ES122494

CAD Manager's Guide: Using Tool Palettes for Managing Standards and Configuration

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Associated Engineering

Learning Objectives

- Become more productive and efficient in managing your company's CAD standards package
- Eliminate inconsistencies across workstation configurations
- Create company-wide tool palette sets that are automatically updated when content is added/modified
- Best practices for discipline/project specific tool palettes including troubleshooting/support tips and tricks

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Description

Ever wonder if there is an easier way to ensure all drawing production staff have the same, equal access to the company's CAD standards?

This class will overview a variety of configuration, productivity and management solutions that can be deployed using AutoCAD's Tool Palettes.

Tool Palettes should not be limited to sourcing warehoused block/symbol libraries; they can also facilitate company specific CAD software configurations along with a multitude of other tools to assist CAD Managers with eliminating inconsistencies across workstations, projects and even offices.

Tool Palettes can easily become the 'one-stop-shop' for sourcing preconfigured, controlled content and the mechanism to configure AutoCAD-based software for the required environment.

Additional discussions on quick access for discipline/project specific toolsets including troubleshooting/support tools through the use of 'live' tool palettes.

![Autodesk University logo]

Speaker

Chad Franklin is the CAD Coordinator for Associated Engineering, a multi-discipline engineering firm with 21 offices across Canada. He currently provides drawing production coordination including CAD standards development and implementation across the company's 400 Autodesk users.

Having 25 years of experience primarily on civil infrastructure and transportation design, Chad has been utilized for the past 5 years dedicated to full-time development of corporate CAD standards including extensive templates, macros/scripts and lisp, tool palette sets, sheet set manager implementation, quality management and production staff technical support/training.

Chad is an Autodesk Certified Professional (AutoCAD) and a member of the Autodesk Customer Council/Beta programs.

Chad has attended Autodesk University for the past 4 years, returning in 2017 (first time as an AU speaker/instructor).

Chad also authors/owns the AutoCAD Blog: theCADcafé (www.thecadcafe.com).

Contact Information

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AUTODESK COMMUNITY — Find answers, share expertise, and connect with your peers.	[Username: Cadologist](#)

Acknowledgement

I would like to personally thank **Paul Munford**, owner of the [CADSetterOut](#) blog/website and award winning Autodesk University speaker for his mentoring and guidance related to the development of this class and beyond. Thanks Paul, very grateful for your time and assistance!!

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Introduction

*** *This handout uses BOOKMARKS to assist in navigating the content. Be sure to enable this feature within your PDF viewing software.*

What are AutoCAD Tool Palettes?

AutoCAD Tool Palettes became a standard feature in AutoCAD 2004 (Release 19) in March, 2003. They have been available for the past 14 years with little modification or change. Tool Palettes are displayed as a 'panel or palette' within AutoCAD (and AutoCAD-based software such as Civil 3D, Plant 3D, etc.). Tool Palettes can be docked, floating or rolled up, similar to the functionality of the Layer or XREF Manager, Properties Palette, Sheet Set Manager and Design Center.
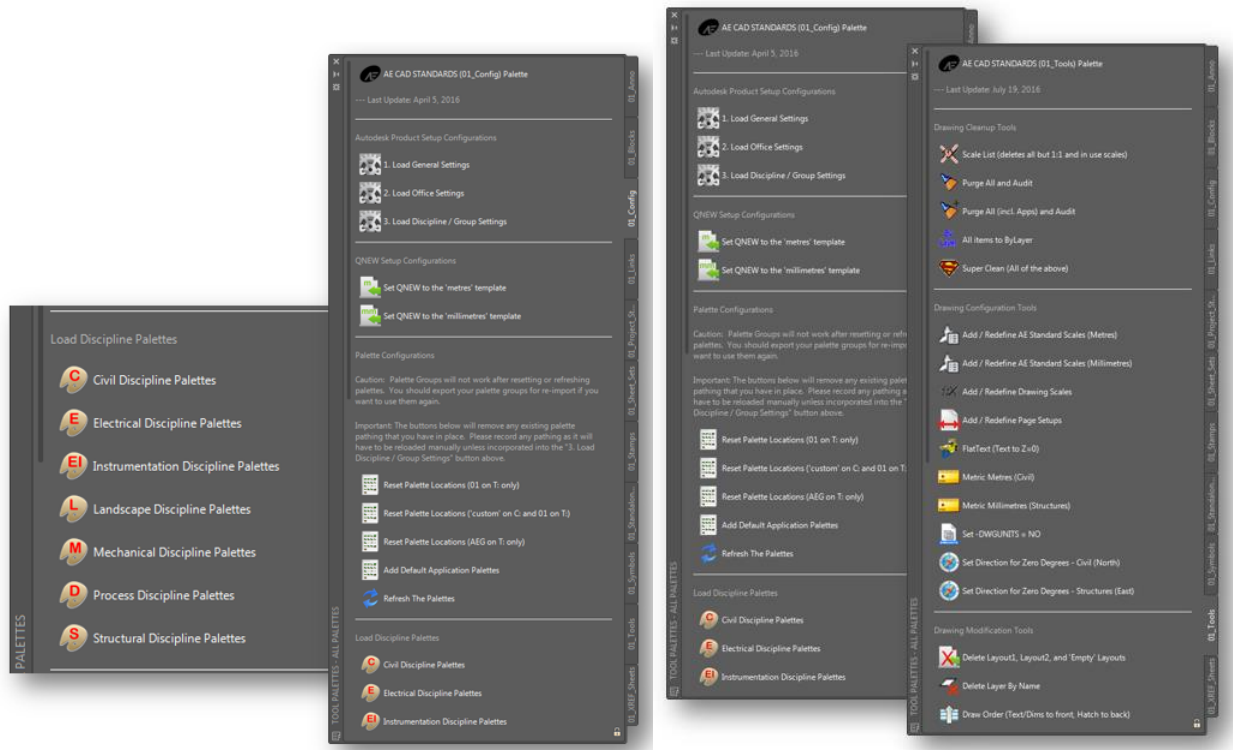
Frequently used symbols, blocks and tools can easily be added to a Tool Palette, many with a simple drag-and-drop approach. Ultimately, Tool Palettes provide convenient, quick access to a variety of frequently used tools and content. Although they are commonly used to warehouse block and symbol libraries; they can also be used to manage standards and configuration. Tool Palettes are highly customizable, allowing for a variety of code (Macros, Script and AutoLISP) to be run through the click of a Tool Palette button.

Customized Tool Palette buttons can greatly assist CAD Managers with distributing time-savings workflows and Support/Troubleshooting tools to resolve a variety of issues that may occur.

![AUTODESK UNIVERSITY logo]

Why Should You Use Them to Manage Standards and Configuration?

As a CAD Manager, providing CAD Standards content, tools, documentation and other entities to all users equally can be a huge challenge. Some CAD Standards content may reside on local or network servers while other content may be stored in SharePoint sites, other depositories, etc. So what options are available to create a "one-stop-shop" for users to access this content?

The Answer = AutoCAD's Tool Palettes...!!!

Design Center can be useful to warehouse templates, sheet borders, symbology, annotation styles and other content, however it cannot 'configure' AutoCAD settings and easily be used as a troubleshooting tool. With Tool Palettes, configurations can be coded into a 'button'.

Accessing stored content on a corporate or regional/local server manually (through Windows Explorer) is another option, however users will have to constantly 'leave' their drawing(s) to go and find the content that they require. It takes time to hunt through multiple folder structures to find that key item that is required at that moment. With Tool Palettes, everything is a simple mouse click away, all accessed from the same location (within AutoCAD) regardless of where the content is stored (file pathing).

Install or Deployment images can preconfigure some settings but what happens when a user needs to update/modify the settings or add new required content post-install?

Throughout this handout (and class) I will be providing problem solving and viable productivity solutions that we at Associated Engineering have had success with; by providing users with consistent, equal access to company and project CAD Standards content using AutoCAD's Tool Palettes.

Tool Palettes are an ideal platform for providing all necessary and future content to your users, including options to directly provide solutions to issues, with only a simple click of a button.

For more information on AutoCAD's Tool Palettes, refer to the [Autodesk Knowledge Network (Creating Tool Palettes) – CLICK HERE](#).

Before you Begin

Before creating your company's Tool Palettes, you should consider what existing content is already available, respective to the company's CAD Standards package. Before adding content to a Tool Palette, ensure that content is free of errors or omissions and has been thoroughly tested.

As a CAD Manager, the last thing you want to provide your users with is incorrect, error filled, incompatible content that doesn't work correctly.

Types of content that can be added to a Tool Palette, includes:

- Drawing Templates
- Sheet Borders
- Blocks and Symbols Libraries
- Sheet Border Stamps
- Annotation Standards / Styles (Text, Dimension, Multi-Leader, Tables)
- Plotter Support Files (CTBs)
- Other?

Because Tool Palettes can be constantly updated and modified, you can start small and over time continue to add additional content (and additional Tool Palettes) to your company's Tool Palette set.

In fact, starting small has several benefits as users will not necessarily be overwhelmed with a ton of new/fresh content all at once. As a suggestion, to facilitate adoption and awareness of Tool Palettes, getting staff to assist with the development and contribution of the company's Tool Palette set can be worthwhile as staff may already have ideas or solutions at hand that they would like to see implemented.

Network Considerations

As a best practice, CAD Standards content should be warehoused on a server location where access rights are enabled. This approach ensures that CAD Standards content is unaltered and cannot be modified (accidentally) by staff, whereas the CAD Manager and respective stakeholders will have the ability to update, modify and edit content (as required).
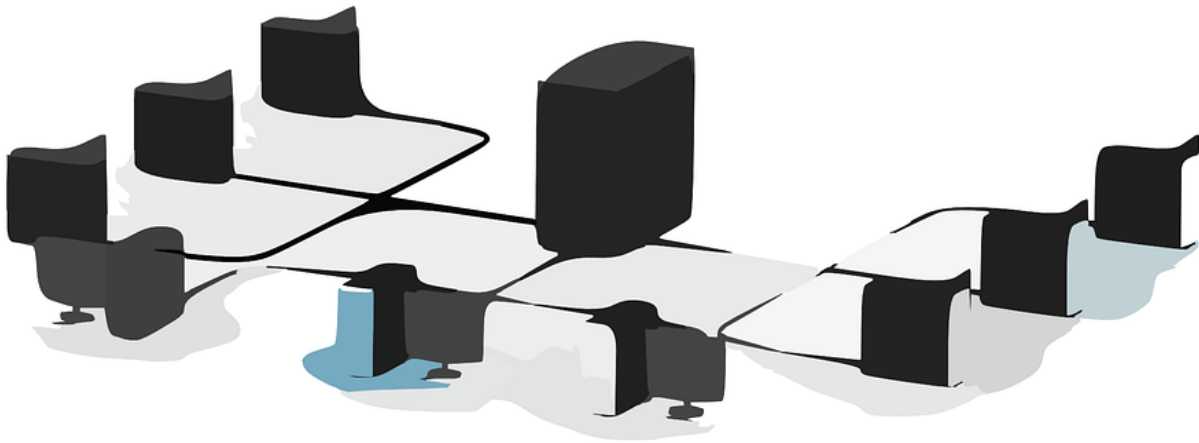
- **Read-Only Access:** Majority of users within the company should be limited to accessing the content in a 'read-only' structure. This type of access ensures that users can only access the content without the option to edit, delete or create any new content. Most users will not require 'modify' privileges as CAD Standard content and development should be limited to only a select number of users/management.

- **Modify Access:** Only users directly involved with managing and developing content (company and project CAD Standards) require 'modify' access. This type of access ensures that those responsible and with the authority to update and create content have the required access to complete those tasks.

Using the above system will ensure that only vetted CAD Standards content is made available to the userbase while mitigating potential issues that may arise (i.e.: accidental edits, deletions, errors propagating throughout files, etc.).

Once the content has been reviewed and warehoused on a secure network location, it can then be used to source and populate Tool Palette sets.

Available References

There are multiple articles on Autodesk's Knowledge Network to assist in getting you started with Tool Palettes and related coding. Be sure to visit the site and use the search functionality to find the desired information you are looking to obtain. The search crawls not only Product Documentation but also Forum Posts, Technical Support, YouTube and Screencast videos, as well as blogs and other online depositories. I have highlighted several links below.

AutoLISP Developer's Guide - - http://au.autodesk.com/au-online/classes-on-demand/class-catalog/classes/year-2015/autocad/gen11407#chapter=0

AutoLISP Functions Reference - - https://knowledge.autodesk.com/search-result/caas/CloudHelp/cloudhelp/2018/ENU/AutoCAD-AutoLISP-Reference/files/GUID-4CEE5072-8817-4920-8A2D-7060F5E16547-htm.html

About Command Macros - - https://knowledge.autodesk.com/support/autocad-lt/learn-explore/caas/CloudHelp/cloudhelp/2018/ENU/AutoCAD-LT/files/GUID-D991386C-FBAA-4094-9FCB-AADD98ACD3EF-htm.html

About Command Scripts - - https://knowledge.autodesk.com/search-result/caas/CloudHelp/cloudhelp/2016/ENU/AutoCAD-Customization/files/GUID-95BB6824-0700-4019-9672-E6B502659E9E-htm.html

In addition to the Autodesk Knowledge Network, you can search Autodesk University Online for hundreds of recorded sessions from past Autodesk University conferences.

I have provided a selection of past classes that I either attended in person or references in the past regarding Tool Palettes and Code Workflows and Learning (Macros, Script and AutoLISP) and other customizable options for AutoCAD.

Be sure to check them out!! For other past Autodesk University classes that have been

Paul Munford: AutoCAD Tool Palettes Master Class (Planning and Preparation, Not Perspiration) - - http://au.autodesk.com/au-online/classes-on-demand/class-catalog/classes/year-2017/autocad/lo-aec02#chapter=0

Sam Lucido: Mighty Macros – Pumping Up Productivity 1 Character at a Time - - http://au.autodesk.com/au-online/classes-on-demand/class-catalog/classes/year-2014/autocad/ac4873#chapter=0

Sam Lucido: CSI – CAD Standards implementation - - http://au.autodesk.com/au-online/classes-on-demand/class-catalog/classes/year-2016/autocad/it15277#chapter=0

Robert Green: AutoLISP Strategies for CAD Managers - - http://au.autodesk.com/au-online/classes-on-demand/class-catalog/classes/year-2016/class-detail/it20767#chapter=0

Robert Green: AutoLISP Strategies for CAD Managers - - http://au.autodesk.com/au-online/classes-on-demand/class-catalog/classes/year-2014/autocad/cm7268-l

Matt Murphy: The Productivity Power of AutoCAD Tool Palettes – Revealed - - http://au.autodesk.com/au-online/classes-on-demand/class-catalog/classes/year-2015/autocad/gen11407#chapter=0

Lee Ambrosius: AutoCAD Customization Boot Camp – Basic (No Experience Required) - - http://au.autodesk.com/au-online/classes-on-demand/class-catalog/classes/year-2016/autocad/it20495-l

Lee Ambrosius: AutoCAD Customization Boot Camp – Beyond the Basics - - http://au.autodesk.com/au-online/classes-on-demand/class-catalog/classes/year-2016/autocad/it20496-l

R.K. McSwain: Deployments and AutoLISP – Strategies for Easy Installations and Maintenance - - http://au.autodesk.com/au-online/classes-on-demand/class-catalog/classes/year-2015/autocad/it9952#chapter=0
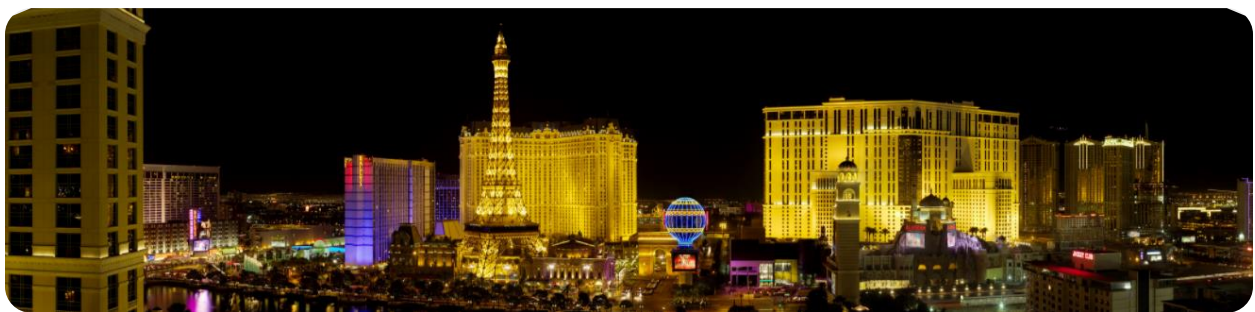
Types of Tool Palettes

There are two types of Tool Palettes, each with varying application and situations: Exported Tool Palettes and Network Tool Palettes.

Exported Tool Palettes

Exported Tool Palettes are 'standalone' or 'static' versions that can be imported by users into AutoCAD (or AutoCAD-based) software.

Exported Tool Palettes do not automatically update when new content is added. Exported Tool Palettes (.XTP extension) can be structured to not rely on a network or server connection, meaning they can be used 'offline'.

When a Tool Palette is exported, an image folder with the same name is created in the same location as the XTP file. This folder contains the images for user-created content tools and command tools with user-defined images.

When content updates are required, the CAD Manager would first have to apply any updates to the existing Tool Palettes in the source location, then re-export the updated Tool Palette(s). Users would then have to ensure they are accessing the new version of the Tool Palette(s) otherwise they will not have the newly added content. There is risk associated with exported tool palettes in a company setting as some users may not receive the updated content if they forgot or didn't manually update their current Tool Palette(s) to the new versions.

Network Tool Palettes

Network Tool Palettes are 'dynamic' Tool Palettes that are directly pathed, rather than imported by users into AutoCAD (or AutoCAD-based) software. Unlike Exported Tool Palettes (.XTP extension), Network Tool Palettes use a Tool Catalog File (.ATC extension).

Workstations can be pathed *(or automated via an install image, or via a Tool Palette button)* to the location where the network Tool Palettes are warehoused. This process ensures all users access the same iteration of the Network Tool Palettes equally, thus ensuring consistency across all users/workstations. As new content is added, it will be made available on a user's workstation automatically, not requiring any action from the users themselves.

NOTE

A "lock" symbol displayed in the lower corner of a Tool Palette indicates a 'read only' status, typical for Network Tool Palettes that are warehoused in a location with access rights enabled. Users cannot modify the Tool Palette beyond changing its display settings if this 'lock' symbol is displayed.
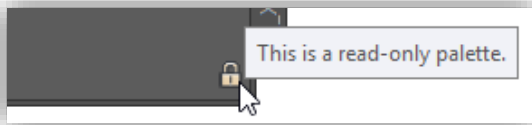
As an updating workflow, the CAD Manager could log in to the network server, with credentials allowing for content modification and apply any updates to the Tool Palette(s). One complete, he/she will close the AutoCAD (or AutoCAD-based) software which "writes" the updates to the Tool Catalog File (.ATC extension) and respective support files in the network location. The next time a user opens AutoCAD (or AutoCAD-based) software post-update, the new or updated content will be automatically available.

Creating "Live" Tool Palettes

The process of creating "live" tool palettes is quite simple. Within AutoCAD (or AutoCAD-based) software, under **Options → Files → Tool Palette File Locations** enter the path where the Network Tool Palettes will reside (server location).
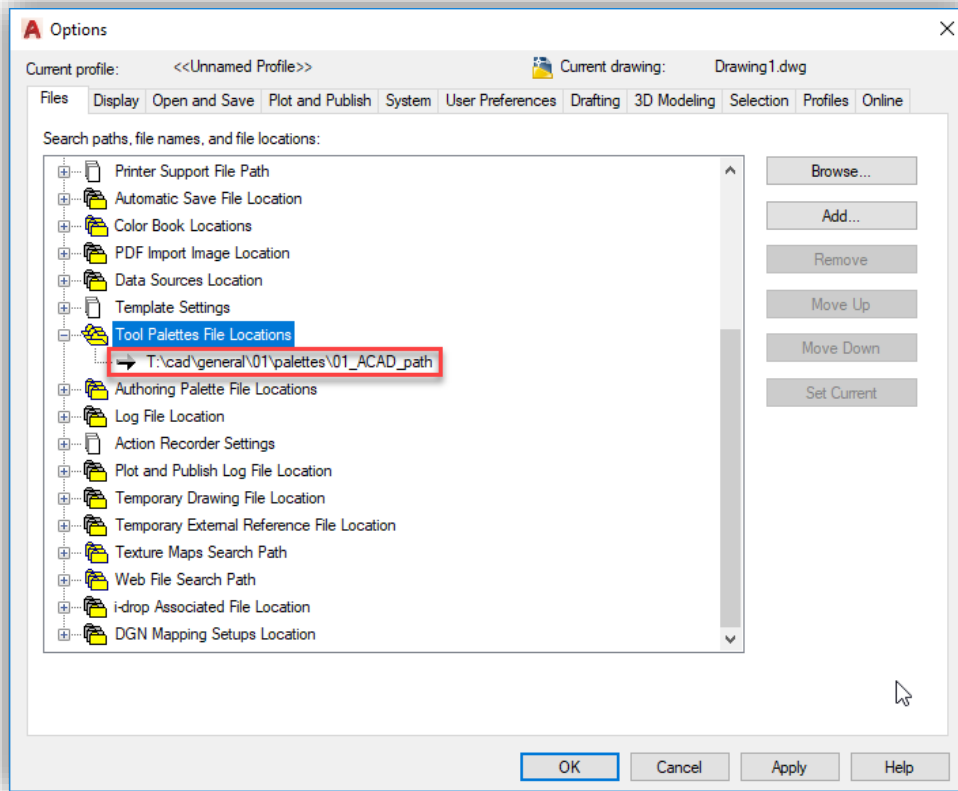
In the example above, the Network Tool Palette location is:

> ➔ **T:\cad\general\01\palettes\01_ACAD_path**

TIP!

If you are adding additional content (new buttons) to an existing Tool Palette which requires a reorganization of buttons, there is a workflow that needs to be followed to ensure users accessing the Tool Palettes also get the correct, reordered Tool Palette.

The workflow below will ensure that any new button(s) added will display in the correct order on a user's workstation. Even though, as CAD Manager, the newly added buttons appear in correct order, on a user's workstation, they may be appended to the 'bottom' of the existing Tool Palette, thus out of intended order.

As an example, an existing Tool Palette has 5 buttons, numbered 1, 2, 3, 4 and 5 respectfully. If a new button is required to be placed between 4 and 5 (let's call the new button 4a)
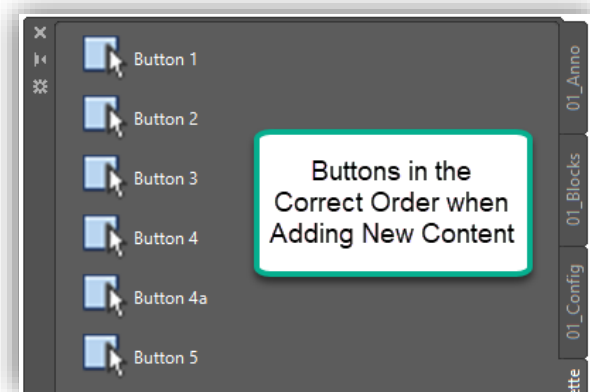
When you shut down AutoCAD (or AutoCAD-based) software, the changes are saved to the Network Tool Palette(s).

When a user accesses the updated Tool Palette(s), Button 4a may appear at the 'bottom' of the existing Tool Palette.
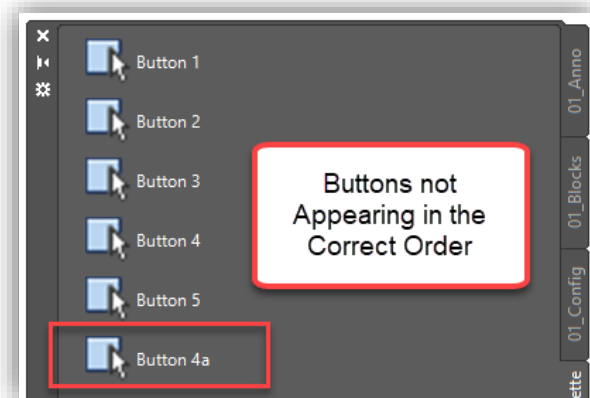
This can occur as the new button code has been appended to the end/bottom of a Tool Palette's existing database. By using the workflow below, the Tool Palette database is re-created, ensuring the order of buttons is correctly retained.

To correct this issue, when you add or reorder buttons on an existing Tool Palette, follow the workflow as shown below.

- First update the Tool Palette as required, reorganizing the order of the buttons as needed
- Highlight all the Tool Palette's content **(CTRL+A)**, then **Right-Click**, select **Copy**.
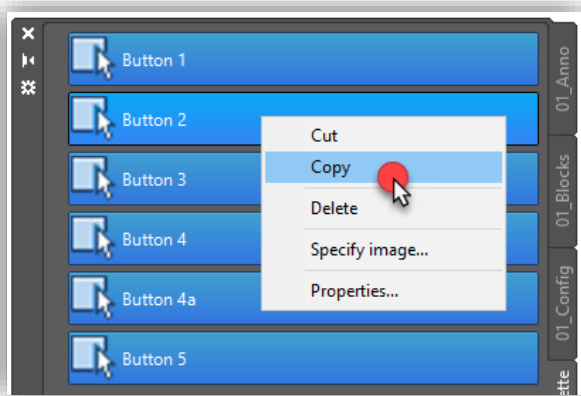
- While the buttons are Highlighted, press the **Delete** key *(deleting all existing content)*
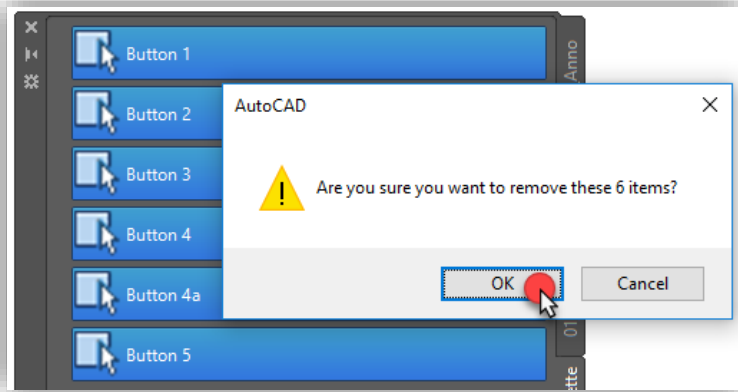
- Once deleted, the existing Tool Palette will be 'empty'. Simply **Right-Click** and select **Paste** which will add all the previous copied buttons back onto the Tool Palette *(re-creating and re-building the Tool Palette's database).*

When users access the revised Tool Palette, all the buttons and content will be displayed in the specified order as intended.

1-2-3 Button Configuration Workflow

This configuration workflow provides a very effective solution to ensuring that all workstations/users within the company have equal, consistent access to the CAD/Drawing Production Standards Toolkit(s) and related resources.

A deployment image can be customized to include a variety of preconfigured settings, paths and content, however once the installation has been executed, what options are available post-install to ensure consistency, future updates of company CAD/Drawing Production Standards, new projects, etc.?

The solution? The 1-2-3 Button Configuration Workflow….
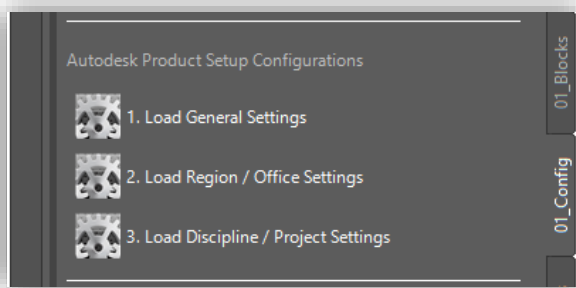
Each button in this workflow loads an AutoLISP routine, which includes a different set of configuration/settings specific to the requirement-type being applied. The intention is that this workflow is actioned in sequence, where users will press button 1 first, then proceed to button 2 and finally, button 3. Once this workflow has been completed, the user's workstation will be configured to the company/project configuration and settings.

The 1-2-3 button can be re-run at any time, ensuring that AutoCAD (or AutoCAD-based) software is configured correctly to that of the company's requirements. If a user is experiencing technical issues related to configuration, they can attempt to resolve the issue by simply re-running the 1-2-3 button workflow. If the issue remains apparent, using 'process of elimination' you can rule out that this issue is not related to configuration, but perhaps an internal drawing issue or some other problem at hand.

Button 1 - Load General Settings
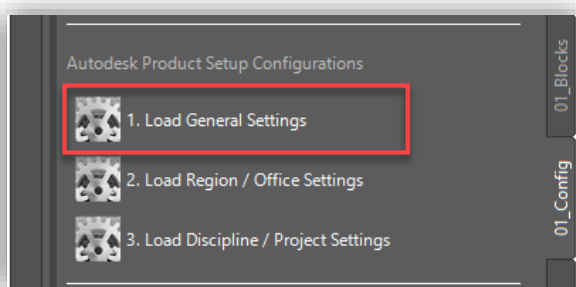
The intent of the first button is to configure AutoCAD (or AutoCAD-based) software to the requirements and settings specific to the company. "Static" settings that should be consistent for all workstations/users company-wide.

Button 1 may include:

- Creation of Local CAD Folder Support, such as: C Drive folders for autosave, plot logs, local plotter support files, etc.
- Assigning Temp File Locations
- Trusted Sites
- Plotter Settings and Pathing
- Template Pathing
- Miscellaneous Variable Adjustments such as: MTEXTCOLUMN set to 0, IMAGEFRAME set to 0, PLINEGEN set to 1, etc.

Button 2 – Load Region / Office Settings
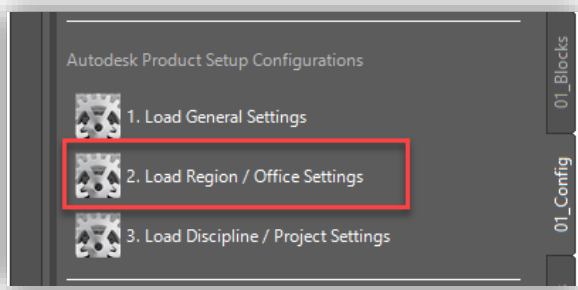
The intent of the second button is to add additional configuration, or modify configuration to the requirements and settings of the office (or region) that the user is situated in. Because different offices may be working with unique provincial, state or regional CAD/Drawing Production Standards, ensuring all staff within those offices have access to the respective content is critical.

Button 2 may include:

- Revised order of priority for Plot Styles (local files take precedence over corporate files)
- Revised Tool Palette pathing for Regional/Local requirements
- Additional Trusted Sites
- Plotter Settings and Pathing

Button 3 – Load Discipline / Project Settings / Troubleshooting and Support
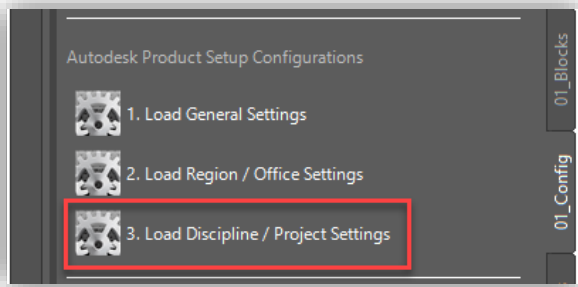
The intent of the third button is to provide additional, customizable configurations that may be specific to a project or a discipline group. A project may require a different set of symbols, templates and sheet borders, all of which could be preconfigured and pathed automatically so that all users working on a specific project all have the same equal access to the required content.

A discipline group (e.g.: Civil Infrastructure) could have a variety of settings adjusted and configuration to include: settings unit variables and annotation scales to meters, automatically adding the Civil Infrastructure Tool Palette, template repathing, etc.

The third button can also be utilized to provide Troubleshooting Support. A CAD Manager could instruct users to run an AutoLISP routine, accessible through the third button, that provides a solution to a specific or commonly occurring issue.

Button 3 may include:

- Discipline Specific Configurations
- Project Specific Configurations
- Troubleshooting and Support Solutions

Tool Palette Demonstration and Examples

The eleven (11) Tool Palettes (examples below) provide Associated Engineering's Drawing Production Staff with all corporate CAD standard configurations, documentation links, project standards, sheet border types, annotation styles, blocks and symbols, drawing sheet stamps and tools for troubleshooting/support.

IMPORTANT

Example code for the majority of tool palette buttons shown in this example/demonstration has been provided within each section.

NOTE

AutoLISP code examples related to the example/demonstration has been provided in the Appendices section at the end of this handout.

TIP!

To assist with tracking Tool Palette version history, a 'last updated date' can be added to the top of each Tool Palette. Should any discrepancies occur with the content being provided, the date can be referenced to ensure the user is accessing the current version of the Tool Palette(s).
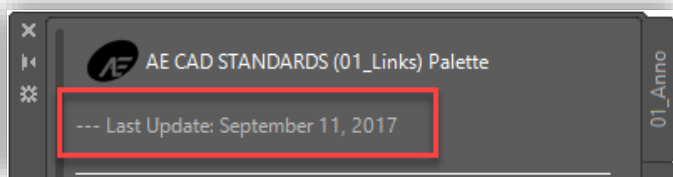
TIP!

Using the following two AutoLISP commands as part of a button's code is a simple way to notify a user once the sequence of code for a button has completed.

- **ALERT** - displays a dialog box containing a message
- **STRCAT** - returns "concatenate" a text string

When a user clicks a Tool Palette button, the code associated with that button is executed and completed. It may be unapparent when the sequence of code or process has completed.

A dialog box (**ALERT**) will pop up on-screen, with a text message (**STRCAT**) that notifies the user that the sequence or process has completed for that specific Tool Palette button.
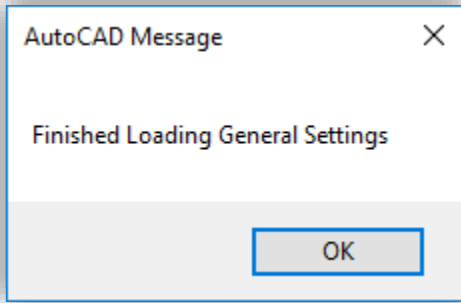
BUTTON CODE

ALERT / STRCAT Example	(LOAD "T:/ae/xxxxx.lsp");(alert(strcat "Finished Loading General Settings"))

Configuration Tool Palette

The Configuration Tool Palette contains a variety of configuration setups and tools that will assist CAD Managers and users with ensuing workstations are configured equally. The **01_Config Tool Palette** contains several sections: Autodesk Product Setup Configurations, QNEW Setup Configurations, Palette Configurations, Load Discipline Palettes, Local Plotter Support Configurations, Programs, LISP Configurations and ACAD Advanced Configurations.

Section – Autodesk Product Setup Configurations

*** Refer to the 1-2-3 Button Configuration Workflow section of this handout for more detail.*
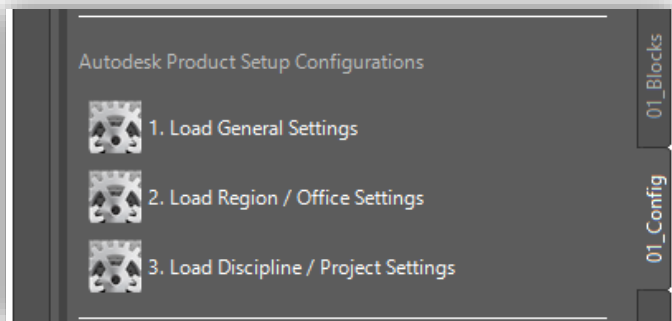
BUTTON CODE

Load AutoLISP	(LOAD "T:/ae/xxxxx.lsp");(alert(strcat "enter-message-here"))

*** Refer to the Appendix C of this handout for AutoLISP code(s).*

Section – QNEW Setup Configurations
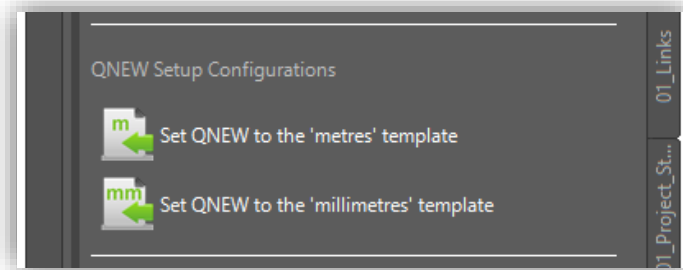
The "QNEW Setup Configurations" provides an option to set the QNEW command (creates a new drawing from a template) to either the meters or millimeters template. Each template is preconfigured, including drawing/dimension scales and drawing variable settings respective to the unit type (meters or millimeters).

BUTTON CODE

Load AutoLISP	(LOAD "T:/ae/xxxxx.lsp");(alert(strcat "enter-message-here"))

*** Refer to the Appendix C of this handout for AutoLISP code(s).*

Section – Palette Configurations
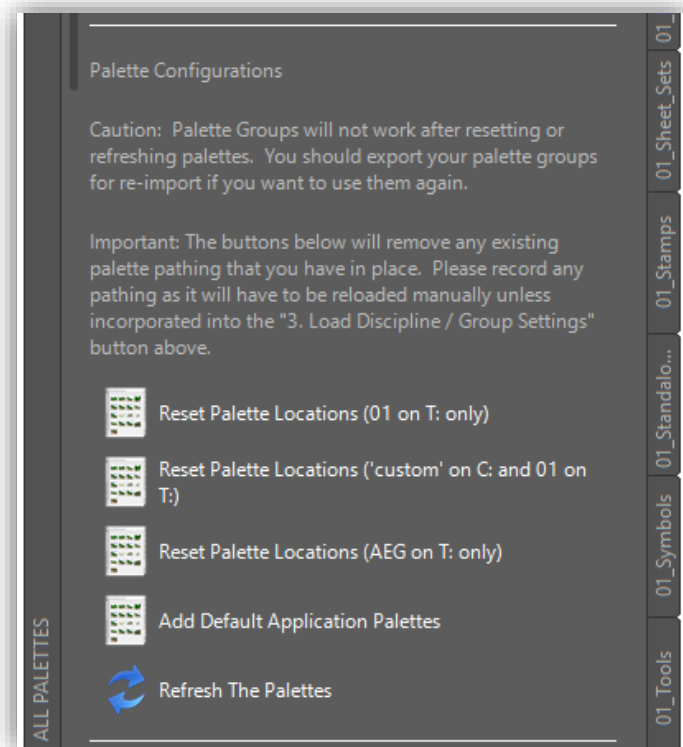
The "Palette Configurations" section provides several options to setup and refresh Tool Palettes, including resetting palette locations to the corporate server (T Drive), adding multiple palette locations (C and T Drives), access to our legacy CAD standard Tool Palettes, adding the default AutoCAD palettes and refreshing/reloading the palettes.

BUTTON CODE

| Load AutoLISP | (LOAD "T:/ae/xxxxx.lsp");(alert(strcat "enter-message-here")) |

*** *Refer to the Appendix C of this handout for AutoLISP code(s).*

Section – Load Discipline Palettes
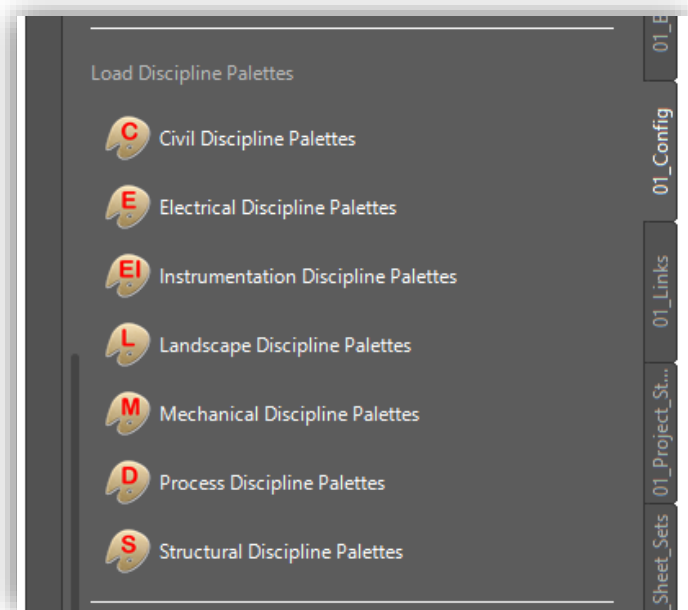
The "Load Discipline Palettes" section provides a selection of discipline-specific Tool Palettes. These buttons automatically add the selected discipline Tool Palette to the Tool Palette Panel.

TIP!

Tool Palette Groups can be created or imported for each Tool Palette set. This will assist users in quickly selecting between the corporate Tool Palette set and a discipline-specific Tool Palette set. This can be particularly useful if a user works in a variety of disciplines, providing a quick and simple way to switch between currently loaded Tool Palette sets.
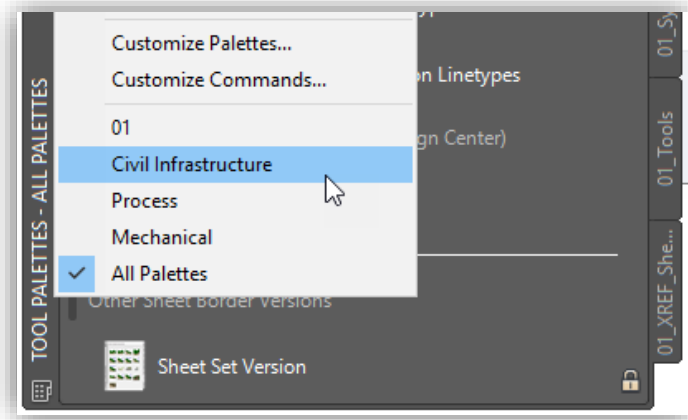
BUTTON CODE

Load AutoLISP	(LOAD "T:/ae/xxxxx.lsp");(alert(strcat "enter-message-here"))

*** Refer to the Appendix C of this handout for AutoLISP code(s).

<u>Section – Local Plotter Support Configurations</u>
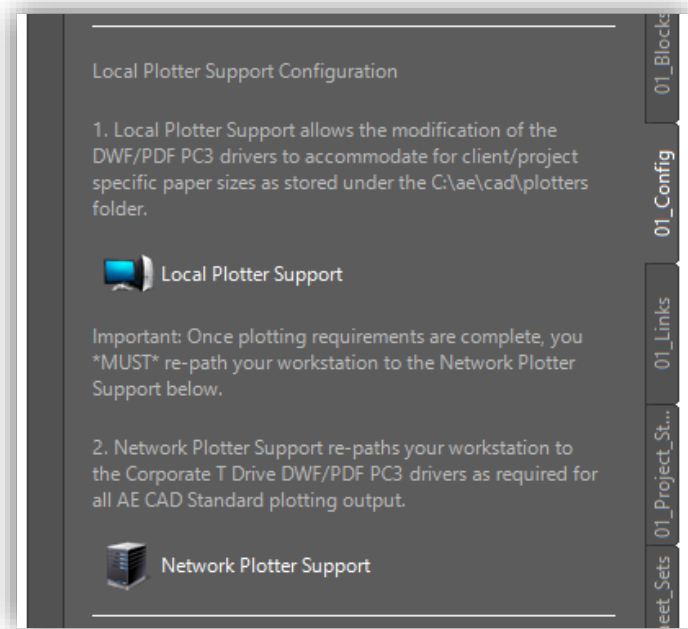
The "Local Plotter Support Configuration" section provides an option to setup local or network plotter support. Corporate plotter drivers are locked-down to all staff so custom paper sizes and/or configurations cannot be added and to ensure existing settings are not accidentally or deliberately altered.

If a user needs to create a custom paper size or other custom plotting requirements, they can simply press the <u>Local Plotter Support</u> (first button). This button copies the corporate plotter

drivers to their workstation (local) and automatically updates any pathing or configuration requirements within AutoCAD (or AutoCAD-based) software. Any custom settings specific the needs of the project/user can be achieved locally without modifying the corporate plotter driver. Once the user has completed their custom plotting requirements, they can easily reset the Plotter Configuration back to Network Plotter Support (second button).

BUTTON CODE

Load AutoLISP	(LOAD "T:/ae/xxxxx.lsp");(alert(strcat "enter-message-here"))

*** Refer to the Appendix C of this handout for AutoLISP code(s).*

Section – Programs
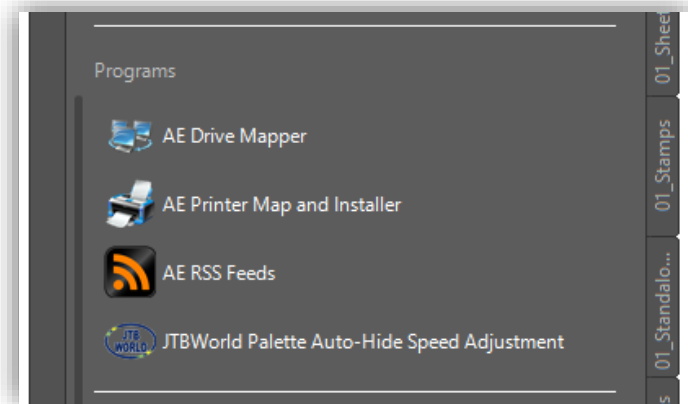
The "Programs" section provides links which load custom programs. Associated Engineering has a Drive Mapper Tool (repaths network drivers to various office locations), a Printer Map and Installer Utility Program and RSS Feeds Tool. JTBWorld's Palette Auto-Hide Speed Adjustment program is also linked from this section.

BUTTON CODE

| Run Program	^C^C_Shell "T:/xxxxx/program-to-run.exe";
Open Website	^C^C_Start https://xxxxx.ca/;

Section – LISP Configurations
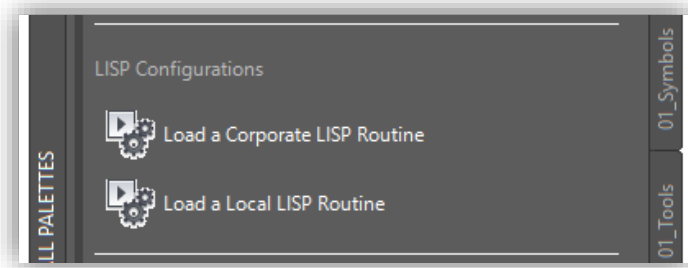
The "LISP Configuration" section assists users with locating and loading AutoLISP routines from a depository located on either our corporate server (T Drive) or a local/regional server (S Drive).

BUTTON CODE

Load AutoLISP / Run APPLOAD	(LOAD "T:/ae/xxxxx.lsp");appload;

<u>Section – ACAD Advanced Configuration</u>
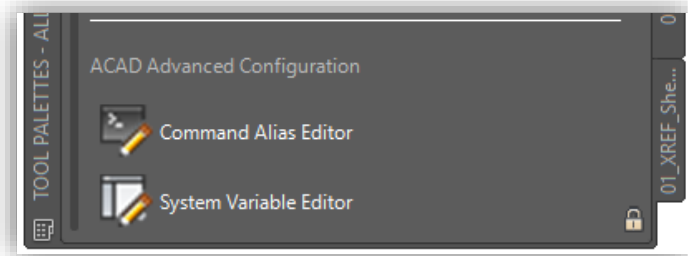
The "ACAD Advanced Configuration" section provides customization tools related to commands and system variables.

NOTE

Caution should be used when editing commands and/or adjusting system variable settings and configuration. Changing default settings may negatively impact the performance and usability of AutoCAD (or AutoCAD-based) software.

BUTTON CODE

Run Command	^C^C_xxxxx *** *Replace 'xxxxx' with relevant AutoCAD Command.*

Links Tool Palette

The Links Tool Palette contains a variety of shortcut or hyperlinks to assist users with accessing documentation. The **01_Links Tool Palette** contains several sections: AEthena (Associated Engineering's Intranet) Links, Manuals, Procedures, Specifications and CAD Quality Control (QC) Checklists.

Section – AEthena Links
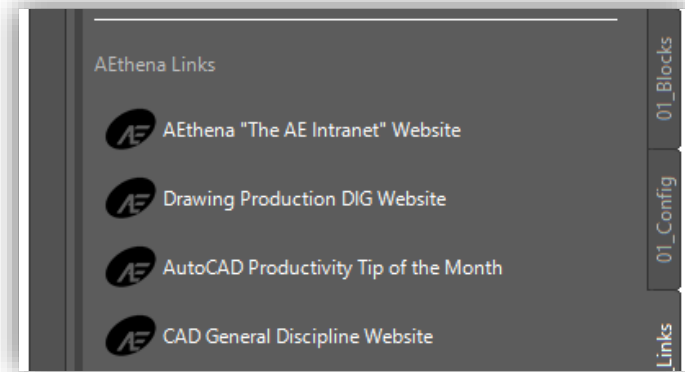
AEthena is Associated Engineering's Intranet site, which warehouses all groups, disciplines and includes our internal CAD/Drawing Production site. The "AEthena Links" section provides quick access internal CAD/Drawing Production Manuals, websites and standards information.

BUTTON CODE

Open Website	^C^C_Start https://xxxxx.ca/;

Section – Manuals, Procedures and Specifications
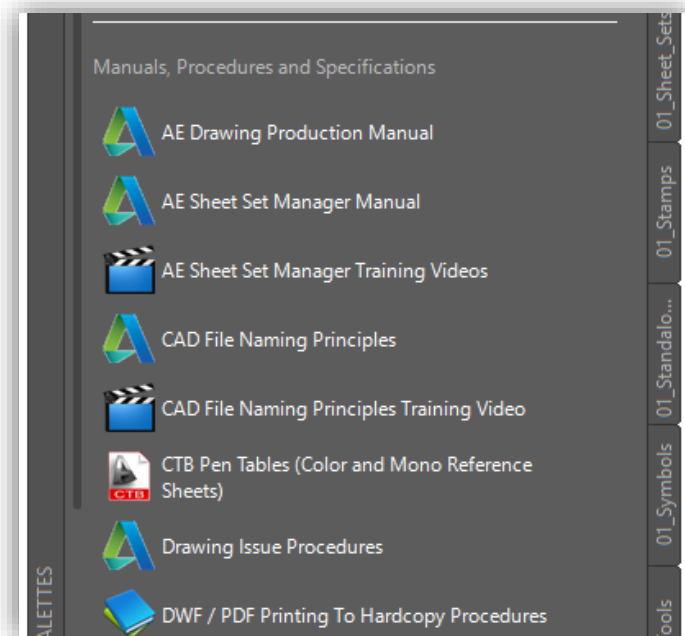
The "Manuals, Procedures and Specifications" section provides quick access to various internal links related to website links including Drawing Production Manuals, File Naming Principles, Training Videos, Drawing Issuing Procedures, Printing Procedures, etc.

BUTTON CODE

Open Website	^C^C_Start https://xxxxx.ca/;

Section – CAD QC Checklists
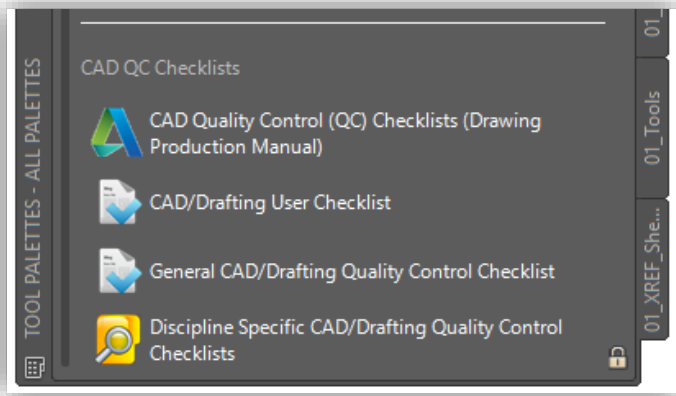
The "CAD QC Checklists" section provides links to our internal Quality Management checklists specific to CAD/Drawing Production protocols. Some Tool Palette buttons open a specific checklist directly whereas others open a corporate server folder (Windows Explorer) to browse a variety of available checklists.

BUTTON CODE

Open Document	^C^C_Shell ""T:/xxxxx/file-to-open.docx";
Open Windows Explorer to a Specific Folder	^C^C_Start T://xxxxx//folder-to-open//;

Project Standards Tool Palette

The Project Standards Tool Palette contains a variety of shortcuts and hyperlinks to available documentation to assist Project CAD Leaders with setting up new projects. The **01_Project_Standards Tool Palette** contains several sections: Project CAD Leader manual, Project CAD Leader checklist, CAD Standards Information Form (CSIF), Checking for Client Standards, CTB Files and Selecting the Sheet Border Type.

Section – Project CAD Leader
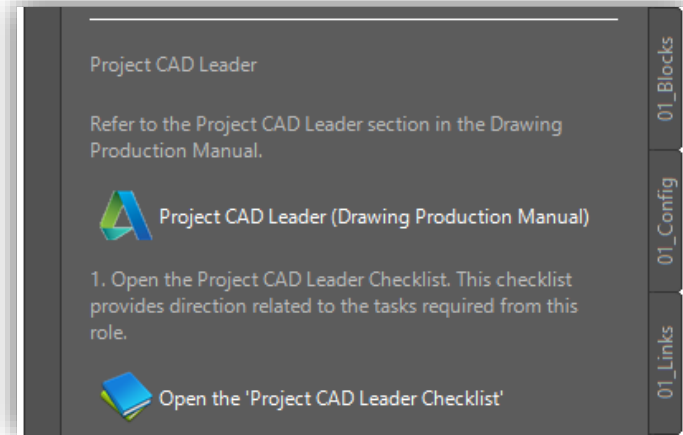
The "Project CAD Leader" section is broken up into 5 distinct steps that assist in fulfilling this project role. A link to the documentation pertaining to the duties/requirements of the Project CAD Leader has been provided.

- Step 1 opens the Project CAD Leader Checklist to review all duties/responsibilities respective to the role and project requirements.
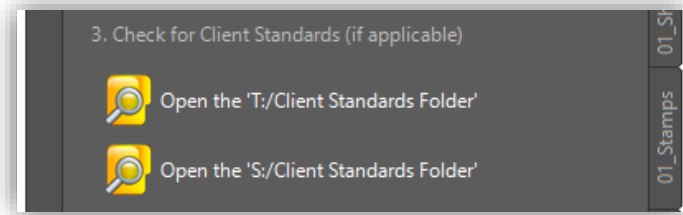
BUTTON CODE

Open Website	^C^C_Start https://xxxxx.ca/;
Open Document	^C^C_Shell ""T:/xxxxx/file-to-open.docx";
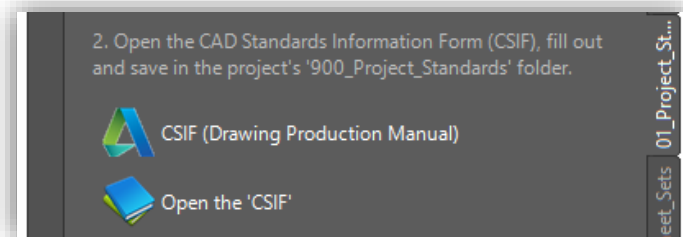
- Step 2 opens the CAD Standards Information Form (CSIF) which contains all pertinent information regarding the project's CAD Standards, such as templates, software version, project folder pathing, project team contact information, etc.
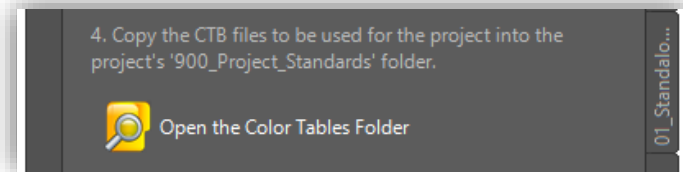
BUTTON CODE

Open Website	^C^C_Start https://xxxxx.ca/;
Open Document	^C^C_Shell ""T:/xxxxx/file-to-open.docx";

- <u>Step 3</u> provides links to two folder locations which warehouse client standards. Associated Engineering warehouses client standards on two servers: corporate server (T) and local/regional server (S).

BUTTON CODE

Open Windows Explorer to a Specific Folder	^C^C_Start T://xxxxx//folder-to-open//;

- <u>Step 4</u> provides a link to the location of available Color Tables (CTB Files), which in accordance with our internal CAD/Drawing Production Standards, are copied to each project's folder structure.

BUTTON CODE

Open Windows Explorer to a Specific Folder	^C^C_Start T://xxxxx//folder-to-open//;
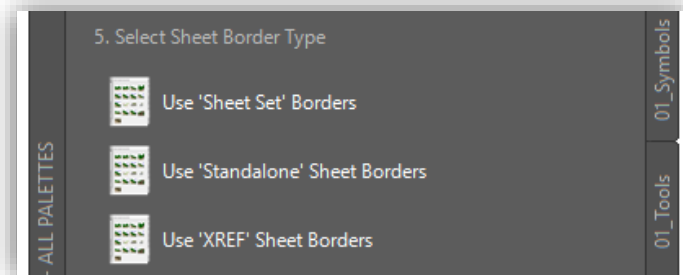
- <u>Step 5</u> provides quick navigation to the available sheet border types and their respective Tool Palette(s). The buttons in Step 5 automatically switch the active/currently displayed Tool Palette to the respective Sheet Border Tool Palette as selected.
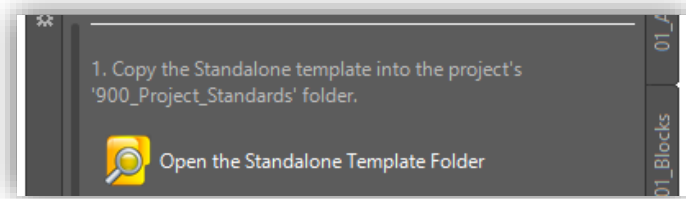
BUTTON CODE

Load AutoLISP	(LOAD "T:/ae/xxxxx.lsp");(alert(strcat "enter-message-here"))

*** Refer to the Appendix C of this handout for AutoLISP code(s).
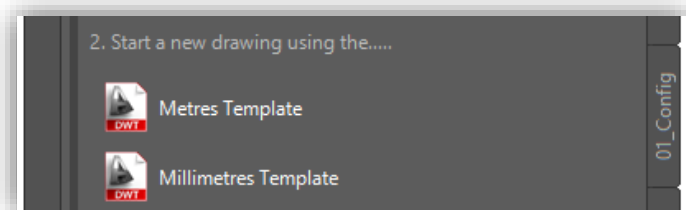
Standalone Sheets Tool Palette

The Standalone Sheets Tool Palette contains a step by step approach to using Standalone Sheet Borders/Templates. The term "Standalone" defines Sheet Borders that do not require any external references or support files; where the entire Sheet Border and all respective entities are contained within a single drawing file. The **01_Standalone_Sheets Tool Palette** contains a 5 Step workflow which assists users in utilizing Standalone Sheet Borders/Templates within the project.

- Step 1 provides a link to the Standalone Sheet Border Templates warehoused on the corporate server. The template file(s) get copied to the project's folder structure in accordance with our internal CAD/Drawing Production Standards.
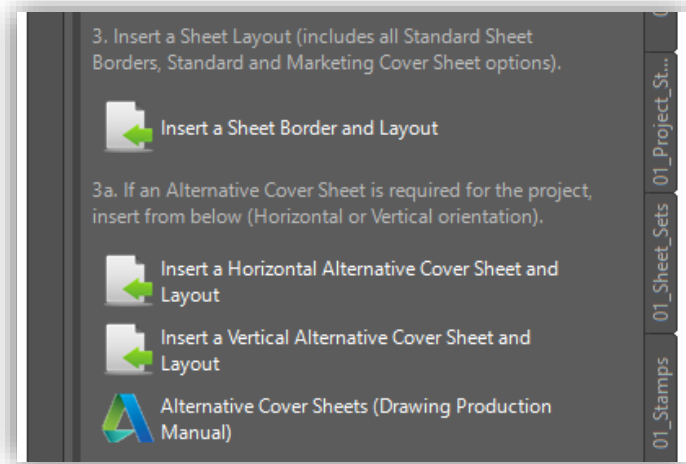
BUTTON CODE

Open Windows Explorer to a Specific Folder	^C^C_Start T://xxxxx//folder-to-open//;

- Step 2 starts a new drawing based on the Meters or Millimeters Template, ensuring each new drawing is created using all the corporately defined preconfigured drawing variables and respective unit settings (as selected).
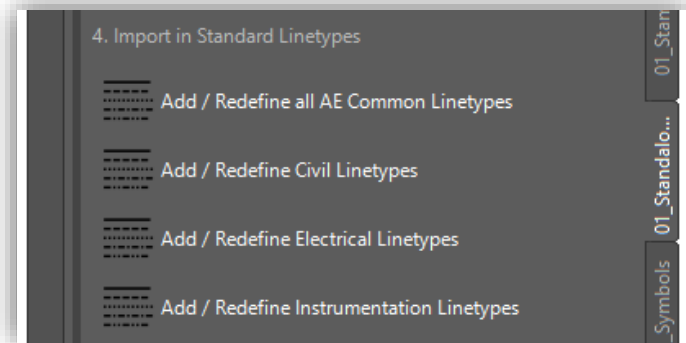
BUTTON CODE

Open a Specific Template	^C^C^P(vl-load-com)(vla-add(vla-get-documents(vlax-get-acad-object)) "T:/ae/xxxxx.dwt"));^P

- <u>Steps 3 and 3a</u> prompt the user (via a dialog box) to select a specific Sheet Border/Layout/Orientation which will automatically be inserted into the current drawing. A link to the documentation pertaining to the use of Alternative Cover Sheets has also been provided.
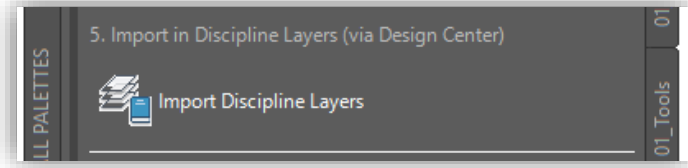
BUTTON CODE

Insert Sheet Border / Layout from Template	^C^C^R_layout;t;"T:/folder-path-to-template/xxxxx.dwt";_layout1;d;layout2;d;layout;d;
Open Website	^C^C_Start https://xxxxx.ca/;

- <u>Step 4</u> provides the option to import specific linetype styles, should additional linetypes be required. This step is being decommissioned as Discipline Layer sets include predefined linetypes associated to a specific layer, however certain internal circumstances that may require linetypes to be imported separately.

BUTTON CODE

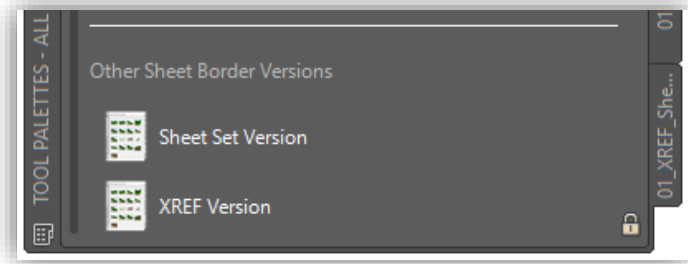| Import Linetypes	^C^C_filedia;0;-linetype;load;*; T:/ae/xxxxx.lin;^C^C_filedia;1;-style;linetype-style-name;Arial.TTF;0;1;0;N;N;(alert (strcat "enter-message-here"))

- <u>Step 5</u> opens Design Center to a specific location on the corporate server that warehouses our discipline-specific layer sets. Users can select the layers they wish to import into the current drawing as required, through Design Center's functionality.

BUTTON CODE

Open Design Center to a Specific Folder	^C^C_adcnavigate;T:/xxxxx/folder-to-open/;

<u>Section – Other Sheet Border Versions</u>

The "Other Sheet Border Versions" section provides quick navigation to the other available sheet border types and their respective Tool Palette(s).

BUTTON CODE

Load AutoLISP	(LOAD "T:/ae/xxxxx.lsp");(alert(strcat "enter-message-here"))

*** *Refer to the Appendix C of this handout for AutoLISP code(s).*

XREF Sheets Tool Palette

The External Reference (XREF) Sheets Tool Palette contains a step by step approach to using XREF Sheet Borders/Templates. XREF Sheet Borders are structured so a portion of the Sheet Border is in an externally referenced drawing. "Static" information such as a client logo, project name and total sheet number count can be entered "once" within the XREF rather than being

entered on each individual sheet drawing. The **01_XREF_Sheets Tool Palette** contains a 7 Step workflow which assists users in utilizing XREF Sheet Borders/Templates within the project.
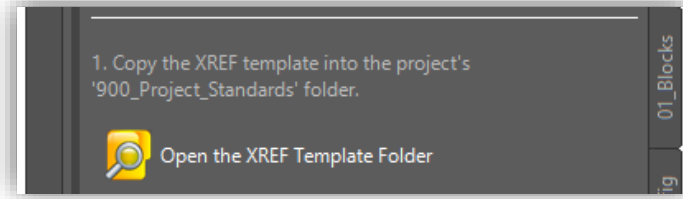
- Step 1 provides a link to the XREF Sheet Border Templates warehoused on the corporate server. The template (dwt) file gets copied to the project's folder structure in accordance with our internal CAD/Drawing Production Standards.
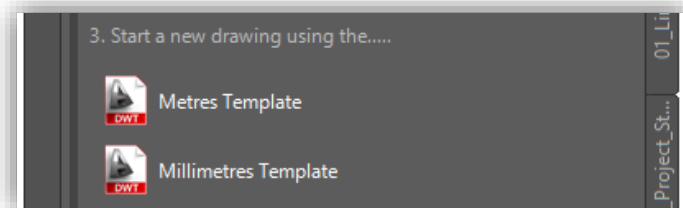
BUTTON CODE

Open Windows Explorer to a Specific Folder	^C^C_Start T://xxxxx//folder-to-open//;
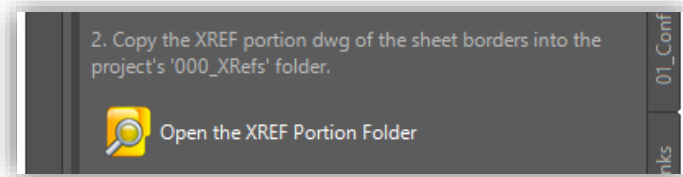
- Step 2 provides a link to the XREF Sheet Border files warehoused on the corporate server. The drawing (dwg) portion of the Sheet Border gets copied to the project's external references folder in accordance with our internal CAD/Drawing Production Standards.

BUTTON CODE

Open Windows Explorer to a Specific Folder	^C^C_Start T://xxxxx//folder-to-open//;

- Step 3 starts a new drawing based on the Meters or Millimeters Template, ensuring each new drawing is created using all the corporately defined preconfigured drawing variables and respective unit settings (as selected).

BUTTON CODE

Open a Specific Template	^C^C^P(vl-load-com)(vla-add(vla-get-documents(vlax-get-acad-object))" "T:/ae/xxxxx.dwt"));^P

- Steps 4 and 4a prompt the user (via a dialog box) to select a specific Sheet Border/Layout which will automatically be inserted into the current drawing. Various Sheet Border sizes and orientations (vertical and horizontal) layouts are available, as well as alternative Cover Sheet options. Users simply select which Sheet Border/Layout as required and it is inserted automatically into the current drawing. A link to the documentation pertaining to the use of Alternative Cover Sheets has also been provided.

BUTTON CODE

Insert Sheet Border / Layout from Template	^C^C^R_layout;t;"T:/folder-path-to-template/xxxxx.dwt";_layout1;d;layout2;d;layout;d;
Open Website	^C^C_Start https://xxxxx.ca/;

- Step 5 is a text entity on the Tool Palette that instructs users to 'repath' all references to the project's working drawings folder in accordance with our internal CAD/Drawing Production Standards.

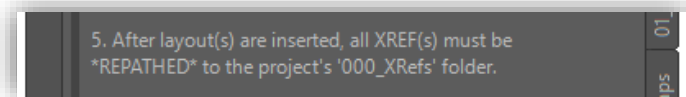- Step 6 provides the option to import specific linetype styles, should additional linetypes be required. This step is being decommissioned as Discipline Layer sets include predefined linetypes associated to a specific layer, however certain internal circumstances that may require linetypes to be imported separately.

BUTTON CODE

Import Linetypes	^C^C_filedia;0;-linetype;load;*; T:/ae/xxxxx.lin;^C^C_filedia;1;-style;linetype-style-name;Arial.TTF;0;1;0;N;N;(alert (strcat "enter-message-here"))

- Step 7 opens Design Center to a specific location on the corporate server that warehouses our discipline-specific layer sets. Users can select the layers they wish to import into the current drawing as required, through Design Center's functionality.

BUTTON CODE

Open Design Center to a Specific Folder	^C^C_adcnavigate;T:/xxxxx/folder-to-open/;

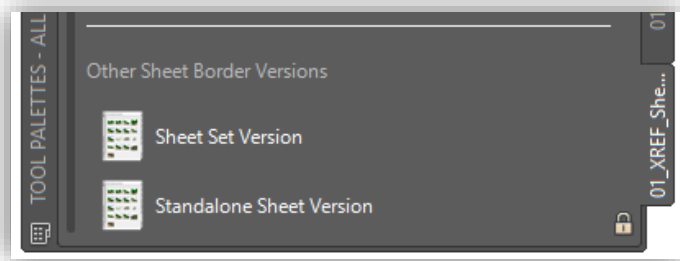Section – Other Sheet Border Versions

The "Other Sheet Border Versions" section provides quick navigation to the other available sheet border types and their respective Tool Palette(s).

BUTTON CODE

Load AutoLISP	(LOAD "T:/ae/xxxxx.lsp");(alert(strcat "enter-message-here"))

*** Refer to the Appendix C of this handout for AutoLISP code(s).

Sheet Sets Tool Palette

The Sheet Sets Tool Palette contains a step by step approach to using Sheet Set Borders/Templates. Sheet Set Borders allow the 'automation' of Title Block information which is synchronized across all Sheet Borders within the project. Once they have been configured to the company/project CAD/Drawing Production Standards, they are extremely productive and dramatically reduce effort/budget and time spend.

The **01_Sheet_Sets Tool Palette** contains a 7 Step workflow which assists users in utilizing XREF Sheet Borders/Templates within the project. Additional sections include Callout Blocks, Tools and Performance Settings specific to Sheet Set functionality.
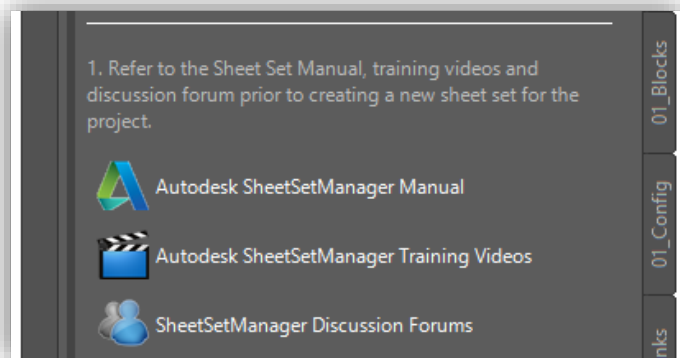
- Step 1 provides links to extensive documentation and setup guides for using Sheet Set Manager (and Sheet Sets). Internally we have created training videos specific to the use of our CAD/Drawing Production Standard Sheet Sets, including a support discussion forum.

BUTTON CODE

Open Website	^C^C_Start https://xxxxx.ca/;
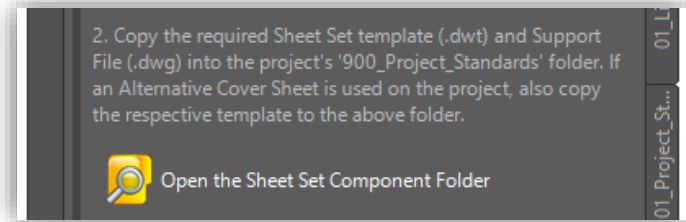
- <u>Step 2</u> provides a link to the Sheet Set Component Folder, which warehouses the Sheet Set Template and Support File on the corporate server. The template and support files get copied to the project's folder structure in accordance with our internal CAD/Drawing Production Standards.

BUTTON CODE

Open Windows Explorer to a Specific Folder	^C^C_Start T://xxxxx//folder-to-open//;
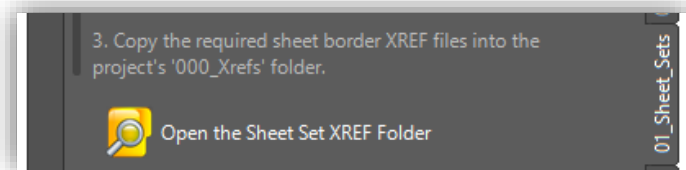
- <u>Step 3</u> provides a link to the Sheet Set XREF Folder, which warehouses the various Sheet Set XREF Borders on the corporate server. Only the required Sheet Set XREF drawings get copied to the project's folder structure in accordance with our internal CAD/Drawing Production Standards.
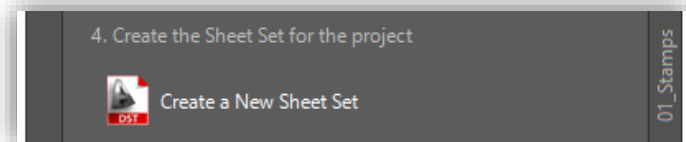
- <u>Step 4</u> launches the Sheet Set Manager – Create a New Sheet Set command. This command begins the process of creating a Sheet Set.

BUTTON CODE

Create New Sheet Set	^C^C_newsheetset
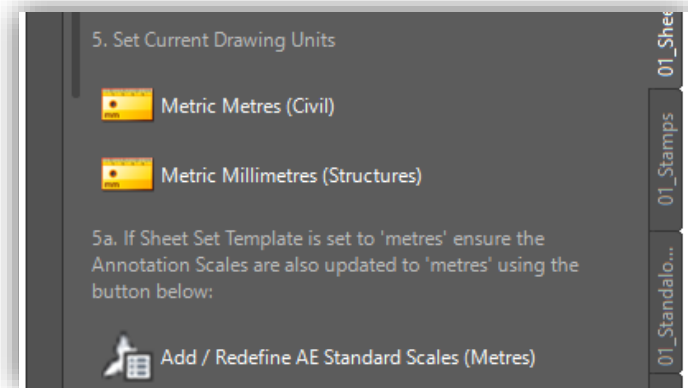
- Step 5 and 5a describe adjusting drawing's units, to either meters or millimeters. Occasionally a user may accidentally start a new drawing using the incorrect units. If this occurs, a user can simply press the respective button to update all unit variables to the desired choice. Our corporate templates are set to millimeters (by default, as most of our engineering disciplines use millimeters rather than meters).

BUTTON CODE

Modify Drawing Units	^C^C_set;measurement;1;set;lunits;2;set;luprec;3;set;insunits;6; set;insunitsdefsource;6;set;insunitsdeftarget;6;-dwgunits;6;2;3;N'Y; N;regen;(graphscr);(alert(strcat "enter-message-here"))

- Step 6 provides the option to import specific linetype styles, should additional linetypes be required. This step is being decommissioned as Discipline Layer sets include predefined linetypes associated to a specific layer, however certain internal circumstances that may require linetypes to be imported separately.

BUTTON CODE

Import Linetypes	^C^C_filedia;0;-linetype;load;*; T:/ae/xxxxx.lin;^C^C_filedia;1;- style;linetype-style-name;Arial.TTF;0;1;0;N;N;(alert (strcat "enter- message-here"))

- <u>Step 7</u> opens Design Center to a specific location on the corporate server that warehouses our discipline-specific layer sets. Users can select the layers they wish to import into the current drawing as required, through Design Center's functionality.

BUTTON CODE

Open Design Center to a Specific Folder	^C^C_adcnavigate;T:/xxxxx/folder-to-open/;

<u>Section – Callout Blocks</u>
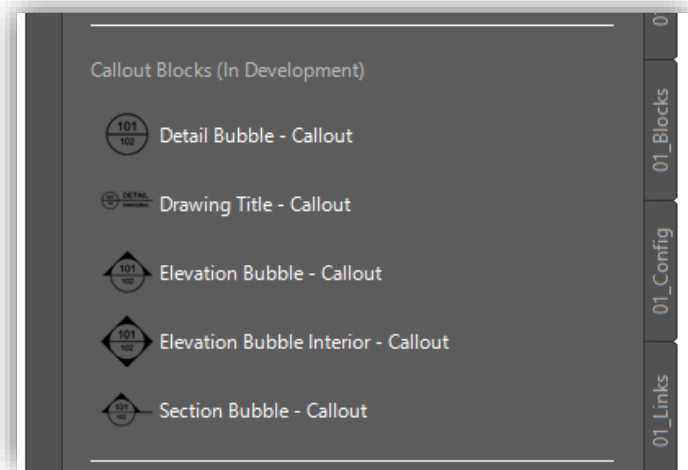
The "Callout Blocks" section provides access to the modified General Symbology for use with Sheet Sets. Special fields/coding has been applied to these symbols so that the automation of view numbering, view scales, etc.

BUTTON CODE

No code required, simply drag-and-drop symbols from their network location/pathing or via Design Center (Windows Explorer) onto the Tool Palette.

Section – Tools
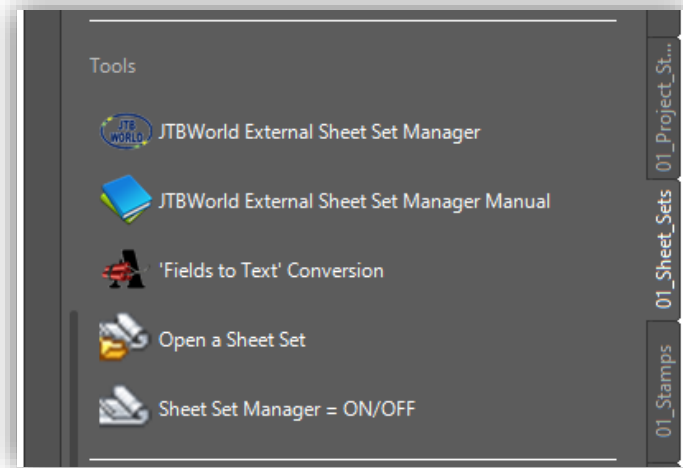
The "Tools" section provides several components that will assist users when working with Sheet Sets.

BUTTON CODE

Run Program	^C^C_Shell "T:/xxxxx/program-to-run.exe";
Open Website	^C^C_Start https://xxxxx.ca/;
Load AutoLISP	(LOAD "T:/ae/xxxxx.lsp");
Sheet Set Manager Panel On / Off	$M=$(if,$(and.$(getvar.ssmstate_.1_.'_SheetSetHide,^C^C)SheetSet)

Section – Performance Settings
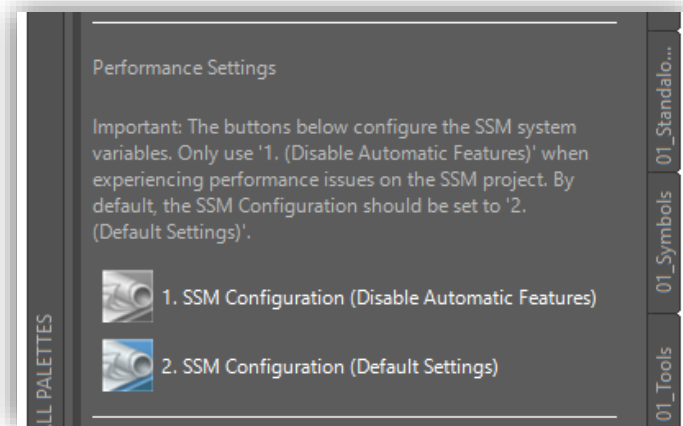
The "Performance Settings" section provides several Sheet Set Manager variable adjustments which can be beneficial to users working across networks.

Button 1 (Disable Automatic Features) adjusts the SSMSHEETSTATUS variable to 0 (disables automatic refresh of status data in a Sheet Set) and SSMAUTOOPEN variable to 0 (disables automatic opening of the Sheet Set Manager).

Button 2 (Default Settings) returns the adjusted variables back to 'default' settings and adjusts SSMPOLLTIME (set to 60 seconds for refresh). Additionally, this button opens the Sheet Set Manager.

BUTTON CODE

Sheet Set Manager (Disable Automatic Features)	^C^Cssmsheetstatus;0;ssmautoopen;0;
Sheet Set Manager (Default Settings) and Open SSM	^C^Cssmsheetstatus;2;ssmautoopen;1;ssmpolltime;60;ssm

Section – Other Sheet Border Versions
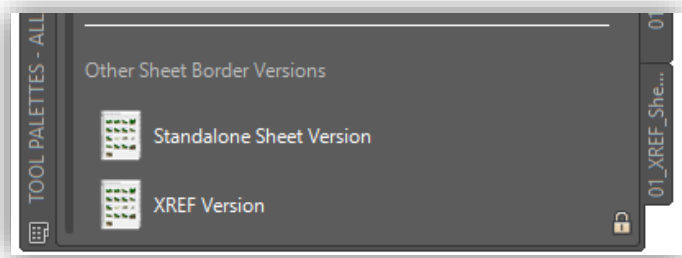
The "Other Sheet Border Versions" section provides quick navigation to the other available sheet border types and their respective Tool Palette(s).

BUTTON CODE

Load AutoLISP	(LOAD "T:/ae/xxxxx.lsp");(alert(strcat "enter-message-here"))

*** Refer to the Appendix C of this handout for AutoLISP code(s).

Annotation Tool Palette

The Annotation Tool Palette contains various quick access and settings related to annotation styles and objects. The **01_Anno Tool Palette** contains several sections: Set Current Text Style, Text Commands, Dimension Configuration, Table Configuration, and Set Multi-Leader Style - Start Command.

Section – Set Current Text Style
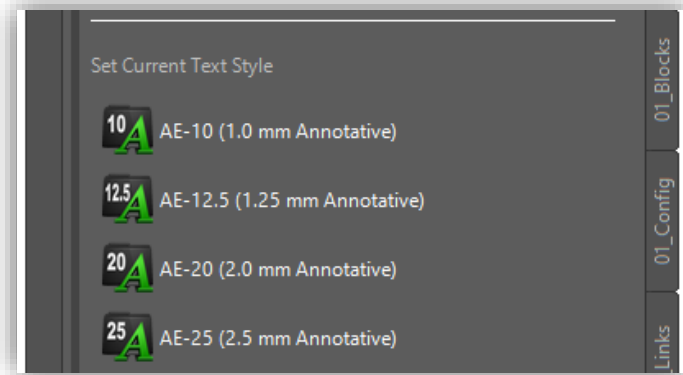
The "Set Current Text Style" switches the drawing's current text style to the desired choice.

Set Current Text Style	^C^C_-style;text-style-name;Arial;TTF;Annotative;Y;N;2.5;1;0;N;N; *** Arial used as 'example' in the above code.

Section – Set Current Text Style
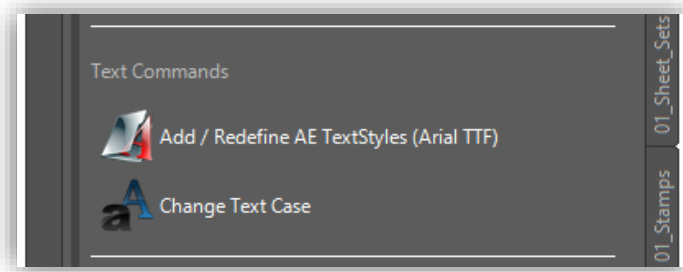
The "Text Commands" section provides options to add or redefine text styles as well as quick access to the change text case command.

Add / Redefine Text Styles	^C^C_-style; text-style-name;Arial;TTF;Annotative;Y;N;2.5;1;0;N;N; *** Additional text styles can be added to the code(text-style-name).
Change Text Case	^C^C_tcase

Section – Dimension Configuration
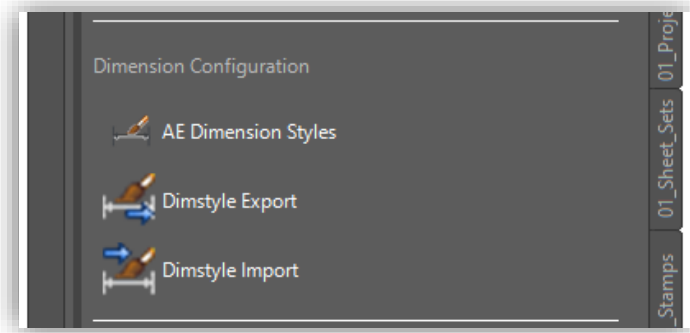
The "Dimension Configuration" section includes various components to import and export dimension styles.

Open Design Center to a Specific Folder	^C^C_adcnavigate;T:/xxxxx/folder-to-open/;
Dimension Export	^C^C_dimex
Dimension Import	^C^C_dimin

Section – Table Configuration
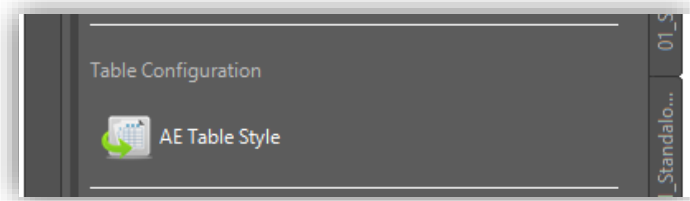
The "Table Configuration" section includes a link to access corporate tables styles from Design Center.

Open Design Center to a Specific Folder	^C^C_adcnavigate;T:/xxxxx/folder-to-open/;

Section – Set Multi-Leader Style and Start Command
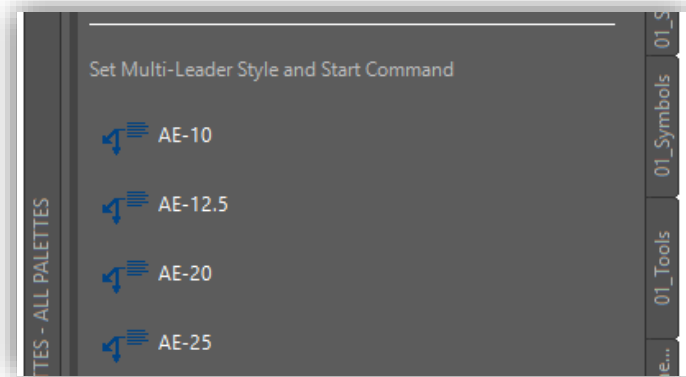
The "Set Multi-Leader Style and Start Command" switches the drawing's current multi-leader style to the desired choice, then starts the MLEADER command with the selected style set to 'current'.

BUTTON CODE

No code required, simply drag-and-drop multi-leader styles from their network location/pathing or via Design Center (Windows Explorer) onto the Tool Palette.

Blocks Tool Palette

The Blocks Tool Palette contains a collection of symbology. The **01_Blocks Tool Palette** contains several sections: People – Worker, People – General, Vehicles – Car / Light Truck and Vehicles / Equipment - Commercial.

Sections – Block Symbology
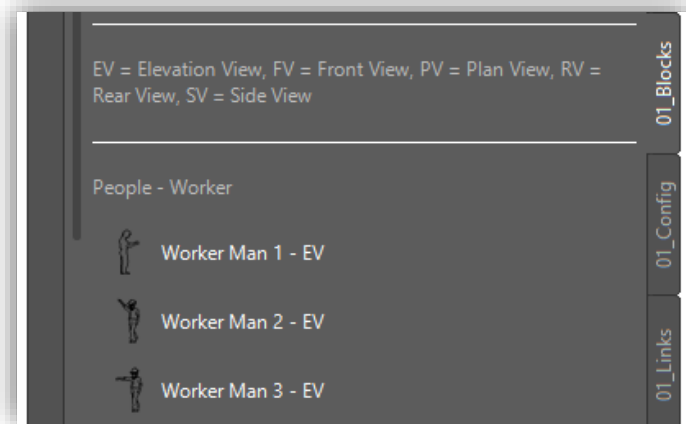
Each section includes categorized symbology including various view types. A text entry was added to the top of this Tool Palette to assist with view types (e.g.: EV = Elevation View).

TIP!

If you open Windows Explorer, you can simple drag-and-drop AutoCAD drawings onto the Tool Palette. Additionally, you can select multiple blocks in Windows Explorer (Pressing the Control or Shift Key) and drop them all, at once onto the Tool Palette. Ensure the blocks/symbols are stored on a server location where all users can access.

BUTTON CODE

No code required, simply drag-and-drop symbols from their network location/pathing or via Design Center (Windows Explorer) onto the Tool Palette.

Symbols Tool Palette

The Symbols Tool Palette contains a collection of general / non-discipline specific symbology. The **01_Symbols Tool Palette** contains several sections: Symbols (Current Standard) and Symbols (Superseded).
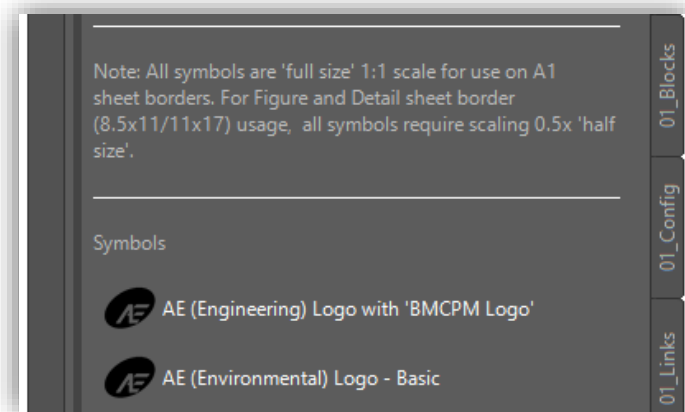
A text entry was added to the top of this Tool Palette to notify users that all symbols contained within this Tool Palette are 'full size' scaled.

BUTTON CODE

No code required, simply drag-and-drop symbols from their network location/pathing or via Design Center (Windows Explorer) onto the Tool Palette.

Stamps Tool Palette

The Stamps Tool Palette contains a collection of drawing stamps that can be inserted onto a Sheet Border (Title Block). The **01_Stamps Tool Palette** contains several sections: Sheet Border Stamps, Regional Stamps and Other Stamps.
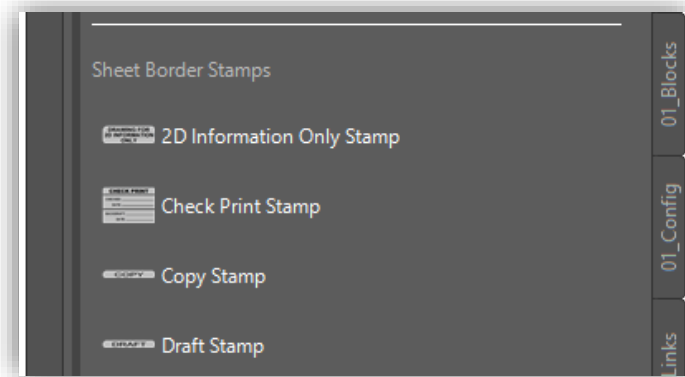
BUTTON CODE

No code required, simply drag-and-drop stamps from their network location/pathing or via Design Center (Windows Explorer) onto the Tool Palette.

Tools / Troubleshooting Tool Palette

The Tools / Troubleshooting Tool Palette contains a collection of useful and efficient routines to directly impact productivity by automating various procedures. Buttons on this Tool Palette assist users in cleaning up, configuring and modifying their drawings. An additional section for quick access to applications is also included. The **01_Tools Tool Palette** contains several sections: Drawing Cleanup Tools, Drawing Configuration Tools, Drawing Modification Tools and Applications.

Sections – Drawing Cleanup Tools
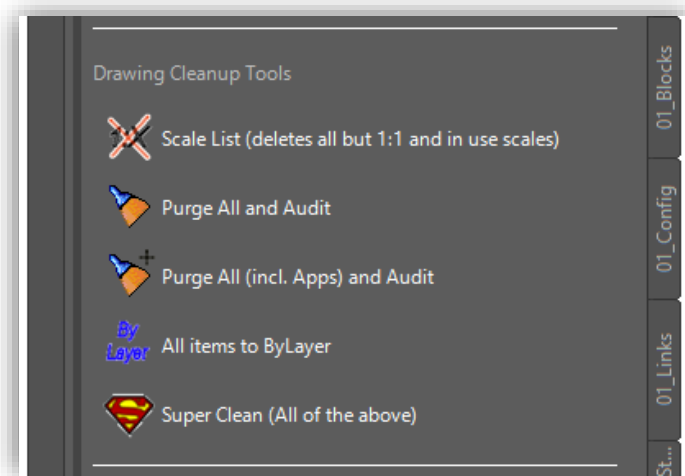
The "Drawing Cleanup" section includes several multi-step procedures for cleaning up a drawing, conveniently structured into single Tool Palette buttons.

The Scale Lists button can be quickly purged of any excess scales that are not in use.

The Purge All and Audit, Purge All (including apps) and Audit buttons will ensure your drawings are error free and clean of any excess, unused content.

The All Items to ByLayer button is helpful with ensuring any drawing entities are correctly using Layer settings in accordance with our internal CAD/Drawing Production Standards.

The Super Clean button combined the previous 4 buttons into a single one-click option.

BUTTON CODE

Scale List Purge	^C^C_-scalelistedit;reset;yes;xxxxx;(alert(strcat "enter-message-here")) *** Replace 'xxxxx' (e.g.: D;1:2; D; 1:4: etc.)
Purge All and Audit	^C^C_audit;y;-purge;all;;n;audit;y;-purge;all;;n;audit;y;(alert(strcat "enter-message-here"))
All Items to ByLayer	^C^C_setbylayer;all;;y;y;(alert(strcat "enter-message-here"))
Super Clean	Combine all the above code "sections" above into a single button

Sections – Drawing Configuration Tools
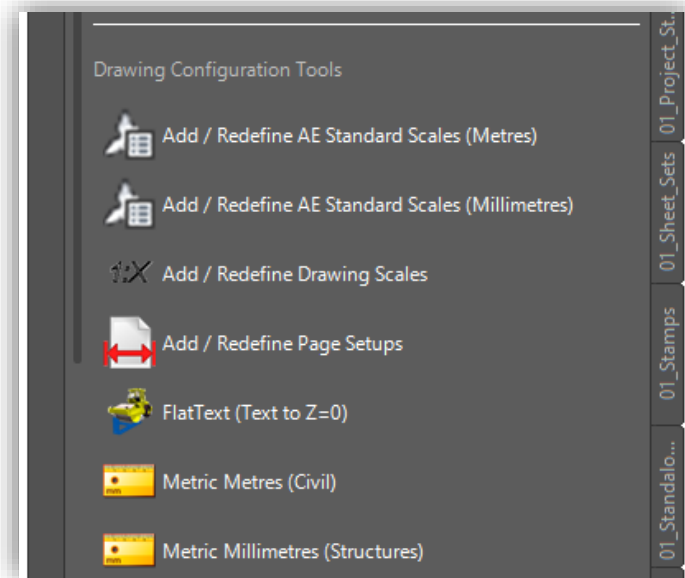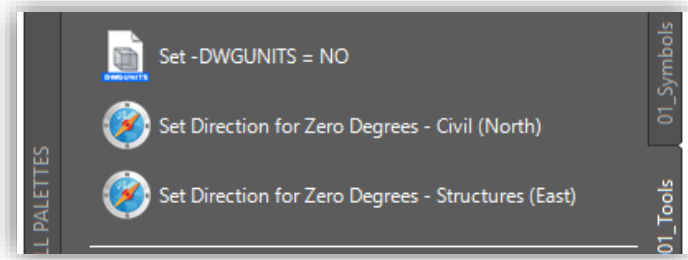
The "Drawing Configuration Tools" section includes several procedures for updating and configuring drawings.

The Add / Redefine Scales button adjusts the drawing's scale lists to the selected unit (meters, millimeters).

The Add / Redefine Page Setups button can resolve plotting issues by importing/overriding corporate Page Setups as defined in the templates.

The FlatText button runs an AutoLISP command to remove elevations from text objects, which can cause them to print 'bold' on output.

The Unit Adjustment buttons set the drawing's units, to either meters or millimeters.

The DWGUNITS button update to ensure inserted objects are not 'automatically' scaled, which can create size/scaling issues in certain instances.

The Zero Degrees Adjustment buttons set the direction of '0' based on discipline requirements.

BUTTON CODE

Add / Refine Scales	^C^C_filedia;0;script; "T:/ae/xxxxx.scr";filedia;1;(alert(strcat "enter-message-here"))
Add / Redefine Page Setups	(LOAD "T:/ae/xxxxx.lsp");(alert(strcat "enter-message-here")) *** Refer to the Appendix C of this handout for AutoLISP code(s).
FlatText (Load AutoLISP)	(LOAD "T:/ae/xxxxx.lsp");
Modify Drawing Units	^C^C_set;measurement;1;set;lunits;2;set;luprec;3;set;insunits;6; set;insunitsdefsource;6;set;insunitsdeftarget;6;-dwgunits;6;2;3;N'Y; N;regen;(graphscr);(alert(strcat "enter-message-here"))
DWGUNITS (Scaling Set to NO)	^C^C_-dwgunits;;;;n;y;(alert(strcat "enter-message-here"))
Zero Degrees Adjustment	^C^C_set;aunits;1;set;auprec;3;set;angbase;90;set; angdir;1;regen;(alert(strcat "Zero Degrees Set to North"))

Sections – Drawing Modification Tools
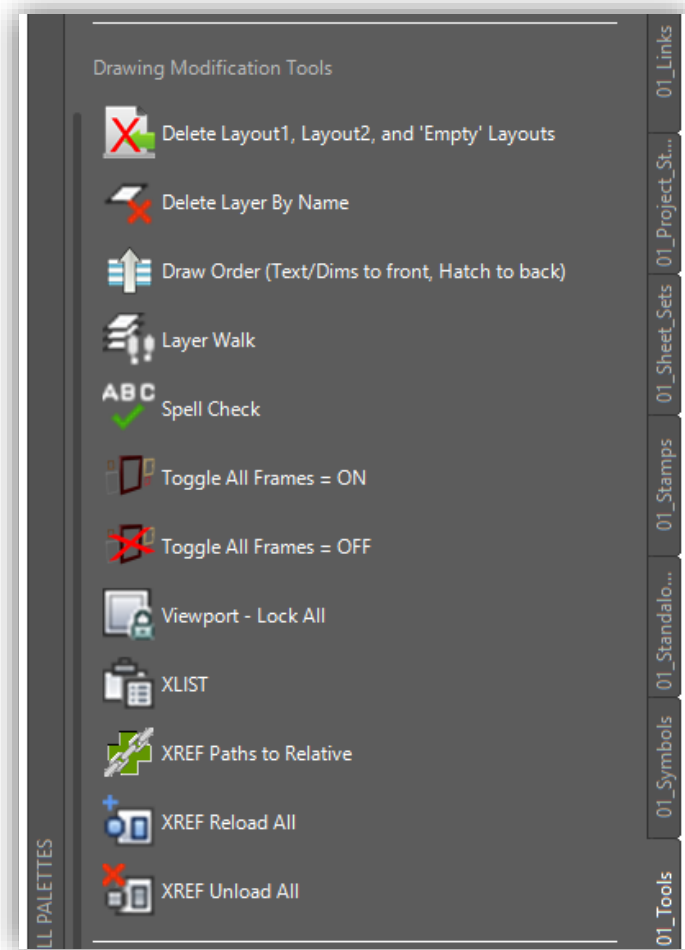
The "Drawing Modification Tools" section includes several procedures for modifying drawings content and other productivity tools.

The Delete Layout 1, Layout 2 and 'Empty' Layouts button removes any unused layouts, including Layout 1 and Layout 2 (not used corporately at Associated Engineering).

The Delete Layer By Name button launches the LAYDEL command.

The Draw Order button moves all annotation (text/dimensions) to the front, and subsequently moves any hatch objects to the back.

The Layer Walk button launches the LAYWALK command.

The Spell Check button launches AutoCAD's Spell Checker.

The Toggle Frames = ON button turns on any object frame within the current drawing.

The <u>Toggle Frames = OFF</u> button turns off any object frame within the current drawing.

The <u>Viewport – Lock All</u> button quickly locks all viewports within the current drawing.

The <u>XLIST</u> button launches the XLIST command.

The <u>XREF Paths to Relative</u> button sets all XREF pathing within the current drawing to relative (rather than full path, etc.).

The <u>XREF Reload All</u> button reloads all XREFs within the current drawing.

The <u>XREF Unload All</u> button unloads all XREFs within the current drawing.

BUTTON CODE

Delete Layout 1, Layout 2 and 'Empty' Layouts	^C^C_-layout;delete;empty;-layout;delete;layout1;layout;delete;layout2;(alert(strcat "enter-message-here"))
Delete Layout by Name	^C^C^R_laydel;n;
Draw Order (Text/Dims to Front, Hatch to Back)	^C^C^P(ssget"X"'((0. "Hatch")));draworder;p;;b;texttofront;b;(alert(strcat "enter-message-here"))
Layer Walk	^C^C_laywalk
Spell Check	^C^C_'dctmain;enc;_spell;
Toggle All Frames ON	^C^C_'imageframe;2;wipeout;f;on;
Toggle All Frames OFF	^C^C_'imageframe;0;wipeout;f;off;
Viewport Lock All	^C^C_-vports;l;on;all;;(alert(strcat("enter-message-here"))
XLIST	^C^C_xlist
XREF Paths to Relative	(command "._xref" "_T " "*" _R")
XREF Unload All	^C^C-xref;r;*;(alert(strcat "enter-message-here"))
XREF Reload All	^C^C-xref;u;*;(alert(strcat "enter-message-here"))

Section - Applications
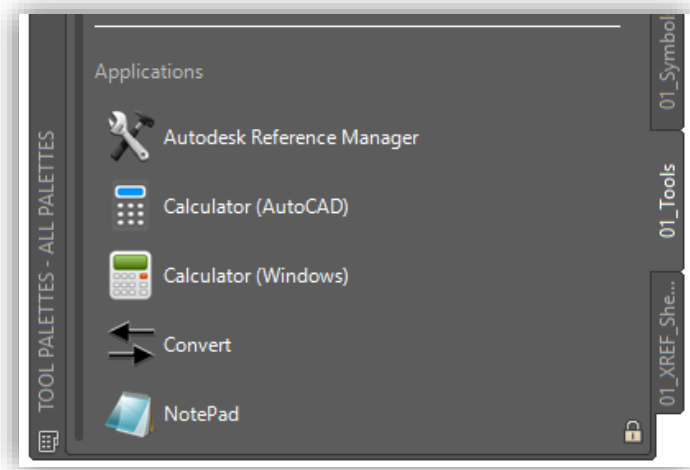
The "Applications" section provides quick access to several useful programs that assist users with various tasks.

BUTTON CODE

Run Program	^C^C_Shell "T:/xxxxx/program-to-run.exe";

Appendix A – What are Macros, Scripts and AutoLISP?

Macros

You use the Action Recorder to record commands and input as an action macro (ACTM) file. The Action Recorder is a panel on the ribbon that contains tools to record, modify, and play back an action macro. While recording, actions, commands, and input values are captured and displayed in the Action Tree as value nodes. A value node records the input provided at any prompt within a command, including acquired points, text strings, numbers, keywords, or other values that are entered when recording a command.
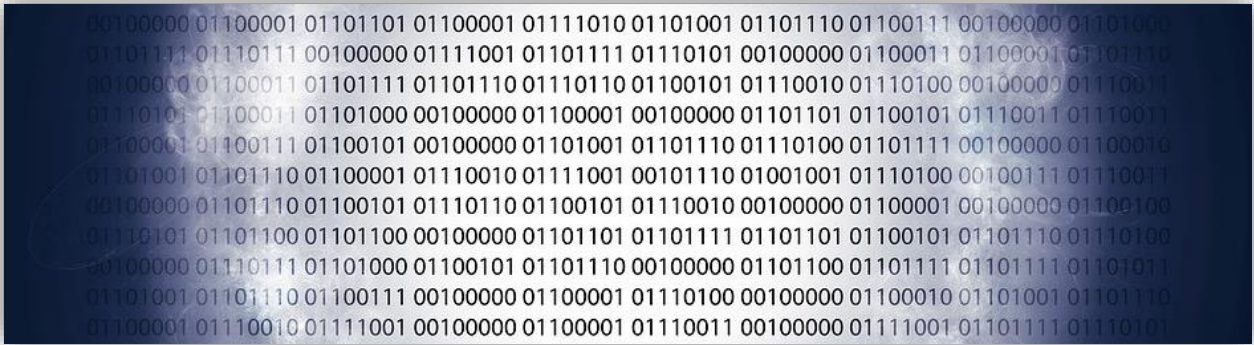
After recording is stopped, you can save captured commands and input to an action macro (ACTM) file which can be played back later. Once saved, you can specify base points, insert user messages, or change the behavior of recorded input values to pause for input during playback. You can also manage recorded action files with the Action Macro Manager from inside of the product or through the file system from outside the product.

Autodesk Knowledge Network (Action Macros) – CLICK HERE

Command macros can contain commands, special characters, DIESEL expressions, or AutoLISP programming code. You can define and then assign a macro to a command by modifying the Macro property of a command in the Customize User Interface Editor.

Autodesk Knowledge Network (Command Macros) – CLICK HERE

Scripts

A script is a text file with command or a script call on each line. You can invoke a script at startup or run a script using either the SCRIPT or the SCRIPTCALL command. The difference is that the SCRIPTCALL command can execute nested scripts in addition to commands. With the SCRIPT command, if a script is currently active when the SCRIPT command is invoked, the script is stopped.

You create script files outside the program using a text editor text editor that saves in ASCII format (for example, Notepad on Windows or TextEdit on Mac OS). The file extension must be saved as .*SCR*.

Each line of a script contains a command, and each blank space in a script is significant because it is like pressing Enter or the Spacebar. You must be familiar with the sequence of prompts for a command to provide an appropriate sequence of responses in a script.

A script can execute any command at the Command prompt except a command that displays a dialog box. In most cases, a command that displays a dialog box has an alternative version of the command that displays Command prompts instead of a dialog box. Most alternative versions of a command start with a hyphen (-). For example, use -INSERT instead of INSERT. Scripts can contain comments. Any line that begins with a semicolon (;) is considered a comment, and is ignored while the script is being processed. The last line of the script must be blank.

A script is treated as a group, a unit of commands, reversible by a single U command. However, each command in the script causes an entry in the undo log, which can slow the execution of a script. Changing the Control option of the UNDO command to None will turn off undo recording, which will improve the performance of a script when executed. Remember to turn undo recording back on (UNDO Control All) when the script is finished.

[Autodesk Knowledge Network (Command Scripts) – CLICK HERE](link)

AutoLISP

AutoLISP is a programming language designed for extending and customizing AutoCAD product functionality. It is based on the LISP programming language, whose origins date back to the late 1950s. LISP was originally designed for use in Artificial Intelligence (AI) applications, and is still the basis for many AI programs.

Autodesk introduced AutoLISP as an application programming interface (API) in Release 2.1, in the mid-1980s. LISP was chosen as the initial AutoCAD API because it was uniquely suited for

the unstructured design process of AutoCAD projects, which involved repeatedly trying difference solutions to design problems.

AutoLISP programs are developed using a basic ASCII text editor, such as Notepad on Windows or TextEdit on Mac OS, or the Visual LISP (VLISP) integrated development environment (IDE) on Windows only. The Visual LISP integrated development environment (IDE) provides features to help ease the tasks of source-code creation and modification, program testing, and debugging.

After an AutoLISP program is written, it must be loaded into the product before it can be used or debugged. Debugging your program allows you to evaluate and verify the code is working as expected, and if not identify what might be going wrong. The basics of debugging involve adding statements to the code and reviewing the contents of variables at strategic points in the program. If you discover you still do not have enough information to determine the error, you change the code again by adding additional debugging points. And finally, when you get the program working, you can either comment out or remove the debugging code.

Autodesk Knowledge Network (AutoLISP) – CLICK HERE

Appendix B - AutoCAD's Tool Palettes

Tool Palettes put the command you need at your fingertips, providing all necessary tools in a consistent user interface, both highly visual and customizable. Tool Palettes allow users to add frequently used commands, content (blocks, symbols), annotation styles and a variety of other preconfigured, CAD/Drawing Production Standards components to a panel within AutoCAD (or AutoCAD-based) software. Users can quickly access all the content they require in a single location within the software, directly increasing productivity and output.

By default, AutoCAD-based installation packages come with a default AutoCAD Tool Palette set, including Tool Palettes for:

- Annotation (Tables and Leaders)
- Discipline-Specific including Architectural, Civil, Electrical, Mechanical and Structural
- Hatches and Fills
- Visual Styles including Lighting and Cameras
- Modeling
- Draw and Modify
- Constraints
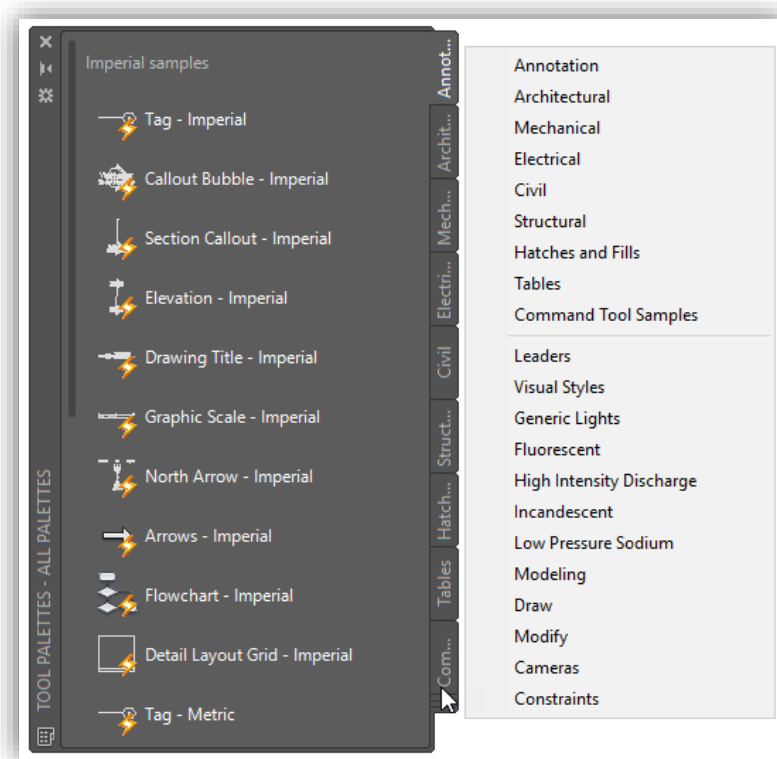
Creating Tool Palettes

First, ensure the Tool Palette Panel is open and displayed. You can open the Tool Palettes Panel using several different methods:

- On the **AutoCAD Ribbon**, under the View tab, press the Tool Palettes button
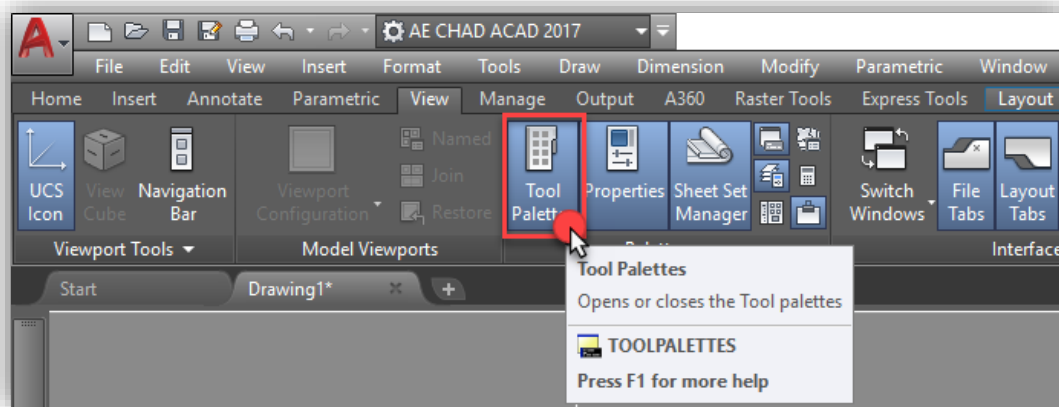
- In the **Pulldown Menus**, under Tools → Palettes → Tool Palettes
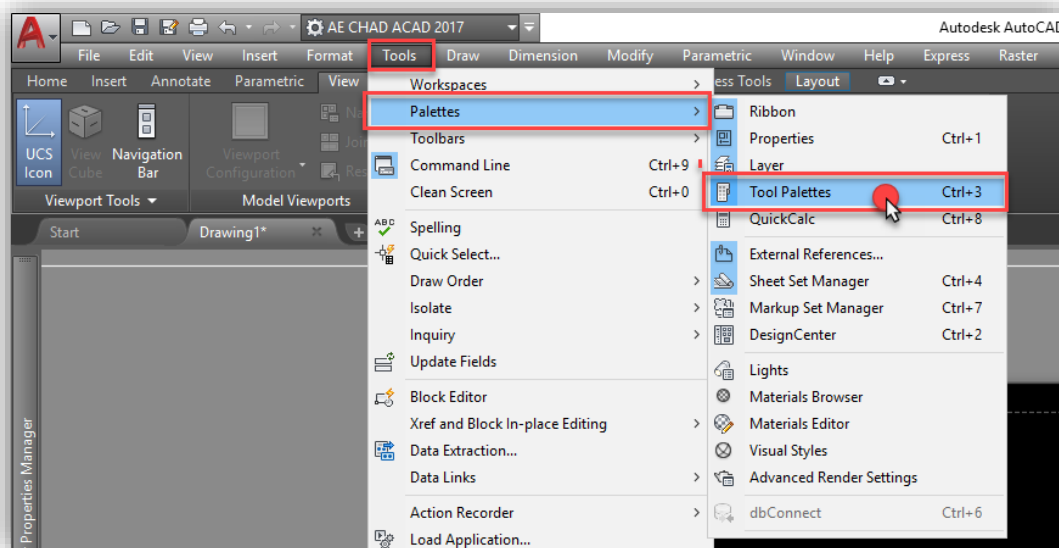
- **Shortcut Key** - press the Control (CTRL) Key and Number Key 3 (at the same time)

Once you have the AutoCAD Tool Palettes Panel open, simply **Right-Click** on the Tool Palette Panel "edge" and select **New Palette**...
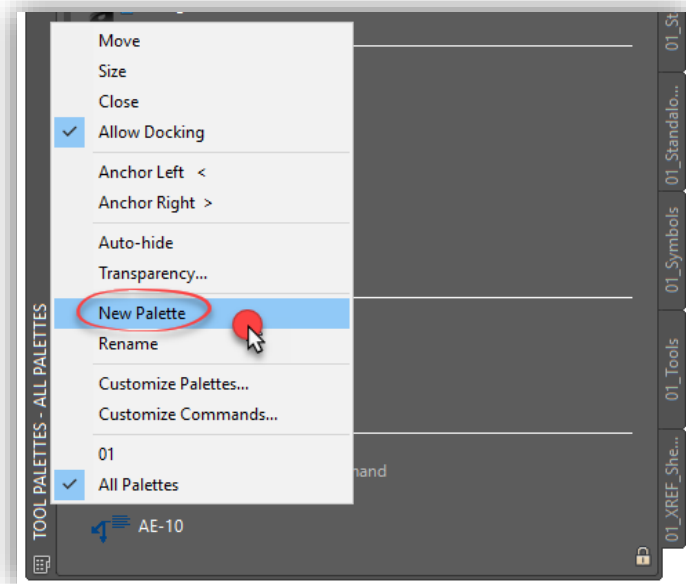
A New Tab (Palette) will show up in the Tool Palettes Panel, which you can rename accordingly.

As for populating content to the newly created Tool Palette, there are multiple ways:

- Drag tools from your current drawing onto the Tool Palette, including geometric objects, dimensions, fills, blocks, XREFs, raster images and tables. You can also add lights, cameras, visual styles and materials (not available in AutoCAD LT).
- Drag drawings, blocks and hatches from Design Center. Drawing that are inserted as blocks when dragged into drawings.
- Drag Toolbar buttons from the Customize Dialog box
- Drag commands from the Command Line pane on the Customize User Interface (CUI) Editor
- Paste tools from one tool palette to another
- Custom buttons (using a variety of coding options) can also be added

Additionally, once you have created a Tool Palette, you can modify it to suit your needs:

- Rearrange the tools by dragging and sorting them
- Add text and separator lines

- Move a Tool Palette up or down the list of tabs by using the Shortcut Menu (or Customize dialog box)
- Delete Tool Palettes that you no longer need, keeping in mind Tool Palettes that are deleted are lost unless they are first saved by exporting them

TIP!

Another quick and convenient way to create a Tool Palette from an existing folder of blocks is to simply open **Design Center**, then **Right-Click** on the folder where you have stored your blocks, and select **Create Tool Palette of Blocks**
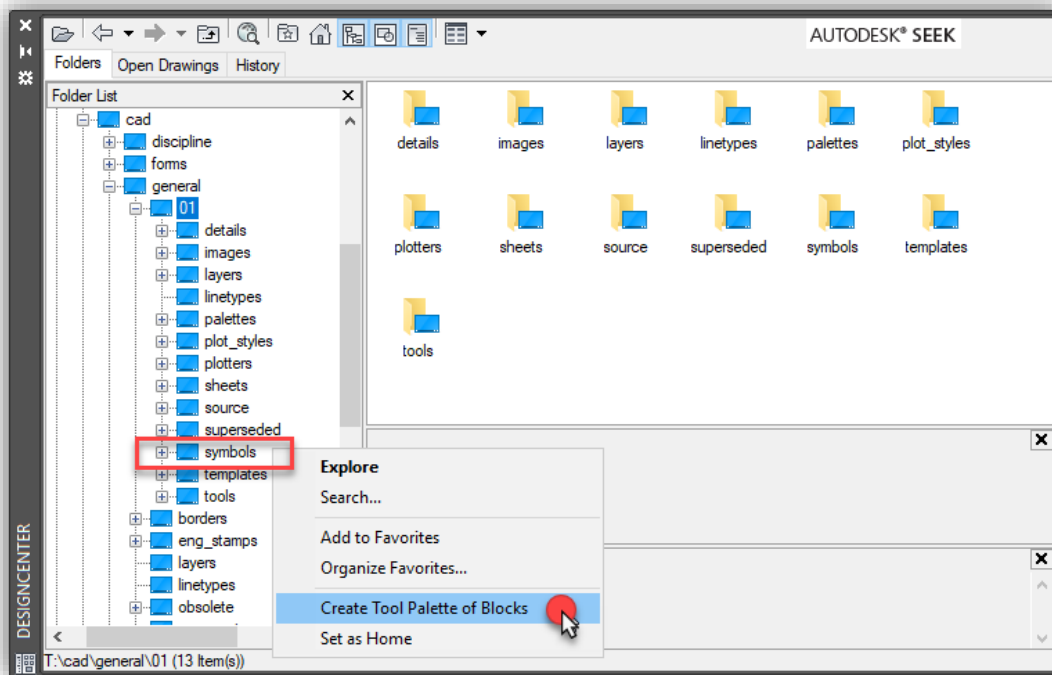
What are Tool Palette Groups?

Tool Palette Groups help you focus on the tools you need the most. Groups allow a user to organize individual (or a user defined selection of) Tool Palettes into 'groups' of similar content or discipline. Additionally, a user can control which group(s) of Tool Palettes are displayed on the Tool Palette Panel. An individual Tool Palette may belong to multiple Tool Palette Groups at the same time. Deleting a Tool Palette Group does not delete the individual Tool Palette(s), it just removes the grouping.

For example, if you have several Tool Palettes that contain hatch patterns, you can create a Tool Palette Group called 'Hatch Patterns'. Next, you can drag-and-drop all Tool Palettes that contain hatch patterns to the Hatch Patterns group. Make the Hatch Patterns Group 'current' to display only the Tool Palettes in that group within the Tool Palette Panel.

Creating a Tool Palette Group *(Example)*

To start, **Right-Click** on the Tool Palette Panel "edge" and select **Customize Palettes**...
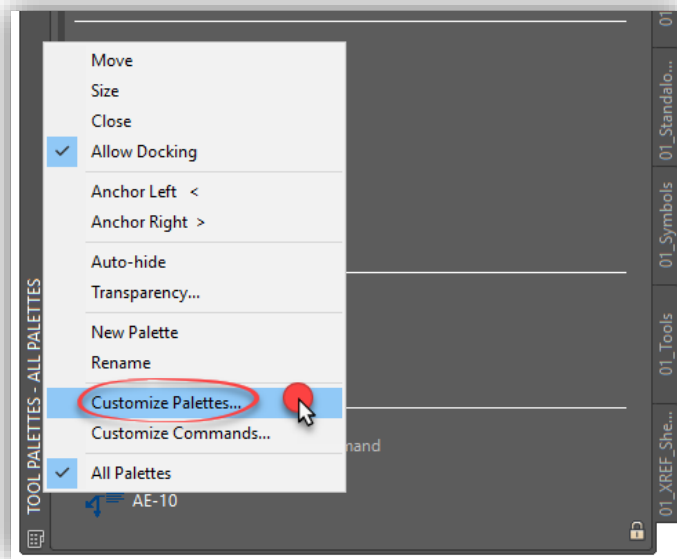
Within the Customize dialog box, you will see two sections:

- Palettes: which include all the loaded/existing Tool Palettes that are available
- Palette Groups: will include any Tool Palette Groups that have been defined or imported
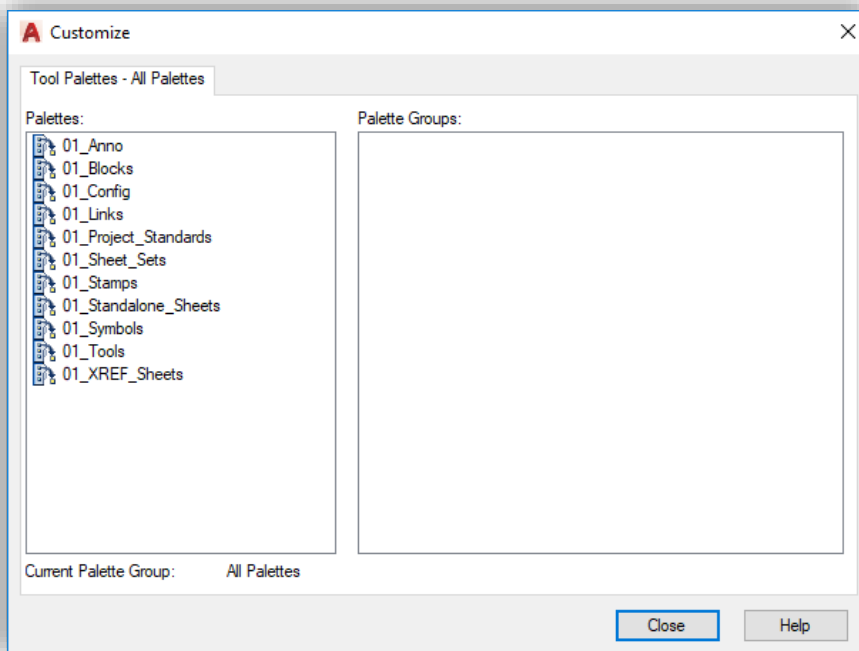
In this example, multiple individual Tool Palettes are shown (on the left side of the dialog box).

These Tool Palettes can be grouped together by similar content. In this example, the 01_XXX Tool Palettes are General/Corporate CAD/Drawing Production Standards and below, are Process-Discipline Tool Palettes (e.g.: 500mm – CS/SS).

Right-Click in the empty Palette Groups area (on the right) and select **New Group**…
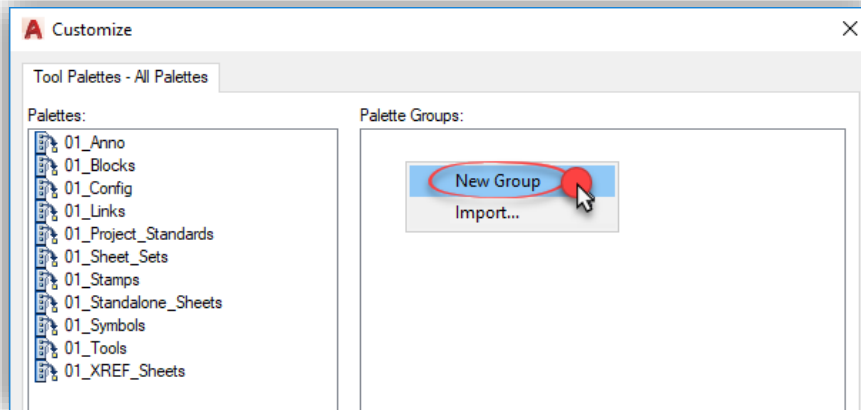
Name the newly created Tool Palette Group, **01**…
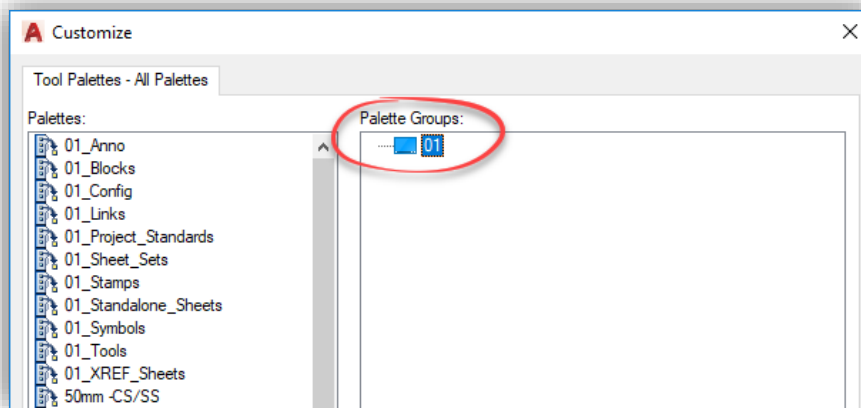
Next, drag-and-drop any 01_XXX Tool Palette (from the left side of the dialog box, under Palettes) into the 01 Palette Group (on the right side of the dialog box, under Palette Groups)…
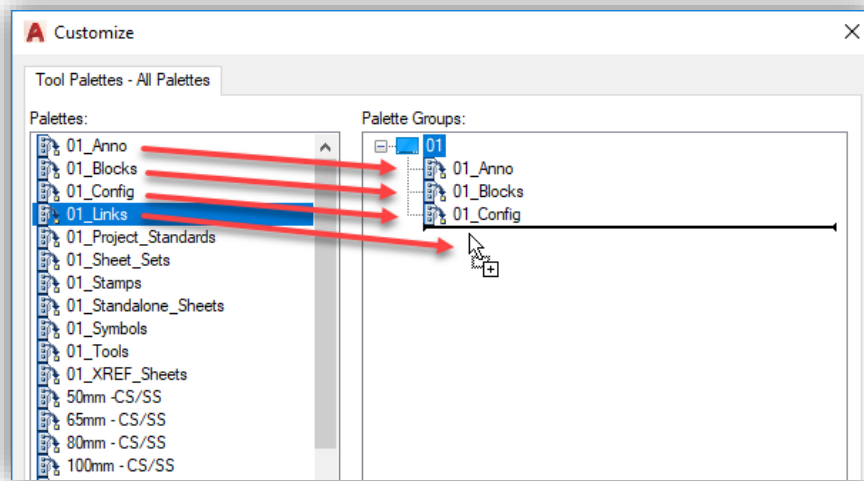
Once you have placed all 01 Tool Palettes within the 01 Palette Group, **Export** the Palette Group to a XPG file.
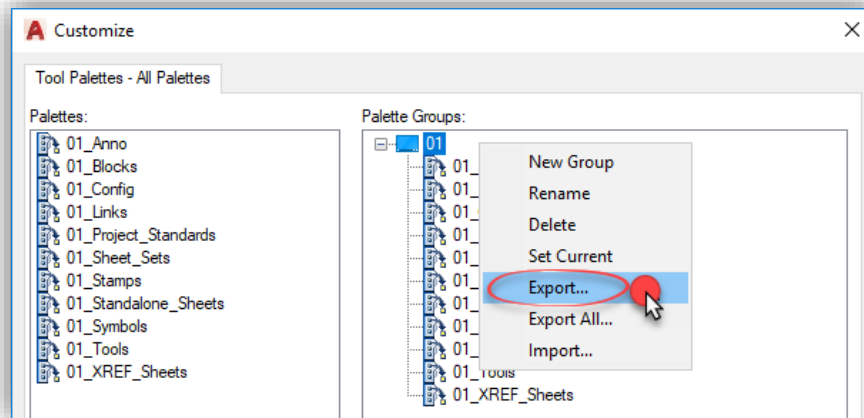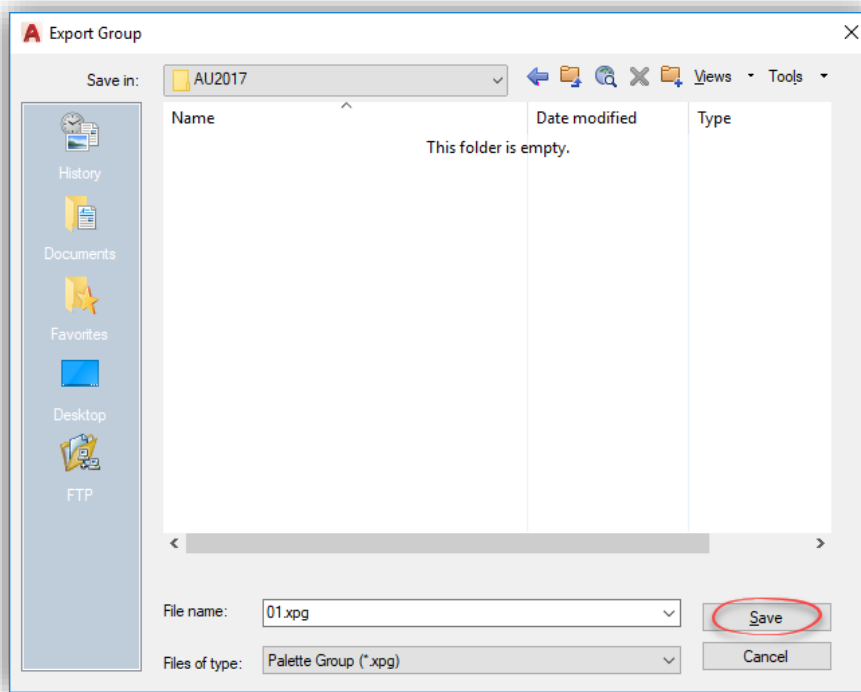
Click **Save** to create the Palette Group (.XPG) file. This file is used to Import the pre-defined 01 Palette Group (as required) into AutoCAD (or AutoCAD-based) software installs.

Importing a Tool Palette Group *(Example)*

To start, **Right-Click** on the Tool Palette Panel "edge" and select **Customize Palettes**...
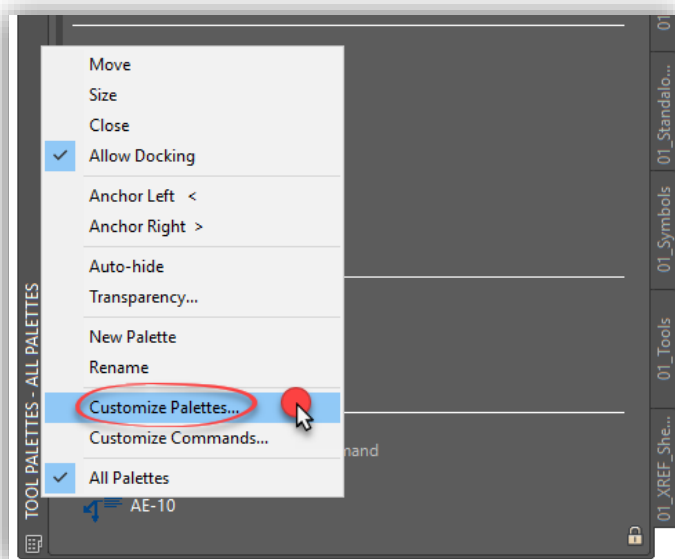
Right-Click in the Palette Groups area (on the right) and select **Import**…
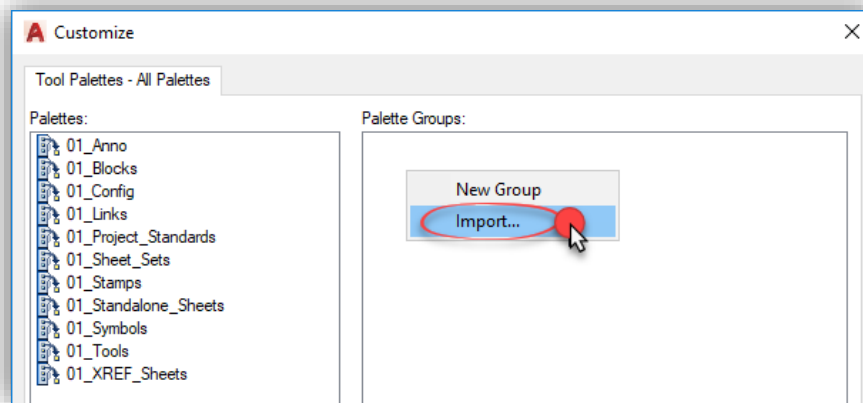
From the location where you exported the Palette Group (.XPG) file, select the file and press **Open**…
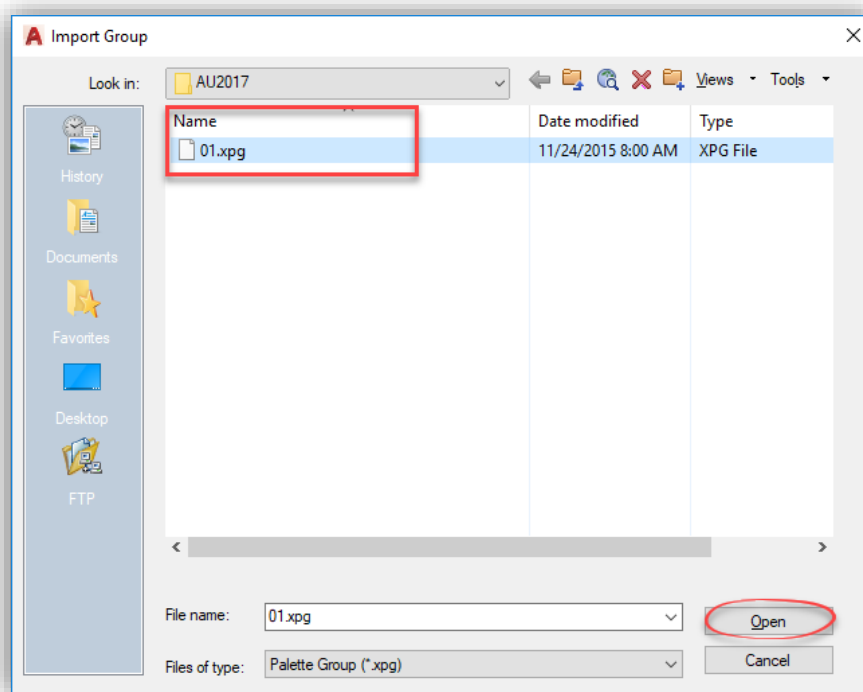
You will now see that the exported Palette Group has been imported, including all the individual 01 Tool Palettes… Click **Close** to exit the Customize dialog box.
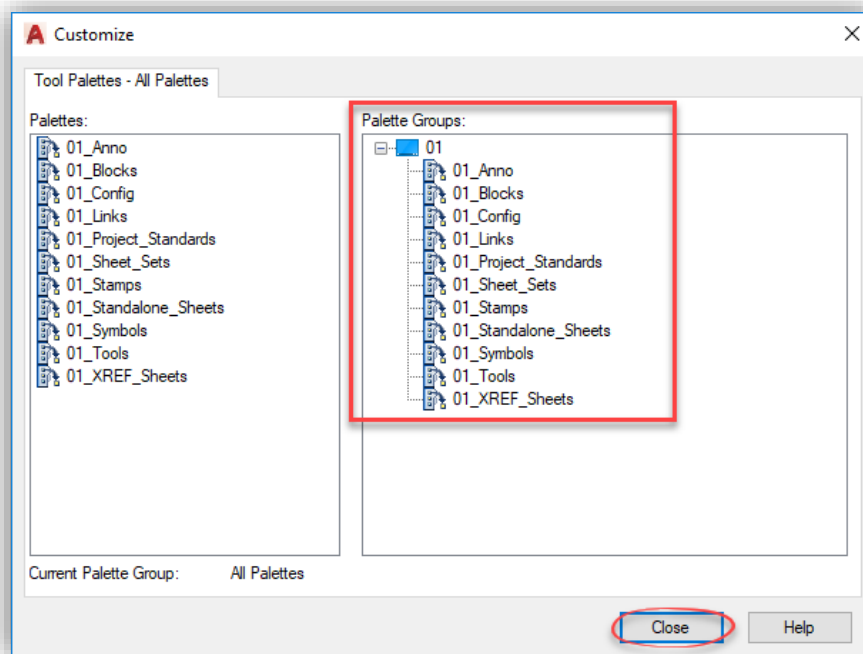
If additional Tool Palettes are added to an existing Palette Group, ensure you re-export the updated Palette Group so next time it is imported (by a user) it will includes all specified Tool Palettes.

Appendix C – AutoLISP Code Reference

AutoLISP code examples shown below has been provided for reference. New/Revised code or alternative examples may be available, refer to code sources online and/or via the Autodesk Community forums. Use the following code at your discretion, may not apply correctly to your specific network and company requirements. Ensure proper backups are in place prior to running any AutoLISP code that are you unfamiliar with.

NOTE

Not all AutoLISP code as shown during the Tool Palette Demonstration has been provided in this handout.

NOTE

Some folder/file paths and specifics contained within the example codes are respective to the requirements at Associated Engineering. You will need to structure your own folders/files as required prior to modifying the code as shown.

1-2-3 Button Configuration Workflow – Button 1: Example Code

```
; INITIATE PROCESS

(prompt "Starting AutoCAD Settings Update")

;; Disable Command Echoing
(command "cmdecho" 0)

; ****************************************************************************************************
; CREATE LOCAL CAD FOLDER SUPPORT STRUCTURE

(COMMAND "SH" "MD C:\\xxxxx")
(COMMAND "SH" "MD C:\\xxxxx\\xxxxx")
(COMMAND "SH" "MD C:\\xxxxx\\xxxxx\\xxxxx")

; ****************************************************************************************************
; COPY BASE PLOTTER SUPPORT FILES LOCAL

(COMMAND "SH" "Copy T:\\xxxxx\\plot_styles\\*.ctb C:\\xxxxx\\plot_styles\\.")
(COMMAND "SH" "Copy T:\\xxxxx\\plot_styles\\legacy\\*.ctb C:\\xxxxx\\plot_styles\\.")
 (COMMAND "SH" "Copy T:\\xxxxx\\plotters\\*.pc3 C:\\xxxxx\\plotters\\.")
(COMMAND "SH" "Copy T:\\xxxxx\\plotters\\*.pmp C:\\xxxxx\\plotters\\.")

; ****************************************************************************************************
; MISCELLANEOUS VARIABLE ADJUSTMENTS

;; Set startup behavior
```

```
(setvar "STARTUP" 0)

;; Set Alternate font default
(setvar "fontalt" "arial.ttf")

;; Auto-Save frequency (minutes)
(setvar "savetime" 10)

;; Turns on demand-loading. Copies of referenced drawings are opened and locked; referenced
drawings are not locked.
(setvar "XLOADCTL" 2)

;; Set MTEXTCOLUMN to 0
(command "mtextcolumn" 0)

;; Set IMAGEFRAME to 0
(command "imageframe" 0)

;; Set PLINEGEN to 1
(command "plinegen" 1)

;; Set EPDFSHX to 0
(command "epdfshx" 0)

; ******************************************************************************************************
; TRUSTED SITES

; This series of steps will ensure that all required Trusted Site Locations are applied to the CAD
installs.
; The path for the user's appdata will duplicate each time the LISP is run, currently no way
around checking
; for multiple entries in a single variable. Duplicates do not cause any disruption to settings.


; DEFINE FUNCTION: SPRPARSE

; This function, SPRPARSE, is a string parsing function, i.e.: a helper routine.

(defun strParse        (Str Delimiter / SearchStr StringLen return n char)
        (setq SearchStr Str)
        (setq StringLen (strlen SearchStr))
        (setq return '())

        (while (> StringLen 0)
                (setq n 1)
                (setq char (substr SearchStr 1 1))
                (while (and (/= char Delimiter) (/= char ""))
                        (setq n (1+ n))
                        (setq char (substr SearchStr n 1))
```

```
        ) ;_ end of while
        (setq return (cons (substr SearchStr 1 (1- n)) return))
        (setq SearchStr (substr SearchStr (1+ n) StringLen))
        (setq StringLen (strlen SearchStr))
    ) ; end of while
    (reverse return)
); end function


; DEFINE FUNCTION: ADDTRUSTPATH

; This function, ADDTRUSTPATH, defines how to handle added Path Locations specified later.

(defun addTrustPath (dir pos / tmp c lst)
 (setq tmp "" c -1)
 (if (not (member (strcase dir)
 (setq lst (mapcar 'strcase (strParse (getvar "TRUSTEDPATHS") ";")))))
  (progn
   (if (not pos) (setq tmp (strcat dir ";" (getvar "TRUSTEDPATHS")))
     (mapcar '(lambda (x)
      (setq tmp (if (= (setq c (1+ c)) pos)
      (strcat tmp ";" dir ";" x)
      (strcat tmp ";" x)
     )
     )
     )
     lst
    )
   )
  )
 (setvar "TRUSTEDPATHS" tmp)
 )
 )
 (princ)
); end function


; DEFINE FUNCTION: ADDTRUST

; This function, ADDTRUST, creates a place to define the paths required to add to the
"TRUSTED LOCATIONS".
; Adding "\... at the end of the path gives trust to all subfolders after the main folder you specify.

(defun ADDTRUST ()
(addTrustPath "T:\\CAD\\..." nil)
(addTrustPath "S:\\CAD\\..." nil)
(addTrustPath "%appdata%\\Autodesk\\..." nil)
(addTrustPath "C:\\ProgramData\\Autodesk\\..." nil)
(addTrustPath "C:\\Program Files\\Common Files\\Autodesk Shared\\..." nil)
```

```
); end function


; ACTION: TRUSTED LOCATIONS

; This code will reference the installation .LSP file to confirm your running ACAD2014 or higher.
; If higher then 19.1, it will apply ADDTRUST.

(if (>= (getvar "ACADVER") "19.1")(ADDTRUST))

; *****************************************************************************************************
;
; TEMP FILE LOCATIONS

; Temporary file location for Auto Save
(setvar "SAVEFILEPATH" "c:\\xxxxx\\temp\\autosave")

;; Temporary file location for xref copy
(setvar "XLOADPATH" "c:\\xxxxx\\temp\\xref")

;; Temporary file location for plot logs
(setenv "PlotLogPath" "c:\\xxxxx\\temp\\plot_logs")

;; Temporary file location for AutoCAD logs
(setvar "LogFilePath" "c:\\xxxxx\\temp\\commands")

;; Temporary file location for general AutoCAD temp files and read-only dwg files
(setenv "TempDirectory" "c:\\xxxxx\\temp\\general")

;; Turn on Palettes and go to xxxxx palette
(command "TPNAVIGATE" "xxxxx")

; *****************************************************************************************************
;
; PLOT STYLES LOCATIONS

(setenv "PrinterStyleSheetDir" "T:\\xxxxx\\plot_styles")

;; Plotter config folder for PC3 files
(setenv "PrinterConfigDir" "T:\\xxxxx\\plotters")

;; Plotter config folder for PMP files
(setenv "PrinterDescDir" "T:\\xxxxx\\plotters")

; *****************************************************************************************************
;
; TEMPLATE SETTINGS FOLDER LOCATIONS

;; Set default Drawing Template File Location
(setenv "TemplatePath" "T:\\xxxxx\\templates")

;; Set default Sheet Set Template File Location
```

```
(setenv "SheetSetTemplatePath" "T:\\xxxxx\\sheetset\\template")

;; Set default Template for Sheet Creation and Page Setup Overrides
(vla-put-PageSetupOverridesTemplateFile (vla-Get-Files (vla-Get-Preferences (vlax-get-acad-
object))) "T:\\xxxxx\\source\\xxxxx.dwt")


; ***********************************************************************************************
; FINALIZE PROCESS

(prompt "Starting AutoCAD Settings Update")

;; Enable Command Echoing
(command "cmdecho" 1)
```

1-2-3 Button Configuration Workflow – Button 2: Example Code

```
;; Plot Styles initial location (regional setting will override)
(setenv "PrinterStyleSheetDir" "S:\\xxxxx\\plot_styles;t:\\xxxxx\\plot_styles")

;; Plotter config folder for PC3 files
(setenv "PrinterConfigDir" "t:\\xxxxx\\plotters")

;; Plotter config folder for PMP files
(setenv "PrinterDescDir" "t:\\xxxxx\\plotters")
```

1-2-3 Button Configuration Workflow – Button 3: Example Code

```
;; Forces Appload path to S:\xxxxx\xxxxx
 (vl-load-com)
 (vl-registry-write
  (strcat
   "HKEY_CURRENT_USER\\"
   (vlax-product-key)
   "\\Profiles\\"
   (vla-get-activeprofile
      (vla-get-profiles
        (vla-get-preferences (vlax-get-acad-object))
      )
   )
   "\\Dialogs\\Appload"
  )
  "MainDialog"
  "S:\\xxxxx\\xxxxx\\"
 )
```

Set QNEW: Example Code

```
;; Set the drawing template file used by QNEW
;; This writes it to the registry but is later dismissed and overwritten by AutoCAD
;; (ax:SetQnewPath "T:\\xxxxx\\templates\\xxxxx.dwt")
(defun ax:SetQnewPath (QnewPath / prof key)
  (setq prof (vla-get-ActiveProfile (vla-get-profiles (vla-get-preferences (vlax-get-Acad-Object)))))
  (setq key (strcat "HKEY_CURRENT_USER\\" (vlax-product-key) "\\Profiles\\" prof "\\General"))
  (vl-registry-write key "QnewTemplate" QnewPath)
)

;; Gets current template
(getenv "QnewTemplate")
"T:\\xxxxx\\templates\\xxxxx.dwt"
and
;; Sets a different template
(setenv "QnewTemplate" "T:\\xxxxx\\templates\\xxxxx.dwt")
```

Palette Configuration: Example Code

```
;; Add T: only palette location
(command "*_TOOLPALETTEPATH" "T:\\xxxxx\\palettes\\xxxxx")

;; Go to xxxxx palette
(command "TPNAVIGATE" "xxxxx")
```

Load Discipline Palette: Example Code

```
;; Set Civil Discipline Tool Palette locations

;;Capture what they had
(setq OriginalPath (getvar "*_TOOLPALETTEPATH"))

;;Define Civil path
(setq CivilPath "T:\\xxxxx\\palettes\\xxxxx")

;;Concatenate the paths together
(setq path (strcat CivilPath ";" OriginalPath))

;; add Civil Palette Path
(command "*_TOOLPALETTEPATH" path)
;;
;; Go to Civil - Civil Discipline Palette - Start palette
(command "TPNAVIGATE" "Civil Discipline Palette")
```

Local Plotter/Network Plotter Support: Example Code

```
; INITIATE PROCESS

(prompt "Starting AutoCAD Settings Update")

;; Disable Command Echoing
(command "cmdecho" 0)

; ********************************************************************************************************
; CREATE LOCAL CAD FOLDER SUPPORT STRUCTURE

(COMMAND "SH" "MD C:\\xxxxx")
(COMMAND "SH" "MD C:\\xxxxx\\xxxxx")
(COMMAND "SH" "MD C:\\xxxxx\\xxxxx\\xxxxx")

; ********************************************************************************************************
; COPY BASE PLOTTER SUPPORT FILES LOCAL

; This is done in case local plotter support files are needed.

(COMMAND "SH" "Copy T:\\xxxxx\\plot_styles\\\*.ctb C:\\xxxxx\\plot_styles\\.")
(COMMAND "SH" "Copy T:\\xxxxx\\plot_styles\\legacy\\\*.ctb C:\\xxxxx\\plot_styles\\.")
 (COMMAND "SH" "Copy T:\\xxxxx\\plotters\\\*.pc3 C:\\xxxxx\\plotters\\.")
(COMMAND "SH" "Copy T:\\xxxxx\\plotters\\\*.pmp C:\\xxxxx\\plotters\\.")

; ********************************************************************************************************
; PLOT STYLES LOCATIONS

(setenv "PrinterStyleSheetDir" "C:\\\xxxxx\\plot_styles")

;; Plotter config folder for PC3 files
(setenv "PrinterConfigDir" "C:\\xxxxx\\plotters")

;; Plotter config folder for PMP files
(setenv "PrinterDescDir" "C:\\xxxxx\\plotters")

; ********************************************************************************************************
; FINALIZE PROCESS

(prompt "Starting AutoCAD Settings Update")

;; Enable Command Echoing
(command "cmdecho" 1)
```

Navigate/Swap Currently Displayed Tool Palette: Example Code

```
;; Go to xxxxx palette
(command "TPNAVIGATE" "xxxxx")
```

Add / Redefine Page Setups: Example Code

```
; INITIATE PROCESS

(prompt "Starting AutoCAD Settings Update")

;; Disable Command Echoing
(command "cmdecho" 0)

; ********************************************************************************************************
; REMOVE ALL EXISTING PAGE SETUPS EXCEPT CURRENT (IF AVAILABLE)

(defun Delset ()
  (vl-load-com)
  (vlax-for y (vla-get-plotconfigurations
  (vla-get-activedocument (vlax-get-acad-object))
          )
      (if (/= "Model" (vla-get-name y))
        (vla-delete y)
        )
  )
)
(Delset)

; ********************************************************************************************************
; ADD ALL CURRENT 01 PAGE SETUPS

(defun PageSetupsIn ()
  (command "._-PSETUPIN" "T:/xxxxx/source/xxxxx.dwt" "*")
)
(PageSetupsIn)

; ********************************************************************************************************
; FINALIZE PROCESS

(prompt "Starting AutoCAD Settings Update")

;; Enable Command Echoing
(command "cmdecho" 1)
```