaderlines and arrowheads | 0 | V | 0 |
| 3 | E-ANNO-NOTE | General notes and general remarks | 0 | V | 0 |
| 4 | E-ANNO-NPLT | Construction lines, reference targets, area calculations | 0 | 0 | 1 |
| 5 | E-ANNO-PATT | Miscellaneous patterning, cross-hatching, poche | 0 | 0 | 9 |
| 6 | E-ANNO-SYMB | Miscellaneous symbols | V | 2 | 5 |
| 7 | E-ANNO-TEXT | Miscellaneous text and callouts with associated leaderlines and arrowheads | 0 | V | 0 |
| | | **CONTROL CIRCUIT** | | | |
| 10 | E-CNTL-ANTA | Antenna | V | 1 | 2 |
| 11 | E-CNTL-AVLV | Arrestor Valves | V | 1 | 2 |
| 12 | E-CNTL-BATR | Batteries | V | 1 | 2 |
| 13 | E-CNTL-CAPT | Capacitor | V | 1 | 2 |
| 14 | E-CNTL-CKTB | Circuit Boards | V | 1 | 2 |
| 15 | E-CNTL-CONT | Contacts | V | 1 | 2 |
| 16 | E-CNTL-FUSE | Fuses | V | 1 | 2 |
| 17 | E-CNTL-GENR | Generators | V | 1 | 2 |
| 18 | E-CNTL-GRND | Grounds | V | 1 | 2 |
| 19 | E-CNTL-METR | Metering Devices | V | 1 | 2 |
| 20 | E-CNTL-MOTR | Motors | V | 1 | 2 |
| 21 | E-CNTL-OVLD | Overloads | V | 1 | 2 |
| 22 | E-CNTL-RACT | Reactors | V | 1 | 2 |
| 23 | E-CNTL-RELA | Relays | V | 1 | 2 |
| 24 | E-CNTL-RSTR | Resistors | V | 1 | 2 |
| 25 | E-CNTL-SWCH | Switches | V | 1 | 2 |
| 26 | E-CNTL-XFMR | Transformers | V | 1 | 2 |
| | | **ONE-LINE DIAGRAM LINEWORK** | | | |
| 30 | E-1LIN-LW18 | Fine one-line linework | V | 0 | 1 |
| 31 | E-1LIN-LW25 | Thin one-line linework | V | 1 | 3 |
| 32 | E-1LIN-LW35 | Medium one-line linework | V | 2 | 4 |

| TABLE B-3 ELECTRICAL | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 33 | E-1LIN-LW50 | Wide one-line linework | V | 3 | 7 |
| 34 | E-1LIN-LW70 | Extra wide one-line linework | V | 5 | 0 |

| TABLE B-4 FIRE PROTECTION | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 1 | F-ANNO-DIMS | Witness/extension lines, dimension arrowheads/dots/slashes, dimension text | 0 | V | 0 |
| 2 | F-ANNO-KEYN | Keynotes with associated leaderlines and arrowheads | 0 | V | 0 |
| 3 | F-ANNO-NOTE | General notes and general remarks | 0 | V | 0 |
| 4 | F-ANNO-NPLT | Construction lines, reference targets, area calculations | 0 | 0 | 1 |
| 5 | F-ANNO-PATT | Miscellaneous patterning, cross-hatching, poche | 0 | 0 | 9 |
| 6 | F-ANNO-SYMB | Miscellaneous symbols | V | 2 | 5 |
| 7 | F-ANNO-TEXT | Miscellaneous text and callouts with associated leaderlines and arrowheads | 0 | V | 0 |

| TABLE B-5 GENERAL/MISCELLANEOUS | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 1 | G-ANNO-DIMS | Witness/extension lines, dimension arrowheads/dots/slashes, dimension text | 0 | V | 0 |
| 2 | G-ANNO-KEYN | Keynotes with associated leaderlines and arrowheads | 0 | V | 0 |
| 3 | G-ANNO-NOTE | General notes and general remarks | 0 | V | 0 |
| 4 | G-ANNO-NPLT | Construction lines, reference targets, area calculations | 0 | 0 | 1 |
| 5 | G-ANNO-PATT | Miscellaneous patterning, cross-hatching, poche | 0 | 0 | 9 |
| 6 | G-ANNO-SYMB | Miscellaneous symbols | V | 2 | 5 |
| 7 | G-ANNO-TEXT | Miscellaneous text and callouts with associated leaderlines and arrowheads | 0 | V | 0 |

| TABLE B-6 ELECTRONIC | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 1 | X-ANNO-DIMS | Witness/extension lines, dimension arrowheads/dots/slashes, dimension text | 0 | V | 0 |
| 2 | X-ANNO-KEYN | Keynotes with associated leaderlines and arrowheads | 0 | V | 0 |
| 3 | X-ANNO-NOTE | General notes and general remarks | 0 | V | 0 |
| 4 | X-ANNO-NPLT | Construction lines, reference targets, area calculations | 0 | 0 | 1 |
| 5 | X-ANNO-PATT | Miscellaneous patterning, cross-hatching, poche | 0 | 0 | 9 |
| 6 | X-ANNO-SYMB | Miscellaneous symbols | V | 2 | 5 |
| 7 | X-ANNO-TEXT | Miscellaneous text and callouts with associated leaderlines and arrowheads | 0 | V | 0 |

| TABLE B-7 LANDSCAPE | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 1 | X-ANNO-DIMS | Witness/extension lines, dimension arrowheads/dots/slashes, dimension text | 0 | V | 0 |
| 2 | X-ANNO-KEYN | Keynotes with associated leaderlines and arrowheads | 0 | V | 0 |
| 3 | X-ANNO-NOTE | General notes and general remarks | 0 | V | 0 |
| 4 | X-ANNO-NPLT | Construction lines, reference targets, area calculations | 0 | 0 | 1 |
| 5 | X-ANNO-PATT | Miscellaneous patterning, cross-hatching, poche | 0 | 0 | 9 |
| 6 | X-ANNO-SYMB | Miscellaneous symbols | V | 2 | 5 |
| 7 | X-ANNO-TEXT | Miscellaneous text and callouts with associated leaderlines and arrowheads | 0 | V | 0 |
| | | **DETAIL INFORMATION** | | | |
| 10 | L-DETL-GENF | General features (miscellaneous items) | 0 | 2 | 5 |
| 11 | L-DETL-CABS | Cabinets, enclosures | 0 | 2 | 4 |
| 12 | L-DETL-CONC | Concrete | 0 | 1 | 3 |
| 13 | L-DETL-ERTH | Earth | 0 | 1 | 2 |
| 14 | L-DETL-FENC | Fencing | 0 | 2 | 5 |
| 15 | L-DETL-FILL | Fill/cover material | 0 | 0 | 1 |
| 16 | L-DETL-FURN | Furniture, furnishings | 0 | 2 | 4 |
| 17 | L-DETL-GRAS | Grass, sod | 0 | 1 | 2 |
| 18 | L-DETL-PIPE | Piping, conduit, sprinklers | 0 | 2 | 5 |
| 19 | L-DETL-STRC | Structural metal, supports | 0 | 2 | 5 |
| 20 | L-DETL-VEGI | Trees, plants | 0 | 1 | 2 |
| 21 | L-DETL-VLVE | Valves, fittings | 0 | 2 | 4 |
| 22 | L-DETL-WIRE | Wiring | 0 | 2 | 5 |

| TABLE B-8 MECHANICAL | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 1 | M-ANNO-DIMS | Witness/extension lines, dimension arrowheads/dots/slashes, dimension text | 0 | V | 0 |
| 2 | M-ANNO-KEYN | Keynotes with associated leaderlines and arrowheads | 0 | V | 0 |
| 3 | M-ANNO-NOTE | General notes and general remarks | 0 | V | 0 |
| 4 | M-ANNO-NPLT | Construction lines, reference targets, area calculations | 0 | 0 | 1 |
| 5 | M-ANNO-PATT | Miscellaneous patterning, cross-hatching, poche | 0 | 0 | 9 |
| 6 | M-ANNO-SYMB | Miscellaneous symbols | V | 2 | 5 |
| 7 | M-ANNO-TEXT | Miscellaneous text and callouts with associated leaderlines and arrowheads | 0 | V | 0 |

| TABLE B-9 PLUMBING | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 1 | P-ANNO-DIMS | Witness/extension lines, dimension arrowheads/dots/slashes, dimension text | 0 | V | 0 |
| 2 | P-ANNO-KEYN | Keynotes with associated leaderlines and arrowheads | 0 | V | 0 |
| 3 | P-ANNO-NOTE | General notes and general remarks | 0 | V | 0 |
| 4 | P-ANNO-NPLT | Construction lines, reference targets, area calculations | 0 | 0 | 1 |
| 5 | P-ANNO-PATT | Miscellaneous patterning, cross-hatching, poche | 0 | 0 | 9 |
| 6 | P-ANNO-SYMB | Miscellaneous symbols | V | 2 | 5 |
| 7 | P-ANNO-TEXT | Miscellaneous text and callouts with associated leaderlines and arrowheads | 0 | V | 0 |

| TABLE B-10 EQUIPMENT | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 1 | Q-ANNO-DIMS | Witness/extension lines, dimension arrowheads/dots/slashes, dimension text | 0 | V | 0 |
| 2 | Q-ANNO-KEYN | Keynotes with associated leaderlines and arrowheads | 0 | V | 0 |
| 3 | Q-ANNO-NOTE | General notes and general remarks | 0 | V | 0 |
| 4 | Q-ANNO-NPLT | Construction lines, reference targets, area calculations | 0 | 0 | 1 |
| 5 | Q-ANNO-PATT | Miscellaneous patterning, cross-hatching, poche | 0 | 0 | 9 |
| 6 | Q-ANNO-SYMB | Miscellaneous symbols | V | 2 | 5 |
| 7 | Q-ANNO-TEXT | Miscellaneous text and callouts with associated leaderlines and arrowheads | 0 | V | 0 |

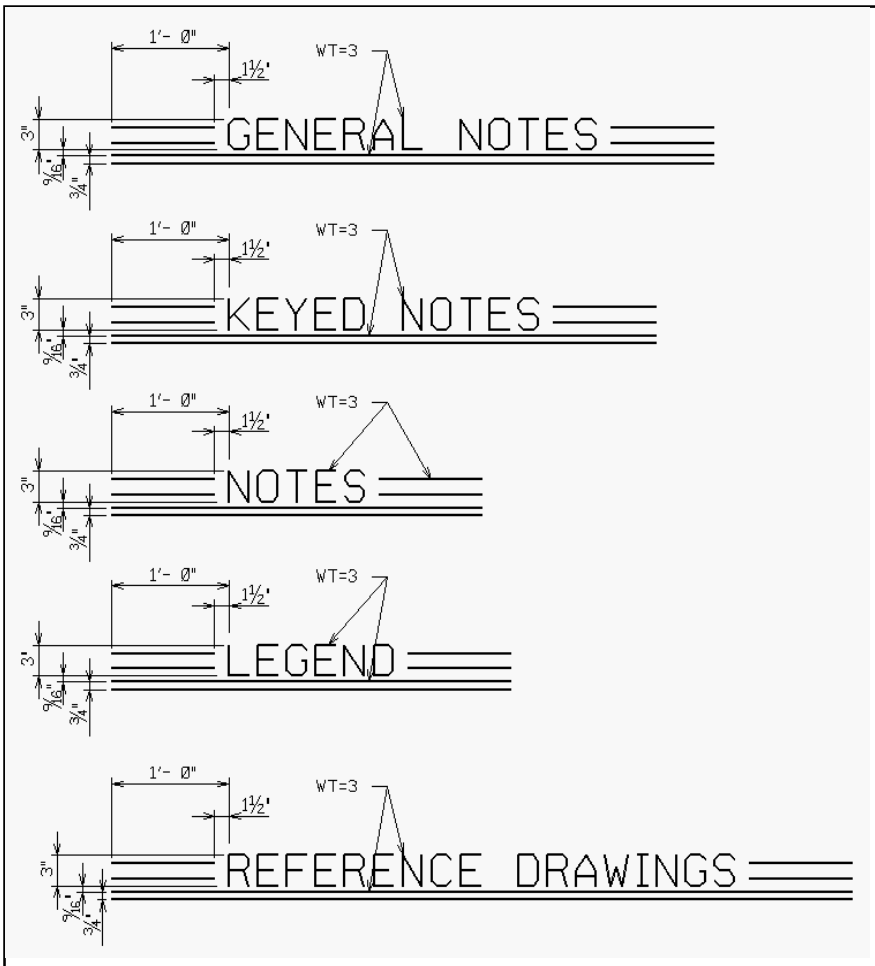
| TABLE B-11 STRUCTURAL | | | | | |
|---|---|---|---|---|---|
| **LV =** | **Level Name** | **Level Description** | **LC =** | **WT =** | **CO =** |
| 1 | S-ANNO-DIMS | Witness/extension lines, dimension arrowheads/dots/slashes, dimension text | 0 | V | 0 |
| 2 | S-ANNO-KEYN | Keynotes with associated leaderlines and arrowheads | 0 | V | 0 |
| 3 | S-ANNO-NOTE | General notes and general remarks | 0 | V | 0 |
| 4 | S-ANNO-NPLT | Construction lines, reference targets, area calculations | 0 | 0 | 1 |
| 5 | S-ANNO-PATT | Miscellaneous patterning, cross-hatching, poche | 0 | 0 | 9 |
| 6 | S-ANNO-SYMB | Miscellaneous symbols | V | 2 | 5 |
| 7 | S-ANNO-TEXT | Miscellaneous text and callouts with associated leaderlines and arrowheads | 0 | V | 0 |
| | | **ELEVATIONS** | | | |
| 10 | S-ELEV-IDEN | Component identification numbers | 0 | 2 | 4 |
| 11 | S-ELEV-OTLN | Building outlines | 0 | 2 | 5 |
| 12 | S-ELEV-PATT | Textures and hatch patterns | 0 | 0 | 9 |
| 13 | S-ELEV-SIGN | Signage | 0 | 2 | 3 |
| | | **SECTIONS** | | | |
| 15 | S-SECT-IDEN | Component identification numbers | 0 | 2 | 4 |
| 16 | S-SECT-MBND | Material beyond section cut | 0 | 0 | 1 |
| 17 | S-SECT-MCUT | Material cut by section | 0 | 3 | 7 |
| 18 | S-SECT-PATT | Textures and hatch patterns | 0 | 0 | 9 |
| | | **DETAIL INFORMATION** | | | |
| 20 | S-DETL-GENF | General features (miscellaneous items) | 0 | 2 | 5 |
| 21 | S-DETL-CMUW | CMU outline (no patterning) | 0 | 3 | 7 |
| 22 | S-DETL-CONC | Concrete outline (no patterning) | 0 | 3 | 7 |
| 23 | S-DETL-FNGR | Finished grade | 0 | 2 | 4 |
| 24 | S-DETL-MISC | Joint materials (e.g., felt), vapor barrer, other | 0 | 1 | 3 |
| 25 | S-DETL-REIN | Rebar, welded wire mesh | V | 0 | 1 |
| 26 | S-DETL-STLS | Wide flange shapes, plates, open web joists, decking, bolts, nails | V | 1 | 2 |
| 27 | S-DETL-WELD | Weld symbols | 0 | 1 | 2 |
| 28 | S-DETL-WOOD | Wood outline (no patterning) | 0 | 2 | 4 |

# APPENDIX C
# TITLE BLOCK SCALE RATIO TABLE

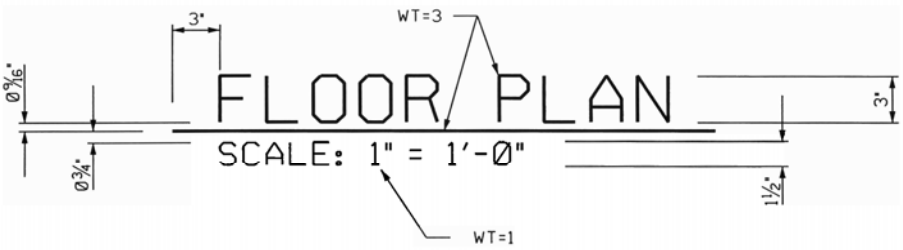
| TABLE C-1 TITLE BLOCK SCALE | | |
|---|---|---|
| | **Scale (Master : Reference)** | **Active Scale for Title Block Information Cell** |
| 1/16” = 1’ – 0” | 16 : 1 | AS = 16 |
| 3/32” = 1’ – 0” | 10.6667 : 1 | AS = 10.6667 |
| 1/8” = 1’ – 0” | 8 : 1 | AS = 8 |
| 3/16” = 1’ – 0 | 5.3333 : 1 | AS =5.333 |
| 1/4” = 1’ – 0” | 4 : 1 | AS =4 |
| 3/8” = 1’ – 0” | 2.6667 : 1 | AS =2.667 |
| 1/2” = 1’ – 0” | 2 :1 | AS =2 |
| 3/4” = 1’ – 0” | 1.333 : 1 | AS =1.3333 |
| 1” = 1’ – 0” | 1 : 1 | AS =1 |
| 1 1/2” = 1’ – 0” | 0.6667 : 1 | AS =0.6667 |
| 2” = 1’ – 0” | 0.5 : 1 | AS =0.5 |
| 3” = 1’ – 0” | 0.333 : 1 | AS =0.3333 |
| 1” = 10’ | 10 : 1 | AS =10 |
| 1” = 20’ | 20 : 1 | AS =20 |
| 1” = 30’ | 30 : 1 | AS =30 |
| 1” = 40’ | 40 : 1 | AS =40 |
| 1” = 50’ | 50 : 1 | AS =50 |
| 1” = 100’ | 100 :1 | AS =100 |
| 1” = 200’ | 200 : 1 | AS =200 |
| 1” = 300’ | 300 : 1 | AS =300 |
| 1” = 400’ | 400 : 1 | AS =400 |
| 1” = 500’ | 500 : 1 | AS =500 |
| 1” = 600’ | 600 : 1 | AS =600 |
| 1” = 700’ | 700 : 1 | AS =700 |
| 1” = 800’ | 800 : 1 | AS =800 |
| 1” = 900’ | 900 : 1 | AS =900 |
| 1” = 1000’ | 1000 : 1 | AS =1000 |

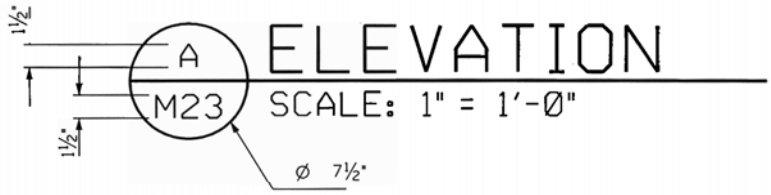
# APPENDIX D
# GENERAL DRAWING INFORMATION TITLES

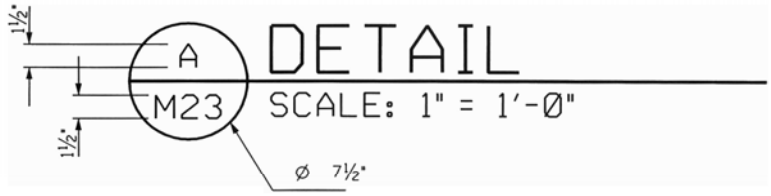
# GENERAL DRAWING INFORMATION TITLES



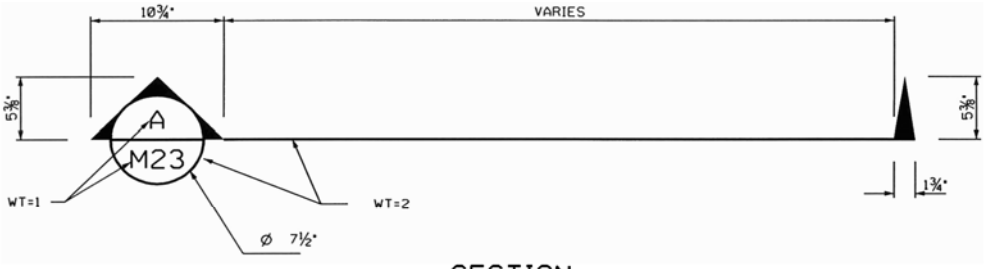
# ELEVATION, SECTION AND DETAIL TITLES



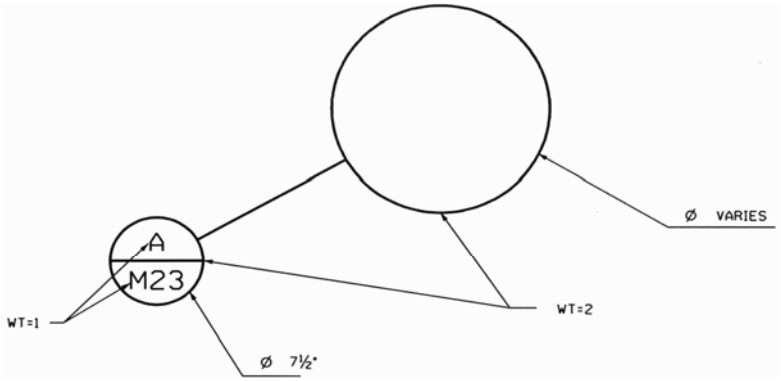





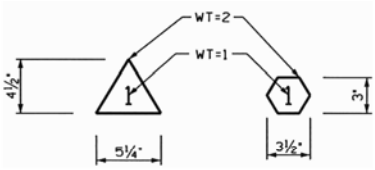
# GENERAL MARKING SYMBOLS



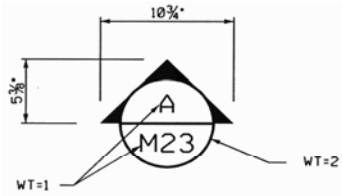

SECTION




DETAIL



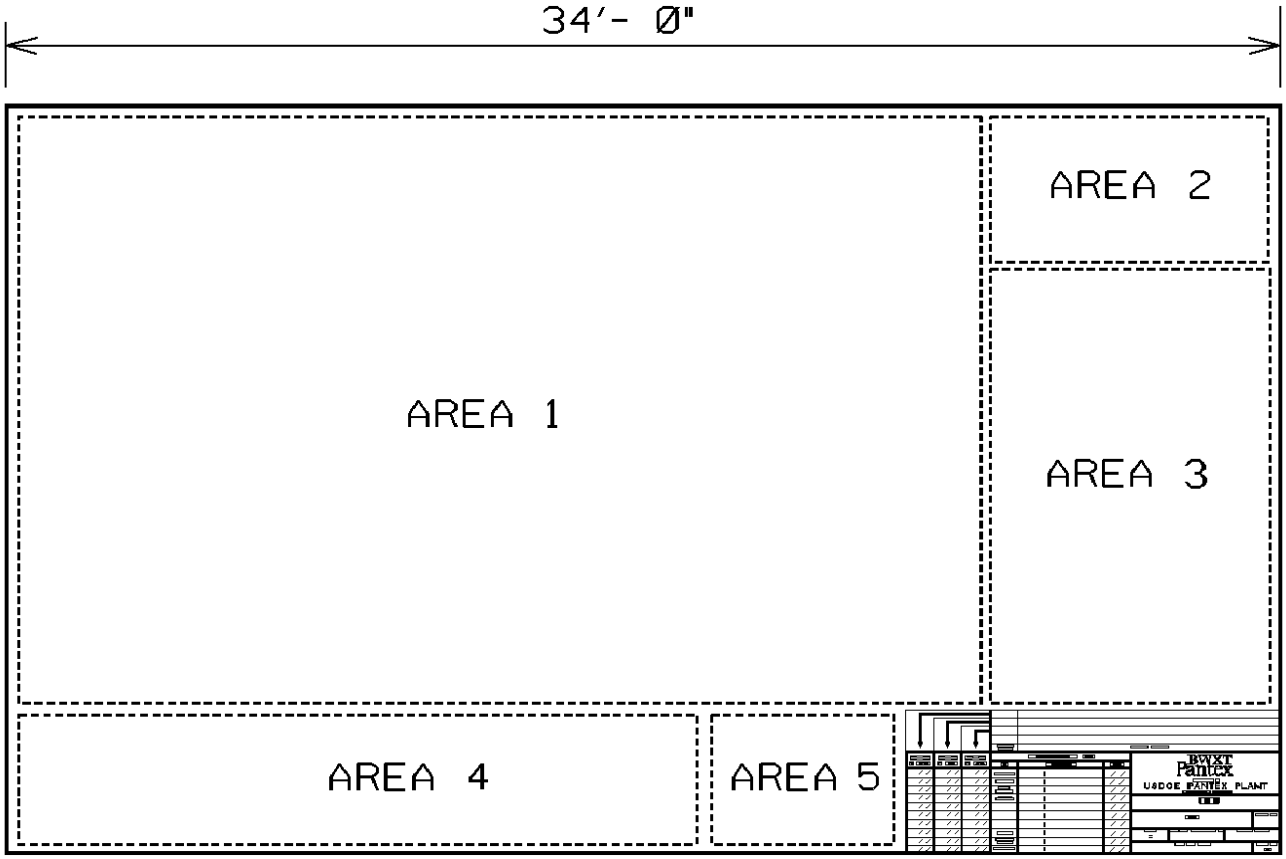

DELTA KEYED NOTE




ELEVATION

GE

# NERAL DRAWING AREAS




**Area 1** General Drawing Space. May extend into Areas 4 and 5 if necessary.

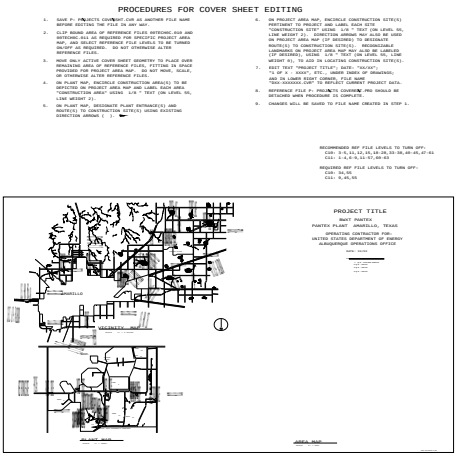
**Area 2** Reserved for drawings with Key Plans. May be combined with Area 3 if necessary.

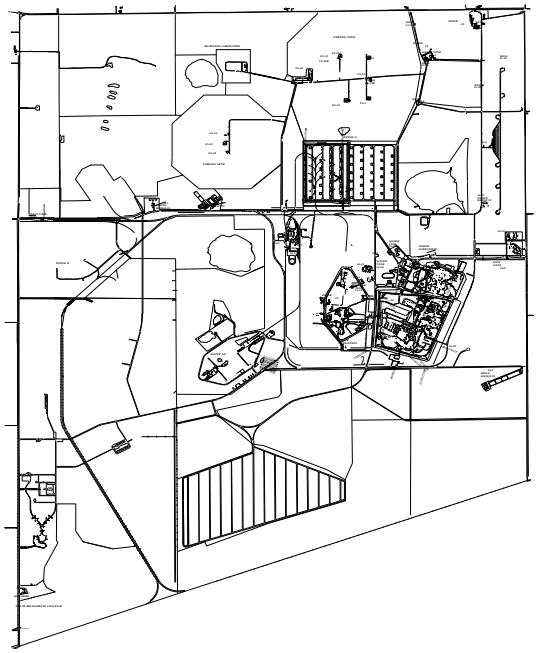
**Area 3** Reserved for General Notes, Notes, Keyed Notes, Legend and Reference Drawings as necessary.

**Area 4** Information from Area 3 may be continued in this area if necessary.

**Area 5** Reserved for North Arrow, Graphic Scales, Engineering Seals, and Contractor logo and company information as necessary.

# TITLE SHEET
# DRAWING FILE COVERSHT.CVR



## PROCEDURES FOR COVER SHEET EDITING

1. SAVE P: PROJECTS COVERSHT.CVR AS ANOTHER FILE NAME BEFORE EDITING THE FILE IN ANY WAY.
2. CLIP BOUND AREA OF REFERENCE FILES 00TECH0C.010 AND 00TECH0C.011 AS REQUIRED FOR SPECIFIC PROJECT AREA MAP, AND SELECT REFERENCE FILE LEVELS TO BE TURNED ON/OFF AS REQUIRED. DO NOT OTHERWISE ALTER REFERENCE FILES.
3. MOVE ONLY ACTIVE COVER SHEET GEOMETRY TO PLACE OVER REMAINING AREA OF REFERENCE FILES, FITTING IN SPACE PROVIDED FOR PROJECT AREA MAP. DO NOT MOVE, SCALE, OR OTHERWISE ALTER REFERENCE FILES.
4. ON PLANT MAP, ENCIRCLE CONSTRUCTION AREA(S) TO BE DEPICTED ON PROJECT AREA MAP AND LABEL EACH AREA "CONSTRUCTION AREA" USING 1/8 " TEXT (ON LEVEL 55, LINE WEIGHT 2).
5. ON PLANT MAP, DESIGNATE PLANT ENTRANCE(S) AND ROUTE(S) TO CONSTRUCTION SITE(S) USING EXISTING DIRECTION ARROWS ( ).
6. ON PROJECT AREA MAP, ENCIRCLE CONSTRUCTION SITE(S) PERTINENT TO PROJECT AND LABEL EACH SITE "CONSTRUCTION SITE" USING 1/8 " TEXT (ON LEVEL 55, LINE WEIGHT 2). DIRECTION ARROWS MAY ALSO BE USED ON PROJECT AREA MAP (IF DESIRED) TO DESIGNATE ROUTE(S) TO CONSTRUCTION SITE(S). RECOGNIZABLE LANDMARKS ON PROJECT AREA MAP MAY ALSO BE LABELED (IF DESIRED), USING 1/8 " TEXT (ON LEVEL 55, LINE WEIGHT 0), TO AID IN LOCATING CONSTRUCTION SITE(S).
7. EDIT TEXT "PROJECT TITLE"; DATE: "XX/XX"; "1 OF X - XXXX", ETC., UNDER INDEX OF DRAWINGS; AND IN LOWER RIGHT CORNER, FILE NAME "DXX-XXXXXXX.CVR" TO REFLECT CURRENT PROJECT DATA.
8. REFERENCE FILE P: PROJECTS COVEREDIT.PRO SHOULD BE DETACHED WHEN PROCEDURE IS COMPLETE.
9. CHANGES WILL BE SAVED TO FILE NAME CREATED IN STEP 1.

# PROJECT TITLE

BWXT PANTEX
PANTEX PLANT AMARILLO, TEXAS

OPERATING CONTRACTOR FOR:
NATIONAL NUCLEAR SECURITY ADMINISTRATION
ALBUQUERQUE OPERATIONS OFFICE

DATE: XX/XX

INDEX OF DRAWINGS

DRAWING NUMBER - SHEET NUMBER - DRAWING DESCRIPTION
DRAWING NUMBER - SHEET NUMBER - DRAWING DESCRIPTION
DRAWING NUMBER - SHEET NUMBER - DRAWING DESCRIPTION
DRAWING NUMBER - SHEET NUMBER - DRAWING DESCRIPTION

# APPENDIX E

# PXLSTYLE RESOURCE LIBRARY PANTEX STANDARD LINE STYLES

# PXLSTYLE RESOURCE LIBRARY

DEFAULT MICROSTATION LINE CODES

| LINE CODE | LINE STYLE | LINE CODE | LINE STYLE |
|---|---|---|---|
| 0 | | HPFL | HPFL |
| 1 | | HWR | HWR |
| 2 | | HWS | HWS |
| 3 | | LP | LP |
| 4 | | G | G |
| 5 | | OHEP | OHE |
| 6 | | OHES | OHE |
| 7 | | PA | PA |
| AEMS | AMES | PLN | PLN |
| ABD | ABD | PT | PT |
| CB | CB | PDS | PDS |
| CP | CP | SDA | SDA |
| CWR | CWR | SS | SS |
| CWS | CWS | SA | SA |
| CC | CC | ST | ST |
| CA | CA | STS | STS |
| C | C | T | T |
| D | D | UEP | UE |
| FOP | FOP | UES | UE |
| FA | FA | V | V |

Refer to

Section 1.4.1 for details on resource file names and placement. Refer to Appendix A and Appendix B for level, color and weight assignments for CADD files.

# APPENDIX F
# PLOT DRIVERS FOR THE HP650C AND HP5000PS

# PX650COL.PLT

```
;PANTEX COLOR PLOTTER CONFIGURATION FILE FOR THE HP650C PLOTTER

num_pens=255            ; Defines pens used - max value is 255
change_pen=both             ; options are color, weight, level or both
end_plot=eject              ; force page eject
rotate=cw                           ; enable/disable automatic rotation to maximize
                    ; plots: cw = rotate clockwise, ccw = rotate
                    ; counter-clockwise, none = disableclockwise rotation
model=HPGL2             ; plotter model number
driver=hpgl2                ; MDL driver to use
autocenter                  ; Automatically center plot on page
; border/pen=1/filename/time       ; leave this out for no border
default_extension='000'       ; default extension for plotfiles

communication=(handshake=1,baud=9600,par=none,data=8,stop=1)

size=(8.5,11)/num=0/off=(0,.25)/name=a
size=(17,11)/num=0/off=(0,.25)/name=b
size=(44,22)/num=0/off=(.3125,.75)/name=X
size=(34,22)/num=0/off=(.3125,.75)/name=d

;PXCOLOR.TBL color 1 is white, color 1 prints black using this plot driver. Color 255 is not
;included due to space limintations
pen (1)= (0) /rgb=(0,0,0)
pen (2)= (1) /rgb=(0,0,255)
pen (3)= (2) /rgb=(0,255,0)
pen (4)= (3) /rgb=(255,0,0)
pen (5)= (4) /rgb=(255,255,0)
pen (6)= (5) /rgb=(255,0,255)
pen (7)= (6) /rgb=(255,127,0)
pen (8)= (7) /rgb=(0,255,255)
pen (9)= (8) /rgb=(233,233,233)
pen (10)= (9) /rgb=(204,204,204)
pen (11)= (10) /rgb=(178,178,178)
pen (12)= (11) /rgb=(153,153,153)
pen (13)= (12) /rgb=(127,127,127)
pen (14)= (13) /rgb=(102,102,102)
pen (15)= (14) /rgb=(77,77,77)
pen (16)= (15) /rgb=(26,26,26)
pen (17)= (16) /rgb=(245,0,0)
pen (18)= (17) /rgb=(255,115,0)
pen (19)= (18) /rgb=(255,168,0)
pen (20)= (19) /rgb=(255,214,0)
pen (21)= (20) /rgb=(245,245,0)
pen (22)= (21) /rgb=(214,255,0)
pen (23)= (22) /rgb=(168,255,0)
```

pen (24)= (23) /rgb=(115,255,0)
pen (25)= (24) /rgb=(0,245,0)
pen (26)= (25) /rgb=(0,255,115)
pen (27)= (26) /rgb=(0,255,168)
pen (28)= (27) /rgb=(0,255,214)
pen (29)= (28) /rgb=(0,245,245)
pen (30)= (29) /rgb=(0,214,255)
pen (31)= (30) /rgb=(0,168,255)
pen (32)= (31) /rgb=(0,115,255)
pen (33)= (32) /rgb=(0,0,245)
pen (34)= (33) /rgb=(115,0,255)
pen (35)= (34) /rgb=(168,0,255)
pen (36)= (35) /rgb=(214,0,255)
pen (37)= (36) /rgb=(245,0,245)
pen (38)= (37) /rgb=(255,0,214)
pen (39)= (38) /rgb=(255,0,168)
pen (40)= (39) /rgb=(255,0,115)
pen (41)= (40) /rgb=(230,0,0)
pen (42)= (41) /rgb=(230,105,0)
pen (43)= (42) /rgb=(230,153,0)
pen (44)= (43) /rgb=(230,194,0)
pen (45)= (44) /rgb=(230,230,0)
pen (46)= (45) /rgb=(194,230,0)
pen (47)= (46) /rgb=(153,230,0)
pen (48)= (47) /rgb=(105,230,0)
pen (49)= (48) /rgb=(0,230,0)
pen (50)= (49) /rgb=(0,230,105)
pen (51)= (50) /rgb=(0,230,153)
pen (52)= (51) /rgb=(0,230,194)
pen (53)= (52) /rgb=(0,230,230)
pen (54)= (53) /rgb=(0,194,230)
pen (55)= (54) /rgb=(0,153,230)
pen (56)= (55) /rgb=(0,105,230)
pen (57)= (56) /rgb=(0,0,230)
pen (58)= (57) /rgb=(105,0,230)
pen (59)= (58) /rgb=(153,0,230)
pen (60)= (59) /rgb=(194,0,230)
pen (61)= (60) /rgb=(230,0,230)
pen (62)= (61) /rgb=(230,0,194)
pen (63)= (62) /rgb=(230,0,153)
pen (64)= (63) /rgb=(230,0,105)
pen (65)= (64) /rgb=(205,0,0)
pen (66)= (65) /rgb=(205,96,0)
pen (67)= (66) /rgb=(205,137,0)
pen (68)= (67) /rgb=(205,173,0)
pen (69)= (68) /rgb=(205,205,0)
pen (70)= (69) /rgb=(173,205,0)
pen (71)= (70) /rgb=(137,205,0)
pen (72)= (71) /rgb=(96,205,0)

pen (73)= (72) /rgb=(0,205,0)
pen (74)= (73) /rgb=(0,205,96)
pen (75)= (74) /rgb=(0,205,137)
pen (76)= (75) /rgb=(0,205,173)
pen (77)= (76) /rgb=(0,205,205)
pen (78)= (77) /rgb=(0,173,205)
pen (79)= (78) /rgb=(0,137,205)
pen (80)= (79) /rgb=(0,96,205)
pen (81)= (80) /rgb=(0,0,205)
pen (82)= (81) /rgb=(96,0,205)
pen (83)= (82) /rgb=(137,0,205)
pen (84)= (83) /rgb=(173,0,205)
pen (85)= (84) /rgb=(205,0,205)
pen (86)= (85) /rgb=(205,0,173)
pen (87)= (86) /rgb=(205,0,137)
pen (88)= (87) /rgb=(205,0,96)
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pen (91)= (90) /rgb=(168,115,0)
pen (92)= (91) /rgb=(168,143,0)
pen (93)= (92) /rgb=(168,168,0)
pen (94)= (93) /rgb=(143,168,0)
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pen (97)= (96) /rgb=(0,168,0)
pen (98)= (97) /rgb=(0,168,81)
pen (99)= (98) /rgb=(0,168,115)
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pen (138)= (137) /rgb=(255,192,168)
pen (139)= (138) /rgb=(255,214,168)
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pen (144)= (143) /rgb=(192,255,168)
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pen (150)= (149) /rgb=(168,235,255)
pen (151)= (150) /rgb=(168,214,255)
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pen (157)= (156) /rgb=(255,168,255)
pen (158)= (157) /rgb=(255,168,235)
pen (159)= (158) /rgb=(255,168,214)
pen (160)= (159) /rgb=(255,168,192)
pen (161)= (160) /rgb=(230,153,153)
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pen (165)= (164) /rgb=(230,230,153)
pen (166)= (165) /rgb=(212,230,153)
pen (167)= (166) /rgb=(194,230,153)
pen (168)= (167) /rgb=(174,230,153)
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pen (170)= (169) /rgb=(153,230,174)

pen (171)= (170) /rgb=(153,230,194)
pen (172)= (171) /rgb=(153,230,212)
pen (173)= (172) /rgb=(153,230,230)
pen (174)= (173) /rgb=(153,212,230)
pen (175)= (174) /rgb=(153,194,230)
pen (176)= (175) /rgb=(153,174,230)
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pen (179)= (178) /rgb=(194,153,230)
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pen (182)= (181) /rgb=(230,153,212)
pen (183)= (182) /rgb=(230,153,194)
pen (184)= (183) /rgb=(230,153,174)
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pen (187)= (186) /rgb=(205,173,137)
pen (188)= (187) /rgb=(205,190,137)
pen (189)= (188) /rgb=(205,205,137)
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pen (194)= (193) /rgb=(137,205,156)
pen (195)= (194) /rgb=(137,205,173)
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pen (206)= (205) /rgb=(205,137,190)
pen (207)= (206) /rgb=(205,137,173)
pen (208)= (207) /rgb=(205,137,156)
pen (209)= (208) /rgb=(168,115,115)
pen (210)= (209) /rgb=(168,129,115)
pen (211)= (210) /rgb=(168,143,115)
pen (212)= (211) /rgb=(168,156,115)
pen (213)= (212) /rgb=(168,168,115)
pen (214)= (213) /rgb=(156,168,115)
pen (215)= (214) /rgb=(143,168,115)
pen (216)= (215) /rgb=(129,168,115)
pen (217)= (216) /rgb=(115,168,115)
pen (218)= (217) /rgb=(115,168,129)
pen (219)= (218) /rgb=(115,168,143)

pen (220)= (219) /rgb=(115,168,156)
pen (221)= (220) /rgb=(115,168,168)
pen (222)= (221) /rgb=(115,156,168)
pen (223)= (222) /rgb=(115,143,168)
pen (224)= (223) /rgb=(115,129,168)
pen (225)= (224) /rgb=(115,115,168)
pen (226)= (225) /rgb=(129,115,168)
pen (227)= (226) /rgb=(143,115,168)
pen (228)= (227) /rgb=(156,115,168)
pen (229)= (228) /rgb=(168,115,168)
pen (230)= (229) /rgb=(168,115,156)
pen (231)= (230) /rgb=(168,115,143)
pen (232)= (231) /rgb=(168,115,129)
pen (233)= (232) /rgb=(126,89,89)
pen (234)= (233) /rgb=(126,99,89)
pen (235)= (234) /rgb=(126,109,89)
pen (236)= (235) /rgb=(126,117,89)
pen (237)= (236) /rgb=(126,126,89)
pen (238)= (237) /rgb=(117,126,89)
pen (239)= (238) /rgb=(109,126,89)
pen (240)= (239) /rgb=(99,126,89)
pen (241)= (240) /rgb=(89,126,89)
pen (242)= (241) /rgb=(89,126,99)
pen (243)= (242) /rgb=(89,126,109)
pen (244)= (243) /rgb=(89,126,117)
pen (245)= (244) /rgb=(89,126,126)
pen (246)= (245) /rgb=(89,117,126)
pen (247)= (246) /rgb=(89,109,126)
pen (248)= (247) /rgb=(89,99,126)
pen (249)= (248) /rgb=(89,89,126)
pen (250)= (249) /rgb=(99,89,126)
pen (251)= (250) /rgb=(109,89,126)
pen (252)= (251) /rgb=()117,89,126
pen (253)= (252) /rgb=(126,89,126)
pen (254)= (253) /rgb=(126,89,117)
pen (255)= (254) /rgb=(126,89,109)
resolution(IN)=(0.00098425197,0.00098425197) ; English resolution

stroke_tolerance=4.5

weight_strokes=(7,15,25,30,35,40,45,50,55,60,65,70,75,80,85,90,95,100,105,110,115,120,125,130,135,140,145,150,155,160,165)

The style records defines how the design file line codes (styles)
; are to be plotted. Values are in plotter units (resolutions).
; Values determine pen down/up movements, where (14,42) for a dot
; pattern leaves the pen down for 14 units and up for 42 units. The
; /nohardware switch causes software stroking with these values.
style(1) = (14,42)/nohardware ; style = dot

```
style(2) = (70,42)/nohardware      ; style = med dash
style(3) = (168,56)/nohardware          ; style = long dash
style(4) = (112,42,28,42)/nohardware    ; style = dot-dash
style(5) = (56,56)/nohardware      ; style = short dash
style(6) = (84,28,28,28,28,28)/nohardware    ; style = dash-dot-dot
style(7) = (112,28,56,28)/nohardware    ; style = long dash - short dash

linecap    =1           ; 1=butt, 2=square, 3=triangle, 4=round
linejoin   =2           ; 1=mitered, 2=miter/bevel, 3=triangle,
                  ; 4=round, 5=beveled, 6=no join
miter_limit=1.5         ; larger values mean longer spikes

; Construction/active points are not plotted by default. Uncomment the
; next line if you want points plotted. Points are plotted 0.1 cm dia.
; point_size = .1

; software_raster allows for plotting of type 87/88 raster elements. Value
; for resolution can be as high as your plotter's resolution.  Lower values
; will produce grainier images.  Remove comment to plot raster image.
; software_raster/res=32
; Specify color to plot colored raster images
software_raster/res=300/background=color

; largest_polygon is used only for element filling.  The value defines
; the point at which software filling takes over in place of hardware
; filling.  The value relates to number of vertices used to draw the
; element.
largest_polygon=2048

; The quality command can be set to a value between 0 and 100.  0 represents
; the lowest quality (Draft), 50 represents middle quality (Final) and 100
; represents best quality (Enhanced).  If no quality value is specified then
; the front panel setting will be used for the plot.
;
quality=50
```

# PLOT DRIVES FOR THE HP5000

## PX5KBW.PLT

```
PANTEX BLACK AND WHITE PLOTTER CONFIGURATION FILE FOR THE HP5000ps
PLOTTER

num_pens=255            ; Defines pens used - max value is 255
change_pen=both             ; options are color, weight, level or both
end_plot=eject              ; force page eject
rotate=cw                           ; enable/disable automatic rotation to maximize
                    ; plots: cw = rotate clockwise, ccw = rotate
                    ; counter-clockwise, none = disable clockwise rotation
model=HPGL2             ; plotter model number
driver=hpgl2                ; MDL driver to use
autocenter                  ; Automatically center plot on page
; border/pen=1/filename/time       ; leave this out for no border
default_extension='000'       ; default extension for plotfiles

communication=(handshake=1,baud=9600,par=none,data=8,stop=1)

size=(8.5,11)/num=0/off=(0,.25)/name=a
size=(17,11)/num=0/off=(0,.25)/name=b
size=(44,22)/num=0/off=(.3125,.75)/name=X
size=(34,22)/num=0/off=(.3125,.75)/name=d
size=(44,34)/num=0/off=(.3125,.75)/name=e

;PXCOLOR.TBL All colors are printed black except for 8 through 15 which are gray scales.
pen (1)= (0-7,16-255) /rgb=(0,0,0)
pen (2)= (8) /rgb=(233,233,233)
pen (3)= (9) /rgb=(204,204,204)
pen (4)= (10) /rgb=(178,178,178)
pen (5)= (11) /rgb=(153,153,153)
pen (6)= (12) /rgb=(127,127,127)
pen (7)= (13) /rgb=(102,102,102)
pen (8)= (14) /rgb=(77,77,77)
pen (9)= (15) /rgb=(26,26,26)

resolution(IN)=(0.00098425197,0.00098425197) ; English resolution

stroke_tolerance=4.5

weight_strokes=(7,15,25,30,35,40,45,50,55,60,65,70,75,80,85,90,95,100,105,110,115,120,125,130,135,140,145,150
,155,160,165)

; The style records defines how the design file line codes (styles)
; are to be plotted.  Values are in plotter units (resolutions).
; Values determine pen down/up movements, where (14,42) for a dot
```

```
; pattern leaves the pen down for 14 units and up for 42 units.  The
; /nohardware switch causes software stroking with these values.
style(1) = (14,42)/nohardware       ; style = dot

style(2) = (70,42)/nohardware      ; style = med dash
style(3) = (168,56)/nohardware          ; style = long dash
style(4) = (112,42,28,42)/nohardware    ; style = dot-dash
style(5) = (56,56)/nohardware      ; style = short dash
style(6) = (84,28,28,28,28,28)/nohardware    ; style = dash-dot-dot
style(7) = (112,28,56,28)/nohardware    ; style = long dash - short dash

linecap =1          ; 1=butt, 2=square, 3=triangle, 4=round
linejoin =2         ; 1=mitered, 2=miter/bevel, 3=triangle,
                    ; 4=round, 5=beveled, 6=no join
miter_limit =1.5  ; larger values mean longer spikes

; Construction/active points are not plotted by default. Uncomment the
; next line if you want points plotted. Points are plotted 0.1 cm dia.
; point_size = .1

; software_raster allows for plotting of type 87/88 raster elements. Value
; for resolution can be as high as your plotter's resolution.  Lower values
; will produce grainier images.  Remove comment to plot raster image.
software_raster/res=300

; Specify color to plot colored raster images
; software_raster/res=32/background=color

; largest_polygon is used only for element filling.  The value defines
; the point at which software filling takes over in place of hardware
; filling.  The value relates to number of vertices used to draw the
; element.
largest_polygon=2048

; The quality command can be set to a value between 0 and 100.  0 represents
; the lowest quality (Draft), 50 represents middle quality (Final) and 100
; represents best quality (Enhanced).  If no quality value is specified then
; the front panel setting will be used for the plot.
;
quality=0
```

# PX5KCOL.PLT

```
;PANTEX COLOR PLOTTER CONFIGURATION FILE FOR THE HP5000ps PLOTTER

num_pens=255            ; Defines pens used - max value is 255
change_pen=both             ; options are color, weight, level or both
end_plot=eject              ; force page eject
rotate=cw                           ; enable/disable automatic rotation to maximize
                            ; plots: cw = rotate clockwise, ccw = rotate
                            ; counter-clockwise, none = disable clockwise rotation
model=HPGL2                 ; plotter model number
driver=hpgl2                ; MDL driver to use
autocenter                  ; Automatically center plot on page
; border/pen=1/filename/time       ; leave this out for no border
default_extension='000'       ; default extension for plotfiles

communication=(handshake=1,baud=9600,par=none,data=8,stop=1)

size=(8.5,11)/num=0/off=(0,.25)/name=a
size=(17,11)/num=0/off=(0,.25)/name=b
size=(44,22)/num=0/off=(.3125,.75)/name=X
size=(34,22)/num=0/off=(.3125,.75)/name=d
size=(46, 34)/num=0/off=(.3125,.75)/name=e

;PXCOLOR.TBL color 1 is white, color 1 prints black using this plot driver. Color 255 is not
;included due to space limintations
pen (1)= (0) /rgb=(0,0,0)
pen (2)= (1) /rgb=(0,0,255)
pen (3)= (2) /rgb=(0,255,0)
pen (4)= (3) /rgb=(255,0,0)
pen (5)= (4) /rgb=(255,255,0)
pen (6)= (5) /rgb=(255,0,255)
pen (7)= (6) /rgb=(255,127,0)
pen (8)= (7) /rgb=(0,255,255)
pen (9)= (8) /rgb=(233,233,233)
pen (10)= (9) /rgb=(204,204,204)
pen (11)= (10) /rgb=(178,178,178)
pen (12)= (11) /rgb=(153,153,153)
pen (13)= (12) /rgb=(127,127,127)
pen (14)= (13) /rgb=(102,102,102)
pen (15)= (14) /rgb=(77,77,77)
pen (16)= (15) /rgb=(26,26,26)
pen (17)= (16) /rgb=(245,0,0)
pen (18)= (17) /rgb=(255,115,0)
pen (19)= (18) /rgb=(255,168,0)
pen (20)= (19) /rgb=(255,214,0)
pen (21)= (20) /rgb=(245,245,0)
```

pen (22)= (21) /rgb=(214,255,0)
pen (23)= (22) /rgb=(168,255,0)
pen (24)= (23) /rgb=(115,255,0)
pen (25)= (24) /rgb=(0,245,0)
pen (26)= (25) /rgb=(0,255,115)
pen (27)= (26) /rgb=(0,255,168)
pen (28)= (27) /rgb=(0,255,214)
pen (29)= (28) /rgb=(0,245,245)
pen (30)= (29) /rgb=(0,214,255)
pen (31)= (30) /rgb=(0,168,255)
pen (32)= (31) /rgb=(0,115,255)
pen (33)= (32) /rgb=(0,0,245)
pen (34)= (33) /rgb=(115,0,255)
pen (35)= (34) /rgb=(168,0,255)
pen (36)= (35) /rgb=(214,0,255)
pen (37)= (36) /rgb=(245,0,245)
pen (38)= (37) /rgb=(255,0,214)
pen (39)= (38) /rgb=(255,0,168)
pen (40)= (39) /rgb=(255,0,115)
pen (41)= (40) /rgb=(230,0,0)
pen (42)= (41) /rgb=(230,105,0)
pen (43)= (42) /rgb=(230,153,0)
pen (44)= (43) /rgb=(230,194,0)
pen (45)= (44) /rgb=(230,230,0)
pen (46)= (45) /rgb=(194,230,0)
pen (47)= (46) /rgb=(153,230,0)
pen (48)= (47) /rgb=(105,230,0)
pen (49)= (48) /rgb=(0,230,0)
pen (50)= (49) /rgb=(0,230,105)
pen (51)= (50) /rgb=(0,230,153)
pen (52)= (51) /rgb=(0,230,194)
pen (53)= (52) /rgb=(0,230,230)
pen (54)= (53) /rgb=(0,194,230)
pen (55)= (54) /rgb=(0,153,230)
pen (56)= (55) /rgb=(0,105,230)
pen (57)= (56) /rgb=(0,0,230)
pen (58)= (57) /rgb=(105,0,230)
pen (59)= (58) /rgb=(153,0,230)
pen (60)= (59) /rgb=(194,0,230)
pen (61)= (60) /rgb=(230,0,230)
pen (62)= (61) /rgb=(230,0,194)
pen (63)= (62) /rgb=(230,0,153)
pen (64)= (63) /rgb=(230,0,105)
pen (65)= (64) /rgb=(205,0,0)
pen (66)= (65) /rgb=(205,96,0)
pen (67)= (66) /rgb=(205,137,0)
pen (68)= (67) /rgb=(205,173,0)
pen (69)= (68) /rgb=(205,205,0)
pen (70)= (69) /rgb=(173,205,0)

pen (71)= (70) /rgb=(137,205,0)
pen (72)= (71) /rgb=(96,205,0)
pen (73)= (72) /rgb=(0,205,0)
pen (74)= (73) /rgb=(0,205,96)
pen (75)= (74) /rgb=(0,205,137)
pen (76)= (75) /rgb=(0,205,173)
pen (77)= (76) /rgb=(0,205,205)
pen (78)= (77) /rgb=(0,173,205)
pen (79)= (78) /rgb=(0,137,205)
pen (80)= (79) /rgb=(0,96,205)
pen (81)= (80) /rgb=(0,0,205)
pen (82)= (81) /rgb=(96,0,205)
pen (83)= (82) /rgb=(137,0,205)
pen (84)= (83) /rgb=(173,0,205)
pen (85)= (84) /rgb=(205,0,205)
pen (86)= (85) /rgb=(205,0,173)
pen (87)= (86) /rgb=(205,0,137)
pen (88)= (87) /rgb=(205,0,96)
pen (89)= (88) /rgb=(168,0,0)
pen (90)= (89) /rgb=(168,81,0)
pen (91)= (90) /rgb=(168,115,0)
pen (92)= (91) /rgb=(168,143,0)
pen (93)= (92) /rgb=(168,168,0)
pen (94)= (93) /rgb=(143,168,0)
pen (95)= (94) /rgb=(115,168,0)
pen (96)= (95) /rgb=(81,168,0)
pen (97)= (96) /rgb=(0,168,0)
pen (98)= (97) /rgb=(0,168,81)
pen (99)= (98) /rgb=(0,168,115)
pen (100)= (99) /rgb=(0,168,143)
pen (101)= (100) /rgb=(0,168,168)
pen (102)= (101) /rgb=(0,143,168)
pen (103)= (102) /rgb=(0,115,168)
pen (104)= (103) /rgb=(0,81,168)
pen (105)= (104) /rgb=(0,0,168)
pen (106)= (105) /rgb=(81,0,168)
pen (107)= (106) /rgb=(115,0,168)
pen (108)= (107) /rgb=(143,0,168)
pen (109)= (108) /rgb=(168,0,168)
pen (110)= (109) /rgb=(168,0,143)
pen (111)= (110) /rgb=(168,0,115)
pen (112)= (111) /rgb=(168,0,81)
pen (113)= (112) /rgb=(126,0,0)
pen (114)= (113) /rgb=(126,65,0)
pen (115)= (114) /rgb=(126,89,0)
pen (116)= (115) /rgb=(126,109,0)
pen (117)= (116) /rgb=(126,126,0)
pen (118)= (117) /rgb=(109,126,0)
pen (119)= (118) /rgb=(89,126,0)

pen (120)= (119) /rgb=(65,126,0)
pen (121)= (120) /rgb=(0,126,0)
pen (122)= (121) /rgb=(0,126,65)
pen (123)= (122) /rgb=(0,126,89)
pen (124)= (123) /rgb=(0,125,109)
pen (125)= (124) /rgb=(0,126,126)
pen (126)= (125) /rgb=(0,109,126)
pen (127)= (126) /rgb=(0,89,126)
pen (128)= (127) /rgb=(0,65,126)
pen (129)= (128) /rgb=(0,0,126)
pen (130)= (129) /rgb=(65,0,126)
pen (131)= (130) /rgb=(89,0,126)
pen (132)= (131) /rgb=(109,0,126)
pen (133)= (132) /rgb=(126,0,126)
pen (134)= (133) /rgb=(126,0,109)
pen (135)= (134) /rgb=(126,0,89)
pen (136)= (135) /rgb=(126,0,65)
pen (137)= (136) /rgb=(255,168,168)
pen (138)= (137) /rgb=(255,192,168)
pen (139)= (138) /rgb=(255,214,168)
pen (140)= (139) /rgb=(255,235,168)
pen (141)= (140) /rgb=(255,255,168)
pen (142)= (141) /rgb=(235,255,168)
pen (143)= (142) /rgb=(214,255,168)
pen (144)= (143) /rgb=(192,255,168)
pen (145)= (144) /rgb=(168,255,168)
pen (146)= (145) /rgb=(168,255,192)
pen (147)= (146) /rgb=(168,255,214)
pen (148)= (147) /rgb=(168,255,235)
pen (149)= (148) /rgb=(186,255,255)
pen (150)= (149) /rgb=(168,235,255)
pen (151)= (150) /rgb=(168,214,255)
pen (152)= (151) /rgb=(168,192,255)
pen (153)= (152) /rgb=(168,168,255)
pen (154)= (153) /rgb=(192,168,255)
pen (155)= (154) /rgb=(214,168,255)
pen (156)= (155) /rgb=(235,168,255)
pen (157)= (156) /rgb=(255,168,255)
pen (158)= (157) /rgb=(255,168,235)
pen (159)= (158) /rgb=(255,168,214)
pen (160)= (159) /rgb=(255,168,192)
pen (161)= (160) /rgb=(230,153,153)
pen (162)= (161) /rgb=(230,174,153)
pen (163)= (162) /rgb=(230,194,153)
pen (164)= (163) /rgb=(230,212,153)
pen (165)= (164) /rgb=(230,230,153)
pen (166)= (165) /rgb=(212,230,153)
pen (167)= (166) /rgb=(194,230,153)
pen (168)= (167) /rgb=(174,230,153)

pen (169)= (168) /rgb=(153,230,153)
pen (170)= (169) /rgb=(153,230,174)
pen (171)= (170) /rgb=(153,230,194)
pen (172)= (171) /rgb=(153,230,212)
pen (173)= (172) /rgb=(153,230,230)
pen (174)= (173) /rgb=(153,212,230)
pen (175)= (174) /rgb=(153,194,230)
pen (176)= (175) /rgb=(153,174,230)
pen (177)= (176) /rgb=(153,153,230)
pen (178)= (177) /rgb=(174,153,230)
pen (179)= (178) /rgb=(194,153,230)
pen (180)= (179) /rgb=(212,153,230)
pen (181)= (180) /rgb=(230,153,230)
pen (182)= (181) /rgb=(230,153,212)
pen (183)= (182) /rgb=(230,153,194)
pen (184)= (183) /rgb=(230,153,174)
pen (185)= (184) /rgb=(205,137,137)
pen (186)= (185) /rgb=(205,156,137)
pen (187)= (186) /rgb=(205,173,137)
pen (188)= (187) /rgb=(205,190,137)
pen (189)= (188) /rgb=(205,205,137)
pen (190)= (189) /rgb=(190,205,137)
pen (191)= (190) /rgb=(173,205,137)
pen (192)= (191) /rgb=(156,205,137)
pen (193)= (192) /rgb=(137,205,137)
pen (194)= (193) /rgb=(137,205,156)
pen (195)= (194) /rgb=(137,205,173)
pen (196)= (195) /rgb=(137,205,190)
pen (197)= (196) /rgb=(137,205,205)
pen (198)= (197) /rgb=(137,190,205)
pen (199)= (198) /rgb=(137,173,205)
pen (200)= (199) /rgb=(137,156,205)
pen (201)= (200) /rgb=(137,137,205)
pen (202)= (201) /rgb=(156,137,205)
pen (203)= (202) /rgb=(173,173,205)
pen (204)= (203) /rgb=(190,137,205)
pen (205)= (204) /rgb=(205,137,205)
pen (206)= (205) /rgb=(205,137,190)
pen (207)= (206) /rgb=(205,137,173)
pen (208)= (207) /rgb=(205,137,156)
pen (209)= (208) /rgb=(168,115,115)
pen (210)= (209) /rgb=(168,129,115)
pen (211)= (210) /rgb=(168,143,115)
pen (212)= (211) /rgb=(168,156,115)
pen (213)= (212) /rgb=(168,168,115)
pen (214)= (213) /rgb=(156,168,115)
pen (215)= (214) /rgb=(143,168,115)
pen (216)= (215) /rgb=(129,168,115)
pen (217)= (216) /rgb=(115,168,115)

pen (218)= (217) /rgb=(115,168,129)
pen (219)= (218) /rgb=(115,168,143)
pen (220)= (219) /rgb=(115,168,156)
pen (221)= (220) /rgb=(115,168,168)
pen (222)= (221) /rgb=(115,156,168)
pen (223)= (222) /rgb=(115,143,168)
pen (224)= (223) /rgb=(115,129,168)
pen (225)= (224) /rgb=(115,115,168)
pen (226)= (225) /rgb=(129,115,168)
pen (227)= (226) /rgb=(143,115,168)
pen (228)= (227) /rgb=(156,115,168)
pen (229)= (228) /rgb=(168,115,168)
pen (230)= (229) /rgb=(168,115,156)
pen (231)= (230) /rgb=(168,115,143)
pen (232)= (231) /rgb=(168,115,129)
pen (233)= (232) /rgb=(126,89,89)
pen (234)= (233) /rgb=(126,99,89)
pen (235)= (234) /rgb=(126,109,89)
pen (236)= (235) /rgb=(126,117,89)
pen (237)= (236) /rgb=(126,126,89)
pen (238)= (237) /rgb=(117,126,89)
pen (239)= (238) /rgb=(109,126,89)
pen (240)= (239) /rgb=(99,126,89)
pen (241)= (240) /rgb=(89,126,89)
pen (242)= (241) /rgb=(89,126,99)
pen (243)= (242) /rgb=(89,126,109)
pen (244)= (243) /rgb=(89,126,117)
pen (245)= (244) /rgb=(89,126,126)
pen (246)= (245) /rgb=(89,117,126)
pen (247)= (246) /rgb=(89,109,126)
pen (248)= (247) /rgb=(89,99,126)
pen (249)= (248) /rgb=(89,89,126)
pen (250)= (249) /rgb=(99,89,126)
pen (251)= (250) /rgb=(109,89,126)
pen (252)= (251) /rgb=()117,89,126
pen (253)= (252) /rgb=(126,89,126)
pen (254)= (253) /rgb=(126,89,117)
pen (255)= (254) /rgb=(126,89,109)

resolution(IN)=(0.00098425197,0.00098425197) ; English resolution

stroke_tolerance=4.5

weight_strokes=(7,15,25,30,35,40,45,50,55,60,65,70,75,80,85,90,95,100,105,110,115,120,125,130,135,140,145,150,155,160,165)

; The style records defines how the design file line codes (styles)
; are to be plotted. Values are in plotter units (resolutions).
; Values determine pen down/up movements, where (14,42) for a dot

```
;  pattern leaves the pen down for 14 units and up for 42 units.  The
;  /nohardware switch causes software stroking with these values.
style(1) = (14,42)/nohardware       ; style = dot
style(2) = (70,42)/nohardware      ; style = med dash
style(3) = (168,56)/nohardware          ; style = long dash
style(4) = (112,42,28,42)/nohardware    ; style = dot-dash
style(5) = (56,56)/nohardware      ; style = short dash
style(6) = (84,28,28,28,28,28)/nohardware    ; style = dash-dot-dot
style(7) = (112,28,56,28)/nohardware    ; style = long dash - short dash

linecap    =1           ; 1=butt, 2=square, 3=triangle, 4=round
linejoin   =2           ; 1=mitered, 2=miter/bevel, 3=triangle,
                        ; 4=round, 5=beveled, 6=no join
miter_limit=1.5         ; larger values mean longer spikes

; Construction/active points are not plotted by default. Uncomment the
; next line if you want points plotted. Points are plotted 0.1 cm dia.
; point_size = .1

; software_raster allows for plotting of type 87/88 raster elements. Value
; for resolution can be as high as your plotter's resolution.  Lower values
; will produce grainier images.  Remove comment to plot raster image.
; software_raster/res=32

; Specify color to plot colored raster images
software_raster/res=300/background=color

; largest_polygon is used only for element filling.  The value defines
; the point at which software filling takes over in place of hardware
; filling.  The value relates to number of vertices used to draw the
; element.
largest_polygon=2048

; The quality command can be set to a value between 0 and 100.  0 represents
; the lowest quality (Draft), 50 represents middle quality (Final) and 100
; represents best quality (Enhanced).  If no quality value is specified then
; the front panel setting will be used for the plot.
;
quality=50
```

# APPENDIX G
# PXCOLOR.TBL RGB CODES

# PXCOLOR.TBL RGB CODES

Color 0 = RGB Code 0,0,0
Color 1 = RGB Code 0,0,255
Color 2 = RGB Code 0,255,0
Color 3 = RGB Code 255,0,0
Color 4 = RGB Code 255,255,0
Color 5 = RGB Code 255,0,255
Color 6 = RGB Code 255,127,0
Color 7 = RGB Code 0,255,255
Color 8 = RGB Code 233,233,233
Color 9 = RGB Code 204,204,204
Color 10 = RGB Code 178,178,178
Color 11 = RGB Code 153,153,153
Color 12 = RGB Code 127,127,127
Color 13 = RGB Code 102,102,102
Color 14 = RGB Code 77,77,77
Color 15 = RGB Code 26,26,26
Color 16 = RGB Code 245,0,0
Color 17 = RGB Code 255,115,0
Color 18 = RGB Code 255,168,0
Color 19 = RGB Code 255,214,0
Color 20 = RGB Code 245,245,0
Color 21 = RGB Code 214,255,0
Color 22 = RGB Code 168,255,0
Color 23 = RGB Code 115,255,0
Color 24 = RGB Code 0,245,0
Color 25 = RGB Code 0,255,115
Color 26 = RGB Code 0,255,168
Color 27 = RGB Code 0,255,214
Color 28 = RGB Code 0,245,245
Color 29 = RGB Code 0,214,255
Color 30 = RGB Code 0,168,255
Color 31 = RGB Code 0,115,255
Color 32 = RGB Code 0,0,245
Color 33 = RGB Code 115,0,255
Color 34 = RGB Code 168,0,255
Color 35 = RGB Code 214,0,255
Color 36 = RGB Code 245,0,245
Color 37 = RGB Code 255,0,214
Color 38 = RGB Code 255,0,168
Color 39 = RGB Code 255,0,115
Color 40 = RGB Code 230,0,0
Color 41 = RGB Code 230,105,0
Color 42 = RGB Code 230,153,0
Color 43 = RGB Code 230,194,0
Color 44 = RGB Code 230,230,0
Color 45 = RGB Code 194,230,0
Color 46 = RGB Code 153,230,0
Color 47 = RGB Code 105,230,0
Color 48 = RGB Code 0,230,0
Color 49 = RGB Code 0,230,105
Color 50 = RGB Code 0,230,153
Color 51 = RGB Code 0,230,194
Color 52 = RGB Code 0,230,230
Color 53 = RGB Code 0,194,230
Color 54 = RGB Code 0,153,230
Color 55 = RGB Code 0,105,230
Color 56 = RGB Code 0,0,230
Color 57 = RGB Code 105,0,230
Color 58 = RGB Code 153,0,230
Color 59 = RGB Code 194,0,230
Color 60 = RGB Code 230,0,230
Color 61 = RGB Code 230,0,194
Color 62 = RGB Code 230,0,153
Color 63 = RGB Code 230,0,105
Color 64 = RGB Code 205,0,0
Color 65 = RGB Code 205,96,0
Color 66 = RGB Code 205,137,0
Color 67 = RGB Code 205,173,0
Color 68 = RGB Code 205,205,0
Color 69 = RGB Code 173,205,0
Color 70 = RGB Code 137,205,0
Color 71 = RGB Code 96,205,0
Color 72 = RGB Code 0,205,0
Color 73 = RGB Code 0,205,96
Color 74 = RGB Code 0,205,137
Color 75 = RGB Code 0,205,173
Color 76 = RGB Code 0,205,205
Color 77 = RGB Code 0,173,205
Color 78 = RGB Code 0,137,205
Color 79 = RGB Code 0,96,205
Color 80 = RGB Code 0,0,205
Color 81 = RGB Code 96,0,205
Color 82 = RGB Code 137,0,205
Color 83 = RGB Code 173,0,205
Color 84 = RGB Code 205,0,205
Color 85 = RGB Code 205,0,173
Color 86 = RGB Code 205,0,137
Color 87 = RGB Code 205,0,96

Color 88 = RGB Code 168,0,0
Color 89 = RGB Code 168,81,0
Color 90 = RGB Code 168,115,0
Color 91 = RGB Code 168,143,0
Color 92 = RGB Code 168,168,0
Color 93 = RGB Code 143,168,0
Color 94 = RGB Code 115,168,0
Color 95 = RGB Code 81,168,0
Color 96 = RGB Code 0,168,0
Color 97 = RGB Code 0,168,81
Color 98 = RGB Code 0,168,115
Color 99 = RGB Code 0,168,143
Color 100 = RGB Code 0,168,168
Color 101 = RGB Code 0,143,168
Color 102 = RGB Code 0,115,168
Color 103 = RGB Code 0,81,168
Color 104 = RGB Code 0,0,168
Color 105 = RGB Code 81,0,168
Color 106 = RGB Code 115,0,168
Color 107 = RGB Code 143,0,168
Color 108 = RGB Code 168,0,168
Color 109 = RGB Code 168,0,143
Color 110 = RGB Code 168,0,115
Color 111 = RGB Code 168,0,81
Color 112 = RGB Code 126,0,0
Color 113 = RGB Code 126,65,0
Color 114 = RGB Code 126,89,0
Color 115 = RGB Code 126,109,0
Color 116 = RGB Code 126,126,0
Color 117 = RGB Code 109,126,0
Color 118 = RGB Code 89,126,0
Color 119 = RGB Code 65,126,0
Color 120 = RGB Code 0,126,0
Color 121 = RGB Code 0,126,65
Color 122 = RGB Code 0,126,89
Color 123 = RGB Code 0,125,109
Color 124 = RGB Code 0,126,126
Color 125 = RGB Code 0,109,126
Color 126 = RGB Code 0,89,126
Color 127 = RGB Code 0,65,126
Color 128 = RGB Code 0,0,126
Color 129 = RGB Code 65,0,126
Color 130 = RGB Code 89,0,126
Color 131 = RGB Code 109,0,126
Color 132 = RGB Code 126,0,126
Color 133 = RGB Code 126,0,109
Color 134 = RGB Code 126,0,89
Color 135 = RGB Code 126,0,65
Color 136 = RGB Code 255,168,168
Color 137 = RGB Code 255,192,168
Color 138 = RGB Code 255,214,168
Color 139 = RGB Code 255,235,168
Color 140 = RGB Code 255,255,168
Color 141 = RGB Code 235,255,168
Color 142 = RGB Code 214,255,168
Color 143 = RGB Code 192,255,168
Color 144 = RGB Code 168,255,168
Color 145 = RGB Code 168,255,192
Color 146 = RGB Code 168,255,214
Color 147 = RGB Code 168,255,235
Color 148 = RGB Code 186,255,255
Color 149 = RGB Code 168,235,255
Color 150 = RGB Code 168,214,255
Color 151 = RGB Code 168,192,255
Color 152 = RGB Code 168,168,255
Color 153 = RGB Code 192,168,255
Color 154 = RGB Code 214,168,255
Color 155 = RGB Code 235,168,255
Color 156 = RGB Code 255,168,255
Color 157 = RGB Code 255,168,235
Color 158 = RGB Code 255,168,214
Color 159 = RGB Code 255,168,192
Color 160 = RGB Code 230,153,153
Color 161 = RGB Code 230,174,153
Color 162 = RGB Code 230,194,153
Color 163 = RGB Code 230,212,153
Color 164 = RGB Code 230,230,153
Color 165 = RGB Code 212,230,153
Color 166 = RGB Code 194,230,153
Color 167 = RGB Code 174,230,153
Color 168 = RGB Code 153,230,153
Color 169 = RGB Code 153,230,174
Color 170 = RGB Code 153,230,194
Color 171 = RGB Code 153,230,212
Color 172 = RGB Code 153,230,230
Color 173 = RGB Code 153,212,230
Color 174 = RGB Code 153,194,230
Color 175 = RGB Code 153,174,230
Color 176 = RGB Code 153,153,230
Color 177 = RGB Code 174,153,230
Color 178 = RGB Code 194,153,230
Color 179 = RGB Code 212,153,230
Color 180 = RGB Code 230,153,230
Color 181 = RGB Code 230,153,212
Color 182 = RGB Code 230,153,194
Color 183 = RGB Code 230,153,174
Color 184 = RGB Code 205,137,137
Color 185 = RGB Code 205,156,137
Color 186 = RGB Code 205,173,137
Color 187 = RGB Code 205,190,137
Color 188 = RGB Code 205,205,137
Color 189 = RGB Code 190,205,137

Color 190 = RGB Code 173,205,137
Color 191 = RGB Code 156,205,137
Color 192 = RGB Code 137,205,137
Color 193 = RGB Code 137,205,156
Color 194 = RGB Code 137,205,173
Color 195 = RGB Code 137,205,190
Color 196 = RGB Code 137,205,205
Color 197 = RGB Code 137,190,205
Color 198 = RGB Code 137,173,205
Color 199 = RGB Code 137,156,205
Color 201 = RGB Code 156,137,205
Color 202 = RGB Code 173,173,205
Color 203 = RGB Code 190,137,205
Color 204 = RGB Code 205,137,205
Color 205 = RGB Code 205,137,190
Color 206 = RGB Code 205,137,173
Color 207 = RGB Code 205,137,156
Color 208 = RGB Code 168,115,115
Color 209 = RGB Code 168,129,115
Color 210 = RGB Code 168,143,115
Color 211 = RGB Code 168,156,115
Color 212 = RGB Code 168,168,115
Color 213 = RGB Code 156,168,115
Color 214 = RGB Code 143,168,115
Color 215 = RGB Code 129,168,115
Color 216 = RGB Code 115,168,115
Color 217 = RGB Code 115,168,129
Color 218 = RGB Code 115,168,143
Color 219 = RGB Code 115,168,156
Color 220 = RGB Code 115,168,168
Color 221 = RGB Code 115,156,168
Color 222 = RGB Code 115,143,168
Color 223 = RGB Code 115,129,168
Color 224 = RGB Code 115,115,168
Color 225 = RGB Code 129,115,168
Color 226 = RGB Code 143,115,168
Color 227 = RGB Code 156,115,168
Color 228 = RGB Code 168,115,168
Color 229 = RGB Code 168,115,156
Color 230 = RGB Code 168,115,143
Color 231 = RGB Code 168,115,129
Color 232 = RGB Code 126,89,89
Color 233 = RGB Code 126,99,89
Color 234 = RGB Code 126,109,89
Color 235 = RGB Code 126,117,89
Color 236 = RGB Code 126,126,89
Color 237 = RGB Code 117,126,89
Color 238 = RGB Code 109,126,89
Color 239 = RGB Code 99,126,89
Color 240 = RGB Code 89,126,89
Color 241 = RGB Code 89,126,99
Color 242 = RGB Code 89,126,109
Color 243 = RGB Code 89,126,117
Color 244 = RGB Code 89,126,126
Color 245 = RGB Code 89,117,126
Color 246 = RGB Code 89,109,126
Color 247 = RGB Code 89,99,126
Color 248 = RGB Code 89,89,126
Color 249 = RGB Code 99,89,126
Color 250 = RGB Code 109,89,126
Color 251 = RGB Code 117,89,126
Color 252 = RGB Code 126,89,126
Color 253 = RGB Code 126,89,117
Color 254 = RGB Code 126,89,109
Color 200 = RGB Code 137,137,205

# APPENDIX H
# TITLE BLOCK INFORMATION

# TITLE BLOCK INFORMATION

Refer to Chapter 1, Section 6.3 for Details

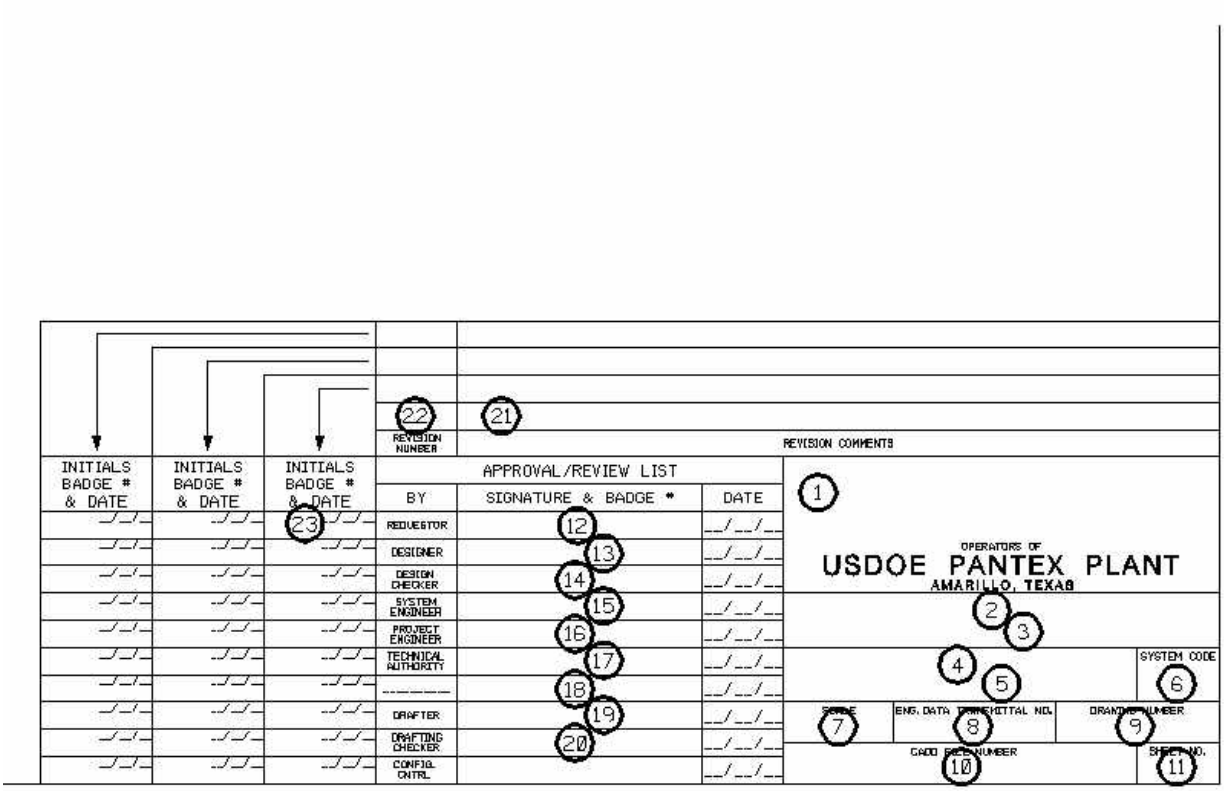



**Figure 1**

Standard Title Block Layout For PXTB_D.DGN

The following Table contains a brief description and references for the title block areas containing the circled numbers in Figure 1. Refer to Chapter 1, Section 6.3 for more detailed definitions and placement information.

| TITLE BLOCK AREA DESCRIPTIONS AND REFERNCES | | | |
|---|---|---|---|
| **AREA** | **DESCRIPTION** | **ASSIGNED BY** | **REFERENCE** |
| 1 | Company | N/A | Section 5 |
| 2 | PassPort ® Unit | Requester | Section 1.6.3 (1) |
| 3 | Drawing Type | Requester | Section 1.6.3 (2) |
| 4 | System Name and System IDT | Requester | Section 1.6.3. (3) |
| 5 | Free Form Information Text | Requester | Section 1.6.4. (4) |
| 6 | System Type Code | ~~System Engineering~~ | ~~MNL-00014~~ |
| 7 | Scale | Drafting Tech. | Section 1.6.3 (6) |
| 8 | Engineering Data Transmittal Number | ~~System Engineering~~ | ~~MNL-00014~~ |
| 9 | Drawing Number | ~~FCC~~ Configuration Control | MNL-00054 |
| 10 | CADD File Number | Drafting Tech. | Section 1.6.3 (10) |
| 11 | Sheet Number | Drafting Tech. | Section 1.6.3 (11) |
| 12 | Requestor – Signature, Badge # and Date | N/A | Section 1.6.3 (12) |
| 13 | Designer – Signature, Badge # and Date | N/A | Section 1.6.3 (13) |
| 14 | Design Checker – Signature, Badge # and Date | N/A | Section 1.6.3 (14) |
| 15 | System Engineer – Signature, Badge # and Date | N/A | Section 1.6.3 (15) |
| 16 | Project Engineer – Signature, Badge # and Date | | |
| 17 | Technical Authority – Signature, Badge # and Date | | |
| 18 | Additional signature as needed | N/A | Section 1.6.3 (16) |
| 19 | Drafter, Architectural or Engineering Contractor | N/A | Section 1.6.3 (17) |
| 20 | Drafting Checker – Signature, Badge # and Date | N/A | Section 1.6.3 (18) |
| 21 | Revision Number | Drafting Tech. | Section 1.6.4 (5)[c] |
| 22 | Revision Comments | Drafting Tech. | Section 1.6.4 (1) (2) |
| 23 | Initials, Badge # and Dates for Revisions | N/A | Section 1.6.3 (12 –20) |

# APPENDIX I
# PANTEX STANDARD LINE WEIGHTS

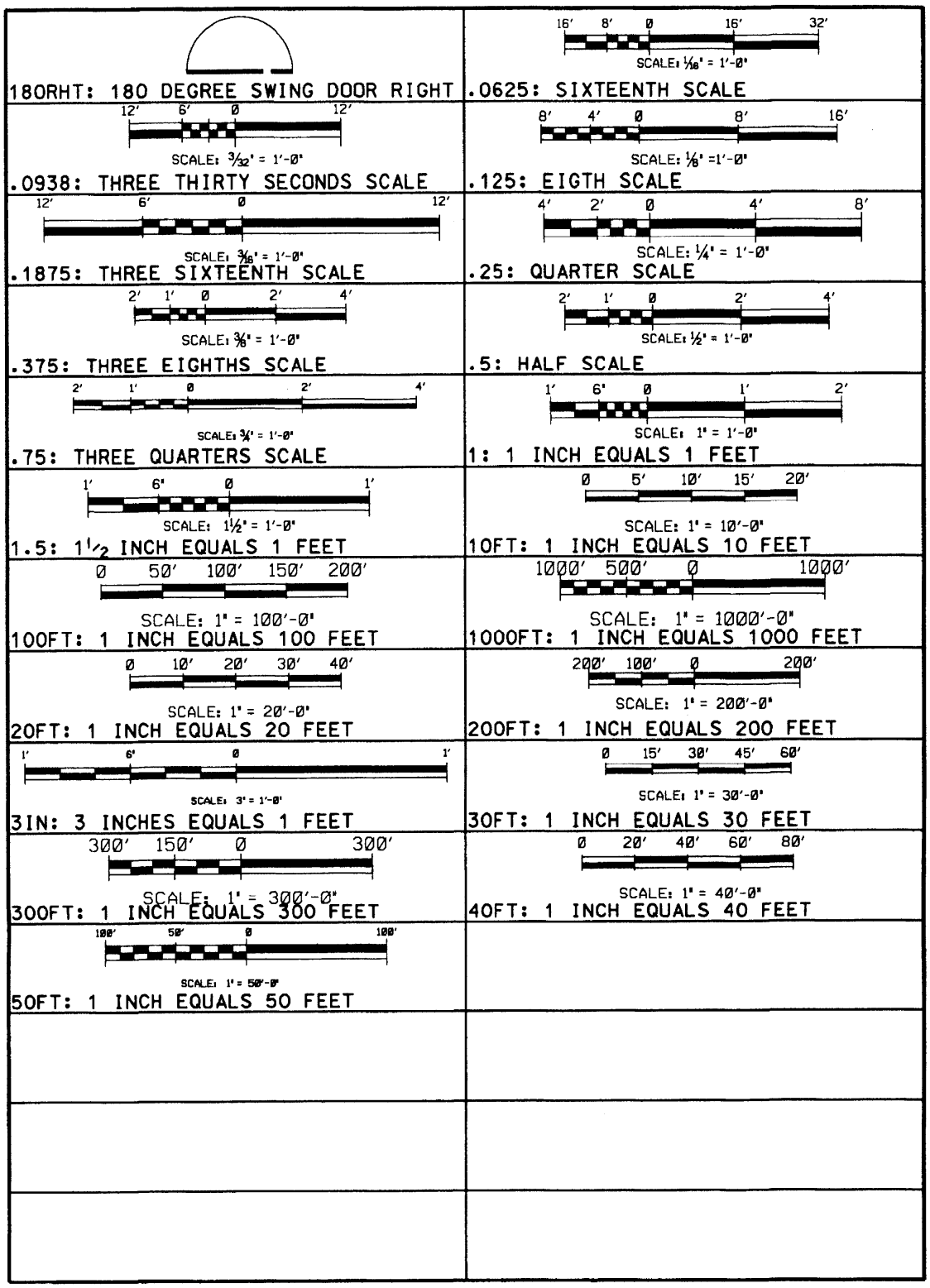
# PANTEX STANDARD LINE WEIGHTS

| Weight | Inches | Millimeters | | | Weight | Inches | Millimeters |
|---|---|---|---|---|---|---|---|
| 0 | 0.007 | 0.18 | | | 16 | 0.095 | 2.41 |
| 1 | 0.015 | 0.38 | | | 17 | 0.1 | 2.54 |
| 2 | 0.025 | 0.63 | | | 18 | 0.105 | 2.67 |
| 3 | 0.03 | 0.76 | | | 19 | 0.11 | 2.79 |
| 4 | 0.035 | 0.89 | | | 20 | 0.115 | 2.92 |
| 5 | 0.04 | 1.01 | | | 21 | 0.12 | 3.05 |
| 6 | 0.045 | 1.14 | | | 22 | 0.125 | 3.17 |
| 7 | 0.05 | 1.27 | | | 23 | 0.13 | 3.3 |
| 8 | 0.055 | 1.4 | | | 24 | 0.135 | 3.43 |
| 9 | 0.06 | 1.52 | | | 25 | 0.14 | 3.56 |
| 10 | 0.065 | 1.65 | | | 26 | 0.145 | 3.68 |
| 11 | 0.07 | 1.78 | | | 27 | 0.15 | 3.81 |
| 12 | 0.075 | 1.9 | | | 28 | 0.155 | 3.94 |
| 13 | 0.08 | 2 | | | 29 | 0.16 | 4.06 |
| 14 | 0.085 | 2.16 | | | 30 | 0.165 | 4.19 |
| 15 | 0.09 | 2.29 | | | | | |

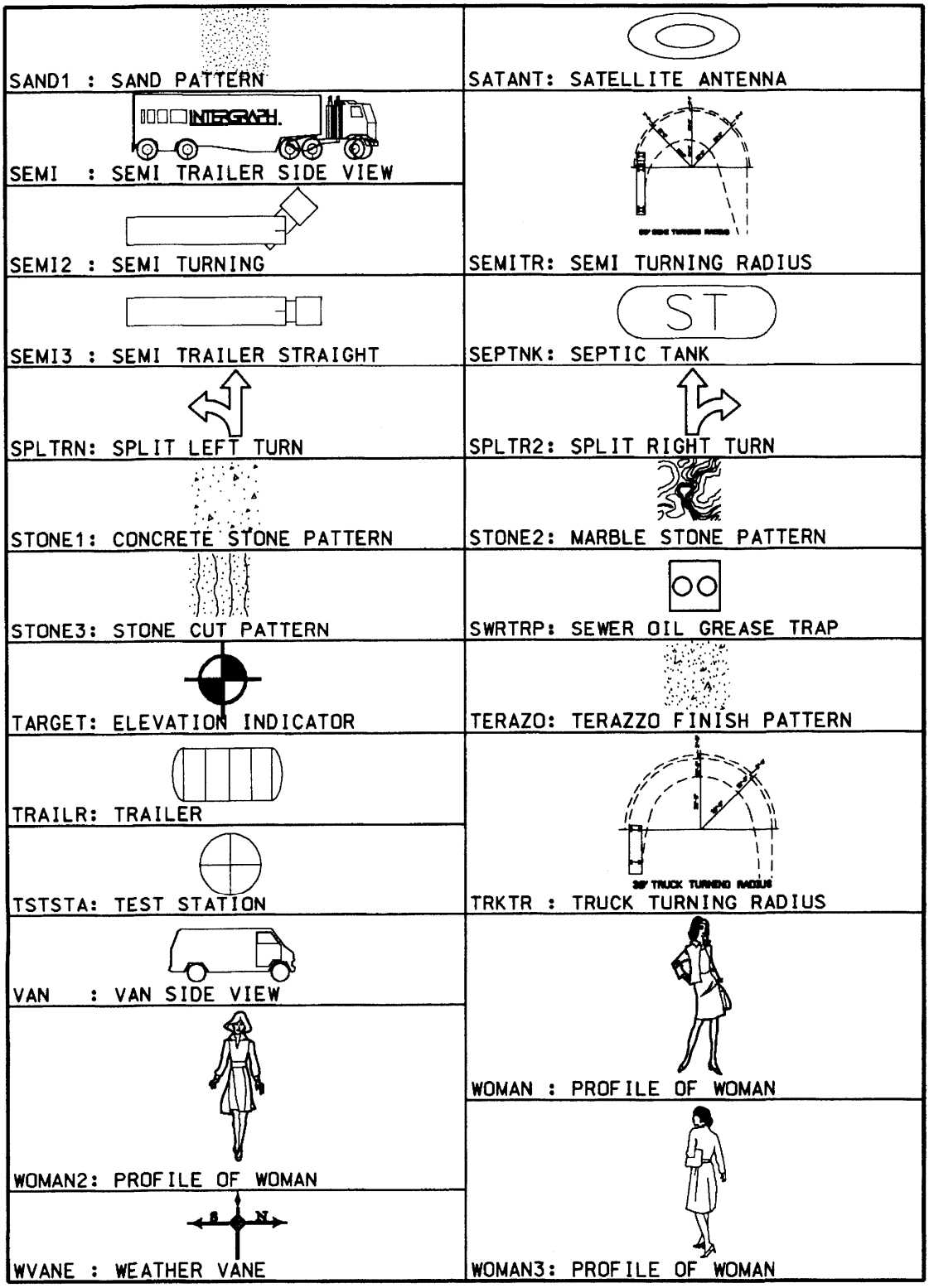
# APPENDIX J
# ARCHITECTURAL RELATED CELLS

| | |
|---|---|
| BIFLDL: BIFOLD DOOR LEFT | BIFLDR: BIFOLD DOOR RIGHT |
| CHAIR: | DBLEGL: DOUBLE EGRESS LEFT |
| DBLEGR: DOUBLE EGRESS RIGHT | DBLLFT: DOUBLE DOOR LEFT |
| DBLRHT: DOUBLE DOOR RIGHT | DBWC2: 2 FT DOUBLE CASEMENT WINDOW |
| DBW4: 4 FT DOUBLE CASEMENT WINDOW | DRFRAME: DOOR FRAME JAMB |
| DRSCH: DOOR SCHEDULE | DTLARW: DETAIL ARROW INDICATOR |
| DTLRND: DETAIL INDICATOR | FIXW2: 2 FT FIXED WINDOW |
| FIXW4: 4 FT FIXED WINDOW | RMFIN: ROOM FINISH SCHEDULE |
| SCW2: 2 FT SINGLE CASEMENT WINDOW | |
| SCW4: 4 FT SINGLE CASEMENT WINDOW | SGLFLR: SINGLE FULL RIGHT |
| SGLFUL: SINGLE FULL SWING DOOR LEFT | SGLLFT: SINGLE DOOR LEFT |
| SGLRHT: SINGLE DOOR RIGHT | SLDW2: 2 FT SLIDING WINDOW |
| SLDW4: 4 FT SLIDING WINDOW | SLIDE: SLIDING DOOR |
| STOVE: | 180LFT: 180 DEGREE SWING DOOR LEFT |

# APPENDIX K
# CIVIL AND SITE RELATED CELLS


180RHT: 180 DEGREE SWING DOOR RIGHT
.0625: SIXTEENTH SCALE
SCALE: 1/16" = 1'-0"
.0938: THREE THIRTY SECONDS SCALE
SCALE: 3/32" = 1'-0"
.125: EIGTH SCALE
SCALE: 1/8" =1'-0"
.1875: THREE SIXTEENTH SCALE
SCALE: 3/16" = 1'-0"
.25: QUARTER SCALE
SCALE: 1/4" = 1'-0"
.375: THREE EIGHTHS SCALE
SCALE: 3/8" = 1'-0"
.5: HALF SCALE
SCALE: 1/2" = 1'-0"
.75: THREE QUARTERS SCALE
SCALE: 3/4" = 1'-0"
1: 1 INCH EQUALS 1 FEET
SCALE: 1" = 1'-0"
1.5: 1 1/2 INCH EQUALS 1 FEET
SCALE: 1 1/2" = 1'-0"
10FT: 1 INCH EQUALS 10 FEET
SCALE: 1" = 10'-0"
100FT: 1 INCH EQUALS 100 FEET
SCALE: 1" = 100'-0"
1000FT: 1 INCH EQUALS 1000 FEET
SCALE: 1" = 1000'-0"
20FT: 1 INCH EQUALS 20 FEET
SCALE: 1" = 20'-0"
200FT: 1 INCH EQUALS 200 FEET
SCALE: 1" = 200'-0"
3IN: 3 INCHES EQUALS 1 FEET
SCALE: 3" = 1'-0"
30FT: 1 INCH EQUALS 30 FEET
SCALE: 1" = 30'-0"
300FT: 1 INCH EQUALS 300 FEET
SCALE: 1" = 300'-0"
40FT: 1 INCH EQUALS 40 FEET
SCALE: 1" = 40'-0"
50FT: 1 INCH EQUALS 50 FEET
SCALE: 1" = 50'-0"

| | |
|---|---|
| CB<br>BASIN : CATCH BASIN | |
| BRIDGE: | BIKE : GIRL ON BIKE |
| CAR : SIDE VIEW OF CAR | CARTOO: FRONT VIEW OF CAR |
| CAR TURNING RADIUS<br>CARTR : CAR TURNING RADIUS | CLNOUT: SEWER CLEANOUT |
| CONC1 : LITEWEIGHT CONCRETE | COUPL : PROFILE OF COUPLE |
| COUPL2: PROFILE OF COUPLE | COUPL3: PROFILE OF COUPLE |
| N<br>E<br>CRDNTE: SITE COORDINATE | |
| EARTH1: CRUSHED ROCK GRAVEL | EARTH2: UNDISTURBED EARTH |
| EARTH3: COMPACTED FILL | EARTH4: EARTHWORK ROCK PATTERN |
| EARTH5: EROSION SEDIMENT CONTROL | FENCE : 1 TO 1 CHAIN LINK |
| GROUT1: GROUT PATTERN | GYPSUM: PLASTER OR GYPSUM BD |
| HNDICP: HANDICAP SYMBOL | |
| LFTRN : LEFT TURN ARROW | JOGGER: SILHOUETTE OF JOGGER |


SAND1 : SAND PATTERN
SATANT: SATELLITE ANTENNA
INTERGRAPH
SEMI : SEMI TRAILER SIDE VIEW
SEMI2 : SEMI TURNING
SEMITR: SEMI TURNING RADIUS
SEMI3 : SEMI TRAILER STRAIGHT
ST
SEPTNK: SEPTIC TANK
SPLTRN: SPLIT LEFT TURN
SPLTR2: SPLIT RIGHT TURN
STONE1: CONCRETE STONE PATTERN
STONE2: MARBLE STONE PATTERN
STONE3: STONE CUT PATTERN
SWRTRP: SEWER OIL GREASE TRAP
TARGET: ELEVATION INDICATOR
TERAZO: TERAZZO FINISH PATTERN
TRAILR: TRAILER
TSTSTA: TEST STATION
TRKTR : TRUCK TURNING RADIUS
VAN : VAN SIDE VIEW
WOMAN : PROFILE OF WOMAN
WOMAN2: PROFILE OF WOMAN
S
N
WVANE : WEATHER VANE
WOMAN3: PROFILE OF WOMAN

| | |
|---|---|
| 100X :100 TO 1 BARBED WIRE PATTERN | 1000CT:1000 TO 1 CONCERTINA PATTERN |
| 1000DT:1000 TO 1 CHAIN LINK PATTERN | 1000RR: 1000 TO 1 RAILROAD PATTERN |
| 1000SN:1000 TO 1 SNOW FENCE PATTERN | 1000X :1000 TO 1 BARBED WIRE PATTRN |
| 200CT :200 TO 1 CENCERTINA PATTERN | 200DOT:200 TO 1 CHAIN LINK PATTERN |
| 200RR : 200 TO 1 RAILROAD PATTERN | 200SN :200 TO 1 SNOW FENCE PATTERN |
| 200X :200 TO 1 BARBED WIRE PATTERN | 50CT : 50 TO 1 CONCERTINA PATTERN |
| 50DOT : 50 TO 1 CHAIN LINK PATTERN | 50RR : 50 TO 1 RAILROAD PATTERN |
| 50SN : 50 TO 1 SNOW FENCE PATTERN | 50X : 50 TO 1 BARBED WIRE PATTERN |
| | |
| | |
| | |
| | |
| | |
| | |

# APPENDIX L
# ELECTRICAL RELATED CELLS

| | |
|---|---|
| BB<br>BRKBOX: BREAKER BOX | DISPOL:ELECTRICAL DISTRIBUTION POLE |
| H<br>ELEC01: HANDHOLE | ELEC02: EARTH GROUND |
| ELEC03: GUY WIRE | T T<br>ELEC04: DUCT TROLLEY |
| C C<br>ELEC05: CABLE LADDER | ELEC06: UNDER FLOOR JUNCTION BOX |
| J<br>ELEC07: JUNCTION BOX | PB<br>ELEC08: PULL BOX |
| ELEC09: PANELBOARD HOMERUN | W W<br>ELEC10: ELECTRICAL WIREWAY |
| ELEC11: DUCT CELL FLOOR HEATER | ELEC12: NORMALLY CLOSED RELAY |
| ELEC13: NORMALLY OPEN RELAY | D<br>ELEC14: OUTLET DATA COMMUNICATION |
| ELEC15:FLR OUTLET DATA COMMUNICATION | ELEC16: PRESSURE SWITCH CLOSED |
| ELEC17: PRESSURE SWITCH OPEN | ELEC18: PUSH BUTTON |
| C<br>ELEC19: RECEPTACLE CLOCK HANGER | ELEC20: DUPLEX RECEPTACLE |
| ELEC21: DUPLEX RECEPTACLE EMERGENCY | ELEC22: RECEPTACLE GROUND FAULT |
| ELEC23: QUADRAPLEX RECEPTACLE | ELEC24: SINGLE RECEPTACLE |
| S<br>ELEC25: SINGLE RECEPTACLE W/ SWITCH | ELEC26: SPECIAL PURPOSE RECEPTACLE |

| | |
|---|---|
| S<br>ELEC27: SWITCHED DUPLEX RECEPTACLE | S<br>ELEC28: CEILING MOUNTED SPEAKER |
| $P<br>ELEC29: SWITCH W/ PILOT LIGHT | P<br>ELEC30: CEILING MOUNTED PULL SWITCH |
| $2<br>ELEC31: DOUBLE POLE SWITCH | $4<br>ELEC32: 4 WAY SWITCH |
| $K<br>ELEC33: KEY OPERATED SWITCH | L PS<br>ELEC34: LAMP HOLDER SWITCH |
| $LM<br>ELEC35: LOW VOLTAGE MASTERSWITCH | ELEC36: MULTIPOSITION SWITCH |
| ELEC37:NORMALLY CLOSED FLOAT SWITCH | ELEC38:NORMALLY CLOSED FOOT OPERTATE |
| ELEC39:NORMALLY CLOSED LIMIT SWITCH | ELEC40:NORMALLY CLOSED TEMP ACTIVATE |
| ELEC41:NORMALLY CLOSED TIME DELAY | ELEC42: NORMALLY OPEN FLOAT SWITCH |
| ELEC43: NORMALLY OPEN LIMIT SWITCH | ELEC44:NORMALLY OPEN TEMP ACTIVATED |
| ELEC45: NORMALLY OPEN TIME DELAY | ELEC46: SINGLE BREAK SWITCH |
| $<br>ELEC47: SINGLE POLE SWITCH | $3<br>ELEC48: 3 WAY SWITCH |
| $T<br>ELEC49: TIMER OPERATED SWITCH | ELEC50: AERIAL SERVICE WEATHER |
| ELEC51: 3 PHASE MOTOR | ELEC52: SINGLE PHASE MOTOR |
| G<br>ELEC53: GENERATOR POWER | ELEC54: BATTERY |

| | |
|---|---|
| ELEC55: DELTA CONNECTION | ELEC56: TRANSFORMER |
| ELEC57: CURRENT TRANSFORMER | ELEC58: WYE CONNECTION |
| ELEC59: CAPACITATOR | ELEC60: METER |
| ELEC61: SUBSTATION | ELEC62: CIRCUIT BREAKER |
| ELEC63: DISCONNECT SWITCH FUSED | ELEC64: DISCONNECT SWITCH UNFUSED |
| ELEC65: FUSED SWITCH | ELEC66: FUSIBLE LINK |
| ELEC67: STARTER COMBO W/ DISCONNECT | ELEC68: STARTER OR MOTOR CONTROLLER |
| ELEC69: TIME CLOCK | ELEC70: DISTRIBUTION PANEL |
| ELEC71: LIGHTING PANEL | ELEC72:PANELBOARD CABINET FLUSH MNT |
| ELEC73:PNLBOARD CABINET SURFACE MNT | ELEC74: POWER PANEL |
| ELEC75: BUSWAY | ELEC76: FUSE W/ RATING |
| ELEC77: INCANDESCENT CEILING MOUNTED | ELEC78: 2x4 RECESSED FLUORESCENT |
| ELEC79: 1x4 RECESSED FLUORESCENT | ELEC80: 1x8 RECESSED FLUORESCENT |
| ELEC81: 2x4 SURFACE MNT FLUORESCENT | ELEC82: 1x4 SURFACE MNT FLUORESCENT |

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|---|---|
| C<br>ELEC83: 1x8 SURFACE MNT FLUORESCENT | ELEC84: STREET LIGHT W/ BRACKET |
| ELEC85: AIRFIELD RUNWAY LIGHT | ELEC86: AIRFIELD TAXIWAY LIGHT |
| ELEC87: EXTERIOR BUILDING LIGHT | ELEC88: RUNWAY LIGHTING |
| ELEC89: WALL MOUNTED EXIT SIGN | ELEC90: HEATER ELECTRIC RESISTANCE |
| D<br>ELEC91: EMERGENCY FLUORESCENT | ELEC92: 1 EMERGENCY BATTERY LIGHT |
| ELEC93: 3 EMERGENCY BATTERY LIGHTS | ELEC94: FLOOR RECEPTACLE TELEPHONE |
| ELEC95: WALL MOUNTED TELEPHONE | ELEC96: 2 EMERGENCY BATTERY LIGHTS |
| GM<br>GASMTR: GAS METER | GV<br>GASVLV: GAS VALVE |
| HFRAME: DUAL HIGHMAST LIGHTS | HIMAST: HIGH MAST LIGHT POLE |
| HIVOLT: HIGH VOLTAGE MANHOLE | LITZ4: ZONE 4 LIGHT |
| PADTRN: PAD MOUNTED TRANSFORMER | L<br>PBLS: PULL BOX LIGHT SWITCH |
| PWRPOL: POWER POLE | ET<br>PWRTRN:ELECTRICAL POWER TRANSFORMER |
| PWRTWR: ELECTRICAL POWER TOWER | Z4LIT: ZONE 4 LIGHT TOWER |
| | |

# APPENDIX M
# FIRE PROTECTION RELATED CELLS

| | |
|---|---|
| HA<br>ABORT : HALON ABORT STATION | ALARM : WATER MOTOR ALARM |
| F<br>ALRMBX: MANUAL ALARM BOX | F<br>BELL : ALARM BELL |
| T<br>BELL2 : TROUBLE BELL | DCP<br>DCP :HIGH SPEED DELUGE CONTROLLER |
| S<br>DETEC1: GENERAL SMOKE DETECTOR | S I<br>DETEC2: IONIZATION SMOKE DETECTOR |
| S PE<br>DETEC3:PHOTOELECTRIC SMOKE DETECTOR | D I<br>DETEC4:DUCT SMK IONIZATION DETECTOR |
| G<br>DETEC5: GAS DETECTOR | H RR<br>DETEC6: HEAT RATE OR RISE |
| H FT<br>DETEC7: HEAT FIXED TEMPERATURE | H RC<br>DETEC8: HEAT RATE COMPENSATED |
| H C<br>DETEC9: HEAT COMBINATION | H<br>DETC10: HEAT GENERAL |
| S H<br>DETC11: INTRINSICALLY SAFE | F UV<br>DETC12: FLAME ULTRAVIOLET DETECTOR |
| D PE<br>DETC13: DUCT SMOKE PHOTOELECT | DH<br>DRHLDR: ELECTRIC DOOR HOLDER |
| DN<br>DROP1 : ON CROSSMAN | DN<br>DROP2 : ON LINE |
| AZT 4<br>EQUAD : ADDRESSABLE QUAD AZT | S<br>E48 : STROBE ALARM LIGHT |
| F<br>E53 : BELL STROBE | C<br>E54 : ALARM CHIME |
| J<br>E55 : JUNCTION BOX | C<br>E56 : ALARM CHIME STROBE |

| | |
|---|---|
| RT<br>E60 : ROOM TEMPERATURE SENSER | POC FS<br>E68 : POC FIRE STATION |
| POC $CO^2$<br>E70 : POC TO CO2 | AST<br>E74 : ADDRESSABLE SIGNAL TERMINAL |
| AZT<br>E75 : ADDRESSABLE ZONE TERMINAL | F<br>E76 : HORN STROBE |
| SS PIV<br>E77 : PIV SWITCH | SS OSY<br>E78 : OS & Y SWITCH |
| SS GV<br>E79 : GLOBE VALVE SWITCH | SS BV<br>E80 : BALL VALVE SWITCH |
| TS LL<br>E81 : LOW WATER LEVEL SWITCH | TS LH<br>E82 : HIGH WATER LEVEL SWITCH |
| TS TL<br>E83 : LOW WATER TEMP SWITCH | PS LA<br>E84:LOW AIR PRESS SUPERVISORY SWITCH |
| PS HA<br>E85:HI AIR PRESS SUPERVISORY SWITCH | PS H/L<br>E86 : HIGH LOW AIR PRESS SWITCH |
| POC<br>E91 : POINT OF CONNECTION | FCP<br>FCP : FIRE ALARM CONTROL PANEL |
| FDCON1: 2 WAY FIRE DEPT CONNECTION | FDCON2:FREE STAND FIRE DEPT CONNECT |
| S<br>FW1 : SMOKE BARRIER | FW2 : FIRE WALL 1/2 HOUR |
| S<br>FW3:FIRE WALL 1/2 HR SMOKE BARRIER | FW4: FIRE WALL 3/4 HOUR |
| S<br>FW5:FIRE WALL 3/4 HR SMOKE BARRIER | FW6 : FIRE WALL 1 HOUR |
| S<br>FW7:FIRE WALL 1 HOUR SMOKE BARRIER | FW8 :FIRE WALL 2 HOUR |

| | |
|---|---|
| S<br>FW9:FIRE WALL 2 HOUR SMOKE BARRIER | FW10 : FIRE WALL 3 HOUR |
| S<br>FW11:FIRE WALL 3 HOUR SMOKE BARRIER | FW12 : FIRE WALL 4 HOUR |
| S<br>FW13:FIRE WALL 4 HOUR SMOKE BARRIER | HCP<br>HCP : HALON CONTROL PANEL |
| F<br>HORN : ALARM HORM | HYDR1 : 1 HOSE FIRE |
| HYDR2 : 2 HOSE FIRE | HYDR3 : 2 HOSE W/ PUMPER |
| HYDR4 : 2 HOSE WALL | HYDR5 : PRIVATE HOUSED 2 HOSE |
| S<br>H59 : SOLENOID VALVE | ADA<br>LITE1 : ADA ALARM STROBE |
| A<br>LITE2 : ALARM INCANDESCENT | T<br>LITE3 : TROUBLE INCANDESCENT |
| LITE4 : 1 LAMP BATTERY EMERGENCY | LITE5 : 2 LAMP BATTERY EMERGENCY |
| LITE6 : 3 LAMP BATTERY EMERGENCY | LITE7 : REMOTE EMERGENCY |
| PS<br>N31 : POWER SUPPLY PANEL | W<br>N86 : WET RISER |
| DR<br>N87 : DRY RISER | PA<br>N88 : PRE ACTION RISER |
| DE<br>N89 : DELUGE RISER | HP<br>N90 : HOSE PIPE RISER |
| ART<br>N92 : NEW ADDRESS RELAY TERMINAL | RAN<br>PANEL1: REMOTE ANNUNCIATOR |

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|---|---|
| PHONE : | POC : POC DRY CHEMICAL |
| RELAY : AUXILIARY RELAY | RISER1: ON CROSSMAN |
| RISER2: ON LINE | SIGN1 : ILLUMINATED EXIT |
| SIGN2:ILLUMINATED EXIT W/ DIRECTION | SPRK1 : UPRIGHT SPRINKLER |
| SPRK2 : PENDANT | SPRK3 : DRY PENDANT |
| SPRK5 : SPRINKLER W/ GUARD | SPRK6 : PENDANT DROP NIPPLE |
| SPRK7 : SIDEWALK SPRINKLER | SPRK8 : OUTSIDE SPRINKLER |
| SPRK9 : SPRAY NOZZLE | SPRK10: DELUGE NOZZLE |
| SPRK11: UPRIGHT NIPPLED | SWTCH6: WATER FLOW VANE |
| SWTCH7: SUPERVISORY | SWTCH8: PRESSURE |
| SWTCH9: WATER FLOW PRESSURE | TRIP1 : DELUGE TRIP MECHANCIAL |
| TRIP2 : HALON TRIP STATION | TRIP3 : DELUGE TRIP ELECTRICAL |
| UCP : ULTRAVIOLET CONTROL PANEL | VALVE1: PIV VALVE |
| VALVE2: KEY OPERATED | VALVE3: OS & Y VALVE |

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|---|---|
| VALVE4: GATE VALVE | VALVE5: IN PIT |
| VALVE6: CHECK VALVE | VALVE7: GLOBE VALVE |
| VALVE8: BALL VALVE | SS<br>VALVE9: SUPERVISED OS & Y |
| SS<br>VLV10 : SUPERVISED BALL VALVE | SS<br>VLV11 : SUPERVISED PIV |
| VLV12 : ANGLE VALVE | V1 : ALARM CHECK |
| V2 : DRY PIPE | V3 : DRY PIPE QUICK OPEN |
| D<br>V4 : DELUGE | P<br>V5 : PRE ACTION |
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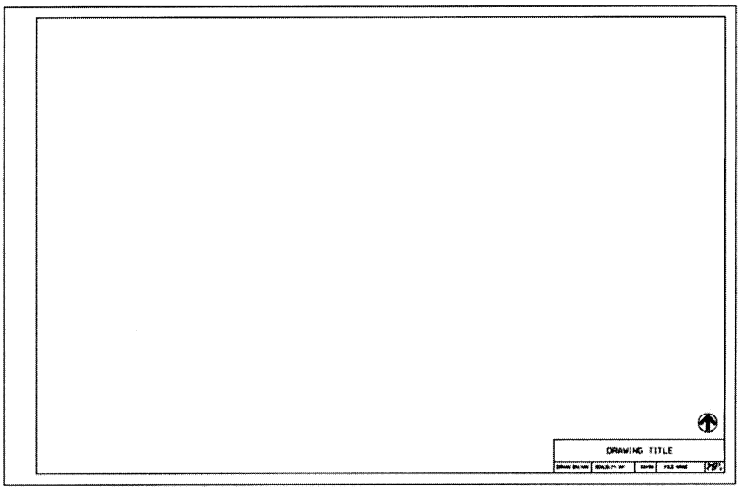
# APPENDIX N
# GENERAL DRAWING
# MISCELLANEOUS CELLS

| | |
|---|---|
| AS BUILT<br>ASBLDT: AS BUILT LABEL | BID SET<br>BID: BID SET LABEL |
| FOR CONSTRUCTION<br>CONST: FOR CONSTRUCTION LABEL | REVIEW ONLY<br>REVIEW: REVIEW ONLY TITLE BLK LABEL |
| BOX1: BOX WITH ONE DATA FIELD | BOX2: BOX WITH TWO DATA FIELDS |
| BOX3: BOX WITH THREE DATA FIELDS | |




CDR: CONSEPTUAL DESIGN TITLE BLOCK

| | |
|---|---|
| PXTB_D: INFO FOR PXTB_D.DGN | PXSITE: INFO FOR PXSITE.DGN |
| DORNUM: DOOR NUMBER SYMBOL | DTLOVL: OVAL DETAIL INDICATOR |
| RECT1: RECTANGLE W/ 1 DATA FIELD | RECT2: RECTANGLE W/ 2 DATA FIELDS |
| RECT3: RECTANGLE W/ 3 DATA FIELDS | RECT4: RECTANGLE W/ 4 DATA FIELDS |

REV_4D: REVISION #4 FOR TITLE BLOCK

REV5_D: REVISION #5 FOR TITLE BLOCK

RMNUM: ROOM NUMBER AND NAME LABEL

RND1: CIRCLE W/ 1 DATA FIELD

RND2: CIRCLE W/ 2 DATA FIELDS

RND3: CIRCLE W/ 3 DATA FIELDS

THE SAFETY SYSTEM CONFIGURATION SHOWN ON THIS DRAWING WAS FIELD VALIDATED ON __/__/__ , USING A TYPE ---------- VALIDATION.

SCC1: VALIDATION NOTE

THE SAFETY SYSTEM CONFIGURATION SHOWN ON THIS DRAWING WAS FIELD VALIDATED BY ONSITE ENGR. & MGMT., INC WALKDOWN PERFORMED BY _____ ON __/__/__ , USING A TYPE _____ VALIDATION.

SCC2: VALIDATION NOTE

DIS1: 11x17 DIS TITLE BLOCK

DIS2: 11x8.5 DIS TITLE BLOCK

DIS3: 8.5x11 DIS TITLE BLOCK

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OUO: DISCLAIMER

# APPENDIX O
# LANDSCAPE RELATED CELLS

| | |
|---|---|
| GRASS : SWAMP GRASS | SNOW : SNOWFLAKE |
| TREE : TREE PLAN VIEW | TREE1 : |
| TREE2 : EVERGREEN TYPE TREE | VEG01 : VEGETATION |
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# APPENDIX P
# MECHANICAL RELATED CELLS

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|---|---|
| AIR01: FLEXIBLE CONNECTOR | AIR02: TRANSITION |
| AIR03: ADJUSTABLE BLANK OFF DAMPER | AIR04: ADJUSTABLE DAMPER PLAQUE |
| AIR05: BAROMETRIC DAMPER | AIR06: DUCTWORK COWL GOOSENECK |
| AIR07: DUCTWORK SOUND ATTENUATOR | AIR08: FIRE AND SMOKE DAMPER |
| AIR09: FIRE DAMPER | AIR10: FLOW SWITCH |
| AIR11: ORIFICE FLOWMETER | AIR12: SMOKE DAMPER |
| AIR13: TURNING VANE IN DUCT | AIR14: VENTURI FLOWMETER |
| AIR15: WATER HEATER DIRECT CONTACT | AIR16: CENTRIFUGAL FAN PUMP |
| AIR17: DUCT FAN | AIR18: AIR DISTRIBUTION FAN |
| AIR19: CEILING SPOUT OUTLET | AIR20: SUPPLY OUTLET WALL |
| AIR21: VENTILATION OPENINGS | AIR22: AUTOMATIC FILTER PANEL |
| AIR23: FILTER AND DEHUMIDIFER | AIR24: FILTER LINE |
| AIR25: CONTROLLER LIQUID LEVEL | AIR26: DAMPER CONTROL ELECT OPERATED |
| AIR27: DUCT DETECTOR | AIR28: PNEUMATIC OPPERATED DAMPER |

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|---|---|
| BOILER: EQUIPMENT BOILER | CHILL1: CHILLER TANK CLOSED LIQUID |
| CHILL2: CHILLER TANK OPEN LIQUID | RS RL CHILL3:CHILLER LIQ DIRECT EXPANSION |
| RS L RL CHILL4: CHILLER LIQUID FLOODED | BDD DAMP01: BACK DRAFT DAMPER |
| FD DAMP02: FIRE DAMPER | VD DAMP03: MANUAL VOLUME DAMPER |
| R DAMP04: STANDARD BRANCH RETURN | S DAMP05: STANDARD BRANCH SUPPLY |
| DEHUM: DEHUMIDIFER | CD DIFF01:CEILING W/ COMBINATION LIGHT |
| CD DIFF02:CEILING 2 WAY RECTANGLE/SQ | CD DIFF03: CEILING 3 WAY RECTANGLE/SQ |
| CD DIFF04:CEILING 4 WAY RECTANGLE/SQ | CD DIFF05: CEILING CORNER BLOW |
| CD NECK DIFF06: CEILING ROUND DIFFUSER | DIFF07: LINEAR DIFFUSER |
| DUCT01: RETURN AIR | DUCT02: SUPPLY AIR |
| DUCT03: FLEXIBLE DUCT | DUCT04: CHANGE IN ELEVATION |
| DUCT05: FLEXIBLE CONNECTOR | DUCT06: DIRECTION OF FLOW |
| TR__X__ ___CFM DUCT07: EXHAUST INLET WALL | DUCT08: CEILING DUCTWORK |
| DUCT09: RETURN AIR CEILING | DUCT10: SUPPLY AIR CEILING |

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|---|---|
| R1.2<br>FAN01: AXIAL FLOW FAN | M<br>FAN02: BLOWER FAN |
| ERV-<br>FAN03: EXHAUST ROOF VENT FAN | SRV-<br>FAN04: INTAKE ROOF VENT FAN |
| FAN05: LOUVERED ROOF VENT FAN | E 1.2<br>FAN06: PROPELLER FAN |
| FRIG01: CENTRIFUGAL COMPRESSOR | L<br>FRIG02: CHILLING CENTRIFUGAL UNIT |
| L<br>FRIG03: CHILLING RECIPROCATING | L<br>FRIG04: CHILLING ROTARY SCREW |
| FRIG05: COMPRESSOR MOTOR ENCLOSED | FRIG06: COMPRESSOR MOTOR SEALED |
| FRIG07: COMPRESSOR OPEN CRANKCASE | FRIG08: COMPRESSOR RECIPROCATING |
| FRIG09: COMPRESSOR ROTARY MOTOR | FRIG10:COMPRESSOR ROTARY ENCASED |
| FRIG11: COMPRESSOR ROTARY SEALED | FRIG12:OPEN CRANKCASE RECIPROCATING |
| FRIG13: ROTARY COMPRESSOR | L L<br>FRIG14: CHILLING ABSORPTION UNIT |
| FRIG15: COOLING TOWER | FRIG16: BARE TUBE GRAVITY AIR |
| C H<br>FRIG17: COIL LOOP | L.S. EVAP H.S. EVAP<br>FRIG18: CONDENSER EVAP CASCADE SYS |
| FRIG19: CONDENSER SURFACE | FRIG20:DOUBLE BUNDLE CONDENSER |
| FRIG21: EVAPORATIVE CONDENSER | FRIG22:EVAP FINNED CIRCULAR CEILING |

| | |
|---|---|
| FRIG23:EVAP FINNED COIL NTRL CONVECT | FRIG24: EVAP FINNED GRAVITY AIR |
| FRIG25: EVAP FORCED CONVECTION | FRIG26: EVAP FORCED CONVECTION COIL |
| FRIG27: EVAPORATOR PIPE COIL | FRIG28: EVAPORATOR PLATE COIL |
| FRIG29: IMMERSION COOL UNIT | FRIG30: PLATE COIL HEAD |
| FRIG31: WTR COOLED CONCRETRIC TUBE | RS RL<br>FRIG32: AIR COOLED CONDENSING UNIT |
| FRIG33: AIR COOLED FIN CONDENSER | FRIG34: AIR COOLED FIN CONDENSER |
| FRIG35: WATER COOLED CONDENSER | S RL W<br>FRIG36: WTR COOLED CONDENSING UNIT |
| FRIG37:WTR COOLED SHELL/COIL CONDEN | FRIG38:WTR COOLED SHELL/TUBE CONDEN |
| TG /<br>GRILL1: TRANSFER GRILLE | CG--/--<br>GRILL2:CEILNG SUPPLY REGISTR GRILLE |
| HEATR: HEATER FEED W/ AIR OUTLET | HEATR1: LIVE STEAM SUPERHEATER |
| HEAT2: FLUE GAS REHEATER | HEATR3: DESUPERHEATER |
| UH<br>HEATR4:HEATING UNIT (INDICATE TYPE) | H C TU M-<br>HEATR5: MIXING TERMINAL UNIT |
| TU RH-<br>HEATR6: REHEAT TERMINAL UNIT | TU VAV-<br>HEATR7:VARIBLE VOLUME TERMINAL UNIT |
| HEATR8:FIRE RATED CEILING HEAT STOP | HEATR9: DUCT HEATER ELECTRIC |

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|---|---|
| HVAC01: HEAT EXCHANGER | HVAC02: INTERCOOLER DESUPERHEATER |
| HVAC03: DRIVE FLUID | HVAC04: ROOM AIR CONDITIONING EQUIP |
| HVAC05: ROTARY HEAT WHEEL | HVAC06: REMOTE BULB THERMOSTAT |
| HVAC07: SELF CONTAINED THERMOSTAT | HVAC08: THERMAL BULB |
| HVAC09: THERMOMETER | HVAC10: THERMOMETER WELL |
| HVAC11: ELECTRIC THERMOSTAT | HVAC12: PNEUMATIC THERMOSTAT |
| HVAC13: SELF CONTAINED THERMOSTAT | HVAC14:3 WAY ELECT MTR OPP GATE VLV |
| HVAC15: FLANGED MTR OPP GATE VALVE | HVAC16: FLANGED MTR OPP GLOBE VALVE |
| HVAC17: SCREWED MTR OPP GATE VALVE | HVAC18: SCREWED MTR OPP GLOBE VALVE |
| HVAC19: SOLENOID VALVE | HVAC20: VALVE ACTUATOR ELECTIC MTR |
| HVAC21: VLV ACTUATOR ELECT SOLENOID | HVAC22: WELDED MTR OPP GLOBE VALVE |
| HVAC23: WELDED MTR OPP GATE VALVE | HVAC24:3 WAY AIR MTR CONTROLLED VLV |
| HVAC25:AIR MTR CONTROLLED GLOBE VLV | HVAC26: SWITCH NORMALLY CLOSED FLOW |
| HVAC27: SWITCH NORMALLY OPEN FLOW | HVAC28: AIR MTR CONTROLLED GATE VLV |

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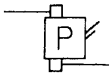
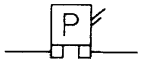
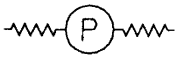
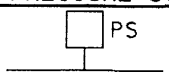
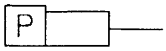
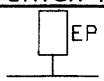
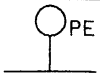
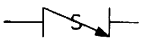
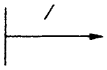
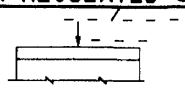
|---|---|
|  HVAC29:DIFFERENTIAL OIL PRESSURE SWH |  HVAC30: DUAL PRESSURE SWITCH |
|  HVAC31: PRESSURE STAT |  HVAC32: PRESSURE SWITCH TYPE 1 |
|  HVAC33: PRESSURE SWITCH TYPE 2 | HVAC34:PRESS SWTH W/HI PRESS CUTOUT |
| HVAC35: VLV ACTUATOR PNEUMATIC MTR | HVAC36: VLV ACTUATOR PNEUMATIC MTR |
|  HVAC37: ELECTRIC PNEUMATIC CONTROL |  HVAC38: PNEUMATIC ELECTRIC CONTROL |
| HVAC39: AUTOMATIC GOVERNOR OPP VLV | HVAC40: FUSIBLE LINK QUICK VALVE |
|  HVAC41: SPRING CHECK VALVE | HVAC42: VAPOR REGULATED SUCTION VLV |
|  LOUV1: DOOR OR WALL OPENING LOUVER |  LOUV2: INTAKE AND SCREEN LOUVER |
| STMGEN: STEAM GENERATOR | |
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# APPENDIX Q
# PLUMBING RELATED CELLS

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|---|---|
| ACT01 : ACTUATOR MANUAL GEAR | ACT02 : ACTUATOR MANUAL LEVER |
| ACT03 :ACTUATOR MNL NON RISE STEM | ACT04 :ACTUATOR MNL OUT STEM YOKE |
| AIR1 : AIR ELIMINATOR | AIR2 : AIR HEATER PLATE OR TUBE |
| AIR3 : AIR HEATER ROTATING | AIR4 : AIR SEPARATOR |
| AIR5 : AUTOMATIC AIR VENT | ANCHO1: INTERMEDIATE ANCHOR |
| ANCHO2: MAIN ANCHOR | BARCON: BAROMATIC CONDENSER |
| BF1 : BLIND FLANGE | BUSH1 : BUSHING BELL SPIGOT |
| BUSH2 : SCREWED BUSHING | BUSH3 : SOLDERED BUSHING |
| BUSH4 : WELDED BUSHING | CAP : BELL SPIGOT |
| CAP1 : SCREWED CAP | COCK1 : COCK BELL SPIGOT |
| COCK2 : COCK FLANGED | COCK3 : SCREWED COCK |
| COCK4 : SOLDERED | COCK5 : SQUARE HEAD |
| COCK6 : WELDED | CROSSA: OVER BELL SPIGOT |
| CROSSB: REDUCING FLANGED | CROSSC: PLATE FIN CROSS FLOW |

| | |
|---|---|
| CROSSD: REDUCING CROSS BELL SPIGOT | CROSSE: SCREWED CROSSOVER |
| CROSSF: STRAIGHT SIZE BELL SPIGOT | CROSSG: STRAIGHT SIZE FLANGED |
| CROSSH: STRAIGHT SIZE SCREWED | CROSSI: STRAIGHT SIZE SOLDERED |
| CROSSJ: STRAIGHT SIZE WELDED | DBLSNK: DOUBLE KITCHEN SINK |
| DISCO1: RUPTURE DISC | DRAIN : HOSE END |
| DRKFF : DRINK FOUNTAIN FRONT VIEW | DROP : PITCH OR PIPE DROP |
| ELBOAA: 45 DEGREE SOLDERED | ELBOBB: 90 DEGREE SOLDERED |
| ELBOCC: REDUCING SOLDERED | ELBODD: TURNED DOWN SOLDERED |
| ELBOEE: TURNED UP SOLDERED | ELBOFF: 45 DEGREE TURNED DOWN |
| ELBOGG: 45 DEGREE WELDED | ELBOHH: 90 DEGREE WELDED |
| ELBOII: TURNED DOWN WELDED | ELBOJJ: TURNED UP WELDED |
| ELBOWA: BASE ELBOW SCREWED | ELBOWB: 45 DEGREE BELL SPIGOT |
| ELBOWC: 90 DEGREE BELL SPIGOT | ELBOWD: TURNED DOWN |
| ELBOWE: TURNED UP | ELBOWF: 45 DEGREE FLANGED |

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|---|---|
| ELBOWG: 90 DEGREE FLANGED | ELBOWH: BASE ELBOW FLANGED |
| ELBOWI: DOUBLE BRANCH FLANGED | ELBOWJ: SIDE OUTLET DOWN FLANGED |
| ELBOWK: SIDE OUTLET UP FLANGED | ELBOWL: LONG RADIUS FLANGED |
| ELBOWM: TURNED DOWN ELBOW FLANGED | ELBOWN: TURNED UP ELBOW FLANGED |
| ELBOWO: 45 DEGREE SCREWED | ELBOWP: 90 DEGREE SCREWED |
| ELBOWQ: TURNED UP FLANGED | ELBOWR: DOUBLE BRANCH SCREWED |
| ELBOWS: LONG RADIUS SCREWED | ELBOWT: SIDE OUTLET DOWN SCREWED |
| ELBOWU: SIDE OUTLET UP SCREWED | ELBOWV: STREET SCREWED |
| ELBOWW: TURNED DOWN SCREWED | ELBOWX: TURNED UP SCREWED |
| ELBOWY:SIDE OUTLET DOWN BELL SPIGOT | ELBOWZ: SIDE OUTLET UP BELL SPIGOT |
| FLRDRN: FLOOR DRAIN | FLUSH : FLUSH VALVE |
| FPLATE: FIXED PLATE | GAGE01: PRESSURE GAUGE |
| GAGE02: PRESSURE AND COCK | GAGE03: TEMPERATURE |
| GASOFF: GAS SHUTOFF | GLASS1: SIGHT GLASS |

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| GWALL : GLENWALL TOILET | HEAT : PIPE HEAT |
| HLE : HEAT LIQUID EXCHANGER | HTS : HEAT TRANFER SURFACE |
| JET : CONDENSER JET | JOINTA: CONNECTING JOINT |
| JOINTB: EXPANSION BELL JOINT | JOINTC: EXPANSION |
| JOINTD: CONNECTING FLANGED | JOINTE: EXPANSION FLANGED |
| JOINTF: CONNECTING JOINT SCREWED | JOINTG: CONNECTING SOLDERED |
| JOINTH: EXPANSION SOLDERED | JOINTI: CONNECTING WELDED |
| JOINTJ: EXPANSION WELDED | JOINTK: BALL JOINT |
| LATER : LATERAL FLANGED | LATE1 : SCREWED LATERAL |
| LAVYF : LAVATORY FRONT VIEW | LOOP1 : EXPANSION |
| MADERA: MADERA TOILET | MDRKS : DRINK FOUNTAIN SIDE VIEW |
| MFLRS : TOILET FLOOR SIDE VIEW | MIT2B : SIT 2 BATH SIDE VIEW |
| MLAVS : LAVATORY SIDE VIEW | MOTOR : ENGINE INDICATE FUEL |
| MTKSD : TOILET TANK SIDE VIEW | MWLSD : TOILET FLOOR SIDE VIEW |

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| NOZZ01: NOZZLE FLOW | OPNDRN: OPEN FUNNEL DRAIN |
| ORIFIC: FLANGED ORIFICE | OVALSK: OVAL CABINET SINK |
| PEDTUB: PEDESTAL TUB SIDE VIEW | PLUGA : BULL PLUG BELL SPIGOT |
| PLUGB : BELL SPIGOT | PLUGC : BULL PLUG FLANGED |
| PLUGD : PIPE PLUG | PLUGE : PIPE PLUG SCREWED |
| E<br>PRECIP: PIPING PRECIPITATOR | PTUBF : PEDESTAL TUB FRONT VIEW |
| PUMP01: DYNAMIC PUMP | CW<br>PUMP02: PLAN VIEW INDICATE USE |
| CW-1<br>PUMP03: SCHEMATIC INDICATE USE | RECVR1: HIGH PRESSURE HORIZONTAL |
| RECVR2: HIGH PRESSURE VERTICAL | RECVR3: LOW PRESSURE RECEIVER |
| REDUCA: CONCENTRIC REDUCER | REDUCB: ECCENTRIC REDUCER |
| REDUCC: CONCENTRIC FLANGED | REDUCD: ECCENTRIC FLANGED |
| REDUCE: FLANGED REDUCING FLANGE | REDUCF: SCREWED CONCENTRIC |
| REDUCG: SCREWED ECCENTRIC REDUCER | REDUCH: CONCENTRIC SOLDERED |
| REDUCI: ECCENTRIC SOLDERED | REDUCJ: STRAIGHT CROWN ECCENTIC |

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| REDUCK: CONCENTRIC WELDED | REDUCL: ECCENTRIC WELDED |
| RISE : PITCH OR PIPE RISE | SHRGNG: SHOWER OVERHEAD GANG |
| SHWR : SHOWER STALL PLAN VIEW | SHWRHD: ELEVATION OF SHOWER HEAD |
| SLEVA : BELL SPIGOT | SLEVB : FLANGED SLEEVE |
| SLEVC : SLEEVE SCREWED | SLEVD : PIPING SCREWED |
| SLEVE : SOLDERED SLEEVE | SLEVF : WELDED SLEEVE |
| SPOOL : FLANGED SPOOL PIECE | STRNR1: BLOW OFF STRAINER |
| STRNR2: DUPLEX STRAINER | STRNR3: FILTER STRAINER LINE |
| STRNR4: STRAINER PLAN | STRNR5: STRAINER |
| SWRDRN: SHOWER FLOOR DRAIN | TEE1 : OUTLET DOWN |
| TEE2 : OUTLET UP | TEE3 : REDUCING BELL SPIGOT |
| TEE4 : SIDE OUTLET | TEE5 : SIDE OUTLET DOWN |
| TEE6 : DOUBLE SWEEP FLANGED | TEE7 : OUTLET DOWN FLANGED |
| TEE8 : OUTLET UP FLANGED | TEE9 : SIDE OUTLET UP FLANGED |

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| TEE10 : SIDE OUTLET FLANGED | TEE11 : SINGLE SWEEP FLANGED |
| TEE12 : STRAIGHT SIZE FLANGED | TEE13 : DOUBLE SWEEP SCREWED |
| TEE14 : OUTLET DOWN SCREWED | TEE15 : OUTLET UP SCREWED |
| TEE16 : SIDE OUTLET SCREWED | TEE17 : SIDE OUTLET UP SCREWED |
| TEE18 : SINGLE SWEEP SCREWED | TEE19 : STRAIGHT SIZE SCREWED |
| TEE20 : OUTLET DOWN SOLDERED | TEE21 : OUTLET UP SOLDERED |
| TEE22 : STRAIGHT SIZE SOLDERE | TEE23 : OUTLET DOWN WELDED |
| TEE24 : OUTLET UP WELDED | TEE25 : STRAIGHT SIZE WELDED |
| TFLRF : TOILET FLOOR FRONT VIEW | TRAP : ELEVATION OF TRAP PIPE |
| TRAP01: BOILER RETURN TRAP | TRAP02: FLOAT AND THERMOSTATIC |
| TRAP03: FLOAT TRAP | TRAP04: STEAM TRAP |
| TRAP05: THERMOSTATIC BLAST | TRAP06: THERMOSTATIC TRAP |
| TRAP07: TRAP SCALE | TRAP08: GREASE TRAP |
| TTKFT : TOILET TANK FRONT VIEW | TUB : BATHTUB PLAN VIEW |

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| TUBE : CAPILLARY | TURB01: CONDENSING STEAM TURBINE |
| TURB02: STEAM TURBINE | TURB03: GAS TURBINE |
| TWLFNT:WALL MOUNT TOILET FRONT VIEW | TWLSID: WALL MOUNT TOILET SIDE VIEW |
| UNION : FLANGED | UNIONA: SCREWED UNION |
| UNIONB: SOLDERED UNION | UNIONC: WELDED UNION |
| UNIOND: DIE ELECTRIC UNION | |
| URNPLN: URINAL PLAN VIEW | URNFL : URINAL FLOOR SIDE VIEW |
| URNWF :URINAL WALL MOUNT FRONT VIEW | URNWL : URINAL WALL MOUNT SIDE VIEW |
| VALV01: LOCK SHIELD FLANGED | VALV02: MAGNETIC STOP VALVE |
| VALV03: 3 WAY MANUAL | VALV04: ANGLE CHECK BELL SPIGOT |
| VALV05: ANGLE CHECK FLANGED | VALV06: ANGLE CHECK SCREWED |
| VALV07: ANGLE CHECK SOLDERED | VALV08: ANGLE CHECK WELDED |
| VALV09: ANGLE GATE FLANGED (ELEV) | VALV10: ANGLE GATE FLANGED (PLAN) |

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| VALV11: ANGLE GATE SCREWED (ELEV) | VALV12: ANGLE GATE SCREWED (PLAN) |
| VALV13: ANGLE GATE WELDED (PLAN) | VALV14: ANGLE GATE WELDED (ELEV) |
| VALV15: ANGLE GLOBE (ELEV) | VALV16: ANGLE GLOBE FLANGED (ELEV) |
| VALV17: ANGLE GLOBE FLANGED (PLAN) | VALV18: ANGLE GLOBE SCREWED (ELEV) |
| VALV19: ANGLE GLOBE SCREWED (PLAN) | VALV20: ANGLE GLOBE SOLDERED (PLAN) |
| VALV21: ANGLE GLOBE WELDED (ELEV) | VALV22: ANGLE GLOBE WELDED (PLAN) |
| VALV23: ANGLE HOSE | VALV24: AUTO BYPASS FLANGED |
| VALV25: AUTO GOVERNOR OPERATED FLNGD | VALV26: AUTO REDUCING FLANGED |
| VALV27: BALL VALVE | VALV28: GATE BELL SPIGOT (ELEV) |
| VALV29: GLOBE BELL SPIGOT (ELEV) | VALV30: SAFETY BELL SPIGOT |
| VALV31: STOP BELL SPIGOT | VALV32: BUTTERFLY |
| VALV33: CONDENSER WATER REGULATING | VALV34: DIAPHRAGM FLANGED |
| VALV35: FLOAT FLANGED | VALV36: GATE FLANGED (ELEV) |
| VALV37: GATE FLANGED (PLAN) | VALV38: GLOBE FLANGED (ELEV) |

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|---|---|
| VALV39: GLOBE FLANGED (PLAN) | VALV40: HOSE ANGLE FLANGED |
| VALV41: HOSE GATE FLANGED | VALV42: HOSE GLOBE FLANGED |
| VALV43: QUICK OPENING FLANGED | VALV44: STOP FLANGED |
| VALV45: HIGH SIDE FLOAT VALVE | VALV46: HOSE GLOBE VALVE |
| VALV47: LATERAL BELL SPIGOT | VALV48: LOW SIDE FLOAT VALVE |
| VALV49: NEEDLE VALVE | VALV50: PLUG VALVE |
| VALV51: DIAPHRAGM SCREWED | VALV52: FLOAT VALVE SCREWED |
| VALV53: GATE VALVE SCREWED | VALV54: GATE VALVE SCREWED |
| VALV55: GLOBE VALVE SCREWED | VALV56: GLOBE VALVE SCREWED |
| VALV57: HOSE ANGLE SCREWED | VALV58: HOSE GATE SCREWED |
| VALV59: HOSE GLOBE SCREWED | VALV60: LOCK SHIELD SCREWED |
| VALV61: QUICK OPENING SCREWED | VALV62: STOP VALVE SOLDERED |
| VALV63: GATE VALVE SOLDERED | VALV64: GLOBE SOLDERED (ELEV) |
| VALV65: GLOBE SOLDERED (PLAN) | VALV66: LOCK SHIELD SOLDERED |

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| VALV67: QUICK OPENING SOLDERED | VALV68: STOP VALVE SOLDERED |
| VALV69:STRAIGHT WAY CK BELL SPIGOT | VALV70: STRAIGHT WAY CK FLANGED |
| VALV71: STRAIGHT WAY CK SCREWED | VALV72: STRAIGHT WAY CK SOLDERED |
| VALV73: STRAIGHT WAY CK WELDED | VALV74: SWING GATE CK VALVE |
| VALV75: UNCLASSIFIED VALVE | VALV76: SNAP ACTION |
| VALV77: WATER VALVE | VALV78: FLOAT VALVE WELDED |
| VALV79: GATE VALVE WELDED (PLAN) | VALV80: GATE VALVE WELDED (ELEV) |
| VALV81: GLOBE VALVE WELDED | VALV82: QUICK OPENING WELDED |
| VALV83: STOP VALVE WELDED | VALV84: AUTOMATIC BYPASS |
| VALV85: AUTOMATIC EXPANSION | VALV86: AUTOMATIC REDUCING |
| VALV87: EXPANSION HAND VALVE | VALV88: FLANGED SAFETY VALVE |
| VALV89: PRESSURE REDUCING VALVE | VALV90: RELIEF OR SAFETY VALVE |
| VALV91: SCREWED SAFETY VALVE | VALV92: SOLDERED SAFETY VALVE |
| VALV93: TEMPERATURE PRESSURE RELIEF | VALV94: THERMOSTATIC EXPANSION |

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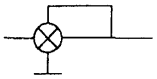
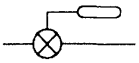
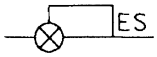
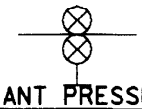
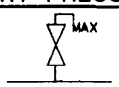
|---|---|
|  VALV95: EVAP PRESS REG SNAP ACTION |  VALV96: EVAP PRESS REG THROTTLING |
|   VALV97: EVAP PRESS REG THRTLNG EVAP |  VALV98: CONSTANT PRESSURE SUCTION |
| VALV99: REFRIGERANT REVERSING |   VENT01: MANUAL AIR VENT |
| WALOVL: WALL MOUNT OVAL SINK | WALSNK: WALL MOUNT BATH SINK |
| WALTOL: WALL MOUNT TOILET PLAN VIEW | MWTFNT: FOUNTAIN SIDE VIEW |
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# APPENDIX R
# STRUCTURAL RELATED CELLS

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| BATEN: INSULATION | BEAMHP: HP SHAPE STEEL BEAM |
| BEAMM: M SHAPE STEEL BEAM | BEAMS: S SHAPE STEEL BEAM |
| BEAMST: ST SHAPE STEEL BEAM | BEAMW: W SHAPE STEEL BEAM |
| BEAMWT: WT SHAPE STEEL BEAM | BEAMZ: Z SHAPE STEEL BEAM |
| BOLT1: BOLT HEAD SIDE VIEW | BOLT2: BOLT HEAD TOP VIEW |
| C4x54: STEEL CHANEL | C6x105: STEEL CHANNEL |
| DECK01: CORRUGATED METAL DECK | DECK02: FORM METAL DECK |
| DECK03: HIGH FORM METAL DECK | DECK04: RIBBED METAL DECK |
| JOIST1: SINGLE BAR JOIST | JOIST2: DOUBLE BAR JOIST |
| L2x2: STEEL ANGLE | L2x3: STEEL ANGLE |
| L3x3: STEEL ANGLE | L6x6: STEEL ANGLE |
| M10x23: STEEL BEAM | M6x20: STEEL BEAM |
| M8x185: STEEL BEAM | NUT1: NUT WITH THREADS |

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| NUT2: NUT WITH LOCK WASHER | NUT3: NUT SIDE VIEW |
| PRECST: DOUBLE TEE PRECAST BEAM | TS4x4: TUBE STEEL |
| TS6x6: TUBE STEEL | TS8x8: TUBE STEEL |
| UNI1: ISOMETRIC OF UNISTRUT | UNI2: ISOMETRIC OF UNISTRUT |
| UNI3: LOCK PLATE FOR UNISTRUT | W12x65: STEEL BEAM |
| W14x61: STEEL BEAM | W18x76: STEEL BEAM |
| W8x35: STEEL BEAM | |
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# APPENDIX S
# UTILITIES RELATED CELLS

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|---|---|
| ——— ATV ——— AIR01 : AIR RELIEF LINE | ——— AR ——— ARG01 : ARGON LINE |
| ——— BBD ——— BOIL01: BOILER BLOW DOWN | ——— A ——— COMP01: COMPRESSED AIR LINE |
| ——— C ——— COND01: CONDENSATE LINE | ——— D ——— DRN01 : DRAIN LINE |
| ——— IW ——— DRN02 : INDIRECT DRAIN LINE | ——— SD ——— DRN03 :STORM DRAIN ABOVE FINISH FLR |
| ----- SD ----- DRN04 :STORM DRAIN BELOW FINISH FLR | ——— ST ——— DRN05 :CONDENSATE DRN BELOW FIN FLR |
| ——— 2ØOP ——— ELE01 : 2 PHASE PRIMARY OVERHEAD | ——— 2ØUP ——— ELE02 : 2 PHASE PRIMARY UNDERGROUND |
| ——— 2ØOS ——— ELE03 : 2 PHASE SECONDARY OVERHEAD | ——— 2ØUS ——— ELE04 :2 PHAZ SECONDARY UNDERGROUND |
| ——— 3ØOP ——— ELE05 : 3 PHASE PRIMARY OVERHEAD | ——— 3ØUP ——— ELE06 :3 PHASE PRIMARY UNDERGROUND |
| ——— 3ØOS ——— ELE07 : 3 PHASE SECONDARY OVERHEAD | ——— 3ØUS ——— ELE08 :3 PHAZ SECONDARY UNDERGROUND |
| ——— 1ØOP ——— ELE09 :SINGLE PHAZ PRIMARY OVERHEAD | ——— 1ØUP ——— ELE10 :SINGLE PHAZ PRIMARY UNDERGRD |
| ——— 1ØOS ——— ELE11 :SINGLE PHAZ SECONDARY OVERHD | ——— 1ØUS ——— ELE12:SINGLE PHAZ SECONDARY UNDERGRD |
| ——— FO ——— FIB01 : FIBEROPTICS LINE | ——— FILL ——— FILL01: FILL LINE |
| ——— F ——— FIRE01: FIRE LINE | ——— SP ——— FIRE02: FIRE PROTECTION SPRINKLER |
| ——— S ——— FIRE03: FIRE PROTECTION MAIN SUPPLY | ——— FOD ——— FUEL01: FUEL OIL DISCHARGE |

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| FOF<br>FUEL02: FUEL OIL FLOW LINE | FOG<br>FUEL03: FUEL OIL GAUGE LINE |
| FOR<br>FUEL04: FUEL OIL RETURN | FOS<br>FUEL05: FUEL OIL SUCTION SUPPLY |
| FOV<br>FUEL06: FUEL OIL TANK VENT | HG<br>GAS01 : HIGH PRESSURE GAS LINE |
| LPG<br>GAS02 : LIQUID PETROLEUM GAS LINE | G<br>GAS03 : LOW PRESSURE GAS LINE |
| MG<br>GAS04 : MEDIUM PRESSURE GAS LINE | HE<br>HEL01 : HELIUM LINE |
| H<br>HUM01 : HUMIDIFICATION LINE | H<br>HYD01 : HYDROGEN LINE |
| LN<br>LIQ01 : LIQUID NITROGEN | LOX<br>LIQ02 : LIQUID OXYGEN |
| N<br>NIT01 : NITROGEN LINE | NO<br>NIT02 : NITROUS OXIDE |
| O<br>OXG01 : OXYGEN LINE | CP<br>PIPE01: CULVERT PIPE |
| CI<br>PIPE02: CAST IRON PIPE | CS<br>PIPE03: CHEMICAL SUPPLY LINE |
| CT<br>PIPE04: CLAY TILE PIPE | DI<br>PIPE05: DUCTILE IRON PIPE |
| RCP<br>PIPE06: REINFORCED CONCRETE PIPE | PC<br>PMP01 : PUMPED CONDENSATE LINE |
| RD<br>REF01 : REFRIGERANT DISCHARGE | RL<br>REF02 : REFRIGERANT LIQUID |
| RS<br>REF03 : REFRIGERANT SUCTION | RC<br>RIG01 : RIGID CONDUIT LINE |

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| CWR<br>RTN01 : CHILLED WATER RETURN | CR<br>RTN02 : CONDENSER WATER RETURN |
| DTR<br>RTN03 : DUAL TEMPERATURE RETURN | HPC<br>RTN04:HI PRESSURE CONDENSATE RETURN |
| HTWR<br>RTN05:HI TEMPERATURE HOT WTR RETURN | LPC<br>RTN06:LOW PRESSURE CONDENSATE RTN |
| HWR<br>RTN07:LOW TEMPERATURE HOT WTR RTN | MPC<br>RTN08:MEDIUM PRESSURE CONDENSATE RTN |
| MTWR<br>RTN09:MEDIUM TEMPERATURE HOT WTR RTN | BR<br>RTN10 : BRINE RETURN LINE |
| GHR<br>RTN11 : GLYCOL HEATING RETURN | IHR<br>RTN12 : INDUSTRIAL HOT WTR RETURN |
| SS<br>SEW01 : SANITARY SEWER FORCE LINE | LPS<br>STM01 : LOW PRESSURE STEAM |
| MPS<br>STM02 : MEDIUM PRESSURE STEAM | CSP<br>STND01: STANDPIPE COMBINATION |
| DSP<br>STND02: DRY STANDPIPE | WSP<br>STND03: WET STANDPIPE |
| CWS<br>SUP01 : CHILLED WATER SUPPLY | DTS<br>SUP02 : DUAL TEMPERATURE SUPPLY |
| HPS<br>SUP03:HI PRESSURE CONDENSATE SUPPLY | HWS<br>SUP04:LOW TEMPERATURE HOT WTR SUPPLY |
| MTWS<br>SUP05:MEDIUM TEMP HOT WATER SUPPLY | B<br>SUP06 : BRINE SUPPLY LINE |
| GHS<br>SUP07 : GLYCOL HEATING SUPPLY | IHW<br>SUP08:INDUSTRIAL HOT WATER SUPPLY |
| T<br>TELE01: TELEPHONE LINE | VAC<br>VAC01 : VACUUM AIR LINE |

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| ——— VC ——— VACO2 : VACUUM CLEANING LINE | ——— VPD ——— VACO3 : VACUUM PUMP DISCHARGE |
| ——— SV ——— WASTE1:WATER AND VENT COMBINATION | ——— SS ——— WASTE2:SANITARY SOIL ABOVE FIN FLR |
| ------ SS ----- WASTE3: SANITARY SOIL BELOW FIN FLR | ——— ACID ——— WASTE4: ACID WASTE LINE |
| ——— INW ——— WASTE5: INDUSTRIAL WASTE LINE | ——— CW ——— WTRO1 : COLD WATER LINE |
| ——— HW ——— WTRO2 : HOT WATER LINE | ——— PW ——— WTRO3 : WATER LINE PUBLIC MAIN |
| ——— — ——— WTRO4 : COLD WATER LINE | ——— DWR ——— WTRO5 : DRINKING WATER RETURN |
| ——— DWS ——— WTRO6 : DRINKING WATER SUPPLY | ——— SW ——— WTRO7 : SOFT WATER LINE |
| ——— TWS ——— WTRO8 : TEMPERED SUPPLY WATER LINE | ——— TWR ——— WTRO9 : TEMPERED WATER RETURN LINE |
| ——— C ——— WTR10 : CONDENSER FLOW | — — — — WTR11 : HOT WATER |
| ——— MU ——— WTR12 : MAKE UP WATER LINE | ——— ICW ——— WTR13 : INDUSTRIAL COLD WATER |
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# APPENDIX T
# DRAFTING FORMS

## CONFIGURATION CONTROL DRAFTING REQUEST

(Ref. MNL-00054, MNL-00014, DRQ-293006)

Index No. PX-3870
Page No. 1 of 1
Issue No. 010

| | | | |
|---|---|---|---|
| GENERAL INSTRUCTIONS: Please print or type all information. This form must be complete and accompany all attachments for drafting work to be completed. | | DR #: | |
| Requestor: | Badge # | Extension: | Date: |
| Work Requested: | | | |
| Work to be performed for Department # | Project # | Charge Code (BBT) | |
| Drawing Category: ( ) Uncontrolled (BOP) ( ) Controlled (SSC) ( ) Other | | Due Date: | |
| Final Drawing Size: ( ) 8-1/2 x 11 ( ) 11 x 17 ( ) 36 x 24 | | ( ) Other | |

**Title Block Information**

( ) Title Block Information Attached ( ) Use "For Information Only" Title

| | | | | |
|---|---|---|---|---|
| Information Above Title Block: | ( ) "REVIEW ONLY" | ( ) "BID SET" | ( ) "FOR CONSTRUCTION" | ( ) "AS-BUILTS" |
| Official Project Title: | | | | |
| Sheet Title: | | | | |
| Drawing # | Revision # | System Code: | | |
| EDT # | DCP # | ( ) See Drawing Red-Lines | | |
| Revision Comment: | | | | |

**DRAFTING USE ONLY**

| | | | | |
|---|---|---|---|---|
| Electronic Drafting Filename(s) including Directory Path: | | | | |
| Drafting Notes: | | | | |
| Drafting Technician(s): | State Date: | Total Drafting Hours: | | |
| Completed for Review Date: | Returned for Correction Date: | Resubmitted Date: | | |
| Drafting Checker: | Date: | Conf. Control: | Date: | Approval Date: |

DRAFTING QUALITY ASSURANCE CHECKLIST
(Reference DRQ-293006)

Index No. PX-4829
Page No. 1 of 2
Issue No. 002

Drafting Technician _____ Drafting Request Number _____

Drafting Checker _____ Drawing Number(s) _____

| DRAWING CONTENT, LAYOUT AND SEQUENCING | | |
|---|---|---|
| **Drafting Technician** | **Drafting Checker** | **Area to Verify** |
| **General Drawing Content** | | |
| ☐ | ☐ | Drawing sheet size. |
| ☐ | ☐ | Appropriate classification markings. (Need to ensure drawing has been examined by OUO/UCNI Reviewing Official and/or Derivative Classifier.) |
| ☐ | ☐ | Correct scale and appropriate graphic scales are shown. |
| ☐ | ☐ | Labeled Match Lines and Key Plans (if necessary). |
| ☐ | ☐ | Not more then one building per sheet. |
| ☐ | ☐ | Sections, details and elevations have title and scale. |
| ☐ | ☐ | Correct standard graphic symbols are used. |
| **General Drawing Layout** | | |
| ☐ | ☐ | "General Notes" are included and in the correct position. |
| ☐ | ☐ | "Legend" is included and in the correct position. |
| ☐ | ☐ | "Reference Drawings" are included and in the correct position. |
| ☐ | ☐ | Dimensions and notes with leader lines are correctly placed. |
| ☐ | ☐ | No abbreviations (unless defined in Legend). |
| ☐ | ☐ | Correct building and/or site orientation. |
| ☐ | ☐ | North Arrow correctly placed. |
| ☐ | ☐ | Sections, details and elevations are correctly placed and ordered within the set. |
| ☐ | ☐ | Sections, details and elevations are drawn with the correct orientation. |
| ☐ | ☐ | Drawings are in the correct sequence by discipline. |
| ☐ | ☐ | Title sheet(s), if required, are included and show the correct information. |

DRAFTING QUALITY ASSURANCE CHECKLIST
(Reference DRQ-293006)



| CADD FILE PARAMETERS | | |
|---|---|---|
| **Drafting Technician** | **Drafting Checker** | **Area to Verify** |
| ☐ | ☐ | Correct seed file was used. |
| ☐ | ☐ | Correct view attributes are on in View Number 1. |
| ☐ | ☐ | All text is the correct font, size, weight, level and color. |
| ☐ | ☐ | All graphic elements are the correct weight, level and color. |
| ☐ | ☐ | The correct color table is attached. |
| ☐ | ☐ | The correct line resource file is attached. |
| ☐ | ☐ | If raster files are attached, they are the correct resolution and scale. |
| ☐ | ☐ | Files have the correct coordinate values (if applicable). |
| ☐ | ☐ | The correct title block is attached, scaled and clip bound properly. |
| ☐ | ☐ | All title block information is filled in properly. |
| ☐ | ☐ | Drawing Number, Sheet Number and CADD file number are correct. |
| ☐ | ☐ | Revision comments, number and deltas are correct. |
| ☐ | ☐ | CADD files are located in the correct directory on the "Drafting Server." |
| ☐ | ☐ | All spelling is correct. |
| **CM CONTROLLED DRAWING REQUIREMENTS** | | |
| ☐ | ☐ | Validation note(s) have been incorporated into body of drawing. |
| ☐ | ☐ | CM controlled boundaries have been rendered as graphic linear designators or described in the notes portion of the drawing. |
| ☐ | ☐ | System Code(s) are identified in Title Block |
| ☐ | ☐ | Original Baseline EDT is recorded in the lower Title Block information section |
| ☐ | ☐ | EDTs and DCPs are sequentially listed in Title Block revision section |
| ☐ | ☐ | Portion(s) of drawing, which is credited as being AB flowdown, are clearly described or graphically rendered. |
| ☐ | ☐ | DCP Package reviewed for scope creep. |