

# **Sandia National Laboratories Facilities CADD Standards Manual**

**June 2002**

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## ***Introduction***

The *Facilities CADD Standards Manual* was produced by Sandia National Laboratories Facilities Management and Operations Center (“Facilities”). It is a supplement to the *Facilities Design Manual* and contains specific information related to Facilities CADD standards and processes. It is not intended as documentation of the general use of standard software. For general use information, refer to the documentation supplied with the software.

This *Facilities CADD Standards Manual* consists of a general chapter describing information about buildings; file management, drawing symbology, cell libraries, and processes. Other chapters address standards specific to the architecture and engineering disciplines. In addition, the Civil/Utility chapters contain information needed to create exterior drawings. Sub-headings are tabbed and appendixes provide forms and additional supporting information.

Adherence to this CADD standards manual is a requirement to all individuals and companies creating or modifying any Facilities CADD files.

## ***Document Updates***

Each copy of the *Facilities CADD Standards Manual* is assigned to an individual or a delegated representative of an off-site contracted firm. It is the responsibility of assigned individuals to keep their books up-to-date by inserting any changed pages issued by Sandia National Laboratories. For off-site contracted firms, it is the responsibility of the delegated representative to keep all copies of the *Facilities CADD Standards Manual* in the company’s possession up-to-date.

As information changes, updates to this manual will be issued in the form of changed pages. Changed pages include a date in the footer. A complete list of revised pages will be provided at the time of issue.

Each copy of the *Facilities CADD Standards Manual* remains the property of Sandia National Laboratories and shall be returned if the individual which it is assigned leaves the employ of the contracted firm through which it was assigned.

## ***CADD Standards Revision Process***

The *Facilities CADD Standards Manual* is not intended to be static. Modifications and updates will be made as processes, software, and procedures change. Comments and suggestions are encouraged so that updates will reflect the needs of Facilities CADD system users.

Anyone may submit a formal proposal for a CADD standards revision using the Engineering Standards Request (ESR) form. See Appendix 1 for a sample of the paper form. ESRs may also be submitted through e-mail as follows:

- To locate the ESR form, connect a drive to the Standards share directory  
\\london\stdu\ESR\_Form
- Save the ESR\_Form.doc file in your local hard drive (the Standards directory is read-only)
- Open the file esr.doc and fill out the fields
- Note the chairperson of the appropriate discipline

- Compose an e-mail message to the chairperson
- Attach the filled-out ESR form, and send the message to the discipline chairperson

The Facilities Engineering Standards Program evaluates the ESR and provides feedback to the requester whether or not the proposal is accepted. If accepted, the proposal is researched and implemented by the appropriate CADD standards development team.

## ***Manual Notation Conventions***

The following notation conventions are followed in this manual:

- Computer commands and file names are shown in `courier` type  
Examples:  

```
Document Management System    (computer program name)
esr.doc    (file name)
```
- Information to be typed by the operator and special characters are shown enclosed in angle brackets (<>)  
Example:  

```
<return>    (the return or enter key)
<filespec>  (the specification of a file)
```
- Actions to be performed by the operator are enclosed in square brackets ([ ])  
Example:  

```
[select checkout button]    (point to the checkout button and press the mouse
                             button)
```

## ***Abbreviations and Definitions***

Data	Information, the components of products, and the products themselves.
Database	A collection of information organized for easy retrieval. Databases are organized into a hierarchy of files having a predetermined structure and organization that can be communicated, interpreted, or processed by a specific application.
ESR	Engineering Standards Request form. Facilities form to allow request for changes to any Engineering or CADD standards.
Facilities	Sandia National Laboratories business unit responsible for planning, design, construction, maintenance, and operation of facilities and infrastructure. Facilities Maintenance and Operations Center 10800 (FMOC)
Font	Text resource file
FGIS	Facilities Geographic Information System
Key Plan	Reduced building plan outline which identifies associated floor plan area and sheet information.
Macro	Software program that automates often-used sequence of operations
QA	Quality Assurance
Reference File	A design file that is attached to and viewed simultaneously with the active design file. Reference files can be viewed as part of an active design file, but cannot themselves be modified.
Raster graphics	Raster graphics, or bit-mapped graphics, are digital images stored as arrays of pixels for display and modification. In raster data there are

	no lines, circles, or text, only pixels that are grouped to give the appearance of these elements.
Seed file	A template used to create new design files. The new file will have identical settings as that of the seed file.
Vector graphics	<p>Vector elements are graphical objects which have a precise direction, length, and shape. The vector graphical objects can be points, lines, cells, rectangles, circles, splines, text, ellipses, etc.</p> <p>In addition to the vector entities, digital drawings may also contain symbols and details (cell), reference drawings, and reference database files.</p>
Workspace	Custom MicroStation environment or configuration. For Space and Sites Services, this is called <code>sn1</code> with supporting files in the Bentley/Workspace/Projects/SNL and Bentley/Workspace/Interfaces directories.

# *Chapter 1*

## *General Requirements*

### **CADD Software Requirements**

All files submitted to Facilities shall follow the file management, drawing symbology, cell libraries, process descriptions, and discipline-specific standards described in this manual.

Graphic files created or modified for Facilities shall be generated using the following software:

- All new graphic files shall be created using MicroStation J
- Some existing raster graphics files require IRASB or IRASC to view and show removals of existing elements.
- Changes to existing raster files shall be made in MicroStation J vector format.
- These software requirements do not apply to contracts for off-site CADD support for Operational Space Analysis Database (OSAD) or Facilities Geographic Information System (FGIS). For these software requirements refer to the contracts.

---

*For information only:* The following software is currently being used on-site at Sandia National Laboratories, Facilities:

#### Operating System

- Windows/NT 4.0

#### Graphic Applications

- MicroStation J for NT
- IRASB for NT
- IRASC for NT
- IPLOT Version 10 Client and Server for NT
- Project Layout (P-Layout) for NT
- Modular Geographic Information System Environment (MGE) for NT

### **Access to Facilities Maintenance and Operations CADD Server**

Authorized CADD operators are allowed access to the Facilities CADD servers for the purposes of checking out CADD drawings for modification or reference, checking in modified drawings, and other information systems activities. To obtain a Sandia domain user account and password, call Sandia Password Control on 845-9465. For access to the CADD servers, contact the Facilities Technical Support Systems Department.

## How to Find Drawing Files

- On-site staff have the capability to search and view drawings in the Facilities Document Management System. This system should always be your first source for locating all electronic drawings and raster files.
- Off-site A&E's have the ability to use kiosk machines in the Facilities Technical Library for locating all Facilities electronic drawings and raster files.
- The `fastlook` software on the Library kiosk allows view-only access to graphic files located on the CADD file servers. SNL domain user account and password must be obtained before using this machine. For additional instructions on use of this software contact Facilities Technical Support Systems Department 10851.

## CADD Files Check-in/Check-out request

For tracking purposes, all CADD files must be formally checked out before they are used and checked in after they are modified. On-site CADD Technicians connected to the Facilities SRN use the Facilities Document Management System to check-out and check-in files. Off-site contractors are assigned a CADD Technician as a point-of-contract for all files being checked in and out of the Facilities Document Management System.

### **Check-out--On-site operators and firms directly connected to the Facilities LAN.**

Check-out is accomplished through the Facilities Document Management System.

### **Check-out--Off-Site films not directly connected to the Facilities LAN.**

1. Compile a list of needed drawings using the File Request form (refer to Appendix A). This list should include the following items:
  - Name of requester and company
  - Phone Number and Email Address
  - Drawing Number
  - Project Title
  - System code (see System Codes in the Master Files section)
  - Name of SNL Project Leader
  - Building number or Location
  - Service order/ Project Number
2. Submit list via Fax or Email to the Project CADD Coordinator or Sandia Facilities assigned CAD Point-of-Contact. There will be a 24 hour turn around time for needed files, more time may be needed for larger amounts of data.
3. Pick up files when ready. If files are already checked out and unavailable for update, contact the operator/Firm who has the file checked out and request that it be checked in to the SNL Facilities CADD servers.

### **Check-in**

Verify that the new graphic file name and title block description match the Document Management fields exactly. For on-site operators or A/E firms connected to the Facilities LAN, check-in is accomplished through the Facilities Document Management System. Off-site A/Es should always make backups of all project-related files before having their files checked in. Files checked out for reference only should not be returned or checked-in.

## Obtaining New Drawing File Numbers

All CADD plot files must have an official UDS file name assigned to it by Juan Martinez (CADD Coordinator 844-3213) or Amy Rhutasel (Facilities Technical Support Systems 845-9313). Please contact Juan or Amy for reserving drawing numbers. Please verify that the graphic title block information matches the reserved drawing information. (use the request from in Appendix B)

## Deliverable File Requirements

Sandia National Laboratories retains unrestricted ownership of all data, designs, records, graphics and supporting tools used in project creation. Sandia National Laboratories also has the right to provide any of this information to other organizations as it deems appropriate.

Project Design Leaders have the right to request electronic files of project work at any time for the purposes of inspection, including quality assurance and standards compliance checks. See Appendix 5, Quality Assurance Process.

Vector and Raster CADD files may contain reference graphic files, and reference database files, these files will not include device or directory specifications in their path names. New file numbers should have been reserved in the Facilities Document Management System prior to the start of the project. (refer to Obtaining New Drawing File Numbers).

All graphics files shall be saved with the following view parameters:

- “Fit all” graphic elements in view 1
- Title block area in view 5.
- Remove all unnecessary graphics outside the border area.
- Save file parameters

## Data Transfer Requirements

All project files shall be delivered on one of the physical media noted below. No electronic-mail submissions will be accepted.

**Media** –Data shall be exchanged using one of the following media:

- CD-ROM for large amounts of data.
- 3 1/2-inch diskette for smaller amounts of data.

**Labels** – each tape or CD-ROM shall be accompanied by a letter of transmittal with the following information (refer to Appendix 3 for the Letter of Transmittal):

- Hard copy list of filenames and file description
- Date of submission
- Building numbers
- Project Number

## Drawing File Types

The drawing file types described in this section and the standards described in Section 1.9 apply to all disciplines *except* Civil/Exterior Utilities and External Power & Communications. For information on Civil/Exterior Utilities requirements, refer to Chapters 7 and 8, respectively.

Facilities uses three major graphic file types: master files, master cut files, and plot files.

- One master file is created per system, per floor.
- The master cut file consists of a clipped portion of the referenced architectural master floor plan, a border file, and generic information such as a north arrow, column grid tags, match lines, key plan, etc. The master cut file is the template for all plot files in that location of the floor plan.
- The plot file is the electronic representation of the drawing to be plotted.

### Master Files

Each discipline (architectural, mechanical, etc.) and each system (architectural floor plan, HVAC, etc.) has a master file (Figure 1-5). Each system uses its own level assignments. Master files contain the system's components for an entire floor, except for sheet-specific information as defined on master cut files and plot files. The file naming convention for a master file is:

bbbbdfss.dgn      where :

- bbbb      is the project code  
For permanent buildings, the project code is the building number, e.g., 0962, 0887, etc.  
For mobile offices, the project code is m followed by the MO number, e.g., MO154 has project code m154  
For transportable buildings (T-buildings), the project code is t followed by the T-building number (padded with leading 0s to make four digits), e.g. T2 has project code 00t2, T50 is 0t50.  
For substations, the project code is sb followed by the substation number, e.g., substation 35 has project code sb35.
- D          is the discipline, as follows:
- |   |  |
|---|--|
| a | architectural/structural/civil/layout design |
| m | mechanical                                   |
| e | electrical                                   |
| c | controls                                     |
| s | asbestos                                     |
- f          is the floor code; use floor number or b for basement, z for mezzanine, a for attic, p for penthouse, r for roof
- ss        is the system code (see System Codes, below)
- dgn      is the standard extension for all master files

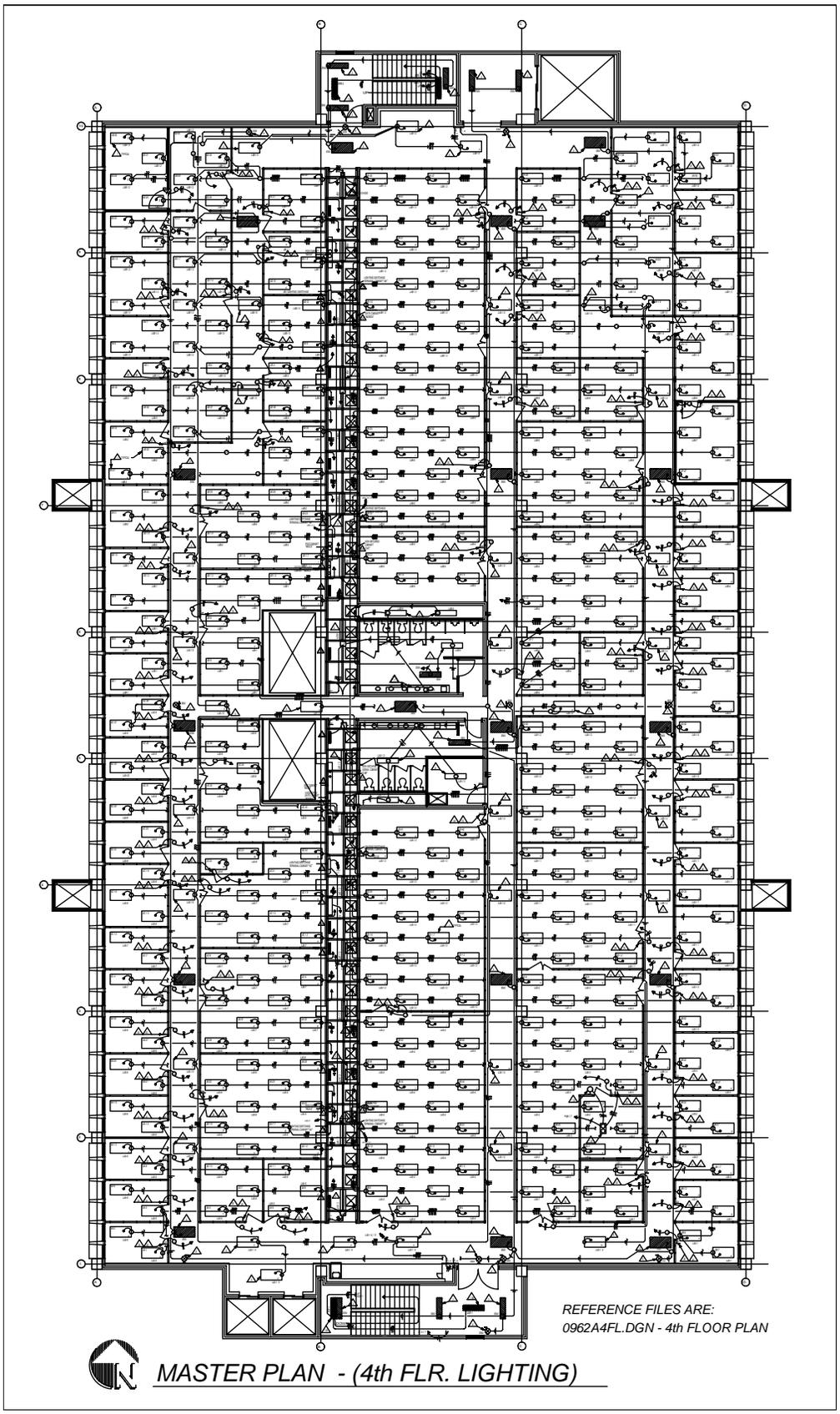


Figure 1-5. Master File

Example:  
0870e11t.dgn

where

Building 870  
e electrical  
first floor  
1t lighting floor plan  
dgn standard design file extension

## Floor Codes

1, 2, 3, 4...	floor level
a	attic
b	basement
m	mezzanine
p	penthouse
r	roof

## System Codes (also the logical names)

key key plan – all floors are located in one file

### Structural (discipline is s)

fn	Foundation Plan
tr	Trench Plan
ff	Floor Framing Plan
rf	Roof Framing Plan
bc	Bridge Crane Plan

### Architectural/Structural (discipline is a)

ly	Layout Plan – furniture (*old name: l_ly.dgn)
eq	Laboratory Equipment Layout Plan – (*old name: l_eq.dgn)
gr	Grading Plan/Plot Plan – Civil/Site (see Chapter 2)
st	Site Plan – Civil/Site (see Chapter 2)
fl	Floor Plan
pr	Partition Plan (* for existing drawings only. For new drawings, partitions are shown on master floor plan)
rc	Reflected Ceiling Plan
ro	Roof Plan
ft	Flooring Textile

### Mechanical (discipline is m)

st	Site Plan (see Chapter 7)	gs	Gases and Process Gases Plan
pp	Plan and Profile (see Chapter 7)	lq	Process Liquids Plan
da	HVAC & Exhaust Plan above ceiling	fa	Fire Protection Plan above ceiling
db	HVAC & Exhaust Plan below ceiling	fp	Fire Protection Plan occupied space
ha	HVAC Piping above	fb	Fire Protection Plan below ceiling
hb	HVAC Piping below	ro	Mechanical Roof Plan (composite)
pl	Plumbing Plan		

## **System Codes (*continued*)**

### Electrical (discipline is e)

pd	Electrical Site Power Distribution (see Chapter 7)
gr	Grounding
ln	Lightning Protection
lt	Lighting
pw	Power
rc	Receptacle
ud	Underfloor Duct
ol	One-line
pp	Exterior Plan and Profile (see Chapter 7)
ps	Panel Schedules (** for existing drawings only. New panel schedules are in Excel on the SNL server)
ro	Electrical Roof Plan (composite)

### Special Systems (discipline is e)

ac	Access Control
fa	Fire Alarm/Evacuation
ia	Intrusion Alarm
rd	Radiation/Gas Detection Systems
md	Toxic Gas Monitoring System
h2	Hydrogen Gas Monitoring System

### Communications (discipline is e)

cb	Voice/Open Data PDS-black PBX-black LAN
cr	PDS-red
pa	Intercom—Emergency Preparedness Public Address (EPPA) and other public address

### Controls (discipline is c)

ct	Control Floor Plan (1/4 inch scale). For files created before May 1997, code is f1
mp	Mechanical Room Plan (1/2 inch scale)
cd	Control Diagrams
so	Sequence of Operation
ld	Ladder Diagrams

### Asbestos (discipline is s)

ap	Asbestos Survey Plan
ct	Asbestos Ceiling Tile Plan
ro	Roof Plan
at	Attic Space Plan

### Miscellaneous

hz	Building Modification Hazard Assessment (BMHA)
sp	Space Planning
I	Inspection/Infrastructure Assessment

## Master Cut Files

Master cut files (Figure 1-6) are standard templates used to create plot files. The Sandia design Architect or Engineer will supply to the A&E firm the Master Cut Files and Key Plans that will be included in a drawing package. The master cut file references the architectural master floor plan file, master key plan, and the border file. Master cut files contain the following generic elements:

- North arrow
- Title block general information
- Piece mark
- Match line continuation cells
- Keyed notes / general notes piecemark
- Other information that is to appear on every sheet.

The file naming convention for a master plot file is:

bbbbsss.dgn     where

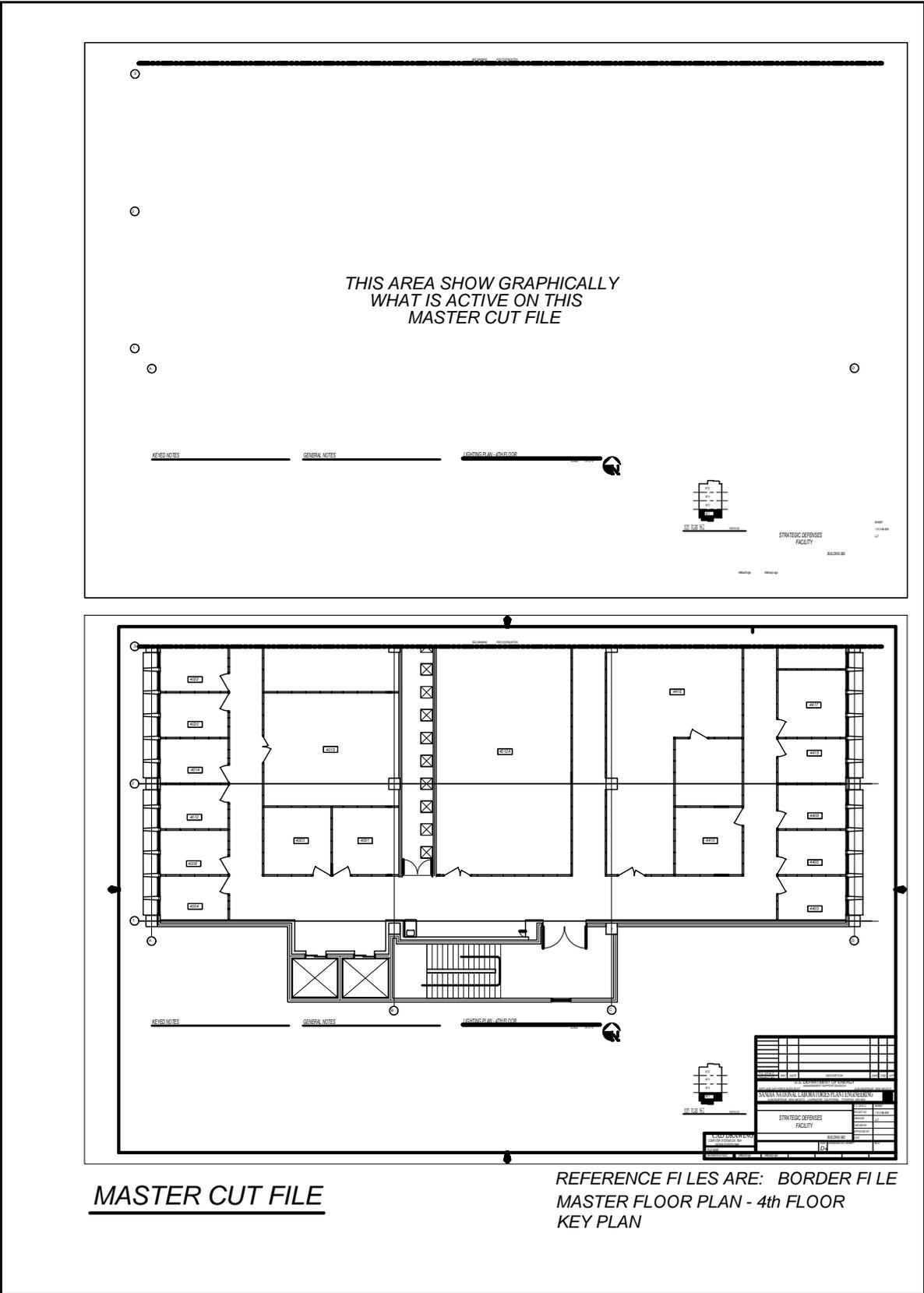
bbbb     is the building number, padded with a leading zero if the building number has only three digits

sss     is the sheet number padded with leading zeros. The sheet number shall coincide with the key plan area numbers where possible.

Dgn     is the standard file extension.

Example:

0962001.dgn     Sheet 1 of the master cut file sheets for Building 962.



**Figure 1-6. Master Cut File**

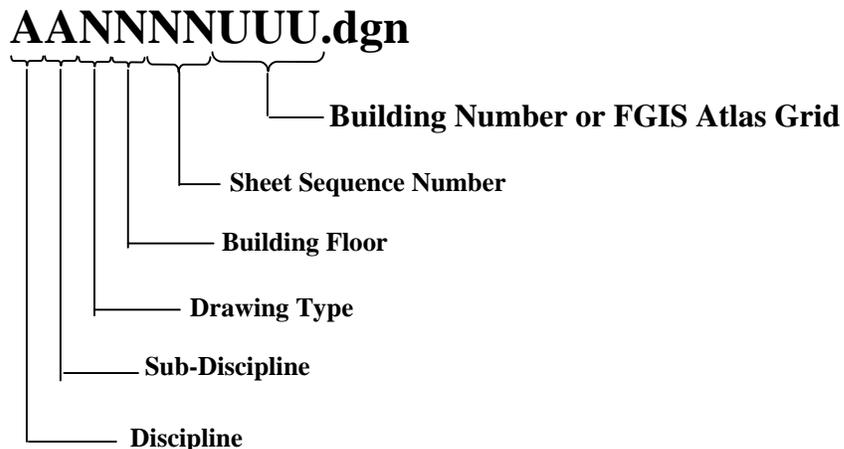
## Plot Files

Plot files (Figure 1-7) are the final CADD project files which are to be plotted. Individual building plot files contain the following active elements

- Construction ballooning and notes
  - New work should always be ballooned, Sandia will not accept shading to identify new work.
- Revision indicators
- Existing symbol indicators
- Keyed and general notes
  - All notes should pertain to the active plot file, Sandia will not accept plot files with generic keyed notes
- Drawing-specific title block information
- Drawing titles
- Drawing continuation numbers

For additional requirements in naming plot files see refer to Obtaining New Drawing File Numbers. Sandia Facilities follows a modified version of the Uniform Drawing System (UDS) file naming convention standard for all plot files.

### Sandia Facilities Drawing System



# Sandia Facilities Drawing System

## Discipline

AANNNUUU.dgn

## Disciplines

**A** Architectural  
**B** Geotechnical  
**C** Civil  
**D** Process  
**E** Electrical  
**F** Fire Protection  
**G** General  
**H** Hazardous Materials  
**I** Interiors  
**L** Landscape  
**M** Mechanical  
**O** Operations  
**P** Plumbing  
**Q** Equipment  
**R** Resource  
**S** Structural  
**T** Telecommunications & Security  
**V** Survey/Mapping  
**W** Civil Work (Exterior Utilities)  
**X** Other Disciplines  
**Z** Contractor/Shop Drawings

All Schedules for all Disciplines  
Should use a dash (-) example

Multi-Disciplines in 1 drawing  
Uses a dash (-) example

## Sub-Discipline

**A**ANNNNUUU.dgn

- Multi-disciplines in 1 drawing use a dash

**A**-NNNNUUU.dgn

## Sub-Discipline

### **A**-Architectural

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>A</b>	<b>D</b>	Architectural Demolition	Protection and removal
	<b>E</b>	Architectural Elements	General Architectural, Floor Plans, Sections, Details, Schedules
	<b>F</b>	Architectural Finishes	<i>Tile &amp; Carpet</i>
	<b>G</b>	Architectural Graphics	<i>Reflected Ceilings</i>
	<b>I</b>	Architectural Interiors	<i>Partitions</i>
	<b>S</b>	Architectural Site	
	-	Multi-Disciplines	

### **B**-Geotechnical

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>B</b>			

### **C**-Civil

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>C</b>	<b>D</b>	Civil Demolition	Structure removal and site clearing
	<b>G</b>	Civil Grading	Excavation, grading, drainage, retention ponds
	<b>I</b>	Civil Improvements	Pavers, flagstone, exterior tile, furnishings, retaining walls, and water features, <i>Permanent Signing, Striping and Bumpers.</i>
	<b>P</b>	Civil Paving	Roads, bridges, drives and parking lots
	<b>S</b>	Civil Survey (Site)	Plats, topographic, dimension control, <i>Layouts</i>
	<b>T</b>	Civil Transportation	Waterway construction, wharves, docks, trams, railway systems, and people movers
* SEE "W"	<b>U</b>	Civil Utilities	Water, sanitary sewer, storm sewer, power, and communications

### **D**-Process

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>D</b>	<b>D</b>	Process/ Plumbing Demolition	Protection, termination, and removal.
	<b>E</b>	<i>Process Electrical</i>	<i>Electrical exclusively associated with a process and not the facility</i>
	<b>I</b>	<i>Process Instrumentation</i>	<i>Instrumentation, measurement, recorders, devices and controllers (electrical and mechanical)</i>
	<b>J</b>	<i>Process Gasses</i>	<i>Piping, valves, insulation, tanks, pumps</i>

			<i>(compressed air)</i>
	<b>K</b>	<i>Process Shop Drawings</i>	
	<b>P</b>	Process Liquids Piping	Piping, valves, insulation, tanks, pumps
	<b>Q</b>	Process Equipment	Systems and equipment for thermal, electrical, materials handling, assembly and manufacturing, nuclear, power generation, chemical, refrigeration, and industrial processes
	<b>S</b>	Plumbing Site	Extension and connections to Civil Utilities
	-	Multi-Disciplines	

## **E-Electrical ( See W for electrical exterior site lighting and exterior power)**

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>E</b>	<b>D</b>	Electrical Demolition	Protection, termination, and removal
	<b>I</b>	Electrical Instrumentation	Controls, relays, instrumentation, and measurement devices
	<b>J</b>	<i>Electrical Receptacle</i>	<i>Receptacle</i>
	<b>K</b>	<i>Under floor</i>	<i>Under floor</i>
	<b>L</b>	Electrical Lighting	
	<b>P</b>	Electrical Power	Power
	<b>S</b>	Electrical Site	<i>lightening and grounding</i>
*	<b>T</b>	Electrical Telecommunications	Telephone, network, voice and data cables
	<b>Y</b>	Electrical Auxiliary Systems	Alarms, nurse call, security, CCTV, PA, music, clock, and program
	-	Multi-Disciplines	

## **F-Fire Protection**

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>F</b>	<b>A</b>	Fire Detection and Alarm	
	<b>X</b>	Fire Suppression	Fire extinguishing systems and equipment
	-	Multi-Disciplines	

## **G-General**

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>G</b>			<i>Master Cut Files, Key Plans, Evacuation Maps</i>
	<b>C</b>	General Contractual	Phasing, schedules, contractor staging areas, fencing, haul routes, erosion control, temporary and special requirements
	<b>I</b>	General Information	Drawing Index, Code Summary, Symbol Legend, Orientation Maps
	<b>R</b>	General Resource	Photographs, soil borings

## **H-Hazardous Materials**

Discipline	Sub-Discipline	Description of Suggested Names	Content

	<b>Discipline</b>		
<b>H</b>	<b>A</b>	Asbestos	Asbestos abatement, identification or containment
	<b>C</b>	Chemicals	Toxic chemicals handling, removal or storage
	<b>L</b>	Lead	Lead piping or paint removal
	<b>P</b>	PCB	PCB containment and removal
	<b>R</b>	Refrigerants	Ozone depleting refrigerants

## **I-Interiors**

Discipline	<b>Sub-Discipline</b>	Description of Suggested Names	Content
<b>I</b>	<b>D</b>	Interior Demolition	
	<b>F</b>	Interior Furnishings	
	<b>G</b>	Interior Graphics	Murals and visuals
	<b>N</b>	Interior Design	
	<b>-</b>	Multi-Disciplines	

## **L-Landscape**

Discipline	<b>Sub-Discipline</b>	Description of Suggested Names	Content
<b>L</b>	<b>D</b>	Landscape Demolition	Protection and removal of existing landscaping
	<b>I</b>	Landscape Irrigation	
	<b>P</b>	Landscape Planting	

## **M-Mechanical (See W for mechanical exterior site conditions)**

Discipline	<b>Sub-Discipline</b>	Description of Suggested Names	Content
<b>M</b>	<b>D</b>	Mechanical Demolition	Protection, termination, and removal
	<b>H</b>	Mechanical HVAC	Ductwork, air devices, equipment and <i>exhaust</i>
	<b>I</b>	Mechanical Instrumentation Controls	Instrumentation and controls
	<b>J</b>	<i>Exhaust Only Systems</i>	<i>Use only when Exhaust is deviled out</i>
	<b>K</b>	User Defined	
	<b>P</b>	Mechanical Piping	Chilled and heating water, steam, <i>tower water</i>
	<b>S *</b>	Mechanical Site	Utility tunnels and piping between facilities,
	<b>-</b>	Multi-Disciplines	

## **O-Operations**

Discipline	<b>Sub-Discipline</b>	Description of Suggested Names	Content
<b>O</b>	<b>A</b>	Operational Architectural	
	<b>B</b>	Operational Geotechnical	
	<b>C</b>	Operational Civil	
	<b>D</b>	Operational Process	
	<b>E</b>	Operational Electrical	
	<b>F</b>	Operational Fire Protection	
	<b>G</b>	Operational General	
	<b>H</b>	Operational Hazardous Materials	

	<b>I</b>	Operational Interiors	
	<b>L</b>	Operational Landscape	
	<b>M</b>	Operational Mechanical	
	<b>P</b>	Operational Plumbing	
	<b>Q</b>	Operational Equipment	
	<b>R</b>	Operational Resource	
	<b>S</b>	Operational Structural	
	<b>T</b>	Operational Telecommunications	
	<b>V</b>	Operational Survey/Mapping	
	<b>W</b>	Operational Civil Work	
	<b>X</b>	Operational Other Disciplines	
	<b>Z</b>	Operational Contractor/Shop Drawing	
	<b>-</b>	Multi-Disciplines	

### **P-Plumbing**

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>P</b>	<b>L</b>	Plumbing	Domestic water, sanitary and storm drainage fixtures

### **Q-Equipment**

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>Q</b>	<b>A</b>	Athletic Equipment	Gymnasium, exercise, aquatic, and recreational
*	<b>B</b>	Bank Equipment	Vaults, teller units, ATMs, drive-through
*	<b>C</b>	Dry Cleaning Equipment	Washers, dryers, ironing, and dry cleaning
*	<b>D</b>	Detention Equipment	Prisons and jails
*	<b>E</b>	Educational Equipment	Chalkboards, library
	<b>F</b>	Food Service Equipment	Kitchen, bar, service, storage, and processing
*	<b>H</b>	Hospital Equipment	Medical, exam, and treatment
	<b>J</b>	User Defined	
	<b>K</b>	User Defined	
	<b>L</b>	Laboratory Equipment	Science labs, planetariums, observatories
	<b>M</b>	Maintenance Equipment	Housekeeping, window washing, and vehicle servicing
	<b>P</b>	Parking Lot Equipment	Gates, ticket and card access
*	<b>R</b>	Retail Equipment	Display, vending, and cash register
*	<b>S</b>	Site Equipment	Bicycle racks, benches, playgrounds
*	<b>T</b>	Theatrical Equipment	Stage, movie, rigging systems
*	<b>V</b>	Video/Photographic Equipment	Television, darkroom, and studio
*	<b>Y</b>	Security Equipment	Access control and monitoring, surveillance
	<b>-</b>	Multi-Disciplines	

### **R-Resource**

Discipline	Sub-Discipline	Description of Suggested Names	Content
------------	----------------	--------------------------------	---------

<b>R</b>	<b>A</b>	Resource Architectural	Existing facility architectural drawings
	<b>C</b>	Resource Civil	Surveyor's information and existing civil drawings
	<b>E</b>	Resource Electrical	Existing facility electrical drawings
	<b>M</b>	Resource Mechanical	Existing facility mechanical drawings
	<b>S</b>	Resource Structural	Existing facility structural drawings
	-	Multi-Disciplines	

### **S-Structural**

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>S</b>	<b>B</b>	Structural Substructure	Foundation, piers, slabs, and retaining walls
	<b>D</b>	Structural Demolition	Protection and removal
	<b>F</b>	Structural Framing	Floors and roofs
	<b>S</b>	Structural Site	

### **T-Telecommunications**

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>T</b>	<b>A</b>	Audio Visual	Cable, music, and CCTV systems
	<b>C</b>	Clock and Program	Time generators and bell program systems
	<b>I</b>	Intercom	Intercom and public address systems
	<b>J</b>	<i>Red Data Network</i>	<i>Red communications</i>
	<b>K</b>	User Defined	
	<b>M</b>	Monitoring	Monitoring, alarm systems , <i>special alarms</i>
	<b>N</b>	Data Networks	Network cabling, equipment and <i>black communications</i> , Telephone systems, wiring, and equipment
	<b>Y</b>	Security	Access control and alarm systems, <i>Intrusion alarm</i>
	-	Multi-Disciplines	

### **V-Survey/Mapping**

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>V</b>	<b>A</b>	Aerial Photos	<i>Photogrammetry</i>
	<b>D</b>	Demolition	
	<b>E</b>	<i>Electrical</i>	<i>Traffic Signals</i>
	<b>F</b>	Field Survey	<i>Design Topo</i>
	<b>G</b>	Natural Gas	
	<b>H</b>	<i>Chilled Water</i>	
	<b>I</b>	Digital Survey	
	<b>J</b>	<i>Lighting</i>	<i>Parking Lot and Street Lighting</i>
	<b>K</b>	<i>Boundry</i>	<i>Land Use Permits, DOE Boundaries, Survey Const. Monuments</i>
	<b>L</b>	LP Gas	
	<b>M</b>	<i>Steam and Condensate</i>	
	<b>O</b>	Fiber Optic	
	<b>P</b>	Power	
	<b>R</b>	Storm Sewer	
	<b>S</b>	Sanitary Sewer	
	<b>U</b>	Combined Utilities	

	<b>V</b>	<i>Environmental</i>	<i>Monitor Wells, ER Sites</i>
	<b>W</b>	Water	

## **W-Civil Work**

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>W</b>	<b>D</b>	Demolition	
	<b>E</b>	<i>Electrical</i>	<i>Traffic Signals, Communications</i>
	<b>G</b>	Natural Gas	
	<b>H</b>	<i>Chilled Water</i>	<i>Tower Water, Reclamation Water</i>
	<b>J</b>	<i>Lighting</i>	<i>Street and Parking Lot Lighting</i>
	<b>K</b>	User Defined	
	<b>L</b>	LP Gas	<i>Oil</i>
	<b>M</b>	<i>Steam and Condensate</i>	
	<b>O</b>	Fiber Optic	
	<b>P</b>	Power	
	<b>R</b>	Storm Sewer	
	<b>S</b>	Sanitary Sewer	
	<b>U</b>	Combined Utilities	
	<b>V</b>	Cable TV	
	<b>W</b>	Water	

## **X-Other Disciplines**

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>X</b>			

## **Z-Contractor/Shop Drawings**

Discipline	Sub-Discipline	Description of Suggested Names	Content
<b>Z</b>			

## **Drawing Type**

AANNNNUUU.dgn

## **Drawing Type**

- 0 General (symbols legend, notes, etc)
- 1 Plans ( plan view 1/4" scale)
- 2 Elevations (vertical view)
- 3 Sections, Wall sections (sectional views)
- 4 Large Scale Views (plans, elevations, stair sections or sections that are not details)
- 5 Details
- 6 Schedules/Equipment Lists
- 7 Diagrams
- 8 Plan and Profiles
- 9 3D Representations (isometrics, perspectives, photographs)

## **Building Floor**

AANNNNUUU.dgn

(Single Story Buildings use number 1. Existing and Old drawings will show this as a 0)

## Floor Number

B Basement  
1 First Floor  
2 Second Floor  
3 Third Floor  
4 Fourth Floor  
5 Fifth Floor  
P Penthouse  
R Roof  
M Mezzanine  
Z Basement Mezzanine

## Sheet Sequence Number

AANNNNUUU.dgn

## Sheet Sequence Number

Numeric count of Discipline, Discipline Modifier and Sheet Type Designator  
01  
02  
99

## Building Number or FGIS grid number

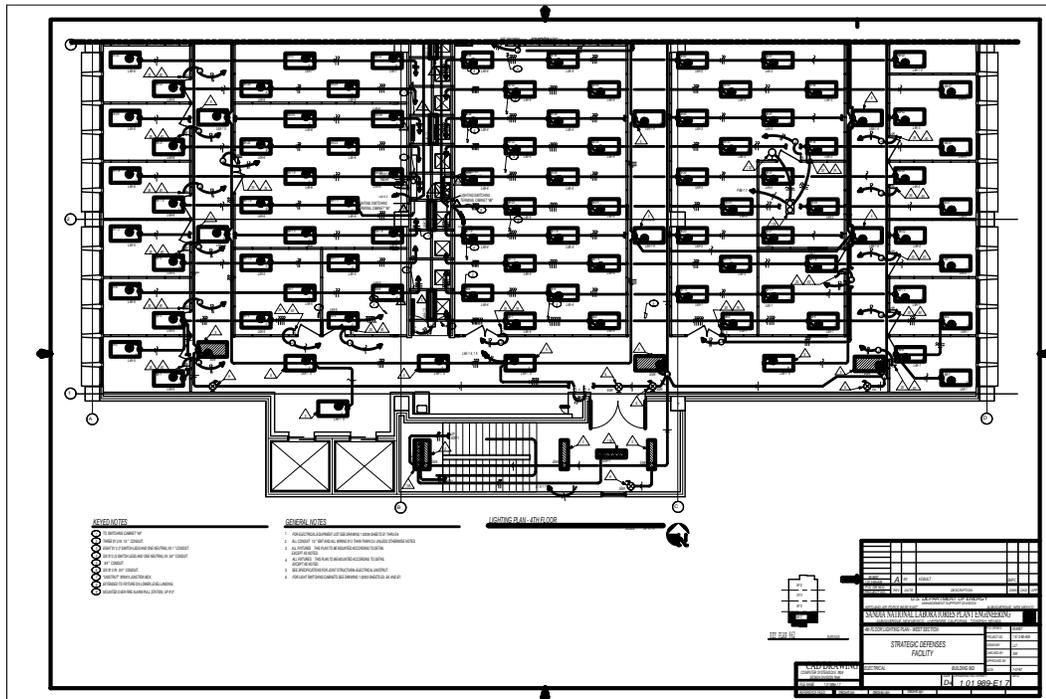
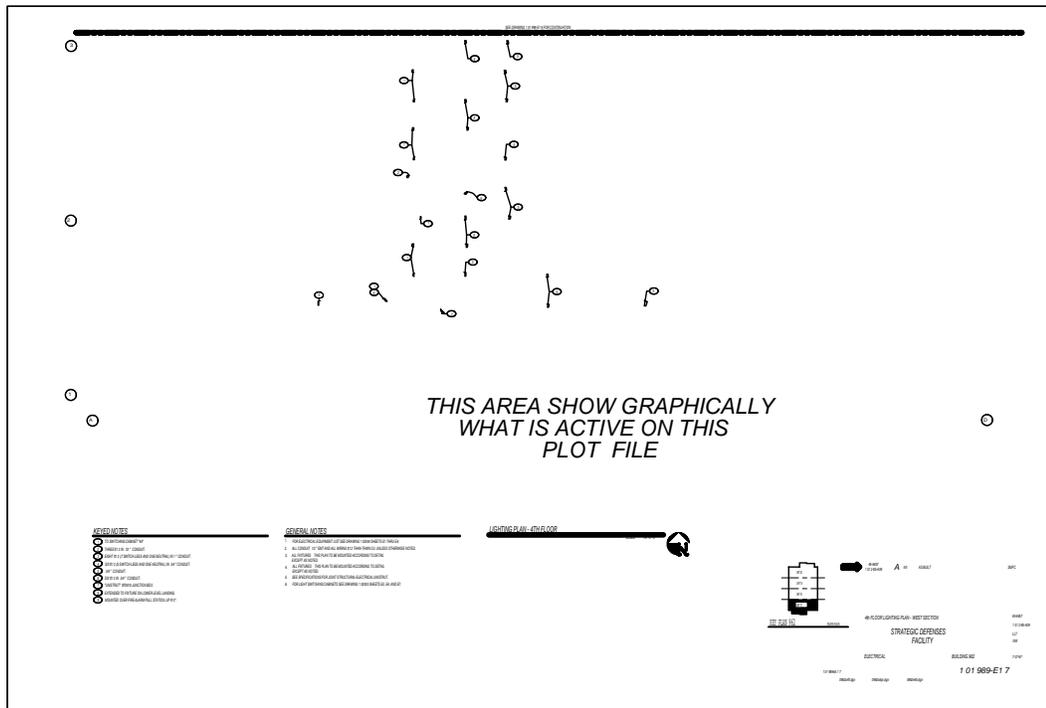
AANNNUUU.dgn

## Building number

No preceding "O" example "963" would be 963  
Use entire building number , example: 6585A

## FGIS Grid Numbers

Exterior files not associated with a building will use the FGIS Grid numbers  
Example: F12



REFERENCE FILES ARE: BORDER FILE  
MASTER FLOOR PLAN - 4th FLOOR  
MASTER LIGHTING PLAN - 4th FLOOR  
KEY PLAN

Figure 1-7. Plot File

Master File/Plot File Symbology Locations

<u>Item</u>	<u>Master Files</u>	<u>Plot Files</u>
Equipment Symbology and Text	X*	
Conduit Symbology and Text	X*	
Elevation Designations and Text	X	
System Element and Text	X	
Dimensions	X**	X**
Sections and Details	X***	X***
General Note Mark and Text		X
Keyed Note Mark and Text		X
Keyed Note Symbology		X*

**General Note:** Facilities CADD Standards assign each element to exactly one master plan. Elements shall be active only in their assigned master plans. The element assignments are shown in the level schemes in each discipline section. To show an element on a master file other than the one to which it is assigned, reference in the assigned master plan and turn off the unwanted levels.

**Special Notes:**

- \* Place leader line and terminator with level and symbology of associated note.
- \*\* As a general rule, place dimensions on the master plan with associative dimensioning and, as needed, on the plot file.
- \*\*\* Section and detail markers may be placed in either master plans or plot files.

**Key plans**

The key plan shall be referenced into the master cut file. The procedure for creating a master key plan drawing is as follows:

1. Create a master drawing named as follows:

bbbbfkey.dgn where

- bbbb is the four-digit building number (with leading zero as required)
- f is the floor number or code (see Master Files, above)
- key.dgn indicates a key plan file.

Example: 08702key.dgn is the key plan for Building 870, second floor

2. Reference in the master floor plan and turn off all levels except 4, 10, 11, and 41:
  - Level 4 —building footprint
  - Level 10—column grid centerlines (optional)
  - Level 11—column grid tags and text (optional)
  - Level 41—matchlines, breaklines, targets, and North Arrow
3. Reference border3.dgn

4. Scale and move the referenced master floor plan down to a size that will fit to the left of the title block. Note the scale for all associated floor plans.
5. With the reference locate lock on, fence *copy* the master floor plan into the key plan. Once the floor plan has been copied to the key plan, turn the display off. **DO NOT DETACH.** Turn the display off on border3.dgn.
6. Fence move levels 4, 10, 11, and 41 to levels 60 through 63:
  - Level 4—Level 60
  - Level 10—Level 61
  - Level 11—Level 62
  - Level 41—Level 63

Place all text (Key Plan, area notation, etc.) on Level 59.

Changing the levels allows the operator to assign the crosshatched areas the same level number:

Example:     Area 1—Level 1  
                   Area 2—Level 2

7. After all the areas and levels have been assigned, the operator can turn off all the levels except 59 through 63 and the active level to be cross-hatched.
8. After the key plan has been created, attach it to the master cut files with levels 60 through 63 and the associated levels turned on.

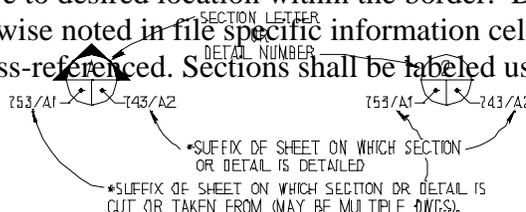
### Border Files

The standard border sheet size is 24 by 36 inches (D+). Facilities uses two standard border files, `border3.dgn` (for 3D drawings) or `border.dgn` (for 2D drawings). Each file contains a blank 24- by 36-inch (D+) border sheet for the generation of plot and master cut files, 22- by 34-inch (D) for consistency with some existing drawing sheets, and 35- by 48-inch (E) for use only under the direction of the Project Manager. Boundary clip the selected border; and place the fence about 1/4" outside the dotted cutting edge.

### Details and Sections

Details and sections shall be presented separately from all other drawings types. Elements shall be active in the plot file (**no referenced master files**). Details and sections for the mechanical and electrical disciplines do not have level schemas. Follow the corresponding floor plan schemas when feasible. Refer to the level schema for plan drawings in the appropriate discipline-specific section of this manual.

Architectural details and sections have level schemas. Refer to the elevation, section, and detail level schemas in Chapter 2, Architectural. Details and sections may vary in scale, depending on the type and quantity of information on them. Details and sections may be scaled by temporarily changing the working units. Details may also be drawn outside the border at 1:1 scale. Fence scale the detail; and move to desired location within the border. Detail sheets shall be plotted at 1/4"=1'-0", unless otherwise noted in file specific information cell. Details and sections shall be properly labeled and cross-referenced. Sections shall be labeled using upper case letters and details are numbered.



## **Master Laboratory Equipment Layout**

The architectural discipline generates a master file showing the location of all laboratory equipment. The laboratory equipment layout file (system code = eq) is referenced by all other disciplines. Modifications, additions, and removals are made only in the one master equipment file.

## **Schedules**

The file `schedule.dgn` (Figure 1-8) contains the mechanical and electrical equipment lists, electrical conduit schedules, architectural master door and window schedule, and the master room finish schedule. All systems in a discipline are included on a single reference file.

Check out `schedule.dgn` from the document management system as a reference file and attach it to the plot file. Fence copy the schedule into the plot file. When adding items to the schedule, do not duplicate numbers already on a record drawing schedule.

The door/window and room finish schedules contain blank listings with data fields to simplify text input. Legend elements are intended for placement in the room finish schedule matrix to denote location of a required finish (North, South, East, West).

## **Roof Plan**

Each discipline has a separate roof plan. Reference the master roof plans to each other to see the location of all equipment and structures. Special care should be taken to line-up vertical pipes, vents, chases, equipment and structural components with the floors below.

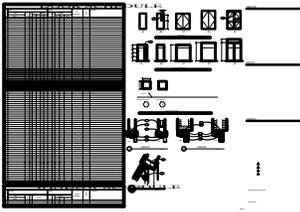
## **Standard Index Layout**

Who is providing this?

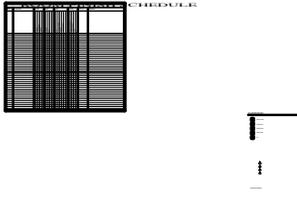
*D+ SCHEDULE*

*D+ SCHEDULE*

ARCHITECTURAL



*DOOR SCHEDULE*

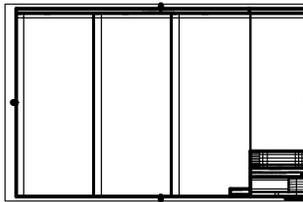
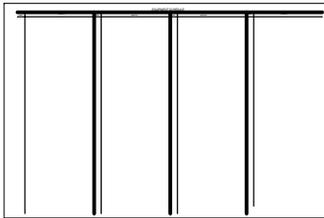


*ROOM FINISH SCHEDULE*

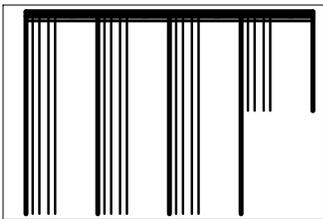
*D+ SCHEDULE*

*D SCHEDULE*

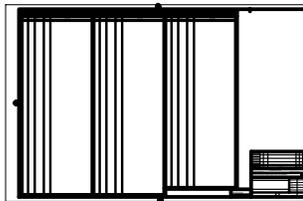
MECHANICAL



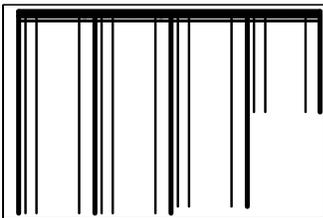
ELECTRICAL



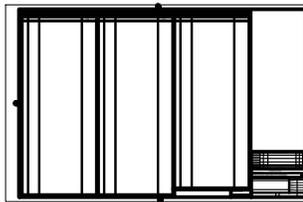
*CONDUIT SCHEDULE*



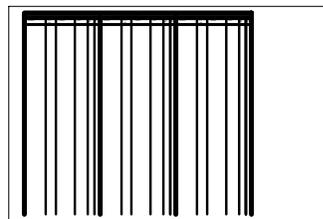
*CONDUIT SCHEDULE*



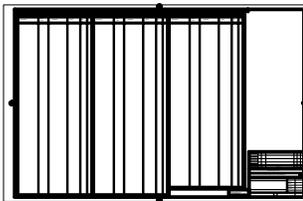
*EQUIPMENT LIST*



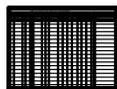
*EQUIPMENT LIST*



*PCC NAMEPLATE SCHEDULE*



*PCC NAMEPLATE SCHEDULE*



*MOTOR CONTROL CENTER SCHEDULE*

Figure 1-8. Schedule.dgn

## System Standards

The following standards are generic for all building graphic requirements. Not included in this section are system standards for Civil/ Exterior Utilities, and Exterior Power & Communications, which are in Chapter 2, respectively. Discipline-specific standards are covered in the discipline chapters.

### Working Units

Working units for all building drawing files are as follows:

Master units = ft or ‘

Sub-units = in or “

Resolution, inch per foot = 12

Positional units per sub-unit = 8000

Working Area = 44,739 feet square

### Cells

Building graphic cells are created at a scale of 1:1. Use the library `noting.cel` (Figure 1-9) for common cells used by all building disciplines when possible. Cell libraries for each discipline are noted in the following chapters. Cells not available in these libraries shall be created in accordance with the *Facilities CADD Standards Manual* and submitted through the ESR Process.

### Global Origin

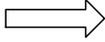
For building master files, the global origin shall be established at the lower left corner of the building perimeter, this location is where the x, y, and z axis values are equal to 0.

### Drawing Scale

Drawing scale is 1:1. Architectural, mechanical, and electrical plans and schedules are plotted at a scale of 1/4 inch=1 foot 0 inches. Other drawings, such as elevations, sections and details, may be plotted at a scale other than 1/4 inch = 1 foot, however this information shall be documented in the file using the file-specific information cell.

### North Arrow

Building master files shall be drawn with north pointing up. If the building warrants the north arrow pointing left, rotate the orientation on the master cut files and plot files by *view rotations* to the referenced building master files. Master cut files and plot files for any given building shall show the north arrow in the same orientation on all sheets.

NOTING.CEL		
NAME	DESCRIPTION	CELL
ARROW	ARROW HEAD USED FOR LEADERING	
EL	NOTING "KEYED NOTE" ELLIPSE	
CIRC	NOTING "DOOR" SYMBOL	
SQ	NOTING "CONDUIT SCHEDULE" SQUARE	
SQ4	NOTING 4 CHARACTER "CONDUIT SCHEDULE" SQUARE	
TRI	NOTING "ELECTRICAL EQUIPMENT" TRIANGLE	
HEX	NOTING "MECHANICAL EQUIPMENT" HEXAGON	
DIA	NOTING "CONTROLS EQUIPMENT" DIAMOND	
REVTRI	REVISION TRIANGLE	
TBTRI	TITLE BLOCK REVISION TRIANGLE	
TBARRW	TITLE BLOCK REVISION IDENTIFIER	
NORTH	NORTH ARROW - UP	
NORTHL	NORTH ARROW - LEFT	
CONT	LEADERING CONTINUATION MARK	
SECARR	SECTION BUBBLE ARROW	
SEC	DETAIL / SECTION BUBBLE	
SECID	SECTION IDENTIFIER	
TARGET	ELEVATION TARGET	

RC = NOTING.CEL

Figure 1-9. Noting.cel



NOTING.CEL		
NAME	DESCRIPTION	CELL
TTLSEC	SECTION BUBBLE FOR TITLES	
GENNOT	GENERAL NOTES COLUMN	<u>GENERAL NOTES</u>
KEYNOT	KEYED NOTES COLUMN	<u>KEYED NOTES</u>
LEGEND	LEGEND COLUMN	<u>LEGEND</u>
TITLE	PIECE MARK	<u>ARCHITECTURAL PLAN - AREA 10</u> SCALE: _____
4SDTIT	4" SECTION/DETAIL COLUMN	 <u>SECTION "AA"</u> SCALE: 1/2" = 1'-0"
6SDTIT	6" SECTION/DETAIL COLUMN	 <u>DETAIL B</u> SCALE: 1/2" = 1'-0"
MATCH	MATCHLINE - FOR CONTINUATION SEE DRAWING	
DOT	DOT USED FOR LEADERING	•
BREAK	BREAK SYMBOL	
BRKT	NOTING BRACKET	{
LNTAG	LINE IDENTIFIER TAG	⊞
POCONN	PT. OF CONN. FROM NEW TO EXIST. CONST.	⊗
POREM	END POINT OF REMOVAL	⊠

RC = NOTING.CEL

Figure 1-11. Noting.cel

## Font Resource File

Facilities has modified the default MicroStation font resource file, therefore `font.rsc`, `font 1`, which is included in the SNL configuration files which are provided on request. The changes to the `font.rsc` file include the following:

- Putting a slash through the number 0 to differentiate it from the letter O
- Added tick at top of the number 1 to differentiate it from the letter l and I.
- Substituting the degree (°) symbol for the caret (^) sign
- Substituting the diameter (Ø) symbol for the question mark (?)

## Text

General text settings are as following:

- Font = 1
- Text height = : 5
- Text width = : 4
- Line weight = 1
- Line spacing = : 3
- Line length = 127
- Text justification is top left.

Use the cells library `noting.cel` (Figure 1-9) for standard cells with data fields when possible. For additional heading not available in `noting.cel` use the following settings:

- Font = 1
- Text height = : 9
- Text width = : 7
- Line weight = 2

Text size may be adjusted as required to miscellaneous plans plotted at other than 1/4-inch scale.

## Reference Files

Reference files allow the designer to use other discipline's drawings without copying or recreating them. When referencing building master files do not move reference file and use the master file system code as the logical name as shown in the following example:

RF = 0962a2f1.dgn, f1     where f1 is the logical name for the floor plan  
RF = 6920a2rc.dgn, rc     where rc is the logical name for the reflected ceiling plan.

## Levels

Refer to the discipline-specific sections of this manual for level schemas. User-defined levels are used where the standard level schemas do not accommodate design needs. **Contact the**

**Project CADD Coordinator Juan Martinez (844-3213) for approval of user-defined levels .**  
User-defined levels must also be documented in the graphic file using the file specific information cell.

### **Title Block**

For completing the graphic drawing title block use the standard library `noting.cel`, cell `ttltext` which contains data fields. See Figure 1-12 for example.

### **Line Weights**

Standard line weight assignments for plans drawings are specified in the level schemas in the discipline specific sections of this manual. Line weights for details and sections are drawn according to design needs.

### **Line Styles**

Line style assignments for plan drawings are specified in the level schemas in the discipline-specific chapters of this manual. Line styles for details and sections are drawn according to design needs.

### **Color Tables**

Colors are assigned by number and are specified in the level schemas in the discipline specific sections of this manual. Color assignments for details and sections are drawn according to design needs. Facilities CADD standards include the following color tables:

<code>default.tbl</code>	architectural color table
<code>pastels.tbl</code>	optional architectural color table
<code>elec.tbl</code>	electrical color table
<code>hvac.tbl</code>	heating ventilating/air conditioning color table
<code>plmb.tbl</code>	plumbing color table

# SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING

## TITLE BLOCK & DETAIL SYMBOLOGY

RECOMMENDED SHEET FORMAT: GENERAL NOTES 1ST  
KEYED NOTES BELOW

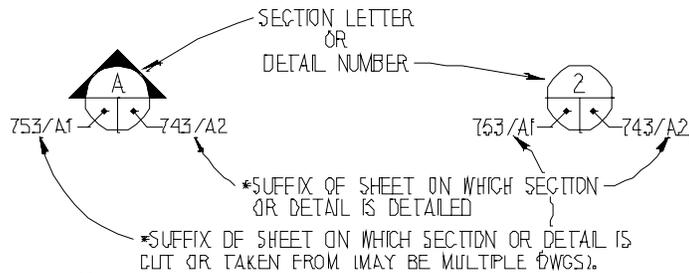
### KEYED NOTES

- 1 APPROPRIATE HEADING STYLE ALT: SANDIA NATIONAL LABORATORIES
- 2 SHEET TITLE
- 3 PROJECT TITLE (DATA FIELDS ARE 1 TO 3 LINES)
- 4 DISCIPLINE/LOCATION FILING CATEGORY
- 5 ENGINEER/DESIGNER/DRAFTER
- 6 CONSTRUCTION CONTRACT NO. - SEE PROJECT FOLDER
- 7 PROJECT NO. - SEE PROJECT FOLDER
- 8 NINE DIGIT SHEET NUMBER
- 9 PROJECT SHEET SEQUENCE
- 10 SNL ENGINEER
- 11 ENGINEER/DESIGNER
- 12 CHECKER
- 13 REVISION BLOCK

### GENERAL NOTES

1 TITLE BLOCK TEXT SHOULD FOLLOW THE GUIDE LINES SET BY THE CADD STANDARDS. THERE IS A CELL FOR THE TITLE BLOCK INFORMATION LOCATED IN NOTING.CEL (2-D) OR NOTING3.CEL (3-D).

2 \* USE THE LAST THREE DIGITS ONLY IF THE FIRST THREE DIGITS ARE THE SAME ON BOTH SHEETS WHERE THE DETAIL OR SECTION IS CUT AND WHERE IT IS SHOWN, OTHERWISE USE ALL SIX DIGITS.



△	
△	
△	1/92 AS BUILT

U.S. DEPARTMENT OF ENERGY	
FLOOR PLAN	<b>SANDIA NATIONAL LABORATORIES</b>
AREA 1 COMMUNICATION SWITCH BUILDING	
ARCHITECTURAL	BLDG. B29
<b>MICROSTATION FILE</b>	4/91
AE1001829.dgn	D+ AE1001829 01
0829KEY.DGN	0829A1FL.DGN

Figure 1-12. Title Block, Detail, Keyed & General Notes Parameters

## Z Depth

The active Z-depth for all files is 0.0000, with depth lock on, except if the plan is to be used for a model.

## Standard Drawings

Standard drawings are used to facilitate the design process by providing typical details and templates for incorporation into design packages. Although all of the drawings are called Standard Drawings, there are actually three categories of standard drawings.

1. **Standard Drawings-** These drawings are used as they are for construction. No modifications to these drawings are required beyond project specific title block additions.
2. **Standard Template Drawings-** These drawings are used as a starting point to create a new building or utility drawing that will be assigned it's own unique number and filed as such.
3. **Standard Design Drawings-** These drawings are used for design calculations and conceptual design layout. These drawings should never be in a construction set except for design-build type projects.

Standard drawings are located in the Facilities Document Management System, A&E firms can contact their CAD point of contact to obtain copies.

Do not check in standard drawings out or into the Facilities file server.

Modifications can be made to a standard template drawing after assigning a permanent project drawing number. See Section 1.5, Obtaining New Drawing File Numbers for additional information. The modified drawing is saved as a project drawing and checked in to the file server.

Hard copies of standard drawings are located in Building 887 room 1290 in an 11"x17" blue binder titled "Active Standard Drawings. Do not remove the drawings from room 1290, however you may make copies of the drawings you receive. All standard drawings are CADD vector files. See Ed Gore for the latest electronic copy. Every A&E on Sandia's distribution list should have electronic copies of the standard drawings. If an A&E needs electronic copies, they should first check if they have them in their system first, otherwise request them from their Sandia Facilities Project Manager.

# Standard Palette Menus

## Introduction

To maximize the efficiency of the Facilities CADD system, a custom workspace (sn1) has been written. The sn1 workspace includes custom tool boxes, tool frames, macros, user commands, and menu bars. The custom workspace is designed to be useful to all technicians, but its use is not mandatory. The following sections describe the capabilities and limitations of the standard palette menus.

## Getting Started

A custom workspace for an organization as large as the Facilities business unit can contain several hundred programs, including MDL applications, user commands, cell libraries, and resource files. Off-site contract firms may obtain a copy of the workspace from the Facilities Technical Support Systems Department.

While the palettes are designed to be self-explanatory and easy to use, it is important to read and follow all prompts, since many execute MDL applications and user commands.

## Custom Menus and Tool Boxes

When MicroStation starts, it displays a custom command window. For each design discipline, Sandia provides several category submenus accessible under the Sandia menu and a Maps pull-down menu to attach GIS graphic files. All of the submenus operate like standard MicroStation menus but perform special functions. Selecting each submenu loads that system's tool frame menu. Each individual tool frame can be pulled off to show the tool boxes available for that selection. The submenus are illustrated in the following figures:

<u>Discipline</u>	<u>Figure</u>
Architectural	1-13
Mechanical	1-14
Electrical	1-15
Controls	1-16
Civil/Site	1-17
Noting	1-18
Maps	1-19
Planimetric Data	1-20
Planning Data	1-21
Transportation Data	1-22
Topographic Data	1-23
Utility Data	1-24
Survey Data	1-25
Misc. FGIS Data	1-26

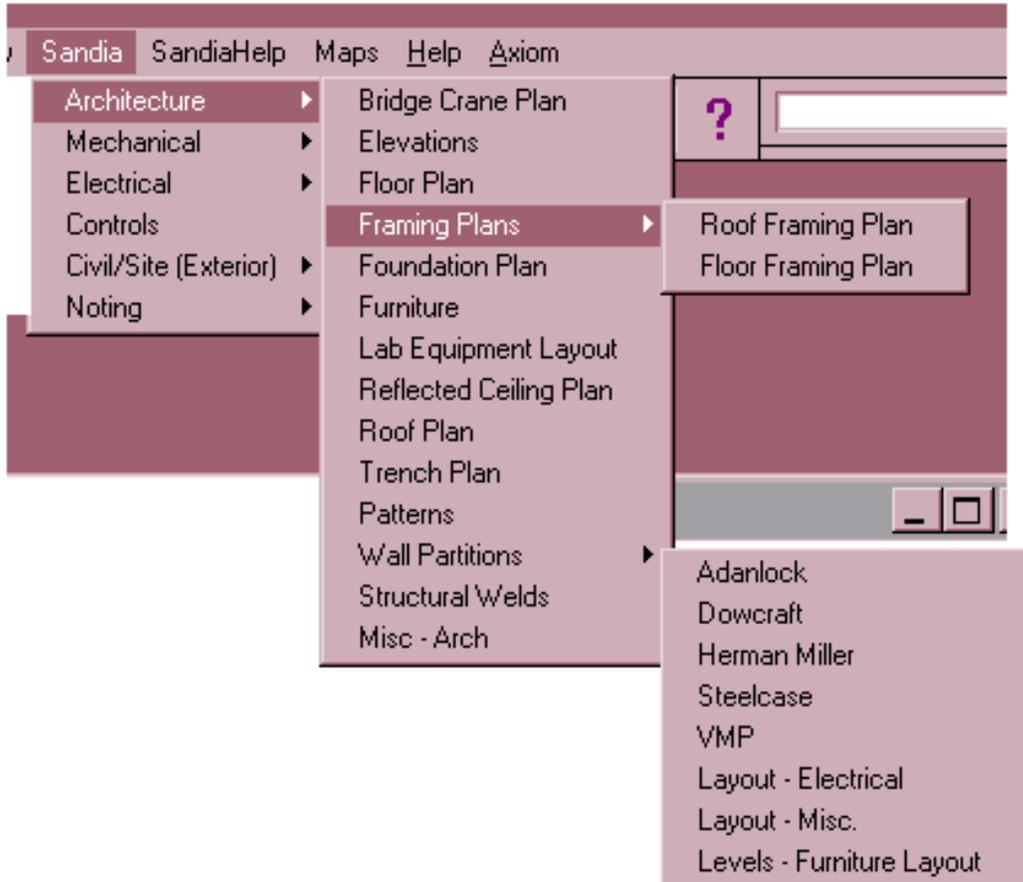


Figure 1-13. Architectural Submenu



Figure 1-14. Mechanical Submenu

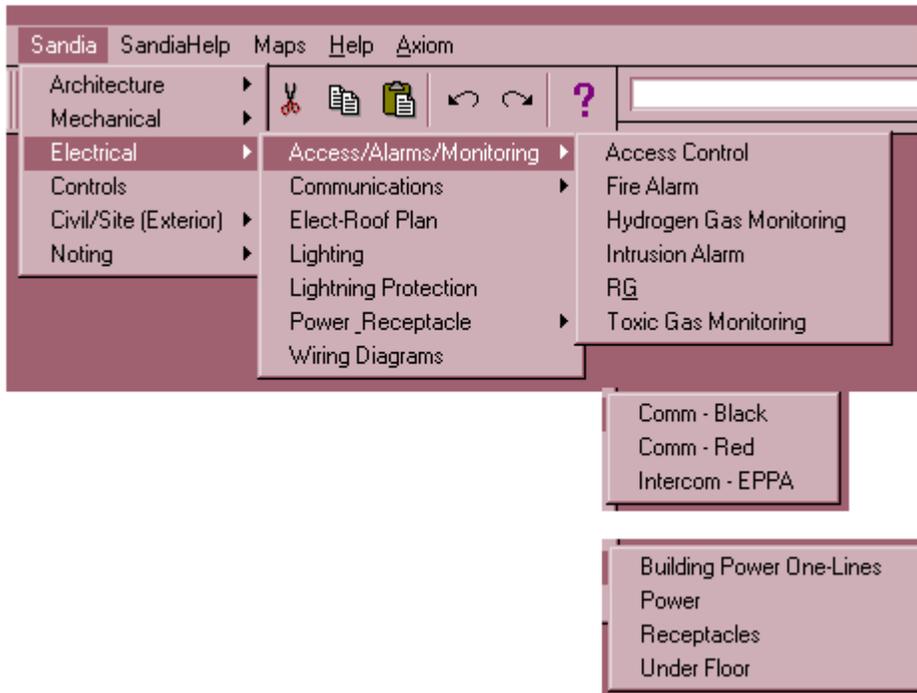


Figure 1-15. Electrical Submenu

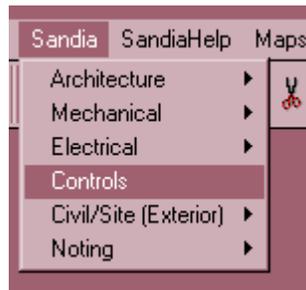


Figure 1-16. Controls Submenu

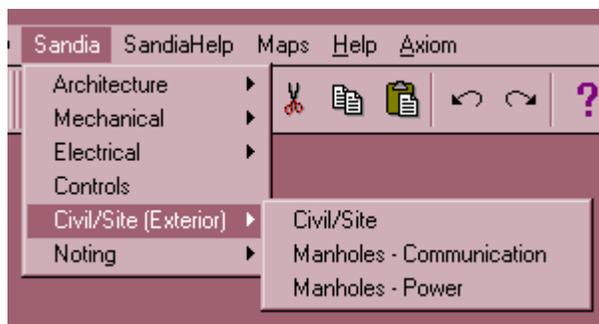


Figure 1-17. Civil/Site Submenu

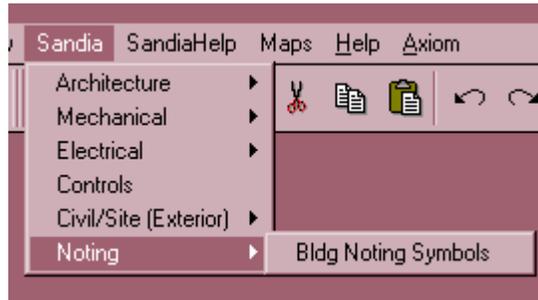


Figure 1-18. Building Noting Submenu

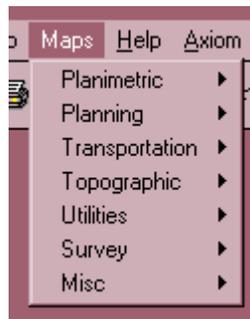


Figure 1-19 GIS Maps Pull-down Menu

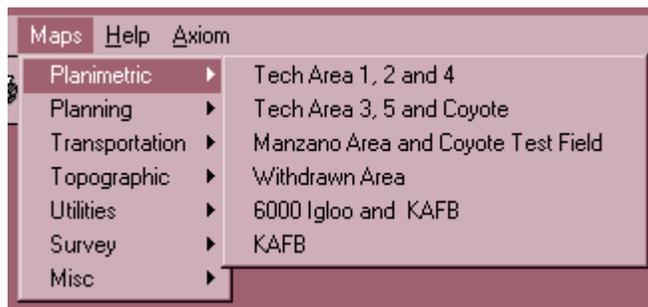


Figure 1-20 GIS Maps Planimetric Sub-Menu

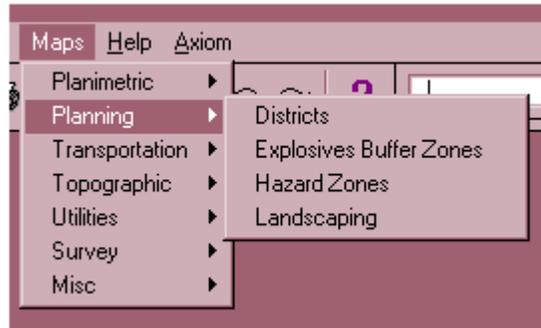


Figure 1-21 GIS Maps Planning Sub-Menu



Figure 1-22 GIS Maps Transportation Sub-Menu

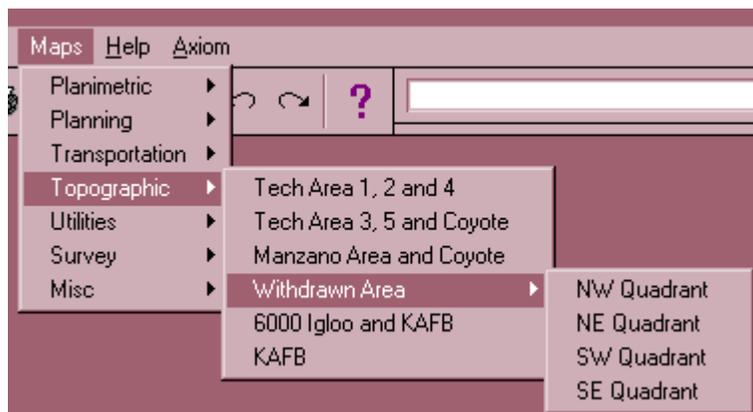


Figure 1-23 GIS Maps Topographic Sub-Menu

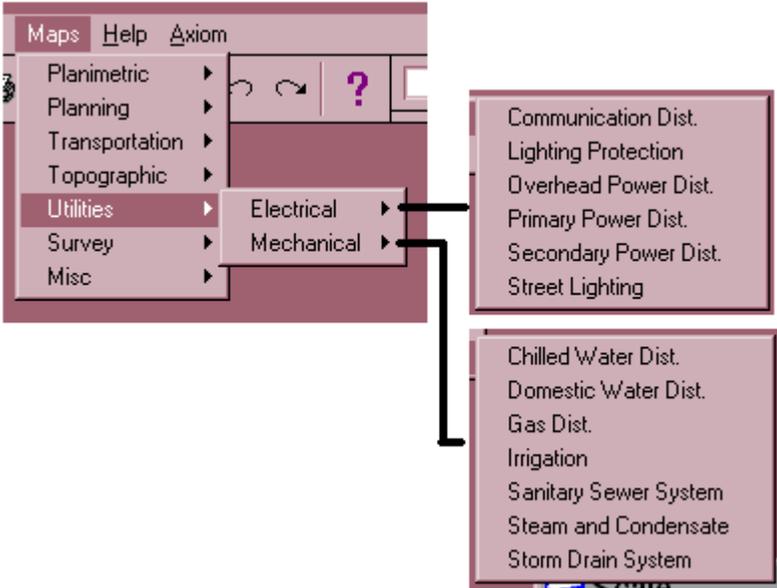


Figure 1-24 GIS Maps Utilities Sub-Menu

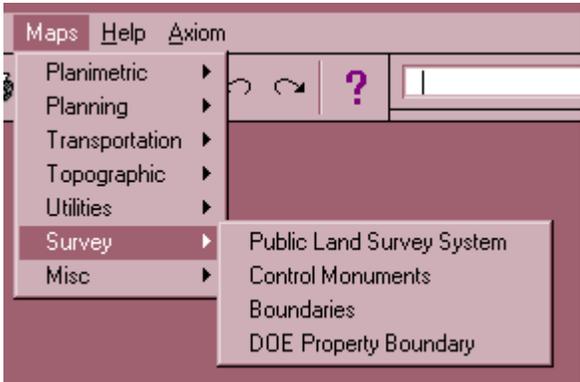


Figure 1-25 GIS Maps Survey Sub-Menu

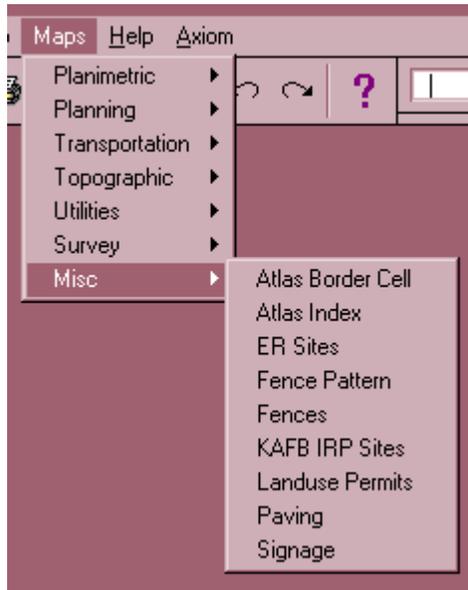


Figure 1-26 GIS Maps Misc. Sub-Menu

## **Chapter 2**

***2a – Civil/Site/Utility/Surveys***

***2b - Power Manholes***

***2c - Communications  
Manholes***

# **Section - 2a**

## ***Civil/Site/Utility/Surveys Drawing Standards & Level Schemes***

### **2a.1 Drawing File Types**

Sandia National Laboratories Civil Site Group uses 2 (two) major graphic file types: Construction files and Survey files.

- The Construction file includes Survey and New Construction Data.
- Topographic Surveys, Boundary/Land Use Permit Surveys include measurement data of real property. Environmental surveys include data pertaining to location of monitoring wells or other areas of environmental concerns.

Existing Site Data files sent out (hard copy and/or electronic files) to A/E/S generally contain one utility or planimetric system per file unless otherwise requested.

- ESD files include present existing conditions for the selected SNL site. These files will be provided in a Hard copy format unless otherwise specified by the assigned SNL Civil CADD coordinator. When the ESD files are provided in electronic format these files ONLY represent data for reference only (for clarification and infrastructure routing purposes). These files are not to be incorporated (referenced) into the design file. If data from the ESD files is needed in the construction files this data must be inserted manually into the construction file. This data must not be copied/referenced from the provided ESD files. See section on ESD's in this chapter for the request procedure.

### **2a.42 Construction Files**

Construction files are the final CADD files to be plotted. These files contain the new and existing data required to construct a project. This file is a stand-alone file where all the graphics are in an active format.

All Civil/Site/Utility and/or Survey systems work shall be based on ground distances and grid bearings, unless otherwise indicated. Final submittal requires that the drawing files be converted

to the SNL Grid based coordinates by applying the project combined ground to grid factor. Stationing and other dimensions shall remain as ground distances.

## 2a.3 Site/Utility/Surveys CADD Drawing/Creation

### Construction files & Survey Site files

1. *Construction and Site Survey files shall be generated from the (abq3D.dgn) seed file. The Civil/Site/Utility and/or the Survey Level Scheme must be followed for the creation of civil related drawings, refer to the end of this chapter. All new Site work shall be based on Ground Distances and Grid Bearings unless otherwise indicated. A/E's shall maintain a Master file system in Title I and Title II to simplify changes and modifications to the design as the projects progresses:*
2. *Title I – a printed set of drawings shall be submitted for review (unless otherwise directed by the project manager).*
3. *Title II – a printed set of drawings shall be submitted for review (unless otherwise directed by the project manager).*
4. *Title III – a printed set of 11" x 17" drawings shall be submitted for review along with Electronic drawing files in Microstation (DGN format). At this time electronic files shall be converted back to SNL **Grid** based Coordinates by applying the project combined ground to grid factor. Electronic files must be a stand-alone file, by copying all graphics active per construction plot file. No reference files shall be attached within the drawing files. The SNL supplied border file will also be copied into the drawing file as an active element. Failure to comply with the Civil/Site/Utility and/or Survey standards will result in incompatible and unacceptable files.*

## 2a.4 Survey Files

1. Survey files are the final CADD files to be plotted. These files must contain the required survey data outlined in the Scope of Work for boundary/land use permit surveys, topographic surveys or environmental surveys.
  - Survey drawings will be provided electronically in Microstation (DGN) format to SNL prior to commencing the engineering design.
  - (1) 24"x36" stamped mylar and (1) 11"x17" stamped mylar hard copy will also be required (unless otherwise specified by the Project Manager).
  - In addition the corresponding ASCII (.txt) file in an electronic format and a hard copy of the ASCII file will also be required upon final submission.
  - All survey nodes shall be a "+" and all text nodes (point numbers, feature codes, elevations and descriptions must be at a 45° angle in legible format.

2. The electronic version of survey drawing must contain all of the data that the ASCII file contains (control monuments, TBM, loop closures, etc.) this data shall be independent from the final submittal (plot file). Within the electronic graphic file this data shall be placed on user defined levels. SNL intent is so that the information used to gather the survey may be turned Off independently from the actual SNL requested survey.
3. All surveys must comply with the Survey CADD drawings level scheme enclosed in this chapter.

## **2a.5 Sandia Furnished Existing Site Data (ESD) File**

Each ESD file reflects present conditions and approximate locations for exterior utilities, roads, sidewalks, fences, planimetrics, etc. An ESD file is a composite of the Facilities Geographic Information Systems (FGIS) maps. Each ESD files that is provided to you contains the following disclaimer: *The location of utilities contained in these files is approximate and may not represent all utilities and/or accurate site conditions. The A/E/S or SNL designer shall verify the actual vertical and horizontal locations of the underground utilities prior to the design. A topographic design survey shall be performed for all site related projects unless otherwise directed by the SNL project manager.*

1. Submit an ESD Request Form to CADD Coordinator. This form defines the geographic location and boundaries required, and include the SNL project leader's name, and the project number. See the CADD manuals appendix for the Existing Site Data Form.
2. SNL CAD Technicians extract the requested data from the Master SNL/FGIS files to create the (.esd), and then sends a copy to the Architectural/Engineering/Surveying (A/E/S) firm as required. These (.esd) files will be provided in Microstation format. The data in these files reside on the levels and contain the colors and line types that SNL uses to maintain these infrastructure master SNL/FGIS files. This data is provided to you in this manner so that you have the flexibility to manipulate these files (turn elements On and Off and Delete) as needed to fit your application.
3. The ESD files serves as the A/E/S Composite Master Site files from which the Construction files are created from; in the event that a design topographic survey is not provided. When a topographic survey is performed, the ESD file is used to provide information that may not be indicated on the topographic survey. Any ESD data that is provided to you and incorporated into the construction file **must** be modified (levels 50-54 etc.) to conform to the Civil/Site/Utility and/or Survey CADD standards, refer to the enclosed level schemes. Please do not return any ESD files that were supplied to you in the final deliverable to SNL.

## **2a.6 Naming Files**

The convention for naming files is based on a Uniform Document System (UDS) convention. Refer to Chapter 1 for the requirements and the process for obtaining new drawing numbers.

## **2a.7 Sandia Supplied Border Files**

Sandia furnished file (bdutl.3d) includes plan type drawing borders of varying scales. Sandia furnished file (bdpp.3d) includes plan and profile drawing borders of varying scales. Select the scale, which is appropriate to the desired plot scale. The selected border shall be copied into the

plot file so that all data become active and each border shall contain SNL tag data in the title block informational section.

## 2a.8 Details and Sections

Details and sections shall be active in the plot file (no referenced files). Details and sections for the exterior disciplines shall follow the corresponding site level scheme, refer to the Civil/Site level scheme enclosed in this chapter.

## 2a.9 Sketches

Sketches are used when the drawing is not required to be a permanent record drawing or when a new drawing is not warranted. Examples of sketches are RFI or change order support documents, concept drawings, traffic control plans/phasing plans, detour(s) signage and striping, etc. In lieu of a drawing number enter the word “sketch” followed by a suffix if more than one sketch is required. Contact the SNL Civil project CADD Coordinator for approval of the “sketch” naming convention.

The drawing As-built Process will incorporate RFI and change order documents at project completion. This process updates the drawings to incorporate directed changes and usually does not require a new drawing but simply updating the existing drawing to reflect the directed changes.

## 2a.10 Seed File

The SNL Furnished Seed File is (abq3d.dgn). It is based on the New Mexico State Plane (NMSP) Coordinate System, New Mexico Central Zone, North American Datum 1927 and North American Vertical Datum 1929. Sandia Seed File based on grid coordinates. All exterior plan work shall be based on ground distances and grid bearing unless otherwise indicated.

## 2a.11 System Standards

### Working Units

The standard (abq3d.dgn) design file working units for the site/utility drawings are as follows:

Master units = sf (survey feet)  
Sub units = su  
Sub units per sf = 1000  
Positional units per sub unit = 1  
Working Area = 4,294,967 square feet

## 2a.12 Cell Libraries

Cells for plot files shall be scaled to match the plotting scale factor. Refer to Section 7.13, for Cell plotting Scale factors. The standard site cell libraries include the following:

- `util.cel` All civil/utility cell pertinent to file.

Cells not available in these libraries shall be created at 1:1 scale factor. Cells that are created for a specific project by an A/E should be stored in a miscellaneous Cell Library and submitted to

SNL with the final deliverable. SNL will evaluate and consider possible implementation into the SNL supplied Util.cell library.

## 2a.13 Global Origin

Use seed file `abq3d.dgn`. Do not move location of ESD files. The site location must not change within the SNL coordinate system.

## 2a.14 Text Font

The Facilities Business Unit has modified the default Microstation Font Resource File, `font.rsc`, font 1, which is included in the SNL-provided configuration files. The changes to the `font.rsc` file include the following:

- Putting a slash through the number 0 to differentiate it from the letter O
- Added tick at top of the number 1 to differentiate it from the letter l and I.
- Substituting the degree (°) symbol for the caret (^) sign
- Substituting the diameter (Ø) symbol for the question mark (?)

## 2a.15 Text Size

The final scale affects the text parameters for text entry. To maintain consistency, text shall be center justified, with text parameters (at various scales) as follows:

The following table lists the scale factors used for text and cells for creating plot files using `bdut1.3D` and `bdpp.3D`:

Plotting Scale Factor	Cell	Text		
	AS=	TH=	TW=	LS=
4:1	1	.5	.4	.3
2:1	.5	.25	.2	.15
10:1	2.5	1.25	1	.75
20:1	5.	2.5	2	1.5
30:1	7.5	3.75	3	2.25
40:1	10.	5.	4	3
50:1	12.5	6.25	5	3.75
60:1	15	7.5	6	4.5
100:1	25	12.5	10	7.5
200:1	50	25.	20	1

## 2a.16 Levels

Refer to the Civil/Site/Utility and/or Survey level schemes enclosed in this chapter. User-defined levels are used when the standard level scheme do not accommodate design needs of a particular project. Contact the SNL Civil project CADD Coordinator for approval of user-defined levels. User-defined levels shall be documented in the graphic plot file using the file-specific information cell (AC=FSI) that reside outside the SNL supplied border files.

## **2a.17 Line Weights**

Line weight assignments are specified in Civil/Site/Utility and/or Survey level schemes enclosed in this chapter. Line weights for details and sections are drawn according to design need.

## **2a.18 Line Styles**

Line style assignments are specified in Civil/Site/Utility and/or Survey level scheme enclosed in this chapter.

## **2a.19 Color Table**

Colors are assigned by number and are specified in the Civil/Site Level Scheme in this chapter. Use color table `gisd.ctb` for all site related files.

## **2a.20 Z Depth**

- Surveys (boundaries, topographic, utility) provided for SNL must hold “Z” depth as collected in the field.
- Sandia supplied ESD files shall maintain 0.00 “Z” depth.
- Construction Plot files shall have a “Z” depth of 0.00 at time of final submittal. If any survey data is used to compile the construction plot file the survey data must hold “Z” depth as collected in the field.

## **2a.21 SNL Standard Drawings**

Standard drawings are used to facilitate the design process by providing typical details and templates for incorporation into design packages. These files are not to be edited in any way or form. Do (SNL) not check in standard drawings to the CADD file server. When requested, the standard Drawings will be provided by the assigned CADD coordinator. If a standard file is modified for any reason it automatically becomes its own independent file and part of a Construction set and a new UDS number should be assigned or it will be considered as an unacceptable file!

## **2a.22 How to use SNL Standard Drawings**

When it is necessary to create new composite detail files using certain details from SNL Standard drawings you must create a new file and copy/insert required details and assign a new UDS drawing number.

Arch. Drawing Standards

Use Arch working units 12:8000

Site/utility Drawing Standards

Use Site/utility working units 1000:1

Do not mix Std. Arch. and Site Details.

*For additional information on using standard drawings, refer to Chapter 1 in the CADD manual.*

## **2a.23 View Rotation**

If a view must be rotated for clarity, use the command Change View Rotation to rotate the *view*. The coordinates shall remain true.

The Microstation Change View Rotation Command is found under the Tools, 3D, 3D View Control, and Change View Rotation Tool Box menus. Use this command to rotate a view while holding the coordinate system place.

- Electronic files submitted to SNL should maintain the coordinate system that SNL supplied with the ESD files or by using the abq3d.dgn seed file unless specified otherwise by the Project Manager.
- Do not rotate border or Existing Site Data files.

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1	SHEET SPECIFIC : TEXT, CALLOUTS, KEYNOTES LEGEND, SCHEDULE TEXT, LEADER LINES w/ TERMINATOR, GENERAL NOTES, MATCHLINES, TITLE BLOCK				USE UTIL.CEL
2	DIMENSIONS, ALL	5	1	0	
3	AREA PATTERNS				USER DEFINABLE SYMBOLOGY - DOCUMENT
4	ROADS, CURB & GUTTER, SIDEWALK, SIGNS, TRAILS, BIKE TRAILS, PAVEMENT EDGE, PARKING LOTS	248	2	0	
5	FENCE w/ANNOTATION	3	2	0	
6	BUILDING & ALL STRUCTURE OUTLINES w/ ANNOTATIONS	0	5	0	
7	PROPERTY LINES, EASEMENTS, CONSTRUCTION LIMITS w/ANNOTATIONS	0	2	0	
8	DEMOLITION (CROSS-HATCHING TO INDICATE EXISTING TO BE REMOVED)	234	0	0	
9	CONTROL MONUMENTS, TIES, BENCHMARKS	1	0	0	
10	RAILROADS				USER DEFINABLE SYMBOLOGY - DOCUMENT
11	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
12	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
13	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
14	LANDSCAPING - ALL COMPONENTS	240	3	0	
15	IRRIGATION LINES - ALL COMPONENTS	162	6	0	
16	WATERLINES w/ANNOTATIONS, FITTINGS	56	8	0	
17	SEWER LINES w/ANNOTATIONS, MANHOLES - ALL COMPONENTS	2	8	0	
18	GAS LINES w/ANNOTATIONS - ALL COMPONENTS	5	8	0	
19	STEAM LINES w/ANNOTATIONS & MANHOLES - ALL COMPONENTS	4	8	0	
20	STEAM PITS - CONCRETE OUTLINE & RELATED GRAPHICS	4	8	0	
21	THERMAL w/ANNOTATIONS - ALL COMPONENTS	6	8	0	
22	ALL COMMUNICATION LINES w/ANNONTATIONS & MANHOLES	21	8	0	
23	ELECTRICAL LINES HIGH VOLTAGE (U/G) w/MANHOLES - ALL COMPONENTS	8	8	0	
24	ELECTRICAL LINES (O/H) w/POWER POLES - ALL COMPONENTS	8	3	0	
25	ALL ELECTRICAL EQUIPMENT- TRANSFORMER, SWITCHGEAR, METERS, PANELS, ANNOTATIONS	8	4	0	
26	STREET/SECURITY EXTERIOR LIGHTING - ALL COMPONENTS	24	4	0	
27	ELECTRICAL SECONDARY LOW VOLTAGE (U/G) LINES - ALL COMPONENTS	1	8	0	
28	STORM DRAIN LINES w/ANNOTATIONS, MANHOLES, INLETS, CLEANOUTS	1	8	0	
29	DRAINAGE COMPONENTS - ALL OTHER	1	2	0	
30	SITE GRADING - ALL COMPONENTS	130	2	0	
31	PROFILE DATA - ALL GRAPHICS & TEXT	216	3	0	
32	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
33	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
34	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
35	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
36	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
37	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
38	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
39	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
40	SITE DETAILS - ALL GRAPHICS & TEXT				USER DEFINABLE SYMBOLOGY - DOCUMENT
41	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
42	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
43	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
44	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
45	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
46	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
47	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
48	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
49	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
50	ALL BUILDINGS & STRUCTURES	234	1	0	EXISTING SITE DATA
51	ALL ROADS, CURB & GUTTER, PARKING LOTS, ETC.	234	0	0	EXISTING SITE DATA
52	ALL COMBINED ELECT., COMM., STLTG., OVERHEAD POWER LINES	234	0	2	EXISTING SITE DATA
53	ALL COMBINED MECH., SEWER, STORM, WATER, THERMAL, GAS & STEAM	234	0	2	EXISTING SITE DATA
54	ALL OTHER EXISTING SITE COMPONENTS				EXISTING SITE DATA
55	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
56	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
57	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
58	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
59	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
60	SURVEY NODES				EXISTING SITE DATA
61	SURVEY FEATURE CODES				EXISTING SITE DATA
62	SURVEY ELEVATIONS				EXISTING SITE DATA
63	SURVEY UTILITY STANDARDS MANUAL				EXISTING SITE DATA

**CIVIL/SITE/UTILITY DRAWINGS**

LEVEL SCHEME - MICROSTATION

PROPOSED CONSTRUCTION LEVELS 1-47

GREY AREA

EXISTING DATA LEVELS 50-59

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1	SHEET SPECIFIC : TEXT, CALLOUTS, KEYNOTES LEGEND, SCHEDULE TEXT, LEADER LINES w/ TERMINATOR, GENERAL NOTES, MATCHLINES, TITLE BLOCK				USE UTIL.CEL
2	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
3	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
4	ROADS, CURB & GUTTER, SIDEWALK, SIGNS, TRAILS, BIKE TRAILS, PAVEMENT EDGE, PARKING LOTS				USER DEFINABLE SYMBOLOGY - DOCUMENT
5	FENCE w/ANNOTATION				USER DEFINABLE SYMBOLOGY - DOCUMENT
6	BUILDING & ALL STRUCTURE OUTLINES w/ ANNOTATIONS				USER DEFINABLE SYMBOLOGY - DOCUMENT
7	PROPERTY LINES, EASEMENTS, CONSTRUCTION LIMITS w/ANNOTATIONS				USER DEFINABLE SYMBOLOGY - DOCUMENT
8	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
9	CONTROL MONUMENTS, TIES, BENCHMARKS				USER DEFINABLE SYMBOLOGY - DOCUMENT
10	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
11	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
12	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
13	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
14	LANDSCAPING - ALL COMPONENTS				USER DEFINABLE SYMBOLOGY - DOCUMENT
15	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
16	WATER/IRRIGATION LINESw/ANNOTATIONS, FITTINGS				USER DEFINABLE SYMBOLOGY - DOCUMENT
17	SEWER LINES w/ANNOTATIONS, MANHOLES - ALL COMPONENTS				USER DEFINABLE SYMBOLOGY - DOCUMENT
18	GAS LINES w/ANNOTATIONS - ALL COMPONENTS				USER DEFINABLE SYMBOLOGY - DOCUMENT
19	STEAM/THERMAL LINES/PITS w/ANNOTATIONS & MANHOLES - ALL COMPONENTS				USER DEFINABLE SYMBOLOGY - DOCUMENT
20	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
21	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
22	ALL COMMUNICATION LINES w/ ANNOTATIONS & MANHOLES				USER DEFINABLE SYMBOLOGY - DOCUMENT
23	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
24	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
25	ALL ELECTRICAL/COMM/ST.LIGHTING w/ANNOTATIONS - ALL COMPONENTS				USER DEFINABLE SYMBOLOGY - DOCUMENT
26	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
27	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
28	STORM DRAIN LINES w/ANNOTATIONS - ALL COMPONENTS				USER DEFINABLE SYMBOLOGY - DOCUMENT
29	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
30	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
31	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
32	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
33	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
34	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
35	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
36	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
37	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
38	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
39	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
40	LOCATION MAPS - ALL GRAPHICS & TEXT				USER DEFINABLE SYMBOLOGY - DOCUMENT
41	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
42	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
43	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
44	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
45	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
46	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
47	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
48	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
49	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
50	ALL BUILDINGS & STRUCTURES	234	1	0	SNL SUPPLIED EXISTING SITE DATA
51	ALL ROADS, CURB & GUTTER, PARKING LOTS, ETC.	234	0	0	SNL SUPPLIED EXISTING SITE DATA
52	ALL COMBINED ELECT., COMM., STLTG., OVERHEAD POWER LINES	234	0	2	SNL SUPPLIED EXISTING SITE DATA
53	ALL COMBINED MECH., SEWER, STORM, WATERM THERMAL, GAS & STEAM	234	0	2	SNL SUPPLIED EXISTING SITE DATA
54	ALL OTHER EXISTING SITE COMPONENTS				SNL SUPPLIED EXISTING SITE DATA
55	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
56	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
57	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
58	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
59	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
60	SURVEY NODES				FIELD GATHERED SITE DATA
61	SURVEY FEATURE CODES				FIELD GATHERED SITE DATA
62	SURVEY ELEVATIONS				FIELD GATHERED SITE DATA
63	SURVEY POINT NAMES				FIELD GATHERED SITE DATA

**BOUNDARY, TOPO'S & FIELD SURVEY DRAWINGS**  
LEVEL SCHEME - MICROSTATION

GREY AREA  
SNL SUPPLIED DATA WITHIN THE ESD FILES SHALL BE  
ON LEVELS 50-59 ONLY

# **Section – 2b**

## ***Power Manholes Drawing Standards & Level Scheme***

### **2b.1 Creating Power Manhole Drawings**

Power manhole drawings shall be generated using the SNL CADD Workspace Power Manhole Palette. Drawings shall be drawn at a 1:1 scale and shall be plotted at ¾"=1'-0" using the SNL supplied ¾" border. No reference files shall be attached, all elements shall be active. Refer to the sample manhole drawing in this chapter for typical cells and elements that constitute a power manhole drawing.

### **2b.2 General File requirements**

This chapter includes requirements for drawing file types and standards only. For the following requirements and standards refer to Chapter 1:

- CADD Software Requirements
- Access to Space and Sites Services CADD Server
- How to Find Drawing Files
- CADD Files Check-in/Check-out
- Obtaining New Drawing File Numbers
- Deliverable File Requirements
- Data Transfer Requirements

Refer to Chapter 1 section 1.9.1 for working unit settings

Refer to Chapter 1 section 1.9.14 for use of standard drawings

Refer to Chapter 1 section 1.10 for general information on the SNL CADD Palette menus

### **2b.3 Construction Plot Files**

Construction Plot files are the final CADD files to be plotted. Plot files contain new and existing data and specific project information required to construct a project.

#### **2b.3.1 Naming Plot Files**

To obtain a new drawing number/file name refer to Chapter 1 Section 1.5 (Obtaining New Drawing File Numbers). Sandia Facilities follows a modified version of the Uniform Drawing System (UDS) file naming convention standard for all plot files.

Power Manhole Drawings are named as follows:

## **WP5101MH067.dgn**

W = DISCIPLINE (CIVIL WORKS)

P = SUB DISCIPLINE (POWER)

5 = DRAWING TYPE

1 = TECH AREA MANHOLE LOCATION

01 = SEQUENCE NUMBER

MH067 = MANHOLE NUMBER

### **2b.3.2 Border Files**

Manhole drawings shall use the 3/4" border file supplied in the SNL CADD Workspace Manhole Palette.

### **2b.3.3 Plot Files**

All of the noting cells, noting symbols, title block tag data, revision tag data and text shall be inserted from the SNL CADD Workspace Power Manhole Palette as these are automatically scaled to coincide with the 3/4" border required for the manhole drawings.

## **2b.4 Cell Libraries**

The following cell library shall be used for power manhole drawings:

MHPWR.cel

Manhole cell library

## **2b.5 Levels, Line Weights and Line Types**

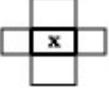
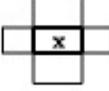
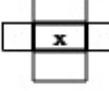
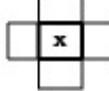
Refer to the level scheme in this chapter. User-defined levels, line weights and line types are used when the standard scheme do not accommodate design needs of a particular project. Contact the SNL Project CADD Coordinator for approval of user-defined levels. User-defined levels shall be documented in the graphic plot file using the file-specific information cell (AC=FSI).

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1	MH PLAN VIEW (OUTLINE) COVER/ LADDER/ VENTS/ DRAIN				USE PRE-DEFINED CELLS
2	MH WALL OUTLINE/ GROUNDING/ RACKS/ PULL IRON/ SUMP & SUMP PUMP				USE PRE-DEFINED CELLS
3	DUCT BANK & FEEDER NUMBER ON DUCT BANK				USE PRE-DEFINED CELLS
4	LIGHTS & RECPT/ MISC. PWR/ SPECIAL SYS.				USE PRE-DEFINED CELLS
5	GENERAL TEXT / BORDER	0			
6					
7					
8	FEEDER 3801/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	1	3	0	
9	FEEDER 3802/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	1	3	0	
10	SUB 35 FEEDERS				
11	FEEDER 3501/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	6	3	0	USE PRE-DEFINED CELLS
12	FEEDER 3502/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	6	3	0	USE PRE-DEFINED CELLS
13	FEEDER 3503/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	6	3	0	USE PRE-DEFINED CELLS
14	FEEDER 3504/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	6	3	0	USE PRE-DEFINED CELLS
15	FEEDER 3505/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	6	3	0	USE PRE-DEFINED CELLS
16	FEEDER 3506/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	6	3	0	USE PRE-DEFINED CELLS
17	FEEDER 3507/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	6	3	0	USE PRE-DEFINED CELLS
18					
19					
20	SUB 36 FEEDERS				
21	FEEDER 3601/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	215	3	0	USE PRE-DEFINED CELLS
22	FEEDER 3602/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	215	3	0	USE PRE-DEFINED CELLS
23	FEEDER 3603/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	215	3	0	USE PRE-DEFINED CELLS
24	FEEDER 3604/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	215	3	0	USE PRE-DEFINED CELLS
25	FEEDER 3605/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	215	3	0	USE PRE-DEFINED CELLS
26	FEEDER 3606/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	215	3	0	USE PRE-DEFINED CELLS
27	FEEDER 3607/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	215	3	0	USE PRE-DEFINED CELLS
28					
29					
30	SUB 37 FEEDERS				
31	FEEDER 3701/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	119	3	0	USE PRE-DEFINED CELLS
32	FEEDER 3702/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	119	3	0	USE PRE-DEFINED CELLS
33	FEEDER 3703/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	119	3	0	USE PRE-DEFINED CELLS
34	FEEDER 3704/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	119	3	0	USE PRE-DEFINED CELLS
35	FEEDER 3705/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	119	3	0	USE PRE-DEFINED CELLS
36	FEEDER 3706/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	119	3	0	USE PRE-DEFINED CELLS
37	FEEDER 3707/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	119	3	0	USE PRE-DEFINED CELLS
38					
39					
40	SUB 41 FEEDERS				
41	FEEDER 4101/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	120	3	0	USE PRE-DEFINED CELLS
42	FEEDER 4102/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	120	3	0	USE PRE-DEFINED CELLS
43	FEEDER 4103/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	120	3	0	USE PRE-DEFINED CELLS
44	FEEDER 4104/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	120	3	0	USE PRE-DEFINED CELLS
45	FEEDER 4106/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	120	3	0	USE PRE-DEFINED CELLS
46	FEEDER 4107/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	120	3	0	USE PRE-DEFINED CELLS
47					
48					
49					
50					
51	BACKUP GENERATOR 862 FEEDERS				
52	FEEDER 302/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	253	3	3	USE PRE-DEFINED CELLS
53	FEEDER 304/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	253	3	3	USE PRE-DEFINED CELLS
54	FEEDER 306/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	253	3	3	USE PRE-DEFINED CELLS
55	FEEDER 308/ T-BODY/ GROUNDING/ INSULATORS/ FEEDER LABELS	253	3	3	USE PRE-DEFINED CELLS
56					
57					
58					
59					
60					
61					
62	DRAFTING NOTES (NOT A PLOTTING LEVEL)	200	2	0	
63	REMOVALS	216	3	0	

MANHOLES - POWER - LEVEL SCHEME



# MANHOLE LAYOUTS

CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	5.5X3	5 SIDED MANHOLE, 5.5x5.5x3x3x3	1,2	0,2	1,3	0
	6X10	4 SIDED MANHOLE, 6X10X6X10	1,2	0,2	1,3	0
	6X11	4 SIDED MANHOLE, 6X11X6X11	1,2	0,2	1,3	0
	6X12	4 SIDED MANHOLE, 6X12X6X12	1,2	0,2	1,3	0
	6X6	4 SIDED MANHOLE, 6X6X6X6	1,2	0,2	1,3	0
	6X8	4 SIDED MANHOLE, 6X8X6X8	1,2	0,2	1,3	0
	6.5X4	5 SIDED MANHOLE, 6.5X6.5X4X3.5X4	1,2	0,2	1,3	0
	8X10	4 SIDED MANHOLE, 8X10X8X10	1,2	0,2	1,3	0
	9X2	8 SIDED MANHOLE, 9X2X9X2X9X2X9X2	1,2	0,2	1,3	0



# STANDARD MANHOLE EQUIPMENT

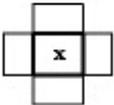
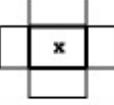
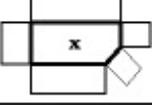
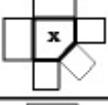
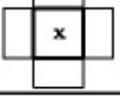
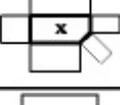
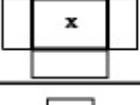
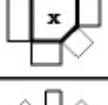
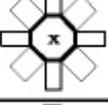
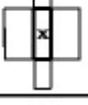
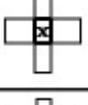
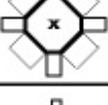
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
◇	PINSUL	PORCELAIN INSULATOR (LEVEL TO BE DETERMINED BY FEEDER)			3	0
—	PIRON	PULLING IRON	2	0	1	0
⑤	PPULL	PULL ROPE	2	0	1	0
—	PRACK	CABLE RACK	2	0	1	0
⊖	PDRANR	MANHOLE DRAIN	1	0	1	0
⊖	PDRANR	MANHOLE DRAIN	1	0	1	0
I	LADDER	LADDER	1	7	1	0

MHPWR.CEL

X - DENOTES CELL ORIGIN

REVISED 5/02

# MANHOLE LAYOUTS

CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	10X12	4 SIDED MANHOLE, 10X12X10X12	1,2	0,2	1,3	0
	10X135	4 SIDED MANHOLE, 10X13.5X10X13.5	1,2	0,2	1,3	0
	10X215	5 SIDED MANHOLE, 10X21.5X6X5.6X18	1,2	0,2	1,3	0
	10X6	5 SIDED MANHOLE, 10X10X6X5X6	1,2	0,2	1,3	0
	12X12	4 SIDED MANHOLE, 12X12X12X12	1,2	0,2	1,3	0
	12X145	5 SIDED MANHOLE, 6.5X14.5X4X3.5X12	1,2	0,2	1,3	0
	12X18	4 SIDED MANHOLE, 12X18X12X18	1,2	0,2	1,3	0
	135X9	5 SIDED MANHOLE, 13.5X13.5X9X6.3X9	1,2	0,2	1,3	0
	34X52	8 SIDED MANHOLE, 3.4X5.2X3.4X5.2X3.4X5.2X3.4X5.2	1,2	0,2	1,3	0
	4X12	4 SIDED MANHOLE, 4X12X4X12	1,2	0,2	1,3	0
	4X6	4 SIDED MANHOLE, 4X6X4X6	1,2	0,2	1,3	0
	4X9	8 SIDED MANHOLE, 4X9X4X9X4X9X4X9	1,2	0,2	1,3	0
	5.1X2	8 SIDED MANHOLE, 5.1X2X5.1X2X5.1X2X5.1X2	1,2	0,2	1,3	0

MHPWR.CEL

X - DENOTES CELL ORIGIN

REVISED 5/02

# CONDUITS AND DUCTS

CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
⊗	PC1	SINGLE DUCT OR CONDUIT	16	5	3	0
○⊗○	PC2C1 R	2-DUCT OR CONDUIT, 1 ROW	16	5	3	0
○⊗○	PC3C1 R	3-DUCT OR CONDUIT, 1 ROW	16	5	3	0
○○⊗○	PC4C1 R	4-DUCT OR CONDUIT, 1 ROW	16	5	3	0
<pre> ○ ○   X ○ ○                     </pre>	PC2C2R	4-DUCT OR CONDUIT, 2 ROW, 2 COLUMN	16	5	3	0
<pre> ○ ○ ○   X ○ ○ ○                     </pre>	PC3C2R	6-DUCT OR CONDUIT, 2 ROW, 3 COLUMN	16	5	3	0
<pre> ○ ○ ○ ○   X ○ ○ ○ ○                     </pre>	PC4C2R	8-DUCT OR CONDUIT, 2 ROW, 4 COLUMN	16	5	3	0
<pre> ○   X ○                     </pre>	PC1 C2R	2-DUCT OR CONDUIT, 1 COLUMN	16	5	3	0
<pre> ○   X ○                     </pre>	PC1 C3R	3-DUCT OR CONDUIT, 1 COLUMN	16	5	3	0
<pre> ○ ○   X ○ ○                     </pre>	PC2C3R	6-DUCT OR CONDUIT, 2 COLUMN, 1 ROW	16	5	3	0
<pre> ○ ○ ○   X ○ ○ ○                     </pre>	PC3C3R	9-DUCT OR CONDUIT, 3 COLUMN, 3 ROW	16	5	3	0
<pre> ○ ○ ○ ○   X ○ ○ ○ ○                     </pre>	PC4C3R	12-DUCT OR CONDUIT, 4 COLUMN, 3 ROW	16	5	3	0
<pre> ○   X ○   X ○                     </pre>	PC1 C4R	4-DUCT OR CONDUIT, 1 COLUMN, 4 ROW	16	5	3	0
<pre> ○ ○   X ○ ○   X ○ ○                     </pre>	PC2C4R	8-DUCT OR CONDUIT, 2 COLUMN, 4 ROW	16	5	3	0
<pre> ○ ○ ○   X ○ ○ ○   X ○ ○ ○                     </pre>	PC3C4R	12-DUCT OR CONDUIT, 3 COLUMN, 4 ROW	16	5	3	0
<pre> ○ ○ ○ ○   X ○ ○ ○ ○   X ○ ○ ○ ○                     </pre>	C4C4R	16-DUCT OR CONDUIT, 4 COLUMN, 4 ROW	16	5	3	0

# ***Section – 2c***

## ***Communication Manholes Drawing Standards & Level Scheme***

### **2c.1 Creating Communication Manhole Drawings**

Communication manhole drawings shall be generated using the SNL CADD Workspace Manhole Palette. Drawings shall be drawn at a 3/4:1 scale and shall be plotted at 1/4"=1'-0" using the SNL supplied 1/4" border. No reference files shall be attached, all elements shall be active, with the exception of the border file.

### **2c.2 General File requirements**

This chapter includes requirements for drawing file types and standards only. For the following requirements and standards refer to Chapter 1:

- CADD Software Requirements
- Access to Space and Sites Services CADD Server
- How to Find Drawing Files
- CADD Files Check-in/Check-out
- Obtaining New Drawing File Numbers
- Deliverable File Requirements
- Data Transfer Requirements

### **2c.3 Construction Plot Files**

Construction Plot files are the final CADD files to be plotted. Plot files contain new and existing data and specific project information required to construct a project.

### **2c.4 Naming Plot Files**

To obtain a new drawing number/file name refer to Chapter 1 Section 1.5 (Obtaining New Drawing File Numbers). Sandia Facilities follows a modified version of the Uniform Drawing System (UDS) file naming convention standard for all plot files.

Communication Manhole Drawings are named as following:

WE5101MH005.dgn WO501MH005.dgn (FIBER)

W = DISCIPLINE (CIVIL WORKS)

E/O = SUB DISCIPLINE (COMMUNICATIONS)

5 = DRAWING TYPE

1 = TECH AREA MANHOLE LOCATION

01 = SEQUENCE NUMBER

MH005 = MANHOLE NUMBER

### **2c.5 Border Files**

Manhole drawings shall use the 1/4" border file supplied in the SNL CADD Workspace Manhole Palette.

### **2c.6 Plot Files**

All of the noting cells, noting symbols, title block tag data, revision tag data and text shall be inserted from the SNL CADD Workspace Manhole Palette as these are automatically scaled to coincide with the 1/4" border required for the manhole drawings.

### **2c.7 Cell Libraries**

The following cell library shall be used for communication manhole drawings:

Manholes.cel

Manhole cell library

#### **2c.7.1 Levels, Line Weights and Line Types**

Refer to the project specific level documentation in this chapter. User-defined levels, line weights and line types are used when the standard schemas do not accommodate design needs of a particular project. Contact the SNL Project CADD Coordinator for approval of user-defined levels. User-defined levels shall be documented in the graphic plot file using the file-specific information cell (AC=FSI).

**PROJECT SPECIFIC LEVEL DOCUMENTATION**

LV	SETSYM EXAMPLE	ELEMENT DESCRIPTION	CO	WT	LC
1	BUILDINGS		0	0	1
3	MANHOLES		1	1	6
31	COMM 31		2	1	0
32	COMM 32		3	1	0
33	COMM 33		4	1	0
34	COMM 34		5	1	0
35	COMM 35		205	1	0
20	MISC.		0	1	0
50	LEAD		116	1	0

REFERENCE FILE MANIPULATIONS RF					
FILE NAME	LOGICAL NAME	MOVED (DI) OR (DL)	SCALE: (MASTER: REF)	ROTATE: (X, Y, Z)	MISCELLANEOUS

**SPECIAL NOTES : COMM COPPER ONE-LINE**

AC = FSI

REVISED 1/01

**PROJECT LEVEL SYMBOLOGY DOCUMENTATION PLATE**

DEVELOPED BY THE MASTER / PLOT FILE QUALITY ACTION TEAM @ FACILITIES ENGINEERING DEPARTMENT - SANDIA NATIONAL LABORATORIES, ALBUQUERQUE, NM

**PROJECT SPECIFIC LEVEL DOCUMENTATION**

LV	SETSYM EXAMPLE	ELEMENT DESCRIPTION	CO	WT	LC
1	BUILDINGS		0	0	1
3	MANHOLES		1	1	6
30	RED COMM		83	1	0
31	RED COMM SM		100	1	0
32	RED COMM MM		54	1	0
40	RED RING		6	1	0
41	RED RING SM		3	1	0
42	RED RING MM		4	1	0
50	BLACK COMM		5	1	0
51	BLACK COMM SM		183	1	0
52	BLACK COMM MM		231	1	0
60	BLACK RING		9	1	0
61	BLACK RING SM		210	1	0
62	BLACK RING MM		248	1	0
20	MISC.		0	1	0

REFERENCE FILE MANIPULATIONS RF					
FILE NAME	LOGICAL NAME	MOVED (DI) OR (DL)	SCALE: (MASTER: REF)	ROTATE: (X, Y, Z)	MISCELLANEOUS

**SPECIAL NOTES : COMM FIBER ONE-LINE**

AC = FSI

REVISED 1/01

**PROJECT SPECIFIC LEVEL DOCUMENTATION**

LV	SETSYM EXAMPLE	ELEMENT DESCRIPTION	CO	WT	LC
1	BUILDINGS		0	0	1
3	MANHOLES		1	1	6
20	MISC.		0	1	0
16	INTRUSION ALARM		102	1	0
15	INTRUSION ALARM		XXX	1	0
14	ACCESS CONTROL.		134	1	0
19	LAN COAX		81	1	0
18	ALCATEL SM FIBER		111	1	0

REFERENCE FILE MANIPULATIONS RF					
FILE NAME	LOGICAL NAME	MOVED (DI) OR (DL)	SCALE: (MASTER: REF)	ROTATE: (X, Y, Z)	MISCELLANEOUS

**SPECIAL NOTES : COMM IA-COPPER ONE-LINE**

AC = PSI

REVISED 1/01

**PROJECT LEVEL SYMBOLOGY DOCUMENTATION PLATE**

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**PROJECT SPECIFIC LEVEL DOCUMENTATION**

LV	SETSYM EXAMPLE	ELEMENT DESCRIPTION	CO	WT	LC
20	COPPER		7	3	0
21	FIBER		5	3	0
24	SYSTEM-COPPER		15	3	0
25	SYSTEM-FIBER		9	3	0
26	CNTRL MNTRG SYS-COPPER		107	3	0
27	CNTRL MNTRG SYS-FIBER		132	3	0
28	ACCESS CNTRL-COPPER		3	3	0
28	ACCESS CNTRL-FIBER		3	3	0
40	PLANT CNTRL-COPPER		248	3	0
41	PLANT CNTRL-FIBER		253	3	0
42	ELEC. COMM CIRC-COPR		0	3	0
43	ELEC. COMM CIRC-FIBER		73	3	0

REFERENCE FILE MANIPULATIONS RF					
FILE NAME	LOGICAL NAME	MOVED (DI) OR (DL)	SCALE: (MASTER: REF)	ROTATE: (X, Y, Z)	MISCELLANEOUS

**SPECIAL NOTES : COMM SYSTEM MISC.**

AC = FSI

REVISED 1/01

**PROJECT SPECIFIC LEVEL DOCUMENTATION**

LV	SETSYM EXAMPLE	ELEMENT DESCRIPTION	CO	WT	LC
16-17	1 CONDUIT	CELL	5	3	0
16-17	2 CONDUITS 1 ROW	CELL	5	3	0
16-17	2 ROWS OF 1 CONDUIT EA.	CELL	5	3	0
16-17	2 ROWS OF 2 CONDUITS EA.	CELL	5	3	0
16-17	2 ROWS OF 3 CONDUITS EA.	CELL	5	3	0
16-17	2 ROWS OF 4 CONDUITS EA.	CELL	5	3	0
16-17	3 CONDUITS 1 ROW	CELL	5	3	0
16-17	3 ROWS OF 1 CONDUIT	CELL	5	3	0
16-17	3 ROWS OF 2 CONDUITS EA.	CELL	5	3	0
16-17	3 ROWS OF 3 CONDUITS EA.	CELL	5	3	0
16-17	3 ROWS OF 4 CONDUITS EA.	CELL	5	3	0
16-17	4 CONDUITS 1 ROW	CELL	5	3	0
16-17	4 ROWS OF 1 CONDUIT	CELL	5	3	0
16-17	4 ROWS OF 2 CONDUITS EA.	CELL	5	3	0
16-17	4 ROWS OF 3 CONDUITS EA.	CELL	5	3	0
16-17	4 ROWS OF 4 CONDUITS EA.	CELL	5	3	0

REFERENCE FILE MANIPULATIONS RF					
FILE NAME	LOGICAL NAME	MOVED (DI) OR (DL)	SCALE: (MASTER: REF)	ROTATE: (X, Y, Z)	MISCELLANEOUS

**SPECIAL NOTES : COMM DUCTBANKS**

AC = FSI

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PROJECT LEVEL SYMBOLOGY DOCUMENTATION PLATE

DEVELOPED BY THE MASTER / PLOT FILE QUALITY ACTION TEAM © FACILITIES ENGINEERING DEPARTMENT - SANDIA NATIONAL LABORATORIES, ALBUQUERQUE, NM

**PROJECT SPECIFIC LEVEL DOCUMENTATION**

LV	SETS/M EXAMPLE	ELEMENT DESCRIPTION	CO	WT	LC
03	SUB 30 FEEDERS		1	3	0
14	SUB 14 FEEDERS		161	3	0
15	SUB 15 FEEDERS		83	3	0
19	SUB 19 FEEDERS		0	3	0
20	SUB 2 FEEDERS		149	3	0
21	SUB 2A FEEDERS		116	3	0
26	SUB 26 FEEDERS		179	3	0
27	SUB 27 FEEDERS		27	3	0
29	SUB 29 FEEDERS		139	3	0
30	FEEDERS FROM GEN 862		24	3	0
31	SUB 31 FEEDERS		49	3	0
32	SUB 32 FEEDERS		182	3	0
33	SUB 33 FEEDERS		208	3	0
35	SUB 35 FEEDERS		215	3	0
36	SUB 36 FEEDERS		120	3	0
37	SUB 37 FEEDERS		75	3	0
38	SUB 38 FEEDERS		25	3	0
40	SUB 4 FEEDERS		33	3	0
41	SUB 41 FEEDERS		219	3	0
41	SUB 4A FEEDERS		202	3	0

**SPECIAL NOTES : FEEDERS**

**PROJECT SPECIFIC LEVEL DOCUMENTATION**

LV	SETSYM EXAMPLE	ELEMENT DESCRIPTION	CO	WT	LC
01	MANHOLE COVER	CELL	0	0	1
1-2	4 SIDED 10 X 12	CELL	1	1	6
1-2	4 SIDED 10 X 13.5	CELL	0	1	0
1-2	4 SIDED 12 X 12	CELL	102	1	0
1-2	4 SIDED 12 X 18	CELL	XXX	1	0
1-2	4 SIDED 4 X 12	CELL	134	1	0
1-2	4 SIDED 4 X 6	CELL	81	1	0
1-2	4 SIDED 6 X 10	CELL	111	1	0
1-2	4 SIDED 6 X 11	CELL			
1-2	4 SIDED 6 X 12	CELL			
1-2	4 SIDED 6 X 6	CELL			
1-2	4 SIDED 8 X 10	CELL			
1-2	5s 10 X 10 X 5 X 5 X 6	CELL			
1-2	5s 10 X 21.5 X 10 X 5.10 X 18	CELL			
1-2	5s 13.5 X 13.5 X 9 X 6 X 9	CELL			
1-2	5s 5.3 X 5.3 X 3 X 3.7 X 3	CELL			
1-2	5s 6.5 X 6.5 X 4 X 3.5 X 4	CELL			
1-2	5s 6.5 X 14.5 X 4 X 3.5 X 12	CELL			
1-2	8 SIDED 3.4 X 5.2	CELL			
1-2	8 SIDED 4 X 9	CELL			
1-2	8 SIDED 5.1 X 2	CELL			
1-2	8 SIDED 9 X 2	CELL			

**SPECIAL NOTES : COMM MANHOLES**

AC = FSI

REVISED 1/01

**PROJECT SPECIFIC LEVEL DOCUMENTATION**

LV	SETSYM EXAMPLE	ELEMENT DESCRIPTION	CO	WT	LC
17	LARGE FEEDER ID NOTE BOX	CELL	0	1	0
17	SMALL FEEDER ID NOTE BOX	CELL	0	1	0
46	DWG REFERENCE BLOCK	CELL	0	1	0
46	NOTE BRACKET	CELL	0	1	0
46	SMALL TEXT FOR MASTER FILE		0	1	0
46	TEXT FOR GEN & KEYED NOTES		0	1	0
50	DIMENSIONS		0	1	0
			0	1	0
			0	1	0

REFERENCE FILE MANIPULATIONS RF					
FILE NAME	LOGICAL NAME	MOVED (DI) OR (DL)	SCALE: (MASTER: REF)	ROTATE: (X, Y, Z)	MISCELLANEOUS

**SPECIAL NOTES : NOTING**

**PROJECT LEVEL SYMBOLOGY DOCUMENTATION PLATE**  
 DEVELOPED BY THE MASTER / PLOT FILE QUALITY ACTION TEAM @ FACILITIES ENGINEERING DEPARTMENT - SANDIA NATIONAL LABORATORIES, ALBUQUERQUE, NM

**PROJECT SPECIFIC LEVEL DOCUMENTATION**

LV	SETSYM EXAMPLE	ELEMENT DESCRIPTION	CO	WT	LC
4	GROUNDING CONNECTION	CELL	50	0	1
4	GROUNDING		50	0	1
4	SPLIT BOLT GROUND CONNECTION	CELL			
51	LIGHT	CELL	219	1	2
51	LIGHT CONDUIT		219	1	0
52	SECONDARY		1	3	0
52	SECONDARY - - - - -		1	3	0
62	RECEPTACLE	CELL	240	1	2

REFERENCE FILE MANIPULATIONS RF					
FILE NAME	LOGICAL NAME	MOVED (DI) OR (DL)	SCALE: (MASTER: REF)	ROTATE: (X, Y, Z)	MISCELLANEOUS

**SPECIAL NOTES : COMM SECONDARY LIGHTS GROUND REC.**

PROJECT/LEVEL SYMBOLOGY DOCUMENTATION PLATE







# **Chapter 3**

# **Structural**

## 3.1 Structural CADD File Requirements

New structural CADD files may be generated in an enhanced Intergraph structural software, however these files cannot be invoked through the enhanced application when delivered to Sandia National Laboratories. Structural software shall be *fully* compatible with Bentley MicroStation J and shall be consistent with the SNL CADD Standards Manual. This includes all file structure(s), level schemas, line weight and cells.

## 3.2 Level Assignments

The level schemas shown in this chapter (see the tabbed Level Schemas section) are the standard element-level definitions for master files, details, and sections for each architectural system. User-definable levels are available where the level schemas do not address system elements requiring placement within the master floor plan file. Contact the Project CADD Coordinator for approval before using user-defined levels. All user defined levels shall be identified using the File Specific Information cell located in `noting.cel`, and shall be submitted with the design package as part of Title submittals for review.

Level schemas in this chapter are as follows:

Level Schema	Page
Bridge Crane Plan	3-3
Floor Framing Plan	3-4
Foundation Plan	3-5
Roof Framing Plan	3-6
Trench Plan	3-7
Structural Sections and Details	3-8
Plot File	3-9

## 3.3 Cell Libraries

### 3.3.1 Standard Cells

The standard structural cell library is `snlstruct.cel`. If additional new cells are required, create a personal project cell library and submit it to the Project CADD Coordinator for approval before using new cells. Submit an Engineering Standards Request (ESR) to incorporate the cells into the `snlstruct.cel` library as required. This would only be necessary in the event of the need for incorporation of new *critical* elements otherwise overlooked during cell library creation. Graphical representations of the cells in `snlstruct.cel` are in the tabbed Structural Cell Libraries section..

### 3.3.2 Sections/Details

In sections and details, all graphic elements shall be active elements in the plot files. No referenced elements are permitted. All placed elements should be assigned those element attributes consistent with the master plan attribute and hierarchy requirements.

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1	SHEET EDGE	0	0	1	a; TYPICALLY REFERENCED IN FROM BORDER FILE
2	NORTH ARROW				a; TYP. REFERENCED IN FROM BORDER FILE - SYM. DICTATED BY CELL
3	BORDER GRAPHICS	1	3	0	a; TYPICALLY REFERENCED IN FROM BORDER FILE
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20	LADDERS AND ASSOCIATED RAILING	3	1	0	
21	RUNAWAY BEAM	5	2	0	
22	BRIDGE BEAM	23	2	0	
23					
24					
25					
26					
27					
28					
29					
30					
31					
32	BRIDGE CRANE TEXT	0	1		
33					
34					
35					
36	TROLLEY AND HOIST ASSEMBLY	7	0	0	
37					
38	BEAM CENTERLINE	1	4	0	
39					
40	REFERENCES SYMBOL TEXT, SYMBOLS	3	1	0	
41	TARGETS	0	1	0	a
42					
43					
44					
45					
46	TEXT	0	1	0	a
47					
48					
49					
50					
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62					
63					
Notes:					
a. Elements typically not placed in Master File - if exception arises, use this level.					Color Table = DEFAULT.TBL

**BC**

**BRIDGE CRANE PLAN**

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS	FF
1	SHEET EDGE	0	0	1	a: TYPICALLY REFERENCED IN FROM BORDER FILE	
2	NORTH ARROW				a: TYP. REFERENCED IN FROM BORDER FILE - SYM. DICTATED BY CELL	
3	BORDER GRAPHICS	1	3	0	a: TYPICALLY REFERENCED IN FROM BORDER FILE	
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21	BEAM EDGES AND JOIST EDGES	6	2	2		
22	SLABS	6	1	0		
23	INTERIOR WALL EDGES (DIRECTLY ASSOCIATED WITH FRAMING PLAN)	4	2	0	WALLS NOT ON MASTER FLOOR PLAN	
24	METAL DECK SYMBOL (3D CELL)				SYMBOLOLOGY DICTATED BY CELL	
25	BRIDGING	0	0	3		
26						
27						
28						
29						
30						
31	BEAM AND JOIST TEXT	0	1	0		
32						
33						
34						
35						
36						
37						
38	BEAM/JOIST CENTERLINES	1	4	0		
39						
40						
41	TARGETS	0	1	0	a	
42	SLOPE ARROW FOR SLAB		1	0		
43						
44						
45						
46						
47						
48						
49						
50						
51						
52	CATWALK & GRATING PATTERN (CROSSHATCH FENCE)	14	2,0	0		
53						
54	BEARING CORBEL / LEDGER	2	0	0		
55	THREADED ROD	37	1	0		
56	UNISTRUT GRID	47	1	0		
57						
58						
59						
60						
61						
62						
63						
NOTES:						
a. Elements typically not placed in Master File - if exception arises, use this level.						Color Table=DEFAULT.TBL

**FLOOR FRAMING PLAN**

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS	FN
1	SHEET EDGE	0	0	1	a; TYPICALLY REFERENCED IN FROM BORDER FILE	
2	NORTH ARROW				a; TYPICALLY REFERENCED IN FROM BORDER FILE - SYM. DICTATED BY CELL	
3	BORDER GRAPHICS	1,1	3,1	0	a; TYPICALLY REFERENCED IN FROM BORDER FILE	
4	PERIMETER SHAPE, REBAR PATTERNING		2	0	b	
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18	FOUNDATION GRADE BEAMS	6	2	0		
19	SPOT/CONTINUOUS FOOTING	6	4	3		
20	FOUNDATION STEM WALLS	6	2	2		
21	FOUNDATION PEDESTALS	6	2	2		
22	FOUNDATION SLAB	6	1	0		
23	CONTROL/EXPANSION JOINTS	0	0	0		
24						
25	SLAB HOLES	2	1	0		
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36	TEXT FOR BEAMS AND SUPPORTS	0	1			
37						
38						
39						
40						
41	TARGETS	0	1	0	a	
42	SLOPE ARROWS	1	1	0		
43						
44						
45						
46	TEXT	0	1	0	a	
47						
48						
49						
50	DIMENSIONS AND ASSOCIATED LEADERLINES AND TERMINATORS	3	1,0	0	a	
51						
52						
53						
54						
55						
56						
57						
58						
59						
60						
61						
62						
63						
Notes:						
a. Elements typically not placed in Master File - if exception arises, use this level.				Color Table=DEFAULT.TBL		
b. Referenced in from floorplan						

**FOUNDATION PLAN**

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS	RF
1	SHEET EDGE	0	0	1	a; TYPICALLY REFERENCED IN FROM BORDER FILE	
2	NORTH ARROW				a; TYP. REFERENCED IN FROM BORDER FILE - SYM. DICTATED BY CELL	
3	BORDER GRAPHICS	1	3	0	a; TYPICALLY REFERENCED IN FROM BORDER FILE	
4	PARAPET FRAMING	4	2	0		
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20	LADDERS AND ASSOCIATED RAILING	3	1	0		
21	BEAM EDGES AND JOIST EDGES	6	2	2		
22	SLABS AND ROOF DECKING	6	1	0		
23	INTERIOR WALL EDGES (DIRECTLY ASSOCIATED WITH FRAMING PLAN)	4	2	0	WALLS NOT ON FLOOR PLAN	
24	METAL DECK SYMBOL (3D CELL), PATTERNING				SYMBOLOLOGY DICTATED BY CELL	
25	BRIDGING	0	0	3		
26	METAL ROOF	6	2	0		
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37	EXPOSED ROOF BEAM	1	3	0		
38	BEAM/JOIST CENTERLINES	1	4	0		
39	ROOF PENETRATION BRACING	1	3	0		
40						
41	TARGETS	0	1	0	a	
42						
43						
44						
45						
46	TEXT					
47						
48						
49						
50						
51						
52	CATWALK & GRATING PATTERN	14	2,0	0		
53						
54	BEARING CORBEL/ LEDGER	2	0	0		
55	THREADED ROD	37	1	0		
56	UNISTRUT GRID	47	1	0		
57						
58						
59						
60						
61						
62						
63						
Notes:						
a. Elements typically not placed in Master File - if exception arises, use this level.						Color Table =DEFAULT.TBL
a. Only one Roof Framing Plan per building unless otherwise approved by SNL CADD Standards						

**ROOF FRAMING PLAN**

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS	TR
1	SHEET EDGE	0	0	1	a; TYPICALLY REFERENCED IN FROM BORDER FILE	
2	NORTH ARROW				a; TYP. REFERENCED IN FROM BORDER FILE - SYM. DICTATED BY CELL	
3	BORDER GRAPHICS	1,1	3,1	0	a; TYPICALLY REFERENCED IN FROM BORDER FILE	
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20	LADDERS AND ASSOCIATED RAILING	3	0	0		
21						
22	GRADE BEAMS, SLABS, AND TRENCH WALLS	5,6,5	1,1/0	2,0,0/3	TRENCH WALLS LC TO BE SAME AS FOUND, FOOTINGS FOR HIDDEN FACE	
23						
24						
25	SLAB HOLES	2	1	0		
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41	TARGETS	0	1	0		
42						
43						
44						
45						
46	TEXT	0	1	0		
47						
48						
49						
50	DIMENSIONS AND ASSOCIATED LEADERLINES	3	1,0	0		
51						
52	GRATING	0	0	0		
53						
54						
55						
56						
57						
58						
59						
60						
61						
62						
63						
Notes:						
a. Elements typically not placed in Master File - if exception arises, use this level.						Color Table = DEFAULT.TBL

**TRENCH PLAN**

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3	TITLEBLOCK INFORMATION	0	1	0	PLACED PER CELL - USED DATA FIELDS
4	FLOORS (OTHER THAN SLABS)				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
5	CEILINGS	7	2	0	
6					
7	PATTERNING (BRICK, INSULATION, CMU, SIDING, etc.)		0		UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
8					
9	CURTAIN WALLS				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
10	COLUMN GRIDS / CENTERLINES	2	0	4	
11	COLUMN GRID TAGS AND ASSOCIATED TEXT	2	1	0	
12	COLUMNS	3	2	0	
13	FINISH FLOOR LINE	68	2	0	
14	LONGITUDINAL LINES	4	0	0	
15	EXTERIOR WALLS (WITH ALL COMPONENTS)	4		0	
16					
17					
18					
19					
20	STAIRS, LADDERS AND ASSOCIATED RAILING	3		0	UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
21	STRUCTURAL BEAMS	3		0	UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
22	FLOOR SLABS, RAISED EQUIPMENT PADS	6		0	UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
23	INTERIOR WALLS (WITH ALL COMPONENTS)	4		0	UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
24	STRUCTURAL WALLS (WITH ALL COMPONENTS)	4		0	UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36	EQUIPMENT - ELECTRICAL				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
37	EQUIPMENT - MECHANICAL				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
38	EQUIPMENT - OWNER PURCHASED				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
39					
40	REFERENCES SYMBOLS AND TEXT	3	3,1	0	
41	MATCHLINES, BREAKLINES, CENTERLINES, & TARGETS				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
42					
43					
44					
45					
46	TEXT	0	3,1	0	NOTE TITLES: WT=3 PER CELL
47	DRAWING COMPONENT TITLES, SCALES, & GRAPHICS	0,0,3	3,1,3	0	TITLES: CO=0, WT=3; SCALES: CO=0, WT=1; GRAPHICS: CO=0, WT=3
48	LEGEND AND SCHEDULE GRAPHICS				DICTATED BY ACTIVE FILE GRAPHICS
49	LEGEND AND SCHEDULE TEXT	0	3,1	0	TITLE TEXT: WT=3; TEXT BODY: WT=1
50	DIMENSIONS, LEADER LINES AND TERMINATORS	3	1,0	0	LEADERS: WT=0; TEXT: WT=1; SLASH TERMINATOR: WT=5; ARROWS: WT=1
51	USER DEFINABLE - DOCUMENT PER PROJECT				
52	USER DEFINABLE - DOCUMENT PER PROJECT				
53	USER DEFINABLE - DOCUMENT PER PROJECT				
54	USER DEFINABLE - DOCUMENT PER PROJECT				
55	CONSTRUCTION NOTES & BALLOONS - 1st REVISION	5	1,6	0	CONSTRUCTION NOTES NOT NEEDED ON RECORD DRAWING
56	CONSTRUCTION NOTES & BALLOONS - 2nd REVISION	37	1,6	0	CONSTRUCTION NOTES NOT NEEDED ON RECORD DRAWING
57					
58					
59	SPECIFICATION SECTION NUMBER (IF USED)	0	1	0	
60					
61	DESIGN NOTES FOR INFORMATION ONLY (NON-PRINT)	11	1	0	
62					
63	PATTERNING WITH PEN TABLE - SEES SYSTEMS				
	Notes:				
	a. Elements typically not placed in Master File - if exception arises, use this level.				Color Table=DEFAULT.TBL

**STRUCTURAL SECTIONS, AND DETAILS**

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2	NORTH ARROW				PLACED PER CELL
3	TITLE BLOCK INFORMATION (GENERIC)	0	1	0	PLACED PER CELL - USED DATA FIELDS
4	KEY PLAN				TYPICALLY REFERENCED AS A MASTER KEY PLAN FILE
5					
6					
7					
8					
9					
10	COLUMN GRIDS	2	0	4	
11	COLUMN GRID TAGS AND ASSOCIATED TEXT	2	1	0	
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40	REFERENCE SYMBOLS AND TEXT - SECTION, DETAIL, & ELEVATION CUTS	3	3	0	
41	TARGETS	0	1	0	
42					
43					
44					
45					
46	KEYED NOTES, GENERAL NOTES, LEADER LINES, TERMINATORS	0	1	0	
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3
48	LEGEND AND SCHEDULE GRAPHICS				
49	LEGEND AND SCHEDULE TEXT	0	3,1	0	
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	
51	USER DEFINABLE - DOCUMENT PER PROJECT				
52	USER DEFINABLE - DOCUMENT PER PROJECT				
53	USER DEFINABLE - DOCUMENT PER PROJECT				
54	USER DEFINABLE - DOCUMENT PER PROJECT				
55	CONSTRUCTION NOTES & BALLOONS - 1st REVISION	5	1,6	0	
56	CONSTRUCTION NOTES & BALLOONS - 2nd REVISION	37	1,6	0	
57					
58					
59					
60					
61					
62					
63					
Notes:					
a. Elements typically not placed in Master File - if exception arises, use this level. Color Table=DEFAULT.TBL					
b. TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3					

**PLOT FILE**

STRUCTURAL - MISC.						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	BREACK	STAIRS BREAK LINE	20	0	0	0
	BOX	SQUARE COLUMN SYMBOL	12	4	2	0
	COLOCP	CLASSI C COLUMN OCTAGONAL	12	4,2	2,0	0
	COLOPH	CLASSI C COLUMN OCTAGONAL HALF	12	4,2	2,0	0
	COLSPH	CLASSI C COLUMN SQUARE HALF	12	4,2	2,0	0
	COLSOP	CLASSI C COLUMN SQUARE	12	4,2	2,0	0
	FPCOL_	FI RE PROTECTI ON COLUMN SYMBOL	12	4	2	0
	I BEAM_	I BEAM COLUMN SYMBOL	12	4	2,0	0
	CELL_	ROUND COLUMN	12	3	2	0
	CONXT	POI NT OF CONNECTI ON CELL/DEFI NI TI ON	46	0	1	0
	REMTXT	POI NT OF REMOVAL CELL/DEFI NI TI ON	46	0	1	0
	PLUS	PLUS OR MI NUS SYMBOL	50	3	1	0
	NUT	NUT I N ELEVATI ON	20	4	1	0
	SLOT	BOLT SLOT	2	0	0	0
	HOLE	BOLT HOLE	22	0	0	0
	SECHOL	SECTI ON OF BOLT HOLE	22	0	0	0
	CL	CENTER LI NE SYMBOL	22	0	0	0

RC = SNLSTRUCT.CEL

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STRUCTURAL - WELDS						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	GNWLDL	GENERIC WELD LEFT	46	0	1	0
	GNWDR	GENERIC WELD RIGHT	46	0	1	0
	FLWDD	FILLET WELD	46	0	1	0
	DBFLWD	DOUBLE FILLET WELD	46	0	1	0
	PLGWLD	PLUG WELD	46	0	1	0
	SQWLD	SQUARE WELD	46	0	1	0
	BVLWLD	BEVEL WELD	46	0	1	0
	FLDWLD	FIELD WELD	46	0	1	0
	SPTWLD	SPOT WELD	46	0	1	0
	SMWLD	SEAM WELD	46	0	1	0
	VWELD	GROOVE "V" WELD	46	0	1	0
	FLVWLD	GROOVE FLAIR WELD	46	0	1	0
	ALLRND	ALL AROUND	46	0	1	0
	TYPSML	TYPICAL WELD SYMBOL LEFT	46	0	1	0
	TYPSMR	TYPICAL WELD SYMBOL RIGHT	46	0	1	0
	18WLD	1/8" WELD TEXT	46	0	1	0
	316WLD	3/16" WELD TEXT	46	0	1	0
	14WLD	1/4" WELD TEXT	46	0	1	0
	516WLD	5/16" WELD TEXT	46	0	1	0

RC = SNLSTRUCT.CEL

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# **Chapter 4**

# **Architectural**

## Architectural CADD File Requirements

New architectural CADD files may be generated in an enhanced Intergraph architectural software, however these files cannot be invoked through the enhanced application when delivered to Sandia National Laboratories. Architectural software shall be *fully* compatible with Bentley MicroStation J and shall be consistent with the SNL CADD Standards Manual. This includes all file structure(s), level schemas, line weight and cells.

## Level Assignments

The level schemas shown in this chapter (see the tabbed Level Schemas section) are the standard element-level definitions for master files, details, and sections for each architectural system. User-definable levels are available where the level schemas do not address system elements requiring placement within the master floor plan file. Contact the Project CADD Coordinator for approval before using user-defined levels. All user defined levels shall be identified using the File Specific Information cell located in `noting.cel`, and shall be submitted with the design package as part of Title submittals for review.

Level schemas in this chapter are as follows:

Level Schema	Page
Architectural Roof Plan	4-4
Floor Plan	4-5
Partition Plan (Reference Only)	4-6
Furniture Layout	4-7
Laboratory Equipment Layout	4-8
Reflected Ceiling Plan	4-9
Flooring Treatment Plan	4-10
Elevations, Sections and Details	4-11
Master Cut File	4-12
Plot File	4-13

## Cell Libraries

### Standard Cells

The standard architectural cell library is `snlarch.cel`. If additional new cells are required, create a personal project cell library and submit it to the Project CADD Coordinator for approval before using new cells. Submit an Engineering Standards Request (ESR) to incorporate the cells into the `snlarch.cel` library as required. This would only be necessary in the event of the need for incorporation of new *critical* elements otherwise overlooked during cell library creation. Graphical representations of the cells in `snlarch.cel` are in the tabbed Architectural Cell Libraries section.

### Standard Furniture Layout Cells

Two standard cell libraries are used for furniture layout. File `catalog2d.cel` is used for Steelcase systems furniture. File `lseed.cel` is used for Herman Miller system furniture and

standard, non-systems furniture placement. Graphical representations of the cells in `catalog2d.cel` and `lseed.cel` are in the tabbed Architectural Cell Libraries section.

## **Sections/Details**

In sections and details, all graphic elements shall be active elements in the plot files. No referenced elements are permitted. All placed elements should be assigned those element attributes consistent with the master floor plan attribute and hierarchy requirements.

## **Door/Window & Room Finish Schedule**

Refer to Section 1.8.10, Schedules.

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1	SHEET EDGE	0	0	1	a; TYPICALLY REFERENCED IN FROM BORDER FILE
2	NORTH ARROW				a; TYP. REFERENCED IN FROM BORDER FILE - SYM. DICTATED BY CELL
3	BORDER GRAPHICS	1	3	0	a; TYPICALLY REFERENCED IN FROM BORDER FILE
4	PARAPETS	4	1	0	BUILDING FOOTPRINT REFERENCED FROM FLOOR PLAN (LV=4)
5	ELEVATORS / STAIR FOOTPRINTS	4	2	0	
6	PENTHOUSE FOOTPRINT	4	2	0	
7	MISCELLANEOUS ITEMS PERIMETER SHAPE / OUTLINE	4	2	0	
8					
9					
10					
11					
12					
13					
14					
15					
16	SKYLIGHTS / FRAMES	6	2	0	
17					
18					
19					
20	LADDERS AND ASSOCIATED RAILING	3	1	0	
21	JIB CRANE	5	1	0	
22					
23					
24					
25					
26					
27					
28					
29					
30	SCUPPERS AND ROOF DRAINS	7	2	0	
31					
32					
33					
34					
35	EQUIPMENT STANDS	3	2	0	
36	GUTTERS	4	2	0	
37	DOWN SPOUTS	4	2	0	
38					
39	ROOF CRICKETS	0	0	0	
40	ROOF SLOPE/CRICKET FLOW ARROWS	5	1	0	
41	TARGETS	0	1	0	a
42					
43					
44					
45					
46	TEXT	0	1	0	
47					
48					
49					
50					
51	ROOF PENETRATIONS	99	2,0	0	OPENING PERIMETER: WT=2; OPENING CROSSHAIRS: WT=0
52	MATS, GRATING, PAVERS, CATWALK, etc.	42	1	0	
53	SPLASH BLOCKS	42	1	0	
54					
55					
56					
57					
58					
59					
60					
61					
62					
63					

**ARCHITECTURAL MASTER FILE LEVEL SYMBOLOGY:**  
 ADAPTED FROM INTERGRAPH SOFTWARE LEVEL SCHEME BY THE ARCHITECTURAL QUALITY ACTION TEAM & FACILITIES STANDARDS AND QUALITY IMPROVEMENT DEPARTMENT - SANDIA NATIONAL LABORATORIES, ALBUQUERQUE, NM

Notes:  
 a. Elements typically not placed in Master File - if exception arises, use this level. Color Table = DEFAULT.TBL  
 b. Only one Roof Plan per building unless otherwise approved by SNL CADD Standards

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1	DRAWING SHEET EDGE - DOTTED CUT LINE	0	0	1	a
2	NORTH ARROW				a; SYMBOLOGY DICTATED BY CELL
3	BORDER GRAPHICS AND TITLE BLOCK INFORMATION	1,1	3,1	0	a
4	BUILDING FOOTPRINT - EXTERIOR WALL EDGES W/OUT SLABS	12	2	0	
5	ROOM PERIMETER SHAPE	5	2	0	
6	BUILDING PERIMETER - INCLUDING SLABS, PADS, etc. (PERTAINING TO BLDG.)	12	2	0	
7	WALL PATTERNING				a; USER DEFINABLE SYMBOLOGY - DOCUMENT
8	CURTAIN WALL CENTERLINE	1	0	2	
9	CURTAIN WALL MULLIONS AND GLASS	4	2	0	
10	COLUMN GRID CENTERLINES	2	0	4	
11	COLUMN GRID TAGS & TEXT	2	0,1	0	
12	ALL COLUMNS - MAIN BUILDING & MEZZANINE	3	2	0	AISC STEEL MEMBERS
13	-RESERVED BY INTERGRAPH-				
14	CAVITY WALL LINES	4	0	0	
15	EXTERIOR WALL EDGES	4	2	0	
16	WINDOWS - INCLUDING GLAZING, MULLIONS, FRAMES & SILLS	4	2,0,0	0	GLAZING & MULLIONS: WT=2; FRAMES BELOW: WT=0; SILLS: WT=0
17					
18	SHAFTS & CHASE	4	2	0	
19	ELEVATORS	4	3	0	USER DEFINABLE SYMBOLOGY - DOCUMENT
20	STAIRS, HANDRAILS, HANDICAP LIFTS & ASSOCIATED BREAKLINES	1	0	0	
21	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
22	RAISED FLOOR AND ASSOCIATED RAMPS AND STEPS	1	0	0	
23	NON-STRUCTURAL INTERIOR WALL EDGES	4	2	0	
24	STRUCTURAL INTERIOR WALL EDGES	4	2	0	
25	DOORS, SWINGS, AND HOLES	4	3,0	0	DOORS: WT=3; SWINGS: WT=0
26	DOOR FRAMES	4	1	0	
27	STAIR WALKLINE	3	0	3	TURN OFF FOR PLOTTING
28	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
29	WALLS TO BE REMOVED - TEMPORARY CONSTRUCTION BARRIERS, etc.	4	1	2	
30	PLUMBING FIXTURES - TOILET, SINK, SHOWER, TUB, WATER COOLER, etc.	2	1	0	
31	TOILET PARTITIONS & ACCESS RAILS	2	1	0	
32	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
33	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
34	DRAWING BOARDS / SCREENS				
35	CASEWORK/MILLWORK (CABINETS, SHELVING, COUNTERS, FIREHOSE CABINETS ETC.)	2	1	0	CASEWORK/MILLWORK IN LABS ARE SHOWN ON THE EQUIPMENT PLAN (E0)
36	ASH CAN, LOCKER, ACCESSORIES	1	2	0	
37					
38					
39	CEILING REFERENCES - IRREGULAR CONFIGURATIONS AFFECTING PLAN - SOFFITS	7	0	2	
40	REFERENCE SYMBOLS AND TEXT - SECTION, DETAIL, & ELEVATION CUTS	3	3,1	0	Note a
41	MATCHLINES, BREAKLINES, & TARGETS	7	7,0,1	6,0,0	MATCH: WT=7,LC=6; BREAK: WT=0,LC=0; TARGETS: WT=1,LC=0
42	DOOR OR HOLE SYMBOL (NUMBER)	4	1	0	
43	WINDOW SYMBOL (LETTER)	4	1	0	
44	WALL FIRE RATING - INDUSTRY STANDARD PATTERNS	0		0	LINEAR PATTERN CELLS
45	ROOM NAME, NUMBER, UNDERLINE & BOX	0	1	0	
46	TEXT	0	1	0	MAY BE COPIED INTO DISCIPLINE SPECIFIC PLAN
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	a; TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3
48	LEGEND AND SCHEDULE GRAPHICS				a; DICTATED BY ACTIVE FILE GRAPHICS
49	LEGEND AND SCHEDULE TEXT	0	3,1	0	
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	a; LEADERS: WT=0; TEXT: WT=1; SLASH TERM.: WT=5; ARROWS: WT=1
51	DEMOUNTABLE PARTITIONS (CELLS)	3	1	0	VMP, ADANLOCK, DOWCRAFT
52	USER DEFINABLE - DOCUMENT PER PROJECT				USER DEFINABLE SYMBOLOGY - DOCUMENT
53	USER DEFINABLE - DOCUMENT PER PROJECT				USER DEFINABLE SYMBOLOGY - DOCUMENT
54	USER DEFINABLE - DOCUMENT PER PROJECT				USER DEFINABLE SYMBOLOGY - DOCUMENT
55	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
56	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
57	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
58	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
59	SPECIFICATION SECTION NUMBERS - TYPICALLY NOT USED	0	1	0	
60	WALL AND PARTITION CENTERLINES	1	0	3	
61	DESIGN NOTES FOR INFORMATION ONLY	11	1	0	TURN OFF FOR PLOTTING
62	NOT DEFINED - DOCUMENT IF USED				USER DEFINABLE SYMBOLOGY - DOCUMENT
63	PATTERNING WITH PEN TABLE - SEE SYSTEMS MANAGER				USER DEFINABLE SYMBOLOGY - DOCUMENT

ARCHITECTURAL  
 MASTER FILE LEVEL SYMBOLOGY:  
 ADAPTED FROM INTERGRAPH SOFTWARE LEVEL SCHEME BY THE ARCHITECTURAL QUALITY ACTION TEAM &  
 FACILITIES STANDARDS AND QUALITY IMPROVEMENT DEPARTMENT - SANDIA NATIONAL LABORATORIES, ALBUQUERQUE, NM

a. Elements typically not place in Master File - if exception arises, use this level.

Color Table = DEFAULT.TBL

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1	DRAWING SHEET EDGE - DOTTED CUT LINE	0	0	1	a; TYPICALLY REFERENCED IN FROM BORDER FILE
2					
3	BORDER GRAPHICS AND TITLE BLOCK INFORMATION	1,1	3,1	0	a; TYPICALLY REFERENCED IN FROM BORDER FILE
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16	WINDOWS - INCLUDING GLAZING, MULLIONS, FRAMES, & SILLS	4	2,0,0	0	GLAZING & MULLIONS: WT=2; FRAMES BELOW: WT=0; SILLS: WT=0
17					
18					
19					
20					
21					
22					
23	INTERIOR PARTITION WALL EDGES	4	2	0	
24					
25	DOORS, SWINGS, AND HOLES	4	3,0	0	DOORS: WT=3; SWINGS: WT=0
26	DOOR FRAMES	4	1	0	
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45	ROOM NUMBER AND BOX PER CELL	0	1	0	a
46	UNIT SIZES	3	1	0	
47					
48					
49					
50					
51		3	1	0	
52	FOR				
53					
54					
55					
56					
57	REFERENCE				
58					
59					
60					
61					
62	ONLY				
63					

PARTITION PLAN  
FOR REFERENCE ONLY - NO LONGER USED

a. Elements typically not place in Master File - if exception arises, use this level.

Color Table = DEFAULT.TBL

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5	FLOOR PERIMETER	5	2	0	
6	PLANNING UNIT PERIMETER	6	2	0	
7	ZONE PERIMETER	7	2	0	
8	GROUPING FOOTPRINT	8	2	0	
9	GROUPING TAG/NUMBER	9	1	0	
10	STEELCASE PANEL CENTERLINES	10	1	0	
11					
12					
13	HERMAN MILLER PARTITIONS CENTERLINES	28	1	0	
14	HERMAN MILLER GLASS DOORS & PARTITIONS	14	1	0	
15	FURNITURE GRAPHICS - OTHER THAN LABORATORY	15	1	0	SEE MASTER EQUIPMENT LAYOUT (EQ) FOR LABORATORIES
16	EQUIPMENT GRAPHICS - OTHER THAN LABORATORY	16	1	0	SEE MASTER EQUIPMENT LAYOUT (EQ) FOR LABORATORIES
17					
18	CARPET GRAPHICS (SEAMING PLAN)	6	2	0	
19	CARPET TEXT/DIMENSIONS	6	1	0	
20					
21	SEATING GRAPHICS	21	1	0	
22					
23	STEELCASE WORK SURFACES, KEYBOARD TRAYS	23	1	0	
24					
25	AREA LOCATION, ROOM PERIMETER TEXT	25	1	0	
26	AREA LOCATION, ROOM PERIMETER	26	2	0	
27					
28	HERMAN MILLER WORK SURFACES, DRAWERS	28	1	0	
29	HERMAN MILLER COUNTERTOPS, SHELVES AND FLIPPER DOORS	29	1	0	
30	FURNITURE MISC. PRODUCTION	30	1	0	
31	SYMBOLS MISC. COMPONENT NUMBER	31	1	0	
32	SYMBOLS INSTALL/CONST. DRAWING	32	1	0	
33					
34					
35					
36					
37	FURNITURE TAG/NUMBER	37	1	0	
38	EQUIPMENT TAG/NUMBER	38	1	0	
39					
40	STEELCASE PANELS, FILLERS	40	1	0	
41	BREAKLINES, CENTERLINES, TARGETS, ETC.	41	1	0	
42	BOOK SHELVES, BINDER BINS	42	1	0	
43	SEATING TAG/NUMBER				
44	FLOOR TEXT				
45	PLANNING UNIT TEXT				
46	TEXT	3	1	0	
47	DRAWING COMPONENT TITLE/SCALE	2	2	0	
48	NOTES				
49					
50	DIMENSIONS, TEXT, & LEADER LINES	3	1	0	a
51	GROUPING TEXT				
52	MISCELLANEOUS TAG/NUMBER				
53	OCCUPANT NAME TEXT	9	1	0	
54	ROOM PERIMETER TEXT				
55	FLOOR PATTERNS	-	-	-	USER DEFINABLE SYMBOLOGY
56	WALL PATTERNS	-	-	-	USER DEFINABLE SYMBOLOGY
57	MISC. PATTERNS	-	-	-	USER DEFINABLE SYMBOLOGY
58	HERMAN MILLER AND DOWCRAFT DOORS	58	1	0	
59	DOWCRAFT SHELVES	59	1	0	
60	SPECIFICATION NUMBERS	60	1	0	
61	REFERENCE ELEMENTS NOT PLOTTED	61			
62	ADDENDA AND BULLETIN BUBBLES	0	7	0	
63	CHANGE INDICATION LEVEL				

Notes:

a. Placed in the Master File or the Plot File

Color Table = DEFAULT.TBL

**FURNITURE LAYOUT**  
 ARCHITECTURAL MASTER FILE LEVEL SYMBOLOGY:  
 ADAPTED FROM INTERGRAPH SOFTWARE LEVEL SCHEME BY THE ARCHITECTURAL QUALITY ACTION TEAM &  
 FACILITIES STANDARDS AND QUALITY IMPROVEMENT DEPARTMENT - SANDIA NATIONAL LABORATORIES, ALBUQUERQUE, NM

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15	LABORATORY FURNITURE (TABLES, BENCHES, CHAIRS, STOOLS)	30	2	0	NO UTILITY HOOK UPS REQUIRED
16	TEXT FOR LABORATORY FURNITURE	30	1	0	
17	FIXTURE GRAPHICS	52	2	0	
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30	COMPUTERS	44	2	0	
31					
32					
33	LABORATORY CASEWORK/MILLWORK - WALL MOUNTED	39	2	0	CASEWORK/MILLWORK NOT IN A LABORATORY IS ON THE FLOOR PLAN
34	TEXT FOR LABORATORY CASEWORK/MILLWORK - WALL MOUNTED	39	1	0	
35	LABORATORY CASEWORK/MILLWORK - BASE CABINETS	17	2	0	CASEWORK/MILLWORK NOT IN A LABORATORY IS ON THE FLOOR PLAN
36	TEXT FOR LABORATORY CASEWORK/MILLWORK - BASE CABINETS	17	1	0	
37	INSTALLATION TEXT FOR CASEWORK/MILLWORK	0	1	0	
38	OWNER PURCHASED EQUIPMENT	12	2	0	EQUIPMENT REQUIRING UTILITY HOOK UPS
39	TEXT FOR OWNER PURCHASED EQUIPMENT	12	1	0	
40	REFERENCE SYMBOLS & TEXT (REFERENCING DETAILS, SECTIONS, ETC.)	3	3,1	0	
41					
42					
43					
44	MECHANICAL SYMBOLS (HEXES) & TEXT	0	1	0	
45	ROOM NAMES, NUMBERS, BOXES, & UNDERLINES				MAY BE COPIED IN FROM THE FLOOR PLAN
46	TEXT				
47	DRAWING COMPONENT TITLE/SCALE	0	3,1	0	
48	ELECTRICAL EQUIPMENT SYMBOLS & TEXT	0	1	0	
49					
50	DIMENSIONS, ASSOCIATED TEXT AND LEADER LINES	3	0,1	0	a: DIMENSIONS WT=0, LEADERS WT=0, TEXT WT=1
51					
52	FUME HOODS	6	4	0	
53	LAM FLOW BENCHES	18	4	0	
54					
55					
56					
57					
58	GAS BOTTLE RACK	0	2	0	
59					
60					
61					
62					
63					

**ARCHITECTURAL MASTER FILE LEVEL SYMBOLS:**  
**LABORATORY EQUIPMENT I A V O I T**

ADAPTED FROM INTERGRAPH SOFTWARE LEVEL SCHEME BY THE ARCHITECTURAL QUALITY ACTION TEAM & FACILITIES STANDARDS AND QUALITY IMPROVEMENT DEPARTMENT - SANDIA NATIONAL LABORATORIES, ALBUQUERQUE, NM

Notes:

a. Placed in the Master File or the Plot File

Color Table = DEFAULT.TBL

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1	DRAWING SHEET EDGE - DOTTED CUT LINE	3	0	1	a; TYPICALLY REFERENCED IN FROM BORDER FILE
2	NORTH ARROW				a; TYP. REFERENCED IN FROM BORDER FILE-SYM. DICTATED BY CELL
3	BORDER GRAPHICS AND TITLE BLOCK INFORMATION	1,0	3,1	0	a; TYPICALLY REFERENCED IN FROM BORDER FILE
4					
5	ROOM PERIMETER SHAPE	5	2	0	REQUIRES PLACEMENT OF ROOM NAME/NO. ON MASTER FLOOR PLAN
6					
7					
8					
9					
10					
11	CEILING PATTERN (GRID)	7	0	0	
12	CEILING PATTERN (PLASTER/GYP. BOARD)	7	0	0	
13	CEILING PATTERN (LINEAR WOOD/METAL)	7	0	0	
14	CEILING PATTERN (EXPOSED CONSTRUCTION)	7	0	0	
15	CEILING PATTERN (MISC. AREA PATTERN)	7	0	0	
16					
17	TEMPORARY CEILING PATTERN (TO BE REMOVED)	11	0	0	
18	CEILING PATTERN (SHAFTS)	7	0	0	
19	CEILING PATTERN (USER DEFINABLE)	7	0	0	
20	CEILING PATTERN (USER DEFINABLE)	7	0	0	
21					
22	SPECIAL CEILING SUPPORTS	7	1	0	
23	UNISTRUT FRAMEWORK	6	1	0	
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41	TARGETS				a
42	CEILING HEIGHT SYMBOLS AND TEXT	0	1,1	0,0	
43					
44					
45					
46	TEXT	0	1	0	a
47					
48					
49					
50	DIMENSIONS	3	1	0	a
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61	CEILING HEIGHT SYMBOLS AND TEXT	1	0	0	TURN OFF FOR PLOTTING
62					
63					

**ARCHITECTURAL MASTER FILE LEVEL SYMBOLOLOGY:**  
**REFLECTED CEILING PLAN**  
 ADAPTED FROM INTERGRAPH SOFTWARE LEVEL SCHEME BY THE ARCHITECTURAL QUALITY ACTION TEAM & FACILITIES STANDARDS AND QUALITY IMPROVEMENT DEPARTMENT - SANDIA NATIONAL LABORATORIES, ALBUQUERQUE, NM

a. Elements typically not place in Master File - if exception arises, use this level.

Color Table = DEFAULT.TBL

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3	TITLE BLOCK INFORMATION	0	1	0	PLACED PER CELL - USE DATA FIELDS
4	FLOORS (OTHER THAN SLABS)				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
5	CEILINGS	7	2	0	
6					
7	PATTERNING (BRICK, INSULATION, CMU, SIDING, etc.)		0		UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
8					
9	CURTAIN WALLS				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
10	COLUMN GRIDS / CENTERLINES	2	0	4	
11	COLUMN GRID TAGS AND ASSOCIATED TEXT	2	1	0	
12	COLUMNS	3	2	0	
13	FINISH FLOOR LINE	68	2	0	
14	CAVITY WALL LINES	4		0	
15	EXTERIOR WALLS (WITH ALL COMPONENTS)	4		0	
16	WINDOWS AND WINDOW FRAMES	4		0	
17					
18					
19					
20	STAIRS, LADDERS AND ASSOCIATED RAILING	3		0	UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
21	STRUCTURAL BEAMS	3		0	UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
22	FLOOR SLABS, RAISED EQUIPMENT PADS	6		0	UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
23	INTERIOR WALLS (WITH ALL COMPONENTS)	4		0	UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
24	STRUCTURAL WALLS (WITH ALL COMPONENTS)	4		0	UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
25	DOORS				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
26	DOOR FRAMES				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
27					
28					
29					
30	PLUMBING FIXTURES	2		0	UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
31	TOILET PARTITIONS AND ASSOCIATED ACCESS RAILING			0	UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
32					
33					
34					
35	CASEWORK/MILLWORK				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
36	EQUIPMENT - ELECTRICAL				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
37	EQUIPMENT - MECHANICAL				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
38	EQUIPMENT - OWNER PURCHASED				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
39					
40	REFERENCE SYMBOLS AND TEXT	3	3,1	0	
41	MATCHLINES, BREAKLINES, CENTERLINES, & TARGETS				UNDEFINED SYMBOLOGIES LEFT FOR USER PREFERENCE
42					
43					
44					
45					
46	TEXT	0	3,1	0	NOTE TITLES: WT=3 PER CELL
47	DRAWING COMPONENT TITLES, SCALES, & GRAPHICS	0,0,3	3,1,3	0	TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=0,WT=3
48	LEGEND AND SCHEDULE GRAPHICS				DICTATED BY ACTIVE FILE GRAPHICS
49	LEGEND AND SCHEDULE TEXT	0	3,1	0	TITLE TEXT: WT=3; TEXT BODY: WT=1
50	DIMENSIONS, LEADER LINES AND TERMINATORS	3	1,0	0	LEADERS: WT=0; TEXT: WT=1; SLASH TERMINATOR: WT=5; ARROWS: WT=1
51	USER DEFINABLE - DOCUMENT PER PROJECT				
52	USER DEFINABLE - DOCUMENT PER PROJECT				
53	USER DEFINABLE - DOCUMENT PER PROJECT				
54	USER DEFINABLE - DOCUMENT PER PROJECT				
55	CONSTRUCTION NOTES & BALLOONS - 1st REVISION	5	1,6	0	CONSTRUCTION NOTES NOT NEEDED ON RECORD DRAWING
56	CONSTRUCTION NOTES & BALLOONS - 2nd REVISION	37	1,6	0	CONSTRUCTION NOTES NOT NEEDED ON RECORD DRAWING
57					
58					
59	SPECIFICATION SECTION NUMBER (IF USED)	0	1	0	
60					
61	DESIGN NOTES FOR INFORMATION ONLY (NON-PRINT)	11	1	0	
62					
63	PATTERNING WITH PEN TABLE - SEE SYSTEMS				

Notes:

a. Elements typically not placed in Master File - if exception arises, use this level.

Color Table = DEFAULT.TBL

**ARCHITECTURAL MASTER FILE LEVEL SYMBOLOGY:**  
**ADAPTED FROM INTERGRAPH SOFTWARE LEVEL SCHEME BY THE ARCHITECTURAL QUALITY ACTION TEAM &**  
**FACILITIES STANDARDS AND QUALITY IMPROVEMENT DEPARTMENT - SANDIA NATIONAL LABORATORIES, ALBUQUERQUE, NM**

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2	NORTH ARROW				PLACED PER CELL
3	TITLE BLOCK INFORMATION (GENERIC)	0	1	0	PLACED PER CELL - USE DATA FIELDS
4	KEY PLAN				TYPICALLY REFERENCED AS A MASTER KEY PLAN FILE
5					
6					
7					
8					
9					
10	COLUMN GRIDS	2	0	4	
11	COLUMN GRID TAGS AND ASSOCIATED TEXT	2	1	0	
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46	GENERIC TEXT (ONLY)	0	1	0	
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3
48					
49					
50					
51	USER DEFINABLE - DOCUMENT PER PROJECT				
52	USER DEFINABLE - DOCUMENT PER PROJECT				
53	USER DEFINABLE - DOCUMENT PER PROJECT				
54	USER DEFINABLE - DOCUMENT PER PROJECT				
55					
56					
57					
58					
59					
60					
61					
62					
63					

**ARCHITECTURAL MASTER CUT FILE**  
 ARCHITECTURAL MASTER FILE LEVEL SYMBOLLOGY:  
 ADAPTED FROM INTERGRAPH SOFTWARE LEVEL SCHEME BY THE ARCHITECTURAL QUALITY ACTION TEAM &  
 FACILITIES STANDARDS AND QUALITY IMPROVEMENT DEPARTMENT - SANDIA NATIONAL LABORATORIES, ALBUQUERQUE, NM

Notes:

a. Elements typically not placed in Master File - if exception arises, use this level.

Color Table = DEFAULT.TBL

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2	NORTH ARROW				PLACED PER CELL
3	TITLE BLOCK INFORMATION (GENERIC)	0	1	0	PLACED PER CELL - USE DATA FIELDS
4	KEY PLAN				TYPICALLY REFERENCED AS A MASTER KEY PLAN FILE
5					
6					
7					
8					
9					
10	COLUMN GRIDS	2	0	4	
11	COLUMN GRID TAGS AND ASSOCIATED TEXT	2	1	0	
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40	REFERENCE SYMBOLS AND TEXT - SECTION, DETAIL, & ELEVATION CUTS	3	3	0	
41	TARGETS	0	1	0	
42					
43					
44					
45					
46	KEYED NOTES, GENERAL NOTES, LEADER LINES, TERMINATORS	0	1	0	
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3
48	LEGEND AND SCHEDULE GRAPHICS				
49	LEGEND AND SCHEDULE TEXT	0	3,1	0	
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	
51	USER DEFINABLE - DOCUMENT PER PROJECT				
52	USER DEFINABLE - DOCUMENT PER PROJECT				
53	USER DEFINABLE - DOCUMENT PER PROJECT				
54	USER DEFINABLE - DOCUMENT PER PROJECT				
55	CONSTRUCTION NOTES & BALLOONS - 1st REVISION	5	1,6	0	
56	CONSTRUCTION NOTES & BALLOONS - 2nd REVISION	37	1,6	0	
57					
58					
59					
60					
61					
62					
63					

**P I O T R I E R**  
 ARCHITECTURAL  
 MASTER FILE LEVEL SYMBOLOLOGY:  
 ADAPTED FROM INTERGRAPH SOFTWARE LEVEL SCHEME BY THE ARCHITECTURAL QUALITY ACTION TEAM &  
 FACILITIES STANDARDS AND QUALITY IMPROVEMENT DEPARTMENT - SANDIA NATIONAL LABORATORIES, ALBUQUERQUE, NM

Notes:

- a. Elements typically not placed in Master File - if exception arises, use this level.
- b. TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3

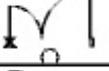
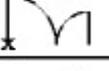
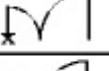
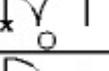
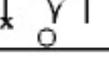
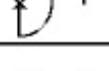
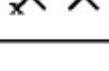
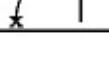
Color Table = DEFAULT.TBL

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1	DRAWING SHEET EDGE - DOTTED CUT LINE	3	0	1	a; TYPICALLY REFERENCED IN FROM BORDER FILE
2	NORTH ARROW				a; TYP. REFERENCED IN FROM BORDER FILE-SYM. DICTATED BY CELL
3	BORDER GRAPHICS AND TITLE BLOCK INFORMATION	1,0	3,1	0	a; TYPICALLY REFERENCED IN FROM BORDER FILE
4					
5	ROOM PERIMETER SHAPE	5	2	0	REQUIRES PLACEMENT OF ROOM NAME/NO. ON MASTER FLOOR PLAN
6					
7	FLOORING PATTERN (CARPET)	7	0	0	
8	FLOORING PATTERN (VAT - VINYL ASBESTOS TILE)	7	0	0	
9	FLOORING PATTERN (VCT - VINYL COMPOSITION TILE)	7	0	0	
10	FLOORING PATTERN ( CERAMIC TILE - VARIOUS SIZES)	7	0	0	
11	FLOORING PATTERN (ESD - ELECTRO-STATIC DISCHARGE TILE)	7	0	0	
12	FLOORING PATTERN (VINYL SHEET GOODS - LINOLEUM, ETC.)	7	0	0	
13	FLOORING PATTERN (STONE, MARBLE, GRANITE, ETC.)	7	0	0	
14	FLOORING PATTERN (CONCRETE)	7	0	0	
15	FLOORING PATTERN (PERGO)	7	0	0	
16	FLOORING PATTERN (STEEL / ALUMINUM - FREIGHT ELEVATOR, ETC.)	7	0	0	
17	FLOORING PATTERN (WALK-OFF SYSTEM)	7	0	0	
18	FLOORING PATTERN - RAISED FLOOR (CARPET)	7	0	0	
19	FLOORING PATTERN - RAISED FLOOR (TILE)	7	0	0	
20	FLOORING PATTERN (- RAISED FLOOR (W/OUT TREATMENT)	7	0	0	
21	FLOORING PATTERN (USER DEFINABLE)	7	0	0	
22	FLOORING PATTERN (USER DEFINABLE)	7	0	0	
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46	TEXT	0	1	0	a
47					
48					
49					
50	DIMENSIONS	3	1	0	a
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62					
63					

**ARCHITECTURAL**  
**MASTER FILE LEVEL SYMBOLLOGY:**  
**FLOORING TREATMENT PLAN**  
 ADAPTED FROM INTERGRAPH SOFTWARE LEVEL SCHEME BY THE ARCHITECTURAL QUALITY ACTION TEAM &  
 FACILITIES STANDARDS AND QUALITY IMPROVEMENT DEPARTMENT - SANDIA NATIONAL LABORATORIES, ALBUQUERQUE, NM

a. Elements typically not place in Master File - if exception arises, use this level.

Color Table = DEFAULT.TBL

ARCHITECTURAL - DOORS						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	L2FT, L2FT6 L3FT, L3FT6 L4FT	SINGLE DOOR W/FRAME AND NOTE	25, 42	4, 0	3, 0 1	0
	R2FT, R2FT6 R3FT, R3FT6 R4FT	SINGLE DOOR W/FRAME AND NOTE	25, 42	4, 0	3, 0 1	0
	ASHNG	SINGLE SWING DOOR	25	4	3, 0	0
	L6FTDB	DOUBLE DOORS W/FRAME AND NOTE	25, 42	4, 0	3, 0 1	0
	HDBFR2	UNEVEN DOUBLE DOORS W/FRAME & NOTE	25, 42	4, 0	3, 0 1	0
	HDBFR3	UNEVEN DOUBLE DOORS W/FRAME & NOTE	25, 42	4, 0	3, 0 1	0
	DHILT	DOUBLE DOORS	25	4	3, 0	0
	ADBLL	UNEVEN DOUBLE DOORS	25	4	3, 0	0
	ADBLR	UNEVEN DOUBLE DOORS	25	4	3, 0	0
	HANDB2	UNEVEN DOUBLE DOORS WITH NOTE	25, 42	4, 0	3, 0 1	0
	HANDB3	UNEVEN DOUBLE DOORS WITH NOTE	25, 42	4, 0	3, 0 1	0
	ADBL45	DOUBLE DOORS 45 DEG. SWING	25	4	3, 0	0
	CDEGR	DOUBLE EGRESS DOORS	25	4	3, 0	0
	ABIFD	BIFOLD DOORS	25	4	3	0
	BSLID	SLIDING DOORS	25	4	3	0
	ADUTCH	DUTCH DOOR	25	4	3, 0	0
	ASH45	HINGE SWING DOOR DOOR 45 DEG. SWING	25	4	3, 0	0
	ASSWG	SINGLE SWING DOOR	25	4	3, 0	0

RC = SNLARCH.CEL

REVISED 9/01



ARCHITECTURAL - WINDOWS & MISC.						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	SILL	WINDOW SILL	16	4	0	0
	WIN1 THRU WIN4	GENERAL USE WINDOW 1 FT THROUGH 4 FT	16	4	2,0	0
	WML1 THRU WML4	WINDOW FOR MULLION 1 FT THROUGH 4 FT	16	4	2,0	0
	WSL2 THRU WSL4	SLIDING WINDOW 2 FT THROUGH 4 FT	16	4	2,0	0
	WINNUM	WINDOW ANNOTATION	42	3	1	0
	BREAKK	STAIRS BREAK LINE	20	0	0	0
	BOX	SQUARE COLUMN SYMBOL	12	4	2	0
	COLOCP	CLASSICAL COLUMN OCTAGONAL	12	4,2	2,0	0
	COLOPH	CLASSICAL COLUMN OCTAGONAL HALF	12	4,2	2,0	0
	COLSPH	CLASSICAL COLUMN SQUARE HALF	12	4,2	2,0	0
	COLSOP	CLASSICAL COLUMN SQUARE	12	4,2	2,0	0
	FPCOL_	FIRE PROTECTION COLUMN SYMBOL	12	4	2	0
	I BEAM_	I BEAM COLUMN SYMBOL	12	4	2,0	0
	CELL_	ROUND COLUMN	12	3	2	0

RC = SNLARCH.CEL

REVISED 9/01

ARCH. PLAN - PLUMBING FIXTURES						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	MADERA	MADERA TOI LET	30	2	1	0
	GWALL	GLENWALL TOI LET	30	2	1	0
	WALL	WALL TOI LET	30	2	1	0
	WCFFV	WATER CLOSET FLOOR MOUNTED FLUSH	30	2	1	0
	WCFTNK	WATER CLOSET FLOOR MOUNTED TANK	30	2	1	0
	WCWFV	WATER CLOSET WALL MOUNTED FLUSH	30	2	1	0
	WCITNK	WATER CLOSET INTERGRAL TANK	30	2	1	0
	WCFFVA	ANSI FLOOR MOUNTED TOI LET	30	2	1	0
	WCGWAL	GLENWALL TOI LET	30	2	1	0
	WCWFVA	ANSI WALL MOUNTED TOI LET	30	2	1	0
	WCWTNK	ANSI WALL MOUNTED TOI LET	30	2	1	0

RC = SNLARCHCEL

REVISED 9/01

ARCH. PLAN - PLUMBING FIXTURES						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	CBOX	BOXED CABINET SINK	30	2	1	0
	COVAL	OVAL CABINET SINK	30	2	1	0
	SNKSC	SINGLE BOWL SINK IN COUNTER	30	2	1	0
	SNKSV	SERVICE SINK	30	2	1	0
	SNKWL	WALL HUNG SINK	30	2	1	0
	SNKWO	WALL HUNG OVAL SINK	30	2	1	0
	WBOX	WALL BATHROOM SINK	30	2	1	0
	SNKOV	SINK OVAL IN COUNTER	30	2	1	0
	SNKDC	SINK DOUBLE BOWL IN COUNTER	30	2	1	0
	SNKCI	SINK CIRCLE IN COUNTER	30	2	1	0
	SNKGH	SEMI GANG WASH FOUNTAIN	30	2	1	0
	SNKGN	FULL GANG WASH FOUNTAIN	30	2	1	0
	URFLR	URINAL FLOOR MOUNTED	30	2	1	0
	URINAL	URINAL TOILET	30	2	1	0
	URWAL	URINAL WALL MOUNTED	30	2	1	0
	URFLRA	URINAL WALL MOUNTED	30	2	1	0
	URWH	URINAL WALL MOUNTED HANDI CAPPED	30	2	1	0
Richard to create a new cell		Need Plan View of ADA Faucet				

RC = SNLARCH.CEL

REVISED 9/01

ARCH. PLAN - PLUMBING FIXTURES						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	SHRPN	SHOWER STALL	30	2	1	0
	SHRST	SHOWER STALL WITH SHOWER HEAD	30	2	1	0
	BATUB	BATH TUB	30	2	1	0
	ACLOC	LOCKER	36	2	1	0
	DRAIN_	SHOWER DRAIN	30	2	1	0
	AHEAD	SHOWER HEAD	30	2	1	0
	ACTBAR	TOWEL BAR	36	2	1	0
	ACTRAS	TRASH BIN SURFACE MOUNT	36	2	1	0
	ACTDW	RECESSED TOWEL DISPENSER	36	2	1	0
	ACSTD	SURFACE TOWEL DISPENSER	36	2	1	0
	ACMIR	MIRROR	36	2	1	0
	ACSMIT	MULTI ROLL BATH TISSUE DISPENSER	36	2	1	0
	ACSMTD	SINGLE ROLL BATH TISSUE DISPENSER	36	2	1	0
	ACSD	RECESSED SOAP DISPENSER	36	2	1	0
	ACBNCH	SHOWER BENCH	36	2	1	0
	FCTDH	FAUCET DOUBLE HANDLE	30	2	1	0
	FCTSH	FAUCET SINGLE HANDLE	30	2	1	0

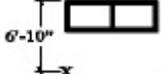
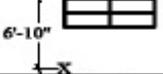
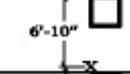
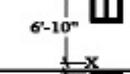
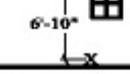
RC = SNLARCH.CEL

REVISED 9/01

ARCHITECTURAL - ELEVATION						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	SBLANK	SINGLE DOOR BLANK 3070	25 26	5	0	0
	DBLANK	DOUBLE DOOR BLANK 6070	25 26	5	0	0
	SFLGLS	SINGLE DOOR FULL GLASS 3070	25 26 27	5 7	0	0
	DFLGLS	DOUBLE DOOR FULL GLASS 6070	25 26 27	5 7	0	0
	SHLIT	SINGLE DOOR HI-LITE 3070	25 26 27	5 7	0	0
	DHLIT	DOUBLE DOOR HI-LITE 6070	25 26 27	5 7	0	0
	SSDLIT	SINGLE DOOR SI DE-LITE 3070	25 26 27	5 7	0	0
	DSDLIT	DOUBLE DOOR SI DE-LITE 6070	25 26 27	5 7	0	0
	SBI FLD	SINGLE DOOR BI-FOLD 3070	25 26	5	0	0
	DBI FLD	DOUBLE DOOR BI-FOLD 6070	25 26	5	0	0
	SLWLUV	SINGLE DOOR LOW LOUVER 3070	25 26	5 10	0	0
	DLWLUV	DOUBLE DOOR LOW LOUVER 6070	25 26	5 10	0	0
	SHGLHL	SINGLE DOOR HALF GLASS LOW LOUVER 3070	25 26 27	5,6 7,10	0	0
	DHGLHL	DOUBLE DOOR HALF GLASS LOW LOUVER 6070	25 26 27	5,6 7,10	0	0
	SLTLV	SINGLE DOOR HI-LITE LOW LOUVER 3070	25 26 27	5,6 7,10	0	0
	DLTLV	DOUBLE DOOR HI-LITE LOW LOUVER 6070	25 26 27	5,6 7,10	0	0
	SLVSLT	SINGLE DOOR SI DE-LITE LOW LOUVER 3070	25 26 27	5,6 7,10	0	0
	DLVSLT	DOUBLE DOOR SI DE-LITE LOW LOUVER 6070	25 26 27	5,6 7,10	0	0
	5070	5070 DOUBLE DOOR	25 26	6	0	0

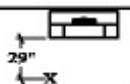
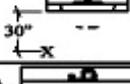
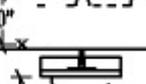
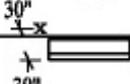
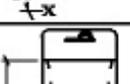
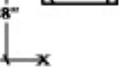
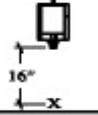
RC = SNLARCH.CEL

REVISED 9/01

ARCHITECTURAL - ELEVATION						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	SFHGLS	SINGLE DOOR HALF GLASS	25 26 27	5,6 7	0	0
	DHFGLS	5x7' DOUBLE DOORS WITH HALF GLASS	25 26 27	5,6 7	0	0
	SFULUV	SINGLE DOOR WITH FULL LOUVER	25 26 27	5,6 7	0	0
	DFULLV	5x7' DOUBLE DOORS WITH FULL LOUVER	25 26 27	5,6 7	0	0
	5070SL	5x7' DOUBLE DOORS WITH SIDE LITE	25 26 27	5,6 7	0	0
	SLIDE	SLIDING GLASS DOOR 6070	25 26 27	5,6 7	0	0
	SFRAME	STANDARD 2" HOLLOW METAL FRAME 3070	26	5	0	0
	SFRMTR	2" HOLLOW METAL DOOR FRAME W/TRANSOM	26 27	5 7	0	0
	PARTDR	STANDARD BATHROOM PARTITION DOOR	31	0 2	0	0
	ROLUP1	OVERHEAD DOOR 10'x10'	25 26	5	0	0
	ROLUP2	ROLL-UP DOOR 10'x10'	25 26	5	0	0
	3X9SLD	3x9 SLIDING WINDOW	19	5 3	0	0
	3X9WM	3x9 WINDOW WITH MULLIONS	19	5 6	0	0
	3X3 3X6 3X9	3 X 3 WINDOW 3 X 6 WINDOW 3 X 9 WINDOW	19	5 3	0	0
	3X3SLD 3X6SLD 3X9SLD	3 X 3 SLIDING WINDOW 3 X 6 SLIDING WINDOW 3 X 9 SLIDING WINDOW	19	5 3	0	0
	3X3WM 3X6WM 3X9WM	3 X 3 WINDOW WITH MULLIONS 3 X 6 WINDOW WITH MULLIONS 3 X 9 WINDOW WITH MULLIONS	19	5 6	0	0

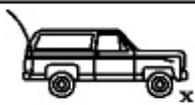
RC = SNLARCH.CEL

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ARCHITECTURAL - ELEVATION						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	SNKFCS	STANDARD SINK FAUCET	30	0	0	0
	SNKFCT	ADA STANDARD SINK FAUCET	30	0	0	0
	BTHSN2	BATHROOM SINK	30	0 9	0	0
	SNKBTH	BATHROOM SINK	30	0 9	0	0 1
	SSINK	BATHROOM SINK	30	0 9 6	0	0 1
	DBLSNK	DOUBLE KITCHEN SINK	30	0 6 9	0	0 1
	SKTSNK	SINGLE KITCHEN SINK	30	0 6 9	0	0 1
	COUNTR	COUNTER	30	6	0	0
	JANSNK	JANI-TORS SINK	30	0 9 10	0	0 1
	TOILET	TYPICAL FLOOR MOUNTED TOILET	30	0 16	0	0
	LGURIN	URINAL	30	0 9	0	0
	WLURIN	WALL MOUNTED URINAL	30 31 32	0 9	0	0
	SHWRHD	SHOWER HEAD	30	4 2	0	0
	PLMPRO	SINK PLUMBING PROFILE	30	2	0	0 1
	PLMFT	SINK PLUMBING FRONT ELEVATION		2,3 4,6	0,1 2,3	
	WMWTRF	WALL MOUNTED WATER FOUNTAIN	30	0 9 12	0	0
	WATERF	FLOOR MOUNTED WATER FOUNTAIN	30	0 9 12	0	0

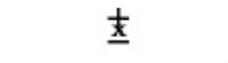
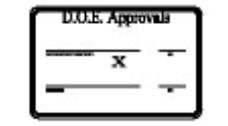
RC = SNLARCH.CEL

REVISED 9/01

ARCHITECTURAL - ELEVATION						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	LOCKER	LOCKER DOOR	30	9	0	0
	PARTDR	BATHROOM PARTITION DOOR	31	0 9	0	0
	TREEEL	TREE ELEVATION	15	2 6	0	0
	TREEPL	TREE PLAN	57	2	0	0
	PPL	PEOPLE	13	2,3 4,6	0,1 2,3	
	LOCKER	LOCKER	25 26		0	0
	CAR	CAR	15	0 3	0	0
	BLAZER	"BLAZER" AUTOMOBILE	15	0 1	0	0

RC = SNLARCH.CEL

REVISED 9/01

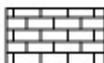
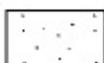
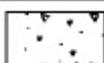
ARCHITECTURAL- MISC.						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
Richard to create a new cell	HANDI	HANDI CAP SYMBOL	46	42	1	0
ISSUED FOR REFERENCE ONLY	FORREF	FOR REFERENCE ONLY CELL	61	0	1	0
	RCPLEG	REFLECTIVE CEILING PLAN LEGEND	25	0 4 6	0 1 2 3 4	0
	CONXT	POINT OF CONNECTION CELL/DEFINITION	46	0	1	0
	REMTXT	POINT OF REMOVAL CELL/DEFINITION	46	0	1	0
	PLUS	PLUS OR MINUS SYMBOL	50	3	1	0
	DOE	DOE APPROVAL STAMP	1 46	2 57 8	0 2 4	0
	NUT	NUT IN ELEVATION	20	4	1	0
	SLOT	BOLT SLOT	2	0	0	0
	HOLE	BOLT HOLE	22	0	0	0
	SECHOL	SECTION OF BOLT HOLE	22	0	0	0
	SNLBRD	SANDIA NATIONAL LABORATORIES T-BIRD	22	0	0	0
	CL	CENTER LINE SYMBOL	22	0	0	0

RC = SNLARCH.CEL

REVISED 9/01

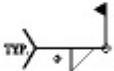
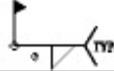
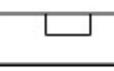
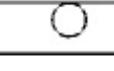
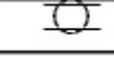
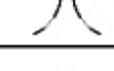
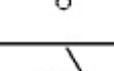
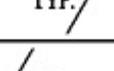
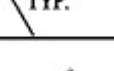
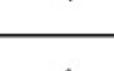
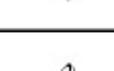
# ARCHITECTURAL - PATTERNS

REVISED 4/25/97

CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	CKRPL	CHECKER STEEL PLATE PATTERN	30	0	1	0
	PERPAN	24" x 24" ACCESS FLOOR PANEL (PERFORATED)	55	0	1	0
	CROSSHATCH 2" SPACING PA=45	CHAIN LINK FENCE PATTERN	30	4	0	0
	BRI CK	BRI CK/BLOCK PATTERN	30	91	0	0
	EARTH2	EARTH PATTERN	30	14	0	0
	EARTH	EARTH PATTERN	30	14	0	3
	AGRGAT	AGGREGATE	30	93	0	0
	STUCCO	STUCCO PATTERN	30	0	0	0
	CONC	CONCRETE PATTERN	30	0	0	0
	I NSUL	BATT I NSULATI ON	25	2	0	0
	RFDECK	METAL ROOF DECK	24	0	0	0
	COBBLE	COBBLE PATTERN	37	93	0	0

RC = SNLARCHCEL

REVISED 9/01

STRUCTURAL - WELDS						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	GNWLDL	GENERIC WELD LEFT	46	0	1	0
	GNWLDR	GENERIC WELD RIGHT	46	0	1	0
	FLWLDD	FILLET WELD	46	0	1	0
	DBFLWD	DOUBLE FILLET WELD	46	0	1	0
	PLGWLD	PLUG WELD	46	0	1	0
	SQWLD	SQUARE WELD	46	0	1	0
	BVLWLD	BEVEL WELD	46	0	1	0
	FLDWLD	FIELD WELD	46	0	1	0
	SPTWLD	SPOT WELD	46	0	1	0
	SMWLD	SEAM WELD	46	0	1	0
	VWELD	GROOVE "V" WELD	46	0	1	0
	FLVWLD	GROOVE FLAIR WELD	46	0	1	0
	ALLRND	ALL AROUND	46	0	1	0
	TYP SML	TYPICAL WELD SYMBOL LEFT	46	0	1	0
	TYP SMR	TYPICAL WELD SYMBOL RIGHT	46	0	1	0
	1/8WLD	1/8" WELD TEXT	46	0	1	0
	3/16WLD	3/16" WELD TEXT	46	0	1	0
	1/4WLD	1/4" WELD TEXT	46	0	1	0
	5/16WLD	5/16" WELD TEXT	46	0	1	0

RC = SNLARCH.CEL

REVISED 9/01

LAYOUT - DOWCRAFT						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
6" □ DC	QAC06	DOWCRAFT 6" PANEL	46 51	3	1	0
12" ▬ DC PP	QACPP	DOWCRAFT 12" PANEL WITH POWER STRIP - INSIDE FACE	46 51	3	1	0
PP 12" ▬ DC	QACPT	DOWCRAFT 12" PANEL WITH POWER STRIP - OUTSIDE FACE	46 51	3	1	0
12" ▬ DC	QAC12	DOWCRAFT 12" PANEL	46 51	3	1	0
18" ▬ DC	QAC18	DOWCRAFT 18" PANEL	46 51	3	1	0
24" ▬ DC	QAC24	24" DOWCRAFT PARTITION PANEL	46 51	3	1	0
30" ▬ DC	QAC30	30" DOWCRAFT PARTITION PANEL	46 51	3	1	0
EF ▬	QACEF	DOWCRAFT "EF" PARTITION PANEL (PANEL RUN END FILLER - LH)	46 51	3	1	0
EF ▬	QACEFL	DOWCRAFT "EF" PARTITION PANEL (PANEL RUN END FILLER - RH)	46 51	3	1	0

RC = PARTITION.CEL

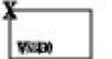
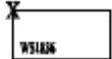
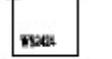
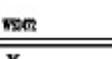
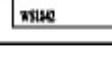
REVISED 9/01

LAYOUT - CATALOG2D						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	SSW4M	1 8" X 48" WORKSURFACE	23	23	1	0
	XXW1 3M	30" X 30" WORKSURFACE	23	23	1	0
	XXW1 4M	30" X 36" WORKSURFACE	23	23	1	0
	XXW1 5M	30" X 42" WORKSURFACE	23	23	1	0
	XXW1 6M	30" X 48" WORKSURFACE	23	23	1	0
	XXW1 7M	30" X 60" WORKSURFACE	23	23	1	0
	XXW1 8M	30" X 72" WORKSURFACE	23	23	1	0
	CR1 M	24" X 24" CORNER SURFACE	23	23	1	0
	CW2M	24" X 36" CORNER SURFACE	23	23	1	0
	CW3M	24" X 42" CORNER SURFACE	23	23	1	0
	CW4M	24" X 30" CORNER SURFACE	23	23	1	0
	CW5M	30" X 36" CORNER SURFACE	23	23	1	0
	CW6M	30" X 42" CORNER SURFACE	23	23	1	0
	BS1 M	30" BOOK SHELF	42	42	1	0
	BS2M	36" BOOK SHELF	42	42	1	0
	BS3M	42" BOOK SHELF	42	42	1	0
	BS4M	48" BOOK SHELF	42	42	1	0
	BS5M	60" BOOK SHELF	42	42	1	0
	BB1 M	30" BINDER BIN	42	42	1	0

RC = CATALOG2D.CEL

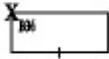
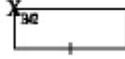
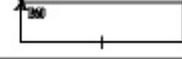
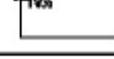
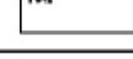
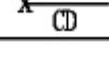
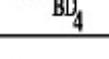
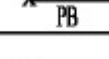
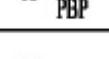
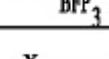
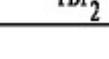
REVISED 9/01



LAYOUT - CATALOG2D						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	P22M	1 8" STEELCASE PANEL	10 40	10 40	1	0, 2
	P23M	24" STEELCASE PANEL	10 40	10 40	1	0, 2
	P24M	30" STEELCASE PANEL	10 40	10 40	1	0, 2
	P25M	36" STEELCASE PANEL	10 40	10 40	1	0, 2
	P26M	42" STEELCASE PANEL	10 40	10 40	1	0, 2
	P27M	48" STEELCASE PANEL	10 40	10 40	1	0, 2
	CP9M	24" STEELCASE CURVED PANEL	40	40	1	0
	SSW1 M	1 8" X 30" WORKSURFACE	23	23	1	0
	SSW2M	1 8" X 36" WORKSURFACE	23	23	1	0
	XXW5M	1 8" X 24" WORKSURFACE	23	23	1	0
	XXW6M	24" X 24" WORKSURFACE	23	23	1	0
	XXW7M	24" X 30" WORKSURFACE	23	23	1	0
	XXW8M	24" X 36" WORKSURFACE	23	23	1	0
	XXW9M	24" X 42" WORKSURFACE	23	23	1	0
	XXW1 0M	24" X 48" WORKSURFACE	23	23	1	0
	XXW1 1 M	24" X 60" WORKSURFACE	23	23	1	0
	XXW1 2M	24" X 72" WORKSURFACE	23	23	1	0
	SSW3M	1 8" X 42" WORKSURFACE	23	23	1	0

RC = CATALOG2D.CEL

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LAYOUT - CATALOG2D						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	BB2M	36" BINDER BIN	42	42	1	0
	BB3M	42" BINDER BIN	42	42	1	0
	BB4M	48" BINDER BIN	42	42	1	0
	BB5M	60" BINDER BIN	42	42	1	0
	TW1M	30" TRANSCATI ON WORK SURFACE	42	42	1	0
	TW2M	36" TRANSCATI ON WORK SURFACE	42	42	1	0
	TW3M	42" TRANSCATI ON WORK SURFACE	42	42	1	0
	TW4M	48" TRANSCATI ON WORK SURFACE	42	42	1	0
	TW5M	60" TRANSCATI ON WORK SURFACE	42	42	1	0
	CT1M	CURVED TRANSCATI ON WORK SURFACE	42	42	1	0
	TWC30	CORNER TRANSCATI ON WORK SURFACE	42	42	1	0
	CD	CENTER DRAWER	23	23	1,3	0
	BD	PEDESTAL -4- BOX DRAWER	23	23	1,3	0
	PB	BOX PEDESTAL	23	23	1,3	0
	PBP	PERS BOX PEDESTAL	23	23	1,3	0
	BFP	BOX FI LE PEDESTAL	23	23	1,5	0
	FDP	FILE DRAWER PEDESTAL	23	23	1,5	0

RC = CATALOG2D.CEL

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LAYOUT - LSEED3D						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	WSS243	24" X 36" HERMAN MILLER SQUARE CORNER WORKSURFACE	28	28	1	0
	WSS244	24" X 36" HERMAN MILLER SQUARE CORNER WORKSURFACE	28	28	1	0
	WSCC24	24" HERMAN MILLER RADIUS CORNER WORKSURFACE	28	28	1	0
	WSC244	24" X 48" HERMAN MILLER RADIUS CORNER WORKSURFACE	28	28	1	0
	HMD	HERMAN MILLER SINGLE DRAWER	28	28	1	0
	HMDD	HERMAN MILLER DOUBLE DRAWER	28	28	1	0
	HMPD	HERMAN MILLER PENCIL DRAWER	28	28	1	0
	HMKT	HERMAN MILLER KEYBOARD TRAY	28	28	1	0
	WS3024	30" X 24" HERMAN MILLER WORKSURFACE	28	28	1	0
	WS3030	30" X 30" HERMAN MILLER WORKSURFACE	28	28	1	0
	WS3036	30" X 36" HERMAN MILLER WORKSURFACE	28	28	1	0
	WS3048	30" X 48" HERMAN MILLER WORKSURFACE	28	28	1	0
	WS3060	30" X 60" HERMAN MILLER WORKSURFACE	28	28	1	0
	WS3072	30" X 72" HERMAN MILLER WORKSURFACE	28	28	1	0
	WSS304	30" X 48" HERMAN MILLER SQUARE CORNER WORKSURFACE	28	28	1	0
	WSC304	30" X 48" HERMAN MILLER RADIUS WORKSURFACE	28	28	1	0
	EW12	HERMAN MILLER ELECTRICAL WHIP 12" PANEL	11	11	1	0
	EW24	HERMAN MILLER ELECTRICAL WHIP 24" PANEL	11	11	1	0
	EW30	HERMAN MILLER ELECTRICAL WHIP 30" PANEL	11	11	1	0

RC = LSEED3D.CEL

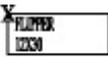
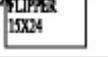
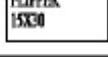
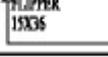
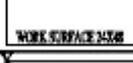
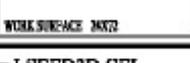
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LAYOUT - LSEED3D						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	F1 828	1 8" X 28" VERTICAL FILE CABINET	15	15	1	0
	VF1 636	1 6" X 36" VERTICAL FILE	15	15	1	0
	VF1 736	1 7" X 36" VERTICAL FILE	15	15	1	0
	VF1 836	1 8" X 36" VERTICAL FILE	15	15	1	0
	VF1 936	1 9" X 36" VERTICAL FILE	15	15	1	0
	R2424	24" X 24" RACK	15	15	1	0
	R2430	24" X 30" RACK	15	15	1	0
	S2030	20" X 30" SAFE	15	15	1	0
	SC2032	20" X 32" SCOPE	15	15	1	0
	HM1 2	1 2" HERMAN MILLER	13, 14	28, 14	1	0,5
	HM24	24" HERMAN MILLER	13, 14	28, 14	1	0,5
	HM30	30" HERMAN MILLER	13, 14	28, 14	1	0,5
	HM36	36" HERMAN MILLER	13, 14	28, 14	1	0,5
	HM48	48" HERMAN MILLER	13, 14	28, 14	1	0,5
Richard to create a new cell		60" HERMAN MILLER				
	HM26	26" HERMAN MILLER CURVE	13, 14	28, 14	1	0,5
	TCON	7" X 2" HERMAN MILLER "T" CONNECTOR	14	14	1	0
	HM1 80	STRAIGHT HERMAN MILLER 1 80 CONNECTOR	14	14	1	0
	HM2WAY	2-WAY HERMAN MILLER 90 DEG CONNECTOR	14	14	1	0

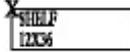
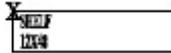
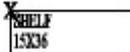
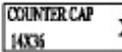
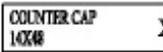
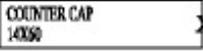
RC = LSEED3D.CEL

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LAYOUT - LSEED3D						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
 X	FD1 230	1 2" X 30" HERMAN MI LLER SHELF W/FLI PPER	29	29	1	0
 X	FD1 236	1 2" X 36" HERMAN MI LLER SHELF W/FLI PPER	29	29	1	0
 X	FD1 248	1 2" X 48" HERMAN MI LLER SHELF W/FLI PPER	29	29	1	0
 X	FD1 524	1 5" X 24" HERMAN MI LLER SHELF W/FLI PPER	29	29	1	0
 X	FD1 530	1 5" X 30" HERMAN MI LLER SHELF W/FLI PPER	29	29	1	0
 X	FD1 536	1 5" X 36" HERMAN MI LLER SHELF W/FLI PPER	29	29	1	0
 X	FD1 548	1 5" X 48" HERMAN MI LLER SHELF W/FLI PPER	29	29	1	0
	HMOUT	HERMAN MI LLER ELEVTRI CAL WHI P OUTLET	10	10	1	0
	2X	HERMAN MI LLER ELEVTRI CAL 2-PLEX OUTLET	10	10	1	0
	4X	HERMAN MI LLER ELEVTRI CAL 4-PLEX OUTLET	10	10	1	0
 X	DF1 41 7	1 4" X 1 7" DRI NKI NG FOUNTAI N	10	10	1	0
	CCS26	COUNTER CAP W/SQUARE CORNER	29	29	1	0
	CCC26	COUNTER CAP W/CURVED CORNER	29	29	1	0
 X	WS2424	24" X 24" HERMAN MI LLER WORK SURFACE	28	28	1	0
 X	WS2430	24" X 30" HERMAN MI LLER WORK SURFACE	28	28	1	0
 X	WS2436	24" X 36" HERMAN MI LLER WORK SURFACE	28	28	1	0
 X	WS2448	24" X 48" HERMAN MI LLER WORK SURFACE	28	28	1	0
 X	WS2460	24" X 60" HERMAN MI LLER WORK SURFACE	28	28	1	0
 X	WS2472	24" X 72" HERMAN MI LLER WORK SURFACE	28	28	1	0

RC = LSEED3D.CEL

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LAYOUT - LSEED3D						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	HM4WAY	4-WAY HERMAN MILLER CONNECTOR	14	14	1	0
	HMFT	HERMAN MILLER SUPPORT LEG	14	14	1	0
	CPRI NT	TABLE TOP TYPE PC PRI NTER	15	15	1	0
	CRT	1 6" X 21" COMPUTER TERMI NAL	15	15	1	0
	SH1 224	1 2" X 24" SHELF	29	29	1	0
	SH1 230	1 2" X 30" SHELF	29	29	1	0
	SH1 236	1 2" X 36" SHELF	29	29	1	0
	SH1 248	1 2" X 48" SHELF	29	29	1	0
	SH1 524	1 5" X 24" SHELF	29	29	1	0
	SH1 530	1 5" X 30" SHELF	29	29	1	0
	SH1 536	1 5" X 36" SHELF	29	29	1	0
	SH1 548	1 5" X 48" SHELF	29	29	1	0
	CC24	1 4" X 24" HERMAN MI LLER COUNTER TOP	29	29	1	0
	CC30	1 4" X 30" HERMAN MI LLER COUNTER TOP	29	29	1	0
	CC36	1 4" X 36" HERMAN MI LLER COUNTER TOP	29	29	1	0
	CC48	1 4" X 48" HERMAN MI LLER COUNTER TOP	29	29	1	0
	CC60	1 4" X 60" HERMAN MI LLER COUNTER TOP	29	29	1	0
	CC72	1 4" X 72" HERMAN MI LLER COUNTER TOP	29	29	1	0
	FD1 224	1 2" X 24" HERMAN MI LLER SHELF W/FLI PPER	29	29	1	0

RC = LSEED3D.CEL

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LAYOUT - LSEED3D						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
X AMES SHELF 12X36	A1 236	12" X 36" AMES SHELF	15	15	1	0
X AMES SHELF 16X36	A1 636	16" X 36" AMES SHELF	15	15	1	0
X BOOKCASE 13X33	BC1 333	13" X 33" BOOKCASE	15	15	1	0
X BOOKCASE 13X36	BC1 336	13" X 36" BOOKCASE	15	15	1	0
X BOOKCASE 14X36	BC1 436	14" X 36" BOOKCASE	15	15	1	0
X BOOKCASE 14X38	BC1 438	14" X 38" BOOKCASE	15	15	1	0
X SHELF 12X24	SD1 224	12" X 24" SHELF (DOWCRAFT)	59	59	1	0
X SHELF 12X30	SD1 230	12" X 30" SHELF (DOWCRAFT)	59	59	1	0
X TABLE 30X48	T3048	30" X 48" TABLE	15	15	1	0
X TABLE 30X60	T3060	30" X 60" TABLE	15	15	1	0
X TABLE 34X45	T3445	34" X 45" TABLE	15	15	1	0
X TABLE 34X60	T3460	34" X 60" TABLE	15	15	1	0
X TABLE 36X48	T3648	36" X 48" TABLE	15	15	1	0
X TABLE 36X72	T3672	36" X 72" TABLE	15	15	1	0
X LATERAL FILE 18X24	LF1 624	18" X 24" LATERAL FILE	15	15	1	0
X LATERAL FILE 18X30	LF1 630	18" X 30" LATERAL FILE	15	15	1	0
X LATERAL FILE 18X36	LF1 636	18" X 36" LATERAL FILE	15	15	1	0
X LATERAL FILE 18X36	LF1 936	18" X 36" LATERAL FILE	15	15	1	0
X LATERAL FILE 18X42	LF1 942	18" X 42" LATERAL FILE	15	15	1	0

RC = LSEED3D.CEL

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LAYOUT - LSEED3D						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
<del>C X T</del>	CT	COAT TREE	15	15	1	0
<del>DESK 3060</del>	D3060	30" X 60" DESK	15	15	1	0
<del>DESK W/Organizer 3060</del>	DO3060	30" X 60" DESK W/ORGANIZER	14	14	1	0
<del>DESK 3072</del>	D3072	30" X 72" DESK	15	15	1	0
<del>DESK 3672</del>	D3672	36" X 72" DESK	15	15	1	0
<del>TYP 820</del>	TY1 820	1 8" X 20" TYPING TABLE	15	15	1	0
<del>PHONE TABLE 824</del>	PT1 824	1 8" X 24" PHONE TABLE	15	15	1	0
<del>TABLE 830</del>	T1 830	1 8" X 30" TABLE	15	15	1	0
<del>TABLE 2232</del>	T2232	22" X 32" TABLE	15	15	1	0
<del>TABLE 2424</del>	T2424	24" X 24" TABLE	15	15	1	0
<del>TABLE 2430</del>	T2430	24" X 30" TABLE	15	15	1	0
<del>TABLE 2436</del>	T2436	24" X 36" TABLE	15	15	1	0
<del>TABLE 2448</del>	T2448	24" X 48" TABLE	15	15	1	0
<del>TABLE 2626</del>	T2626	26" X 26" TABLE	15	15	1	0
<del>TABLE 2640</del>	T2640	26" X 40" TABLE	15	15	1	0
<del>TABLE 2840</del>	T2840	28" X 40" TABLE	15	15	1	0
<del>TABLE 3030</del>	T3030	30" X 30" TABLE	15	15	1	0
<del>TABLE 3036</del>	T3036	30" X 36" TABLE	15	15	1	0
<del>TABLE 3045</del>	T3045	30" X 45" TABLE	15	15	1	0

RC = LSEED3D.CEL

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LAYOUT - LSEED3D						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	DR3FT	SINGLE STUD DOOR 3'-0"	25	58	1	0
	DR6FT	DOUBLE STUD DOOR 6'-0"	25	58	1	0
	HMDRL	HERMAN MILLER SINGLE DOOR GLASS LEFT	25	0	1	0
	HMDRR	HERMAN MILLER SINGLE DOOR GLASS RIGHT	25	0	1	0
	WB4	WRITING BOARD 4'-0"	15	15	1	0
	WB6	WRITING BOARD 6'-0"	15	15	1	0
Richard will create a new cell		WRITING BOARD 3'-0"	15	15	1	0
	TR36	ROUND TABLE 36" DIA.	15	15	1	0
	TR48	ROUND TABLE 48" DIA.	15	15	1	0
	TR54	ROUND TABLE 54" DIA.	15	15	1	0
	B3060	BENCH 30" X 60"	15	15	1	0
	B3072	BENCH 30" X 72"	15	15	1	0
	B3672	BENCH 36" X 72"	15	15	1	0
	C1629	16" X 29" CABINET	15	15	1	0
	C1836	18" X 36" STORAGE CABINET	15	15	1	0
	C2436	24" X 36" STORAGE CABINET	15	15	1	0
	CC2424	24" X 24" CABINET W/COMPUTER	15	15	1	0
	SECL	LEFT HANDED DESK	15	15	1	0
	SECR	RIGHT HANDED DESK	15	15	1	0

RC = LSEED3D.CEL

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LAYOUT - LSEED3D						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	FENCE	FENCE PATTERN	57	57	1	0
	CURT	ACCORDIAN CURTAIN PATTERN	57	57	1	0
	AT	ARROW TERMINATOR	3	3	1	0
	ARROW	DIRECTION ARROW	13	13	1	0
	TB2	2' TACK BOARD (HEMAN MILLER)	29	29	1	0
	TB30	2'-6" TACK BOARD (HEMAN MILLER)	29	29	1	0
	TB3	3' TACK BOARD (HEMAN MILLER)	29	29	1	0
	TB4	4' TACK BOARD (HEMAN MILLER)	29	29	1	0
	RMNUM	ROOM NUMBER SYMBOL	27	27	1	0
	STOOL	DRAFTING STOOL	15	15	1	0
	SCHAIR	SECRETARY CHAIR	15	15	1	0
	VCHAIR	VISITOR CHAIR	15	15	1	0
	ECHAIR	EXECUTIVE CHAIR	15	15	1	0
	DCDOOR	DOWCRAFT DOOR SINGLE	58	58	1	0
	DCDDR	DOWCRAFT DOUBLE DOOR	58	58	1	0
	VDOOR	VMP DOOR SINGLE 3'-0"	29	29	1	0
	VDDR	VMP DOUBLE DOORS 5'-6"	29	29	1	0

RC = LSEED3D.CEL

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# *Chapter 5*

## *Mechanical*

## Level Assignments

The level schemas shown in this chapter are the standard element level definitions for each mechanical system's master file. User-definable levels are used where the level schemas do not accommodate the design needs of a particular project. Contact the Project CADD Coordinator Juan Martinez for approval before using user-defined levels. All user-defined levels shall be identified using the File Specific Information cell located in `noting.cel`. Level schemas in this chapter are as follows:

Level Schema	Page
HVAC & Exhaust Plan—Above	5-6
HVAC & Exhaust Plan—Below	5-7
HVAC Piping Plan—Above	5-8
HVAC Piping Plan—Below	5-9
Plumbing Plan	5-10
Gases & Process Gases	5-11
Fire Protection—Above	5-12
Fire Protection—Below	5-13
Fire Protection—Occupied Space	5-14
Process Liquids	5-15
Mechanical Roof Plan	5-16
Plot File	5-17

## Standard Cell

The standard mechanical cell library is `snlmech.cel`. If additional new cells are required, create a personal project cell library and submit to the Project CADD Coordinator for approval before using new cells. Submit an Engineering Standards Request (ESR) to incorporate the cells into the `snlmech.cel` library. Graphical representations of the cells in `snlmech.cel` are shown in the tabbed Mechanical Cell Library section.

## Mechanical Master Files

Project designs may require plot files and master files showing mechanical systems separated according to location, such as above ceiling, below ceiling, below raised floors, in occupied space, or in trenches. If this type of separation is needed for clarity then separate master files shall be created. Refer to flowcharts and elevation views in Figures 3-1 through 3-6. Contact Project CADD Coordinator Juan Martinez before starting new building design for building requirements.

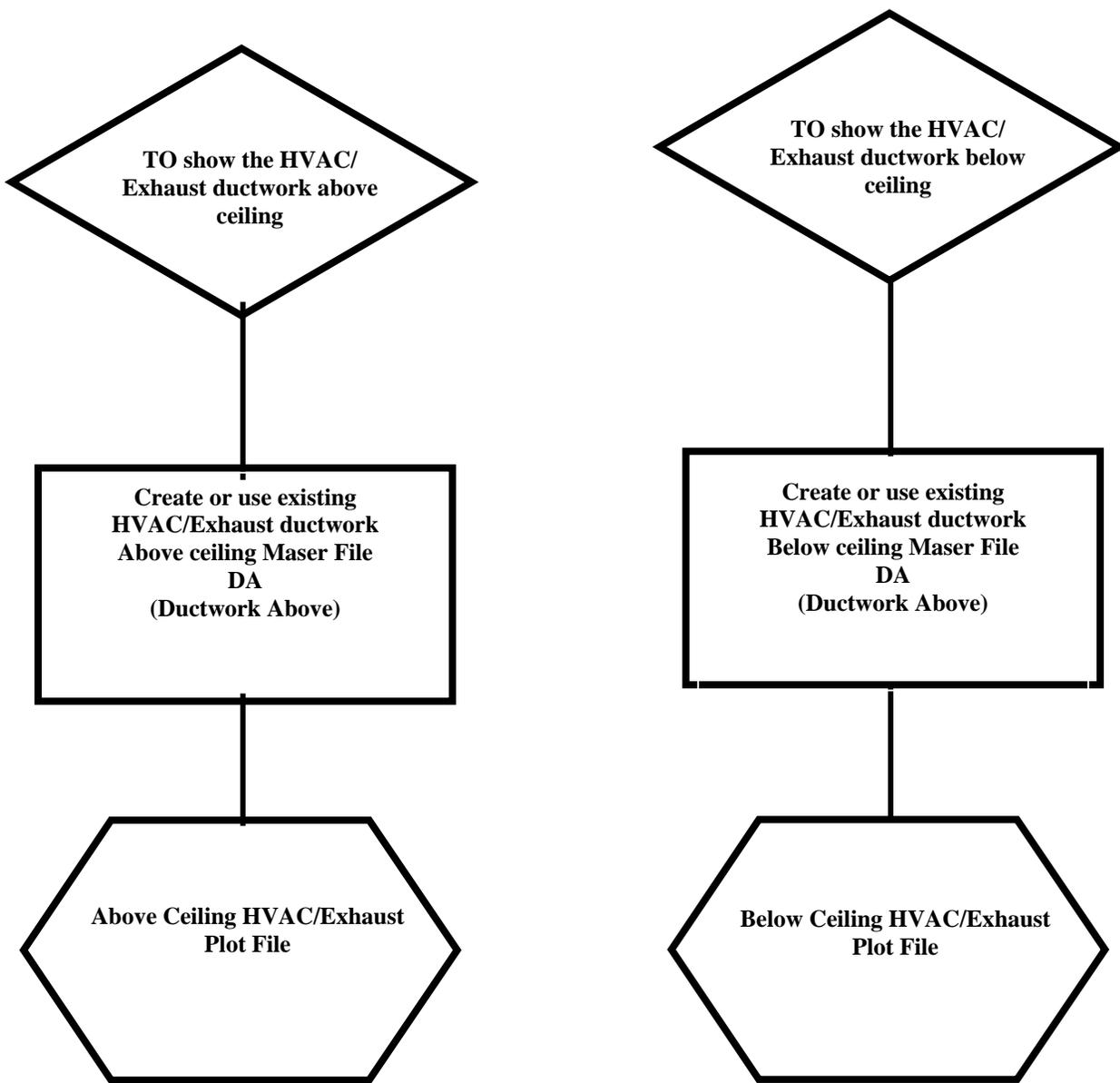


Figure 3-1. HVAC Ductwork Flowchart

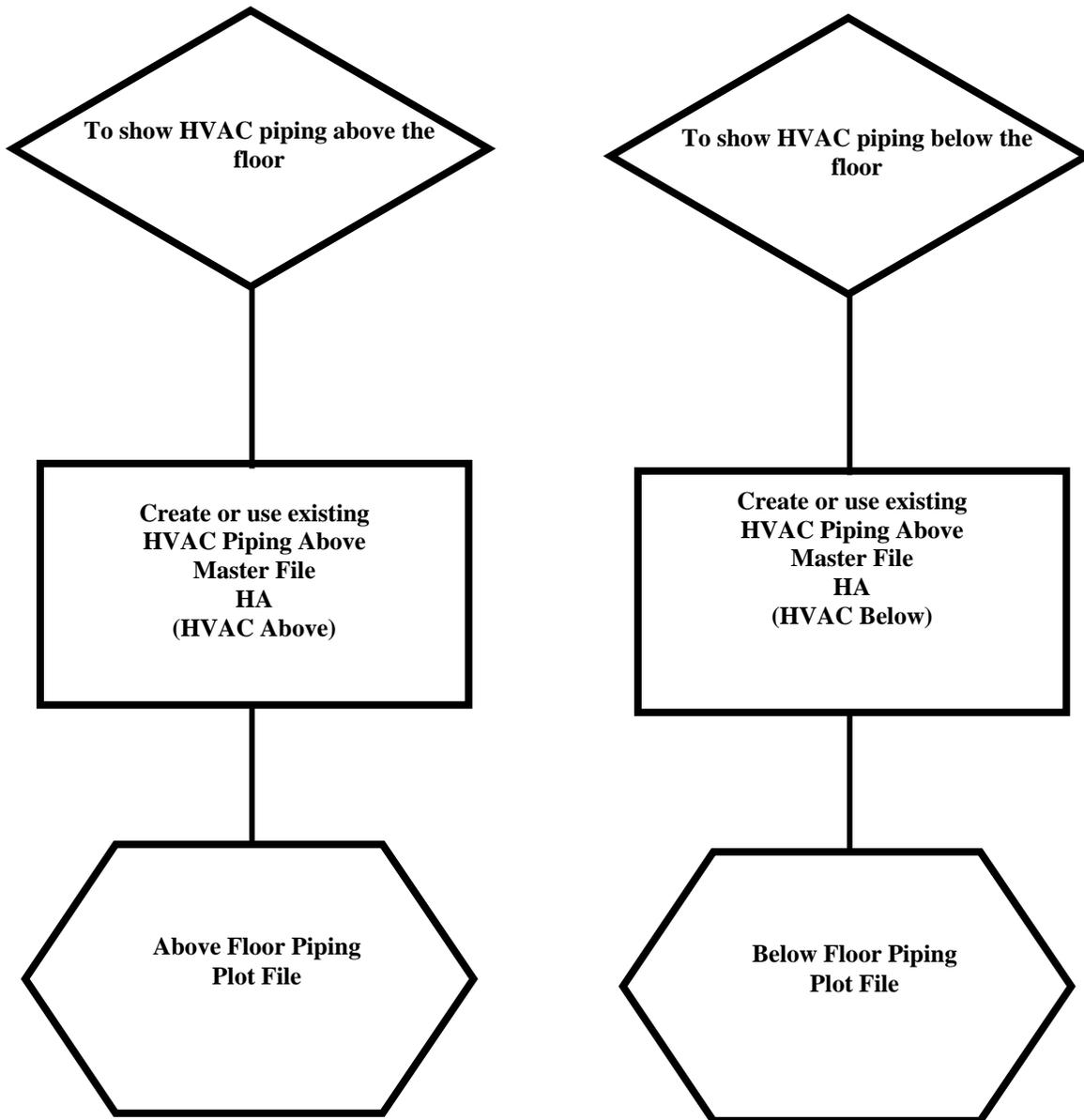


Figure 3-2. HVAC Piping Flowchart

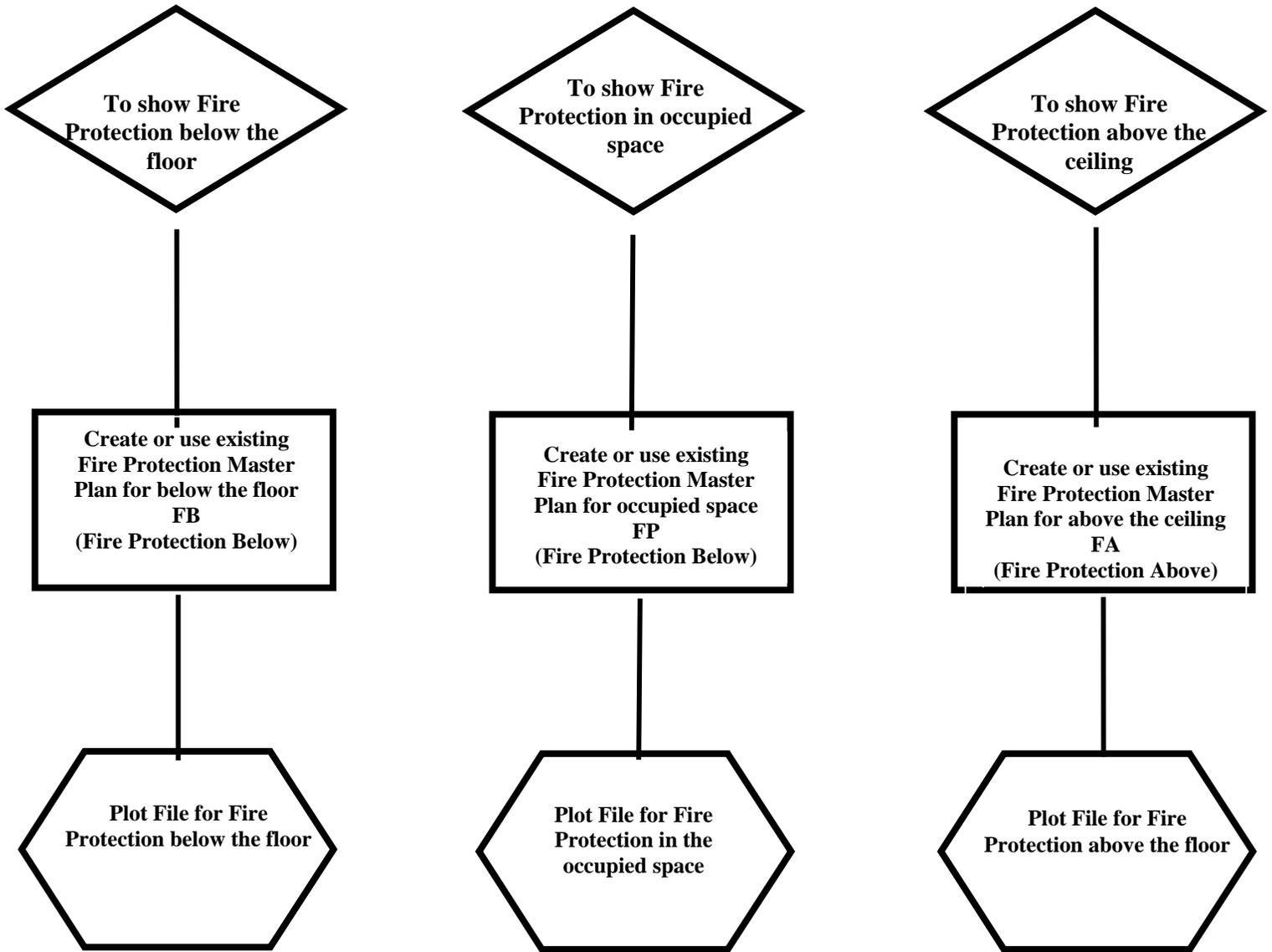


Figure 3-3. Fire Protection Flowchart

(Elevation View)

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3	RETURN AIR FLOW ARROWS	53	1	0	RETURN
4					
5					
6	VAV BOX, TERMINAL BOX	35,16	3,2	0,0	SUPPLY
7	CLEAN ROOM AIR - RECIRCULATING, CLEAN ROOM HEPA FILTERS	64	2	0	
8					
9	DUCTWORK, FITTINGS / DAMPERS, FILTERS, FLOW IND., TURNING VANES, SPLITTERS, EXTRACTORS / FLEX DUCT SYMB., A.L.	13	4,2,0	0,3	RETURN
10	HUMIDIFIER	7	2	0	
11					
12	DUCTWORK, FITTINGS / DAMPERS, FILTERS, FLOW IND., TURNING VANES, SPLITTERS, EXTRACTORS / FLEX DUCT SYMB., A.L.	4	4,2,0	0,3	MAKE - UP
13	DUCTWORK, FITTINGS / DAMPERS, FILTERS, FLOW IND., TURNING VANES, SPLITTERS, EXTRACTORS / FLEX DUCT SYMB., A.L.	6	4,2,0	0,3	EXHAUST
14	SMOKE REMOVAL	9	4	0	
15	SPECIAL EXHAUST	7	4	0	
16	DETECTORS	1	2	0	
17	FANS	35	2	0	
18	AIR HANDLING UNIT	12	3	0	
19	ESSENTIAL DRAWING INFORMATION	0	0	4	
20	ESSENTIAL DRAWING INFORMATION	0	0	4	
21	ACID EXHAUST (DUCTWORK, FITTINGS, & ASSOCIATED ELEMENTS)	18	3	0	EXHAUST
22	SOLVENT EXHAUST	19	3	0	EXHAUST
23					
24					
25	DIFFUSERS, GRILLES, REGISTERS	54	3	0	SUPPLY
26					
27	DOOR LOUVERS	6	2	0	NOTE a
28	FAN COIL UNITS	18	2	0	
29	SUPPLY ARROWS	54	2	0	
30	EQUIPMENT LAYOUT (EQ) PLAN	52	2	0	
31	C.F.M. TEXT FOR ALL DIFFUSERS	8	1	0	a
32	DIFFUSERS	4	3	0	MAKE - UP
33	DIFFUSERS, GRILLES, REGISTERS	6	3	0	EXHAUST
34	DIFFUSERS, GRILLES, REGISTERS	13	3	0	RETURN
35	SPECIAL EXHAUST DIFFUSERS, RETURN AIR GRILLES	20	2	0	EXHAUST
36	TEXT FOR DUCTWORK, DAMPERS, FILTERS, FITTINGS, ETC.	8	1	0	SUPPLY
37	TEXT FOR DUCTWORK, DAMPERS, FILTERS, FITTINGS, ETC.	4	1	0	MAKE - UP
38	TEXT FOR DUCTWORK, DAMPERS, FILTERS, FITTINGS, ETC.	6	1	0	EXHAUST
39	TEXT FOR DUCTWORK, DAMPERS, FILTERS, FITTINGS, ETC.	13	1	0	RETURN
40	REFERENCE SYMBOLS AND TEXT (SECTION CUT, DETAIL, ELEVATION INDICATORS, ETC.)	3	2,1	0	
41	BREAKLINES, CENTERLINES,	2	0	0,4	
42					
43	SPECIAL EXHAUST TEXT	0	1	0	
44	HEX SYMBOLS				
45	ROOM NAMES AND NUMBERS	2	1	0	b
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS (TO BE DRAWN RELATIVE TO ELEMENT BEING LABELED)	0	1	0	
47	DRAWING COMPONENT TITLE AND SCALE	2	2	0	
48					
49					
50	DIMENSIONS AND LEADER LINES	3	1	0	
51					
52					
53					
54					
55					
56	DUCT SUPPORTERS	24	1	0	
57					
58					
59					
60					
61	EXHAUST TO ROOF SHADING	0	0	0	EXHAUST
62	SHADING				
63	PAT TERNING WITH PEN TABLE - SEE SYSTEM MANAGER				

**HVAC & EXHAUST PLAN - ABOVE**

MECHANICAL  
MASTER FILE LEVEL SYMBOLOLOGY:

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3	RETURN AIR FLOW ARROWS	53	1	0	RETURN
4				0	
5	DUCTWORK, FITTINGS / DAMPERS, FILTERS, FLOW IND., TURNING VANES, SPLITTERS, EXTRACTORS / FLEX DUCT SYMB., A. L.	8	4,2,0	0,3	SUPPLY
6	VAV BOX, TERMINAL BOX,	35,16	3,2	0,0	SUPPLY
7	CLEAN ROOM AIR - RECIRCULATING, CLEAN ROOM HEPA FILTERS	64	2	0	
8					
9	DUCTWORK, FITTINGS / DAMPERS, FILTERS, FLOW IND., TURNING VANES, SPLITTERS, EXTRACTORS / FLEX DUCT SYMB., A. L.	13	4,2,0	0,3	RETURN
10	HUMIDIFIER	7	2	0	
11					
12	DUCTWORK, FITTINGS / DAMPERS, FILTERS, FLOW IND., TURNING VANES, SPLITTERS, EXTRACTORS / FLEX DUCT SYMB., A. L.	4	4,2,0	0,3	MAKE - UP
13	DUCTWORK, FITTINGS / DAMPERS, FILTERS, FLOW IND., TURNING VANES, SPLITTERS, EXTRACTORS / FLEX DUCT SYMB., A. L.	6	4,2,0	0,3	EXHAUST
14	SMOKE REMOVAL	9	4	0	
15	SPECIAL EXHAUST	7	4	0	
16	DETECTORS	1	2	0	
17	FANS	35	2	0	
18	AIR HANDLING UNIT	12	3	0	
19	ESSENTIAL DRAWING INFORMATION	0	0	4	
20	ESSENTIAL DRAWING INFORMATION	0	0	4	
21	ACID EXHAUST (DUCTWORK, FITTINGS, & ASSOCIATED ELEMENTS)	18	3	0	EXHAUST
22	SOLVENT EXHAUST	19	3	0	EXHAUST
23	THERMOSTAT CONNECT LINE	2	2	4	
24	THERMOSTATS (PNEUMATIC, ELECTRIC)	2	2	4	
25	DIFFUSERS, GRILLES, REGISTERS	54	3	0	SUPPLY
26					
27	DOOR LOUVERS	6	2	0	a
28	FAN COIL UNITS	18	2	0	
29	SUPPLY ARROWS	54	2	0	
30	LAYOUT (EQ) PLAN	52	1	0	SUPPLY
31	C.F.M. TEXT FOR ALL DIFFUSERS	8	1	0	a
32	DIFFUSERS	4	3	0	MAKE - UP
33	DIFFUSERS, GRILLES, REGISTERS	6	3	0	EXHAUST
34	DIFFUSERS, GRILLES, REGISTERS	13	3	0	RETURN
35	SPECIAL EXHAUST DIFFUSERS, RETURN AIR GRILLES	20	2	0	EXHAUST
36	TEXT FOR DUCTWORK, DAMPERS, FILTERS, FITTINGS, ETC.	8	1	0	SUPPLY
37	TEXT FOR DUCTWORK, DAMPERS, FILTERS, FITTINGS, ETC.	4	1	0	MAKE - UP
38	TEXT FOR DUCTWORK, DAMPERS, FILTERS, FITTINGS, ETC.	6	1	0	EXHAUST
39	TEXT FOR DUCTWORK, DAMPERS, FILTERS, FITTINGS, ETC.	13	1	0	RETURN
40	REFERENCE SYMBOLS AND TEXT (SECTION CUT, DETAIL, ELEVATION INDICATORS, ETC.)	3	2,1	0	
41	BREAKLINES, CENTERLINES,	2	0	0,4	
42					
43	SPECIAL EXHAUST TEXT	0	1	0	EXHAUST
44	HEX SYMBOLS				
45	ROOM NAMES AND NUMBERS	2	1	0	b
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS (TO BE DRAWN RELATIVE TO ELEMENT BEING LABELED)	0	1	0	
47	DRAWING COMPONENT TITLE AND SCALE	2	2	0	
48					
49					
50	DIMENSIONS AND LEADER LINES	3	1	0	
51					
52					
53					
54					
55					
56	DUCT SUPPORTERS	24	1	0	
57					
58					
59	FAN COIL UNITS				
60					
61	EXHAUST TO ROOF SHADING	0	0	0	EXHAUST
62	SHADING				
63	PATTERNING WITH PEN TABLE - SEE SYSTEM MANAGER				

**HVAC & EXHAUST PLAN - BELOW**

MECHANICAL  
MASTER FILE LEVEL SYMBOLOLOGY:

LV	ACRONYMS	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1						
2						
3						
4	HPS	HIGH-PRESSURE STEAM	3	3	0	
5	MPS	MEDIUM-PRESSURE STEAM	4	3	0	
6	LPS	LOW PRESSURE STEAM	2	3	0	
7	C	CONDENSATE, GRAVITY	25	3	0	
8	PC	PUMPED CONDENSATE	5	3	0	
9	FOS	FUEL OIL SUPPLY	7	3	0	
10	FOR	FUEL OIL RETURN	125	3	0	
11	FOG	FUEL OIL GAUGE LINE	20	2	0	
12	FOV	FUEL OIL TANK VENT	13	2	2	
13	TWS	TOWER WATER SUPPLY	16	3	0	
14	TWR	TOWER WATER RETURN	126	3	0	
15		COILS	35	2	0	
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35	HWS,HWR	(HEATED WATER SUPPLY), (HEATED WATER RETURN)	7,9	3	0	
36						
37	CWS, CWR	(CHILLED WATER SUPPLY), (CHILLED WATER RETURN)	10,11	3	0	
38	LCWS	LOW TEMPERATURE CHILLED WATER SUPPLY	63	3	0	
39	RS,RD,RL	(REFRIGERANT SUCTION), (REFRIGERANT DISCHARGE), (REFRIGERANT LIQUID)	12	3	0	
40		REFERENCE SYMBOLS AND TEXT (SECTION CUT, DETAIL, ELEVATION INDICATORS, ETC.)	3	2,1	0	
41		BREAKLINES, CENTERLINES,	2	0	0,4	
42						
43						
44						
45		ROOM NAMES AND NUMBERS	2	1	0	a
46		NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1	0	
47		DRAWING COMPONENT TITLE AND SCALE	2	2	0	
48						
49						
50		DIMENSIONS AND LEADER LINES	3	1	0	
51						
52						
53						
54						
55						
56		PIPING SUPPORTS	24	1	0	
57						
58						
59						
60						
61						
62						
63						

**HVAC PIPING PLAN - ABOVE**

MECHANICAL  
MASTER FILE LEVEL SYMBOLLOGY:

LV	ACRONYMS	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1						
2						
3						
4	HPS	HIGH-PRESSURE STEAM	3	3	0	
5	MPS	MEDIUM-PRESSURE STEAM	4	3	0	
6	LPS	LOW PRESSURE STEAM	2	3	0	
7	C	CONDENSATE, GRAVITY	25	3	0	
8	PC	PUMPED CONDENSATE	5	3	0	
9	FOS	FUEL OIL SUPPLY	7	3	0	
10	FOR	FUEL OIL RETURN	125	3	0	
11	FOG	FUEL OIL GAUGE LINE	20	2	0	
12	FOV	FUEL OIL TANK VENT	13	2	2	
13	TWS	TOWER WATER SUPPLY	16	3	0	
14	TWR	TOWER WATER RETURN	126	3	0	
15		COILS	35	2	0	
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35	HWS,HWR	(HEATED WATER SUPPLY), (HEATED WATER RETURN)	7,9	3,3	0	
36						
37	CWS, CWR	(CHILLED WATER SUPPLY), (CHILLED WATER RETURN)	10,11	3	0	
38	LCWS	LOW TEMPERATURE CHILLED WATER SUPPLY	63	3	0	
39	RS,RD,RL	(REFRIGERANT SUCTION), (REFRIGERANT DISCHARGE), (REFRIGERANT LIQUID)	12	3	0	
40		REFERENCE SYMBOLS AND TEXT (SECTION CUT, DETAIL, ELEVATION INDICATORS, ETC.)	3	2,1	0	
41		BREAKLINES, CENTERLINES,	2	0	0,4	
42						
43						
44						
45		ROOM NAMES AND NUMBERS	2	1	0	a.
46		NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1	0	
47		DRAWING COMPONENT TITLE AND SCALE	2	2	0	
48						
49						
50		DIMENSIONS AND LEADER LINES	3	1	0	
51						
52						
53						
54						
55						
56		PIPING SUPPORTS	24	1	0	
57						
58						
59						
60						
61						
62						
63						

**HVAC PIPING PLAN - BELOW**

MECHANICAL  
MASTER FILE LEVEL SYMBOLOLOGY:

LV	ACRONYMS	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1						
2						
3						
4	HWC	HOT WATER CIRCULATING	5	3	0	
5	D	DRAIN, GRAVITY	7	3	0	
6	PD	PRESSURE DRAIN	8	3	0	
7	NPW	NON-POTABLE WATER	21	3	0	
8	V	VENT	11	2	2	
9	RWL, ORWL	RAIN WATER LEADER, OVERFLOW RAIN WATER LEADER	32	4	0	
10	HW	HOT WATER	1	3	0	
11	CW	COLD WATER	2	3	0	
12	S	SANITARY SEWER	3	4	0	
13	SD	STORM DRAIN	4	4	0	
14	RD	ROOF DRAIN	9	4	0	
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30	FD	FLOOR DRAIN	3	3	0	
31						
32						
33						
34						
35						
36						
37						
38						
39						
40		REFERENCE SYMBOLS AND TEXT (SECTION CUT, DETAIL, ELEVATION INDICATORS, ETC.)	3	2	0	
41		BREAKLINES, CENTERLINES	2	0	0,4	
42						
43						
44						
45		ROOM NAMES AND NUMBERS	2	1	0	a
46		NOTES, MISC. TEXT, LEADER LINES, TERMINATORS (DRAWN RELATIVE TO ELEMENT BEING LABELLED)	0	1	0	
47		DRAWING COMPONENT TITLE AND SCALE	2	2	0	
48						
49						
50		DIMENSIONS AND LEADER LINES	3	1	0	
51						
52	RAD	RADIOACTIVE WASTE	18	4	0	
53	AV	ACID VENT	21	2	0	
54	AW	ACID WASTE	16	4	0	
55						
56						
57						
58						
59						
60	LW	(LABORATORY WASTE) OR (SOLVENT WASTE)	24	4	0	
61						
62		SHADING				
63		PATTERNING WITH PEN TABLE - SEE SYSTEM MANAGER				

**PLUMBING PLAN**

MECHANICAL  
MASTER FILE LEVEL SYMBOLLOGY:

LV	CHEMICAL SYMBOLOGY & ACRONYMS	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1	N <sub>2</sub>	NITROGEN	100	2	0	
2	2N <sub>2</sub>	NITROGEN	102	2	0	
3	3N <sub>2</sub>	NITROGEN	106	2	0	
4	4N <sub>2</sub>	NITROGEN	109	2	0	
5	PN2	PROCESS NITROGEN	110	2	0	
6	LN2	LIQUID NITROGEN	112	2	0	
7	H <sub>2</sub>	HYDROGEN, LIQUID HYDROGEN, PURIFIED HYDROGEN	17,5,64	2	0	
8	H <sub>2</sub> Se	HYDROGEN SELENIDE	48	2	0	
9	C <sub>2</sub> H <sub>6</sub> Te	DIMETHYLTELLURIUM	27	2	0	
10						
11	SiH <sub>4</sub>	SILANE	28	2	0	
12	NH <sub>3</sub>	AMMONIA	29	2	0	
13	O <sub>2</sub>	OXYGEN, LIQUID OXYGEN	39,21	2	0	
14	Ar	ARGON, LIQUID ARGON, PROCESS ARGON	7,13,60	2	0	
15	A <sub>e</sub> H <sub>3</sub>	ARSINE	25	2	0	
16	G	NATURAL GAS	11	2	0	
17	CO <sub>2</sub> , LCO <sub>2</sub>	CARBON DIOXIDE, LIQUID CARBON DIOXIDE	43,39	2	0	
18	Cl <sub>2</sub>	CHLORINE	76	2	0	
19						
20	CA	COMPRESSED AIR	6	2	0	
21						
22	VAC	VACUUM	16	2	0	
23	LPG	LIQUID PETROLEUM GAS	15	2	0	
24	PH <sub>3</sub>	PHOSPHINE	4	2	0	
25	H <sub>e</sub> Si <sub>2</sub>	DISILANE	5	2	0	
26	R12	DICHLORODIFLUOROMETHANE	23	2	0	
27	R14	TETRAFLUOROMETHANE	8	2	0	
28	DMC	DIMETHYLCADMIUM	32	2	0	
29	F <sub>2</sub>	FLUORINE	54	2	0	
30						
31	SF <sub>6</sub>	SULPHUR HEXAFLUORIDE	19	2	0	
32	TEOS/TEB	TETRAETHYLORTHOSILICATE / TRIETHYLBORATE	53	2	0	
33	B <sub>2</sub> H <sub>6</sub>	DIBORANE	79	2	0	
34	NF <sub>3</sub>	NITROGEN TRIFLOURIDE	111	2	0	
35	CF <sub>4</sub>	CARBON TETRAFLOURIDE	77	2	0	
36	HBr	HYDROGEN BROMIDE	73	2	0	
37	H <sub>6</sub> Cl <sub>3</sub>	CHLOROFORM	124	2	0	
38	CHF <sub>3</sub>	HALOCARBON 23	9	2	0	
39	CCl <sub>4</sub>	CARBON TETRACHLORIDE	70	2	0	
40		REFERENCE SYMBOLS AND TEXT (SECTION CUT, DETAIL, ELEVATION INDICATORS, ETC.)	3	2,1	0	
41		BREAKLINES, CENTERLINES,	2	0	0,4	
42	N <sub>2</sub> O	NITROUS OXIDE	89	2	0	
43	BCl <sub>3</sub>	BORON TRICHLORIDE	34	2	0	
44	SiCl <sub>4</sub>	SILICON TETRACHLORIDE	40	2	0	
45		ROOM NAMES AND NUMBERS	2	1	0	a
46		NOTES, MISC. TEXT, LEADER LINES, TERMINATORS (TO BE DRAWN RELATIVE TO ELEMENT BEIN	0	1	0	
47		DRAWING COMPONENT TITLE AND SCALE	2	2	0	
48						
49	SiF <sub>4</sub>	SILICON TETRAFLUORIDE	103	2	0	
50		DIMENSIONS AND LEADER LINES	3	1	0	
51	CDA	CLEAN DRY AIR	20	2	0	
52		MISCELLANEOUS GASES NOT LISTED	104	2	0	
53	HCV	HOUSE KEEPING VACUUM	24	2	0	
54						
55						
56	BA	BREATHING AIR	10	2	0	
57	He	HELIUM	12	2	0	
58		GAS BOTTLE RACK	0	2	0	
59	CH <sub>4</sub>	METHANE	18	2	0	
60	C <sub>2</sub> H <sub>2</sub>	ACETYLENE	22	2	0	
61						
62						
63						

**GASES & PROCESS GASES**

MECHANICAL MASTER FILE LEVEL SYMBOLOGY:

LV	ACRONYMS	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14	F	(FIRE MAIN), (INDIRECT MAIN), (TEXT, PIPE SIZES & HEAD SPACING DIMENSIONS)	3,3	3,1	0,0	
15						
16						
17						
18						
19						
20		SMOKE DETECTORS	?	?	?	
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40		REFERENCE SYMBOLS AND TEXT (SECTION CUT, DETAIL, ELEVATION INDICATORS, ETC.)	3	2,1	0	
41		BREAKLINES, CENTERLINES,	2	0	0,4	
42						
43						
44						
45		ROOM NAMES AND NUMBERS	2	1	0	a
46		NOTES, MISC. TEXT, LEADER LINES, TERMINATORS (TO BE DRAWN RELATIVE TO ELEMENT BEING LABELED)	0	1	0	
47		DRAWING COMPONENT TITLE AND SCALE	2	2	0	
48						
49						
50		DIMENSIONS AND LEADER LINES	3	1	0	
51						
52						
53		SPRINKLER HEADS	3	2	0	
54	RO	DIMENSIONS	51	1	0	
55						
56	AFFF	FOAM	4	3	0	
57	D	DRAIN	5	4	0	
58						
59						
60						
61						
62						
63						

**FIRE PROTECTION - ABOVE**

MECHANICAL  
MASTER FILE LEVEL SYMBOLOGY:

LV ACRONYMS

ASSIGNED ELEMENT DESCRIPTIONS

CO WT LC REMARKS

**FB**

1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14	F	(FIRE MAIN), (INDIRECT MAIN), (TEXT, PIPE SIZES & HEAD SPACING DIMENSIONS)	3,3	3,3	0,0
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40		REFERENCE SYMBOLS AND TEXT (SECTION CUT, DETAIL, ELEVATION INDICATORS, ETC.)	3	2,1	0
41		BREAKLINES, CENTERLINES,	2	0	0,4
42					
43					
44					
45		ROOM NAMES AND NUMBERS	2	1	0 a
46		NOTES, MISC. TEXT, LEADER LINES, TERMINATORS (TO BE DRAWN RELATIVE TO ELEMENT BEIN	0	1	0
47		DRAWING COMPONENT TITLE AND SCALE	2	2	0
48					
49					
50		DIMENSIONS AND LEADER LINES	3	1	0
51					
52					
53		SPRINKLER HEADS	3	2	0
54		DIMENSIONS	51	1	0
55					
56	AFFF	FOAM	4	3	0
57	D	DRAIN	5	4	0
58					
59					
60					
61					
62					
63					

**FIRE PROTECTION - BELOW**

MECHANICAL  
MASTER FILE LEVEL SYMBOLOLOGY:

LV	ACRONYMS	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14	F	(FIRE MAIN), (INDIRECT MAIN), (TEXT, PIPE SIZES & HEAD SPACING DIMENSIONS)	3,3	3,3	0,0	
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40		REFERENCE SYMBOLS AND TEXT (SECTION CUT, DETAIL, ELEVATION INDICATORS, ETC.)	3	2,1	0	
41		BREAKLINES, CENTERLINES,	2	0	0,4	
42						
43						
44						
45		ROOM NAMES AND NUMBERS	2	1	0	a
46		NOTES, MISC. TEXT, LEADER LINES, TERMINATORS (TO BE DRAWN RELATIVE TO ELEMENT BEING LABELED)	0	1	0	
47		DRAWING COMPONENT TITLE AND SCALE	2	2	0	
48						
49						
50		DIMENSIONS AND LEADER LINES	3	1	0	
51						
52						
53		SPRINKLER HEADS	3	2	0	
54		DIMENSIONS	51	1	0	
55						
56	AFFF	FOAM	4	3	0	
57	D	DRAIN	5	4	0	
58						
59						
60						
61						
62						
63						

**FIRE PROTECTION-OCCUPIED SPACE**

MECHANICAL  
MASTER FILE LEVEL SYMBOLOLOGY:

LV	ACRONYMS	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1						
2						
3						
4						
5	SCW	SOFTENED COLD WATER	21	2	0	
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19	DI	DEIONIZED WATER (SUPPLY & RETURN)	32	2	0	
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40		REFERENCE SYMBOLS AND TEXT (SECTION CUT, DETAIL, ELEVATION INDICATORS, ETC.)	3	2,1	0	
41		BREAKLINES, CENTERLINES	2	0	0,4	
42	PCWR	PROCESS CHILLED WATER RETURN	124	2	0	
43	HCl	HYDROCHLORIC ACID	65	2	0	
44	HF	HYDROFLUORIC ACID	126	2	0	
45		ROOM NAMES AND NUMBERS	2	1	0	a
46		NOTES, MISC. TEXT, LEADER LINES, TERMINATORS (TO BE DRAWN RELATIVE TO ELEMENT BEING LABELED)	0	1	0	
47		DRAWING COMPONENT TITLE AND SCALE	2	2	0	
48						
49						
50		DIMENSIONS AND LEADER LINES	3	1	0	
51	PCWS	PROCESS CHILLED WATER SUPPLY	16	2	0	
52						
53						
54	RO	REVERSE OSMOSIS WATER	64	2	0	
55	POR	PROCESS OIL RETURN	6	2	0	
56	POS	PROCESS OIL SUPPLY	7	2	0	
57						
58						
59						
60						
61						
62						
63						

**PROCESS LIQUIDS**

MECHANICAL  
MASTER FILE LEVEL SYMBOLLOGY:

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5	DUCTWORK - SUPPLY, RETURN, MAKE-UP, EXHAUST	8	4	0	
6					
7	CONDENSATE, GRAVITY DRAINS	25	3	0	
8	SEWER VENTS	11	2	2	
9	RAIN WATER LEADER, OVERFLOW RAIN WATER LEADER	32	4	0	
10					
11					
12					
13	STORM DRAINS	4	4	0	
14	ROOF DRAINS	9	4	0	
15	SPECIAL EXHAUST, SMOKE REMOVAL	7	4	0	
16					
17	FANS	35	2	0	
18	AIR HANDLING UNITS	12	3	0	
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30	MISCELLANEOUS EQUIPMENT LOCATED ON ROOF	65	2	0	
31					
32					
33					
34					
35	HEATED WATER SUPPLY & RETURN	7,9	3	0	
36					
37					
38					
39					
40	REFERENCE SYMBOLS AND TEXT (SECTION CUT, DETAIL, ELEVATION INDICATORS, ETC.)	3	2,1	0	
41	BREAKLINES, CENTERLINES,	2	0	0,4	
42					
43					
44	HEX SYMBOLS				
45					
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS (TO BE DRAWN RELATIVE TO ELEMENT BEING LABELED)	0	1	0	
47	DRAWING COMPONENT TITLE AND SCALE	2	2	0	
48					
49					
50	DIMENSIONS AND LEADER LINES	3	1	0	
51					
52					
53	ACID VENT	16	4	0	
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	PATTERNING WITH PEN TABLE - SEE SYSTEM MANAGER				

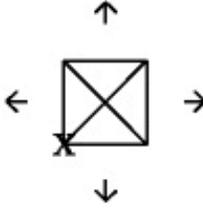
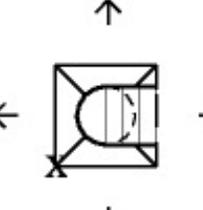
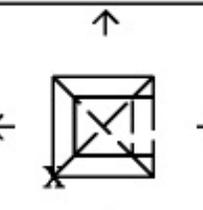
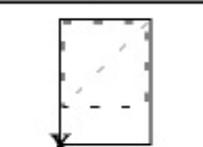
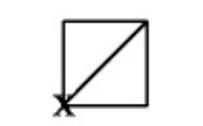
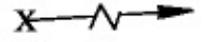
**MECHANICAL ROOF PLAN**

MECHANICAL  
MASTER FILE LEVEL SYMBOLOLOGY:

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2	NORTH ARROW				PLACED PER CELL
3	TITLE BLOCK INFORMATION (GENERIC)	0	1	0	PLACED PER CELL - USE DATA FIELDS
4	KEY PLAN				TYPICALLY REFERENCED AS A MASTER KEY PLAN FILE
5					
6					
7					
8					
9					
10	COLUMN GRIDS	2	0	4	
11	COLUMN GRID TAGS AND ASSOCIATED TEXT	2	1	0	
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40	REFERENCE SYMBOLS AND TEXT - SECTION, DETAIL, & ELEVATION CUTS	3	3	0	
41	TARGETS	0	1	0	
42					
43					
44					
45					
46	KEYED NOTES, GENERAL NOTES, LEADER LINES, TERMINATORS	0	1	0	
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3
48	LEGEND AND SCHEDULE GRAPHICS				
49	LEGEND AND SCHEDULE TEXT	0	3,1	0	
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	
51	USER DEFINABLE - DOCUMENT PER PROJECT				
52	USER DEFINABLE - DOCUMENT PER PROJECT				
53	USER DEFINABLE - DOCUMENT PER PROJECT				
54	USER DEFINABLE - DOCUMENT PER PROJECT				
55	CONSTRUCTION NOTES & BALLOONS - 1st REVISION	0	6	0	
56					
57					
58					
59					
60					
61					
62					
63					

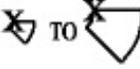
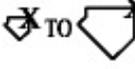
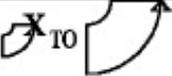
**PLOT FILE**

MECHANICAL  
MASTER FILE LEVEL SYMBOLLOGY:

HVAC						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	24DIFF	24" DIFFUSER	25 29	54 54	*	*
	14FDIF 12FDIF 10FDIF 8FDIFF 6FDIFF	DIFFUSER WITH 14" DIAMETER FLEX DIFFUSER WITH 12" DIAMETER FLEX DIFFUSER WITH 10" DIAMETER FLEX DIFFUSER WITH 8" DIAMETER FLEX DIFFUSER WITH 6" DIAMETER FLEX	5 25 29	8 54 54	*	*
	14DIFF 12DIFF 10DIFF 8DIFF 6DIFF	DIFFUSER WITH 14" SQUARE NECK DIFFUSER WITH 12" SQUARE NECK DIFFUSER WITH 10" SQUARE NECK DIFFUSER WITH 8" SQUARE NECK DIFFUSER WITH 6" SQUARE NECK	5 25 29	8 54 54	*	*
	RETDIF	RETURN AIR DIFFUSER	26	9	*	*
	SLOT	4" X 6' SLOT DIFFUSER	25	54	*	*
	RAGRIL	RETURN AIR GRILLE (R.A.)	26	9	*	*
	RARROW	RETURN AIR OR EXHAUST GRILLE FLOW ARROW	CELL RELATIVE			

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HVAC						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	CALTAP	COLLAR TAPPED OFF MAIN				CELL RELATIVE
	CONCOL	CONICAL COLLAR				CELL RELATIVE
	FDMPR	FIRE DAMPER				CELL RELATIVE
	FINNED	FINNED TUBE RADIATION				CELL RELATIVE
	R2R	ROUND TO RECTANGLE				CELL RELATIVE
	SQELBO	SQUARE ELBOW				CELL RELATIVE
	TRANS	ONE SIDED TRANSITION				CELL RELATIVE
	3WTEE	THREE WAY TEE				CELL RELATIVE
	645RN TO 1445RN	6", 8", 10", 12", AND 14" 45° ROUND ELBOW				CELL RELATIVE
	645SQ TO 1445SQ	6", 8", 10", 12", AND 14" 45° SQUARE ELBOW				CELL RELATIVE
	690RN TO 1490RN	6", 8", 10", 12", AND 14" 90° ROUND ELBOW				CELL RELATIVE
	90SPLT	90° SPLITTER				CELL RELATIVE
	90TKOF	90° TAKE OFF				CELL RELATIVE

RC = SNLMECH.CEL

REVISED 5/97

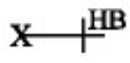
FITTINGS						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	CAP	CAP				CELL RELATIVE
	COTG	CLEAN-OUT TO GRADE				CELL RELATIVE
	ELBDN	ELBOW TURNED DOWN				CELL RELATIVE
	ELBUP	ELBOW TURNED UP				CELL RELATIVE
	EXPAN	EXPANSION JOINT				CELL RELATIVE
	FLANGJ	FLANGED JOINT				CELL RELATIVE
	FLOWAR	DIRECTION AND FLOW				CELL RELATIVE
	LINEST	LINE STRAINER				CELL RELATIVE
	PITVLV	VALVE IN PIT				CELL RELATIVE
	PLUG	PLUG				CELL RELATIVE
	POSTIN	POST INDICATOR VALVE				CELL RELATIVE
	REDCON	CONCENTRIC REDUCER				CELL RELATIVE
	REDECC	ECCENTRIC REDUCER				CELL RELATIVE
	RISER	VALVE IN RISER				CELL RELATIVE
	RUPTUR	RUPTURE DISK				CELL RELATIVE
	SCREWJ	SCREW JOINT				CELL RELATIVE
	TEE	TEE (SHOW SIZES WHEN REDUCING TEE)				CELL RELATIVE
	TEEDN	TEE TURNED DOWN				CELL RELATIVE
	TEEUP	TEE TURNED UP				CELL RELATIVE

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REVISED 9/01





VALVES						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	ALARM	FLANGED ALARM CHECK VALVE				CELL RELATIVE
	ANGLE	ANGLE VALVE				CELL RELATIVE
	BALL	BALL VALVE				CELL RELATIVE
	BKFLPR	BACKFLOW PREVENTER				CELL RELATIVE
	BUCKET	BUCKET TRAP				CELL RELATIVE
	BUTT	BUTTERFLY VALVE				CELL RELATIVE
	CTRVLV	CONTROL VALVE				CELL RELATIVE
	DIAPHR	DIAPHRAM VALVE				CELL RELATIVE
	EXPRES	EXTERNAL PRESSURE REDUCING VALVE				CELL RELATIVE
	FDELUG	FLANGED DELUGE VALVE RISER				CELL RELATIVE
	FLGATE	FLANGED GATE VALVE				CELL RELATIVE
	FSWING	FLANGED SWING CHECK VALVE				CELL RELATIVE
	FT	F & T TRAP				CELL RELATIVE
	GATE	GATE VALVE				CELL RELATIVE
	GLOBE	GLOBE VALVE				CELL RELATIVE
	HBIBB	HOSE BIBB				CELL RELATIVE
	INPRES	INTERNAL PRESSURE REDUCING VALVE				CELL RELATIVE
	MOGLOB	MOTOR OPERATED GLOBE VALVE				CELL RELATIVE
	NEEDLE	NEEDLE VALVE				CELL RELATIVE

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VALVES						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	PGAGE	PRESSURE GAGE				CELL RELATIVE
	PLUGCO	PLUG COCK				CELL RELATIVE
	RELIEF	RELIEF VALVE				CELL RELATIVE
	SETEMP	SELF-CONTAINED TEMPERATURE CONTROL VALVE				CELL RELATIVE
	SOLOPE	SOLENOID OPERATED VALVE				CELL RELATIVE
	SOL3WA	SOLENOID OPERATED 3 WAY VALVE				CELL RELATIVE
	SPRING	SPRING CHECK VALVE				CELL RELATIVE
	SWING	SWING CHECK VALVE				CELL RELATIVE
	THERDY	THERMODYNAMIC TRAP				CELL RELATIVE
	THERMO	THERMOSTATIC TRP				CELL RELATIVE
	3WAYCO	3-WAY MOTORIZED CONTROL VALVE				CELL RELATIVE
	3WAYPN	3-WAY PNEUMATIC CONTROL VALVE				CELL RELATIVE

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FIRE PROTECTION							
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC	
	FSSIAM	FREE STANDING SIAMESE	CELL RELATIVE				
	HYDPMP	HYDRANT W/PUMPER CONNECTION	CELL RELATIVE				
	HYDRNT	HYDRANT W/TWO HOSE OUTLETS	CELL RELATIVE				
	SPKGRD	SPRINKLER WITH GUARD	53	3	2	0	
	SPKPDN	PENDENT ON DROP NIPPLE	53	3	2	0	
	SPKRSR	SPRINKLER RISER	53	3	2	0	
	SPKSDW	SIDEWALL SPRINKLER	53	3	2	0	
	SPKUNU	UPRIGHT NIPPLED UP	53	3	2	0	
	SPKUPR	UPRIGHT SPRINKLER	53	3	2	0	
	VANE	VANE TYPE FLOW ALARM D	CELL RELATIVE				
	WALHYD	WALL HYDRANT W/TWO HOSE CONNECTIONS	CELL RELATIVE				
	2WSIAM	2 WAY SIAMESE CONNECTION	CELL RELATIVE				

# CONTROLS

CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	AVENT	AIR VENT (SPECIFY MANUAL, AUTOMATIC, OR VACUUM)				CELL RELATIVE
	DAMPER	DAMPER MOTOR				CELL RELATIVE
	EP	ELECTRIC-PNEUMATIC RELAY				CELL RELATIVE
	FLOWSW	FLOW SWITCH				CELL RELATIVE
	FLWMTR	FLOW METER				CELL RELATIVE
	ORIFIC	ORFICE FLOW METER				CELL RELATIVE
	PE	PNEUMATIC-ELECTRIC RELAY				CELL RELATIVE
	PRESSW	PRESSURE SWITCH				CELL RELATIVE
	RELAY	RELAY SWITCH				CELL RELATIVE
	TEMPSW	TEMPERATURE SWITCH				CELL RELATIVE
	THEMET	THERMOMETER (WITH TEMPERATURE RANGE)				CELL RELATIVE
	TSTAT	THERMOSTAT				CELL RELATIVE
	VENTURE	VENTURI FLOW METER				CELL RELATIVE

RC = SNLMECH.CEL

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# *Chapter 6*

## *Electrical*

## Level Assignments

The level schemas shown in this chapter (see the tabbed Level Schemas section) are the standard element level definitions for electrical master files. User-definable levels are used where the level schemas do not accommodate the design needs of a particular project. Contact the Project CADD Coordinator Juan Martinez for approval before using user-defined levels. All user-defined levels must be identified using the File Specific Information cell located in `noting.cel`. Level schemas in this chapter are as follows:

<b>Level Schema</b>	<b>Page</b>
Lighting Plan	6-4
Power Plan	6-5
Receptacle Plan	6-6
Underfloor Duct Plan	6-7
Electrical Roof Plan	6-8
Access Control Plan	6-9
Fire Alarm Plan	6-10
Intrusion Alarm Plan	6-11
Radiation—Gas Detection Plan	6-12
Toxic Gas Monitoring System (MDA)	6-13
Hydrogen Gas Monitoring System	6-14
Communications Black and Red Plan	6-15
Intercom—EPPA Plan	6-16
Grounding Plan	6-17
Lightning Protection Plan	6-18
Plot File	6-19

## Standard Cells

The standard electrical cell library is `snlelec.cel`. If additional new cells are required, create a personal project cell library and submit to the Project CADD Coordinator Juan Martinez for approval before using new cells. Submit an Engineering Standards Request (ESR) to incorporate the cells into the `snlelec.cel` library as required. Graphical representations of the cells in `snlelec.cel` are shown in the tabbed Electrical Cell Libraries section.

## Panel Schedules

New panel schedules are created in Excel software on the Facilities Server. Some existing panel schedules may be in MicroStation and are located under the building directories.

Excel panel schedules may be updated by anyone having an authorized panel schedule password account. Contact the electrical process owner at 844-7252 for authorization. Persons with

authorized Excel panel accounts may use the Facilities Technical Libraries community computer or on-site remote access to make panel schedule modifications. Refer to Appendix 6, Panel Schedules for instructions.

## **Security and Access Control Systems**

Intrusion alarm plans follow the master file and plot file requirements explained in Chapter 1. The Facilities Management and Operation Center also has available standard Intrusion Alarm drawings. Refer to Section 1.9.14, Standard Drawings.

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4	FLUORESCENT (WALL MOUNTED)	6	5	0	
5					
6					
7					
8					
9					
10	LIGHTING PANEL, LIGHT SWITCHING CABINETS	6	3	0	
11	CEILING MOUNTED J-BOXES	21	3	0	
12					
13	WALL MOUNTED J-BOXES	21	3	0	
14					
15	SWITCHES, LIGHT SWITCHING CABINETS	61	2	0	
16	LIGHTING CONTACTORS	6	3	0	
17	ROOM NAMES AND UNDERLINES	2	1	0	MAY BE COPIED IN FROM FLOOR PLAN
18					
19					
20					
21					
22					
23					
24					
25					
26	EXIT LIGHT FIXTURE (WALL MOUNTED)	6	4	0	
27					
28					
29					
30	FLUORESCENT LIGHTING (CEILING MOUNTED)	6	5	0	
31	INCANDESCENT LIGHTING (CEILING MOUNTED)	6	4	0	
32	SPECIAL LIGHTING FIXTURES - HID, etc. (CEILING MOUNTED)	6	4	0	
33	EXIT LIGHTING FIXTURES (CEILING MOUNTED)	6	4	0	
34	INCANDESCENT LIGHTING (WALL MOUNTED)	6	4	0	
35	CIRCUIT LINES - CONCEALED CONDUIT	21	2	3	
36	CIRCUIT, LIGHT AND SWITCH TEXT	0	1	0	CKT NUMBER, SWITCH LETTER, etc.
37	WIRE COUNTS, (CIRCUITING)	21	2	0	
38	SPECIAL LIGHTING FIXTURES - HID etc. (WALL MOUNTED)	6	4	0	
39	CIRCUIT LINES - EXPOSED CONDUIT	21	2	0	
40	REFERENCE SYMBOLS AND TEXT - SECTIONS, DETAILS, & ELEVATION CUTS	3	3,1	0	
41					
42	EMERGENCY CROSS HATCH (WALL & CEILING MOUNTED), EMERGENCY LIGHT	50	1	0	
43	CIRCUIT LINES - UNDERGROUND CONDUIT	21	2	4	
44					
45	ROOM NUMBER - AND BOX PER CELL	0	1	0	MAY BE COPIED IN FROM PARTITION PLAN
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1,0	0	KEYED & GENERAL NOTES, etc.; LEADER LINES: WT=0
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE a
48	PANEL TEXT	0	1	0	INCLUDE LEADER LINES & TERMINATORS
49	ELECTRICAL EQUIPMENT SYMBOL & CONDUIT SYMBOL	0	1	0	INCLUDE LEADER LINES & TERMINATORS
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	SHADING PEN TABLE				

L I G H T I N G P L A N

ELECTRICAL  
MASTER FILE LEVEL SYMBOLOLOGY:

NOTES:

- a TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3
- b LEADER: WT=0; TEST: WT=1; SLASH TERMINATORS: WT=5; ARROWS: WT=1

COLOR TABLE=ELEC.TBL

ASSIGNED ELEMENT DESCRIPTIONS

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9	TRANSFORMERS	53	3	0	
10	POWER PANEL	53	3	0	
11	CEILING MOUNTED J-BOXES	21	3	0	
12	METERS, FAN HANGER OUTLETS, & OUTLET BOXES	53	3	0	
13	WALL MOUNTED J-BOXES	21	3	0	
14					
15	THERMAL OVERLOAD SWITCH	61	2	0	WALL & FLOOR MOUNTED
16	MOTOR CONTROLLERS, CONTACTORS & SAFETY SWITCHES	53	3	0	
17	ROOM NAMES AND UNDERLINES	2	1	0	MAY BE COPIED IN FROM FLOOR PLAN
18	MOTORS	53	3	0	
19					
20					
21					
22					
23					
24	THERMOSTATS	53	3	0	
25					
26					
27					
28					
29	WIREWAYS, BUSDUCTS & CABLETRAYS	53	3	0	
30					
31					
32					
33					
34					
35	CIRCUIT LINES - CONCEALED CONDUIT	21	2	3	
36	CIRCUIT NUMBER, TEXT ONLY	0	1	0	
37	WIRE COUNTS, (CIRCUITING)	21	2	0	
38					
39	CIRCUIT LINES - EXPOSED CONDUIT	21	2	0	
40	REFERENCE SYMBOLS AND TEXT - SECTIONS, DETAILS, & ELEVATION CUTS	3	3,1	0	
41					
42					
43	CIRCUIT LINES - UNDERGROUND CONDUIT	21	2	4	
44					
45	ROOM NUMBER - AND BOX PER CELL	0	1	0	MAY BE COPIED IN FROM PARTITION PLAN
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1,0	0	KEYED & GENERAL NOTES, etc.; LEADER LINES: WT=0
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE a
48	PANEL TEXT	0	1	0	INCLUDE LEADER LINES & TERMINATORS
49	ELECTRICAL EQUIPMENT SYMBOL & CONDUIT SYMBOL	0	1	0	INCLUDE LEADER LINES & TERMINATORS
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	NOTE b
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	SHADING PEN TABLE				

PW

POWER PLAN

ELECTRICAL MASTER FILE LEVEL SYMBOLOGY:

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11	CEILING MOUNTED J-BOXES	21	3	0	
12	CEILING MOUNTED DUPLEX, 4PLEX & SPECIAL RECEPTACLES	53	3	0	
13	WALL MOUNTED J-BOXES	21	3	0	
14	WALL MOUNTED DUPLEX AND QUADRAPLEX RECEPTACLES	53	3	0	
15	SPECIAL RECEPTACLES (OTHER THAN DUPLEX & 4-PLEX)	53	3	0	WALL & FLOOR MOUNTED
16	PLUG-IN STRIPS	53	3	0	
17	ROOM NAMES AND UNDERLINES	2	1	0	MAY BE COPIED IN FROM FLOOR PLAN
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35	CIRCUIT LINES - CONCEALED CONDUIT	21	2	3	
36	CIRCUIT NUMBER, RECEPTACLE TYPE & HEIGHT, TEXT ONLY	0	1	0	
37	WIRE COUNTS, (CIRCUITING)	21	2	0	
38					
39	CIRCUIT LINES - EXPOSED CONDUIT	21	2	0	
40	REFERENCE SYMBOLS AND TEXT - SECTIONS, DETAILS, & ELEVATION CUTS	3	3,1	0	
41					
42					
43	CIRCUIT LINES - UNDERGROUND CONDUIT	21	2	4	
44					
45	ROOM NUMBER - AND BOX PER CELL	0	1	0	MAY BE COPIED IN FROM PARTITION PLAN
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1,0	0	KEYED & GENERAL NOTES, etc.; LEADER LINES: WT=0
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE a
48	PANEL TEXT	0	1	0	INCLUDE LEADER LINES & TERMINATORS
49	ELECTRICAL EQUIPMENT SYMBOL & CONDUIT SYMBOL	0	1	0	INCLUDE LEADER LINES & TERMINATORS
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	NOTE b
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	SHADING PEN TABLE				

**R E C E P T A C L E P L A N**

**ELECTRICAL  
MASTER FILE LEVEL SYMBOLOGY:**

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17	ROOM NAMES AND UNDERLINES	2	1	0	MAY BE COPIED IN FROM FLOOR PLAN
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40	REFERENCE SYMBOLS AND TEXT-SECTIONS, DETAILS, & ELEVATION CUTS	3	3,1	0	
41					
42					
43					
44					
45	ROOM NUMBER - AND BOX PER CELL	0	1	0	
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1,0	0	KEYED & GENERAL NOTES, etc.; LEADER LINES: WT=0
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE a
48	PANEL TEXT	0	1	0	INCLUDE LEADER LINES & TERMINATORS
49	ELECTRICAL EQUIPMENT SYMBOL & CONDUIT SYMBOL	0	1	0	INCLUDE LEADER LINES & TERMINATORS
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	NOTE b
51					
52					
53	UNDERFLOOR DUCT, TRENCH & CELLULAR DUCTS	53	3	0	
54					
55					
56	P - POWER	53	2	0	KNOCK-OUTS AND TEXT
57	CB - COMMUNICATIONS BLACK and RED	2,3	2	0	KNOCK-OUTS AND TEXT
58					
59					
60					
61					
62	SHADING				
63	SHADING PEN TABLE				

**UNDERFLOOR DUCT PLAN**

ELECTRICAL MASTER FILE LEVEL SYMBOLLOGY:

NOTES:

- a TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3
- b LEADER: WT=0; TEST: WT=1; SLASH TERMINATORS: WT=5; ARROWS: WT=1

COLOR TABLE = ELEC.TBL

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12	METERS, FAN HANGER OUTLETS, OUTLET BOXES / CEILING MNTD DUPLEX, 4PLEX & SPECIAL RECEPTACLES	21,53	3,3	0	
13					
14	WALL MOUNTED DUPLEX. AND QUADRAPLEX RECEPTACLES	53	3	0	
15	THERMAL OVERLOAD SWITCH, SPECIAL RECEPTACLES (OTHER THAN DUPLEX & 4 PLEX)	61,53	2,3	0	
16	MOTOR CONTROLLERS, CONTACTORS & SAFETY SWITCHES	53	3	0	
17					
18	MOTORS	53	3	0	
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29	WIREWAYS, BUSDUCTS & CABLETRAYS	53	3	0	
30					
31					
32					
33					
34					
35	CIRCUIT LINES - CONCEALED CONDUIT	21	2	3	
36	CIRCUIT NUMBER, RECEPTACLE TYPE & HEIGHT (TEXT ONLY)	0	1	0	
37	WIRE COUNTS (CIRCUITING)	21	2	0	
38					
39	CIRCUIT LINES - EXPOSED CONDUIT	21	2	0	
40					
41					
42					
43					
44					
45					
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS (TO BE DRAWN RELATIVE TO ELEMENT BEING LABELED)	0	1	0	
47	DRAWING COMPONENT TITLE AND SCALE	2	2	0	
48	PANEL TEXT	0	1	0	
49	ELECTRICAL EQUIPMENT SYMBOL & CONDUIT SYMBOL	0	1	0	NOTE a
50	DIMENSIONS AND LEADER LINES	3	1	0	
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	PATTERNING WITH PEN TABLE - SEE SYSTEM MANAGER				

**ELECTRICAL ROOF PLAN**

ELECTRICAL  
MASTER FILE LEVEL SYMBOLOLOGY:

NOTS:

a. INCLUDE LEADERS AND TERMINATORS

BL

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4	ACCESS CONTROL	42	3	0	
5	CEILING MOUNTED ACCESS CONTROL	42	3	0	
6					
7					
8					
9					
10	ACCESS CONTROL PANELS	42	3	0	
11	CEILING MOUNTED J-BOXES	21	3	0	
12					
13	WALL MOUNTED J-BOXES	21	3	0	
14					
15					
16					
17	ROOM NAMES AND UNDERLINES	2	1	0	MAY BE COPIED INTO DISCIPLINE - SPECIFIC PLAN
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28	CAMERA	75	3	0	
29					
30					
31					
32					
33					
34					
35	CIRCUIT LINES - CONCEALED CONDUIT	21	2	3	
36	CIRCUIT NUMBER, TEXT ONLY	0	1	0	
37					
38					
39	CIRCUIT LINES - EXPOSED CONDUIT	21	2	0	
40	REFERENCE SYMBOLS AND TEXT-SECTIONS, DETAILS, & ELEVATION CUTS	3	3,1	0	
41					
42					
43	CIRCUIT LINES - UNDERGROUND CONDUIT	21	2	4	
44					
45	ROOM NUMBER - AND BOX PER CELL	0	1	0	MAY BE COPIED IN FROM PARTITION PLAN
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1,0	0	KEYED & GENERAL NOTES, etc.; LEADER LINES: WT=0
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE a
48	PANEL TEXT	0	1	0	INCLUDE LEADER LINES & TERMINATORS
49	ELECTRICAL EQUIPMENT SYMBOL & CONDUIT SYMBOL	0	1	0	INCLUDE LEADER LINES & TERMINATORS
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	NOTE b
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	SHADING PEN TABLE				

ACCESS CONTROL PLAN

ELECTRICAL MASTER FILE LEVEL SYMBOLOGY:

NOTES:  
 a TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3  
 b LEADER: WT=0; TEST: WT=1; SLASH TERMINATORS: WT=5; ARROWS: WT=1  
 COLOR TABLE = ELEC.TBL

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10	FIRE ALARM TERMINAL CABINETS & DATA GATHERING PANELS	7	3	0	
11	CEILING MOUNTED J-BOXES	21	3	0	
12					
13	WALL MOUNTED J-BOXES	21	3	0	
14					
15					
16					
17	ROOM NAMES AND UNDERLINES	2	1	0	MAY BE COPIED IN FROM FLOOR PLAN
18					
19					
20	FIRE ALARM WALL MNTD (SMOKE DETECTOR, HORN, BELL, VISUAL/AUDIO, ETC.)	7	3	0	
21	FIRE ALARM CEILING MNTD (SMOKE DETECTOR, HORN, BELL, VISUAL/AUDIO, ETC.)	7	3	0	
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35	CIRCUIT LINES - CONCEALED CONDUIT	21	2	3	
36	CIRCUIT NUMBER, TEXT ONLY	0	1	0	
37					
38					
39	CIRCUIT LINES - EXPOSED CONDUIT	21	2	0	
40	REFERENCE SYMBOLS AND TEXT - SECTIONS, DETAILS, & ELEVATION CUTS	3	3,1	0	
41					
42					
43	CIRCUIT LINES - UNDERGROUND CONDUIT	21	2	4	
44					
45	ROOM NUMBER - AND BOX PER CELL	0	1	0	MAY BE COPIED IN FROM PARTITION PLAN
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1,0	0	KEYED & GENERAL NOTES, etc.; LEADER LINES: WT=0
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE a
48	PANEL TEXT	0	1	0	INCLUDE LEADER LINES & TERMINATORS
49	ELECTRICAL EQUIPMENT SYMBOL & CONDUIT SYMBOL	0	1	0	INCLUDE LEADER LINES & TERMINATORS
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	NOTE b
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	SHADING PEN TABLE				

FIRE ALARM PLAN

ELECTRICAL MASTER FILE LEVEL SYMBOLOGY:

NOTES: COLOR TABLE = ELEC.TBL  
 a TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3  
 b LEADER: WT=0; TEST: WT=1; SLASH TERMINATORS: WT=5; ARROWS: WT=1

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10	INTRUSION ALARM PANEL	87	3	0	
11	CEILING MOUNTED J-BOXES	21	3	0	
12					
13	WALL MOUNTED J-BOXES	21	3	0	
14					
15					
16					
17	ROOM NAMES AND UNDERLINES	2	1	0	MAY BE COPIED IN FROM FLOOR PLAN
18					
19					
20					
21					
22	WALL MOUNTED INTRUSION ALARM	87	3	0	
23	CEILING MOUNTED INTRUSION ALARM	87	3	0	
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35	CIRCUIT LINES - CONCEALED CONDUIT	21	2	3	
36	CIRCUIT NUMBER, TEXT ONLY	0	1	0	
37					
38					
39	CIRCUIT LINES - EXPOSED CONDUIT	21	2	0	
40	REFERENCE SYMBOLS AND TEXT - SECTIONS, DETAILS, & ELEVATION CUTS	3	3,1	0	
41					
42					
43	CIRCUIT LINES - UNDERGROUND CONDUIT	21	2	4	
44					
45	ROOM NUMBER - AND BOX PER CELL	0	1	0	MAY BE COPIED IN FROM PARTITION PLAN
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1,0	0	KEYED & GENERAL NOTES, etc.; LEADER LINES: WT=0
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE a
48	PANEL TEXT	0	1	0	INCLUDE LEADER LINES & TERMINATORS
49	ELECTRICAL EQUIPMENT SYMBOL & CONDUIT SYMBOL	0	1	0	INCLUDE LEADER LINES & TERMINATORS
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	NOTE b
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	SHADING PEN TABLE				

ELECTRICAL MASTER FILE LEVEL SYMBOLOLOGY: INTRUSION ALARM P L A

COLOR TABLE = ELEC.TBL

- a TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3
- b LEADER: WT=0; TEST: WT=1; SLASH TERMINATORS: WT=5; ARROWS: WT=1

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11	CEILING MOUNTED J-BOXES	21	3	0	
12					
13	WALL MOUNTED J-BOXES	21	3	0	
14					
15					
16					
17	ROOM NAMES AND UNDERLINES	2	1	0	MAY BE COPIED IN FROM FLOOR PLAN
18					
19					
20					
21					
22					
23	RADIATION DETECTING COMPONENTS	41	3	0	
24	GAS DETECTING COMPONENTS	41	3	0	
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35	CIRCUIT LINES - CONCEALED CONDUIT	21	2	3	
36	CIRCUIT, LIGHT AND SWITCH TEXT	0	1	0	
37					
38					
39	CIRCUIT LINES - EXPOSED CONDUIT	21	2	0	
40	REFERENCE SYMBOLS AND TEXT - SECTIONS, DETAILS, & ELEVATION CUTS	3	3,1	0	
41					
42					
43	CIRCUIT LINES - UNDERGROUND CONDUIT	21	2	4	
44					
45	ROOM NUMBER - AND BOX PER CELL	0	1	0	MAY BE COPIED IN FROM PARTITION PLAN
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1,0	0	KEYED & GENERAL NOTES, etc.; LEADER LINES: WT=0
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE a
48	PANEL TEXT	0	1	0	INCLUDE LEADER LINES & TERMINATORS
49	ELECTRICAL EQUIPMENT SYMBOL & CONDUIT SYMBOL	0	1	0	INCLUDE LEADER LINES & TERMINATORS
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	NOTE b
51					
52	USER DEFINABLE				
53					
54	USER DEFINABLE				
55	USER DEFINABLE				
56					
57					
58					
59					
60					
61					
62	SHADING				
63	SHADING PEN TABLE				

RADIATION - GAS DETECTION PLAN

ELECTRICAL MASTER FILE LEVEL SYMBOLS:

NOTES: COLOR TABLE=ELEC.TBL  
a TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3  
b LEADER: WT=0; TEST: WT=1; SLASH TERMINATORS: WT=5; ARROWS: WT=1

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10	PANELS, MONITORING CABINETS	53	2	0	
11	CEILING MOUNTED J-BOXES, PULL BOXES	21	3	0	
12					
13	WALL MOUNTED J-BOXES	21	3	0	
14					
15					
16					
17	ROOM NAMES AND UNDERLINES	2	1	0	MAY BE COPIED IN FROM FLOOR PLAN
18	SENSING POINTS	53	1	0	
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29	WIREWAYS, BUSDUCTS & CABLETRAYS	53	3	0	
30					
31					
32					
33					
34					
35	CIRCUIT LINES - CONCEALED CONDUIT	21	2	3	
36	CIRCUIT NUMBER, TEXT ONLY	0	1	0	
37					
38					
39	CIRCUIT LINES - EXPOSED CONDUIT	21	2	0	
40	REFERENCE SYMBOLS AND TEXT - SECTIONS, DETAILS, & ELEVATION CUTS	3	3,1	0	
41					
42					
43	CIRCUIT LINES - UNDERGROUND CONDUIT	21	2	4	
44					
45	ROOM NUMBER - AND BOX PER CELL	0	1	0	MAY BE COPIED IN FROM PARTITION PLAN
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1,0	0	KEYED & GENERAL NOTES, etc.; LEADER LINES: WT=0
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE a
48	PANEL TEXT	0	1	0	INCLUDE LEADER LINES & TERMINATORS
49	ELECTRICAL EQUIPMENT SYMBOL & CONDUIT SYMBOL	0	1	0	INCLUDE LEADER LINES & TERMINATORS
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	NOTE b
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	SHADING PEN TABLE				

**TOXIC GAS MONITORING SYSTEM - (MDA)**

ELECTRICAL  
MASTER FILE LEVEL SYMBOLOLOGY:

NOTES:

- a TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3
- b LEADER: WT=0; TEST: WT=1; SLASH TERMINATORS: WT=5; ARROWS: WT=1

COLOR TABLE=ELEC.TBL

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10	PANELS, MONITORING CABINETS	53	2	0	
11	CEILING MOUNTED J-BOXES, PULL BOXES	21	3	0	
12					
13	WALL MOUNTED J-BOXES	21	3	0	
14					
15					
16					
17	ROOM NAMES AND UNDERLINES	2	1	0	MAY BE COPIED IN FROM FLOOR PLAN
18	SENSING POINTS	53	1	0	
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29	WIREWAYS, BUSDUCTS & CABLETRAYS	53	3	0	
30					
31					
32					
33					
34					
35	CIRCUIT LINES - CONCEALED CONDUIT	21	2	3	
36	CIRCUIT NUMBER, TEXT ONLY	0	1	0	
37					
38					
39	CIRCUIT LINES - EXPOSED CONDUIT	21	2	0	
40	REFERENCE SYMBOLS AND TEXT - SECTIONS, DETAILS, & ELEVATION CUTS	3	3,1	0	
41					
42					
43	CIRCUIT LINES - UNDERGROUND CONDUIT	21	2	4	
44					
45	ROOM NUMBER - AND BOX PER CELL	0	1	0	MAY BE COPIED IN FROM PARTITION PLAN
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1,0	0	KEYED & GENERAL NOTES, etc.; LEADER LINES: WT=0
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE a
48	PANEL TEXT	0	1	0	INCLUDE LEADER LINES & TERMINATORS
49	ELECTRICAL EQUIPMENT SYMBOL AND CONDUIT SYMBOL	0	1	0	INCLUDE LEADER LINES & TERMINATORS
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	NOTE b
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	SHADING PEN TABLE				

**HYDROGEN GAS MONITORING SYSTEM**

ELECTRICAL  
MASTER FILE LEVEL SYMBOLOLOGY:

NOTES:

COLOR TABLE=ELEC.TBL

- a TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3
- b LEADER: WT=0; TEST: WT=1; SLASH TERMINATORS: WT=5; ARROWS: WT=1

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10	COMMUNICATIONS BLACK PANELS	1	3	0	
11	CEILING MOUNTED J-BOXES	21	3	0	
12					
13	WALL MOUNTED J-BOXES	21	3	0	
14					
15					
16					
17	ROOM NAMES AND UNDERLINES	2	1	0	MAY BE COPIED IN FROM FLOOR PLAN
18					
19					
20					
21					
22					
23					
24					
25	BLACK/RED OUTLET BOX (TELEPHONE, L.A.N., COPPER, PDS,FIBER OPTICS)	1	3	0	
26					
27					
28					
29					
30					
31					
32					
33					
34					
35	CIRCUIT LINES - CONCEALED CONDUIT	21	2	3	
36	CIRCUIT NUMBER, TEXT ONLY	0	1	0	
37					
38					
39	CIRCUIT LINES - EXPOSED CONDUIT	21	2	0	
40	REFERENCE SYMBOLS AND TEXT-SECTIONS, DETAILS, & ELEVATION CUTS	3	3,1	0	
41					
42					
43	CIRCUIT LINES - UNDERGROUND CONDUIT	21	2	4	
44					
45	ROOM NUMBER - AND BOX PER CELL	0	1	0	MAY BE COPIED IN FROM PARTITION PLAN
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1,0	0	KEYED & GENERAL NOTES, etc.; LEADER LINES: WT=0
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE a
48	PANEL TEXT	0	1	0	INCLUDE LEADER LINES & TERMINATORS
49	ELECTRICAL EQUIPMENT SYMBOL & CONDUIT SYMBOL	0	1	0	INCLUDE LEADER LINES & TERMINATORS
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	NOTE b
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	SHADING PEN TABLE				

**COMMUNICATIONS BLACK/RED PLAN**

ELECTRICAL MASTER FILE LEVEL SYMBOLOGY:

NOTES: COLOR TABLE = ELEC.TBL  
 a TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3  
 b LEADER: WT=0; TEST: WT=1; SLASH TERMINATORS: WT=5; ARROWS: WT=1

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10	INTERCOM PANEL	43	3	0	
11	CEILING MOUNTED J-BOXES	21	3	0	
12					
13	WALL MOUNTED J-BOXES	21	3	0	
14					
15					
16					
17	ROOM NAMES AND UNDERLINES	2	1	0	MAY BE COPIED IN FROM FLOOR PLAN
18					
19					
20					
21					
22					
23					
24					
25					
26					
27	CEILING MOUNTED INTERCOM	43	3	0	
28	WALL MOUNTED INTERCOM	43	3	0	
29					
30					
31					
32					
33					
34					
35	CIRCUIT LINES - CONCEALED CONDUIT	21	2	3	
36	CIRCUIT NUMBER, TEXT ONLY	0	1	0	
37					
38					
39	CIRCUIT LINES - EXPOSED CONDUIT	21	2	0	
40	REFERENCE SYMBOLS AND TEXT - SECTIONS, DETAILS, & ELEVATION CUTS	3	3,1	0	
41					
42					
43	CIRCUIT LINES - UNDERGROUND CONDUIT	21	2	4	
44					
45	ROOM NUMBER - AND BOX PER CELL	0	1	0	MAY BE COPIED IN FROM PARTITION PLAN
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1,0	0	KEYED & GENERAL NOTES, etc.; LEADER LINES: WT=0
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE a
48	PANEL TEXT	0	1	0	INCLUDE LEADER LINES & TERMINATORS
49	ELECTRICAL EQUIPMENT SYMBOL & CONDUIT SYMBOL	0	1	0	INCLUDE LEADER LINES & TERMINATORS
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	NOTE b
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	SHADING PEN TABLE				

I N T E R C O M - E . P . P . A . P L A N

ELECTRICAL  
MASTER FILE LEVEL SYMBOLOLOGY:

COLOR TABLE = ELEC.TBL

a TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3  
 b LEADER: WT=0; TEST: WT=1; SLASH TERMINATORS: WT=5; ARROWS: WT=1

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17	ROOM NAMES AND UNDERLINES	2	1	0	MAY BE COPIED IN FROM FLOOR PLAN
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40	REFERENCE SYMBOLS AND TEXT-SECTIONS, DETAILS, & ELEVATION CUTS	3	3,1	0	
41					
42					
43					
44					
45	ROOM NUMBER - AND BOX PER CELL	0	1	0	MAY BE COPIED IN FROM PARTITION PLAN
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1,0	0	KEYED & GENERAL NOTES, etc.; LEADER LINES: WT=0
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE a
48	PANEL TEXT	0	1	0	INCLUDE LEADER LINES & TERMINATORS
49	ELECTRICAL EQUIPMENT SYMBOL & CONDUIT SYMBOL	0	1	0	INCLUDE LEADER LINES & TERMINATORS
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	NOTE b
51	LIGHTNING PROTECTION & EQUIPMENT	66	3	0,6	COUNTERPOISE: LC=6
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	SHADING PEN TABLE				

GROUNDING PLAN

ELECTRICAL MASTER FILE LEVEL SYMBOLOGY:

NOTES:

- a TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3
- b LEADER: WT=0; TEST: WT=1; SLASH TERMINATORS: WT=5; ARROWS: WT=1

COLOR TABLE = ELEC.TBL

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17	ROOM NAMES AND UNDERLINES	2	1	0	MAY BE COPIED IN FROM FLOOR PLAN
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40	REFERENCE SYMBOLS AND TEXT - SECTIONS, DETAILS, & ELEVATION CUTS	3	3,1	0	
41					
42					
43					
44					
45	ROOM NUMBER - AND BOX PER CELL	0	1	0	MAY BE COPIED IN FROM PARTITION PLAN
46	NOTES, MISC. TEXT, LEADER LINES, TERMINATORS	0	1,0	0	NOTE a
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE b
48	ELECTRICAL EQUIPMENT SYMBOL	0	1	0	INCLUDE LEADER LINES & TERMINATORS
49					
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	NOTE c
51	LIGHTNING PROTECTION & EQUIPMENT	66	2	0,6	COUNTERPOISE: LC=6
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	SHADING PEN TABLE				

LIGHTNING PROTECTION PLAN

ELECTRICAL MASTER FILE LEVEL SYMBOLLOGY:

NOTES: COLOR TABLE=ELEC.TBL  
 a KEYED & GENERAL NOTES, etc.; LEADER LINES: WT=0  
 b TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3  
 c LEADER: WT=0; TEST: WT=1; SLASH TERMINATORS: WT=5; ARROWS: WT=1

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2	NORTH ARROW				PLACED PER CELL
3	TITLE BLOCK INFORMATION (GENERIC)	0	1	0	PLACED PER CELL - USE DATA FIELDS
4	KEY PLAN				TYPICALLY REFERENCED AS A MASTER KEY PLAN FILE
5					
6					
7					
8					
9					
10	COLUMN GRIDS	2	0	4	
11	COLUMN GRID TAGS AND ASSOCIATED TEXT	2	1	0	
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40	REFERENCE SYMBOLS AND TEXT - SECTION, DETAIL, & ELEVATION CUTS	3	3	0	
41	TARGETS	0	1	0	
42					
43					
44					
45					
46	KEYED NOTES, GENERAL NOTES, LEADER LINES, TERMINATORS	0	1	0	
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	NOTE a
48	LEGEND AND SCHEDULE GRAPHICS				
49	LEGEND AND SCHEDULE TEXT	0	3,1	0	
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	
51	USER DEFINABLE - DOCUMENT PER PROJECT				
52	USER DEFINABLE - DOCUMENT PER PROJECT				
53	USER DEFINABLE - DOCUMENT PER PROJECT				
54	USER DEFINABLE - DOCUMENT PER PROJECT				
55	CONSTRUCTION NOTES & BALLOONS - 1st REVISION	0	1,6	0	
56					
57					
58					
59					
60					
61					
62					
63					

NOTE:

a TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3

**PLOT FILE**

ELECTRICAL  
MASTER FILE LEVEL SYMBOLOGY:







CIRCUITING						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
⌘	2HG	2 HOTS, GROUND	37	21	2	0
⌘⌘	3HG	3 HOTS, GROUND	37	21	2	0
⌘⌘⌘	NSLG	NEUTRAL, SWI TCHLEG, GROUND	37	21	2	0
⌘⌘⌘	HSLG	HOT, SWI TCHLEG, GROUND	37	21	2	0
⌘⌘⌘⌘	NHSLG	NEUTRAL, HOT, SWI TCHLEG, GROUND	37	21	2	0
⌘⌘⌘⌘	N2HSLG	NEUTRAL, 2 HOTS, SWI TCHLEG, GROUND	37	21	2	0
⌘⌘⌘⌘	N3HSLG	NEUTRAL, 3 HOTS, SWI TCHLEG, GROUND	37	21	2	0
⌘⌘⌘⌘⌘	N3SLG	NEUTRAL, 3 SWI TCHLEGS, GROUND	37	21	2	0
⌘⌘⌘⌘⌘	NH3SLG	NEUTRAL, HOT, 3 SWI TCHLEGS, GROUND	37	21	2	0
⌘⌘⌘⌘	H3SLG	HOT, 3 SWI TCHLEGS, GROUND	37	21	2	0
⌘⌘⌘⌘	3SLG	3 SWI TCHLEGS, GROUND	37	21	2	0
⌘⌘⌘	N2SLG	NEUTRAL, 2 SWI TCHLEGS, GROUND	37	21	2	0
⌘⌘⌘⌘	NH2SLG	NEUTRAL, HOT, 2 SWI TCHLEGS, GROUND	37	21	2	0
⌘⌘⌘	H2SLG	HOT, 2 SWI TCHLEGS, GROUND	37	21	2	0
⌘	HOT	1 HOT	37	21	2	0
⌘⌘	2H	2 HOTS	37	21	2	0
⌘⌘⌘	3H	3 HOTS	37	21	2	0
⌘⌘⌘⌘	4H	4 HOTS	37	21	2	0
⌘⌘	N1 H	NEUTRAL, 1 HOT	37	21	2	0

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ACCESS CONTROL						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	ACKYPD	ACCESS KEY PAD	4	42	3	0
	ACDRSW	INTERCOM DOOR SWITCH	4	42	3	0
	ACDRLH	DOOR LATCH RELEASE PANEL	4	42	3	0
	ADRSTK	ELECTRIC DOOR STRIKE	4	42	3	0
	ACMONT	MONITOR	4	42	3	0
	ACPGST	PAGING STATION	4	42	3	0
	ACEBGS	EMERGENCY BREAK GLASS SWITCH	4	42	3	0
	ACEMSW	EMERGENCY MUSHROOM SWITCH	4	42	3	0
	ACDRSH	DOOR SWITCH	4	42	3	0
	ACEXSW	MANUAL EXIT SWITCH	4	42	3	0
	ACMSTR	INTERCOM MASTER STATION	4	42	3	0
	ARFWLR	RED FLASHING WARNING LIGHT - RIGHT	4	42	3	0
	ARFWLL	RED FLASHING WARNING LIGHT - LEFT	4	42	3	0
	ARFWLU	RED FLASHING WARNING LIGHT - UP	4	42	3	0
	ARFWLD	RED FLASHING WARNING LIGHT - DOWN	4	42	3	0
	ACFWPR	FLASHING WARNING SIGN - RIGHT	4	42	3	0
	ACFWPL	FLASHING WARNING SIGN - LEFT	4	42	3	0
	ACFWPU	FLASHING WARNING SIGN - UP	4	42	3	0
	ACFWPD	FLASHING WARNING SIGN - DOWN	4	42	3	0

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ACCESS CONTROL						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	ACLICR	LASER INTERLOCK CONNECTION BOX - RIGHT	4	42	3	0
	ACLICL	LASER INTERLOCK CONNECTION BOX - LEFT	4	42	3	0
	ACLICU	LASER INTERLOCK CONNECTION BOX - UP	4	42	3	0
	ACLICD	LASER INTERLOCK CONNECTION BOX - DOWN	4	42	3	0
	ACLASW	LASER INTERLOCK ENABLE SWITCH	4	42	3	0
	ACPHBN	PUSH BUTTON	4	42	3	0
	ACBELL	BELL	4	42	3	0
	ACAM2	2' X 2' CAMERA	4	42	3	0
	ACAM	WALL MOUNTED CAMERA	4	42	3	0
	ACHORN	HORN	4	42	3	0
	ACDRBZ	DOOR BUZZER	4	42	3	0
	ACPNL	ACCESS CONTROL PANEL	10	42	3	0
	ACDREL	REMOTE DOOR RELEASE SWITCH	4	42	3	0
	ACARD	CARD READER	4	42	3	0
	ACDRCT	DOOR CONTACT	4	42	3	0
	ACDRHR	DOOR HOLDER	4	42	3	0
	AMONTC	CEILING MOUNTED MONITOR	5	42	3	0
	ACFWL	CEILING MOUNTED FLASHING WARNING LIGHT	5	42	3	0

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FIRE ALARM						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	WFBELL	FIRE ALARM BELL - WALL MOUNTED	20	7	3	0
	FDHDR	FI RE ALARM DOOR HOLDER	20	7	3	0
	SMDETR	FI RE ALARM SMOKE DETECTOR MTD. - RI GHT	20	7	3	0
	SMDETL	FI RE ALARM SMOKE DETECTOR MTD. - LEFT	20	7	3	0
	SMDETU	FI RE ALARM SMOKE DETECTOR MTD. - UP	20	7	3	0
	SMDETD	FI RE ALARM SMOKE DETECTOR MTD. - DOWN	20	7	3	0
	WBSTR	BELL AND STROBE WALL MOUNTED - RI GHT	20	7	3	0
	WBSTU	BELL AND STROBE WALL MOUNTED - UP	20	7	3	0
	WBSTL	BELL AND STROBE WALL MOUNTED - LEFT	20	7	3	0
	WBSTD	BELL AND STROBE WALL MOUNTED - DOWN	20	7	3	0
	STRBR	STROBE LI GHT WALL MOUNTED - RI GHT	20	7	3	0
	STRBU	STROBE LI GHT WALL MOUNTED - UP	20	7	3	0
	STRBL	STROBE LI GHT WALL MOUNTED - LEFT	20	7	3	0
	STRBD	STROBE LI GHT WALL MOUNTED - DOWN	20	7	3	0
	SMKUFD	SMOKE DETECTOR - UNDERFLOOR	20	7	3	0

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FIRE ALARM						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	DETECT	FI RE ALARM DUCT SMOKE DETECTOR	21	7	3	0
	FAPLSW	FI RE ALARM FLOW SWI TCH	21	7	3	0
	SMKDET	FI RE ALARM SMOKE DETECTOR - CEI LI NG MTD.	21	7	3	0
	HETDET	FI RE HEAT DETECTOR - CEI LI NG MOUNTED	21	7	3	0
	FAPLSN	FI RE ALARM PULLSTATI ON - WALL MOUNTED	20	7	3	0
	AUDVIS	AUDI O / VI SUAL ALARM - CEI LI NG MOUNTED	21	7	3	0
	BLSTR	FI RE ALARM BELL & STROBE - CEI LI NG MTD.	21	7	3	0
	STROBE	FI RE ALARM STROBE LI GHT - CEI LI NG MOUNTED	21	7	3	0
	FAPNL	FI RE ALARM TERMI NAL CABI NET	10	7	3	0
	FACP	FI RE ALARM CONTROL PANEL	10	7	3	0
	FAWSEN	FI RE ALARM WATER SENSOR - FLOOR MOUNTED	20	7	3	0
	WHTDET	FI RE ALARM HEAT DETECTOR - WALL MOUNTED	20	7	3	0
	FLSWRT	FI RE ALARM FLOW SWITCH MOUNTED - RI GHT	20	7	3	0
	FLSWLT	FI RE ALARM FLOW SWI TCH MOUNTED - LEFT	20	7	3	0
	FLSWUP	FI RE ALARM FLOW SWI TCH MOUNTED - UP	20	7	3	0
	FLSWDN	FI RE ALARM FLOW SWI TCH MOUNTED - DOWN	20	7	3	0

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INTERCOM - EPPA						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
Ⓢ	SPEAK	CEILING MOUNTED SPEAKER	27	43	3	0
*Ⓢ	SPKR	SPEAKER WALL MOUNTED - RIGHT	28	43	3	0
Ⓢ*	SPKL	SPEAKER WALL MOUNTED - LEFT	28	43	3	0
Ⓢ *	SPKUP	SPEAKER WALL MOUNTED - UP	28	43	3	0
* Ⓢ	SPKDN	SPEAKER WALL MOUNTED - DOWN	28	43	3	0
* M	MONTRT	MONITOR WALL MOUNTED - RIGHT	28	43	3	0
M *	MONILT	MONITOR WALL MOUNTED - LEFT	28	43	3	0
M *	MONTUP	MONITOR WALL MOUNTED - UP	28	43	3	0
* M	MONTDN	MONITOR WALL MOUNTED - DOWN	28	43	3	0
	CAMERA	WALL MOUNTED CAMERA	28	43	3	0
* PS	PGSTRT	PAGING STATION WALL MOUNTED - RIGHT	28	43	3	0
PS *	PGSTLT	PAGING STATION WALL MOUNTED - LEFT	28	43	3	0
PS *	PGSTUP	PAGING STATION WALL MOUNTED - UP	28	43	3	0
* PS	PGSTDN	PAGING STATION WALL MOUNTED - DOWN	28	43	3	0
	CAM2X2	2' X 2' CAMERA	28	43	3	0
	INTCAB	INTERCOM CABINET	10	43	3	0
* MS	PGMST	PAGING MASTER STATION	28	43	3	0

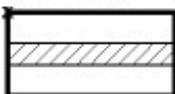
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INTRUSION ALARM						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	IADSW	INTRUSION ALARM DOOR SWITCH	22	87	3	0
	WMIRS	INTRUSION ALARM SENSOR - WALL MOUNTED	22	87	3	0
	DURSWR	INTRUSION ALARM DURESS SWITCH - RIGHT	22	87	3	0
	DURSWL	INTRUSION ALARM DURESS SWITCH - LEFT	22	87	3	0
	DURSWD	INTRUSION ALARM DURESS SWITCH - DOWN	22	87	3	0
	DURSWU	INTRUSION ALARM DURESS SWITCH - UP	22	87	3	0
	IAPNL	INTRUSION ALARM PANEL	10	87	3	0
	WMICS	INTRUSION ALARM MICROWAVE SENSOR	22	87	3	0
	IAKYPD	INTRUSION ALARM KEY PAD	22	87	3	0
	SENPWR	SENSOR POWER SWITCH	22	87	3	0
	TAMPSW	TAMPER SWITCH	22	87	3	0
	IRS	INTRUSION ALARM SENSOR - CEILING	23	87	3	0
	MI CSEN	INTRUSION ALARM MICROWAVE SENSOR - CEILING	23	87	3	0

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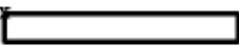
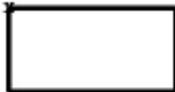
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LIGHTING						
CEILING MOUNTED						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
EMERGENCY 	1 X4EOF	1' X 4' FLUORESCENT EMERGENCY - OFF	30 *42	6 50	5 1	0
EMERGENCY 	1 X4EMC	1' X 4' FLUORESCENT EMERGENCY - CENTER	30 *42	6 50	5 1	0
EMERGENCY 	1 X8EM	1' X 8' FLUORESCENT EMERGENCY - ON	30 *42	6 50	5 1	0
EMERGENCY 	1 X8EOF	1' X 8' FLUORESCENT EMERGENCY - OFF	30 *42	6 50	5 1	0
EMERGENCY 	2X4EM	2' X 4' FLUORESCENT EMERGENCY - ON	30 *42	6 50	5 1	0
EMERGENCY 	2X4EOF	2' X 4' FLUORESCENT EMERGENCY - OFF	30 *42	6 50	5 1	0
EMERGENCY 	2X4EMC	2' X 4' FLUORESCENT EMERGENCY - CENTER	30 *42	6 50	5 1	0
EMERGENCY 	2X2EM	2' X 2' FLUORESCENT EMERGENCY - ON	30 *42	6 50	5 1	0
EMERGENCY 	2X2EOF	2' X 2' FLUORESCENT EMERGENCY - OFF	30 *42	6 50	5 1	0
EMERGENCY 	2X2EMC	2' X 4' FLUORESCENT EMERGENCY - CENTER	30 *42	6 50	5 1	0
	EXLI TE	EXIT LI GHT	33	6	4	0

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\* - EMERGENCY CROSS HATCHING

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LIGHTING						
CEILING MOUNTED						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
HLD. ⊗	HI D	HI GH I NTENSI TY DI SCHARGE FI XTURE	32	6	4	0
INCANDESCENT ⊗	INCAD	INCANDESCENT FI XTURE	31	6	4	0
FLUORESCENT 	1 X4FIX	1 ' X 4' FLUORESCENT FI XTURE	30	6	5	0
FLUORESCENT 	1 X8FIX	1 ' X 8' FLUORESCENT FI XTURE	30	6	5	0
FLUORESCENT 	2X4FIX	2' X 4' FLUORESCENT FI XTURE	30	6	5	0
FLUORESCENT 	2X2FI X	2' X 2' FLUORESCENT FI XTURE	30	6	5	0
EMERGENCY ⊗	HI DEM	HI GH I NTENSI TY DI SCHARGE EMERGENCY - ON	32 *42	1 50	4	0
EMERGENCY ⊗	HI DEOF	HI GH I NTENSI TY DI SCHARGE EMERGENCY - OFF	32 *42	1 50	4	0
EMERGENCY ⊗	INCDEM	INCANDESCENT EMERGENCY FI XTURE - ON	31 *42	1 50	4	0
EMERGENCY ⊗	INCOF	INCANDESCENT EMERGENCY FI XTURE - OFF	31 *42	1 50	4	0
EMERGENCY 	1 X4EM	1 ' X 4' FLUORESCENT EMERGENCY - ON	30 *42	1 50	5	0

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LIGHTING						
CEILING MOUNTED						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
⊗	RECFL	RECESS FLUORESCENT FI XTURE	30	6	4	0
⊗	RECDEM	RECESS FLUORESCENT EMERGENCY - ON	30 * 42	6	4	0
⊗	RCFEF	RECESS FLUORESCENT EMERGENCY - ON	30 * 42	6	4	0
↑ x ↓	EXARRD	DUAL EXI T ARROW LOCATION I DENTI FI ERS	33	0	0	0
x ↓	EXARRT	EXI T ARROW LOCATI ON I DENTI FI ERS - RI GHT	33	0	0	0
↑ x	EXARLT	EXI T ARROW LOCATI ON I DENTI FI ERS - LEFT	33	0	0	0

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LIGHTING						
WALL MOUNTED						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
H.I.D. *○	WMHID	HIGH INTENSITY DISCHARGE FIXTURE	38	6	4	0
H.I.D. *⊙	WMPCR	PHOTO CELL MOUNTED RIGHT	38	6	4	0
H.I.D. ⊙*	WMPL	PHOTO CELL MOUNTED LEFT	38	6	4	0
H.I.D. ⊙*	WMPCU	PHOTO CELL MOUNTED UP	38	6	4	0
H.I.D. *⊙	WMPCD	PHOTO CELL MOUNTED DOWN	38	6	4	0
INCANDESCENT *⊙	WMINCD	INCANDESCENT FIXTURE	34	6	4	0
FLUORESCENT 	6X4FX	6' X 4' FLUORESCENT FIXTURE	4	6	5	0
FLUORESCENT 	6X8FX	6' X 8' FLUORESCENT FIXTURE	4	6	5	0
EMERGENCY *⊙	WHIDEM	HIGH INTENSITY DISCHARGE EMERGENCY - ON	38 *42	6 50	4 1	0
EMERGENCY *⊙	WHIDEO	HIGH INTENSITY DISCHARGE EMERGENCY - OFF	38 *42	6 50	4 1	0
EMERGENCY *⊙	WINCEM	INCANDESCENT EMERGENCY FIXTURE - ON	34 *42	6 50	4 1	0
EMERGENCY *⊙	WINCEO	INCANDESCENT EMERGENCY FIXTURE - OFF	34 *42	6 50	4 1	0
EMERGENCY 	6X4EM	6' X 4' EMERGENCY FIXTURE - ON	4 *42	6 50	5 1	0
EMERGENCY 	6X4EOF	6' X 4' EMERGENCY FIXTURE - OFF	4 *42	6 50	5 1	0

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\* - EMERGENCY CROSS HATCHING

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LIGHTING						
WALL MOUNTED						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
EMERGENCY 	6X8EM	6" X 8' EMERGENCY FI XTURE - ON	4 *42	1 50	5	0
EMERGENCY 	6X8EOF	6" X 8' EMERGENCY FI XTURE - OFF	4 *42	1 50	5	0
SWITCHES 	WMSW	LI GHT SWI TCH	15	61	2	0
EMERGENCY 	EMLI TE	EMERGENCY LI GHT	42	50	4	0
EXIT 	WMEXI T	EXI T LI GHT	26	6	4	0
	LTGPNL	LI GHTI NG PANEL	10	6	3	0

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# ONE - LINE DIAGRAMS

CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	DRAFUS	DRAWN OUT FUSE OVER 600V	12	55	3	0
	DRACIR	DRAWN OUT CIRCUIT BREAKER UNDER 600V	12	55	3	0
	CB	NON-DRAWN OUT CIRCUIT BREAKER OVER 600V	12	55	3	0
	DRACB	DRAWN OUT CIRCUIT BREAKER OVER 600V	12	55	3	0
	OLXFMR	ONE LINE TRANSFORMER	12	55	3	0
	TRANSW	TRANSFER SWITCH	12	55	3	0
	PT	POTENTIAL TRANSFORMER	12	55	3	0
	CT	CURRENT TRANSFORMER	12	55	3	0
	KIRKEY	KIRK KEY	12	55	3	0
	PULBOX	PULL BOX	12	55	3	0
	AMETER	AMMETER	12	55	3	0
	VMETER	VOLTMETER	12	55	3	0
	WMETER	WATTMETER	12	55	3	0

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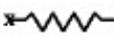
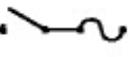
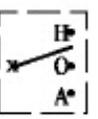
# WIRING & ONE - LINE DIAGRAMS

CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	TERMPT	TERMI NAL POI NT	12	55	3	0
	XFMR	TRANSFORMER	12	55	3	0
	BUZZER	BUZZER	12	55	3	0
	FUSE	FUSE	12	55	3	0
	COIL	COI L	12	55	3	0
	LAMP	LAMP	12	55	3	0
	SOLNOD	SOLENOID	12	55	3	0
	BATERY	BATTERY	12	55	3	0
	GND	GROUND	12	55	3	0
	BKR	BREAKER	12	55	3	0
	OPNCNT	OPEN CONTACT	12	55	3	0
	CSDCNT	CLOSED CONTACT	12	55	3	0
	FUSETN	FUSE TRON	12	55	3	0
	SWOPEN	SWI TCH NORMALLY - OPEN	12	55	3	0
	SWCLSD	SWI TCH NORMALLY - CLOSED	12	55	3	0
	LI MSWO	LI MI T SWI TCH NORMALLY - OPEN	12	55	3	0
	LI MSWC	LI MI T SWI TCH NORMALLY - CLOSED	12	55	3	0
	LI QSWO	LI QUI D LEVEL SWI TCH NORMALLY - OPEN	12	55	3	0
	LI QSWC	LI QUI D LEVEL SWI TCH NORMALLY - CLOSED	12	55	3	0

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# WIRING & ONE - LINE DIAGRAMS

CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	VACSWO	VACUUM SWI TCH - OPEN	12	55	3	0
	VACSWC	VACUUM SWI TCH - CLOSED	12	55	3	0
	TEMSWO	TEMPERATURE SWI TCH - OPEN	12	55	3	0
	TEMSWC	TEMPERATURE SWI TCH - CLOSED	12	55	3	0
	FLWSWO	FLOW SWI TCH - OPEN	12	55	3	0
	FLWSWC	FLOW SWI TCH - CLOSED	12	55	3	0
	ENSWO	ENERGI ZED SWI TCH - OPEN	12	55	3	0
	ENSWC	ENERGI ZED SWI TCH - CLOSED	12	55	3	0
	DENSWO	DE-ENERGI ZED SWI TCH - OPEN	12	55	3	0
	DENSWC	DE-ENERGI ZED SWI TCH - CLOSED	12	55	3	0
	PSHBNO	PUSHBUTTON NORMALLY OPEN	12	55	3	0
	PSHBNC	PUSHBUTTON NORMALLY CLOSED	12	55	3	0
	MPSHBO	MUSHROOM PUSHBUTTON NORMALLY OPEN	12	55	3	0
	MPSHBC	MUSHROOM PUSHBUTTON NORMALLY CLOSED	12	55	3	0
	RESI ST	RESI STOR	12	55	3	0
	FUSDI S	FUSED DI SCONNECT SWI TCH	12	55	3	0
	HOA	HAND - OFF - AUTO	12	55	3	0
	WDMOT	MOTOR	12	55	3	0

RC = SNLELEC.CEL

REVISED 9/01

POWER						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	SPMTR	SINGLE PHASE MOTOR	18	53	3	0
	TPMTR	THREE-PHASE MOTOR	18	53	3	0
	SAFSW	SAFETY SWITCH	16	53	3	0
	COMSTR	COMBINATION STARTER	16	53	3	0
	MTRCNT	MOTOR CONTROLLER	16	53	3	0
	MAGCON	MAGNETIC CONTACTOR	16	53	3	0
	DMPMTR	DAMPER MOTOR	18	53	3	0
	RELAY	RELAY	16	53	3	0
	TRANS	TRANSFORMER	9	53	3	0
	TSWTCH	THERMAL OVERLOAD SWITCH	15	61	2	0
	PWRPOL	INTERIOR POWER POLE	14	53	3	0
	TSTATR	THERMOSTAT MOUNTED - RIGHT	24	53	3	0
	TSTATU	THERMOSTAT MOUNTED - UP	24	53	3	0
	TSTATL	THERMOSTAT MOUNTED - LEFT	24	53	3	0
	TSTATD	THERMOSTAT MOUNTED - DOWN	24	53	3	0
	4X4WW	4" X 4" WIRE WAY	29	53	3	0
	6X6WW	6" X 6" WIRE WAY	29	53	3	0
	CBLTRY	CABLE TRAY	29	53	3	0
	277BD	277/480V BUS DUCT	29	53	3	0

RC = SNLELEC.CEL

REVISED 9/01





x - DENOTES CELL ORIGIN.

RECEPTACLE						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	DUPLEX	CEILING/FLOOR MOUNTED DUPLEX OUTLET	12	53	3	0
	WMDUP	WALL MOUNTED DUPLEX OUTLET	14	53	3	0
	SPURP	CEILING/FLOOR MTD. SPECIAL PURPOSE OUTLET	12	53	3	0
	SPURRT	WALL MOUNTED SPECIAL PURPOSE - RIGHT	15	53	3	0
	SPURLT	WALL MOUNTED SPECIAL PURPOSE - LEFT	15	53	3	0
	SPURUP	WALL MOUNTED SPECIAL PURPOSE - UP	15	53	3	0
	SPURDN	WALL MOUNTED SPECIAL PURPOSE - DOWN	15	53	3	0
	QUPLEX	CEILING/FLOOR MOUNTED QUADRAPLEX	12	53	3	0
	WMQUAP	WALL MOUNTED QUADRAPLEX	14	53	3	0
	3PGSTP	3 FOOT PLUG-IN STRIP	16	53	3	0
	4PGSTP	4 FOOT PLUG-IN STRIP	16	53	3	0

RC = SNLELEC.CEL

REVISED 9/01



# *Chapter 7*

## *Controls*

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## **Level Assignments**

The level schemas shown in this chapter are the standard element level definitions for the controls system master file. User-definable levels are used where the level schemas do not accommodate the design needs of a particular project. Contact the Project CADD Coordinator for approval before using user-defined levels. All user-defined levels shall be identified using the File Specific Information (FSI) cell located in `noting.cel`.

## **Standard Cells**

The standard controls cell library is `snlcont.cel`. If additional new cells are required, create a personal project cell library and submit to the Project CADD Coordinator for approval before using new cells. Submit an Engineering Standards Request (ESR) to incorporate the cells into the `snlcont.cel` library. Graphical representations of the cells in `snlcont.cel` are shown in the tabbed Controls Cell Library section.

## **Control Master File**

Control master files are created by referencing the appropriate mechanical and electrical system master files. The MicroStation J reference levels Symbology command (under the Reference, Settings, Level menus) may be used to adjust line weights and colors on the referenced mechanical and electrical files in order to clearly identify equipment and control labels.

## **Control Labeling**

The control cells contain data fields for text. An important requirement for all control files is the labeling.

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10	FID PANELS	21	3	0	RC=SNLCONT.CEL
11	J BOXES (CEILING MOUNTED)	21	3	0	RC=SNLELECT.CEL
12					
13	J BOXES (WALL MOUNTED)	21	3	0	RC=SNLELECT.CEL
14					
15					
16					
17					
18					
19					
20					
21	DATA LINK (LAN) COMM / INTERNAL SYSTEM LINE	3	2	*	LC=INTERNAL SYSTEM LINE
22					
23					
24					
25					
26					
27	CONTROL DEVICE SYMBOLS, LEADER LINES, TERMINATORS	7	1	0	RC=SNLCONT.CEL
28	CONTROL DEVICES	7	1	0	
29					
30	BUILDING EQUIPMENT (ONLY. USER-SUPPLIED EQUIPMENT IS LOCATED ON THE ARCH. EQUIPMENT LAYOUT (EQ) PLAN)				
31					
32					
33					
34					
35	ELECTRICAL CONTROL SIGNAL	21	1	3	
36	ELECTRICAL POWER SIGNAL	3	2	*	LC=ELECT POWER SIGNAL
37					
38					
39					
40					
41					
42					
43	PNEUMATIC SIGNAL	4	2	*	LC= PNEUMATIC SIGNAL
44	HEX SYMBOLS				RC=NOTING.CEL
45	ROOM NAMES AND NUMBERS				COPIED IN FROM FLOOR PLAN
46	MISC. NOTES, LEADER LINES, TERMINATORS	0	1	0	KEYED NOTES ARE PLACED IN PLOT FILE
47	DRAWING COMPONENT TITLES, SCALES & ASSOCIATED GRAPHICS	0	2	0	RC= NOTING.CEL
48	PANEL I.D. TEXT	0	1	0	
49	ELECTRICAL EQUIPMENT SYMBOL & CONDUIT SYMBOL	0	1	0	RC=NOTING.CEL
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1	0	
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	SHADING				
63	PATTERNING WITH PEN TABLE-SEE SYSTEM MANAGER				

CONTROLS PLAN

CONTROLS MASTER FILE LEVEL SYMBOLOGY:

\* SNL CUSTOM LINE STYLES

COLOR TABLE = ELECT.TBL

NOTE: ALL OTHER ITEMS ARE REFERENCED IN FROM THE APPROPRIATE ARCHITECTURAL, MECHANICAL, OR ELECTRICAL MASTER PLAN

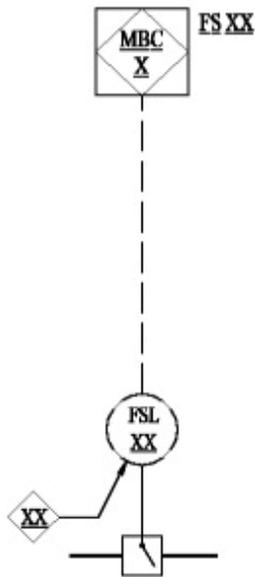
LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2	NORTH ARROW				PLACED PER CELL
3	TITLE BLOCK INFORMATION (GENERIC)	0	1	0	PLACED PER CELL - USE DATA FIELDS
4	KEY PLAN				TYPICALLY REFERENCED AS A MASTER KEY PLAN FILE
5					
6					
7					
8					
9					
10	COLUMN GRIDS	2	0	4	
11	COLUMN GRID TAGS AND ASSOCIATED TEXT	2	1	0	
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40	REFERENCE SYMBOLS AND TEXT - SECTION, DETAIL, & ELEVATION	3	3	0	
41	TARGETS	0	1	0	
42					
43					
44					
45					
46	KEYED NOTES, GENERAL NOTES, LEADER LINES, TERMINATORS	0	1	0	
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	SEE NOTE
48	LEGEND AND SCHEDULE GRAPHICS				
49	LEGEND AND SCHEDULE TEXT	0	3,1	0	
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	
51	USER DEFINABLE - DOCUMENT PER PROJECT				
52	USER DEFINABLE - DOCUMENT PER PROJECT				
53	USER DEFINABLE - DOCUMENT PER PROJECT				
54	USER DEFINABLE - DOCUMENT PER PROJECT				
55	CONSTRUCTION NOTES & BALLOONS - 1st REVISION	6	1,7	0	
56	CONSTRUCTION NOTES & BALLOONS - 2nd REVISION	37	1,7	0	
57					
58					
59					
60					
61					
62					
63					

**CONTROLS**  
**MASTER FILE LEVEL SYMBOLLOGY:**  
**PLOT FILE**

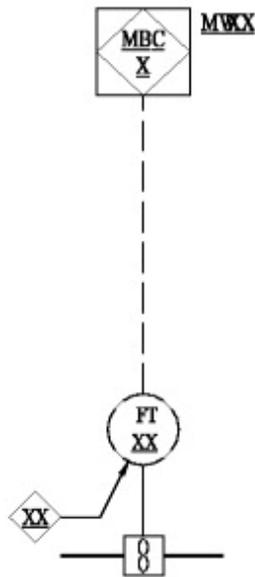
NOTE:  
 TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3

PREPARED BY: <b>E. L. GORE</b>		<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: .....
CHECKED BY: .....			SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>SENSORS (FLOW)</b>	CONTROLS STANDARD

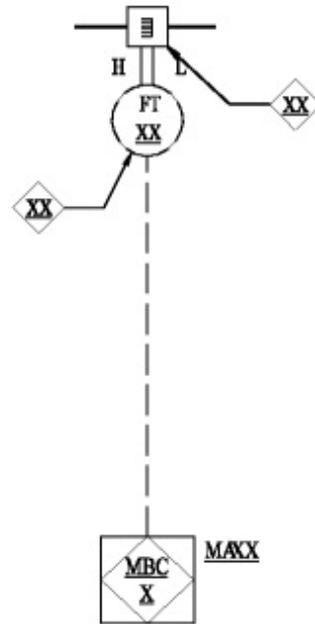
**FLOW SWITCH  
(DUCT OR LIQUID)**



**FLOW TRANSMITTER.  
(TURBINE)**

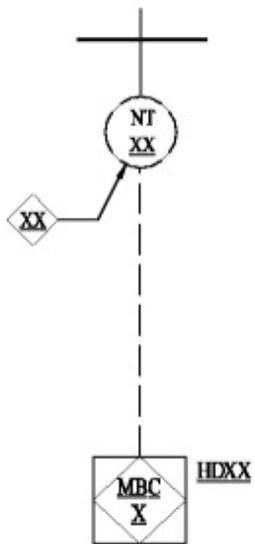


**FLOW TRANS.  
(W/PITOT TUBE)  
(AVG.)**

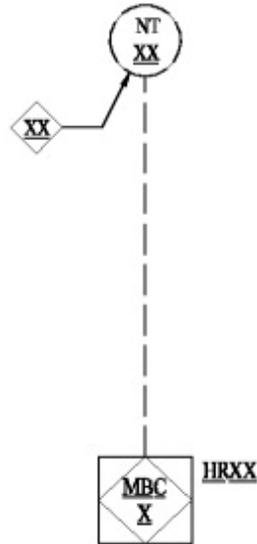


PREPARED BY: <b>E. L. GORE</b>		<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: -----
CHECKED BY: -----			SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>SENSORS (HUMIDITY)</b>	CONTROLS STANDARD

HUMIDITY TRANSMITTER  
(DUCT)

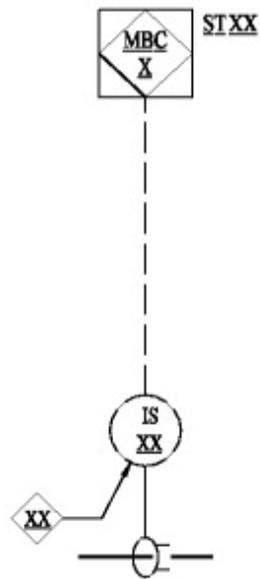


HUMIDITY TRANSMITTER  
(ROOM)

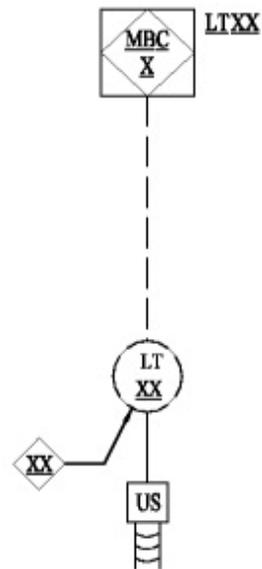


PREPARED BY: <b>E. L. GORE</b>	<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: -----
CHECKED BY: -----		SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>SENSORS</b>
		CONTROLS STANDARD

CURRENT SENSOR

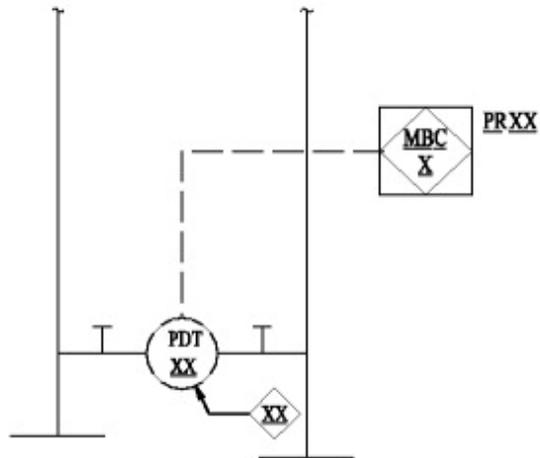


LEVEL TRANSMITTER  
ULTRA SONIC

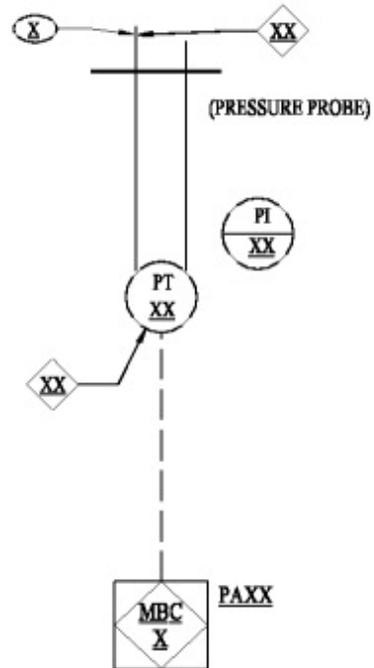


PREPARED BY: <b>E. L. GORE</b>		<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: -----
CHECKED BY: -----			SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>SENSORS (PRESSURE)</b>	CONTROLS STANDARD

DIFFERENTIAL PRESSURE TRANSMITTER  
(LIQUID)

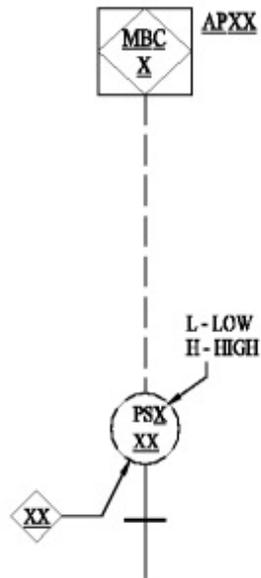


PRESS. TRANS.  
(DUCT STATIC)

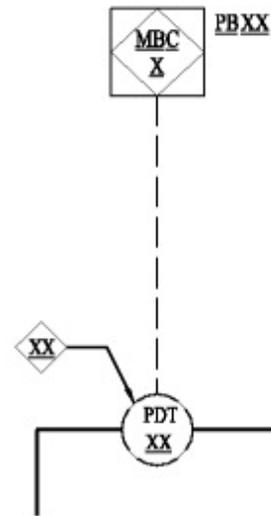


PREPARED BY: <b>E. L. GORE</b>		<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: -----
CHECKED BY: -----			SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>SENSORS (PRESSURE)</b>	CONTROLS STANDARD

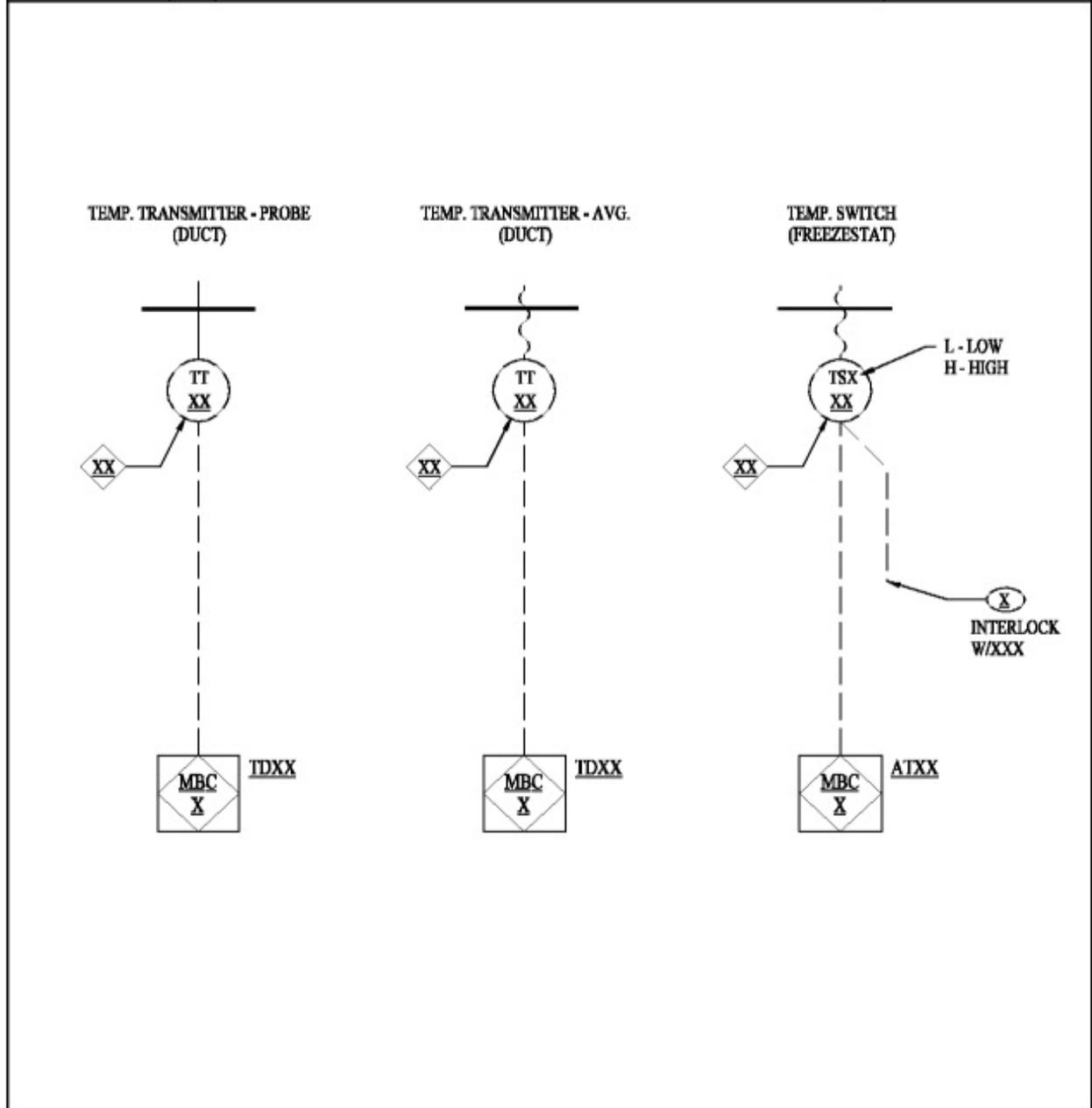
PRESS. SWITCH  
(HIGH OR LOW) (AIR OR LIQUID)



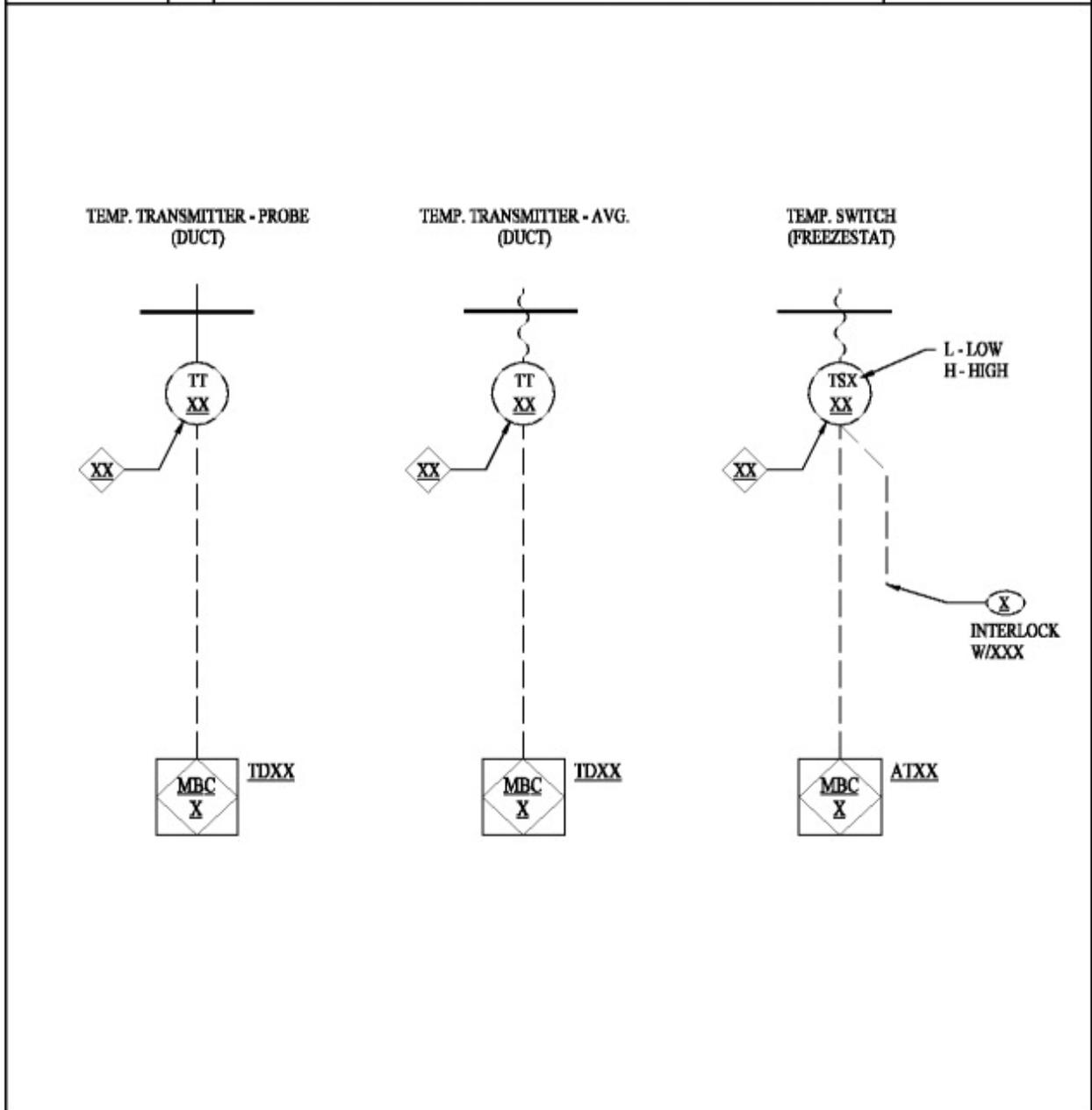
DIFF. PRESS. TRANSMITTER  
(AIR)



PREPARED BY: <b>E. L. GORE</b>		<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: -----
CHECKED BY: -----			SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>SENSORS (TEMPERATURE TRANS)</b>	CONTROLS STANDARD

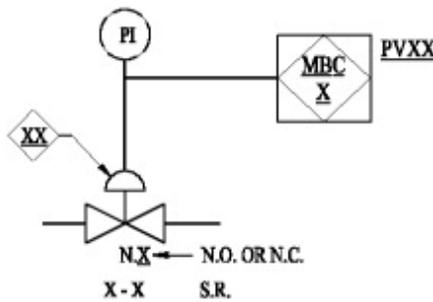


PREPARED BY: <b>E. L. GORE</b>		<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: .....
CHECKED BY: .....			SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>SENSORS (TEMPERATURE TRANS)</b>	CONTROLS STANDARD

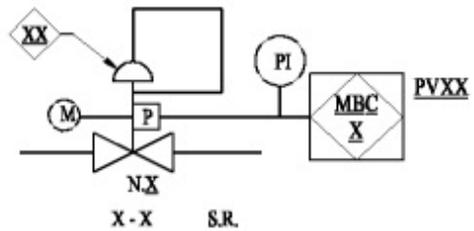


PREPARED BY: <b>E. L. GORE</b>		<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: -----
CHECKED BY: -----			SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>CONTROL DEVICES (VALVE)</b>	CONTROLS STANDARD

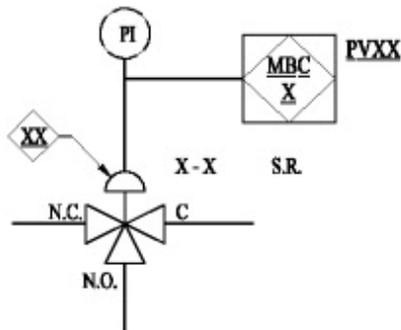
2-WAY CONTROL VALVE  
(PNEUMATIC OPERATOR)



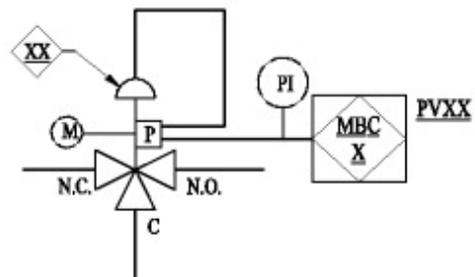
2-WAY CONTROL VALVE  
(PNEUMATIC OPERATOR W/ PILOT POS.)



3-WAY CONTROL VALVE  
(PNEUMATIC OPERATOR)

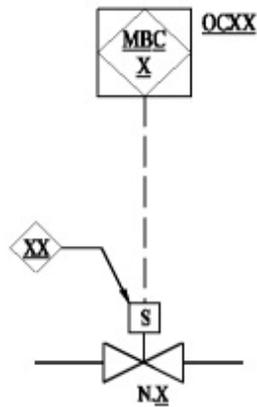


3-WAY CONTROL VALVE  
(PNEUMATIC OPERATOR W/PILOT)

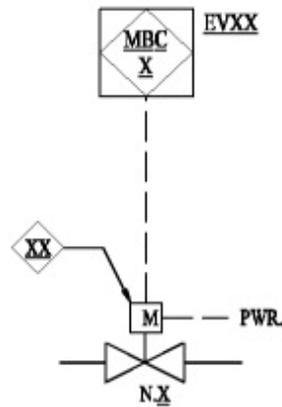


PREPARED BY: <b>E. L. GORE</b>	<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: -----
CHECKED BY: -----		SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	CONTROLS STANDARD

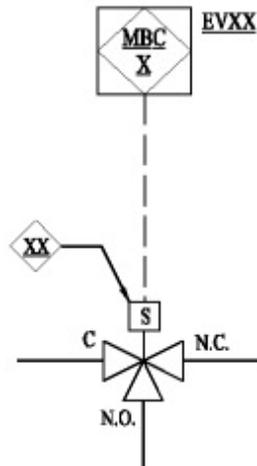
2-WAY VALVE  
(SOLENOID OPERATOR)



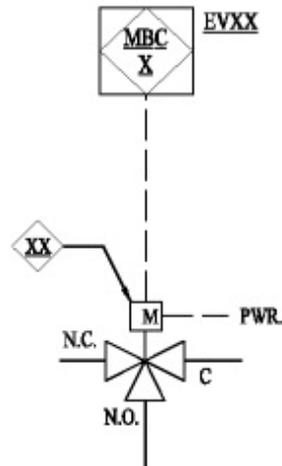
2-WAY VALVE  
MOTORIZED OPERATOR



3-WAY SOLENOID  
VALVE (BP)

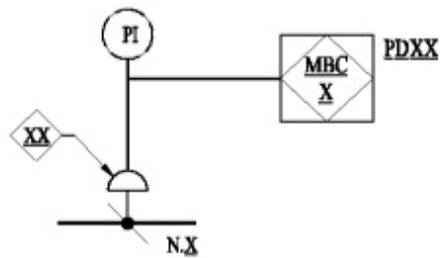


3-WAY MOTORIZED VALVE

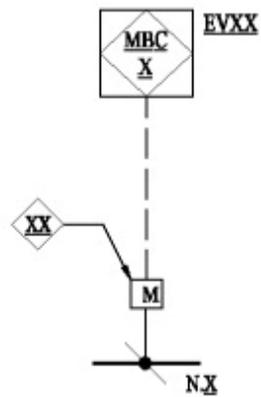


PREPARED BY: <b>E. L. GORE</b>		SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING	DETAIL NO.: .....
CHECKED BY: .....			SCALE: <b>NONE</b> ...
DATE: <b>6-1 5-02</b>	REV: -	<b>CONTROL DEVICES (DAMPER)</b>	CONTROLS STANDARD

CONTROL DAMPER  
(SINGLE BLADE, PNEUMATIC OPERATOR)

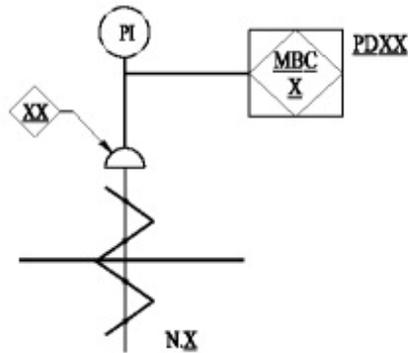


CONTROL DAMPER  
(SINGLE BLADE, ELECTRIC)

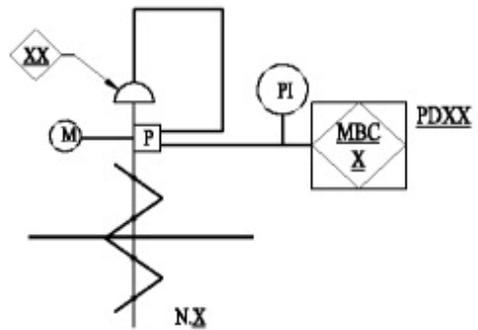


PREPARED BY: <b>E. L. GORE</b>		SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING	DETAIL NO.: -----
CHECKED BY: -----			SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>CONTROL DEVICES (DAMPER)</b>	CONTROLS STANDARD

CONTROL DAMPER  
(MULTI-BLADE W/PNEUMATIC OPERATOR)

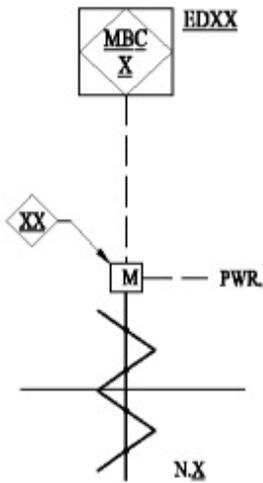


CONTROL DAMPER  
(MULTI-BLADE W/PNEUMATIC OPERATOR AND POSITIONER)

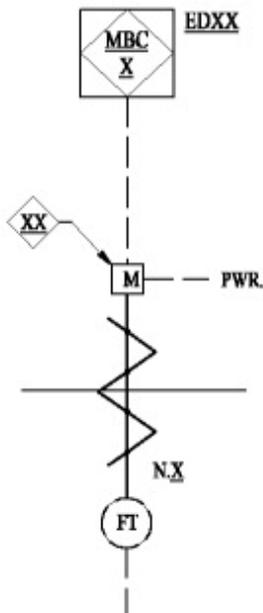


PREPARED BY: <b>E. L. GORE</b>		<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: -----
CHECKED BY: -----			SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>CONTROL DEVICES (DAMPER)</b>	CONTROLS STANDARD

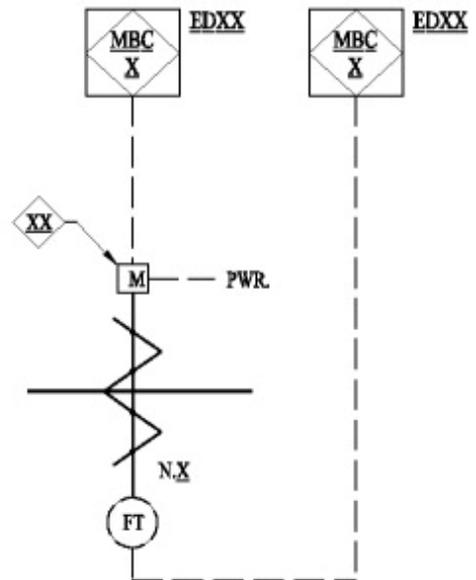
**CONTROL DAMPER  
(MULTI-BLADE W/ELECTRIC  
MOTOR ACTUATOR)**



**CONTROL DAMPER  
FLOW SENSING**

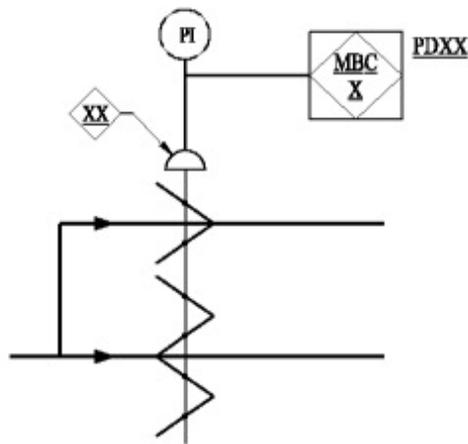


**CONTROL DAMPER ELECT.  
W/INTEGRAL FLOW SENSING ELEMENT  
AND TRANSMITTER**

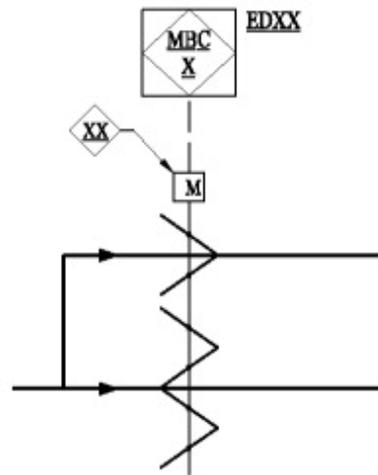


PREPARED BY: <b>E. L. GORE</b>	<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: -----
CHECKED BY: -----		SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>CONTROL DEVICES (F&amp;B DAMPER)</b>
		CONTROLS STANDARD

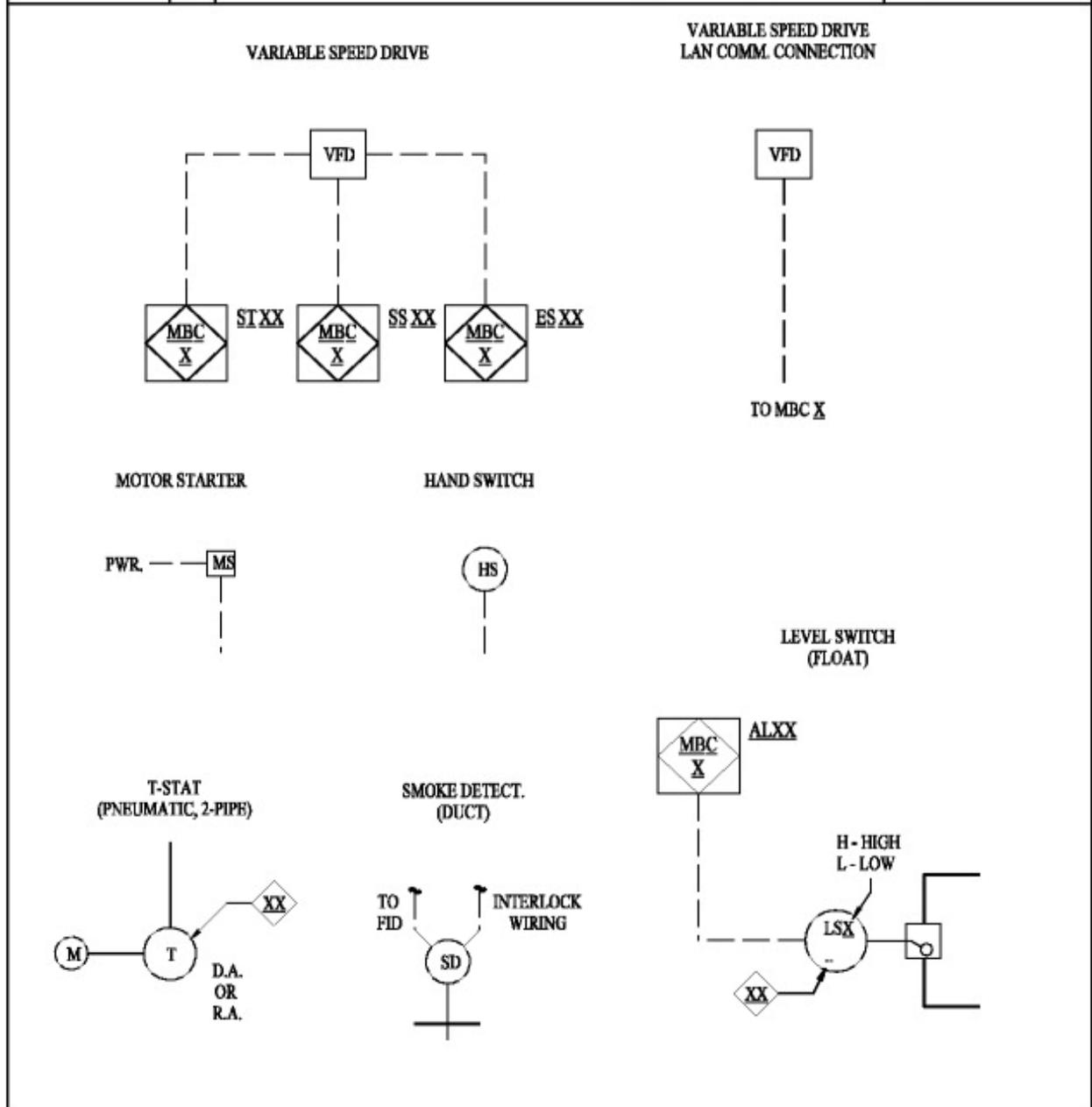
FACE AND BYPASS DAMPERS  
(PNEUMATIC OPERATOR)



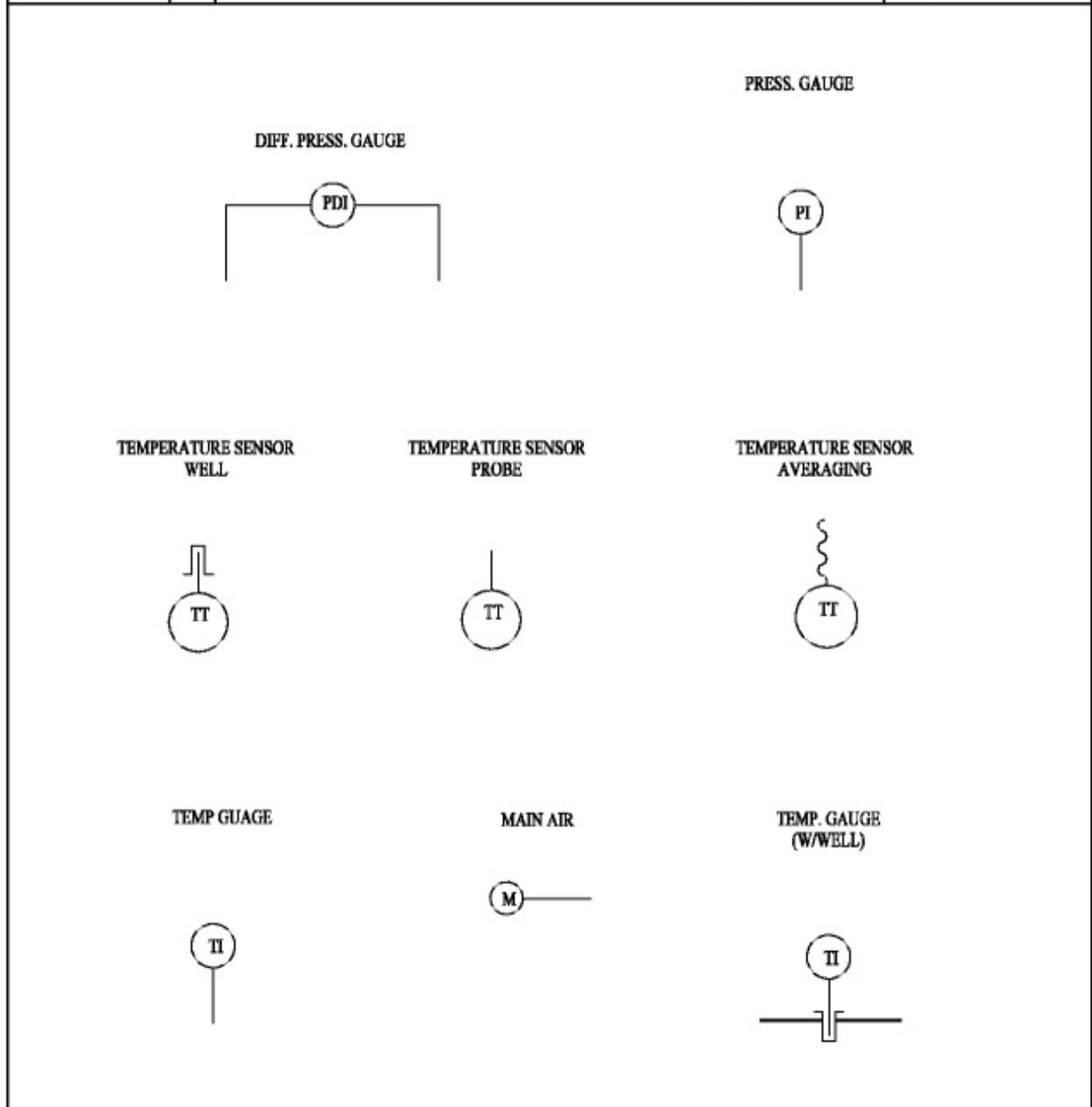
FACE AND BYPASS DAMPERS  
(ELECTRIC OPERATOR)



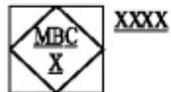
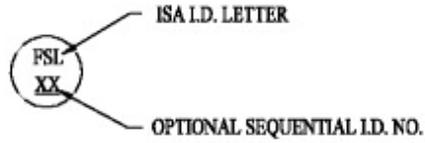
PREPARED BY: <b>E. L. GORE</b>	<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: -----
CHECKED BY: -----		SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>CONTROL DEVICES (ELEC.)</b>
		CONTROLS STANDARD



PREPARED BY: <b>E. L. GORE</b>	<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: -----
CHECKED BY: -----		SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>GAUGES (TEMP. &amp; PRESS.)</b>
		CONTROLS STANDARD



PREPARED BY: <b>E. L. GORE</b>		<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: -----
CHECKED BY: -----			SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>MISC.</b>	CONTROLS STANDARD



PREPARED BY: <b>E. L. GORE</b>	<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>		DETAIL NO.: -----
CHECKED BY: -----			SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>HVAC EQUIPMENT (COILS)</b>	CONTROLS STANDARD

COOLING  
COIL



HEATING  
COIL



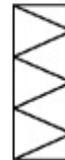
STEAM  
COIL



DX  
COIL



FILTER



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CHECKED BY: -----		SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>HVAC EQUIPMENT (FANS)</b>
		CONTROLS STANDARD

FAN  
(CENTRIFUGAL)

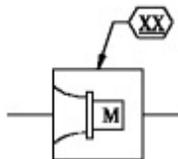


PUMP  
(CENTRIFUGAL)

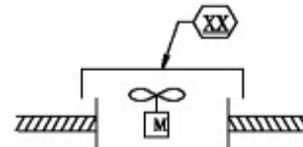
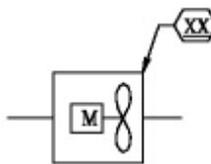


RELIEF HOOD  
(POWERED)

FAN  
(PLUG)

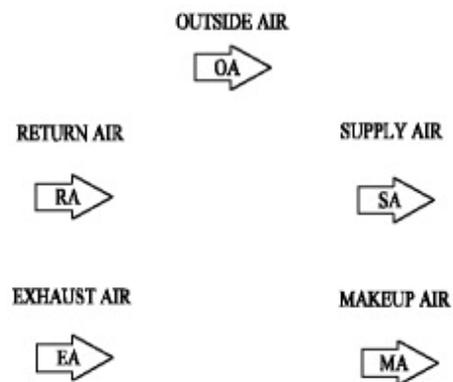


FAN  
(PROPELLER)



PREPARED BY: <b>E. L. GORE</b>		<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.: .....
CHECKED BY: .....			SCALE: <b>NONE</b> ...
DATE: <b>6-1 5-02</b>	REV: -	<b>HVAC FLOW DIRECTION ARROW</b>	CONTROLS STANDARD

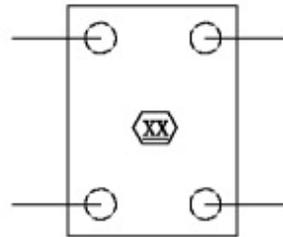
FLOW ARROW (W/DESCRIPTOR)



PREPARED BY: <b>E. L. GORE</b>		SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING	DETAIL NO.:
CHECKED BY:			-----
DATE: <b>6-1 5-02</b>		REV: -	SCALE: <b>NONE</b>
HVAC EQUIPMENT (CONVERTER)			CONTROLS STANDARD

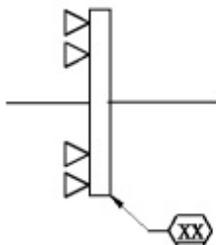
CONVERTER  
(SHELL & TUBE)

HEAT EXCHANGER  
(PLATE & FRAME)

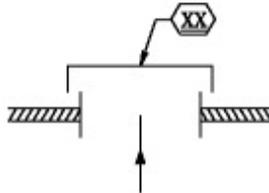


PREPARED BY: <b>E. L. GORE</b>		<b>SANDIA NATIONAL LABORATORIES FACILITIES ENGINEERING</b>	DETAIL NO.:
CHECKED BY:			SCALE: <b>NONE</b>
DATE: <b>6-1 5-02</b>	REV: -	<b>HVAC EQUIPMENT</b>	CONTROLS STANDARD

**HUMIDIFIER  
(STEAM GRID)**



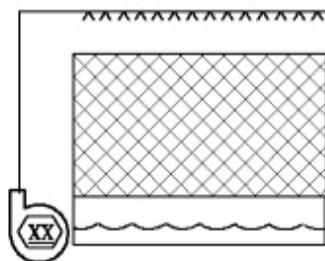
**RELIEF HOOD  
(GRAVITY)**



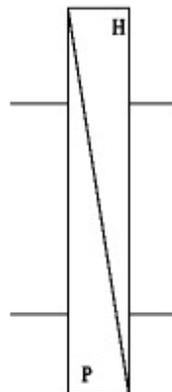
**FUME HOOD**



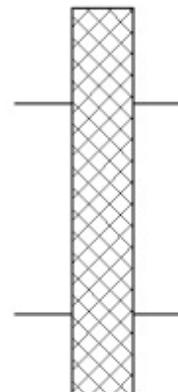
**AIR WASHER**



**HEAT PIPE  
(HEAT RECOVERY)**



**DESICCANT WHEEL  
(DEHUMIDIFIER)**



# *Chapter 8*

## *Asbestos Management*

## Asbestos CADD Requirements

This chapter details standards and processes unique to Asbestos CADD files. For more information, contact the asbestos team leader.

### Level Assignments

The level schemas shown in this chapter are the standard element level definitions for each asbestos master file and plot files. User-definable levels are used where the level schemas do not accommodate the design needs of a particular project. Contact the Project CADD Coordinator for approval before using user-defined levels. All user-defined levels shall be identified within the CADD file using the File Specific Information (FSI) cell located in `noting.cel`.

### Standard Cells

The standard asbestos cell library is `asbesto3.cel`. This cell library was created primarily for files using 1/8" = 1' - 0" scale or smaller. If the scale is 1/4" = 1' - 0" then an operator shall set active scale for cell placement to `AS= .5`

If additional new cells are required, create a personal project cell library and submit to the Project CADD Coordinator for approval before using new cells. Submit an Engineering Standards Request (ESR) to incorporate the cells into the `asbesto3.cel` library. Graphical representations of the cells in `asbesto3.cel` are shown in the tabbed Asbestos Cell Libraries section.

When placing cells for Asbestos Material Samples, refer to the Asbestos Codes and Descriptions list (Section 6.8) to determine the type of mechanical insulation, surfacing material, or miscellaneous materials that were sampled. After the determining the type of sample, determine the result--sample was positive; negative; showed traces; or not tested. Refer to the tabbed Asbestos Cell Library section for descriptions and examples of cells.

The Facilities Asbestos Implementation Team (FAIT) Bulk Sample Report contains information about materials tested, task or service order number, sample number, year, material test results, and brief descriptions of the location of each sample. This information is used to select the proper cells.

## Asbestos Files

Plot File	Zone Assignment Plan Drawing
Master (AP), then Plot file	Asbestos Survey Basement Plan
Master (AP), then Plot file	Asbestos Survey First Floor
Master (AP), then Plot file	Asbestos Survey Second Floor
Master (AP), then Plot file	Asbestos Survey Mezzanine
Master (AP), then Plot file	Asbestos Survey Any Additional Floors
Master (RO), then Plot file	Asbestos Roof Plan
Master (CT), then Plot file	Asbestos Ceiling Tile Plan by Floor (When Necessary)
Master (AT), then Plot file	Asbestos Attic Tile Plan (When Necessary)
Plot file	Abatement Drawing (When Necessary)

When circumstances warrant (for example, in small buildings), the Zone Assignment Plan Drawing and the Asbestos Survey-Floor Plan can be combined onto a single plot file.

If an Architectural CADD Roof Plan does not exist, a separate asbestos design file shall be generated and attached to the plot file. Use a single line for the Roof outline.

## Creating Plot Files

Plot files for any Asbestos drawing follow the plot file standards in Chapter 1, with the exception of the border (D-plus) reference file. Place the referenced border file over the architectural floor plan. If master floor plan reference files require scaling down, then determine the scale factor and the x, y, z, scale about a point. Scale each reference floor plan with the same scale factor and x, y, z point. All master file manipulations shall be identified within the CADD file using the File Specific Information (FSI) cell in `noting.cel`. The FSI cell includes scale factor and recorded x, y, z scale point. Reduce the full-size master reference file to fit the border file as follows:

Scale	Master /Reference
1/8 =	.5 : 1
1/16 =	.25 : 1
3/16 =	.75 : 1
1/10 =	.4 : 1

$$1/30 = .1333 : 1$$

$$1/20 = .2 : 1$$

## Updating Asbestos Abatement Files

FAIT will provide mark-ups indicating abatement tasks performed in buildings, such as removal of positive materials. This data is entered into asbestos CADD files to maintain accurate and current CADD drawings.

Except for HFF symbols and text, graphic elements or data shall not be deleted from asbestos master files. Elements that are abated are reassigned to an abatement level (see level schemas). When HFFs are removed, change the number in the HFF symbol. After all HFFs have been abated remove the symbol from the drawings

When Asbestos Abatement plot files become too cluttered with information, create a new file for clarity.

## Labels and Legends

Several legends and labels are used in asbestos files, as follows

- Title block  
Revision block extends along right side of title block.
- Typical material references  
This cell is shown in asbestos Survey Master Files. See figure 6-2
- Inventory of samples  
Follow the sequence of the Bulk Sample Inventory print-out. See figure 6-3 for close-up example and 6-6 for location on plot file provided by FAIT.
- Inventory of background air samples  
Follow the sequence of the Air Sample Inventory print-out. See Figure 6-4 for close-up example and Figure 6-6 for location on plot file provided by FAIT.
- Asbestos legend  
This cell is shown on each Asbestos Survey plot files. See Figure 6-5 for close-up example and 6-6 for location on plot file.
- Abatement revision indicator  
This symbology is used for each revision balloon indicator on abatement plot files. See Figure 6-7 for close-up example.
- Patterning indicators  
See Figure 6-8 for example of patterning used in creating asbestos plot files.

# Asbestos Codes and Descriptions List

Symbols placed on survey locations are separated into three categories:

- Mechanical Insulation
- Surfacing Material
- Miscellaneous Material

## Mechanical Insulation

<u>Code</u>	<u>Description</u>	<u>Code</u>	<u>Description</u>
ACDI Pipe	Air Cell Duct Insulation	HG/NA	Hard Fittings / Non-Asbestos
AIR	Air Cell Pipe Insulation	HFA	Hard Fittings on Air Cell
AIR/H	Air Cell / Hard Fitting	HFF	Hard Fittings on Fiberglass
AIR/J	Air Cell / Jacket	HFFELT	Hard Fittings on Felt Wrap
API	Asbestos Pipe Insulation	HFM	Hard Fittings on Mag Pipe
API/HF	Asbestos Pipe Insulation / Hard Fittings	HFPERM	Hard Fittings on Permalite
ASML/H	Asphaltic Emulsion / Hard Fittings	HFPW	Hard Fittings on Paper Wrap
ASMUL	Asphaltic Emulsion	WRTAPE	Heat Resistant Tape
BLOCK	Mag Block Insulation	INS	Insulating Cement
DIC	Duct Insulation Cement	INS/FG	Insulating Cement / Fiberglass
DUCT/B	Duct Board	LAG/FG	Felt Lagging on Fiberglass
FAB	Heavy Woven Fabric	LAG/NA	Lagging Non-Asbestos Material
FELT	Felt Wrap Pipe Insulation	LAG/PW	Lagging on Paper Wrap Pipe
FELT/H	Felt Wrap Pipe / Hard Fitting	MAG	MAG Pipe Insulation
FELT/I	Felt Lagging Insulation	MAG/H	MAG Pipe / Hard Fittings
PAPER	Paper Felt	TAPE	Duct Felt Tape
PRM	Permalite Pipe Insulation	TRANS	Transite Tape
PRM/H	Permalite / Hard Fitting	WIRE	Asbestos Insulated Wiring
PW	Paper Wrap	DUCT/LAG	Duct Lagging
PW/H	Paper Wrap / Hard Fitting	WH/FIB INS	White Fibrous Insulation

## Surfacing Materials

<u>Code</u>	<u>Description</u>	<u>Code</u>	<u>Description</u>
PLSTER	Wall and Ceiling Plaster	TO-FP	Troweled on Fireproofing
PORD	Poured Flooring	TEX	Textured Ceiling Material
SC-FP	Sprayed Cementitious Fireproofing	VENR	Veneer Plaster
SF-FP	Sprayed Fibrous Fireproofing	MUD/TAPE	Mud & Tape (joint compound for sheetrock)
T-TEX	Troweled Textured Material	PAINT	Paint
TARP	Asphalt Impregnated Paper	PA-TEX	Paint / textured coating

### Miscellaneous Material

<u>Code</u>	<u>Description</u>	<u>Code</u>	<u>Description</u>
BLANK	Variable unclassified material	LCT	Lay-in Ceiling Tile
BLOWN	Blown-in Insulation	MASTIC	Mastic
BRAKE	Brake & Clutch Pads	MIC	Mechanical Isolation Cloth
BUR	Built-up Roofing	MLBD	Millboard
CAB	Cement Asbestos Board	PUTTY	Putty Wrap
CAS	Cement Asbestos Siding	RFFELT	Roofing Felt
CERGRT	Ceramic Tile / Grout	SHINGL	Cementitious Roof Shingles
CG/CT	Concealed Grid Ceiling Tile	SHT	Sheet Floor Covering
COMP	Composition Shingles	SOIL	Contaminated Soil
CONC	Concrete	VAT	Vinyl Floor Covering
COVBAS	Covebase	FOAM	Foam
DEB	Material Debris	CON/DUST	Concrete Dust
DUST	Settled Dust	TRANS/SID	Transite Siding
FIREDR	Fire Door	TAR	Tar
GASKET	Gasket	TARP	Asphalt Impregnated Paper
GCT	Glued-on Ceiling Tile	TRANS/SHINGL	Transite Shingle
CT	Glued-on Tile	TRANS/PIPE	Transite Pipe

GWT	Glued-on Wall Tile	WALL	Wallboard
GYP	Gypsum Wallboard	WD	Wood
HOTPAD	Hotpad		
LABTOP	Lab Countertop		



# SUPERSEDED

## TYPICAL MATERIAL REFERENCES

### FLOOR MATERIAL REFERENCES:

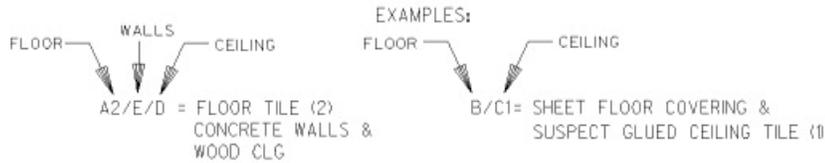
- A FLOOR TILE
- B SHEET FLOOR COVERING
- C CARPET
- D WOOD
- E CONCRETE
- F CERAMIC TILE
- G TERRAZO

### WALL MATERIAL REFERENCES: (if used)

- A GYPSUM AND/OR PLASTER
- B BRICK
- C GLUED WALL TILE
- D WOOD
- E CONCRETE/CONCRETE BLOCK
- F CERAMIC TILE

### CEILING MATERIAL REFERENCES:

- A GYPSUM AND/OR PLASTER
- B SUSPECT LAY-IN CEILING TILE
- C SUSPECT GLUED CEILING TILE
- D WOOD
- E CONCRETE
- F SUSPECT CONCEALED GRID CEILING TILE
- G TEXTURED CEILING MATERIAL
- H FIRTEX
- X NON-SUSPECT LAY-IN CEILING TILE
- Y NON-SUSPECT CONCEALED GRID CEILING TILE
- Z NON-SUSPECT GLUED CEILING TILE



NOTE: WHEN TWO OR MORE DIFFERENT TYPES OF A GIVEN MATERIAL ARE NOTED  
A SUFFIX IS USED TO DIFFERENTIATE BETWEEN THEM eg. (1),(2), ETC.

Figure 6-2. Material References Example

# SUPERSEDED

INVENTORY OF SAMPLES				INVENTORY OF SAMPLES			
DRAWING REFERENCE	SAMPLE CODE	LAB RESULT	MATERIAL SAMPLED	DRAWING REFERENCE	SAMPLE CODE	LAB RESULT	MATERIAL SAMPLED
301	301-301	(-)	LCT(2)	289	200-289	(-)	MASTIC(1)
302	301-302	(-)	LCT(2)	<del>290</del>	<del>200-290</del>	<del>(+)</del>	<del>HFF(1)</del>
303	301-303	(-)	LCT(2)	<del>291</del>	<del>200-291</del>	<del>(+)</del>	<del>HFF(1)</del>
304	301-304	(-)	LCT(1)	<del>292</del>	<del>200-292</del>	<del>(TRACE)</del>	<del>HFF(2)</del>
305	301-305	(-)	LCT(1)	<del>293</del>	<del>200-293</del>	<del>(-)</del>	<del>HFF(3)</del>
306	301-306	(-)	LCT(1)	<del>294</del>	<del>200-294</del>	<del>(+)</del>	<del>HFF(5)</del>
307	301-307	(+)	VAT(1)	295	200-295	(-)	VAT(5)
308	301-308	(+)	VAT(1)	T295	200-T295	(-)	VAT(5)TEM
309	301-309	(TRACE)	VAT(1)	296	200-296	(-)	VAT(5)
310	301-310	(-)	COVBAS(2)	T296	200-T296	(-)	VAT(5)TEM
311	301-311	(-)	GYP(1)	297	200-297	(-)	LCT(1)
301A	302-301	(-)	LCT(2)	298	200-298	(-)	LCT(2)
302A	302-302	(-)	LCT(1)	299	200-299	(-)	GASKET(1)
303A	302-303	(-)	GYP(1)	300	200-300	(-)	GASKET(1)
501	550-501	(-)	GYP(2)	301	200-301	(-)	GASKET(1)
502	550-502	(-)	GYP(2)	001F	CNT113-001	(+)	GYP(4)
503	550-503	(-)	GYP(2)	002F	CNT113-002	(+)	GYP(4)
504	550-504	(-)	GYP(2)	003F	CNT113-003	(+)	GYP(4)
001C	301-001	(-)	GYP(1)	001	CNT258-001	(-)	GYP(5)
002C	301-002	(-)	GYP(1)	002	CNT258-002	(-)	GYP(5)
003C	301-003	(-)	GYP(1)	003	CNT258-003	(-)	GYP(5)
601	601-601	(-)	GYP(1)	004	CNT258-004	(-)	LAG/FG(1)
602	601-602	(-)	GYP(1)	005	CNT258-005	(-)	LAG/FG(1)
603	601-603	(-)	GYP(1)	006	CNT258-006	(-)	LAG/FG(1)
604	601-604	(-)	GYP(1)	007	CNT258-007	(-)	FAB(2)
605	601-605	(-)	GYP(1)	008	CNT258-008	(-)	FAB(2)
606	601-606	(-)	GYP(1)	009	CNT258-009	(-)	FAB(2)
<del>275</del>	<del>200-275</del>	<del>(+)</del>	<del>HFF(3)</del>	010	CNT258-010	(-)	LCT(6)
<del>2750</del>	<del>200-2750</del>	<del>(+)</del>	<del>HFF(3)</del>	011	CNT258-011	(-)	LCT(6)
<del>276</del>	<del>200-276</del>	<del>(-)</del>	<del>HFF(3)</del>	012	CNT258-012	(-)	LCT(6)
277	200-277	(-)	VAT(5)	013	CNT258-013	(-)	MASTIC(3)
278	200-278	(-)	VAT(5)	014	CNT258-014	(-)	MASTIC(3)
279	200-279	(-)	COVBAS(2)	015	CNT258-015	(-)	MASTIC(3)
280	200-280	(-)	COVBAS(2)	016	CNT258-016	(-)	VAT(6)
281	200-281	(-)	COVBAS(2)	017	CNT258-017	(-)	VAT(6)
282	200-282	(-)	VAT(5)	018	CNT258-018	(-)	VAT(6)
283	200-283	(-)	PW(1)	025	CNT258-025	(-)	GYP(3)
284	200-284	(-)	PW(1)	026	CNT258-026	(-)	GYP(3)
285	200-285	(-)	PW(1)				
<del>286</del>	<del>200-286</del>	<del>(-)</del>	<del>COVBAS(3)</del>				
287	200-287	(-)	VAT(5)				
288	200-288	(+)	VAT(1)				
288B	200-288B	(+)	MAS/VT(1)				

LINE INDICATES ABATEMENT

Figure 6-3. Bulk Sample Inventory Example

# SUPERSEDED

## INVENTORY OF BACKGROUND AIR SAMPLES



---

DRAWING REFERENCE	SAMPLE ANALYSIS	CONCENTRATION	
		<u>S/MM<sub>2</sub></u>	<u>F/CC</u>
001	PCM		<0.001
002	PCM		0.003
003	PCM		0.001
004	TEM	NSD	
005	PCM		<0.001

## BACKGROUND AIR SAMPLES NOTES

---

1. BDL = BELOW DETECTION LIMITS
2. NSD = NO STRUCTURES DETECTED
3. ALL SAMPLES WERE ANALYZED BY PCM,  
UNLESS OTHERWISE NOTED.

# SUPERSEDED

## LEGEND

	DRAWING REFERENCE TO BULK SAMPLE FIELD CODE, SEE INVENTORY OF SAMPLES
	MATERIAL SYMBOL
	ENDING POINT OF SPECIFIED BUILDING MATERIAL
	VERTICAL PIPE RUN
	PARTITION WALLS
	ACM PIPE RUN
	ATTIC ACCESS HATCH UNLESS NOTED OTHERWISE
	DRAIN SPACE ACCESS UNLESS NOTED OTHERWISE
	CIRCLED NUMBERS INDICATE THE NUMBER AND LOCATION OF HARD FITTINGS ON FIBERGLASS
B/C	FLOOR/CEILING MATERIAL REFERENCE (SEE TYPICAL MATERIAL REFERENCES)
B/A/C	FLOOR/WALL/CEILING MATERIAL REFERENCE (SEE TYPICAL MATERIAL REFERENCES)
	ROOM NUMBER (WHEN KNOWN)
	BACKGROUND AIR SAMPLE LOCATION

## ABBREVIATIONS

±	APPROXIMATE
AC	AIR CELL
BUR	BUILT-UP ROOFING
CAB	CEMENT ASBESTOS BOARD
CGCT	CONCEALED GRID CEILING TILE
CLG	CEILING
CONC	CONCRETE
COVBA5	COVERBASE/MASTIC
CT	CERAMIC TILE
DEB	MATERIAL DEBRIS
DI	DUCT INSULATION
FD	FIRE DOOR
FG	FIBERGLASS
FLR	FLOOR
FT	FLOOR TILE
FN	FELT WRAP
GCT	GLUED CEILING TILE
GWT	GLUED WALL TILE
GYP	GYPSUM BOARD
HFF	HARD FITTING ON FIBERGLASS, OBSERVED BUT NOT NECESSARILY SAMPLED
INS	INSULATION
LAG/NA	LAGGING NON-ASBESTOS MATERIAL
LCT	LAY-IN CEILING TILE
MAG	MAGNESIUM SILICATE (ASBESTOS CONTAINING)
NA	NO ACCESS
NAD	NO ASBESTOS DETECTED
NS	NON-SUSPECT
NT	BULK SAMPLE TAKEN, BUT NOT TESTED
PI	PIPE INSULATION
PL	PLASTER
PNT	PAINT
PW	PAPER WRAP PIPE INSULATION
SF	SQUARE FEET
SHT	SHEET FLOOR COVERING
TEX	TEXTURED MATERIAL
T-TEX	TRONCELED TEXTURED MATERIAL
VAT	VINYL FLOOR TILE
+	POSITIVE, SAMPLE CONTAINS ASBESTOS
-	NEGATIVE, NO ASBESTOS DETECTED

## TYPICAL MATERIAL REFERENCES

<b>FLOOR MATERIAL REFERENCES:</b>	<b>WALL MATERIAL REFERENCES: (IF USED)</b>
A FLOOR TILE	A GYPSUM AND/OR PLASTER
B SHEET FLOOR COVERING	B BRICK
C CARPET	C GLUED WALL TILE
D WOOD	D WOOD
E CONCRETE	E CONCRETE/CONCRETE BLOCK
F CERAMIC TILE	F CERAMIC TILE
G TERRAZO	FG FIBERGLASS UNDER VINYL
H RAISED COMPUTER FLOORING	J METAL
- NOT DOCUMENTED	- NOT DOCUMENTED
<b>CEILING MATERIAL REFERENCES:</b>	<b>EXAMPLES:</b>
A GYPSUM AND/OR PLASTER	FLOOR/WALL/CEILING
B SUSPECT LAY-IN CEILING TILE	$\frac{C}{A1A1/A1A2} \frac{B1}{A1}$
C SUSPECT GLUED CEILING TILE	
D WOOD	
E CONCRETE	
F SUSPECT CONCEALED GRID CEILING TILE	CARPET OVER FLOOR TILE(4) OVER CONCRETE
FG FIBERGLASS UNDER VINYL	GYPSUM WALLS
G TEXTURED CEILING MATERIAL	SUSPECT LAY-IN CEILING TILE BELOW GYPSUM CEILING
H FIRTEX	
J METAL	
X NON-SUSPECT LAY-IN CEILING TILE	
Y NON-SUSPECT CONCEALED GRID CEILING TILE	
Z NON-SUSPECT GLUED CEILING TILE	
- NOT DOCUMENTED	

## SYMBOLS

NOT TESTED	NEGATIVE -	POSITIVE +	TRACE AMOUNT	
				MECHANICAL INSULATION
				SURFACING MATERIAL
				MISCELLANEOUS MATERIAL

## NOTES

1. THESE DRAWINGS ARE DIAGRAMMATIC. THEY ARE FOR GENERAL INFORMATION AND SAMPLE LOCATION.
2. ACCESSIBLE SPACES WERE SURVEYED FOR SUSPECT ASBESTOS MATERIALS. WHEN OBSERVED THE MATERIALS WERE NOTED ON THE DRAWINGS. NON-FRIABLE MATERIALS SUCH AS FLOOR TILE, PLASTER & ETC. MAY BE PRESENT.



## SUPERSEDED

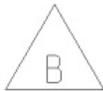
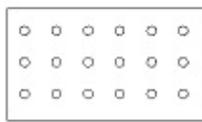
	JA-650 REMOVE DAMAGED VAT IN CONTROL ROOM <hr/> REMOVE: 4 HFF(1) 1 SF VAT(1) 16 SF DEB(2)
	JA-480 REMOVE DAMAGED VAT/MASTIC IN CONTROL ROOM <hr/> REMOVE: 45 HFF(1)
	CN-7113 REMOVE DAMAGED VAT/MASTIC IN CONTROL ROOM <hr/> REMOVE: 20 SF DEB(3) 100 SF VAT(3)

Figure 6-7. Abatement Drawing Revision Indicator

## SUPERSEDED



INDICATES VAT (VINYL FLOOR COVERING)  
ASSUMED OR TESTED POSITIVE  
AREA PATTERN = DOT SPACING = 1:2, 1:2  
PATTERN ANGLE = 0 PATTERN SCALE = 1  
WEIGHT = 2 COLOR = 1 LEVEL = 12



INDICATES SHT (SHEET FLOOR COVERING)  
ASSUMED OR TESTED POSITIVE  
AREA PATTERN = DOT SPACING = :7, :7  
PATTERN ANGLE = 0 PATTERN SCALE = .50  
WEIGHT = 1 COLOR = 47 LEVEL = 13



INDICATES LCT (LAY-IN CEILING TILE)  
ASSUMED OR TESTED POSITIVE  
AREA PATTERN = HATCH SPACING = 1  
PATTERN ANGLE = 45 PATTERN SCALE = 1  
WEIGHT = 1 COLOR = 115 LEVEL = 13



INDICATES GCT (GLUED-IN CEILING TILE)  
ASSUMED OR TESTED POSITIVE  
AREA PATTERN = HATCH PATTEN DELTA = 1  
PATTERN ANGLE = -45 PATTERN SCALE = 1  
WEIGHT = 1 COLOR = 73 LEVEL = 15



INDICATES DEBRIS  
ASSUMED OR TESTED POSITIVE  
AREA PATTERN = HATCH SPACING = :6, :6  
PATTERN ANGLE = 45 PATTERN SCALE = 1  
WEIGHT = 1 COLOR = 25 LEVEL = 16

Figure 6-8. Patterning Indicators

# SUPERSEDED

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1	USER DEFINABLE - DOCUMENT PER PROJECT				
2	NORTH ARROW				PLACED PER CELL
3	TITLE BLOCK INFORMATION	0	1	0	PLACED PER CELL - USE DATA FIELDS
4	KEY PLAN				
5	WALL/PARTITION DISCREPANCIES	13	1	0	
6					
7					
8					
9					
10	COLUMN GRIDS	2	0	4	
11	COLUMN GRID TAGS AND ASSOCIATED TEXT	2	1	0	
12					
13					
14					
15					
16					
17					
18					
19					
20					
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22					
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31					
32					
33					
34					
35					
36					
37					
38					
39					
40	REFERENCE SYMBOLS AND TEXT - SECTION, DETAIL, & ELEVATION CUTS	3	3	0	
41	TARGETS	0	1	0	
42					
43					
44					
45					
46	ZONE PLAN LINE INFORMATION & ZONE TEXT	3, 15	15,1	2	DICTATED BY CELL / STD TEXT FOR NOTES
47	DRAWING COMPONENT TITLES, SCALES, & ASSOCIATED GRAPHICS	0,0,3	3,1,3	0	SEE NOTE
48	LEGEND AND SCHEDULE GRAPHICS				
49	LEGEND AND SCHEDULE TEXT	0	3,1	0	
50	DIMENSIONS AND ASSOCIATED LEADER LINES AND TERMINATORS	3	1,0	0	
51					
52					
53					
54					
55					
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57					
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59					
60					
61					
62					
63					

**ASBESTOS ZONE ASSIGNMENT PLOT PLAN**

ASBESTOS  
PLOT FILE LEVEL SYMBOLLOGY:

BLANK SPACES = USER DEFINABLE - DOCUMENT PER PROJECT Color Table = ASBE.TBL  
 NOTE:  
 TITLES: CO=0,WT=3; SCALES: CO=0,WT=1; GRAPHICS: CO=3,WT=3

# SUPERSEDED

AP

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2	NORTH ARROW 7 GRAPHIC SCALE				Dictated by Cell
3	AIR SAMPLING LOCATION	13	1	-	Dictated by Cell Text
4	USER DEFINABLE - DOCUMENT IF USED				
5	WALL/PARTITION DISCREPANCIES	13	1	0	
6	TASK BOUNDARY INDICATION	19	7	0	
7	FLOOR/WALL/CEILING (ROOM) MATERIALS	32	1	0	Text Sizes: Dependent on Scale of Drawing
8	SURVEY SAMPLE LOCATIONS SYMBOLS AND TEXT	21	1	0	Symbol Dictated by Cell. Text is Scale Dependent
9	MISC. ACBM-CAB, CAB FUME HOOD	31	2	0	Text Dependent on Scale of Drawing
10	MISC. ACBM-METAL PANEL, TRANSITE, ETC.	103	1	0	Spacing: 2' Angle 45, 135
11	(+) VAT/MASTIC CROSS HATCH	6	1	0	Pattern Scheme Dictated by Cell
12	(+) VINYL FLOOR COVERING (VAT)	1	2	-	Pattern Scheme
13	(+) SHEET FLOOR COVERING (SHT)	47	1	-	Pattern Scheme Dictated by Cell
14	(+) LAY-IN CEILINGTILE (LCT)	115	1	0	Pattern Scheme
15	(+) GLUED-ON CEILING TILE (GCT)	73	1	0	Pattern Scheme
16	(+) MATERIAL DEBRIS	25	1	0	
17	(+) GYPSUM WALLBOARD (GYP)	60	4.1	0	Line Weight, Text
18	ATTIC ACCESS & CRAWL SPACE ACCESS	16	-	-	Dictated by Cell
19	MISC. EQUIPMENT: TANKS, AIR HANDLERS, OVENS, LABTOPS	4,111	2	0	
20		-	-	-	
21	(+) "PLUMBING" PIPE RUNS, TEXT (ACM)	*	*	0	See Note *
22	(+) "HVAC" DUCTWORK (ACM)	36	1	0	
23	(+) "HVAC" PIPE RUNS, TEXT (ACM)	*	*	0	See Note *
24	ABATED SAMPLES (SYMBOLS & TEXT)	-	-	-	Same as Level 8
25	(+) GASES (ACM) PIPING	*	*	0	See Note *
26	(+) SPECIALTY GASES (ACM) PIPING	*	*	0	See Note *
27	(+) PROCESS LIQUIDS (ACM) PIPING	*	*	0	See Note *
28	(+) FIRE PROTECTION (ACM) PIPING	-	-	-	See Note *
29	ABATED VINYL FLOOR COVERING (VAT)	-	-	-	Same as Level 12
30	ABATED SHEET FLOOR COVERING (SHT)	-	-	-	Same as Level 13
31	ABATED LAY-IN CEILING (LCT)	-	-	-	Same as Level 14
32	ABATED GLUED-ON CEILING TILE (GCT)	-	-	-	Same as Level 15
33	ABATED MATERIAL DEBRIS	-	-	-	Same as Level 16
34	ABATED GYPSUM WALLBOARD (GYP)	-	-	-	Same as Level 17
35	CEILING TILE PLAN (LCT) ASSIGNMENT	125	1	0	User Definable Symbolology - Document
36	CEILING TILE PLAN (LCT) ASSIGNMENT	3	1	0	User Definable Symbolology - Document
37	CEILING TILE PLAN (LCT) ASSIGNMENT	94	1	0	User Definable Symbolology - Document
38	CEILING TILE PLAN (LCT) ASSIGNMENT	79	1	0	User Definable Symbolology - Document
39	CEILING TILE PLAN (LCT) ASSIGNMENT	111	1	0	User Definable Symbolology - Document
40	CEILING TILE PLAN (LCT) ASSIGNMENT	64	1	0	User Definable Symbolology - Document
41	CEILING TILE PLAN (LCT) ASSIGNMENT	122	1	0	User Definable Symbolology - Document
42	CEILING TILE PLAN (LCT) ASSIGNMENT	21	1	0	User Definable Symbolology - Document
43	ABATED PIPE RUNS & SYMBOLS (PLUMBING)	-	-	-	Same as Level 21
44	ABATED PIPE RUNS & SYMBOLS (HVAC)	-	-	-	Same as Level 23
45	ROOM NUMBERS	-	-	-	Dictated by Cell
46					
47					
48					
49	ABATED DUCTWORK (HVAC)	-	-	-	Same as Level 22
50	CEILING TILE PLAN (GCT) ASSIGNMENT	1	1	0	User Definable Symbolology - Document
51	CEILING TILE PLAN (GCT) ASSIGNMENT	5	1	0	User Definable Symbolology - Document
52	CEILING TILE PLAN (GCT) ASSIGNMENT	10	1	-	User Definable Symbolology - Document
53	CEILING TILE PLAN (GCT) ASSIGNMENT	13	1	-	User Definable Symbolology - Document
54	CEILING TILE PLAN (GCT) ASSIGNMENT	31	1	-	User Definable Symbolology - Document
55					
56					
57					
58	ABATED PIPING - GASES AND SPECIALTY LIQUIDS	-	-	-	Same as Levels 25 & 26
59	ABATED PIPING - PROCESS LIQUIDS & FIRE PROTECTION	-	-	-	Same as Levels 25 & 26
60					
61					
62					
63					

BLANK SPACES = USER DEFINABLE - DOCUMENT IF USED

Color Table = ASBE.TBL

\* NOTE: REFER TO:

COLOR AND WEIGHT TABLE FOR ADDITIONAL PIPE RUN INFORMATION

**ASBESTOS SURVEY, ROOF & TILE MASTER FILES**

ASBESTOS  
MASTER FILE LEVEL SYMBOLLOGY:

# SUPERSEDED

AP

LV	ABBREV.	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
21		<b>PLUMBING ELEMENT DESCRIPTIONS</b>				
	HWC	HOT WATER CIRCULATING	5	3	0	
	D	DRAIN, GRAVITY	7	3	0	
	PD	PRESSURE DRAIN	8	3	0	
	NPW	NON-POTABLE WATER	57	3	0	
	V	VENT	11	2	0	
	RWL	RAIN WATER LEADER	32	4	0	
	HW	HOT WATER	1	3	0	
	CW	COLD WATER	2	3	0	
	S	SANITARY SEWER	3	4	0	
	SD	STORM SEWER	4	4	0	
	RD	ROOF DRAIN	64	4	0	
	LW	SOLVENT DRAIN	24	4	0	
	AV	ACID VENT	64	2	0	
	AW	ACID WASTE	16	4	0	
	LW	LABORATORY WASTE	24	4	0	
23		<b>HVAC PIPING ELEMENT DESCRIPTIONS</b>				
	HPS	HIGH-PRESSURE STEAM	126	3	0	
	MPS	MEDIUM PRESSURE STEAM	4	3	0	
	PC	PUMPED CONDENSATE	5	3	0	
	FOS	FUEL OIL SUPPLY	7	3	0	
	FOR	FUEL OIL RETURN	125	3	0	
	FOV	FUEL OIL VENT	13	2	2	
	FOG	FUEL OIL GAUGE LINE	57	2	0	
	TWS	TOWER WATER SUPPLY	16	3	0	
	TWR	TOWER WATER RETURN	126	3	0	
	HWS	HEATED WATER SUPPLY	8	3	0	
	HWR	HEATED WATER RETURN	65	3	0	
	CWS	CHILLED WATER SUPPLY	10	3	0	
	CWR	CHILLED WATER RETURN	64	3	0	
	RS	REFRIGERANT SUCTION	12	3	0	
	RD	REFRIGERANT DISCHARGE	12	3	0	
	RL	REFRIGERANT LIQUID	12	3	0	
	LCWS	LOW TEMPERATURE CHILLED WATER SUPPLY	63	3	0	
	LPS	LOW PRESSURE STEAM	1	2	0	
	C	CONDENSATE, GRAVITY	25	2	0	
25		<b>GASES ELEMENT DESCRIPTIONS</b>				
	H2	HYDROGEN	3	2	0	
	G	NATURAL GAS	11	2	0	
	LH2	LIQUID HYDROGEN	5	2	0	
	Ar	ARGON	7	2	0	
	LAr	LIQUID ARGON	13	2	0	
	L02	LIQUID OXYGEN	21	2	0	
	LC02	LIQUID CARBON DIOXIDE	39	2	0	
	CA	COMPRESSED AIR	6	2	0	
	N2	NITROGEN	2	2	0	
	VAC	VACUUM	16	2	0	
	LPG	LIQUID PETROLEUM GAS	15	2	0	
	CDA	CLEAN DRY AIR	57	2	0	
	HCV	HOUSE CLEAN VACUUM	1	2	0	
	LN	LIQUID NITROGEN	4	2	0	
	C02	CARBON DIOXIDE	9	2	0	
	BA	BREATHING AIR	10	2	0	
	He	HELIUM	12	2	0	
	Par	PROCESS ARGON	17	2	0	
	CH4	METHANE	18	2	0	
	C2 H2	ACETYLENE	64	2	0	

**ASBESTOS SURVEY COLOR & WEIGHT TABLE**

ASBESTOS  
COLOR & WEIGHT SYMBOLOLOGY:



# SUPERSEDED

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2	NORTH ARROW				PLACED PER CELL
3	TITLE BLOCK INFORMATION (GENERIC)	0	1	0	PLACED PER CELL - USE DATA FIELDS
4	KEY PLAN				
5					
6					
7					
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32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46	ABATEMENT NOTES, LEADER LINES, TERMINATORS & MISC TEXT	0	1	0	
47	ABATEMENT LINE IN SAMPLE INVENTORY LIST	3	0	0	
48	ASBESTOS LEGEND	15			DICTATED BY CELL
49	LEGEND AND SCHEDULE TEXT	0	3,1	0	
50					
51					
52					
53					
54					
55	CONSTRUCTION NOTES & BALLOONS	5	1,6	0	
56					
57					
58					
59					
60					
61					
62					
63					

**ASBESTOS SURVEY, ROOF & TILES PLOT PLANS**

ASBESTOS  
PLOT FILE LEVEL SYMBOLGY:

BLANK SPACE = USER DEFINABLE - DOCUMENT PER PROJECT

Color Table = ASBE.TBL

# SUPERSEDED

LV	ASSIGNED ELEMENT DESCRIPTIONS	CO	WT	LC	REMARKS
1					
2	NORTH ARROW				PLACED PER CELL
3	TITLE BLOCK INFORMATION (GENERIC)	0	1	0	PLACED PER CELL - USE DATA FIELDS
4	KEY PLAN				
5					
6					
7					
8					
9					
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31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46	ABATEMENT NOTES, LEADER LINES, TERMINATORS & MISC TEXT	0	1	0	
47	SAMPLE INVENTORY LIST	15			DICTATED BY CELL
48	LEGEND AND SCHEDULE GRAPHICS				
49	LEGEND AND SCHEDULE TEXT	0	3,1	0	
50					
51					
52					
53					
54					
55	CONSTRUCTION NOTES & BALLOONS	5	1,6	0	
56					
57					
58					
59					
60					
61					
62					
63					

**ASBESTOS ABATEMENT PLOT PLAN**

ASBESTOS  
PLOT FILE LEVEL SYMBOLOLOGY:

BLANK SPACE = USER DEFINABLE - DOCUMENT PER PROJECT

Color Table = ASBE.TBL

SUPERSEDED

x - DENOTES CELL ORIGIN.

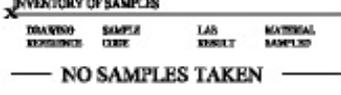
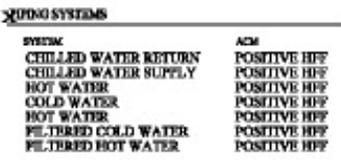
ASBESTOS																											
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC																					
<p><b>LEGEND:</b></p> <p>--- HORIZONTAL ASBESTOS PIPE RUN                      = VERTICAL ASBESTOS PIPE RUN                      (1) NUMBER &amp; LOCATION OF HARD FITTINGS ON FIBERGLASS</p> <p><b>NOTES:</b></p> <p>1. CONTRACTOR TO VERIFY ALL QUANTITIES, BEYOND, LOCATIONS, DIMENSIONS, AND QUANTITIES INDICATED ARE REPRESENTATIVE AND MAY REQUIRE FIELD VERIFICATION.                      2. SEE SPECIFICATIONS FOR BASED SIZE AND HD ALTERNATES.</p>	ABATNO	ABATEMENT NOTE	1 5	0 10	0	0 2																					
	AIR	BACKGROUND AIR SAMPLE	3	36 53	1 2	0																					
	ATAC	ATTIC ACCESS PANEL	18	16	1	0																					
<p><b>SYMBOLS</b></p> <p>NO STRUCTURE                      O ■ ■ HORIZONTAL INSULATION                      □ ■ ■ HORIZONTAL MATERIAL                      ▽ ■ ■ HORIZONTAL MATERIAL</p>	BBCOT2	BBCOT21	1	0	0	0																					
<p><b>INVENTORY OF BACKGROUND AIR SAMPLES</b></p> <table border="1"> <thead> <tr> <th>DRAWNO</th> <th>SAMPLE</th> <th>CONCENTRATION</th> </tr> <tr> <th>REFERENCE</th> <th>ANALYSIS</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>001</td> <td>PCM</td> <td>NSD 0.001</td> </tr> <tr> <td>002</td> <td>TRM</td> <td>NSD</td> </tr> <tr> <td>003</td> <td>PCM</td> <td>0.003</td> </tr> <tr> <td>004</td> <td>PCM</td> <td>0.002</td> </tr> <tr> <td>005</td> <td>FSK</td> <td>2 FIBERS/100 FIELDS</td> </tr> </tbody> </table> <p><b>BACKGROUND AIR SAMPLE NOTES</b></p> <p>1. RDL - BELOW DETECTION LIMITS                      2. NSD - NO STRUCTURES DETECTED                      3. ALL SAMPLES WERE ANALYZED BY PCM, UNLESS OTHERWISE NOTED.</p>	DRAWNO	SAMPLE	CONCENTRATION	REFERENCE	ANALYSIS	DATE	001	PCM	NSD 0.001	002	TRM	NSD	003	PCM	0.003	004	PCM	0.002	005	FSK	2 FIBERS/100 FIELDS	BKGAI R	BKG AI R I NVENTORY LI ST	47	36	1	0
DRAWNO	SAMPLE	CONCENTRATION																									
REFERENCE	ANALYSIS	DATE																									
001	PCM	NSD 0.001																									
002	TRM	NSD																									
003	PCM	0.003																									
004	PCM	0.002																									
005	FSK	2 FIBERS/100 FIELDS																									
	CRWL	CRAWL SPACE ACCESS	18	16	1	0																					
	DOT	DOT PATTERN	PNT	PNT	PNT	PNT																					
	EARRO	EAST DI RECTI ON ARROW	1 2	1 4 13	0 1 2	0																					
<p><b>LEGEND</b></p> <p> (1) NUMBER OF HARD FITTINGS</p>	HFFLEG	LEGEND FOR HFF	48	21 36	1	0																					
	HFFNU	HFF NUMBERS	8	21	1	0																					
	HFFTE	HFF TEENS	8	21	1	0																					
	HFF1	JUST ONE HFF	8	21	1	0																					

RC = ASBESTO3.CEL

REVISED 9/01

SUPERSEDED

x - DENOTES CELL ORIGIN.

ASBESTOS						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
 <p>REMOVE DAMAGED UP TO 12" DIAMETER FROM FLOOR THROUGHOUT CELL AREA REMOVE: 41 SF TAKEN 4 SF TAKEN</p>  <p>REMOVE 41 SF OF DAMAGED UP TO 12" FLOOR TILE IN ROOM 41 AND 42 REMOVE: 44 SF TAKEN</p>  <p>REMOVE 1 SF OF VENEER/TILE IN ROOM 41 REMOVE: 1 SF TAKEN</p>  <p>REMOVE 14 SF OF DAMAGED VENEER/TILE REMOVE: 14 SF TAKEN 2 SF TAKEN 1 SF TAKEN</p>	JA	ABATEMENT CALLOUTS	55	0 7	1 2	0
	LBRACK	LBRACKET	3	4	0	0
	MATQUA	MATERIAL QUANTITY	3	0 4	0 1	0
	NAD	NO SAMPLES TAKEN	46	3	2 3	0 2
	NARRO	NORTH ARROW	1 2	1 4 13	0 1 2	0
	NEG1	NEGATIVE MECHANICAL	8	21	1	0
	NEG2	NEGATIVE SURFACING	8	21	1	0
	NEG3	NEGATIVE MISCELLANEOUS	8	21	1	0
	NOSAMP	NO SAMPLES	1 2	1 4 13	0 1 2	0
	NTES1	NOT TESTED MECHANICAL	8	21	1	0
	NTES2	NOT TESTED SURFACING	8	21	1	0
	NTES3	NOT TESTED MISCELLANEOUS	8	21	1	0
	PI SYS	PIPING SYSTEM NOTES	46	36	1	0

RC = ASBESTO3.CEL

REVISED 9/01

<h1>ASBESTOS</h1>						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
<p>x  INDICATES VAT THAT IS ASSUMED OR TESTED POSITIVE.</p> <p> INDICATES SHIT THAT IS ASSUMED OR TESTED POSITIVE.</p> <p> INDICATES LCT THAT IS ASSUMED OR TESTED POSITIVE.</p> <p> INDICATES OCT THAT IS ASSUMED OR TESTED POSITIVE.</p> <p> INDICATES DEBRIS THAT IS ASSUMED OR TESTED POSITIVE.</p>	PATBLK	PATTERN BLOCK	46	36	1	0
	LEG	LEGEND	3 28	36	1 2	0 1 2

**x**

---

**LEGEND**

007 DRAWING REFERENCE TO BULK SAMPLE FIELD CODE, SEE INVENTORY OF SAMPLES

MATERIAL SYMBOL

ENDING POINT OF SPECIFIED BUILDING MATERIAL

VERTICAL PIPE RUN

PARTITION WALLS

ACM PIPE RUN

ATIC ACCESS HATCH UNLESS NOTED OTHERWISE

CRAWL SPACE ACCESS UNLESS NOTED OTHERWISE

CIRCLED NUMBERS INDICATE TIN NUMBER AND LOCATION OF HARD FITTINGS ON FIBERGLASS

BC FLOOR/CEILING MATERIAL REFERENCE (SEE TYPICAL MATERIAL REFERENCES)

B/WC FLOOR/WALL/CEILING MATERIAL REFERENCE (SEE TYPICAL MATERIAL REFERENCES)

ROOM NUMBER (WHEN KNOWN)

BACKGROUND AIR SAMPLE LOCATION

**TYPICAL MATERIAL REFERENCES**

**FLOOR MATERIAL REFERENCES:**

A FLOOR TILE

B SHEET FLOOR COVERING

C CARPET

D WOOD

E CONCRETE

F CERAMIC TILE

G TERRAZZO

H RAISED-COMPUTER FLOORING

- NOT DOCUMENTED

**WALL MATERIAL REFERENCES (2-wal)**

A GYPSUM ANCHOR PLASTER

B BRICK

C GLUED WALL TILE

D WOOD

E CONCRETE/CONCRETS BLOCK

F CERAMIC TILE

G FIBERGLASS UNDER VINYL

H METAL

- NOT DOCUMENTED

**CEILING MATERIAL REFERENCES:**

A GYPSUM ANCHOR PLASTER

B SUSPECT LAY-IN CEILING TILE

C SUSPECT GLOUED CEILING TILE

D WOOD

E CONCRETE

F SUSPECT CONCRETE/GRID CEILING TILE

G FIBERGLASS UNDER VINYL

H TEXTURED CEILING MATERIAL

I FIBREX

J METAL

K NON-SUSPECT LAY-IN CEILING TILE

L NON-SUSPECT CONCRETE/GRID CEILING TILE

M NON-SUSPECT GLOUED CEILING TILE

- NOT DOCUMENTED

**EXAMPLES:**

FLOOR/WALL/CEILING

C

A/B A(C)/D B(D)

E

A(C)

CARPET OVER FLOOR TILE(S) OVER CONCRETE

GYP(D) WALLS

SUSPECT LAY-IN CEILING TILE BELOW GYP(D) CEILING

---

**ABBREVIATIONS**

+	APPROXIMATE
AC	AIR CELL
BR	BUILT-UP ROOFING
CAB	CEMENT ASBESTOS BOARD
CGMT	CERAMIC GRID CEILING TILE
CL	CEILING
CONC	CONCRETE
COTYBAS	COTYBASE MASTIC
CT	CERAMIC TILE
DEB	MATERIAL DEBRIS
DI	DUCT INSULATION
FD	FIBER DOOR
FG	FIBERGLASS
FLA	FLOOR
FT	FLOOR TILE
FW	FELT WRAP
OCT	GLUED CEILING TILE
OWT	GLUED WALL TILE
OYZ	GYPSUM BOARD
RF	HARD FITTING ON FIBERGLASS, OBSERVED BUT NOT NECESSARILY SAMPLED.
INS	INSULATION
LACINA	LAGGING NON-ASBESTOS MATERIAL
LCT	LAY-IN CEILING TILE
MAG	MAGNESIUM SILICATE (ASBESTOS CONTAINING)
NA	NO ACCESS
NAD	NO ASBESTOS DETECTED
NS	NON-SUSPECT
NT	BULK SAMPLE TAKEN, BUT NOT TESTED
PI	FIBER INSULATION
PL	PLASTER
PST	PAINT
PW	FACE WRAP ZIP INSULATION
SP	SQUARE FEET
SHIT	SHEET FLOOR COVERING
TEX	TEXTURED MATERIAL
T-TEX	TROWELED TEXTURED MATERIAL
VAT	VINYL FLOOR TILE
+	POSITIVE, SAMPLE CONTAINS ASBESTOS
-	NEGATIVE, NO ASBESTOS DETECTED

---

**SYMBOLS**

NOT TESTED	NEGATIVE	POSITIVE	TRACE AMOUNT	
				MECHANICAL INSULATION
				SURFACING MATERIAL
				SCATTERED MATERIAL

---

**NOTES**

- THESE DRAWINGS ARE DIAGNOSTIC. THEY ARE FOR GENERAL INFORMATION AND SAMPLE LOCATION.
- ACCESSIBLE SPACES WERE SURVEYED FOR SUSPECT ASBESTOS MATERIALS. WHEN OBSERVED THE MATERIALS WERE NOTED ON THE DRAWINGS. NON FRAMABLE MATERIALS SUCH AS FLOOR TILE, PLASTER & ETC. MAY BE PRESENT.

**SUPERSEDED**

x - DENOTES CELL ORIGIN.

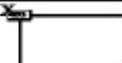
<b>ASBESTOS</b>									
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC			
	LIST	SAMPLE INVENTORY LIST	47	36	1	0			
<b>INVENTORY OF SAMPLES</b>		<b>INVENTORY OF SAMPLES</b>							
DRAWING REFERENCE	SAMPLE CODE	LAB RESULT	MATERIAL SAMPLED	DRAWING REFERENCE	SAMPLE CODE	LAB RESULT	MATERIAL SAMPLED		
301	301-301	(-)	LCT(2)	<del>289</del>	<del>200-289</del>	(-)	<del>MASTIC(1)</del>		
302	301-302	(-)	LCT(2)	<del>290</del>	<del>200-290</del>	(+)	<del>HFP(1)</del>		
303	301-303	(-)	LCT(2)	<del>291</del>	<del>200-291</del>	(+)	<del>HFP(1)</del>		
304	301-304	(-)	LCT(1)	<del>292</del>	<del>200-292</del>	(TRACE)	<del>HFP(2)</del>		
305	301-305	(-)	LCT(1)	<del>293</del>	<del>200-293</del>	(-)	<del>HFP(3)</del>		
306	301-306	(-)	LCT(1)	<del>294</del>	<del>200-294</del>	(+)	<del>HFP(5)</del>		
307	301-307	(+)	VAT(1)	295	200-295	(-)	VAT(5)		
308	301-308	(+)	VAT(1)	T295	200-T295	(-)	VAT(5)TEM		
309	301-309	(TRACE)	VAT(1)	296	200-296	(-)	VAT(5)		
31 0	301-31 0	(-)	COVBAS(2)	T296	200-T296	(-)	VAT(5)TEM		
31 1	301-31 1	(-)	GYP(1)	297	200-297	(-)	LCT(1)		
301A	302-301	(-)	LCT(2)	298	200-298	(-)	LCT(2)		
302A	302-302	(-)	LCT(1)	299	200-299	(-)	GASKET(1)		
303A	302-303	(-)	GYP(1)	300	200-300	(-)	GASKET(1)		
501	550-501	(-)	GYP(2)	301	200-301	(-)	GASKET(1)		
502	550-502	(-)	GYP(2)	001 F	CN71 1 3-001	(+)	GYP(4)		
503	550-503	(-)	GYP(2)	002F	CN71 1 3-002	(+)	GYP(4)		
504	550-504	(-)	GYP(2)	003F	CN71 1 3-003	(+)	GYP(4)		
001 C	301-001	(-)	GYP(1)	001	CN7258-001	(-)	GYP(5)		
002C	301-002	(-)	GYP(1)	002	CN7258-002	(-)	GYP(5)		
003C	301-003	(-)	GYP(1)	003	CN7258-003	(-)	GYP(5)		
601	601-601	(-)	GYP(1)	004	CN7258-004	(-)	LAG/FG(1)		
602	601-602	(-)	GYP(1)	005	CN7258-005	(-)	LAG/FG(1)		
603	601-603	(-)	GYP(1)	006	CN7258-006	(-)	LAG/FG(1)		
604	601-604	(-)	GYP(1)	007	CN7258-007	(-)	FAB(2)		
605	601-605	(-)	GYP(1)	008	CN7258-008	(-)	FAB(2)		
606	601-606	(-)	GYP(1)	009	CN7258-009	(-)	FAB(2)		
<del>275</del>	<del>200-275</del>	(+)	<del>HFP(3)</del>	01 0	CN7258-01 0	(-)	LCT(6)		
<del>275Q</del>	<del>200-275Q</del>	(+)	<del>HFP(3)</del>	01 1	CN7258-01 1	(-)	LCT(6)		
<del>276</del>	<del>200-276</del>	(-)	<del>HFP(3)</del>	01 2	CN7258-01 2	(-)	LCT(6)		
277	200-277	(-)	VAT(5)	01 3	CN7258-01 3	(-)	MASTI C(3)		
278	200-278	(-)	VAT(5)	01 4	CN7258-01 4	(-)	MASTI C(3)		
279	200-279	(-)	COVBAS(2)	01 5	CN7258-01 5	(-)	MASTI C(3)		
280	200-280	(-)	COVBAS(2)	01 6	CN7258-01 6	(-)	VAT(6)		
281	200-281	(-)	COVBAS(2)	01 7	CN7258-01 7	(-)	VAT(6)		
282	200-282	(-)	VAT(5)	01 8	CN7258-01 8	(-)	VAT(6)		
283	200-283	(-)	PW(1)	025	CN7258-025	(-)	GYP(3)		
284	200-284	(-)	PW(1)	026	CN7258-026	(-)	GYP(3)		
285	200-285	(-)	PW(1)						
<del>286</del>	<del>200-286</del>	(-)	<del>COVBAS(3)</del>						
287	200-287	(-)	VAT(5)						
288	200-288	(+)	VAT(1)						
288B	200-288B	(+)	MAS/VT(1)						
●	POS1	POSITION VE MECHANICAL				8	21	1	0
■	POS2	POSITION VE SURFACING				8	21	1	0
◆	POS3	POSITION VE MISCELLANEOUS				8	21	1	0
[080]	QRMNO	ROOM NUMBER				45	2	0 1	0

RC = ASBESTO3.CEL

REVISED 9/01

SUPERSEDED

x - DENOTES CELL ORIGIN.

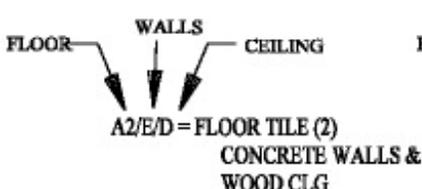
ASBESTOS						
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC
	RD	ROOF DRAIN	21	64	1	0
	REV	REVISION BLOCK ADDS	3	05	1	0
	SAMPRS	SAMPRSLT	46	3	0	0
	SARRO	SOUTH DIRECTION ARROW	12	14	01	0
	SBRACK	SBRACKET	3	4	0	0
	SPNOTE	SPEC NOTE	3	4	012	0
	TRA1	TRACE MECHANICAL	8	21	1	0
	TRA2	TRACE SURFACING	8	21	1	0
	TRA3	TRACE AMOUNT MISCELLANEOUS	8	21	1	0
	POS3	POSITIVE MISCELLANEOUS	8	21	1	0
	WARRO	WEST DIRECTION ARROW	12	1413	012	0
	ZEARR	ZONE EAST ARROW	12	1413	012	0
	ZNARR	ZONE NORTH ARROW	12	14	01	0
	ZPARR	ZONE ARROW HEAD	46	3	1	0
	ZNARR	ZONE NORTH ARROW	12	1413	012	0
ZONE 101	ZTXT	ZONE PLAN TEXT	46	3	1	0
	ZWARR	ZONE WEST ARROW	12	1413	012	0

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x - DENOTES CELL ORIGIN.

<h1>ASBESTOS</h1>							
CELL	CELL NAME	DESCRIPTION	LV	CO	WT	LC	
	ROMLEG	ROOM LEGEND	1	0 1 2	0	0	
<b>TYPICAL MATERIAL REFERENCES</b>							
x							
<b>FLOOR MATERIAL REFERENCES:</b>				<b>WALL MATERIAL REFERENCES: (if used)</b>			
A	FLOOR TILE	A	GYPSUM AND/OR PLASTER				
B	SHEET FLOOR COVERING	B	BRICK				
C	CARPET	C	GLUED WALL TILE				
D	WOOD	D	WOOD				
E	CONCRETE	E	CONCRETE/CONCRETE BLOCK				
F	CERAMIC TILE	F	CERAMIC TILE				
G	TERRAZO						
 <b>CEILING MATERIAL REFERENCES:</b>							
A	GYPSUM AND/OR PLASTER						
B	SUSPECT LAY-IN CEILING TILE						
C	SUSPECT GLUED CEILING TILE						
D	WOOD						
E	CONCRETE						
F	SUSPECT CONCEALED GRID CEILING TILE						
G	TEXTURED CEILING MATERIAL						
H	FIRTEX						
X	NON-SUSPECT LAY-IN CEILING TILE						
Y	NON-SUSPECT CONCEALED GRID CEILING TILE						
Z	NON-SUSPECT GLUED CEILING TILE						
<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p><b>EXAMPLES:</b></p>  <p>A2/E/D = FLOOR TILE (2) CONCRETE WALLS &amp; WOOD CLG</p> </div> <div style="text-align: center;">  <p>B/C1 = SHEET FLOOR COVERING &amp; SUSPECT GLUED CEILING TILE (1)</p> </div> </div> <p align="center">NOTE: WHEN TWO OR MORE DIFFERENT TYPES OF A GIVEN MATERIAL ARE NOTED A SUFFIX IS USED TO DIFFERENTIATE BETWEEN THEM eg. (1),(2). ETC.</p>							
	SANDIT SANDI 3	SANDIT B1 AND SANDIT B3	1 2 40	1 4 13	0 1 2	0	
<div style="border: 1px solid black; width: 100%; height: 100%; position: relative;"> <div style="position: absolute; left: -20px; top: 50%; transform: translateY(-50%); font-size: 8px;">                 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40             </div> </div>							

RC = ASBESTO3.CEL

REVISED 9/01

**SUPERSEDED**

# *Appendixes*

## **Contents**

Number	Title
A	Drawing Request Form
B	New Filename Request Form
C	Quality Assurance Process
D	Panel Schedules
E	Spatial Data Request Form
F	CADD Operators Mentorship Process
G	Master Plot Sheets for Reproductions

# **SUPERSEDED**

## **A. Drawing Request Form**

A & E Companies that are in need of Sandia Facilities Drawings should use the SNL Facilities Drawing Request Form. The turn around time will vary depending on the quantity of drawings requested.



# **SUPERSEDED**

## **B. New Filename Request Form**

The A & E Company should use the New File request form when reseving new file numbers. The following information must be provided or new numbers will not be issued.

Discipline  
Sub Discipline  
Building Number  
Floor Number  
Title  
Project Description/Name  
Project leader/Manager  
Service Order /Project/Contract Number  
Company Name  
Company Engineer/CADD Technician

# SUPERSEDED



**Sandia National Laboratories**

Operated for the U.S. Department of Energy by

Sandia Corporation

Date:

## New Drawing File Request Form

### *A&E /SNL Information*

Name:	Company:
Phone:	E-mail:

### **Project Information**

Project Title:	Service Order/ Project/Contractor Number:
SNL Project Leader/Manager:	Project Description/Name:

### **Drawing Information**

Drawing Title:	Discipline:
Sub-Discipline:	Building Number or Location:
Floor Number:	

# SUPERSEDED

## C. Quality Assurance Process

### Purpose

The purpose of this process is to check the quality, consistency, and compliance with the Facilities CADD standards of drawings being submitted to Sandia National Laboratories Facilities Engineering.

### Scope

This process is applicable to all CADD files generated or used by the Facilities Management and Operation Center and its contracted architectural/engineering (A/E) firms. Informal reviews are encouraged during the project to prevent major discrepancies.

### Project CADD Coordinator

The Project CADD Coordinator is responsible for

- performing QA checks
- reviewing QA comments with original CADD drafter
- soliciting feedback on QA process from participants
- giving feedback to the Space and Site Services centers.

•

### Participant

Participants in the process are responsible for

- undergoing training and understanding the CADD QA process
- reviewing CADD QA comments and making CADD corrections
- providing feedback on the CADD QA process for continuous improvement.

**Note:** See the CADD Quality Assurance Checklist and Project CADD Coordinator description of duties.

Drawings must be checked before they are accepted or checked in to the Space and Site Services CADD file server as record drawings. CADD drawings are checked at the following project stages:

- Conceptual Design
- Title I
- Title II
- Bid Documents
- Change order delivery.

## **SUPERSEDED**

For large projects a percentage of the project files are checked at Title I and Title II. All files are checked at final design.

The Project CADD Coordinator obtains one set of prints and one copy of the electronic CADD files from the project leader or A/E for checking. Problems or discrepancies are noted on the QA form, and on a set of check prints as required. Every checked drawing has a QA form.

The Project CADD Coordinator uses the CADD Standards Manual as the guideline for quality and conformance.

The Project CADD Coordinator reviews the QA form with the CADD drafter(s). CADD drafters make all appropriate corrections, note corrections made, and return the QA form to the Project CADD Manager.

# SUPERSEDED



**Sandia National Laboratories**

**Quality Assurance (QA) Form**

**For CADD Files**

Drawing # :	Drawing Title:
Building # :	Project Title:
Date:	Project # :
CADD Checker:	Phone # :

<b>Type of File:</b>		<b>Title 1</b>	<b>Title 2</b>	<b>Title 3</b>	<b>Final</b>
Master File:	Plot File:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Check mark indicates correct & approved

O indicates corrections required

<b>General:</b>	
Fit all	Matchline with References
View 5	General notes
Naming convention	Keyed notes
Logical name	Legend
Active scale	Working units
Z-depth	Cells
No extra reference files	Dimensioning attributes
Key plan	Border
North arrow (correct orientation)	Section / Detail Cuts & References

# SUPERSEDED

Text Parameters:		Revision Balloons:	
	Text Font		Weight
	Text Color		Level
	Text Weight		Revision Triangle
	Text Size		Accuracy
	Text Level		

Title Block:		Misc. List:	
	Title block cell used		Element Placement
	List reference files		(as reconciled to SNL Stds.)
			Reference File Boundary Clipping

**Comments:**

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Drawing # :	CADD Checker:
-------------	---------------

Level	Comments
1	
2	
3	
4	

# SUPERSEDED

	5	
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# SUPERSEDED

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# SUPERSEDED

## CADD QA Definitions

### General:

- Fit All – Entire Plan view is to be fit into view area, view #1
- View 5 – Plot File title block is to be fit into view area – view #5
- Naming Convention – file name (master/plot) must be consistent with SNL/UDS naming convention per SNL CADD standards
- Logical Name – Reference file attachments must be given logical name consistent with SNL CADD standards
- Active Scale – Must be at One to One for all plans; sections and details to be scaled accordingly for clarity and denoted accurately under piecemark
- Z-Depth – Drawing must be set at a Z-Depth of “0”, with no elements rising or descending into z-axis
- No Extra Reference Files – Master/Plot file must not contain inapplicable or extraneous reference files
- Key Plan – Applicable Key Plan (approx. 1/8 to 1/16 scale of master plan) must be referenced to plot file for working area orientation
- North Arrow – must be active element within master and plot file, and must be orientated correctly respective to floor plan orientation (utilizing cell)
- Matchline w/ References – matchlines must be placed as active elements in the master plan, with correct symbology assigned per SNL CADD standards; all plot file naming references to be accurately called out on plot files relative to master plan matchlines
- General Notes – Must be active elements on Plot File, numbered with numerical characters
- Keyed Notes – Must be active elements on Plot File, numbered with numerical characters within ellipse cell (per Noting “keyed note” workspace cell) and indicated accordingly on plot file where applicable
- Legend – Must be active elements within Plot File
- Working Units - MU/SU/PU units set to follow SNL CADD standards.
- Cells – To be placed utilizing SNL CADD Workspace Palettes, and consistent with SNL CADD standards (Utilization of palettes assures correct symbology)
- Dimensioning Attributes – To be set per SNL CADD standards .
- Border – To be placed about defined (boundary clipped) area of plot file utilizing SNL CADD standard “Border” file; shall be boundary clipped with applicable border visible only

### Text Parameters:

- Text Font – to be consistent with SNL CADD standards
- Text Color - to be consistent with SNL CADD standards
- Text Weight - to be consistent with SNL CADD standards
- Text Size - to be consistent with SNL CADD standards
- Text Level - to be consistent with SNL CADD standards

# SUPERSEDED

## Revision Balloon:

- Weight - to be consistent with SNL CADD standards (Text WT=1; Balloon WT=6)
- Level - to be consistent with SNL CADD standards (LV=55-1st Revision, LV=56-2nd Revision, LV=57-3rd Revision, LV=58-4th Revision)
- Revision Triangle – To be placed as active element in plot file adjacent to revision balloon utilizing SNL CADD Workspace “Noting” Palette (REVTRI), and consistent with SNL CADD standards (Utilization of palette assures correct symbology)
- Accuracy – Assure plot file placed balloon encompasses only those areas directly associated with project modifications

## Title Block:

- Title Block Cell Used - To have data entered relevant to design file utilizing cell (and associated data entry dialog boxes) identified within workspace or cell library selected cell (TTXTLT) consistent with SNL CADD standards
- List Reference Files – All files referenced within active design file to be called out below title block in allocated “Enter Data Field” spaces provided. File names to be consistent with those files referenced

## Comments:

- CADD Coordinator and/or CADD QA Checker to note those general issues to be addressed and/or corrected upon submittal back to responsible A/E Firm

## Specific Level Comments (back page of form):

- Those issues and identified findings specific to each assigned level to be addressed here (i.e.: incorrect level assignments, incorrect element attributes, incorrect use of cells or workspace, etc.

# **SUPERSEDED**

## **D. Panel Schedules**

New panel schedules are created using Excel software on the SNL Facilities Server. Some panel schedules may still be in MicroStation which are located under the building directories; others are hard copies which are located in the SNL Facilities Technical Library.

Excel panel schedules may be updated by anyone having an authorized panel schedule password account; contact the SNL Facilities electrical process owner for authorization.

### **Creating Panel Schedules and SNL**

Instruction for accessing the Space and Sites Services panel schedules:

1. Open File Manager window
2. Map network drive (example: drive P:) to panel schedule server  
\\london\panel
3. Change to mapped drive (example: drive P:)
4. Double click on the Panel folder
5. Double click on the blank panel template
6. Under Microsoft tools select "File"; "Save As" place in correct snl area file folder, then correct building file folder; name file using the panel name.  
Example: The schedule for panel A is A.xls

### **Modifying Panel Schedules and SNL**

Excel version 5.0 or newer must be loaded on computer.

Instruction for accessing the Space and Sites Services panel schedules:

1. Open File manager window
2. Map network drive (example: drive P:) to panel schedule server  
\\london\panel
3. Change to mapped drive (example: drive P:)
4. Double click on the Panel folder
5. Double click on the technical area desired
6. Double click on the building number
7. Double click on the panel schedule desired. (This opens selected panel schedule).

### **Panel Schedule Custom Palette**

Before you can use the custom palette, you must first load it from SNL server. Instructions for loading it are located in \\London\panel\panel\_inst.doc. If you need help contact the Facilities desktop support team.

## SUPERSEDED

The custom palette menu automatically pops up in the toolbar once it has been loaded. This palette menu enables you to place standard electrical symbols in the panel schedule using the right mouse button.

To place a symbol from the custom palette menu:

1. Highlight the Excel cell on the panel schedule where you want the symbol placed
2. Select the symbol from the custom palette menu with a right mouse button

To delete a symbol from a selected panel schedule:

1. Select the symbol on the schedule with the right mouse button. (Handles appear around the symbol).
2. Hit the “delete” key on the keyboard.

### Revisions to the panel schedule

After changes have been made to the schedule, the revision block shall be updated. The revision is listed by alphabetical order. After all five cell blocks are filled, replace the *oldest* revision with the update. Put the revision letter in the column beside the item that was changed.

### Existing Panel Schedules on CADD

New panel schedules are created only in the Excel application written by Facilities Management and Operations Center. CADD master files that contain electrical panel schedules are named according to the following convention:

nnnefps.dgn

where

- nnnn is the building number (padded with leading zeros)
- e denotes electrical discipline
- f is the building floor designator (1, 2, 3, ..., a, b, p, z)
- ps denotes panel schedule
- .dgn is the default extension for drawing files

Modifications to existing CADD panel schedules are: **(you must contact the SNL Facilities System Engineer point of contact first)**

1. Locate the existing master file panel schedule and the associated plot files from the CADD file server
2. If only minor modifications are necessary, make the change using MicroStation 95.

## **SUPERSEDED**

3. If the panel schedule requires many changes, transfer all panel information to Excel panel schedule application.
  - a. Boldly “X” out the schedule in the existing master file panel schedule.
  - b. Using a large text, note that the schedule has been transferred to Excel
  - c. When all schedules in the plot file have been transferred to Excel, contact the drawing database manager to delete the project plot file. Contact the Space and Site Services Information Systems Department to delete the file from the file server permanently.
  - d. When all schedules in the master panel file have been transferred, notify the Space and Site Services Information Systems Department to delete the file from the file server permanently.

# **SUPERSEDED**

## **E. Spatial Data Request Form**

A & E Companies that are in need of Sandia Facilities Utility/ FGIS Site Data should use the SNL Facilities Spatial Data Request Form. The turn around time will vary depending on the quantity of data requested.

**SUPERSEDED**

**SPATIAL DATA REQUEST**  
**Civil, Exterior Utilities, Exterior Power and Communications**

**Section 1**

Engineers Fill out section 1

Requester: \_\_\_\_\_ Today's Date: \_\_\_\_\_

A/E Company: \_\_\_\_\_

Activity Code & Charge #: \_\_\_\_\_ (AW) Project #: \_\_\_\_\_ (TW) Construction #: \_\_\_\_\_

CADD support start date: \_\_\_\_\_ Estimated Design completion Date: \_\_\_\_\_  
Total Est. Hours: \_\_\_\_\_

**Type**

**Media**

As-Build \_\_\_\_\_ Project \_\_\_\_\_ Plotting \_\_\_\_\_ Survey \_\_\_\_\_ Electronic \_\_\_\_\_ Field \_\_\_\_\_  
Files to A/E \_\_\_\_\_ Files from A/E \_\_\_\_\_ A/E CADD interface \_\_\_\_\_ Manual \_\_\_\_\_ Other \_\_\_\_\_  
Other \_\_\_\_\_

Instructions: \_\_\_\_\_

**Utility Systems Required:**

Planimetric (Roads & Bldgs.) \_\_\_\_\_ Water Distribution System \_\_\_\_\_ Steam Distribution System \_\_\_\_\_  
Gases Distribution System \_\_\_\_\_ Sanitary Sewer System \_\_\_\_\_ Storm Sewer System \_\_\_\_\_  
Power Distribution System \_\_\_\_\_ Communication System \_\_\_\_\_ Perimeter Lighting System \_\_\_\_\_  
Control Monuments \_\_\_\_\_ Thermal Water (Chilled & Hot Water) \_\_\_\_\_

All of the Above \_\_\_\_\_  
Contour and Elevation \_\_\_\_\_ Other (please describe) \_\_\_\_\_

**Addition Tracking Information:**

Project Leader: \_\_\_\_\_ Inspector Arch: \_\_\_\_\_

Inspector Mech. \_\_\_\_\_ Inspector Elec: \_\_\_\_\_

Construction Start Date: \_\_\_\_\_

*Note: Drafting Priority is lost if Requester fails to meet Negotiated Start Date or Three day review time*

**Section 2**

FGIS Personnel fill out section 2

Project Assigned to: \_\_\_\_\_ Log-in Date: \_\_\_\_\_

List of on-Going Projects within site plan area: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Section 3**

Assigned CADD person fill out section 3

Date Red-lines received: \_\_\_\_\_

Drafting Start date: \_\_\_\_\_ Date returned to Eng.: \_\_\_\_\_

Misc. Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# SUPERSEDED

## **F. CADD Operators Mentorship Process**

### ***Purpose***

*The purpose of the CADD mentorship program is to familiarize new CADD operator with the CADD system, manuals, references, and introduce key personnel.*

### ***Objectives***

*The objectives of the CADD mentorship program is to maximize the efficiency of the new CADD operators and provide orientation of Space and Site Services specific processes and requirements.*

*The CADD mentorship program is recommended to all on-site and off-site CADD operators.*

### ***Owner - Standards and Requirements Quality Improvement Department***

*Conduct an annual review of this process including feedback from mentors, participants, and managers*

*Spot check for verification of compliance.*

### ***Coordinator responsibilities***

*Assign a key CADD operator to act as mentor for each new CADD operator*

*Schedule time for both mentor and new CADD operator to accomplish this mentorship training.*

### ***Mentor responsibilities***

*Provide training to the new CADD operator to maximize efficiency.*

*Provide a network of resources for the CADD operator to get answers to future questions.*

*See the following CADD Mentorship Checklist*

### ***New CADD Operator***

*Reads and understands the Facilities CADD Standards Manual*

*The new CADD operator is responsible for asking for help whenever the need arises*

### ***Schedule***

*The mentorship process requires about 24 hours per person over a period of six weeks.*

# SUPERSEDED

## Facilities CADD Standards Mentorship Training Checklist

Mentor assigned: \_\_\_\_\_ Start date: \_\_\_\_\_

### Computer orientation and applications

_____	Computer passwords	_____	SNL domain passwd
_____	Login process	_____	Plotting/Plotter room
_____	Workstation and network orientation	_____	
_____	File check out process	_____	Graphic Document Database

### Manuals and Books

\_\_\_\_\_ CADD Standards Manual

### Introductions

\_\_\_\_\_ Facilities Management and Operations Center Departments  
\_\_\_\_\_ Department CADD Operators  
\_\_\_\_\_ CADD standards Department

### Informational Resources

_____	FGIS Department	_____	Facilities Technical Library
_____	Plotter Room	_____	Facilities Document Management

### Facilities System Standards

_____	master file/plot file/cut file	_____	working units
_____	SNL menus	_____	cells
_____	drawing scale	_____	file management
_____	level hierarchies	_____	standard drawings
_____	user commands & MDL's	_____	quality assurance checks
_____	3D capabilities	_____	Facilities File Nameing Stds.

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*CADD Operator*

*End Date*

## **H. Master Plot Sheets for Reproduction**

All CD's delivered to SNL Facilities Engineering shall be given to the SNL Facilities CADD Coordinator. Plotting of drawings on CD's delivered will be done on site by the SNL Facilities Engineering CADD staff to insure a high quality Master set that can be distributed to vendors for reproduction.

- End of CADD Manual and Appendices -