PORT AUTHORITY NY NJ
AIR LAND RAIL SEA

Engineering CAD Standard

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CHANGES TO THE STANDARDS 2022

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1.2 Purpose	Software updated to 2022
1.5.3.15 Discipline Folders	Update folder structure images and folder naming from roman numerals to Arabic numerals Update tables images, using check marks
1.6.8 Text Styles and Heights	Add a “PA Text Settings & Scales” chart
1.8.1 AutoCAD 2018 Configuration	Update the text to ‘2022’ where applicable and updat the path to ‘K:\Application\CAD_Standards\2022’
1.9.4 C & CP Contract Drawing Set	Update the table images, using check marks
1.10.2 Digital Signature	Updated section to include ‘DocuSign’ – use text from VDC Committee meeting notes
1.10.4 Project Websites	Verified and updated website links to make sure it works
Appendices	The CAD Standards and Appendixes will become (2) separate documents
Appendix D	Update to latest folder path
Appendix F, Sec. 1.20.4.3 & 4.5 (3D Site Amenities & 3D Vehicles)	Check with Traffic if the 3D dwgs are used and if they should be removed.
Appendixes’ “Content Preferences” – applies to Civil, Civil 3D, Electrical, Environmental, Geotechnical, Mechanical, Structural, and Traffic	It currently says “This Section is under construction” - what does this section supposed to contain or what is its purpose? Will we have content soon or should it b removed?

CHANGES TO THE STANDARDS 2023

Section	Description
All Document	Links have been fixed.
8.8 STAGE IV_RECORD DRAWINGS	Section content has been updated.

1.0 INTRODUCTION

The CAD Standard outlined within this document was established to provide guidance for the preparation of the Engineering / Architecture (E/A) Design Division and Construction Division (CMD) of the Port Authority of New York and New Jersey's (PANYNJ) contract documents.

This document is intended for use by both in-house personnel as well as outside consultants involved in creating or updating PANYNJ facilities' Computer Aided Drafting (CAD) data.

2.0 PURPOSE

This Standard establishes requirements and procedures for the preparation and milestone records (submissions) of CAD based drawings throughout the project life cycle. Adherence to this standard ensures that the Design and Construction Divisions of the PANYNJ shall produce and receive data in a consistent format. The adherence to the PA Standard also ensures the consistency of the information the information within each discipline and the efficient exchange of information between disciplines.

The level of required understanding of the CAD Standard determines by the role of individual assign to the project. For CAD operators, designers, and functional supervisors a thorough knowledge of all CAD related elements associated with a project is crucial. The project manager however only requires a general knowledge of the EAD CAD Standard and the means by which it is employed to create a project. Both levels of knowledge will be possible through the use of this manual.

The CAD system adopted by the PANYNJ is comprised of several Autodesk products. Throughout this manual terminology and references will be made that are unique to Autodesk and primarily, different AutoCAD based software applications.

Supported Design Software Products
AutoCAD 2022
AutoCAD Architecture 2022
AutoCAD Civil 3D 2022
AutoCAD Map 3D 2022
AutoCAD MEP 2022
AutoCAD Raster Design 2022

2.1 ABOUT THIS STANDARD

The chapters within this standard describe how the E/A Design Division and CMD Construction Division uses AutoCAD and how to configure AutoCAD to support the E/A Design Division and CMD Construction Division CAD Standard, which it has adopted.

The appendices, which are in a separate document, support the chapters in several ways. Each discipline has been assigned an appendix to explain information specific to their functional group. In addition, appendices have been provided to support CAD related subject matter, which is common throughout all disciplines. Finally, some appendices have been created to support internal E/A Design and Construction Divisions staff only; these appendices will be for internal use; however, they have been supplied with the document for both in-house and consultant staff.

3.0 ACRONYMS AND ABBREVIATIONS

The following are Acronyms and Abbreviations used throughout this document.

ACRONYM	DEFINITION
APJ	Autodesk Project File
C3D	Autodesk AutoCAD Civil 3D
C	Confidential
CMD	Construction Management Division
CP	Confidential Privileged
CTB	Color Dependent Plot Style Table
DST	Drawing Sheet File
DWG	AutoCAD drawing file
DWT	AutoCAD template file
EAD	Engineering Architecture Design
EOL	Engineering Online
EOP	Engineer of Projects
FAC	Facility Code
K:\	Internally Mapped Network Drive pointing to \\Patcav56\K_Drive
LE/A	Lead Engineer or Architect
LT	Linetype scale
M:\	Internally Mapped Network Drive pointing to \\Patccsrv2\Cad\Cad
MEP	Autodesk AutoCAD MEP
MS	Model Space
N:\	Internally Mapped Network Drive pointing to \\Patccsrv1\Cad\Archive
PANYNJ	Port Authority of New York and New Jersey
PC3	Plotter Configuration file
PDF	Portable Document Format file
PID	Project Identification Number
PMP	Plotter Model Parameter file
PS	Paper Space
RVT	Autodesk Revit
VDC	Virtual Design and Construction

4.0 ACCESSING CAD STANDARD

The CAD Standard includes a series of support files. All support files are provided in a folder named “VDC Documents\02\2022, which is located on VDC Documents Support folder of the PANYNJ network for in-

house user. Consultant can download the standards and supporting files in Port Authority NY & NJ Engineering Available Documents. The "VDC Documents\02.Development\2022\Content\AutoCAD" folder contains one general "**All_Disciplines**" sub-folder and eight discipline specific sub-folders as illustrated in **Figure 1.2.1-2**.

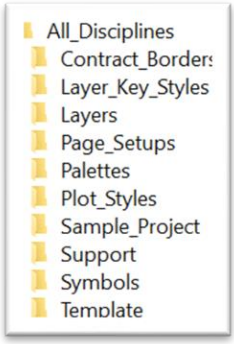


Figure 5.3.1-1

Figure 5.3.1-2

The "All_Disciplines" sub-folder contains all cross-discipline support files. Both folder structures for PA employees and on-site consultants are illustrated in Figure 1.2.1-1.

Each Discipline sub-folder is divided into three sub-folders which contain all the discipline specific support files. An example of this folder structure is illustrated in Figure 1.2.1-3. The layer and symbol content for each discipline can be referenced in the appendices.

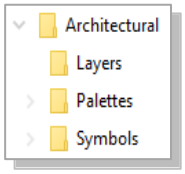


Figure 5.3.1-3

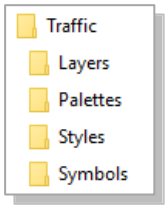


Figure 5.3.1-4

The Traffic and Geotechnical sub-folders contain one additional folder – styles. Figure 1.2.1-4 displays the folder structure that is shared by Traffic and Geotechnical.

The Civil discipline contains folders for civil3d objects in addition to the sub-folders mentioned before. Figure 1.2.1-5 demonstrates the folder structure for the civil discipline.

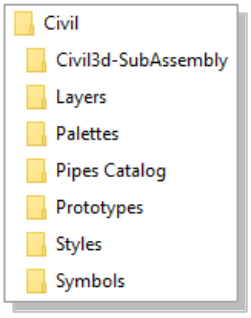


Figure 5.3.1-5

4.1 USING THE STANDARD FILES

The CAD_Standards directory contains two primary types of files: files that do not require ongoing user interaction and files that do.

The first type refers to support files accessed automatically by AutoCAD once they have been copied to the proper support folders. Outside consultants should copy these files to the appropriate directories or create an AutoCAD profile pointing to the files as necessary, refer to **5.0 Project Folder Structure.**

The second type refers to files such as which the user must configure within the project. For instructions on creating a title sheet or working with the contract borders, refer to **9.0 Plan Set Preparation**.

4.2 AUTOCAD CIVIL 3D

When using C3D, project design and data should be stored in the MODEL folder of the appropriate discipline.

M:\<Facility Name>\<PID Number>\<Discipline>\Model\

Consultant shall make sure the path for the design or data content in the model folder to be set as a relative path as such:

…..<PID Number>\<Discipline>\Model\

For a more in depth breakdown on how to use C3D within the PANYNJ, reference to Section 1.8.14.1 in the Engineering CAD Appendix. For C3D requirements go to VDC Requirements.

5.0 PROJECT FOLDER STRUCTURE

The E/A Design Division CAD Standard provides a structure for the organization of CAD projects within the department to improve coordination between functional groups of E/A Design Division and its consultants.

5.1 PROJECT FOLDER STRUCTURE

Internally CAD projects are stored on the CAD volume, with an internal mapping to the drive letter “M:\”. The “M:\” drive contains a sub-directory for each facility named using its facility code as displayed in Figure 1.5.1-A.

FACILITY CODE	FACILITY NAME
AMT	Automobile Marine Terminal
BB	Bayonne Bridge
BRKMT	Brooklyn Port Authority Marine Terminal
EP	Elizabeth Port Authority Marine Terminal
EWR	Newark Liberty International Airport
FERRY	Ferry Transportation
GB	Goethals Bridge
GWB	George Washington Bridge and Bus Terminal
HCMF	Harrison Car Maintenance Facility
HELI	Downtown Manhattan Heliport
HH	Howland Hook Marine Terminal
HT	Holland Tunnel
IPY	Industrial Park at Yonkers
JFK	John F. Kennedy International Airport
JSTC	Journal Square Transportation Center
LGA	LaGuardia Airport
LT	Lincoln Tunnel

FACILITY CODE	FACILITY NAME
MULTI	Multi Facility Projects
NFC	Newport Financial Center
NJMT	New Jersey Marine Terminals
NLCC	Newark Legal and Communication Center
OBX	Outerbridge Crossing
PABT	Port Authority Bus Terminal
PACD	Port Authority Police Academy
PATC	Port Authority Technical Center
PATH	Port Authority Trans-Hudson Corporation
PHQ	Police Headquarters
PJ	Port Jersey
PN	Port Newark
PRTC	Police Rescue Training Center
RLLC	Cross Harbor Rail Road NY/NJ
SWF	Stewart International Airport
TEB	Teterboro Airport
TLPT	Staten Island Teleport
WTC	World Trade Center

Figure 5.3.1-A

5.2 PROJECT IDENTIFICATION NUMBER

The Project Identification Number (PID) is a unique Identification assigned for all EAD projects.

The EOP is responsible for getting the PID number from the Facility Project Manager at the kick-off meeting and distributing it to all discipline task leaders involved in the project. The LE/A is responsible for distributing the PID number to their outside consultants. The LE/A will request the creation of the project folder structure through the use of the TECNow form. Refer to **Section 1.7.6 Request Project Folder Structure** in the CAD Standard Appendix.

The "M:\" drive is divided into Facility Folders, each containing project specific sub-folders. These project folders are named using the eight (8)-digit PID number. **Figure 1.5.2-1** illustrates this concept using a project example.

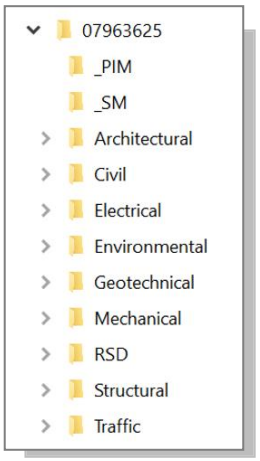


Figure 5.3.1-1

5.3 DISCIPLINE FOLDERS

Every discipline is provided with a folder in the project directory in which all design related data is to be stored. Each discipline folder has a series of standardized sub-folders which are to contain the various types of design data.

Figure 1.5.3-1 illustrates these standardized sub-folders using the Architectural folder as an example.

The Model, Plotsheet and Publish folders should always contain the current version of all CAD/BIM drawings related to the project.

For more information on the usage of these folders refer to the section titled Discipline Folder Rules of this standard.

For more information on the Plotsheets_CP and PDF_CP folders refer to **10.0 Confidential & Confidential Privileged Projects** of this standard.

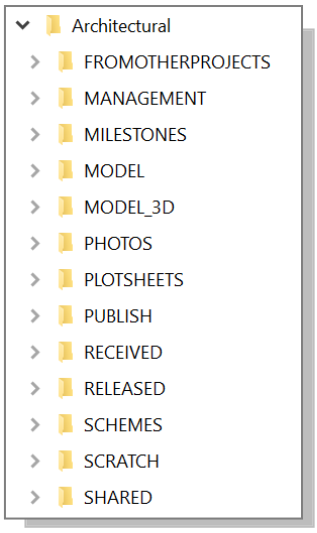


Figure 5.3.1-1

5.3.1 DISCIPLINE INTERNAL FOLDERS RULES

All folders have a pre-set of rules that inhouse and consultant shall follow. The rules on Table 5.3.1-A displays, for specific discipline, the use of each folders for consistency throughout the projects for the Port Authority.

Table 5.3.1-A

FOLDER	RULES			
	Sub-folders Permitted	Read-write Permissions (per discipline)	Access for Other Disciplines (Read-only Permission)	Archived
FROMOTHERPROJECTS	✓	✓		
MANAGEMENT	✓	✓		✓
MILESTONES		✓	✓	✓
MODEL		✓	✓	✓
MODEL_3D		✓	✓	✓
PHOTOS	✓	✓	✓	✓
PLOTSHEETS		✓	✓	✓
PUBLISH		✓	✓	✓
RECEIVED	✓	✓		
RELEASED	✓	✓		
SCHEMES	✓	✓		
SCRATCH	✓	✓		
SHARED	✓	✓	✓	

5.3.2 FROMOTHERPROJECTS FOLDER

The FROMOTHERPROJECTS folder will contain drawings and data that have been taken from other projects that relate to the current project. If a file from another project is required for reference purposes only and is not going to be included as part of the contract set it will be stored in this directory. If a file is required to be part of the contract set, then it will be copied to the MODEL/MODEL_3D folder and must comply with the current CAD and BIM Standards. Related contracts and reference documents are shared in Livelink/E-Builder with the consultants in Stage I through Stage III.

5.3.3 MANAGEMENT FOLDER

The MANAGEMENT folder will contain all non-drawing related project data. Spreadsheets, documents, specifications, memos, estimates, etc. will be stored in this folder.

5.3.4 MILESTONES FOLDER

The MILESTONES folder is a location for storing independent (duplicate) copies of project information as it appears at each milestone of the project. While the root Model, Plotsheets and Publish folders contain the current versions of drawings which will evolve throughout the life cycle of the project, the MILESTONES folder will preserve the state of those drawings at the moment of each milestone.

Sub-folders have been created for each submission milestone from Stage I through Stage IV.

Each discipline Task Leader is responsible for archiving their own discipline-specific Central Files into one of the sub-folders within MILESTONES. After verifying that all discipline Task Leaders has archived their folders, the LEA should notify the VDC Group.

For more information regarding the specific submittal milestones, refer to **8.0 Submissions.**

5.3.5 MODEL FOLDER

All design work and annotation must be stored inside AutoCAD drawings saved within the MODEL folder. The CAD Standard refers to these design drawings as Model files.

Images and Office documents referenced or linked by drawing files will also be stored in the Model folder and must comply with the rules for Model files. References to OLE objects are not permitted.

5.3.6 MODEL_3D FOLDER

This folder stores the Central Revit Model files.

Within this folder lives the SUPPORT sub-folder, which stores Revit-related information that is not contained under any other existing available folder and do not need to be shared outside each discipline. If NWCs need to be stored for BIM Coordination purposes, the COORDINATION folder should be used.

5.3.7 PHOTOS FOLDER

The PHOTOS folder will contain all digital photographs relevant to the project, with the exception of those used on contract drawings. If a photo needs to be part of the Contract Set, it should be moved or copied into the MODEL or MODEL_3D folder and renamed accordingly.

Within this folder lives the RENDERING sub-folder, which stores Rendering files such as JPGs, PNGs, TIFs, etc.

5.3.8 PLOTSHEETS FOLDER

All layouts f or plotted sheets will be saved inside AutoCAD drawings stored within the PLOTSHEETS folder. The CAD Standard refers to these layout drawings as Plotsheet Files. These files are assembled sheets used f or plotting. These drawings consist of a series of external references. Only Plotsheets files will be stored within this folder.

All paper drawings in the Contract Set will have a corresponding Plotsheet file in the PLOTSHEETS folder, the only exception is the Title Sheet.

Within this folder lives the **PDF** sub-folder, which **STORES PDF FILES.** A PDF is an industry standard non-editable file format. Refer to section 1.5.5.5 for PDF requirements.

The PDF folder will always contain the most recent milestone version of the PDF file(s). Earlier milestone files once copied to the MILESTONES folder for the milestone will be either deleted from the PDF folder or overwritten in place.

5.3.9 PUBLISH FOLDER

The PUBLISH folder will be used as a sharing mechanism between disciplines. A discipline may copy Model files into its own PUBLISH folder, making them available for other disciplines to reference. Other disciplines are not permitted to copy these files but will instead externally reference them directly from the owner's PUBLISH folder.

There will be only one Contract Border per project. The only exception to this rule is when new drawings are added to the Contract Set as part of a Stage IV – PACC. Refer to 8.7 Stage IV_PACC for instructions. If necessary, BIM Models will be exported as DWG files and saved within this folder.

It is important that this methodology for referencing design files from other disciplines be followed. If a user copies design files from another discipline's Model, Plotsheets or Publish folder then they must take ownership of the file. By taking ownership the discipline copying the file will then be responsible for all CAD Standards compliance of that file as if it were created by that discipline. Only copies of Model files for other disciplines to references shall be stored in the Publish folder. The owning discipline is not able to reference file from its own PUBLISH folder.

5.3.10 HISTORY FOLDER

The HISTORY folder is the only sub-folder permitted within the PUBLISH folder. If a single file is to be published more than once, the file that exists in the PUBLISH folder will be moved to a dated sub-folder within the HISTORY folder. The updated version of the file will then be copied into the root of the PUBLISH folder. This will allow other disciplines to continue to reference older or time-phased versions of reference drawings if required by their design schedule by changing the external reference path to the dated sub-folder within the History folder. Only copies of previously published files will be copied to the HISTORY folder.

5.3.11 _DATASHORTCUTS FOLDER

The _DATASHORTCUTS folder is only populated in the folder structure for disciplines that use AutoCAD Civil3D as an authoring application. This folder exists only under CIVIL and GEOTECHNICAL Publish folder.

- This is the folder selected when setting up the Data Shortcut using Civil 3D the Toolspace Prospector.
- Sub-folders are permitted within the _DATASHORTCUTS folder (Refer to **6.6 Folder Naming Convention** for proper usage).

- The _DATASHORTCUTS folder has read-write permissions assigned to the owning discipline.
- Other disciplines have read permissions assigned to the _DATASHORTCUTS folder.
- The _DATASHORTCUTS folder will be archived with the project.

5.3.12 RECEIVED FOLDER

The RECEIVED folder will contain a dated archive of design information received from other disciplines and outside sources. This folder is intended as a record to identify exactly what information was provided and on what date.

5.3.13 RELEASED FOLDER

The RELEASED folder will contain a dated archive of design information provided to other disciplines and outside sources. This folder is intended as a record to identify exactly what information was provided and on what date.

5.3.14 SCHEMES FOLDER

The SCHEMES folder will contain various schemes of a design as well as any temporary design data. This folder provides the designer with an area in which to make trial changes to a design and a place to store temporary files. If a scheme is created and is later chosen as the final design version, the files stored under that scheme are to be copied to the MODEL folder.

When using the Revit-based applications, Design Options is the preferred method to accomplish schemes. This folder is a record intended to identify exactly when, and what information was provided to a consultant.

5.3.15 SCRATCH FOLDER

The SCRATCH folder is meant to be used by team members to work on details, or store Project related information relevant to the Discipline members.

5.3.16 SHARED FOLDER

The SHARED folder will be used as a sharing mechanism for non-CAD\BIM-related information between disciplines. A discipline may copy MANAGEMENT files into its own SHARED folder, making them available for other disciplines. Files stored within the SHARED folder are not to be referenced into any contract drawings and are provided for information only. Only copies of MANAGEMENT files shall be stored in this folder, Model files are not permitted within the SHARED folder.

5.4 SAMPLE PROJECT

To simplify the exchange of information between the various PANYNJ departments, divisions, and function groups as well as between consultants and contractors, every attempt will be made to adhere to both the drive mapping and directory structures defined within this section.

A sample project folder structure has been provided with the CAD Standard as shown in **Figure 1.5.4-1**.

The project folder structure requires the replacement of “Facility Name” with the Facility Code provided in **5.1 Project Folder Structure** and the letters “PID” with the eight (8) digit Project Identification Number proved by the LEA.

A copy of the project folder structure can be found at:

Sample Project Folder Structure

The following link is the location of the Sample Project for Consultants:

All_Disciplines_Support_Files\Sample Project

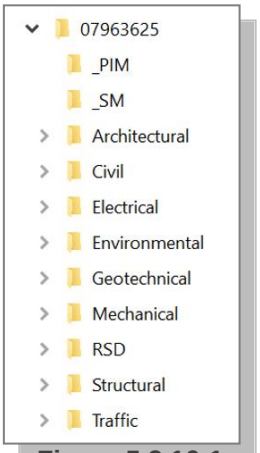


Figure 5.3.16-1

6.0 FILE NAMING CONVENTION

All electronic project files such as DWG, PDF, Images and Office documents referenced by a contract drawing, will be named following the CAD Standard File Naming Convention.

6.1 DISCIPLINE CODES

There are eight (8) disciplines within the E/A Design Division of the PANYNJ. All files referenced by contract drawings will be named beginning with the appropriate Discipline Code. The only exception to this rule is the Contract Border file. Sub-discipline codes can be used for MODEL and PLOTSHEET file naming.

Table 5.3.16-A

CODE	DISCIPLINE
A	Architectural
C	Civil
E	Electrical
N	Environmental
G	Geotechnical
M	Mechanical
S	Structural
T	Traffic

6.2 CONTRACT BORDER FILE

The Contract Border file contains general information about the project.

ACRONYM	DESCRIPTION
PID	Eight Digit Project Identification Number

CB	Contract Border

The filename will take the form of:

- PID-CB.dwg (ex. 01234567-CB)

Since one Contract Border file is used by all disciplines of the project, no discipline code is used in its file name. The filename will also contain no spaces or description.

Consultants may create their own Contract Border file only if they are the Lead Discipline. Otherwise, they will request the Contract Border from the EAD LE/A and place it in the Lead Discipline's Publish folder.

If new drawings are added to the Contract Set during a Stage III via an Addendum or in Stage IV - PACC the original Contract Border cannot be used. A new Contract Border will be issued by the Lead Discipline and the new issue date will be included within the Revision Stamp and as the drawing date. The new Contract Border will be issued with the name appended with the date the Addendum is issued and named as follows:

- PID-CB-YYYY_MM_DD.dwg (ex. 01234567-CB-2022_03_02)

The original Contract Border will remain un-changed and both files will co-exist within the Publish folder.

6.2.1 CONFIGURING THE CONTRACT BORDER

To create the project border, open the "Contract_Border.dwg" file provided with this standard fill in all attribute information requested and save it to your discipline's PUBLISH folder with the name following the format described in **6.2 Contract Border File**.

As with the Title Sheet, the "WORK ORDER No." line has been turned off by default and layer GN-ANNO-TTLB-WRKO is to be turned on if a WORK ORDER No. needs to be entered.

For a listing of Contract Border files, refer to the CAD Appendix document section **1.6 Appendix D – Distribution Files**.

Model files are working drawing files containing the actual design geometry and annotations; they may also include externally referenced files from either the discipline's own Model folder or other disciplines' Publish folders. The file names will take form of:

ACRONYM	DESCRIPTION
D	Discipline Code (Refer to **Table 5.3.16-A**)
PID	Eight Digit Project Identification Number
FP	Model File Plan Type (Refer to **Table 6.2.1-A**)
01	Sequence Modifier (If used will be two digits)
User Description	A description of up to 24 characters, including spaces. The following characters are not permitted < > / \ " " : ; ? * | , = ' & %

- DPID-FP01-UserDescription.dwg (M01234567-SPK01-North Wind.dwg)

Refer to the list of approved Model File Plan Types listed in **Table 6.2.1-A.**

Once defined a model file's name will not change through the life of the project. This restriction is required due to the nature of externally referencing Model files.

Table 6.2.1-A lists all allowable Model File Plan Types. For a listing of common Model File Plan Types for particular disciplines, refer to that specific discipline's appendix in the Engineering CAD Appendix document. The Model File Plan Types shown in Table 1.5-C is not discipline specific and available for use by all disciplines.

Table 6.2.1-A

MODEL FILE PLAN TYPE	DESCRIPTION
3D	3D Isometric
AA	Asbestos Abatement
ALN	Alignment Plan
AN	Annotations
AP	Auxiliary Power Plan
ASL	Asbestos Sample Location
BSE	Background Drawing
CD	Communication System Plan
CFP	Concrete Framing Plan
COM	Communication Plan
CP	Control Plan
CPP	Corrosion Protection Plan
CS	Construction Staging
CSD	Control Schematic
D	Decking Plan
DAT	Microsoft Office Document
DTL	Detail
EL	Exterior Elevation
EM	EMCS Plan
EP	Enlarge Plan
EV	Environmental Plan
FA	Fire Alarm
FD	Foundation Plan
FNP	Furniture Plan
FP	Floor Plan
FPW	Floor Plan Wall
FR	Framing Plan
FS	Fire Suppression Plan
GP	Grounding Plan
GRD	Grading Plan

MODEL FILE PLAN TYPE	DESCRIPTION
GT	Geotechnical Plan
HDP	HVAC Ductwork Plan
HP	Hydraulic Profile
ICM	ITS Communication Plan
IDX	Index of Drawings
IEL	Interior Elevation
IMG	Image
JL	Joist Girder Load Diagram
KP	Keyplan
LA	Lead Abatement
LIP	Lighting Plan
LP	Landscape Plan
LR	Lightning Protection Plan
LSL	Lead Paint Sample Location
MD	Machine Design Plan
MH	Material Handling Plan
MIS	Miscellaneous
MLS	Marking Lighting & Signage
MT	Maintenance of Traffic Plan
NOT	Notes and Specifications Plan
ONL	One Line Diagram
PAV	Paving Plan
PB	Presentation Border
PIP	Piping Plan
PJ	Project Location
PL	Part Plan
PLP	Plumbing Plan
PM	Pavement Marking Plan
PP	Power Plan

MODEL FILE PLAN TYPE	DESCRIPTION
PPL	Pre-cast Panel Layout Plan
PPP	Pollution Prevention Plan
PRF	Profile
QP	Equipment Plan
RCP	Reflected Ceiling Plan
RE	Reinforcement Plan
RI	Riser Diagram
RL	Removal
RM	Remediation Plan
RP	Roof Plan
SCH	Schedule
SE	Soil Erosion Plan
SEC	Section
SF	Stair Framing Plan
SG	Signal Plan
SK	Sketch
SNP	Sign Plan

MODEL FILE PLAN TYPE	DESCRIPTION
SO	Sequence of Operation Plan
SP	Site Plan
SPK	Sprinkler Plan
SPP	Specialty Piping Plan
ST	Steel Framing Plan
STG	Staging Plan
TB	Truss Bracing Plan
TOP	Topographic Plan
TRK	Track Plan
UTL	Utility Plan
WD	Wiring Diagram
WET	Wetland Plan
WG	Wind Girt Plan
WTP	Water Treatment Plan
WWT	Wastewater Treatment Plan
XB	X Bracing Plan

The Sequence Modifier is restricted to the following two options:

- Option 1 – Without using the Sequence Modifier

  For Example:

  M01234567-SPK-Level 2 North Wing.dwg

  M01234567-SPK-Level 2 South Wing.dwg

  M01234567-SPK-Level 4 North Wing.dwg

  M01234567-SPK-Level 4 South Wing.dwg

- Option 2 – Using the Sequence Modifier

  For Example:

  M01234567-SPK02-North Wing.dwg

  M01234567-SPK02-South Wing.dwg

  M01234567-SPK04-North Wing.dwg

  M01234567-SPK04-South Wing.dwg

Note that each discipline can choose which of the options they will follow for the project.

6.3 PLOTSHEET FILES

Plotsheet files are drawings assembled as sheets for plotting consisting of an externally referenced Contract Border, an inserted Drawing_Info block and externally referenced Model files from either the discipline's own Model folder or other disciplines' Publish folders. The filename will take the form of:

ACRONYMN	DESCRIPTION
D	Discipline Code (Refer to **Table 5.3.16-A**)
PID	Eight Digit Project Identification Number
PT	Plotsheet Plan Type (Refer to **Table 6.3.1-A**)
XX	Series Modifier (Refer to **Section 6.4**)
01	Sheet Number

- DPID-PTXX01.dwg (ex. M01234567-SP001.dwg)

For multiple layouts in one Plotsheets file the filename will take form of:

- DPID-PTXX01_PTXX02.dwg (E01234567-ES001_ES004.dwg)

The Plotsheet file is not permitted to have a user description appended to its name.

Sheet Set Manager has been adopted for the use of Plotsheet creation. When using Sheet Set Manager, a .dst file format shall be submitted in the Plotsheets folder and the filename will take form of:

- DPID.dst (E01234567.dst)

6.3.1 PLOTSHEET PLAN TYPE

Plotsheet Plan Types organize the contract drawings within the contract document set, they are the alphabetic character components of the sheet number depicted in the lower right-hand corner of the plotted sheet.

A listing of the Plotsheet Plan Types usable by specific discipline appears in **Table 6.3.1-A.**

Table 6.3.1-A

USEABLE BY	DESCRIPTION	PLOTSHEET PLAN TYPE
Confidential and Confidential Privileged	Cover Sheet (See Section 1.9.4)	CV
All Disciplines	Index of Drawing Sheet (see Section 1.9.4)	IX
	General Project Sheets (Regional Plan, Project General Notes, etc.)	G
	Stage IV Sketch Sheets (For Stage IV use only)	SK
	Construction Staging or Sequence Plan	CS
	Title Sheet	TS
Architectural	Architectural Plan	A
	Landscape Plan	LS

Civil	Civil Plan	C
	Marking Lighting & Signage	ML
Electrical	Electrical Plan	E
	Corrosion Protection Plan	CP
	Electronics Plan	ES
	Fire Alarm Plan	FA
	Marking Lighting & Signage	ML
Environmental	Environmental Plan	N
Geotechnical	Geotechnical Plan	GT
Mechanical	Mechanical HVAC Plan	M
	Baggage Handling Plan	B
	Fire Protection Plan	FP
	Plumbing Plan	P
	Sprinkler Plan	SP
	Vertical Transportation Plan	VT
Structural	Structural Plan	S
Traffic	Traffic Plan	T
	Intelligent Transportation Systems	ITS
	Maintenance of Traffic	MT
	Signal Plan	SG

6.3.2 PDF FILES

PDF files will be created at full-size, directly from the AutoCAD drawing files. When signing and sealing, if applicable, do not disable the function that allows the document to be printed to PDF.Two forms of PDF files can exist, Single Sheet and Multi Sheet.

The PDF filename will take the form of:

ACRONYM	DESCRIPTION
D	Discipline Code (Refer to **Table 5.3.16-A**)
PID	Eight Digit Project Identification Number
PT	Plotsheet Plan
XX	Series Modifier (Refer to Section **6.4 Drawing Number Conventions**)
01	Single Sheet Number
XX01_XX20	Starting Sheet Number to Ending Sheet Number

- DPID-PTXX01.pdf (Single Sheet)
- DPID-PTXX01_PTXX20.pdf (Multi Sheet)

The PDF file is not permitted to have a user description appended to its name.

PDF files will be submitted as multi-sheet files at every milestone submission of the project and will be created:

- From the current set of Plotsheet files
- Full Size (either 22x34 or 34x56)
- In black and white (exception: graphic signage type sheets)
- In consecutive order
- Grouped together by Discipline Plotsheet Plan Type and drawing number

When using a Series drawing arrangement, the PDF files will be named by grouping them together by Plotsheet Plan Type.
DWF files are not permitted as substitutions for PDF files.

For Example:

- T01234567-G001_G007.pdf
- T01234567-T101_T307.pdf

In addition, a multi-sheet contract set PDF is required by the LE/A. Once the individual discipline's PDFs are submitted to the LE/A, a multi-sheet contract set of the drawings needs to be created and saved in the Lead Discipline's PDF folder. This should be assembled according to the Drawing Index and named by the **Contract Number** only.

For Example:

- EWR154395.pdf

6.4 DRAWING NUMBER CONVENTIONS

The Port Authority CAD Standards supports three options of sheet numbering, numbering by "One-Digit-Series", numbering by "Two-Digit-Series" or numbering by "Counter" alone. At the start of each project the LE/A will determine which numbering option will be used. This (and only this) option will be used by all disciplines for every contract drawing produced for the project.

When a "Series" numbering system is chosen by the LE/A, each disciplines Task Leader will be responsible for the determination of what drawing types are assigned to each of the available counters in the series. This information will be distributed within the discipline by the Task Leader.

These three formats **cannot** co-exist on the same project. The Sheet Number will take the form of:

Option One		
Plotsheet Plan Type	Series Number (1 through 9)	Counter Number (01 through 99)
S	1	01

Option Two		
Plotsheet Plan Type	Series Number (01 through 99)	Counter Number (01 through 99)
S	01	01

Option Three	
Plotsheet Plan Type	Counter Number (001 through 999)
S	001

Option One (One-digit series)

For projects with nine or less series the sheet number format will include a one or two letter Plotsheet Plan Type followed by a one-digit series number followed by a zero-padded, two-digit sheet "counter" number.

- Use digits "0" through "9" as the series numbers
- Series number can be skipped
- Counter numbers must be consecutive numbers beginning at "01" for each series.
    - D_Series Number_Drawing Counter
    - Example: S101

Option Two (Two-digit series)

For projects with ten or more series the sheet number format will include a one or two letter Plotsheet Plan Type followed by a two-digit series number followed by a two-digit sheet "counter" number.

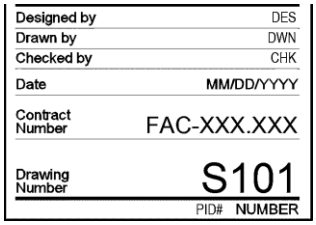
- Use digits "01" through "99" as the series numbers
- Series numbers can be skipped
- Counter numbers must be consecutive numbers beginning at "01" for each series.
    - D_Series Number_Drawing Counter
    - Example: S0101

Option Three (Without Series)

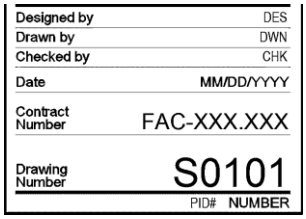
For projects that are not using a series the sheet number format will include a one or two letter Plotsheet Plan Type followed by a zero-padded three-digit sheet "counter" number.

- Counter numbers must be consecutive numbers beginning at "001"
- D_Counter Number
    - Example: S001

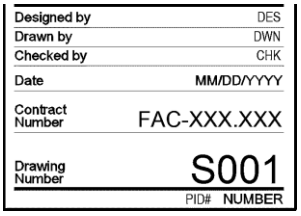
The following images display how the three options would appear on a Plotsheet.



Option 1



Option 2



Option 3

6.5 LAYERING SCHEME DEFINITION

All layers contained within E/A Design Division drawings have been defined using variations of the Tri-Services and the AIA layer guidelines and standards. All disciplines use a layer standard that is similar.

FIELD	DESCRIPTION	LENGTH
Discipline	Discipline Code	Table 1.5.7-B
Major	Major grouping of features that have common characteristics	4 Chr
Minor	Sub grouping of Major category	4 Chr
Description	Extended description of layers for clarity	4 Chr
Phase	Indication of the information's current Phase	Table 1.5.7-A

Table 6.3.2-B

CODE	DISCIPLINE
A	Architectural
L	Landscape
C	Civil
E	Electrical
N	Environmental
G	Geotechnical
M	Mechanical
S	Structural
T	Traffic
GN	General

Table 6.3.2-A

CODE	PHASE
EXST	Existing
OTHR	Work by others
RELO	Relocation
RMVL	Removal
TEMP	Temporary
FUTR	Future (if needed)

Note that the discipline codes listed in **Table 1.5.7-B** are for layer definitions only. Sub-discipline codes should not be used for layer naming.

The major components of a standard layer name are defined as follows:

Discipline-Major-Minor-Description-Phase

For Example:

- C-UTIL-STRM-IDEN or C-UTIL-STRM-SYMB-RELO or C-UTIL-STRM-SYMB-RMVL

The field position and character count in each component of the layer stratagem is always to be preserved for standard layer naming. The underscore "_" character is used to both pad and fill unused character spaces in fields or fill entire unused fields. Character padding is always appended to the right side of the fields designation.

For Example:

S-BEAM-STL_-____-EXST

The E/A Design Division layering stratagem consists of nine discipline groups and a general group that corresponds to spatial data layers to assist in the isolation of information f or design purposes and for the translation and use with GIS. Although every attempt has been made to create an all -encompassing standard, reality dictates that additions will need to be made to the layer stratagem. In the case that additions are required, they will only be accepted as additions to minor or description categories. If an addition is required to the Standard layer list for the discipline or major categories, then a Request to Change Standard Form is required. Project specific layers can be used and should follow the layer naming convention in the CAD Appendix **Section 1.3.1 Request to Change Standard**.

6.6 Folder Naming Convention

For the folders allowed to create sub-folders within the pre-defined folder structure will take the form of:

ACRONYM	DESCRIPTION
YYYY	Four digit Year
MM	Two digit Month
DD	Two digit Day
User Description	A description of up to 24 characters, including spaces. The following characters are not permitted < > / \ " " : ; ? * | , = ' & %

- YYYY_MM_DD-User Description

7.0 CAD Practices and Procedures

CAD drawing files must be consistently formatted in order to provide an effective method of data dissemination and retrieval. To that end, these standards will guide the user in the requirements of layer naming, graphic symbology, lettering styles, drawing units and other drawing related features.

7.1 CAD Environment Setup

In order to plot successfully using this standard, some configuration of the AutoCAD environment will be necessary. This configuration will only need to be done once and will streamline plotting moving forward.

7.2 COORDINATE SYSTEMS

In an effort to organize, consolidate and standardize the information generated and consumed by all divisions within the agency, Coordinate Systems must be used on all projects. Go to the VDC Requirements **section 5.3** for the default horizontal and Vertical systems.

7.3 TEMPLATE DRAWING SETUP

For proper plotting and consistency, the CAD Standard makes use of template drawing files. Supplied with this standard are two primary template files:

- PA-deci-feet.dwt" for Decimal units
- PA-arch-inch.dwt" for Architectural units

All templates are essentially blank drawings saved with the extension ".dwt", that have been started from scratch, been assigned a unit type and make use of a CTB f ile. In addition, both templates have the Text Style LINEFONT defined for use with the CAD Standard linetypes. If you currently have a drawing template, ensure that your template has the "Use Color Dependent Plot Styles" option selected and the "Default plot style table" set to "PA-MasterFULL.ctb" as shown in **Figure 1.6.3-1**. These options are found under the "Plot Style Table Settings" button of the Plot and Publish tab in the Options dialog box.

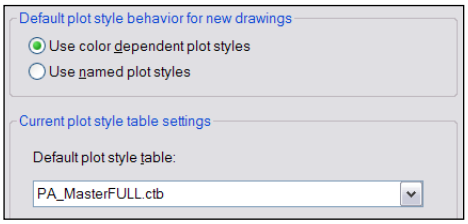


Figure 6.3.2-1

7.4 UNITS

Every object created is measured in drawing units. Before drawing can begin, the drawing units used will need to be decided based on the type of plan being drawn. All drawings will be created at actual size with the unit convention decided on.

Template files have been provided for both, Architectural units (inches) and Decimal units (feet). These templates can be found at:

2022 Disciplines Templates

Consultant can find the template by downloading the support files and go to:

All_Discipline_Support_File/Template

The creation of all drawings will be accomplished by using one of the two templates provided with the CAD Standard. By adhering to this process problems will be avoided when loading custom EAD linetypes. For a listing of which templates are typically used by each discipline refer to **Table 1.6.4-A**.

ARCHITECTURAL UNITS	DECIMAL UNITS
Architectural	Civil
Electrical	Environmental
Mechanical	Geotechnical
Structural	Traffic

Table 6.3.2-A

7.5 ENTITY AND LAYER LINETYPES

Standard E/A Design Division linetypes have been created for use with all design documents. These linetypes have been assigned to their respective layers in the <Layers.dwt> drawings, which have been provided for each discipline as part of this standard. Special linetypes supplied require the use of a textstyle named LINEFONT, starting a drawing with the template drawings provided as part of this standard will ensure that the linetypes are loaded correctly. All entities will have their linetype assigned “bylayer”.

To ensure correct linetype scaling settings for Plotsheet drawings the “LTScale” and “PSLTScale” variables will be set to “1” prior to plotting. This sets all linetypes to be scaled based on the paper space viewport scale f actor.

For design (MODEL) files, which utilize model space, will have the “LTScale” variable set to the drawing scale. “MSLTSCALE” should be set to ‘0’

For discipline specific linetype usages refer to the Engineering CAD Appendix document sections **1.8 Appendix F – Architectural Discipline** through **1.14 Appendix M – Traffic Discipline**. All entities will be drawn on the specified layers and must have color assigned to “bylayer”. Layer color assignments are included in the layer definitions provided.

For discipline specific color usages refer to the Engineering CAD Appendix document sections **1.8 Appendix F – Architectural Discipline** through **1.14 Appendix M – Traffic Discipline**.

7.6 BLOCKS

A pre-arranged group of geometry that can be inserted at scale into a drawing. is defined by AutoCAD as a “block”. There are two (2) types of blocks provided in this standard, Scalable and Non-Scalable blocks. Standard blocks have been provided as part of this standard.

For discipline specific symbol definitions refer to the Engineering CAD Appendix document sections **1.8 Appendix F – Architectural Discipline** through **1.14 Appendix M – Traffic Discipline**..

7.6.1 SCALABLE BLOCKS

Scalable blocks are created with the intent that they will appear the same size when plotted at different scales.

- Blocks are created on Layer “0” and will automatically take on the characteristics of the layer they are inserted on. All blocks will be inserted on the layer identified within this standard.
- For ease of use, the insertion scale factor of each scalable block will depend on the plot scale.
- Any text associated with the block should be on layer “0”, color set to “212”

7.6.2 NON-SCALABLE BLOCKS

Non-Scalable symbols are created with the intent that they will appear at true size for all plot scales.

- Blocks are created on Layer “0” and will automatically take on the characteristics of the layer they are inserted on. All blocks shall be inserted on the layer identified within this standard.
- The insertion scale factor for all Non-Scalable blocks will be “1”.
- Any text associated with the block should be on layer “0”, color set to “212”

7.6.3 CREATING BLOCKS

Blocks must be documented and supplied to the CAD committee in digital format as a single AutoCAD drawing file accompanied by a plot of the block and a Request to Change Standard Form found in the Engineering CAD Appendix document **section 1.3.1 – Request to Change Standard**.

Blocks will be created on Layer "0". Other layers may be present in the drawing for supplemental information such as no-plot information within the block.

- Blocks will be created using the current version of AutoCAD software in use by the E/A Design Division.
- Colors and Linetypes will always be set to "bylayer".
- Text within the block will utilize one of the Text Styles provided within this standard so that it is legible upon plotting. Any text associated with the block should be on layer "0", color set to "212"
- The block will be drawn so that the insertion point is located appropriately and is at 0,0,0.
- The "base" of the drawing will be set to 0,0,0.
- The block drawing will be purged of all unused blocks, layers, linetypes, text styles, etc.

7.7 PLOTTED LINEWEIGHTS

Table 7.6.3-A

VARIABLE	VALUE
Color	Black
Dither	On
Virtual Pen Number	Automatic
Linetype	Use Object Linetype
Adaptive	On
Line End Style	Use Object End Style
Line Join Style	Miter
Fill Style	Use Object Fill Style

The colors used in the layer definitions provided within this standard correspond to plotted pen weights. AutoCAD products make use of a CTB file to assign pen weights to object colors. All Contract Drawings are to be plotted using the "PA-Master.ctb" file that is provided with this standard. Many variables within the CTB file remain constant throughout the pen assignments, these variables are defined in Table 7.6.3-A. The pen numbers, lineweights and percent screening assigned to the pens used in the "PA-MasterFull.ctb" file is displayed displayed inTable 7.6.3-B. The values displayed in Table 7.6.3-A and Table 7.6.3-B are for Contract Drawings, disciplines are permitted to use their own ctb files for presentation and Stage I documentation purposes.

Table 7.6.3-B

Pen	Color	Weight	Screen
1		0.0100	100%
2		0.0140	100%
3		0.0200	100%

Pen	Color	Weight	Screen
4		0.0360	100%
5		0.0080	100%
6		0.0240	100%

Pen	Color	Weight	Screen
7		0.0080	100%
8		0.0080	100%
9		0.0080	100%

Pen	Color	Weight	Screen
10		0.0140	100%
11		0.0180	100%
12		0.0100	100%
13		0.0280	100%
14		0.0080	100%
15		0.0140	100%
20		0.0180	100%
21		0.0080	100%
23		0.0200	100%
24		0.0320	100%
30		0.0400	100%
31		0.0080	100%
32		0.0200	100%
33		0.0240	100%
35		0.0240	100%
37		0.0080	100%
40		0.0200	100%
41		0.0140	100%
42		0.0080	100%
43		0.0240	100%
46		0.0040	100%
50		0.0200	100%
51		0.0280	100%
52		0.0240	100%
53		0.0040	100%
54		0.0100	100%
60		0.0160	100%
61		0.0100	100%
62		0.0080	100%
71		0.0100	100%

Pen	Color	Weight	Screen
80		0.0100	100%
81		0.0200	100%
82		0.0140	100%
83		0.0080	100%
90		0.0240	100%
92		0.0120	100%
93		0.0080	100%
96		0.0100	100%
100		0.0160	100%
110		0.0080	100%
120		0.0200	100%
121		0.0140	100%
130		0.0100	100%
131		0.0200	100%
132		0.0040	100%
133		0.0080	100%
140		0.0240	100%
141		0.0320	100%
142		0.0180	100%
143		0.0080	100%
144		0.0720	100%
148		0.0100	30%
150		0.0280	100%
170		0.0200	100%
172		0.0240	100%
180		0.0040	100%
190		0.0080	100%
110		0.0080	100%
120		0.0200	100%
121		0.0140	100%

Pen	Color	Weight	Screen
130		0.0100	100%
131		0.0200	100%
132		0.0040	100%
133		0.0080	100%
140		0.0240	100%
141		0.0320	100%
142		0.0180	100%
143		0.0080	100%
144		0.0720	100%
148		0.0100	30%
150		0.0280	100%
170		0.0200	100%
172		0.0240	100%
180		0.0040	100%
190		0.0080	100%
191		0.0140	100%
192		0.0240	100%
194		0.0200	100%
200		0.0100	100%
201		0.0280	100%
202		0.0100	100%
210		0.0160	100%
211		0.0320	100%
212		0.0140	100%
220		0.0200	100%
221		0.0040	100%
222		0.0100	100%
223		0.0040	100%
230		0.0160	100%
231		0.0240	100%

Pen	Color	Weight	Screen
232		0.0440	100%
234		0.0160	100%
240		0.0040	100%
241		0.0080	100%
242		0.0040	100%
244		0.0080	100%
250		0.0040	80%
251		0.0080	70%
252		0.0080	60%
253		0.0080	50%
254		0.0040	40%
255		0.0480	100%

7.8 TEXT STYLES AND HEIGHTS

To promote consistency in Contract Drawings as well as prevent the use of “third -party” un-licensed AutoCAD font files, and to ensure a consistent plotted appearance of text, only ARIAL.TTF, ARIALN.TTF, and RomanS fonts are permitted for use on Contract Drawings. It should be noted that RomanS font is not permitted for general use, being reserved specifically for use in Line Types that contain text.

Six Text Styles have been provided as part of this standard. Two of the Text Styles provided (ARIAL, and Linefont) are used f or Contract Border, Drawing Information or Linetype definitions and are not permitted f or general use by the disciplines. The remaining four Text Styles provided, which are permitted for use by the disciplines are created as annotative styles and utilize ARIAL.TTF font. Annotative styles allow the AutoCAD product to scale the text heights appropriately based on the scale of the plotted drawing. The Text Styles provided are:

TEXT STYLE	PLOTTED HEIGHT	ANNOTATIVE	FONT	DESCRIPTION OF USE	USABLE BY DISCIPLINES
PA – 0.10	0.10”	Yes	ARIAL.TTF	Normal Text	Yes
PA – 0.15	0.15”	Yes	ARIAL.TTF	Headings	Yes
PA – 0.20	0.20”	Yes	ARIAL.TTF	Titles	Yes
PA – 0.25	0.25”	Yes	ARIAL.TTF	Alternate Titles	Yes
Linefont	0.10”	No	RomanS.shx	Linetype Definitions	No
ARIAL	Varies	No	ARIAL.TTF	Contract Border and Drawing Info	No

TEXT SETTING AND SCALES					
DRAWING SCALE:	DIMSCALE (SCALE FACTOR [in])	TEXT HEIGHT [in] IN MODEL SPACE			
		PA - 0.10 (3/32")	PA - 0.15 (5/32")	PA - 0.20 (13/64")	PA - 0.25 (1/4")
1:1	1	0.10	0.15	0.20	0.25
ARCHITECTURAL DRAWINGS					
1/32" = 1'-0"	384	38.4	57.6	76.8	96
1/16" = 1'-0"	192	19.2	28.8	38.4	48
3/32" = 1'-0"	128	12.8	19.2	25.6	32
1/8" = 1'-0"	96	9.6	14.4	19.2	24
3/16" = 1'-0"	64	6.4	9.6	12.8	16
1/4" = 1'-0"	48	4.8	7.2	9.6	12
3/8" = 1'-0"	32	3.2	4.8	6.4	8
1/2" = 1'-0"	24	2.4	3.6	4.8	6
3/4" = 1'-0"	16	1.6	2.4	3.2	4
1'-0" = 1'-0"	12	1.2	1.8	2.4	3
1-1/2" = 1'-0"	8	0.8	1.2	1.6	0
3" = 1'-0"	4	0.4	0.6	0.8	1
SITE PLANS					
1" = 5' (1:5)	60	6	9	12	15
1" = 10' (1:10)	120	12	18	24	30
1" = 20' (1:20)	240	24	36	48	60
1" = 30' (1:30)	360	36	54	72	90
1" = 40' (1:40)	480	48	72	96	120
1" = 50' (1:50)	600	60	90	120	150
1" = 60' (1:60)	720	72	10.8	144	180
1" = 100' (1:100)	1200	120	18	240	300
1" = 200' (1:200)	2400	240	36	480	600
1" = 300' (1:300)	3600	360	54	720	900
1" = 400' (1:400)	4800	480	72	960	1200
1" = 500' (1:500)	6000	600	90	1200	1500
1" = 600' (1:600)	7200	720	108	1440	1800

7.9 Dimension and Leader Styles

To promote consistency in Contract Drawings only the Dimension and Leader Styles that have been provided as part of this standard are permitted for use. Three Dimension Styles and eight Multi-Leader Styles that have been provided are:

DIMENSION STYLE	ARROW HEAD	CONTENT	UNIT TYPE
PA-Arrow	Closed Filled Arrow	0.10” Mtext	Inches
PA-Arrow-Deci	Closed Filled Arrow	0.10” Mtext	Feet
PA-Tick	Tick	0.10” Mtext	Inches

7.10 TABLE STYLES

As with the text and dimension styles, the EAD CAD Standard has provided Table Styles as part of this standard in an attempt to promote consistency throughout the creation of Contract Drawings.

TABLE STYLE	DESCRIPTION OF USAGE
PA-Table	General Tables

7.11 EXTERNAL REFERENCE FILES

Files that are “attached” using AutoCAD’s XREF command should always use the coordinate 0,0 for two-dimensional files or 0,0,0 for three-dimensional files as the insertion point and a zero rotation angle.

All external reference drawings will be attached as “Overlays”. By adhering to this process, all users will be able to use drawings within their own disciplines as well as drawings from other disciplines without concern for circular references and other potential problems. The path type will be set to “Relative Path”, for both, external reference drawings and external reference images, this process will ensure the proper exchange of drawings and/or images between in-house staff and outside consultants.

8.0 SUBMISSIONS

CAD files in DWG and PDF format, accompanied with hardcopies are required at 100% Milestone Submissions.

Until project completion, all current working drawings are saved in the MODEL, PLOTSHEETS and PUBLISH folders of each discipline’s root directory.

At the completion of every milestone, each discipline will copy its MODEL, PLOTSHEETS and PUBLISH folders, into the appropriate milestone sub-folder within SUBMITTALS. Refer to **section 5.3.4 MILESTONES FOLDER**

Once the folders have been copied, the involved Task Leaders will notify the LEA, who will then notify the CAD Support Group for Cad compliance report, refer to **12.0 Compliance CAD Standards Report**. Upon notification, the CAD Support Group will only move files from the discipline’s SUBMITTALS folder to the ARCHIVE server.

The SUBMITTALS folder is for internal use only. Consultants are required to submit the entire Project Folder Structure as outlined in **5.1 Project Folder Structure** containing not only the Discipline folder in which their drawings are saved but also all other Discipline folders from which external references were made.

8.1 STAGE I_100PERCENT

Stage I (Conceptual Design) is used to develop design concepts, confirm Facility scope, determine anticipated construction costs and schedules and to compare alternatives before proceeding with Design Development (Stage II) or Final Design (Stage III).

8.2 STAGE II_100PERCENT

Stage II (Design Development) is used to develop the chosen design concept, further refine anticipated construction costs and schedules before proceeding to final design (Stage III).

8.3 STAGE III_PA-WIDE REVIEW (100%)

The Stage III (Final Design) effort includes preparation of contract documents that will be used for construction. The procedures vary for alternate delivery methods such as Work Order Contracts, Design/Bid/Build, Design/Build Contracts and Design/Build/Operate/Maintain Contracts.

PA Wide Review usually happens when the project is between 90% to 95% complete, this may vary depending on the project specifics. When a project reaches PA-Wide Review, full-sized PDFs are required to begin the Electronic Review Process.

8.4 STAGE III_AS-ADVERTISED-SIGNED-SET

The signed and sealed, updated based on PA-Wide 100% submission comments review, final submission plotted on Permalife® paper is the “As Advertised Signed Set”. All original signatures shall be in blue ink.

8.5 STAGE III_ADDENDUM

The Addendum Set contains drawings that have been modified or new drawings that have been issued after the original As Advertised Signed Set was signed, sealed, and issued. Not all addenda contain drawings; some may only contain specifications or other revised contract information pertinent to bidders. There for, an Addendum Set may contain non-consecutive addenda sub-folders. The StageIII_Addendum f older should only contain the Addenda sub-folder in which drawings were required. This folder should not contain the entire set of CAD files; it should only contain the Addenda files.

The revision procedures detailed in section **9.3.4 Making Revisions in Contract Drawings** apply to Addenda.

8.6 STAGE III_AS-BID

The As-Bid Set incorporates all the addenda that have been issued during the bid period and the As Advertised drawings, specifications and contract book sections that have not been modified by Addenda.

8.7 STAGE IV_PACC

The PACC Set (Post Award Contract Changes) contains As Bid drawings that have been modified or new drawings that have been issued after the Contract was awarded.

The revision procedures detailed in section **9.3.4 Making Revisions in Contract Drawings** apply to PACC Sets.

8.8 STAGE IV_RECORD DRAWINGS

The Drawing-of-Record Set is the set of drawings created after construction is completed.

In addition to any revisions required by the Engineer, updated Design Files shall include all approved (a) Shop Drawing changes as field verified by the Contractor, (b) revisions resulting from responses to requests for information (RFIs) during performance of the Work, and (d) accurate geometry and location for all constructed Work.

All submissions shall include a description of updates made to these files and all necessary linked files to ensure a comprehensive, coordinated submission (including but not limited to *.dwg and/or *.rvt files). When requested by the Engineer, editable model geometry and data shall be submitted in native approved formats (e.g., *.rvt, *.dwg) in addition to published formats (i.e., *.pdf).

All files submissions should be delivered following the Standard drawings requirements; the Contract Border should include the “As-Constructed” Stamp to indicate the drawings reflect the final conditions of each element in the field.

Files will be submitted for compliance review and will need to be approved in order to closeout the Project final Submission.

8.9 PLOT SETUP

All drawings will be plotted from a paper space layout tab. The tab will be named the same as the sheet number being plotted. Full-size and Half-size sheets may be plotted from a single layout by utilizing page setups. Multiple layouts are not to be used f or the separation of Full-size and Half -size sheets. Multiple layouts may be used for the plotting of multiple sequential sheets.

Stage I CAD Standard

In an effort to streamline the CAD projects a comprehensive CAD Standard has been developed. Although this standard was intended for use with projects that are at Stage II or beyond, many of the ideas are to be implemented during the Stage I effort.

8.10 PAGE SETUP

Page Setups enable the user to save specific settings within the AutoCAD plotting environment. The Page Setups created for the in-house designers make use of PC3, PMP and CTB files as well as configuration changes. PC3 files are typically copied to the “Plotters” folder under the root AutoCAD installation directory. The Page Setups created for in-house use are located on the internal network at Disciplines Page Setups.

The Page Setups that contain the PC3, PMP and CTB of the Port Authority are for the use of in-house designers since they are configured for the plotters within the Agency. Outside consultants will not have access to the Port Authority’s plotters but may want to develop page setups using the Authority standards.

9.0 PLAN SET PREPARATION

9.1 AUTOCAD 2022 CONFIGURATION (PLOTTING BY LAYOUT)

AutoCAD 2022 options must be modified to ensure proper placement of the Contract Border in the paper space layout environment.

To make the required modifications, right click within the drawing pane and select Options. From within the Options dialog, select the Display tab and make the changes shown in **Figure 7.6.3-1** to the “Layout Elements” portion of the tab and then select “OK”.

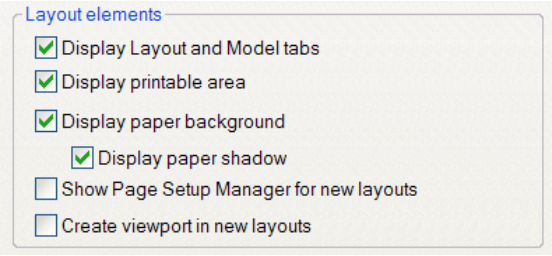


Figure 7.6.3-1

The Layout Elements settings that were changed affect the workstation and will not need to be reconfigured in future sessions.

9.2 PLAN SET TITLE SHEET

The term “Title Sheet” refers to the topmost sheet of the plan set. The use of block attributes will ensure consistency between contracts and improve the appearance of all contracts sets. It is important to maintain the integrity of the Title Sheet.

9.2.1 TITLE SHEET CONFIGURATION

The Title Sheet drawing has purposely been created in paper space. As a result, this border drawing cannot be inserted as a block or externally referenced into other drawing files. The process for defining t Title Sheet is as follows.

- Begin by opening the Title_Sheet.dwg file located at:
    - Title Sheets and Contract Borders (In-house)
    - All_Discipline_Support_File\Template (Consultant)
- Once open, Save the drawing to the appropriate project sub-folder.
- Enter the appropriate values for each attribute provided in the Title Sheet.

9.2.2 ENTERING TITLE SHEET INFORMATION

Each Title Sheet drawing file provided with the standard has three signature lines defined. They are:

- Chief of Design, E/A Design Division
- Program Director “XX” or Sr. Program Manager “XX” or Program Manager “XX”
- Chief Engineer/Director

There are two possible options for the signature lines. Refer to **Table 9.2.2-A** and

Table 9.2.2-B to identify which option to use based on your contract type and cost and to determine which Layers are to be turned off for each option.

Table 9.2.2-A

CONTRACT TYPE	ENGINEER'S ESTIMATE	TITLE SHEET SIGNATURES REQUIRED	OPTION TO USE
S/M/WBE Contracts	Up to $1,000,000	Chief of Design, E/A Design Division Facility Sr. Program Manager / Program Manager	Option 1
	Above to $1,000,000	Chief of Design, E/A Design Division Facility Program Director Chief Engineer/Director	Option 2
Work Order Drawings and Standard Contracts	Up to $2,500,000	Chief of Design, E/A Design Division Facility Sr. Program Manager / Program Manager	Option 1
	Above to $2,500,000	Chief of Design, E/A Design Division Facility Program Director Chief Engineer/Director	Option 2

Table 9.2.2-B

LAYER NAME	STATUS FOR OPTION 1	STATUS FOR OPTION 2
GN-ANNO-TTLB-CHIF	OFF	ON
GN-ANNO-TTLB-PDIR	OFF	ON
GN-ANNO-TTLB-PMAN	ON	OFF

Under no circumstance will the Title Sheet block attributes be exploded or modified. **Figure 9.2.2-1** shows the default Title Sheet provided with the EAD CAD Standard. The “WORK ORDER No.” line has been turned off by default and layer GN-ANNO-TTLB-WRKO is to be turned on if a WORK ORDER No. needs to be entered.

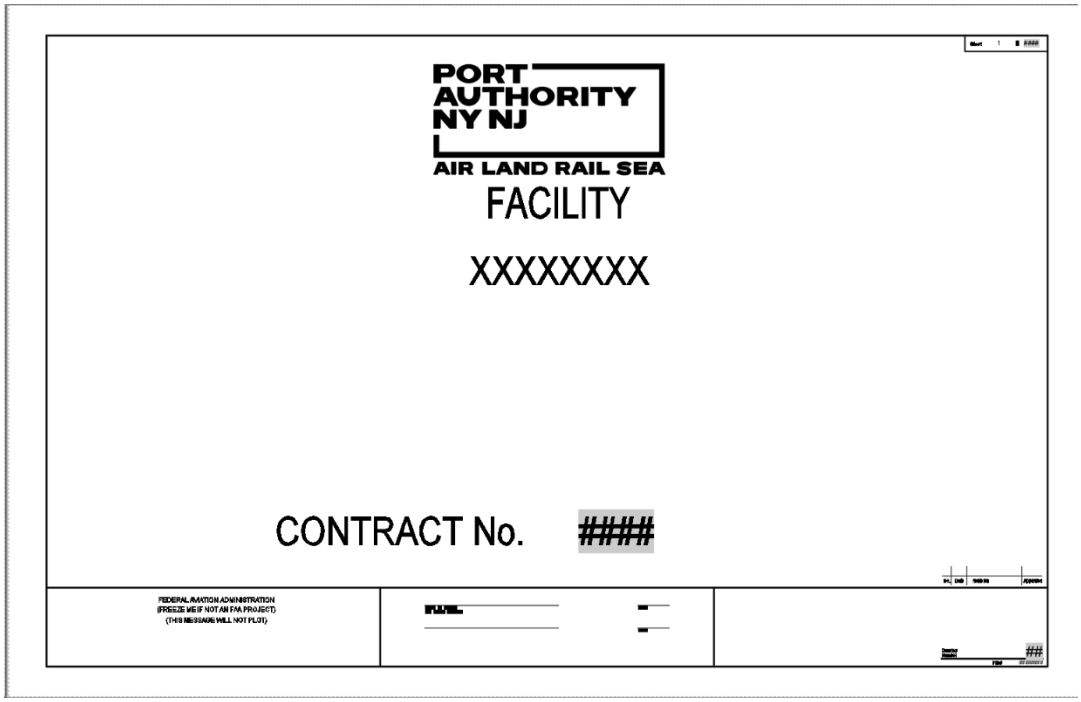


Figure 9.2.2-1

The “PROGRAM DIRECTOR” line contains an attribute, which by default is set to XX. The XX value is to be replaced with one of the following options:

- TB&T
- PORT COMMERCE
- AVIATION
- PATH
- SECURITY
- WTC

Under the Contract Number the letters “FAC” are to be replaced with the appropriate Facility Code listed in **Table 5.3.16-A** and then followed by the Contract Number itself.

Multiple stamps have been provided within the Title Sheet and are to be turned on/off when necessary. The stamps provided and the layers on which they are stored are show in **Table 9.2.2-C**.

Table 9.2.2-C

STAMP	LAYER NAME
FAA	GN-ANNO-TTLB-FAA
Law Review	GN-ANNO-STMP-LAWR
Preliminary	GN-ANNO-STMP-PRLM
Submission	GN-ANNO-STMP-SUBM

9.2.3 USING THE REVISION BLOCK WITHIN THE TITLE SHEET

A revision block named “Drawing_Info – Stamp_Revision.dwg” has been provided with the EAD CAD Standard. When revisions are made, this block is to be inserted using an endpoint snap to the upper left corner of the previous revision line. **Figure 1.8.2-2** displays where the revision stamp is to be inserted. The stamp is located on the network at:

“Contract Borders Stamps”

“All_Discipline_Support_File\Contract Border\Stamp” (Consultant)

Once inserted the revision block will prompt the user for information pertaining to the revision. Under no circumstances will the revision block be exploded or modified.

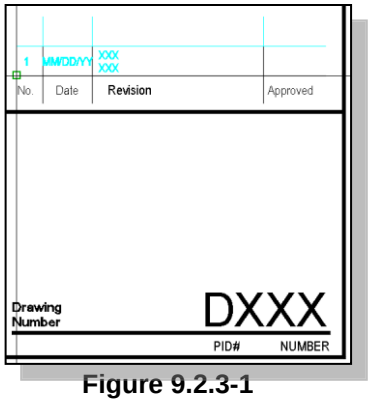


Figure 9.2.3-1

9.2.4 PLOTTING THE TITLE SHEET

The layout for the Title Sheet will be configured to use one of the page setups supplied within this standard. As previously stated, outside consultants will need to configure the page setups for their own use and for the particular environment they are working in. After importing an appropriate page setup, the Title Sheet will be configured to plot by layout and use the PA-MasterFull.ctb plot style.

9.3 PLAN SET PLOT SHEETS

Plotsheet files are drawing files assembled as sheets for printing. These drawings consist only of external reference files, see section **7.11**, and the items indicated below. No line work is permitted within Plotsheet drawings in either Model or Paper space with the following exceptions:

- North Arrows
- Graphic Scales
- Revision Clouds and Revision Cloud Text
- Match Lines and Match Line Text
- View Titles
- Block with the prefix “Drawing_Info”
- Architectural Plotsheets

All Plotsheet files shall make use of a relevant PANYNJ Graphic Scale symbol. Such a scale bar is critical for any party viewing the drawings to be able to verify distances within the drawing. It is mandatory to include a standardized PANYNJ Graphic Scale, available through the PANYNJ CAD Standards website, on each Plotsheet drawing.

In order to comply with this standard, each project will have a single Contract Border that will be created by the Lead Discipline and will be stored in that discipline's PUBLISH folder. All other disciplines will externally reference the border from the Lead Discipline's PUBLISH f older. This border will contain all information pertinent to the project itself. Once the Contract Border is properly referenced into each sheet the appropriate "Drawing_Information" block is to be inserted into each layout tab. The Drawing_Information block will contain all drawing specific information. Illustrations of the Contract Borders provided can be found in the **Engineering CAD Appendix Document – section 1.5 Appendix C – Contract Borders and Title Sheets**.

Outside consultants are required to reproduce the folder structure as specified in **5.0 Project Folder Structure** by copying the Sample Project and replacing the Facility name and PID with those of the current project. All backgrounds (including the Contract Border) provided by the E/A Design Division will go into their respective discipline folders.

9.3.1 REFERENCING THE CONTRACT BORDER

To create a Plotsheet file, begin by externally referencing the Contract Border that was configured in the previous section. The border is to be referenced into a paper space layout, that has been configured following the steps outlined in **8.9 Plot Setup**, with an insertion point of 0,0. Under no circumstances will the contract border be exploded, renamed or modified.

9.3.2 INSERTING THE DRAWING INFORMATION

Once the Contract Border has been externally referenced the "Drawing_Info.dwg" block will need to be inserted. This block will be inserted with an insertion point of 0,0 and all attribute information is to be filled out.

The "Drawing_Info.dwg" block contains a pair of lines that state "Original Signed By" and "Original Signee". These lines of text are stored on the layer GN-ANNO-TTLB-SIGN, which by default is turned off. The "Original_Signee" attribute field is to be filled in using the name of the person that signed the drawings. The layer with this information shall be turned on once the Stage III is completed and contract drawings are signed by the Chief discipline Engineer. **Figure 9.3.2-1** and **Figure 9.3.2-2** display this text OFF and ON. Note, this attribute is only required for internal use and outside consultants need not turn on this layer. For information on the correct process for outside consultants refer to **9.3.7 Using the Signature Stamps**.

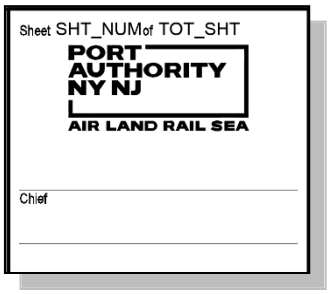


Figure 9.3.2-1

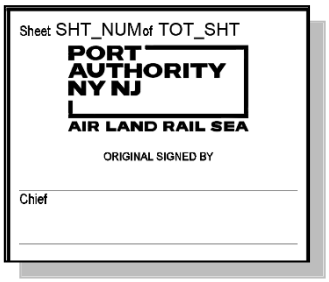


Figure 9.3.2-2

When entering the “Discipline Group” and “Discipline Sub-Group” attribute fields users will need to refer to Table 9.3.2-A for the proper values to be used within these fields.

Table 9.3.2-A

DISCIPLINE GROUP	DISCIPLINE SUB-GROUP
Architecture	
	Landscape
Civil	
Electrical	
	Power
	Electronics
	Corrosion Protection
Environmental	
General	
	Construction Staging
Geotechnical	
Mechanical	
	Fire Protection
	HVAC
	Plumbing
Structural	
Traffic	
	Maintenance of Traffic

To promote consistency and easy identification of the people involved in the project the Designed By, Drawn By and Checked By attribute fields are to be filled out following the next example:

For Example:

Filippo Brunelleschi would fill out the field as F.Brunellesc

Note that spaces before or after the period are not permitted. The process used to create Contract Borders allows for flexibility in editing and updating information both at the project level as well as at the drawing level. If a

project level change is required, then the PID-CB.dwg file can be opened and modified and if a drawing level change is required then the individual drawing can be opened and modified.

9.3.3 CREATING A VIEWPORT

When a viewport is created in Paper Space, it is to be placed on the appropriate layer for that discipline, typically <discipline>"-ANNO-VPRT". Once the viewport is created the scale of the viewport must be set. All Division files are created to be plotted with a scale of 1:1, which means that the viewports created will need to have a scale assigned to them. Once the viewport scale has been assigned and the drawing information has been centered within the view, the viewport display should be set to locked.

9.3.4 MAKING REVISIONS IN CONTRACT DRAWINGS

Two types of revisions can happen in a Contract Drawing Set: Partial Revisions and Additions. A partial revision is when only portions of the Contract Drawings have been changed and an Addition takes place when an additional Contract Drawing is added to the Drawing Set.

Regardless of the revision type, users will be required to place the "Drawing_Info – Stamp_Triangle.dwg" block in the drawing pane, near the revised entities. A revision cloud is also to be placed around the area that is being revised. The revision cloud is not required for new drawings.

For Partial Revisions:

A Revision Cloud will be placed either in Model Space or in Paper Space surrounding just the area of the drawing where changes were made. The Stamp Triangle will be placed right next to the Revision Cloud with an arc linking it to the cloud including the Revision Number, see Figure 1.8-6. The Revision Block will be inserted including the Revision Number as well as the Date, the Description and the Initials of the person that approved the changes (Refer to 1.8.3.6). The initials should be an original signature, in blue ink, for the current revision, if a new revision to the same drawing is required, the first revision initials should be added in AutoCAD and the initials for the new revision should be added in an original signature in blue ink.

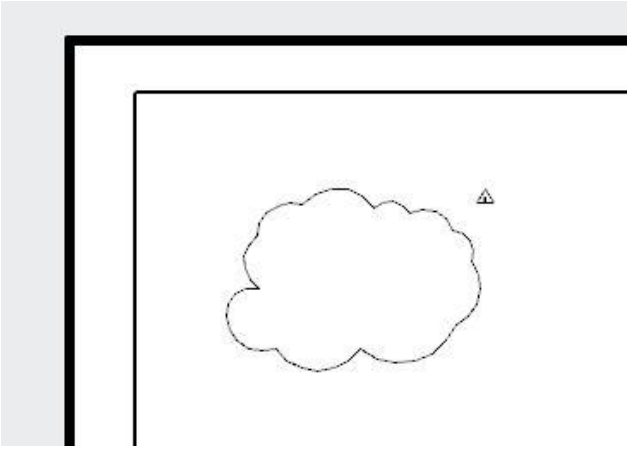


Figure 9.3.4-1

For Additions:

The entry for the Sheet in the Drawing Index will be bubbled with a Revision Cloud. The Revision Block will be inserted including the Revision Number as well as the Date, the Description and the Initials of the person

who approved the changes. A new Contract Border shall be issued, reference **6.2 Contract Border File** for the file name of the Contract Borders use on addition sheets. Lastly, the sheet counter text "Sheet _ of _", displayed on the new drawing, must reflect the location of the new sheet and total number of sheets in the set.

Figure 9.3.4-2

Note that for any drawings that are added within a series (as opposed to the end of the series), all drawings following the inserted drawing must be renumbered correctly so that drawing numbers remain unique. Any drawings that have had their drawing number changed as a result of the addition of a drawing within a series must have the drawing number bubbled on the Sheet itself as well as in the Drawing Index, since the corresponding entry for the drawing shall be modified. When a drawing is removed from the contract set, the Drawing Index will also have the drawing name removed.

9.3.5 USING THE REVISION BLOCK WITH THE CONTRACT BORDER

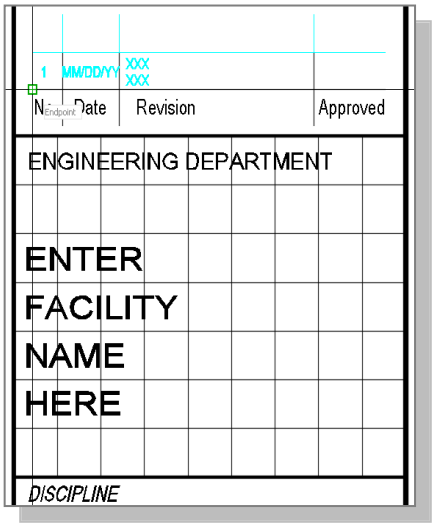


Figure 9.3.5-1

A revision block named “Drawing_Info – Stamp_Revision.dwg” has been provided with the CAD Standard. When revisions are made, this block is to be inserted using an endpoint snap to the upper left corner of the previous revision line. **Figure 1.8.3.5** displays where the revision stamp is to be inserted. The stamp is located on the network at:

Contract Borders Stamps (in-house)

All_Discipline_Support_File\Contract Border\Stamp (Consultant)

Once inserted the revision block will prompt the user for information pertaining to the revision. Under no circumstances will the revision block be exploded or modified.

A revision cloud is to be placed around the area of revision whenever a revision is made. Also, note that when an entirely new sheet is added to the set as a revision, the date of the sheet should be the date of the revision, not the original signature date (a revision note is still required on the new sheet).

9.3.6 USING THE SUBMISSION STAMPS

Submission stamps have been provided for both the Contract Border and Contract Border – OS (oversize) sheets and can be found at:

Contract Borders Stamps

All_Discipline_Support_File\Contract Border\Stamp (Consultant)

The submission stamps will be inserted as blocks within the Contract Border with an insertion point of 0,0. The following submission types have stamps provided with this standard:

- Law-Review
- Preliminary

- QA-Submission
- Percent Submission
- As-Constructed

Figure 9.3.6-1 displays how the submission stamp types appear on the Contract Border.

Figure 9.3.6-1

9.3.7 USING THE SIGNATURE STAMPS

Signature stamps have been provided for both the New York and New Jersey Professional Engineer and Registered Architect and are to be used by outside consultants in-lieu of Consultant Logos. The word "Drawing_Info – Stamp_" has been prefixed at the beginning of each stamp to indicate that these stamps are to be placed within the individual layout tabs and not directly into the Contract Border file. The signature stamps provided within this standard are located at:

Contract Borders Stamps

All_Discipline_Support_File\Contract Border\Stamp (Consultant)

The use of the Signature stamps by outside consultants will require that the GN-ANNO-TTLB-PANU layer be turned off. This layer contains the signature lines for the in-house staff and is not needed when outside consultants are signing the sheets.

Signature stamps are to be inserted with an insertion point of 0,0 and are required to have all appropriate attribute fields filled in. The stamp is dynamic and has visibility states. It should be inserted and then edited. Note that when filling in the Consultant company information only the company name and address is to appear, not the logo. If a sub-consultant is used, then the primary consultant will fill in their company name using the first NYPE Consultant and the second NYPE Consultant attribute fields and the sub-consultant will fill in their company name using the Sub-Consultant1 and Sub-Consultant2 attribute fields. Bi-State drawing information stamps are provided and should be used when it's appropriate.

On the left side of **Figure 9.3.7-1** the Contract Border with the GN-ANNO-TTLB-PANU layer for in-house use turned on is displayed, on the middle of **Figure 9.3.7-1** the Contract Border with that layer turned off and a consultant signature stamp inserted is displayed and on the right side of **Figure 9.3.7-1** the Contract Border with that layer turned off and the Bi-state consultant signature stamp inserted is displayed.

The seal for the Architectural and/or Engineering firm should be shaded or stamped in the open space under the NJ/NY PE/RA consulting firm name.

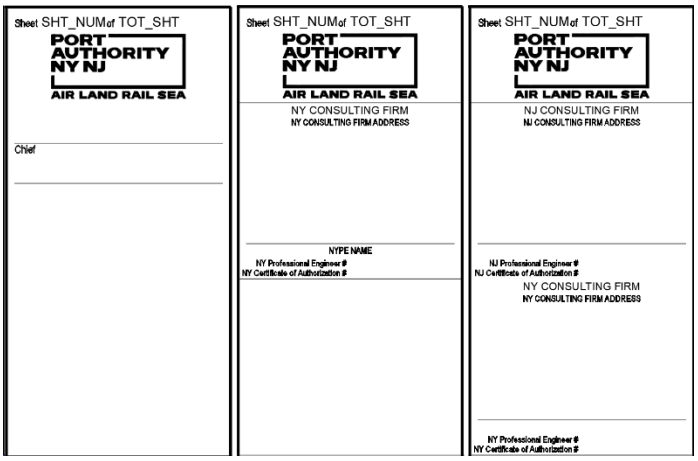


Figure 9.3.7-1

9.3.8 USING THE CONFIDENTIAL PRIVILEGED STAMPS

Confidential Privileged Stamps have been provided for both, the Contract Border and Contract Border - OS (oversize version). The Confidential Privileged Stamps are to be inserted as blocks with an insertion point of 0,0 on each individual sheet unless the entire project is considered Confidential and Privileged, in which case the stamps can be placed within the Contract Border. The Confidential Privileged Stamps provided with this standard are located at:

Contract Borders Stamps

All_Discipline_Support_File\Contract Border\Stamp (Consultant)

Figure 9.3.8-4 illustrates a Contract Border with a Confidential Privileged Stamp (Drawing_Info - Stamp_CPbar.dwg) inserted.

10.0 CONFIDENTIAL & CONFIDENTIAL PRIVILEGED PROJECTS

Confidential and Confidential Privileged Projects are those in which unique circumstances may require different guidelines be followed in order to comply with the CAD Standards. The contents of this document will be followed in addition to the ones already specified in the CAD Standards, unless specifically instructed otherwise within this section.

10.1 PURPOSE

The Port Authority C & CP Standard Compliance outlined is established to provide guidance for the preparation of the EAD Division of the Port Authority of New York and New Jersey's contract documents that contain Confidential and Confidential Privileged information.

This document is intended for use by both in-house personnel as well as outside consultants involved in creating construction documents for the Port Authority. It establishes requirements and procedures for the preparation and submission of CAD based drawings throughout the project life cycle. Adherence to this standard ensures that the E/A Design Division and the Construction Division of the PANYNJ will receive and produce data in a consistent format.

For more information on practices and procedures on protected information projects it can be found on Engineering Department Protected Information Practices and Procedures.

10.2 CONFIDENTIAL PROJECTS

Confidential Projects contain highly sensitive information that if lost or made public could seriously damage or compromise the Port Authority and/or public safety and security. Confidential information includes, but is not limited to, methods utilized to mitigate vulnerabilities and threats, such as identity, location, design construction and fabrication of security systems.

For that reason, if aspects being worked on as part of a project drawing are considered Confidential, they will need to be handled differently than standard contract drawings.

If information on a drawing is considered to be Confidential, then that model drawing is to be stored in the Model_C folder. Any plotsheet drawing that contains Confidential information must be stored in the Plotsheets_C folder. It is permitted to reference non-Confidential information from outside the Confidential f older into a Confidential project. If a model file that has been deemed Confidential needs to be shared across disciplines, then the file is to be copied to the Publish_C folder.

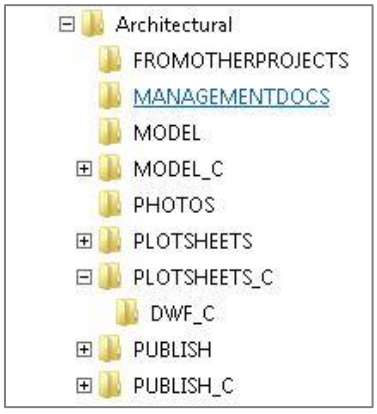


Figure 9.3.8-1

Cover sheets shall be used to divide the complete set into Unmarked, Confidential and Confidential Privileged drawings, the cover sheet files are found inside the Contract Border f older of the standardize files. If a project contains Confidential sheets, then they must be separated out into their own set with its own Cover Sheet. The Confidential Stamp markings at the top, bottom and right side of the pages must be displayed, identifying the project as Confidential. This is accomplished by turning on and thawing the "GN-ANNO-TTLB-CONF" layer. Confidential Cover Sheet doesn't require the use of the Warning stamp.

All interior Confidential pages within the set must also be marked Confidential at the top, bottom, and right side of the page. Sets of documents that are folded or rolled must be marked so that the marking is visible on the outside of the set once folded or rolled. This is accomplished by inserting the "Drawing_Info – Stamp_Cbar.dwg" block into paper space of the Plotsheet drawing containing the Confidential information. The "Drawing_Inf o – Stamp_Cbar.dwg" block is to be inserted with an insertion point of 0,0,0 on layer 0 and is not to be exploded or modified in any way. All the Confidential Markings are displayed in **Figure1.9.2.2** and **Figure 9.3.8-3**.

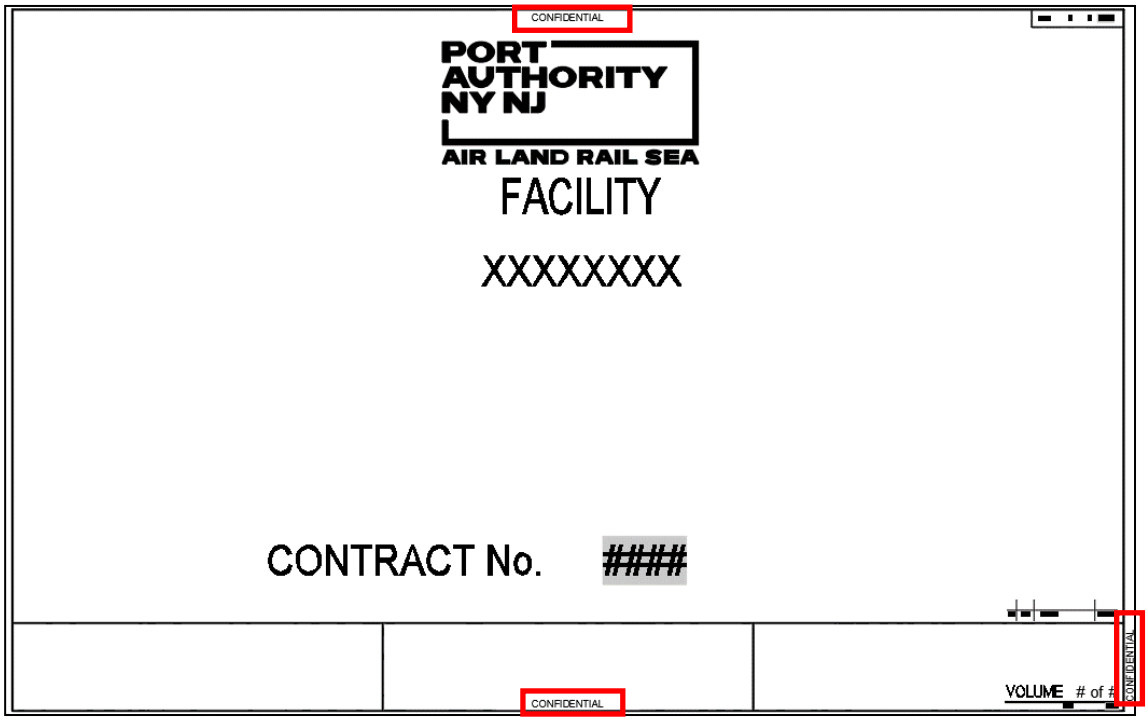


Figure 9.3.8-2

Figure 9.3.8-3

Confidential and Unmarked drawings will be separated into two sets, for more referred to section 1.9.4 C & CP Contract Drawing Set. On the Drawing Index sheet, names of Confidential drawings shall be listed to inform the viewer that additional drawings have protected information. This drawing shall take the form "<Drawing Title> (Protected Information Volume X)", where <Drawing Title> is the title of a Confidential drawing and X is the Volume number as shown in **Figure 9.3.8-4** below.

INDEX OF DRAWINGS	
DRAWING NO.	SHEET TITLE
GENERAL	
TS001	TITLE SHEET
G001	INDEX OF DRAWINGS
CIVIL	
C001	NOTES, LEGEND AND ABBREVIATION
C002	SITE PLAN (PROTECTED INFORMATION VOL. 2)
ELECTRICAL	
E001	NOTES, LEGEND AND ABBREVIATION
E002	ELECTRICAL DETAILS (PROTECTED INFROMATION VOL. 3)

Figure 9.3.8-4

For more information on the handling and submitting of Confidential projects refer to “The Port Authority of New York & New Jersey Information Security Handbook”.

10.3 CONFIDENTIAL PRIVILEGED PROJECTS

Confidential Privileged Projects contain extremely sensitive security or public safety information that if lost or made public could seriously damage or compromise the Port Authority and/or public safety and security.

Confidential Privileged information includes, but is not limited to, any information identifying vulnerabilities, capabilities, threats, operational methodologies and/or security related design criteria.

For that reason, if aspects being worked on as part of a project drawing are considered Confidential Privileged, they will need to be handled differently than standard contract drawings.

If information on a drawing is considered to be Confidential Privileged, then that model drawing is to be stored in the Model_CP folder. Any plotsheet drawing that contains Confidential Privileged information must be stored in the Plotsheets_CP folder. It is permitted to reference non-Confidential information from outside the CP f older into a Confidential Privileged plotsheet drawing. If a model file that has been deemed Confidential Privileged needs to be shared across disciplines, then the file is to be copied to the Publish_CP folder.

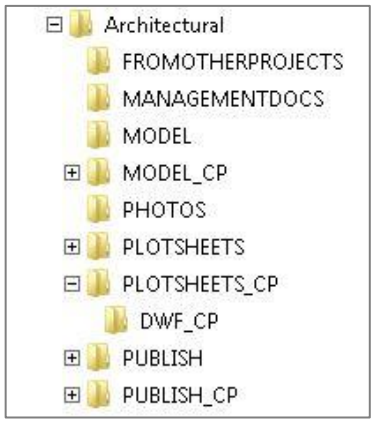


Figure 9.3.8-1

Cover sheets shall be used to divide the contract set into Unmarked, Confidential and Confidential Privileged drawings; the cover sheet files are found inside the Contract Border f older of the standardize f iles. If a project contains any Confidential Privileged sheets, then they must be separated out into their own set with its own Cover Sheet. The Confidential Information Warning Sign (CP - WARNING.dwg) must be displayed on the Cover Sheet of the Confidential Privileged set, along with markings at the top, bottom and right side of the page identifying the project as Confidential Privileged. This is accomplished by turning on and thawing the “GN-ANNO-TTLB-CP ” layer. The Warning Sign is displayed in **Figure 9.3.8-2 and Figure 9.3.8-3.**

"WARNING": THE ATTACHED IS THE PROPERTY OF THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY (PANYNJ). IT CONTAINS INFORMATION REQUIRING PROTECTION AGAINST UNAUTHORIZED DISCLOSURE. THE INFORMATION CONTAINED IN THE ATTACHED DOCUMENT CANNOT BE RELEASED TO THE PUBLIC OR OTHER PERSONNEL WHO DO NOT HAVE A VALID NEED TO KNOW WITHOUT PRIOR WRITTEN APPROVAL OF AN AUTHORIZED PANYNJ OFFICIAL. THE ATTACHED DOCUMENT MUST BE CONTROLLED, STORED, HANDLED, TRANSMITTED, DISTRIBUTED AND DISPOSED OF ACCORDING TO PANYNJ INFORMATION SECURITY POLICY. FURTHER REPRODUCTION AND/OR DISTRIBUTION OUTSIDE OF THE PANYNJ ARE PROHIBITED WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PANYNJ.

AT A MINIMUM, THE ATTACHED WILL BE DISSEMINATED ONLY ON A NEED TO KNOW BASIS AND, WHEN UNATTENDED, WILL BE STORED IN A LOCKED CABINET OR AREA OFFERING SUFFICIENT PROTECTION AGAINST THEFT, COMPROMISE, INADVERTENT ACCESS AND UNAUTHORIZED DISCLOSURE.

Figure 9.3.8-2

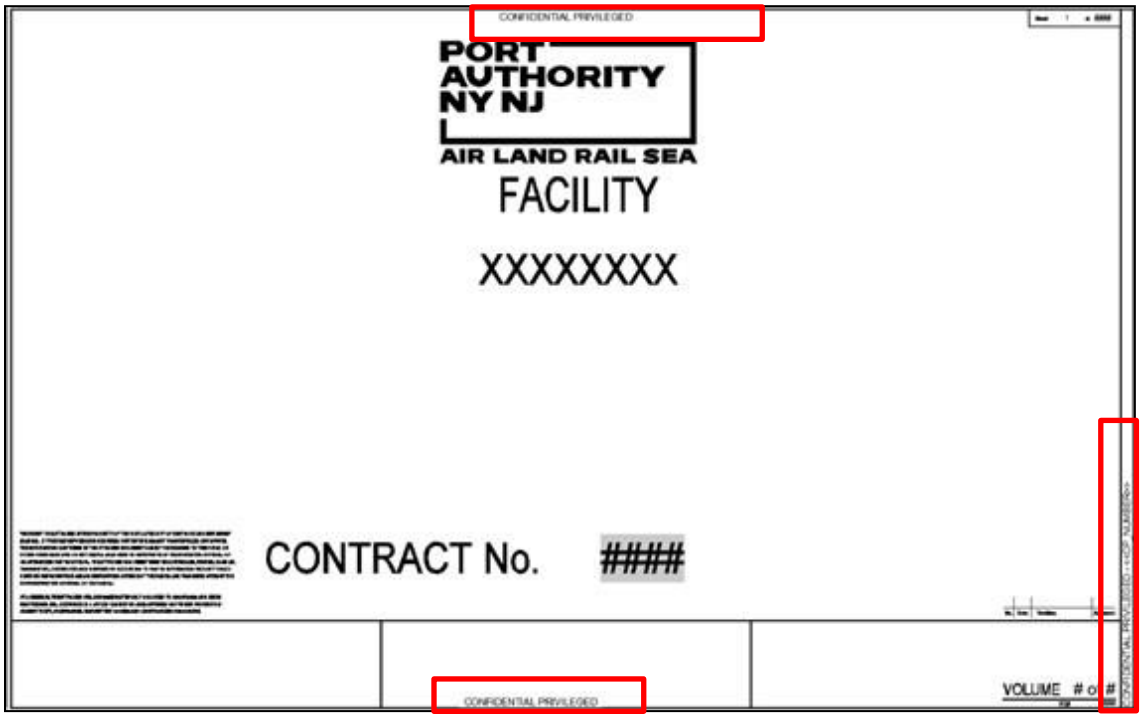


Figure 9.3.8-3

All interior pages within the set must also be marked at the top, bottom and right side of the page. Sets of documents that are folded or rolled must be marked so that the marking is visible on the outside of the set once folded or rolled. This is accomplished by inserting the "Drawing_Info – Stamp_CPbar.dwg" block into paper space of the Plotsheet drawing containing the Confidential Privileged information. The "Drawing_Info – Stamp_CPbar.dwg" block is to be inserted with an insertion point of 0,0,0 on layer 0 and is not to be exploded or modified in any way.

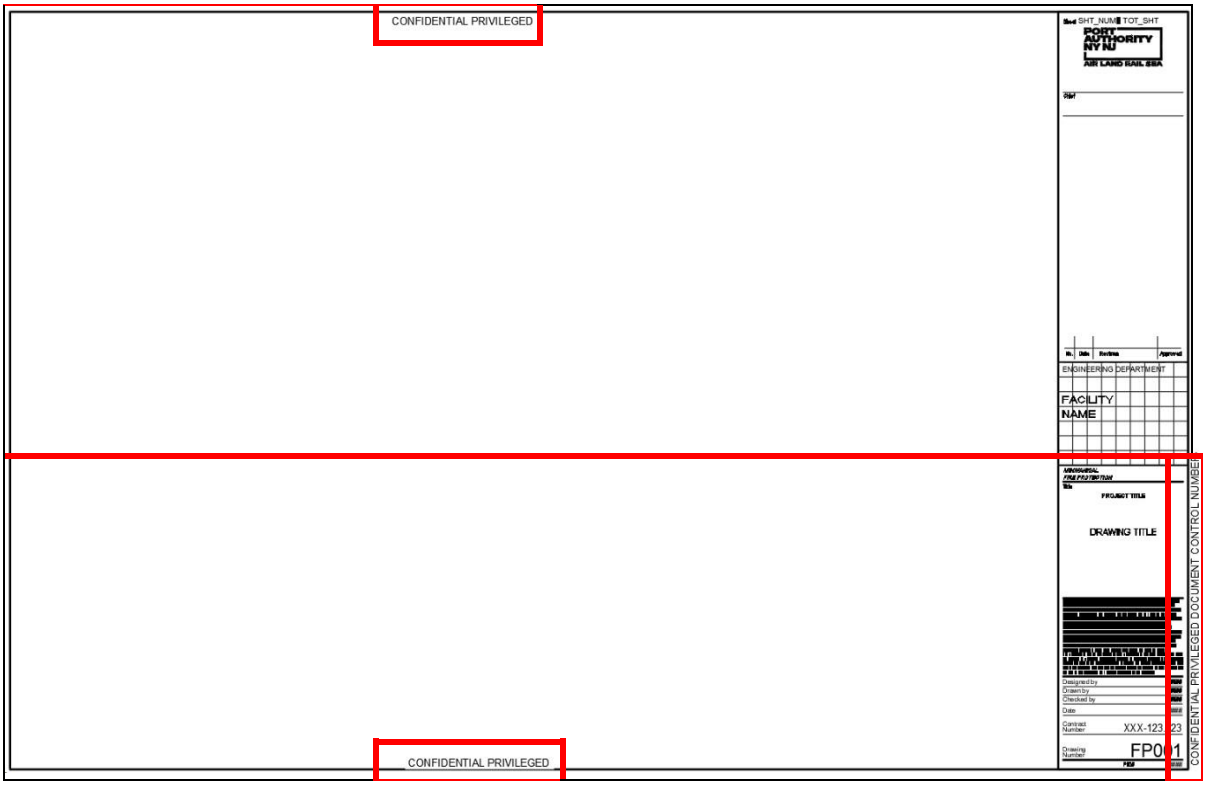


Figure 9.3.8-4

Projects identified as Confidential Privileged are assigned a Confidential Privileged Document Control Number. These markings are to appear on the top, bottom and right side of each printed sheet next to the Conf identical Privileged markings and is also stored on the GN-ANNO-TTLB-CP_layer for title sheets and within the "Drawing_Info – Stamp_CPbar.dwg" block. All the Confidential Privileged Markings are displayed in **Figure 9.3.8-3** and **Figure 9.3.8-4**.

On the Drawing Index sheet, names of Confidential Privileged drawings that are separated out of the main drawing set should be listed to inform the viewer that additional drawings are available and should take the form "<Drawing Title> (Protected Information Volume X)", where <Drawing Title> is the title of a Confidential Privileged drawing and X is the Volume number as shown in **Figure 9.3.8-4**.

For more information on the Document Control Number and the handling and submitting of Confidential Privileged projects refer to "The Port Authority of New York & New Jersey Information Security Handbook".

10.4 C & CP Contract Drawing Set

This document defines what are the requirements that Confidential and Confidential Privileged Projects shall contain prior to submission to the Port Authority. If a project contains both C & CP drawings, then the Contract Set shall be divided into three volumes as stated in section 1.9.2 and 1.9.3. The set containing the unmarked drawings will be Volume 1, the set containing confidential drawings will be Volume 2, the set

containing the confidential privileged drawings will be Volume 3 and shall be marked in the index drawings as the following:

<Drawing Title> (Volume 1)

<Drawing Title> (Protected Information Volume 2)

<Drawing Title> (Protected Information Volume 3)

Each volume shall have a Cover sheet and an Index of drawings with the number of the volume in the file name. The following requirements on

Table 9.3.8-A and Table 9.3.8-B only applies when Confidential and Confidential Privilege documents are part of the Contract Set.

Table 9.3.8-A

STANDARD PROJECTS			
ITEMS INCLUDED PER SET	UNMARKED SET	CONFIDENTIAL SET	CONFIDENTIAL PRIVILEGED SET
Title Sheet*	X		
Cover Sheet		X	X
Warning Label (Title Sheet Only)			X
Signature Lines (Title Sheet)	X		
Index of Drawings	X	X	X
Security Markings		X	X
Document Control Numbers			X

Table 9.3.8-B

SECURITY PROJECTS ONLY			
ITEMS INCLUDED PER SET	VOLUME 1	VOLUME 2	VOLUME 3
Title Sheet*	X		
Cover Sheet		X	X
Warning Label (Title Sheet Only)	X	X	X
Signature Lines (Title Sheet)	X		
Index of Drawings	X	X	X
Security Markings	X	X	X
Document Control Numbers			X

The Title Sheet is the first sheet of the first volume in the Contract Set. The cover sheets are duplicate title sheets sans the drawing number and signature lines, see **Figure 9.3.8-1** and **Figure 9.3.8-2** for reference. The Title Sheet, Cover Sheet and Index of drawings sheets will have unique names to distinguish them from the design/construction plotsheet files.

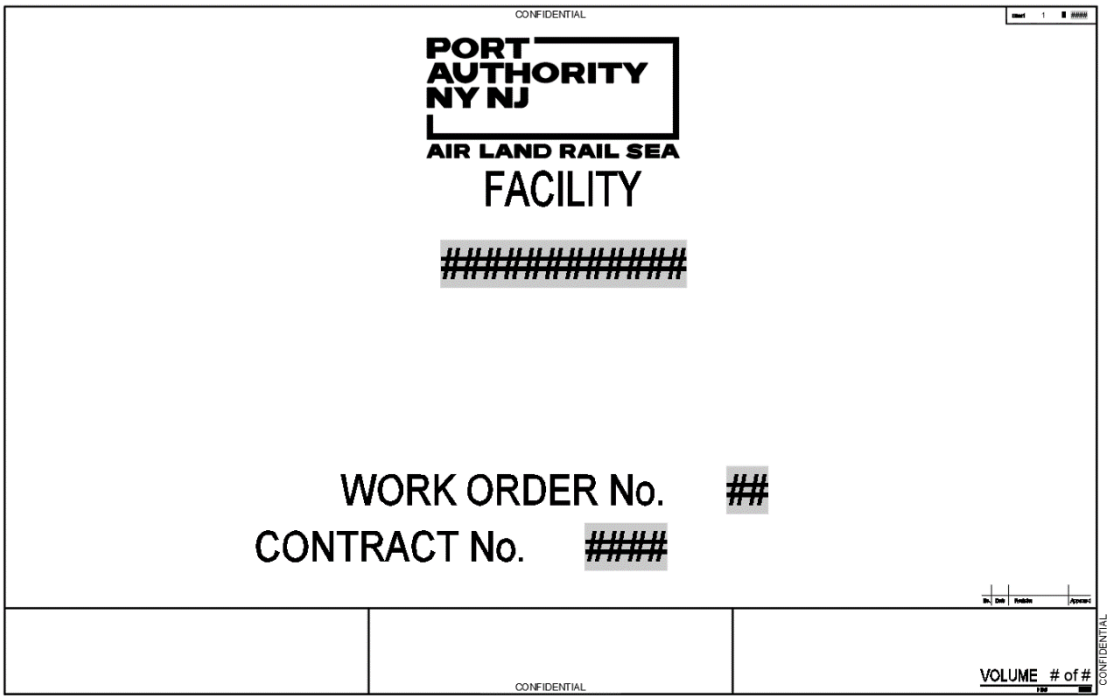


Figure 9.3.8-1

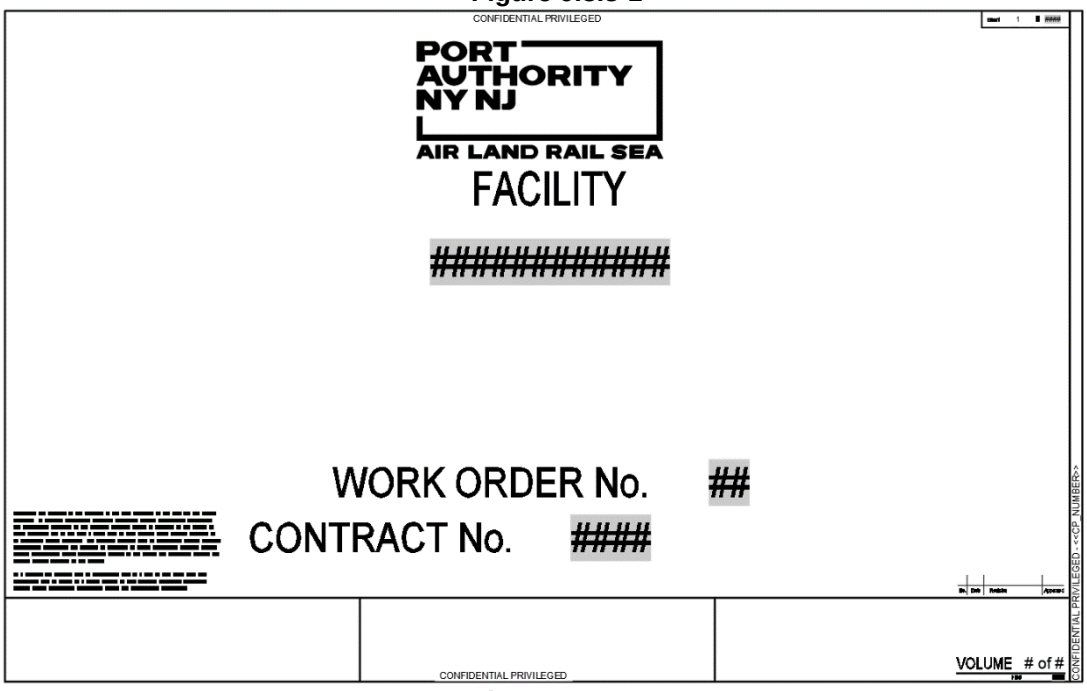


Figure 9.3.8-2

The volume number must be noted in the bottom right corner of the Cover sheet, when multiple volumes are produced. The title sheet is dynamic and has visibility states that allows the Volume attributes to be filled. If the project does not contain any Confidential or Confidential Privileged information the volume number will not be noted on the Title sheet of that set.

11.0 DELIVERABLES

The CAD Standard adopts AutoCAD as the “Standard CAD Software”. Consultants are required to submit electronic CAD files in a format compatible with the current version of AutoCAD software in use by the E/A Design Division of the PANYNJ.

Soft copy submittals (electronic CAD files) must include all information presented on the hardcopy submittals (plots). This precludes the use of sticky-backs, graphic tapes, hand lettering and anything else that is placed on the drawing after it is plotted excepting any signatures and seals.

Consultants are required to submit CAD files accompanied with hardcopies every time a project reaches a 100% submittal milestone. This includes, but is not limited to, PA Review Set, Percent Submittal Set, Addendum Set, As Bid Set, PACC Set, Drawing of Record Set, etc. Refer to **Section 8.0 Submissions.**

When submitting files on electronic media, the AutoCAD drawing file version should be noted.

If terrain model files are requested for the project, the consultant will submit these files in XML format. If alignment files are requested for the project, the consultant will submit alignment files in XML format.

If a coordinate geometry point database is requested for a project, the consultant will supply this database as an XML file.

When requested, these files will be submitted with the project structure intact, as outlined in **Section 4.2 AutoCAD Civil 3D**.

11.1 MEDIA AND FORMAT

AutoCAD drawing files will be submitted on media CDs. All disks are to be delivered virus free.

Final hardcopies of each sheet must use the PANYNJ Contract Border identified in this standard and must be submitted at full size, either 22x34 or 34x56. Submitted hardcopies must use archival paper with Permalife® plotter paper specifications. Engineering Department staff will verify that submissions contain the “Permalife 25% cotton content” watermark. Authorized professional signatures must use blue ink.

11.2 DIGITAL SIGNATURE

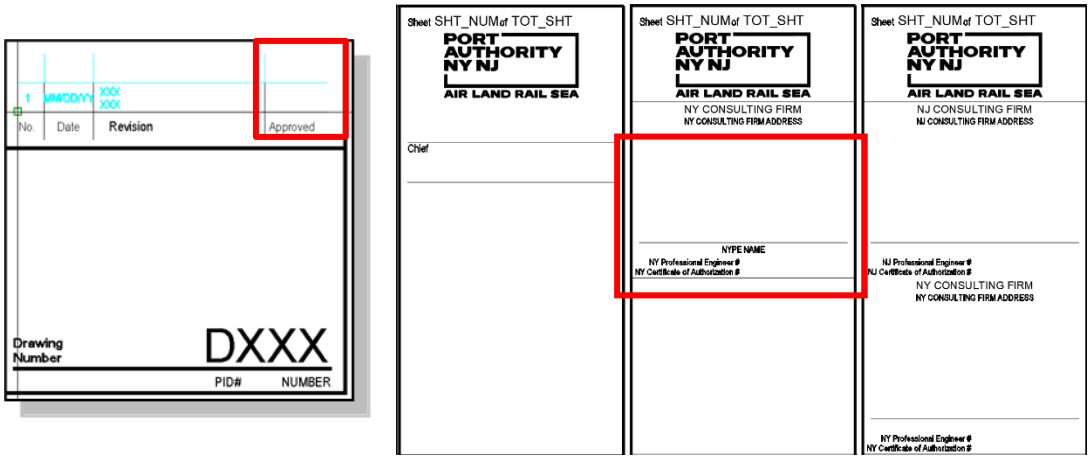
Digital signatures and digital seals will be used on all sheets of the PDF contract sets and documents where signatures are required on all Port Authority projects. Engineering Department staff will be verifying submissions contain the appropriate digital seals and signatures.

Digitally signed and sealed documents following the New York and New Jersey State regulations and guidelines will be provided. Each signee will provide a signed letter stating that all digital signature New York and New Jersey State regulations and guidelines have been followed. Address the letter to the discipline Chief for all discipline involved.

All drawings prepared must be digitally signed and sealed by a Principal of the firm with a New York Professional Engineer’s or New York Registered Architect’s License.

The digital signature and digital initials will be used by all In-House and Consultant professionals. The signature will represent the recipients' evidence of signage and that the document(s) or sheet(s) have been approved.

When reviewing addenda or post award contract change (PACC) drawings, digital initials will be used by the discipline principal and/or checker using Adobe or BlueBeam software. The initials shall be placed on the appropriate revision line in the APPROVED column on the contract border.



The digital seal will also be used by all In-House and Consultant professionals who are required to sign contract. The seal will be used on all contract, addenda and PACC sheets as proof of the professional seal. This is integrated with the digital signature which is applied with DocuSign.

It is the responsibility of all licensed professionals to add the digital signatures to the appropriate contract documents and signify that there are no errors prior to final submission. Once documents have been digitally signed and sealed, they cannot be updated or changed in any manner. It is also the responsibility of the Consultant signee to ensure that all state digital regulations and/or guidelines have been met. A letter or memo certifying compliance should be submitted, by the Consultant, as part of the final deliverables to the Authority.

For more information on how to get and use digital signature and digital seals refer to the Digital Signatures and Digital Seals documentations.

11.3 IDENTIFICATION

All CDs submitted to the E/A Design Division of the PANYNJ will be labeled with the following information:

- Consultant's name and Project Identification Number (PID)
- Contact name and phone number of consulting project manager
- Discipline-Facility (e.g. Civil-JFK)
- Submittal Date and Percent Completed
- Data Format (e.g. AutoCAD Version .dwg)

- File Name(s) on CD
- As much information as possible should be printed on both the CD label and the CD case. If all the information will not fit on either the CD label or the CD case, the information can be listed in an orderly manner in a text file that will be copied to the CD in electronic format.

11.4 PROJECT WEBSITES

The PANYNJ developed a "Project Extranet" to enhance collaboration between in-house designers and outside consultants, as well as with different departments and divisions throughout the agency. All Project Websites have a folder structure similar to that described in **5.0 Project Folder Structure** of this standard.

Please refer to the project specifics to determine if a Project Website is available for use. If so, all transfer of digital information should be made via the website. Transfer of data via email or CDs is not permitted if a project website is available.

If a Project Website is available f or the project the Project Website link will be provided along with a Username and a Password.

12.0 COMPLIANCE CAD STANDARDS REPORT

In an effort to confirm the compliance of the CAD Standard, the use of the Compliance report shall be filled based on the status of all submitted files. CAD Standards reviews are applicable to all projects, in-house and/or consultant that are issued either for construction contracts or work orders.

12.1 WORK ORDER & CONSTRUCTION CONTRACT PA WIDE CAD REVIEW

- Review is mandatory for all Contract Drawings
  - Initial failures are issued to the LEA and Task Leaders
    - 3 weeks are provided for the correction of the files
  - At the end of the 3-week period a Report is issued to the Assistant Chiefs, Principals, LEA and Task Leaders
  - During the PA Wide Review drawings will be analyzed and a FINAL pass/fail Report will be issued.
    - Drawings will not be reviewed after the PA Wide Review period.
- Requirements
  - Timeframe: Required at the on-set of PA Wide Review
  - Initiated by the LEA via EOL request form

Only for **PA Wide Review** upon receipt of the request the CAD Support Group is to upload the files to Live Link for electronic review and notify the Contract Engineer of the initiation of PA Wide Review.

- Final Report is issued the Assistant Chiefs, Principals, LEA and Task Leaders

All items on the CAD Standards Review Report are required to be in compliance with CAD Standards in order for the project to pass, this is followed by a Notes section that includes comments pertaining to the review.

This form will be reviewed on a regular basis and is subject to changes. If a change is approved, it will be posted on the E/A Design Division CAD Standard website https://www.panynj.gov/port-authority/en/business-opportunities/engineering-available-documents.html and incorporated into the next revision of this document.

The following two pages illustrate the CAD Standards Review Report and are to be used as a checklist for checking CAD Standard compliance prior to submitting drawings. (See **Figure 9.3.8-1**and **Figure 9.3.8-2**)

Project information Items

CAD - DISCIPLINE COMPLIANCE REPORT

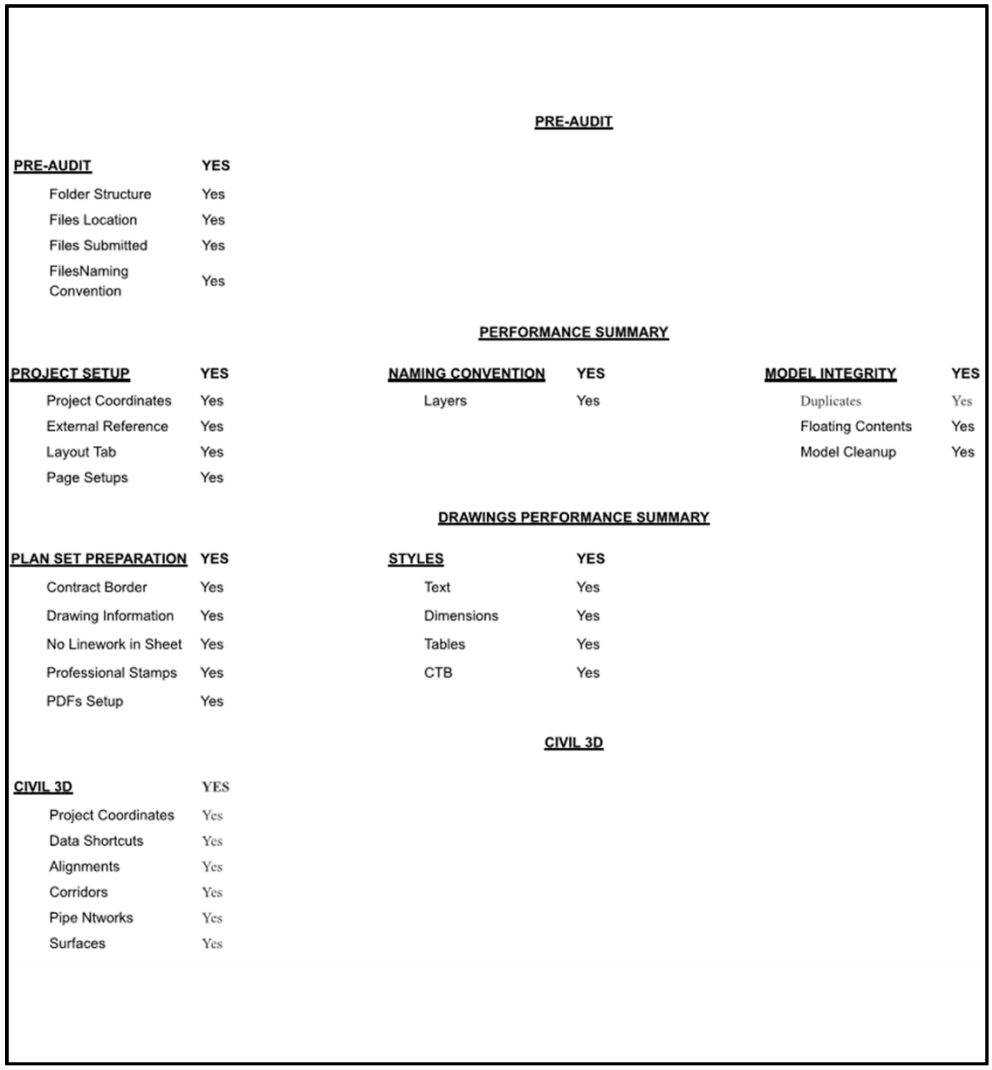
ACCEPTED **Reviewed By:**

PROJECT INFORMATION

Facility Name:	Newark Airport	**Review Type:**	PA Wide Review
Contract Number:		**Submittal Percentage / Number:**	100
PID Number:		**Date Submitted:**	1/3/2022
Project Title:	CAD Report	**Date Reviewed:**	
Stage:	3	**Due Date:**	
Lead Discipline:	Civil	**Task Leader:**	
LEA:		**Discipline:**	Civil
Consultant:		**File Reviewed:**	
Confidentiality Level:	Not Confidential		

Figure 9.3.8-1

Mandatory Items



PRE-AUDIT

PRE-AUDIT	YES
Folder Structure	Yes
Files Location	Yes
Files Submitted	Yes
FilesNaming Convention	Yes

PERFORMANCE SUMMARY

PROJECT SETUP	YES	NAMING CONVENTION	YES	MODEL INTEGRITY	YES
Project Coordinates	Yes	Layers	Yes	Duplicates	Yes
External Reference	Yes			Floating Contents	Yes
Layout Tab	Yes			Model Cleanup	Yes
Page Setups	Yes				

DRAWINGS PERFORMANCE SUMMARY

PLAN SET PREPARATION	YES	STYLES	YES
Contract Border	Yes	Text	Yes
Drawing Information	Yes	Dimensions	Yes
No Linework in Sheet	Yes	Tables	Yes
Professional Stamps	Yes	CTB	Yes
PDFs Setup	Yes		

CIVIL 3D

CIVIL 3D	YES
Project Coordinates	Yes
Data Shortcuts	Yes
Alignments	Yes
Corridors	Yes
Pipe Ntworks	Yes
Surfaces	Yes

Figure 9.3.8-2

12.2 CAD STANDARD UPDATE AND REVISION PROCEDURES

The dynamic nature of CAD technology and the engineering process dictates that this document will change over time. Changes to this document will be made by following strict procedures and guidelines.

Changes may be made based on errors and omissions, as well as to enhance or update the standards based on changes in the CAD environment. All requested changes to this document must be accompanied by a Request to Change Standard form provided in the Engineering CAD Appendix **section 1.3.1 Request to Change Standard**.

Updates to this document and the related support files will be made as required. Updates will be posted on https://www.panynj.gov/port-authority/en/business-opportunities/engineering-available-documents.html. For in-house the updates shall be posted on CAD_Standards\2022 and K:\Documentation\Standards Documents.

13.0 CONTACT AND SUPPORT INFORMATION

Questions regarding the standards provided within this document should be directed to the VDC Support Group at: 212-435-6102 or engvdc@panynj.gov

14.0 CONCLUSION

This document is a comprehensive standard for the creation of contract drawings for the PANYNJ. All drawings submitted to the E/A Design Division and Construction Division must adhere to the conventions documented here. The VDC Support Group will use automated procedures to verify compliance with this standard.