

1.0 STANDARD USE

This latest version of USITT Graphic Recommended Best Practices is intended for use on all productions and projects involving live entertainment. The original 1982 and 1992 revised versions, identified as the *USITT Scenic Design and Technical Production Graphic Standards*, were developed for hand drafters exclusively, CAD drafting still being very much in its infancy at that time. This document melds those documents with an “in progress” proposed Recommended Best Practices (RBP).

At this time USITT no longer creates standards and has determined that future documents should be referenced as “recommended best practices” rather than as an actual standard. In this document, which services both hand and CAD drafting, it is left to the user to determine what is applicable, or not. However, many aspects overlap, and graphic communication remains the same whether done by pencil or computer. All sections are clearly labeled as one or the other, when the distinction seems of any importance.

The following set of RBP is intended to guide drafting work, both within a specific organization, and within the entertainment field nationally. The intention is that it will produce information in a clean, efficient and consistent manner that can be shared with colleagues and partners, as well as a guideline in the instruction of students and young professionals. The document is not envisioned as being complete or even necessarily 'correct,' but it is an attempt to address the needs of entertainment industry users nationwide.

This version was created using as its baseline both the aforementioned *USITT 1992 Graphic Standard* and the *United States National CAD Standard (USNCS_Version4)*. Hopefully it will be updated as subsequent USNCS releases are published. The guideline is meant to be appropriate to any existing and future drafting software applications, i.e., platform-neutral.

1.1 INTENT

- 1.1.1 To assist in classifying electronic design and construction data consistently, to streamline and simplify the exchange of data with the design and construction departments, and to illustrate the appropriate presentation of two-dimensional graphic standards. Key to this practice is that any information provided must be clear, specific, consistent, accurate, comprehensive and tailored to the needs of the end user, be it drafter or reader.
- 1.1.2 During design, use of the USITT-RBP is intended to efficiently transfer information between producer, director, consultants, and production department heads
- 1.1.3 During construction, use of the USITT- RBP is intended to increase communication between producer, designer, consultants, and vendors

- 1.1.4 In post-production, use of the USITT- RBP is intended to facilitate continued use of archived design and construction documents

1.2 SCOPE

- 1.2.1 The USITT- RBP assists in classifying and organizing electronic data within CAD data files; addressing issues such as layer names, line weights, dimensions and notation, symbols, and the graphic organization of design and construction drawing sheets
- 1.2.2 Implementation of the USITT-RBP by users is intended to facilitate the exchange of data between current and future CAD software and help ensure the future utility of today's CAD data files

1.3 IMPLEMENTATION

- 1.3.1 Implementation of the USITT-RBP in whole or in part is voluntary. Each organization may determine its degree of conformance, noting that agreements between producer and design professional or between design professional and consultant/contractor may require specific conformance.

2.0 LINES

Clear use of different line forms, widths and colors can help convey extra meaning. Standardization of line forms and weights is important to establish a logical hierarchy within the drawing, leading the reader instinctively to the most important information.

2.1 LINESTYLES

- 2.1.1 Each line is made of two variables:
- Width (often referred to as “weight”)
 - Type (continuous, dashed, dotted, dash-dot-dash, etc.)

Together, these elements form a Line Style. The most commonly occurring Line Styles are defined in the following sections. These line types, their approximate proportions, and their associated widths and purposes shall be used wherever possible.

2.1.2 LINEWEIGHTS (CAD)

Fine	0.13 mm	0.005 in	sightlines, hatch lines
Thin	0.25 mm	0.010 in	dimension, extension, and arrows
Medium	0.35 mm	0.014 in	object lines
Thick	0.50 mm	0.020 in	cutting plane lines, title block
Extra thick	0.70 mm	0.028 in	border
Text	0.40 mm	0.016 in	standard 3/32" or 1/8" lettering

2.1.3 LINEWEIGHTS (Hand)

(This recommendation is a modified ANSI standard)

Pen

Thin	-----	0.010" — 0.0125" Pen	(ANSI standard = 0.016")
Thick	-----	0.20" — 0.025"	(ANSI standard = 0.032")

Pencil




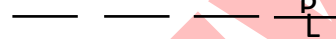


Pencil line weights can be varied by pressure and sharpness of lead.

Thin	0.30 mm	-----	F, H, 2H
Thick	0.50 mm	-----	2B, B, HB
Extra Thick	0.90mm	-----	3B, 4B

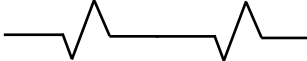




2.1.3 LINESTYPES

2.1.3.1 Continuous lines

Default Object	Medium	
Set Line	Thin	
Leader line	thin	 or 
Section/Hatch line	Fine	
Sightline	Fine	
Title Block/Strip	Thick	
Section Outline	Thick	
Border	Extra-thick	

Architectural Outline	Extra-thick (90 mm)	
2.1.3.2 <u>Dashed lines</u>		
Hidden	Thin	
Ceiling Line	Thin	
Plaster Line	Thin	
2.1.3.3 <u>Phantom lines</u>		
Default	Thin	
2.1.3.4 <u>Centerline lines</u>		
Default	Thin	

INDUSTRY SPECIFIC LINES

2.1.3.5 <u>Break lines</u>		
Long	Thin	
Short	Thin	
2.1.3.6 <u>Section solid</u>		
	Thick	
2.1.3.7 <u>Cutting Plane</u>		
	Thick	
<u>Cutting Plane (Alternate Form)</u>		
	Thick	

3.0 TEXT

Drawings and notation must be complete, accurate, and effectively communicate the project to the drawing user in the simplest, most efficient manner possible. The placement of notes within the drawing block should comply with the drawing block format requirements as described in Section 9.5.

3.1 NOTATION FORMAT

Fonts should be upper case, sans-serif, and proportionate. In most situations use one of the five recommended font options shown in Section 3.4. Do not use italics, underlining, bold, or other highlighting techniques.

3.2 NOTATION VOICE

3.2.1 Developments in drafting technology and CAD systems have made the preparation of notes less burdensome but have also made it easier to create overly long notes—diluting efficient communication. Clearly, reference keynotes or sheet keynotes reduce drawing text by eliminating repetitious text and replacing it with a simple symbol and legend. *The Project Resource Manual—CSI Manual of Practice* offers “streamlining” (more commonly known as “active voice”) and the “imperative mood” as additional means to reduce and clarify specifications.

3.2.2 These same principles apply to drawing notes, as illustrated below:

- Avoid “indicative mood” note language: CONTRACTOR SHALL NOT SCALE DRAWINGS
- Use “streamlined” note language: DO NOT SCALE DRAWINGS

3.3 NOTATION EFFICIENCIES

This Section lists some guidelines for proper development of efficient notes:

3.3.1 Match the generic terminology used by manufacturers. Names of materials and products appearing on the drawings should be identical to the generic names used to identify these products. Identify objects and materials on the drawings with generic terminology and a description adequate to distinguish among similar products.

3.3.2 Write notes using complete terminology and avoid the use of abbreviations. Where an abbreviation is essential, be consistent and use recognized abbreviations.

3.3.3 References to written specifications and/or other drawings should provide the reader with an exact reference location. In the case of drawing sets, identify the reference by specifying sheet and drawing numbers.

3.4 FONTS

On a drawing or drawing set, use only a few selected fonts and use only one throughout whenever possible. Below are examples of easy-to-read, standard (readily available regardless of platform), and attractive fonts.

- CITYBLUEPRINT
- ROMAND
- ARIAL
- CALIBRI
- SANS SERIF

3.5 **TEXT SIZES** (varies by font and legibility)

- Notes – 3/32" – 1/8" height (10-13.5 font size)
- Labels – 3/16" height (20 font size)
- Titles – 1/4" height (26.5 font size)

3.6 **COMMON NOTATIONAL SHORTHAND / ABBREVIATIONS** (sampling only)

Alternate = ALT	Outside Diameter = OD
Center Line = CL	Plaster Line = PL
Diameter = DIA	Plywood = PLY
Do Not Cover = DNC	Reverse & Repeat = R&R
Each = EA	Sheet = SHT
Hardware = HDW	Stage Left = SL
Inside Diameter = ID	Stage Right = SR
Loose Pin Hinge = LPH	Tight Pin Hinge = TPH
Muslin = MUS	Tongue & Groove = T&G
Not To Scale = NTS	Typical = TYP
On Center = OC	White Pine = WP

4.1 **UNITS OF MEASUREMENT**

- 4.1.1 This standard system of measurement for lines is the **imperial system**, i.e., feet and inches. Precision shall be set to 1/16" or 1/8". Set DIM Round off factor in Dimension Properties to 1/16" (or 1/8") unless the project calls for dimensional precision greater than 1/16".
- 4.1.2 The standard system of measurement for angles is the **decimal system**. Except in instances requiring increased accuracy such as machining, set the precision level using whole numbers only, unless shop equipment allows greater accuracy.

5.0 **DIMENSIONING**

5.1 **UNITS & PLACEMENT**

- 5.1.1 Dimensions must be clear, consistent, and easily understood
- 5.1.2 Orientation of dimensioning should follow ANSI recommendations of **Unidirectional** or **Aligned** Systems. Regardless of choice, one method should be maintained throughout the project.
- 5.1.3 Imperial dimensions less than 1'-0" are given in inches without a foot notation, such as: 6", 9-1/2", etc. Dimensions greater than 1'-0" include the whole feet with a single apostrophe followed by dash then inches followed by a double apostrophe: 7'-1/2", 18'-5 1/4", 1'-3", etc.

- 5.14 Metric dimensions less than one meter are to be noted as a zero, decimal point, and portion of meter in numerals. Dimensions greater than one meter are given as a whole meter number, decimal point, and portion of meter: 0.1m, 0.52m, 1.5m, and 2.35m.
- 5.1.5 Dimension lettering can be placed 1/16" above the dimension line or centered within a broken dimension line allowing a 3/32" gap of white space on each side.

5.2 EXTENSION & DIMENSION LINES

- 5.2.1 Extension lines should allow 1/16" gap of white space between the object and the tail of the extension line.
- 5.2.2 Dimension lines run between extension lines and should allow for a 1/2" gap between object and dimension lines and for a 1/4" to 3/8" space between dimension line.
- 5.2.3 Dimension lines should be punctuated at the ends with an appropriate arrowhead or thick lineweight 45° slashes (Architectural tick). Arrowheads should be about 1/8"-3/16" in length.
- 5.2.4 Dimensions should be the same height as lettering. To avoid placing dimensions into spaces that are too small, use a leader line with an arrow at the end to indicate an edge or location. Use a leader line with dot on the end if a surface is being identified. Any leader line should meet note at the middle of the note's first or last word with a 1/16" gap between line and notation.


5.3 CIRCLES & ARCS

- 5.3.1 A circle is dimensioned by its diameter; an arc by its radius.
- 5.3.2 Diameter dimensions should be preceded or followed by "DIA" or "Ø"
- 5.3.3 Radius dimensions should be preceded or followed by an "R" and be at the end of a leader line with one arrowhead touching the arc.
- 5.3.4 All circles, arcs, and holes should be accompanied by a center mark that includes quadrant intersections.

5.4 COMMON DIMENSION SYMBOL SHORT HAND

Diameter = 

Radius = **R**

Angle = 

6.0 SHEET SIZES

6.1	<u>System</u>	<u>Designation</u>	<u>inches</u>	<u>mm</u>
	<u>ANSI</u>	A	8.5x11	216x279
		B	11x17	279 × 432
		C	17x22	432 × 559
		D	22x34	559 × 864
		E	34x44	864 × 1118
	<u>Architectural</u>	A	9x12	229 × 305
		B	12x18	305 × 457
		C	18 x 24	457 × 610
		D	24 x 36	610 × 914
		E	36 x 48	914 × 1219
		E1	30 x 42	762 × 1067

7.0 SCALE

7.1 Drawing scale is in **imperial** units and appropriate to the type of project, allowing for adequate detail and clarity. Examples of typical scales are:

$\frac{1}{4}'' = 1'-0''$	Ground Plans and Sections
$\frac{1}{2}'' = 1'-0''$	Ground Plans, Sections, Elevations, and Construction (Shop) Drafting
$1'' = 1'-0''$	Small object Elevations and Construction (Shop) Drafting, and Details
$3'' = 1'-0''$	Very–Small Object Drawings and Details
$1'' = 1''$	FULL SIZE: for maximum precision

8.0 LAYERS/CLASSES

(Layers in AutoCAD relate to Classes in Vectorworks. Vectorworks users can assume that Layers in this document refers to Vectorworks classes)

8.1 DEFINED LAYER NAME DATA FIELDS

Layer identification is used to group all layers from a single department together in an organizational string

8.1.1 Discipline Designator (mandatory)

- Denotes the category of subject matter contained on the specified layer and is a single-character field

8.1.2 Drawing View Layer Name (mandatory)

- are specialized codes for layers that are organized primarily by drawing type

8.1.3 One or two Minor Groups (optional)

8.1.4 What the layer actually consists of: e.g., walls, platforming, handrail, etc.

Each data field is separated from adjacent fields by a dash (“-”) for clarity. For example, the designation below reads as:

- S - E L - D I M S = *Scenery - Elevation - Dimensions*
- SELWALLS = *Scenery Elevations Wall*

For example: CP1 = *Construction Drawings Platforming #01*

8.2 **DATA FIELD ELEMENTS**

Discipline Designators

- A Architectural Structure
- U Audio
- L Lighting & Electrics
- J Projections
- P Props
- S Scenery
- E Special Effects
- C Construction Drawings

- RI Riser Drawing
- RG Rigging

Minor Groups

- DIMS Dimensions
- LABL Labels
- LEGN Legends/Symbol Keys
- NOTE Notes
- REVC Revision Clouds
- REVS Revisions
- SYMB Reference Symbols
- TABL Data Tables
- TEXT Text
- TITL Drawing & Detail Titles
- TTLB Border & Title Block
- DDNN Discipline Dwg # – 2 digits

Drawing View Layer Name

- EL Elevations
- DT Details
- GP Ground plan
- SC Section

8.3 **LAYER COLORS** (CAD)

Individual layers should be assigned different colors for ready recognition on the monitor screen or based upon an organization’s implemented plot style.

8.3.1 Layer colors are difficult to mandate due to factors of organizational preferences, layer systems, and the issue of color-blindness.

8.3.2 Below are several suggestions that appear to enjoy wide consensus

Layer	Color	Use
Default	White/Black	Blocks, etc.
DAT	Green	Reference & Center Line
LN	White/Black	Basic Drawing Lines
DIM	Red	Dimensions
TXT	Red	Text

9.0 DRAFTING SHEET CONTENTS and ORGANIZATION

9.1 BORDER

A border is strongly recommended to ensure that the complete drawing is contained in its entirety on the media on which it is presented. Printed plans, where possible, should always include a border. The border should be kept simple and clear, the recommended choice being a continuous ultra-thick line. While sheet/border size recommendations are presented below, the border placement should always consider the plotter's printable area. (CAD)

9.1.1 A 1/2" border should be maintained from the papers edge, except the left border which should be inset 1" to accommodate the full file name (folder file string) outside of the left border edge. (CAD)

9.1.2 If drawings are to be bound, the left margin should be 1-1/2" to accommodate binding.

9.2 TITLE BLOCK/STRIP & CONTENT

The position of the title block should be changed only in exceptional circumstances, e.g., the drawings are to be stored on a hanging rack. The title and number should remain clearly visible when the drawing is folded. Normally, the Title Block/Strip is anchored to the bottom right corner and read from either the bottom or right-side edges of the sheet. If the left-hand edge of the title block/panel meets the top border line, the area between left and right lines provides space for additional information including notes, revisions, etc. Line and text widths and layout within the title block should be chosen for greatest clarity.

Drawings Block and Strips shall contain:

- Producing Organization Name (and contact information as space allows)
- Show Title
- Plate Title
- Filename
- Director Name

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- Set Designer Name
- Technical Director Name
- Drafter Name
- Checker/Approval Name (if not required, list as N/A)
- Plate Number
- Drawing Date
- Scale
- Full File String Name (If not placed along left border edge outside of border) (CAD)

2. Vertical Title Strip Format

	
COMPANY NAME 987 ADDRESS ST CITY NAME, ST 98109 TEL: (###) ###-#### FAX: (###) ###-#### EMAIL@THEATER.ORG	
VENUE NAME	
SHOW NAME	
REVISIONS: NO. DATE DESCRIPTION # MM/DD/YY DESCRIPTION OF THE REVISION GOES HERE.	
DIRECTOR NAME	SET DESIGNER NAME
TD NAME	DRAFTER NAME
MM/DD/YYYY	
AS NOTED	ARCH D
SHEET TITLE	
##	
OF ##	

1 Horizontal Title Strip Format

CALIBRITY COPY STANDARDS \ PERSONNEL \ TELE BLOCKING		COMPANY NAME 987 ADDRESS ST CITY NAME, ST 26901 TEL: (###) ###-#### FAX: (###) ###-#### EMAIL@THEATER.ORG	REVISIONS: DATE: DESCRIPTION:	SHOW NAME		PLATE NAME: PLATE TITLE TECHNICAL DIRECTOR: TD NAME DATE: MM/DD/YYYY	PLATE: #
		DIRECTOR: DIRECTOR NAME DESIGNER: DESIGNER NAME DRAFTER BY: DRAFTER NAME SCALE: 1/2"=1'-0"					

3. Corner Title Strip Format

NAME OF ORGANIZATION	
SHOW TITLE	
SCENIC UNIT & PLATE TITLE	PL # ;
DIRECTOR:	OF
DESIGNER:	
TECH DIRECTOR:	
DRAFTER:	
APPROVED:	SCALE: 1/2" = 1'-0" DATE: 8-24-09
FILE NAME:	

9.3 REVISION TRACKING LEGEND

Locate the revision legend near the title block, either as shown in figure 4, or within the title block itself if using one of the formats shown in figures 1 & 2.

9.3.1 If using a title block versus strip, placing the revision info in reverse order (most recent version at top of list, is easy and efficient. To accommodate anticipated revisions, leave sufficient space open above the title block, e.g. 1-1/2” – 2”.

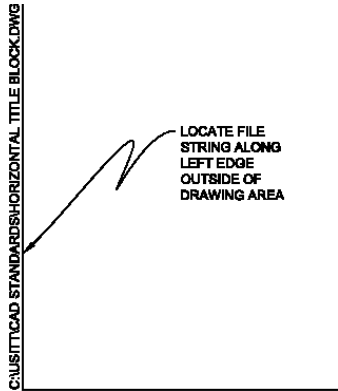
9.3.2 Revision legend should include Revision #, Date, Drawing # and sheet #, plus brief description.

Revisions :		
Date :	Description :	
Company		Production Office Any Street TOWN, A1 2BC Tel: 0123 45678 Fax: 0123 45679 po@company.org
Theatre Royal		
The Greatest Show on Earth		
GroundPlan Act 2, Sc.3		
Scale :	Date :	Drawn By :

4. Revision Legend Typical Location on Drawing Sheet

9.4 ELECTRONIC FILE STRING RECORD KEEPING

To maintain a complete file management system, the entire string should be located somewhere on the drawing. The location shown in figure 5 is non-invasive and easy to locate on each drawing provided standard sheet practice is observed.



5. Insert complete file string name as shown

9.5 NOTES

General notes should be located above or to the left of the title block/strip. Local notes are attached with leader lines and arrows to appropriate drawings. Use local notes whenever possible.

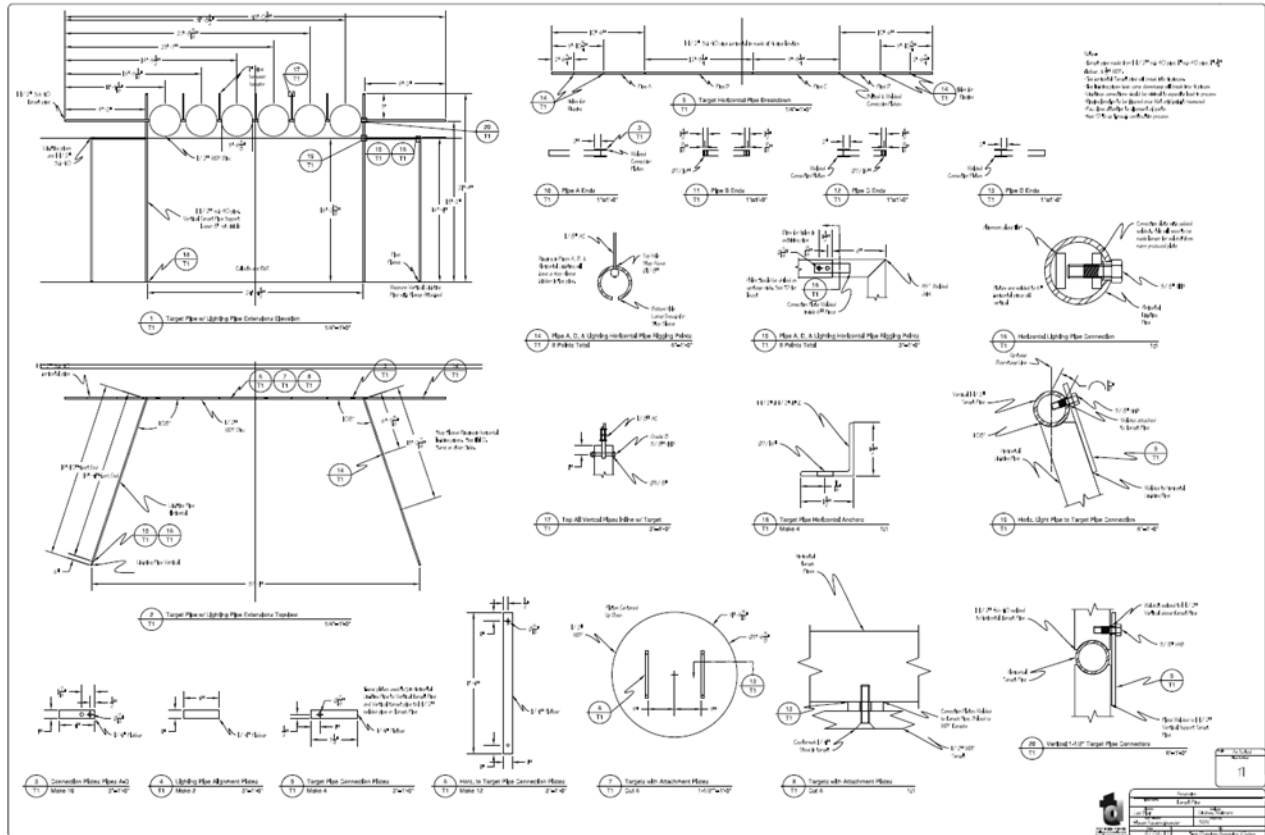
9.6 LEGEND

The use of a Legend is necessary to define the meaning of non-standard symbols, line types (and line widths) contained in the drawing. If the drawing conforms to the Standards laid down in this document, it is not necessary to include a Legend if the following phrase is clearly visible:

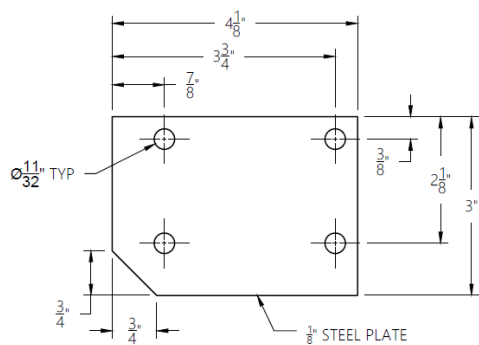
THIS DRAWING HAS BEEN PREPARED IN ACCORDANCE WITH
USITT RECOMMENDED GRAPHIC BEST PRACTICES

The above statement is adequate unless non-standard Line Styles etc. are used.

7. Element drafting with detail views



8. Detail drawing Formats



5
01

DETAIL: CASTER PLATE

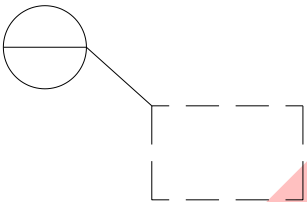
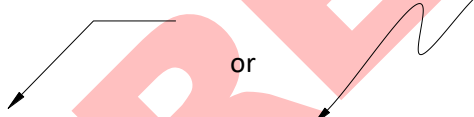
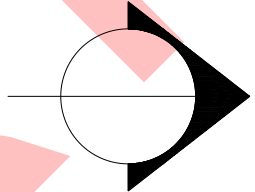
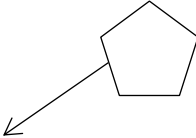

MAKE (6)

6" = 1'-0"

10.0 SYMBOLS / BLOCKS / RESOURCES

Blocks shall be created on the default layer in full size (scale 1:1) with using the default linetype and color. Blocks with potential use beyond the current project should be added to the drafter’s symbol/resource library as a stand-alone file. The use of blocks is encouraged as it will promote consistency and ease of correction or alteration. What follows is a sample of some standard USITT CAD approved Symbols. USITT Symbols for Lighting and Audio practice are available in stand-alone documents, available from the national office or on the USITT website: www.usitt.org

10.1 STANDARDIZED BLOCKS/SYMBOLS

Symbol Name	Symbol	Notes:
Detail Reference w/ Outline Box		Top portion of circle for drawing #, bottom portion for Plate #. Hidden box outlines detailed section.
Leader Line		Callouts
Section Reference		Top portion of circle for drawing #, bottom portion for Plate #. These indicate where to find section. Arrow direction indicates view direction.
Scenic Unit Reference Icon		Place Letter of Unit in Pentagon
Reference Line		Top portion of circle for drawing #, bottom portion for Plate #.

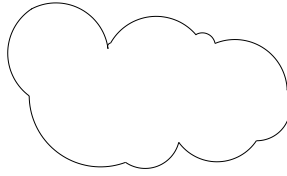
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Revision Cloud



Lineweight is consistent with dimensioning

Set Line



Text Height is 1/4" and on top of line.

Center Line



Text Height is 1/4" and on top of line.

Plaster Line



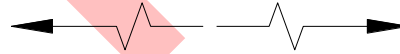
Text Height is 1/4" and on top of line.

Break Line



Place to show an object continues.

Break Line Dimensions



Replace existing dimension lines to show a break in dimensioning.

Break Cylindrical



10.2 HATCHES

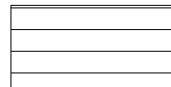
Use

Example

Hatch

Scale

Plywood



LINE

1

Wood



ANSI31

1

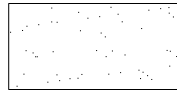
Steel



STEEL

1

Composite



AR-SAND

.125

11.0 DRAWING AND PLOTTING PRACTICES (CAD)

Model Space and Paper Space (Sheet Layers)

Whenever possible drawings should be generated in Model Space and plotted in Paper Space. Dimensions, detail references, call-outs, title lines, notes, and title blocks should appear in Paper Space. For the above system to be most effective, drawings are created full size in Model Space. The scaling of Model Space drawings to fit paper size is done through the use of viewports and model view scaling.

11.1 Text Height for 1/8" plotted notes created in Model Space seen through Viewports

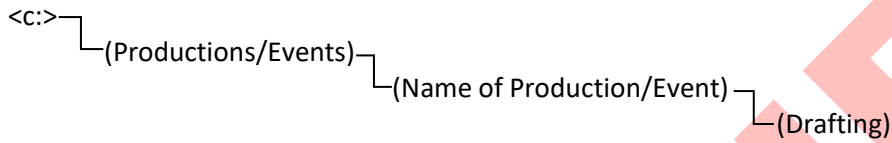
<u>Plotted Scale</u>	<u>Text Height in Model Space</u>
¼"	6"
½"	3"
1"	1.5"
1-1/2"	1"
3"	0.5"

12.0 PLATE NAMING (use a clear system of organization, in the spirit of what is shown below)

- All Ground Plans use **GP** → **GP1** – Act 1 GP **GP2** – Act 2 GP **GP3** – Act 3 GP
- All Sections use **SEC** → **SEC1** – Section Looking SR; **SEC2** – Section Looking RL
- All shop drawings use:
 - A: **C1, C2, C3** etc. (**C** - construction drawing code); or
 - B: **By type of unit:** Walls start with **W**, Platforming **P**, Stairs **S**, etc.

13.0 FILE MANAGEMENT (CAD)

- 13.1 The full file name should be listed vertically along the left border outside of the drawing area.
- 13.2 If the full file name is listed on the drawing, the organization should determine the file string order that best meets its own organizational needs.
- 13.3 A suggested file string is depicted below.



FOR REVIEW