



CITY OF LAS VEGAS, NEVADA

CAD Standards Manual





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Introduction

This document provides a single source location for the City of Las Vegas CAD Standards, as well as links to all support files necessary for the preparation of CAD files relevant to city projects. The purpose of these CAD Standards is to develop uniformity in drawing information and to improve electronic data sharing between disciplines within the City of Las Vegas as well as consultants working for the City of Las Vegas.

It is recognized existing documentation found within the City of Las Vegas may conflict with some parts of these CAD Standards. All efforts have been made to resolve the conflicts, but the City of Las Vegas does not guarantee that all discrepancies have been found or resolved. This document supersedes all CAD related documentation currently used within the City of Las Vegas Department of Public Works.

General Requirements

Software

The City of Las Vegas currently uses the following CAD software products:

AutoCAD Map 3D
AutoCAD Civil 3D
AutoCAD Raster Design
Autodesk Design Review
AutoCAD 3DS Max Design
Autodesk Navisworks

PLEASE NOTE:

The actual software version used by City of Las Vegas internally will change from time to time, therefore please refer to the specific project contract or contact the project manager for actual version and submission requirements. As of the release of this document version 2013 or version 2014 are acceptable formats.

Civil 3D Objects

To ensure the integrity and continuity of an efficient workflow and design process throughout the survey, design, construction, and Building Information Modeling (BIM) processes, all City of Las Vegas projects require the use of Civil 3D objects to facilitate three-dimensional data. These methods include, but are not limited to, the following:

- POINTS
- SURFACES
- ALIGNMENTS
- PROFILES - SECTIONS
- CORRIDORS
- PIPE NETWORKS

Not all Disciplines use these design elements, therefore some disciplines will not have a specific Civil 3D Object requirement. Please refer to each discipline's Civil 3D Objects section for details.





Downloading and Installation of Support Files

1. It is recommended that you familiarize yourself with the installation procedures prior to configuring your machine to follow the CLV standards. This example will demonstrate installation for Civil 3D 2014. The year listed is reference to the version of Civil 3D being used. Your version may differ.
2. Since this template will be used by different disciplines there will be periodic updates. It is suggested that the latest version is downloaded and used to replace possibly outdated support files. If previous versions have been installed, please remove the existing desktop icon and support files located on the C: drive. Support path should be C:\CLV-2014.
3. Support files are located on the City of Las Vegas website. It is necessary to download the correct file for the version of CAD being used. The files are in zip format and contain all necessary content such as templates, plot styles, and tool palettes.
4. Unzip the downloaded file and place the directory structure on the C: drive. You should now see C:\CLV-2014.
5. Within the C:\CLV-2014 folder locate the profile folder (ex. C:\CLV-2014\CLV Profiles) and copy the CLV2014.C3D icon to the desktop.
6. Once copied to your desktop, click on the icon and open Civil 3D. The tool palette path and template structure is already configured when using the CLV2014.C3D icon.

Electronic Drawing Submission Requirements

1. The electronic versions (DWG, DWF, & PDF) of the plan set being submitted must match the paper copy, except for inked seals, signatures, or other information pertaining to the approval process. The AutoCAD drawings will use the standard CLV named plot style files (CLV.stb).
2. All source reference files and data shortcuts must maintain their links to the working drawings when transferred. Creating a transmittal file with the AutoCAD eTransmit tool is recommended. Follow the standard CLV directory structure guidelines and use relative paths when referencing external data.
3. A list of the files being submitted will be included in a text file, which will contain the complete file name and a brief description.

Drawing Template

1. All DWG files created for any City of Las Vegas project must use the CLV template.
2. The file will be named CLV-(*AutoCAD version*).dwt.
3. This template includes City of Las Vegas specific Civil 3D styles, fonts, dimension styles, (all prefixed with "CLV"), and most of the standard City of Las Vegas Annotation, Design, and Survey layers needed for completion of City of Las Vegas projects.





4. All new projects must use the latest version of the drawing template, available on the City of Las Vegas website. Please download the current drawing template and supporting files prior to beginning any City of Las Vegas projects.
5. The template file contains layout tabs which contain drawing sheet content such as the Title Block, Cover Sheet, General Notes, and other components for use on City of Las Vegas projects.

Coordinate System

1. Most of the projects in the City of Las Vegas area will be based on NAD83 NCRS, Las Vegas Zone, US Foot (Autodesk code: NV83.NCRS-LVF), or NV83.NCRS-LVHEF for those projects located in the higher elevations, or as otherwise specified by the City of Las Vegas Project Manager.
2. Any information referenced in design drawings shall not be moved or rotated from the original coordinates used in the drawing.
3. The coordinate system is set in the Civil 3D Drawing Settings (Figure 1), or Map 3D Coordinate System Settings (Figure 2).

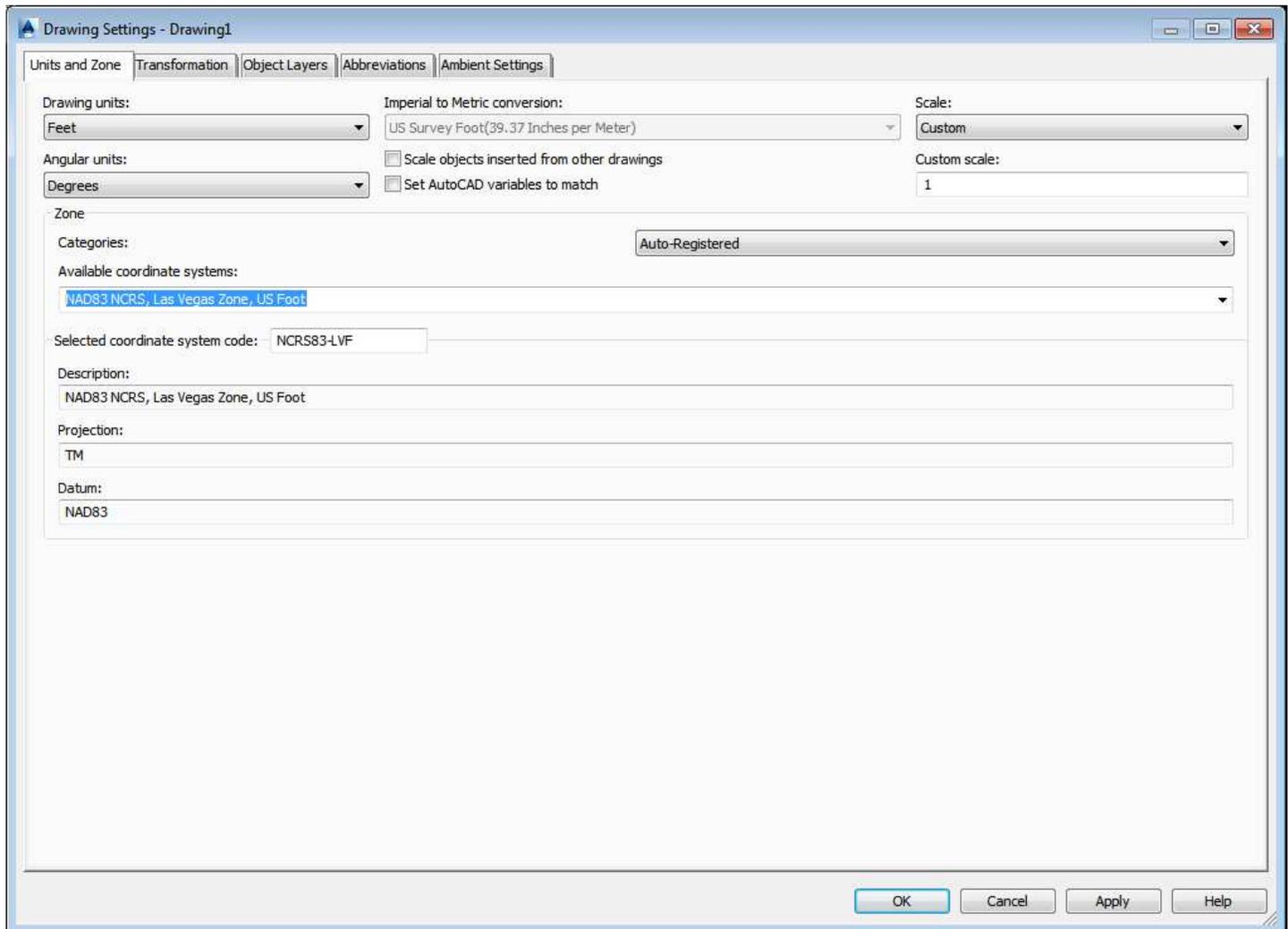


Figure 1: Civil 3D Drawing Settings





Coordinate System – Assign

Currently Assigned

Code: NCRS83-LVF
 Description: NAD83 NCRS, Las Vegas Zone, US Foot

Show

Status: Up to date Code type: Autodesk Category: No filter selected Unit: No filter selected

Search

ncrs

Status	Code	Description	Definition type	Referenced to	Categories	EPSG code	Unit
	NCRS83-LVF	NAD83 NCRS, Las Vegas Zone, U...	P	NAD83	Auto-Registered	-	US Survey Foot
	NV83.NCRS-LV	NAD83 NCRS, Las Vegas Zone, M...	P	NAD83	USA, Nevada	-	Meter
	NV83.NCRS-LVF	NAD83 NCRS, Las Vegas Zone, U...	P	NAD83	USA, Nevada	-	US Survey Foot
	NV83.NCRS-L...	NAD83 NCRS, Las Vegas High Ele...	P	NAD83	USA, Nevada	-	Meter
	NV83.NCRS-L...	NAD83 NCRS, Las Vegas High Ele...	P	NAD83	USA, Nevada	-	US Survey Foot
	NVHRN.NCRS-...	HARN/NV NCRS, Las Vegas Zone,...	P	HARN/NV	USA, Nevada	-	Meter
	NVHRN.NCRS-...	HARN/NV NCRS, Las Vegas Zone,...	P	HARN/NV	USA, Nevada	-	US Survey Foot
	NVHRN.NCRS-...	HARN/NV NCRS, Las Vegas High...	P	HARN/NV	USA, Nevada	-	Meter
	NVHRN.NCRS-...	HARN/NV NCRS, Las Vegas High...	P	HARN/NV	USA, Nevada	-	US Survey Foot

Assign View Close Help





Nevada Coordinate Reference System (NCRS)

Table 1: NCRS Autodesk Coordinate Systems Definitions

CODE	DESCRIPTION	UNIT	DATUM (GEODETIC)	PROJECTION
NCRS83-LVF	NAD83 NCRS, Las Vegas Zone, US Foot	Foot	NAD 1983, Alaska, Canada, Continental US, Mexico, Central America	Transverse Mercator
NCRS83-LVHEF	NAD83 NCRS, LV High Elev Zone, US Foot	Foot	NAD 1983, Alaska, Canada, Continental US, Mexico, Central America	Transverse Mercator

Table 1: NCRS Autodesk Coordinate Systems Definitions (continued)

CODE	FALSE NORTHING	FALSE EASTING	ORIGIN LATITUDE	SCALE	CENTRAL MERIDIAN
NCRS83-LVF	656166.6667	328083.3333	36d15'0.000000"	1.0001	-114d58'0.000000"
NCRS83-LVHEF	1312333.3333	984250.0000	36d15'0.000000"	1.000135	-114d58'0.000000"





Project Folder Structure

City of Las Vegas requires that electronic file submissions be provided in the following directory structure. Below is an example of a Civil discipline project that has been issued a City of Las Vegas project number of **H10000** and has been placed on a file server sharing a logical drive letter mapping of **X:**.



X:\H10000



_Shortcuts – *(Automatically created by the Civil 3D “New Data Shortcuts Project Folder” dialog)*



Base Drawings – *(Existing and proposed 2D geometry.)*



Blocks – *(Project-specific blocks)*

2D

3D



Documents – *(Project drawings and documents sent to or received from clients and others)*

Files In

<Name of source> – *(e.g., ABC Architects)*

DGN

DWF

DWG

Images

Files Out

Transmittal

Admin

Redlines



Engineering Drawings – *(Engineering working design folders)*

Alignment

Corridor

Details

Exhibits

Pipe Networks

Profiles

Surfaces

Existing Ground

Proposed Ground



GIS – *(Project-specific GIS data and documents)*

DWG

LYR

Misc

MXD

PDF

SHP



Reports

Plan Review





Sheet Set – *(Final Plan sets to be plotted)*

- DWG**
- DWF**
- PDF**



Submittals

- 30%**
- 70%**
- 90%**
- Bid Set**
- 99% Pre Final**
- 100% Final**
- PDF (Current Version)**
- Record Drawings**



Survey Drawings

- Details**
- Exhibits**
- GPS Data**
- Mapping**
- Parcel Layout**





File Naming

The City of Las Vegas requires the following guidelines for all CAD related files created, used, or submitted to the organization. This applies to all drawings, images, DWF's, PDF's, or any other file type used in support of, or used in conjunction with this CAD Standard.

Example:

Using the file naming designators below, a typical sanitary sewer plan and profile drawing may be named as follows:

H 1 0 0 0 0 - S S 0 1 . D W G



Civil Plan Code	Plan Type	Comments
CV	Cover Sheet	
GN	General Notes	general notes, sheet index , vicinity map, key map, legend, abbreviations list, quantities
SC	Survey Control Plan	horizontal and vertical survey control (or embedded Record of Survey), alignment data optional
HC	Horizontal Control Plan	alignment data
RW	Right of Way Plan	
SU	Subsurface Utility Engineering Map	existing utility data and pothole locations (with SUE quaility levels)
DR	Demolition/Removal Plan	
GR	Grading Plan	
DR	Drainage Plan (Detail)	
CI	Civil Plan	general civil plan (on-site or non-corridor project area)
PP	Civil Plan and Profile	general civil plan and profile (corridor project area)
DT	Detail	general civil details
TY	Typical Sections	
RD	Roadway Plan (Profile, Detail)	
TR	Trail Plan (Profile, Detail)	
SD	Storm Drain Plan (Profile, Detail)	
SS	Sanitary Sewer Plan (Profile, Detail)	
UT	Utility Plan (Profile, Detail)	combined utilities or master utility plan
WT	Water Plan (Profile, Detail)	
CH	Channel Plan (Profile, Detail)	open flood control channel





ST	Structural Plan (Detail)	
BR	Bridge Plan (Profile, Detail)	
EL	Electrical Plan (Detail)	
SL	Street Lighting Plan (Detail)	
TS	Traffic Signal Plan (Detail)	
SM	Signing and Marking Plan (Detail)	
BP	Bypass Plan	sanitary sewer bypass
TC	Traffic Control Plan	
LA	Landscaping Plan (Detail)	
IR	Irrigation Plan (Detail)	





Layer Naming

The City of Las Vegas drawing template has been provided with standardized layers designed to comply with the United States National CAD Standard (NCS) and accommodate information required in any drawing. Every attempt must be made to use the layers provided. In the event that an additional layer is required, the following layer naming procedure shall be used. Each layer must be assigned a Major and a Minor code separated by a hyphen (-). Three Optional Codes have been provided to allow for ease of customization, should a layer not be available.

Level 1 Discipline Designators	
Codes	Description
C	Civil Engineering
V	Survey
VA	Aerial Survey
VF	Field Survey

List of Level 1 Discipline Designators.

C - W A T R - P R O F - E

A typical Civil drawing layer name showing the required NCS Level 1 Discipline Designator code (C).

Status Fields	
Codes	Description
D	Existing to demolish
E	Existing to remain
F	Future work
M	Items to be moved
N	New work
S	Superseded Design Data
T	Temporary work
X	Not in contract
1-9	Phase numbers

C - W A T R - P R O F - E

A typical Civil drawing layer name showing the Status Field code (E) to specify a profile of an existing water supply feature.





Major Group	
Codes	Description
ALGN	Alignments
ANNO	Annotation
BLDG	Buildings
BRDG	Bridge
CATV	Cable television
DRIV	Driveways
ESMT	Easements
FAST	Freeway and Arterial System of Transportation (FAST)
FENC	Fences
FIBR	Fiber optic
NGAS	Natural gas
PARK	Parks
PHON	Telephone
POWR	Power
PRKG	Parking lots
PROP	Property
PVMT	Pavement
REUS	Reuse water
ROAD	Roadways
SLGT	Street Lighting
SSWR	Sanitary sewer
STRM	Storm drain
SURV	Survey
SWLK	Sidewalks
TINN	Triangulated irregular network (DTM)
TOPO	Topographic features
TRAL	Trails or paths
TSIG	Traffic signal
UNID	Unidentified site objects
UTIL	Utilities
WALL	Walls
WATR	Water

C - W A T R - P R O F - E

A typical Civil drawing layer name showing the Major Group code (**WATR**) to specify a water supply feature.

Sample list of Major Group codes. Please refer to NCS layer guidelines for a complete list of codes.



Minor Group	
Codes	Description
ASPH	Asphalt
ASSM	Assemblies
BNDY	Boundaries
CNTR	Centerlines
CONC	Concrete
COND	Conduits
CORR	Corridors
CTRL	Control
CURB	Curbs
GRND	Ground
LABL	Labels
MAJR	Major
MRKG	Markings
MTCH	Matchlines
PATT	Hatch patterns
PHOL	Potholes
PIPE	Piping
PLAY	Play structures
PLNT	Plants
PNTS	Points
POLE	Poles
PRCL	Parcels
PRKG	Parking
PROF	Profile
SAMP	Sample lines
SCTN	Section
SHAP	Shapes
SIGN	Signage
STRC	Structures
SWCT	Sawcut lines

C - W A T E R - P R O F - E

A typical Civil drawing layer name showing the Minor Group code (**PROF**) to specify a profile of a water supply feature.

Sample list of Minor Group codes. Please refer to NCS layer guidelines for a complete list of codes.





Linetypes

Below are the approved line Linetypes included within the template. Lines should always be drawn at a linytphpe scale value of 1.

LINETYPES	
DESCRIPTION	LINETYPE
CENTERLINE	
PROPOSED	
EXISTING	
RIGHT OF WAY	

Text Styles/Fonts and Dimension Styles

Text Styles

The following fonts and text styles are approved for City of Las Vegas use and are pre-defined within the drawing template.

NAME	FONT NAME	FONT STYLE	TEXT HEIGHT	ANNOTATIVE
CLV-Standard	Swis721 BT	Roman	0.00	Yes
CLV-Bold	Swis721 BT	Bold	0.00	Yes

Dimension Styles

The following dimension styles are approved for City of Las Vegas use and are pre-defined within the drawing template.

NAME	Text Style
CLV	CLV-Standard

Plot Style Table/Lineweights

Plot Styles

The City of Las Vegas has created – A standard named plot styles file (CLV.stb) file to aid in plotting standardized paper copies. This plot style is intended to provide seamless integration while exchanging drawings with the Department of Public Works.

Note: The AutoCAD CONVERTPSTYLES command converts a currently open drawing from color-dependent plot styles to named plot styles, or from named plot styles to color-dependent plot styles, depending on which plot style method the drawing is currently using.

Lineweights

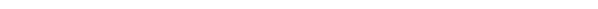
The following exhibit displays the expected plotting results for line weights when using the CLV.stb style.



Plot Style Table/Lineweights (continued)

Lineweight and Plot Screening Table

<u>LINEWEIGHTS</u>		
XXS	0.13mm	
XS	0.18mm	
S	0.25mm	
M	0.35mm	
L	0.50mm	
XL	0.70mm	
XXL	1.00mm	
XXXL	1.40mm	
XXXXL	2.00mm	

<u>PLOT SCREENING</u>		
XL	100%	
XL-75	75%	
XL-6	60%	
XL-45	45%	
XL-3	30%	
XL-15	15%	





Parts Catalog

1. The CLV drawing template contains parts catalog content with styles already applied.
2. To create pipe networks using the CLV template, the pipes catalog directory must be pointed to the CLV Parts Catalog. If this step is skipped, structures and pipes will not display in the parts list when creating networks. This should already be configured if starting Civil 3D using the CLV2014.C3D icon.
3. All new projects must use the latest version of the parts catalog, available on the City of Las Vegas website. Please download the current parts catalog prior to beginning any City of Las Vegas projects.

