



CAD Standards Manual

2012



April 2012
Version 2.0

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Introduction

This document provides a single source location for the Massachusetts Department of Transportation (MassDOT), Highway Division, CAD Standards, as well as links to all support files necessary for the preparation of CAD files relevant to highway projects.

The purpose of this CAD Standard is to standardize drawing information and improve electronic data sharing between disciplines within MassDOT and from consultants working for MassDOT.

It is recognized that there remains existing documentation found within MassDOT which may conflict with some parts of this CAD Standard. All efforts have been made to resolve the instances of conflict but MassDOT does not guarantee that all discrepancies have been found or resolved. This document supersedes all CAD related requirements found within any documentation currently used within the MassDOT, Highway Division.

Please direct any questions or comments about this document to:

Email: CAD.Standard@state.ma.us

Software

The MassDOT Highway Division currently uses the following CAD software products.

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

PLEASE NOTE:

Actual software version used by MassDOT 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.

All new projects must use the latest version of the drawing template, available on the MassDOT CAD Standard website. Please download the current drawing template and supporting files prior to beginning any MassDOT Highway Division projects.

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 MassDOT projects shall require the use of Civil 3D objects.

The following design items must be created as Civil 3D objects and must be assigned MassDOT Civil 3D Object Styles using the provided MassDOT Civil 3D drawing template.

- 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 disciplines Civil 3D Objects section for details.

General Requirements

File Types

MassDOT Highway Division now requires that all project submissions shall include the following file types. All project related Drawing Files shall be provided in all 3 supported formats, listed below.

AutoCAD Drawing format (.dwg)	[Placed in DWG project folder]
AutoCAD Drawing Web Format (.dwt)	[Placed in DWF project folder]
Adobe Portable Document Format (.pdf)	[Placed in PDF project folder]

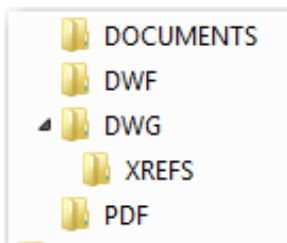
Discipline Codes

The MassDOT Highway Division has established the following discipline codes to be used in all file naming and folder naming for all projects.

BR	Bridge
EV	Environmental
HD	Highway Design
GT	Geotechnical
LD	Landscape Design
LO	Layouts
RW	Right of Way
SV	Survey
TR	Traffic
UT	Utilities

Default Folder Structure

MassDOT Highway Division requires that electronic file submissions shall be provided in the following Default Folder Structure. Each discipline will have its own additional requirements; see the respective discipline section of this document for further details.



DOCUMENTS – supporting files, Standards Audit Reports, Audit Notes, contracts, etc

DWF – All project drawings plotted to DWF

DWG – All project DWG files

XREFS – All DWG, DWF, DGN, PDF, and IMAGE files inserted as external references (Subfolder of DWG)

PDF – All project drawings plotted to PDF

It is a requirement that each project drawing/sheet created for a project shall be published/plotted to DWG, DWF, and PDF, and placed in the appropriate folder. All external references (DWG, DWF, DGN, PDF, TIFF, MrSID, JPG, etc.) which are used in support of the creation of these project sheets shall be stored within the XREF folder only (Subfolder of DWG).

File Naming

MassDOT Highway Division has adopted the following file naming standard for all CAD related files created, used, or submitted to the organization.

This applies to all CAD drawings, DWF's, PDF's used in support of, or used in conjunction with this CAD Standard.

File names shall begin with their actual project file/MEPA number assigned (available through the MassDOT Project Manager), followed by the percentage of submission enclosed in brackets, i.e [25%], [75%], [100%], and followed by the appropriate discipline code. If a project consists of multiple CAD files, assign the appropriate number to the end (ex. 1,2,3).

File Name: 123456[25%]SV1

Example 1.

A set of survey plans and documents were prepared for project file number 123456; the proper filenames would be as follows:

123456[25%]SV.dwg	123456[25%]SV.pdf	123456[25%]SV.dwf
123456[25%]SV1.dwg	123456[25%]SV1.pdf	123456[25%]SV1.dwf
123456[25%]SV2.dwg	123456[25%]SV2.pdf	123456[25%]SV2.dwf
123456[25%]SV3.dwg	123456[25%]SV3.pdf	123456[25%]SV3.dwf

Optional File Name Identifier

An optional identifier can be used to enter any information relevant for identification. Simply enclose the information within parenthesis (****). A 15 character maximum is allowed within the parenthesis.

Example 2.

A set of design plans and documents were prepared for project file number 123456; the proper filenames would be as follows:

123456[75%]HD1 (Base Design)
123456[75%]LD1 (P1234 AB Design)
123456[75%]LD2 (P1234 AB Design)
123456[75%]BR (C-12-123)

FINAL SUBMISSIONS

When completing the final submission (beyond 100%), remove the percentage identifier from the file names.

123456HD1(ABC Engineering)

Drawing Setup

Drawing Template

1. The MassDOT Highway Division Civil 3D Standard drawing template can be found within the Resources Section. [Click here](#) (MassDOT_version_release.dwt)
2. All DWG files created for any MassDOT Highway Division project must use this default template.
3. This template includes MassDOT specific Civil 3D styles, fonts, dimension styles, (all prefixed with “MassDOT”), and most of the standard MassDOT Annotation, Design and Survey layers needed for completion of MassDOT projects.
4. Optional templates for the Civil 3D Plan Production Tool (for plan/profile, and sections) can also be found within the Resources Page. These can only be used on Civil 3D 2012 and above.
5. All project data must be located on the following;
Horizontal Datum - Massachusetts State Plane Coordinate System of 1983 (NAD83) US Feet
Vertical Datum – North American Vertical Datum of 1988 (NAVD88)
or as otherwise specified by the MassDOT Project Manager.
6. Any information referenced in design drawings shall not be moved or rotated from the original coordinates used in the drawing.

Borders and Sheets - DesignCenter

1. The MassDOT Highway Division Civil 3D drawing template contains a Title Sheet and Sample Sheet only.
2. Each MassDOT Highway Division section has a standard set of pre-defined sheets. Detailed information as to the contents of each can be found in the Plan Requirements of the appropriate section.
3. The links to these can be found within the Resource Section [here](#).

BRIDGE_SHEETS.dwg
ENVIRONMENTAL_SHEETS.dwg
HWYDESIGN_SHEETS.dwg
GEOTECH_SHEETS.dwg
LANDSCAPE_SHEETS.dwg
LAYOUT_SHEETS.dwg
ROW_SHEETS.dwg
SURVEY_SHEETS.dwg
TRAFFIC_SHEETS.dwg

4. The use of DesignCenter to drag-n-drop these layouts into a project DWG is recommended.

Scale and Units

All CAD drawing models, i.e. plan views, shall be drafted at full scale in engineering units such that one drawing unit equals one foot. Where sections, elevations, or details are necessary, the use of architectural units is permitted.

Font & Text Styles

The following fonts and text styles are approved for MassDOT use and are pre-defined within the drawing template. These shall be the only fonts and text styles used on Plan & Detail Sheets.

<u>NAME</u>	<u>DESCRIPTION</u>	<u>SIZE</u>	<u>FONT</u>
DOT-E	Existing Text	(size 0.10)	RomanS
DOT-P	Proposed Text	(size 0.12)	Arial
DOT- BR4	Bridge Text	(size 0.125)	RomanS
DOT- BR5	Bridge Text	(size 0.15625)	RomanS
DOT- BR6	Bridge Text	(size 0.1875)	RomanS
DOT- BR8	Bridge Text	(size 0.25)	RomanS
DOT-PB	Proposed Text BOLD	(size 0.12)	Arial Bold
DOT-Street	Street and Town Text	(size 0.25)	Arial Bold
DOT-Title	Title Text for Layout/Survey		RomanT

Dimension Styles

The following dimension styles are approved for MassDOT use and are pre-defined within the drawing template. These shall be the only dimension styles used on Plan & Detail Sheets.

<u>NAME</u>	<u>DESCRIPTION</u>	<u>FONT</u>
DOT-E	Existing Text (size 0.10)	RomanS
DOT-P	Proposed Text (size 0.12)	Arial
DOT-BR	Bridge Text (size 0.12)	RomanS

Multileader Styles (2012 version only)

The following multileader styles are approved for MassDOT use and are pre-defined within the drawing template. These shall be the only multileader styles used on Plan & Detail Sheets.

<u>NAME</u>	<u>DESCRIPTION</u>	<u>FONT</u>
DOT-E	Existing Text (size 0.10)	RomanS
DOT-P	Proposed Text (size 0.12)	Arial
DOT-BR	Bridge Text (size 0.12)	RomanS

Table Styles

The following table styles are approved for MassDOT use and are pre-defined within the drawing template. These shall be the only table styles used on Plan & Detail Sheets.

<u>NAME</u>	<u>DESCRIPTION</u>	<u>FONT</u>
DOT-E	Existing Text (size 0.10)	RomanS
DOT-P	Proposed Text (size 0.12)	Arial

Symbols and Blocks

Symbols have been developed for the proposed construction items to closely represent those provided in Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide, 2006. These symbols must be used for plans prepared for MassDOT. No substitute symbols will be accepted. Additional symbols may be added for items not listed. However, the list of additional symbols with descriptions must be included with the plan submission to MassDOT.

Each section has a standard set of pre-defined symbols and blocks contained within the DWG files listed below. These can be found on the Resources page [here](#).

BRIDGE_SYMBOLS.dwg
HWYDESIGN_SYMBOLS.dwg
GEOTECH_SYMBOLS.dwg
LANDSCAPE_SYMBOLS.dwg
LAYOUT_SYMBOLS.dwg
SURVEY_SYMBOLS.dwg
TRAFFIC_SYMBOLS.dwg

NOTE: The use of DesignCenter to drag-n-drop these symbols and blocks into a project DWG is recommended.

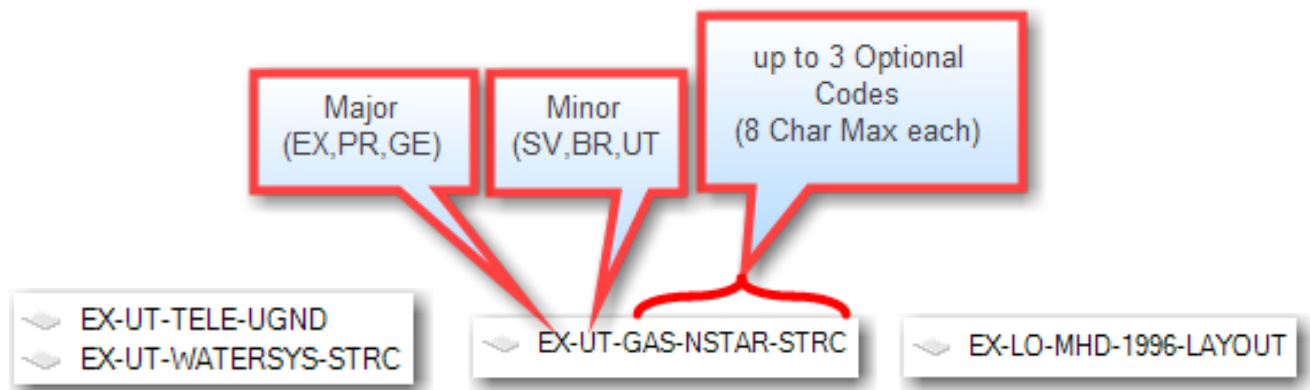
Layers and Layer Naming

Layer Naming

The MassDOT Highway Division drawing template has been provided with standardized layers designed to 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 (excluding OB and GE layers) must be assigned a Major and a Minor code separated by a hyphen (-). 3 Optional Codes have been provided to allow for ease of customization, should a layer not be available.

Each layer must also use the appropriate Plot Styles provided. (See Plot Styles)



The Major Codes are:

EX – Existing Feature

GE – General Feature
(general notes, sheets, title blocks)

PR – Proposed Feature

OB – Civil 3D Object Layers

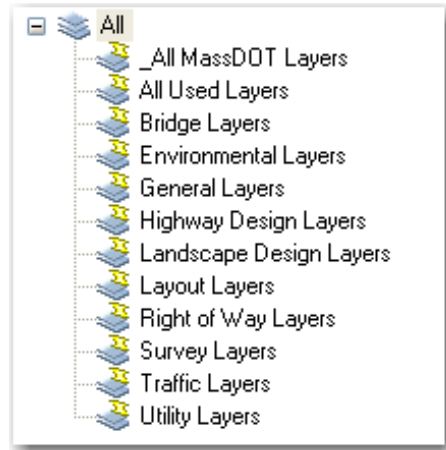
Minor Codes (i.e. Discipline Codes)

BR	Bridge
EV	Environmental
GT	Geotechnical
HD	Highway Design
LD	Landscape Design
LO	Layouts
RW	Right of Way
SV	Survey
TR	Traffic
UT	Utilities

Optional Codes (up to a maximum number of 3) - can be created to provide additional information to the layer name. Each optional code cannot be larger than eight (8) characters.

Layer Filters

A standard set of layer filters has been provided within the Layer Manager to organize all MassDOT layers into their unique discipline groups.



Master Layer List

The following is the Master Layer List of all layers contained within the MassDOT drawing template.

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
0	white	Continuous	SOLID 100%	DO NOT USE
Defpoints	white	Continuous	SOLID 100%	Default Layer - DO NOT USE
EXISTING LAYERS				
EX-BR-COMP	8	DASHDOT2	BR 50%	Existing Bridge Components
EX-BR-COMP-HIDN	8	HIDDEN	BR 50%	Existing Bridge Components - Hidden
EX-BR-HATCH	8	Continuous	SOLID 25%	Existing Bridge Hatching
EX-BR-REBAR	magenta	DASHDOT2	BR 100%	Existing Bridge Rebar
EX-BR-TEXT	yellow	Continuous	BR 50%	Existing Bridge Text
EX-EV-REGL-BUFFER-100	240	DASHEDX2	ENVR EXIST	Regulatory – 100 ft Buffer Zone
EX-EV-REGL-FLOOD	magenta	BORDERX2	ENVR EXIST	Regulatory – Flood Zones
EX-EV-REGL-MHW	212	BORDER	ENVR EXIST	Regulatory – Mean High Water - Tidal
EX-EV-REGL-OHWL	212	BORDER2	ENVR EXIST	Regulatory – Ordinary High Water - Non-Tidal
EX-EV-REGL-RIVR-FRNT	221	BORDER2	ENVR EXIST	Regulatory – Riverfront Protection Zones
EX-EV-TEXT	magenta	Continuous	ENVR EXIST	Regulatory – Riverfront Protection Zones
EX-GT-FEAT	9	Continuous	BR 50%	Existing Geotechnical Features
EX-LD-SITE-FEAT	170	Continuous	SURVEY 100%	Existing Landscape Site Features
EX-LD-VEGE	green	Continuous	SURVEY 100%	Existing Trees, Shrubs, and Vegetation
EX-LD-VEGINV	12	Continuous	SURVEY 100%	Existing Invasive Vegetation
EX-LO-CT	yellow	CENTERX2	ROW 100%	Existing County Layout Lines

EXISTING LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-LO-RR	yellow	EXIST RR SIDELINE	ROW 100%	Existing Railroad Layout Lines
EX-LO-SHLO	yellow	Continuous	ROW 100%	Existing State Highway Layout Lines
EX-LO-TEXT	yellow	Continuous	ROW 100%	Existing Text for Layout Information
EX-LO-TN	yellow	PHANTOM	ROW 100%	Existing Town/City Layout Lines
EX-LO-TP	yellow	PHANTOM2	ROW 100%	Existing Turnpike Authority Layout Lines
EX-SV-BL-CT	red	DASHED	ROW 100%	Existing Baseline - County
EX-SV-BL-RR	red	EXIST RR SIDELINE	ROW 100%	Existing Baseline - Railroad
EX-SV-BL-SHLO	red	CONST BASELINE	ROW 100%	Existing Baseline - State Highway
EX-SV-BL-TEXT	red	Continuous	ROW 100%	Existing Baseline - Text
EX-SV-BL-TN	red	DASHED2	ROW 100%	Existing Baseline - City/Town
EX-SV-BL-TP	red	DASHED	ROW 100%	Existing Baseline - Turnpike Authority
EX-SV-BL-XX	red	DASHED2	ROW 100%	Existing Baseline - Miscellaneous
EX-SV-BLDG	9	Continuous	SURVEY 100%	Existing Buildings, Decks
EX-SV-BP-ALL	253	Continuous	SURVEY 100%	Survey Point - Default Point Layer
EX-SV-BP-TEXT	253	Continuous	SURVEY 100%	Survey Point - Text Labels
EX-SV-BR-DETL	9	Continuous	SOLID 50%	Existing Bridge Items and Structures
EX-SV-CONT-MJR	142	DASHED	SOLID 50%	Existing Contours - MAJOR
EX-SV-CONT-MNR	54	DASHED2	SURVEY 100%	Existing Contours - MINOR
EX-SV-CONT-TXT	red	Continuous	SURVEY 100%	Existing Contours - Text
EX-SV-CONT-USER	172	Continuous	SOLID 50%	Existing User-Defined Contours

EXISTING LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-SV-DETL	8	Continuous	SURVEY 100%	Existing Miscellaneous Detail
EX-SV-DRWY	9	Continuous	SURVEY 100%	Existing Driveway Items
EX-SV-EROS	55	Continuous	SURVEY 100%	Existing Erosion Control
EX-SV-FIGURE	white	Continuous	SOLID 100%	Existing Survey Figure – Undefined Code
EX-SV-FNCE-CLF	9	FENCE-CHAIN LINK	SURVEY 100%	Existing Chain Link or Metal Fences
EX-SV-FNCE-WRF	9	FENCE-WOODRAIL	SURVEY 100%	Existing Wood Fences
EX-SV-GRDL-STBM	9	GUARDRAIL-STEEL	SURVEY 100%	Existing Steel Post Guardrail and Barrier
EX-SV-GRDL-WOOD	9	GUARDRAIL-WOOD	SURVEY 100%	Existing Wood Post Guardrail and Barrier
EX-SV-GRND	9	Continuous	SURVEY 100%	Existing Ground Surface
EX-SV-GRVL	9	Continuous	SURVEY 100%	Existing Soil, Gravel, and Stone
EX-SV-LN-EASE	white	LINE OF EASE	ROW 100%	Existing Easement Lines
EX-SV-LN-PROP	cyan	PROP LINE	ROW 100%	Existing Abutting Property Lines
EX-SV-LN-STATE	yellow	STATE BNDY LINE	ROW 100%	Existing State Boundary Lines
EX-SV-LN-TEXT	white	Continuous	ROW 100%	Existing Boundary Line Text
EX-SV-LN-TN	yellow	CENTERX2	ROW 100%	Existing Town/City Boundary Lines
EX-SV-MONU	red	Continuous	SURVEY 150%	Existing Monuments, Survey Points
EX-SV-PM	9	Continuous	SURVEY 50%	Existing Pavement Markings
EX-SV-RDWY	9	Continuous	SURVEY 100%	Existing Roadway Items
EX-SV-RRTR	9	Continuous	SURVEY 100%	Existing Railroad Items
EX-SV-SRF-BDR	white	Continuous	SURVEY 100%	Existing Surface - Border

EXISTING LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-SV-SRF-FLT	white	Continuous	SURVEY 100%	Existing Surface - Faults, Breaklines
EX-SV-SRF-VIEW	8	Continuous	SURVEY 100%	Existing Surface - TIN lines
EX-SV-TEXT	104	Continuous	SURVEY 100%	Existing Survey Text
EX-SV-TR-FEAT	31	Continuous	SURVEY 100%	Existing Traffic Items
EX-SV-VEGE	104	Continuous	SURVEY 100%	Existing Vegetation
EX-SV-WALK	9	Continuous	SURVEY 100%	Existing Walkways
EX-SV-WALL-RETW	163	RETWALL	SURVEY 100%	Existing Walls - Retaining
EX-SV-WALL-STONE	163	STONEWALL	SURVEY 100%	Existing Walls – Balanced Stone
EX-SV-WETL	blue	DASHED	ENVR BOLD	Existing Wetlands, Ponds, Rivers
EX-TR-FEAT	31	Continuous	SURVEY 100%	Existing Traffic Items
EX-UT-CATV-STRC	30	Continuous	UTILITY EXIST	Existing Cable TV Structures
EX-UT-CATV-TXT	30	Continuous	UTILITY EXIST	Existing Cable TV Text
EX-UT-CATV-UGND	30	HIDDEN2	UTILITY EXIST	Existing Cable TV Underground
EX-UT-DRAIN-STRC	252	Continuous	UTILITY EXIST SV	Existing Drainage Items
EX-UT-DRAIN-TEXT	252	Continuous	UTILITY EXIST SV	Existing Drainage Text
EX-UT-DRAIN-UGND	252	HIDDEN2	UTILITY EXIST SV	Existing Drainage Underground
EX-UT-ELEC-STRC	10	Continuous	UTILITY EXIST	Existing Electric Structures
EX-UT-ELEC-TXT	10	Continuous	UTILITY EXIST	Existing Electric Text
EX-UT-ELEC-UGND	10	HIDDEN2	UTILITY EXIST	Existing Electric Underground
EX-UT-GAS-STRC	42	Continuous	UTILITY EXIST	Existing Gas Items

EXISTING LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-UT-GAS-TXT	42	Continuous	UTILITY EXIST	Existing Gas Text
EX-UT-GAS-UGND	42	HIDDEN2	UTILITY EXIST	Existing Gas Underground
EX-UT-OIL-STRC	42	Continuous	UTILITY EXIST	Existing Oil Structures
EX-UT-OIL-TXT	42	Continuous	UTILITY EXIST	Existing Oil Text
EX-UT-OIL-UGND	42	HIDDEN2	UTILITY EXIST	Existing Oil Underground
EX-UT-OTHR-STRC	42	Continuous	UTILITY EXIST	Existing Utility - OTHER Structures
EX-UT-SEWER-STRC	80	Continuous	UTILITY EXIST	Existing Sewer Items
EX-UT-SEWER-TXT	80	Continuous	UTILITY EXIST	Existing Sewer Text
EX-UT-SEWER-UGND	80	HIDDEN2	UTILITY EXIST	Existing Sewer Underground
EX-UT-STEAM-STRC	42	Continuous	UTILITY EXIST	Existing Steam Structures
EX-UT-STEAM-TXT	42	Continuous	UTILITY EXIST	Existing Steam Text
EX-UT-STEAM-UGND	42	HIDDEN2	UTILITY EXIST	Existing Steam Underground
EX-UT-TELE-STRC	30	Continuous	UTILITY EXIST	Existing Telephone/Communication Structures
EX-UT-TELE-TXT	30	Continuous	UTILITY EXIST	Existing Telephone/Communication Text
EX-UT-TELE-OVHD	30	HIDDEN	UTILITY EXIST SV	Existing Telephone/Communication Overhead
EX-UT-TELE-UGND	30	HIDDEN2	UTILITY EXIST	Existing Telephone/Communication Underground
EX-UT-TR-UGND	30	HIDDEN2	UTILITY EXIST	Existing Traffic Underground
EX-UT-WATERSYS-STRC	blue	Continuous	UTILITY EXIST	Existing Water Systems Structures
EX-UT-WATERSYS-TXT	blue	Continuous	UTILITY EXIST	Existing Water Systems Text
EX-UT-WATERSYS-UGND	blue	HIDDEN2	UTILITY EXIST	Existing Water Systems Underground

GENERAL LAYERS

GE-IMAGES	white	Continuous	BORDER	Default Images Layer
GE-MTCH	white	Continuous	SOLID 100%	Match Lines and Text
GE-PROF-BASE	white	Continuous	SOLID 100%	Profile - Base
GE-PROF-DESIGN	white	Continuous	SOLID 100%	Profile - Design
GE-PROF-EGC	21	DASHED	SOLID 50%	Profile - Existing Grade Centerline
GE-PROF-EGCT	9	Continuous	SOLID 50%	Profile - Existing Grade Centerline Text
GE-PROF-EGL	red	BORDER2	SOLID 50%	Profile - Existing Grade Left
GE-PROF-EGR	green	DIVIDE2	SOLID 50%	Profile - Existing Grade Right
GE-PROF-FGC	white	Continuous	SOLID 100%	Profile - Finish Grade Centerline
GE-PROF-FGCT	white	Continuous	SOLID 100%	Profile - Finish Grade Centerline Text
GE-PROF-VGRID	252	Continuous	SOLID 75%	Profile - Profile View Grid Lines
GE-SAMPLE-LINE	yellow	Continuous	SOLID 25%	Sample Line Base Layer
GE-SAMPLE-LINE-GRID	252	Continuous	SOLID 75%	Cross Section - Section View Grid Lines
GE-SHEET	white	Continuous	BORDER	Default Border and Paperspace layer
GE-TEXT	white	Continuous	BORDER	General Text – Paperspace Text
GE-VIEWPORT	white	Continuous	BORDER	Default Paperspace Viewport Layer
GE-XREF	white	Continuous	BORDER	Default External Reference Layer
GE-XSECT	white	Continuous	SOLID 100%	Cross Section
GE-XSECT-EGC	21	HIDDEN2	SOLID 50%	Cross Section - Existing Grade Centerline
GE-XSECT-FGC	white	Continuous	SOLID 100%	Cross Section View

GENERAL LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
GE-XSECT-TEXT	white	Continuous	SOLID 100%	Cross Section Text
GE-XSECT-VIEW	white	Continuous	SOLID 100%	Cross Section View Base layer

Civil 3D OBJECT LAYERS

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
OB-BASELINE	white	Continuous	ROW 100%	Boundary Line – CIVIL 3D OBJECT
OB-FEATURE-LINE	white	Continuous	SOLID 100%	Feature Line - CIVIL 3D OBJECT
OB-INTERFER	white	Continuous	SOLID 100%	Interference - CIVIL 3D OBJECT
OB-PARCEL	white	Continuous	ROW 100%	Parcel - CIVIL 3D OBJECT
OB-SURFACE	white	Continuous	SOLID 100%	Surface - CIVIL 3D OBJECT
OB-SURVEY	white	Continuous	SOLID 100%	Survey - CIVIL 3D OBJECT
OB-UTILITY	white	Continuous	SOLID 100%	Utility Line - CIVIL 3D OBJECT

PROPOSED LAYERS

PR-BR-CENTER	cyan	CENTER	BR 100%	Proposed Centerline of Components
PR-BR-COMP	red	Continuous	BR 100%	Proposed Bridge Components
PR-BR-COMP-HIDN	red	HIDDEN	BR 100%	Proposed Bridge Features - Hidden
PR-BR-CONST-CENTER	cyan	CENTER	BR 150%	Prop. Centerline of Const. and Survey Baseline
PR-BR-CONSTJT	white	ZIGZAG	BR 100%	Prop. Const. Joint and Prop. Conc. Surface Cut Line
PR-BR-DIMS	cyan	Continuous	BR 100%	Proposed Bridge Dimensions
PR-BR-HATCH	blue	Continuous	Greyscale	Proposed Bridge Hatching
PR-BR-REBAR	magenta	Continuous	BR 200%	Proposed Bridge Rebar
PR-BR-TEXT	yellow	Continuous	BR 100%	Proposed Bridge Text

PROPOSED LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
PR-BR-TEXT-D	yellow	Continuous	BR 175%	Proposed Bridge Section/Detail Text
PR-BR-TEXT-S	yellow	Continuous	BR 150%	Proposed Bridge Sub-Title Text
PR-EV-EROS	131	Continuous	ENVR PROP	Proposed Environmental - Erosion Control
PR-EV-REGL-MITG	131	Continuous	ENVR PROP	Regulatory – Mitigation Areas
PR-EV-TEXT	131	Continuous	ENVR PROP	Proposed Environmental - Text
PR-GT-FEAT	white	Continuous	BR 100%	Proposed Geotechnical Features and Text
PR-HD-ASSM	white	Continuous	SOLID 100%	Proposed Assembly
PR-HD-ASSM-LINK	white	Continuous	SOLID 100%	Proposed Assembly: corridor and section links
PR-HD-ASSM-XSECT	white	Continuous	SOLID 100%	Proposed Assembly: corridor cross section
PR-HD-BL-CT	white	DASHED	ROW 200%	Proposed Baseline - County
PR-HD-BL-RR	white	DASHEDX2	ROW 200%	Proposed Baseline - Railroad
PR-HD-BL-SHLO	white	DASHED	ROW 200%	Proposed Baseline - Highway Division
PR-HD-BL-TEXT	white	Continuous	ROW 100%	Proposed Baseline - Proposed Text
PR-HD-BL-TN	white	DASHED2	ROW 200%	Proposed Baseline - City/Town
PR-HD-BL-XX	white	DASHED2	ROW 200%	Proposed Baseline - Miscellaneous
PR-HD-CONT	33	Continuous	SOLID 100%	Proposed Contours
PR-HD-CORR	white	Continuous	SOLID 100%	Proposed Corridor
PR-HD-CORR-PATT	141	Continuous	SOLID 100%	Proposed Corridor Patterns
PR-HD-CORR-SHAP	32	Continuous	SOLID 100%	Proposed Corridor and Section Shapes
PR-HD-CORR-SHAP-PATT	white	Continuous	SOLID 100%	Proposed Corridor and Section Shape Patterns

PROPOSED LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
PR-HD-CURB	191	Continuous	SOLID 100%	Proposed Curbing
PR-HD-DAYL	white	HIDDEN	SOLID 200%	Proposed Daylight
PR-HD-DETL	140	Continuous	SOLID 100%	Proposed Miscellaneous Items
PR-HD-EPAV	white	Continuous	SOLID 100%	Proposed Edge of Pavement
PR-HD-FNCE-CLF	62	FENCE – CHAIN LINK	SOLID 100%	Proposed Fence – Chain Link
PR-HD-FNCE-WRF	62	FENCE – WOOD RAIL	SOLID 100%	Proposed Fence – Wood Rail
PR-HD-GRAD	white	Continuous	SOLID 100%	Proposed Grade
PR-HD-GRDL-STBM	71	GUARDRAIL – STEEL	SOLID 100%	Proposed Guardrail – Steel Posts
PR-HD-GRDL-WOOD	71	GUARDRAIL – WOOD	SOLID 100%	Proposed Guardrail – Wood Posts
PR-HD-GRVL	white	Continuous	SOLID 100%	Proposed Gravel
PR-HD-SSLP	white	Continuous	SOLID 100%	Proposed Sideslope
PR-HD-WALK	white	Continuous	SOLID 100%	Proposed Sidewalks
PR-HD-WALL-RETW	200	RETWALL	SOLID 100%	Proposed Walls - Retaining
PR-HD-WALL-STONE	200	STONEWALL	SOLID 100%	Proposed Walls – Balanced Stone
PR-LD-DETAILS	white	Continuous	SOLID 100%	Proposed Landscaping Details
PR-LD-DIMS	240	Continuous	SOLID 100%	Proposed Landscaping Dimensions
PR-LD-GRCOVER	green	Continuous	SOLID 100%	Proposed Ground Cover
PR-LD-HATCH	white	Continuous	SOLID 100%	Proposed Hatching
PR-LD-ORNGRASS	yellow	Continuous	SOLID 100%	Proposed Ornamental Grass
PR-LD-PERNNL	red	Continuous	SOLID 100%	Proposed Perennial

PROPOSED LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
PR-LD-PLNT-TAG	240	Continuous	SOLID 200%	Proposed Plant Tag
PR-LD-SEED	green	Continuous	SOLID 100%	Proposed Seed - Standard
PR-LD-SHRUB	white	Continuous	SOLID 100%	Proposed Shrubs
PR-LD-SITE-FURNISH	182	Continuous	SOLID 100%	Proposed Site Furnishings
PR-LD-TEXT	240	Continuous	SOLID 100%	Proposed Landscaping Text
PR-LD-TREE	white	Continuous	SOLID 200%	Proposed Trees
PR-LD-TREE-PROT	182	Continuous	SOLID 200%	Proposed Tree Protection
PR-LO-CT	231	Continuous	ROW 200%	Proposed County Layout Lines
PR-LO-RR	231	Continuous	ROW 200%	Proposed Railroad Layout Lines
PR-LO-SHALT	231	Continuous	ROW 200%	Proposed State Highway Alteration Lines
PR-LO-SHDISC	231	Dashed	ROW 200%	Proposed State Highway Discontinuance Lines
PR-LO-SHLO	231	Continuous	ROW 200%	Proposed State Highway Layout Lines
PR-LO-SHLO-SPRCD	231	Dashed	ROW 100%	Proposed State Highway Superseded Layout Lines
PR-LO-TEXT	231	Continuous	ROW 200%	Proposed Text for Layout Information
PR-LO-TN	231	Continuous	ROW 200%	Proposed Town/City Layout Lines
PR-RW-FEE-CITY	32	Continuous	ROW 200%	Proposed Town/City Fee Taking
PR-RW-FEE-DRAIN	163	Continuous	ROW 200%	Proposed Drainage Fee Taking
PR-RW-FEE-STATE	51	Continuous	ROW 200%	Proposed State Fee Taking
PR-RW-MISC	211	Continuous	ROW 100%	Proposed Miscellaneous Items
PR-RW-MONU	84	Continuous	ROW 100%	Proposed Monuments

PROPOSED LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
PR-RW-PERMEASE-CITY	32	LINE OF EASE	ROW 200%	Proposed Permanent Easement CITY
PR-RW-PERMEASE-DRAIN	141	LINE OF EASE	ROW 200%	Proposed Permanent Drainage Easement
PR-RW-PERMEASE-STATE	41	LINE OF EASE	ROW 200%	Proposed Permanent Easement STATE
PR-RW-TEMPEASE	42	LINE OF EASE	ROW 200%	Proposed Temporary Easement
PR-RW-TEXT	211	Continuous	ROW 100%	Proposed Right of Way Text
PR-TR-FEAT	31	Continuous	SOLID 100%	Proposed Traffic Items
PR-TR-LGHT	31	Continuous	SOLID 100%	Proposed Traffic Lighting
PR-TR-PVMK	31	Continuous	SOLID 100%	Proposed Traffic Pavement Markings
PR-TR-SGNL	31	Continuous	SOLID 100%	Proposed Traffic Signals
PR-TR-SGNS	31	Continuous	SOLID 100%	Proposed Traffic Signs
PR-TR-TEXT	31	Continuous	SOLID 100%	Proposed Traffic Text
PR-TR-UGND	31	Conduit	UTILITY PROP	Proposed Traffic Items - Underground
PR-UT-CATV	40	Continuous	UTILITY PROP	Proposed Communication/CATV
PR-UT-CATV-TXT	40	Continuous	UTILITY PROP	Proposed Communication/CATV Text
PR-UT-CATV-UGND	40	Continuous	UTILITY PROP	Proposed Communication/CATV Underground
PR-UT-DRAIN	254	Continuous	UTILITY PROP	Proposed Drainage
PR-UT-DRAIN-DITCH	254	DASHEDX2	UTILITY PROP	Proposed Drainage Ditch
PR-UT-DRAIN-UGND	254	Continuous	UTILITY PROP	Proposed Drainage Pipes
PR-UT-DRAIN-UGND-PATT	white	Continuous	UTILITY PROP	Proposed Drainage Hatching
PR-UT-DRAIN-PROF	254	Continuous	UTILITY PROP	Proposed Drainage Profile

PROPOSED LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
PR-UT-DRAIN-TXT	254	Continuous	UTILITY PROP	Proposed Drainage Text
PR-UT-ELEC	11	Continuous	UTILITY PROP	Proposed Electric Structures
PR-UT-ELEC-TXT	11	Continuous	UTILITY PROP	Proposed Electric Text
PR-UT-ELEC-UGND	11	Continuous	UTILITY PROP	Proposed Electric Underground
PR-UT-GAS	44	Continuous	UTILITY PROP	Proposed Gas Items
PR-UT-GAS-TXT	44	Continuous	UTILITY PROP	Proposed Gas Text
PR-UT-GAS-UGND	44	Continuous	UTILITY PROP	Proposed Gas Underground
PR-UT-SEWER	93	Continuous	UTILITY PROP	Proposed Sewer Structures
PR-UT-SEWER-UGND	93	Continuous	UTILITY PROP	Proposed Sewer Pipes
PR-UT-SEWER-UGND-PATT	white	Continuous	UTILITY PROP	Proposed Sewer Hatching
PR-UT-SEWER-PROF	93	Continuous	UTILITY PROP	Proposed Sewer Profile
PR-UT-SEWER-TXT	93	Continuous	UTILITY PROP	Proposed Sewer Text
PR-UT-TELE	40	Continuous	UTILITY PROP	Proposed Telephone/Communication Structures
PR-UT-TELE-OVHD	40	HIDDEN	UTILITY PROP	Proposed Telephone/Communication Overhead
PR-UT-TELE-TXT	40	Continuous	UTILITY PROP	Proposed Telephone/Communication Text
PR-UT-TELE-UGND	40	Continuous	UTILITY PROP	Proposed Telephone/Comm. Underground
PR-UT-WATERSYS	150	Continuous	UTILITY PROP	Proposed Water System
PR-UT-WATERSYS-UGND	150	Continuous	UTILITY PROP	Proposed Water System Pipes
PR-UT-WATERSYS-UGND-PATT	white	Continuous	UTILITY PROP	Proposed Water System Hatching
PR-UT-WATERSYS-PROF	150	Continuous	UTILITY PROP	Proposed Water System Profile

PROPOSED LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
PR-UT-WATERSYS-TXT	150	Continuous	UTILITY PROP	Proposed Water System Text

Plot Styles

Purpose

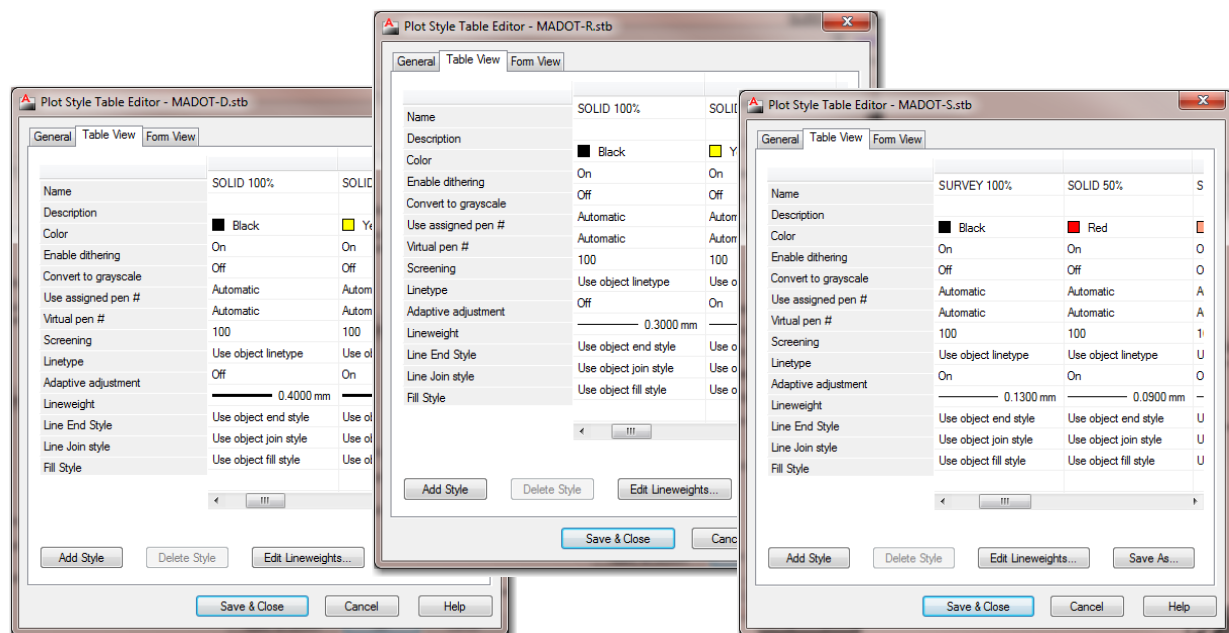
MassDOT Highway Division has created a standard set of plot styles to aid in plotting. These plot styles are intended to provide seamless integration while passing DWG files back and forth between the Survey Division, Design Divisions, as well as the other Divisions.

Definitions

MassDOT Highway Division has adopted the following named plot style standards;

- MADOT-C.stb (use this for Color Plotting, i.e. presentations)
- MADOT-D.stb (use this for all Design sections)
- MADOT-E.stb (use this for all Environmental Color Plotting)
- MADOT-R.stb (use this for all Right-of-Way, Layouts)
- MADOT-S.stb (use this for all Survey)
- MADOT-U.stb (use this for all Utility Color Plotting)

These can be found on the Resources page [here](#).



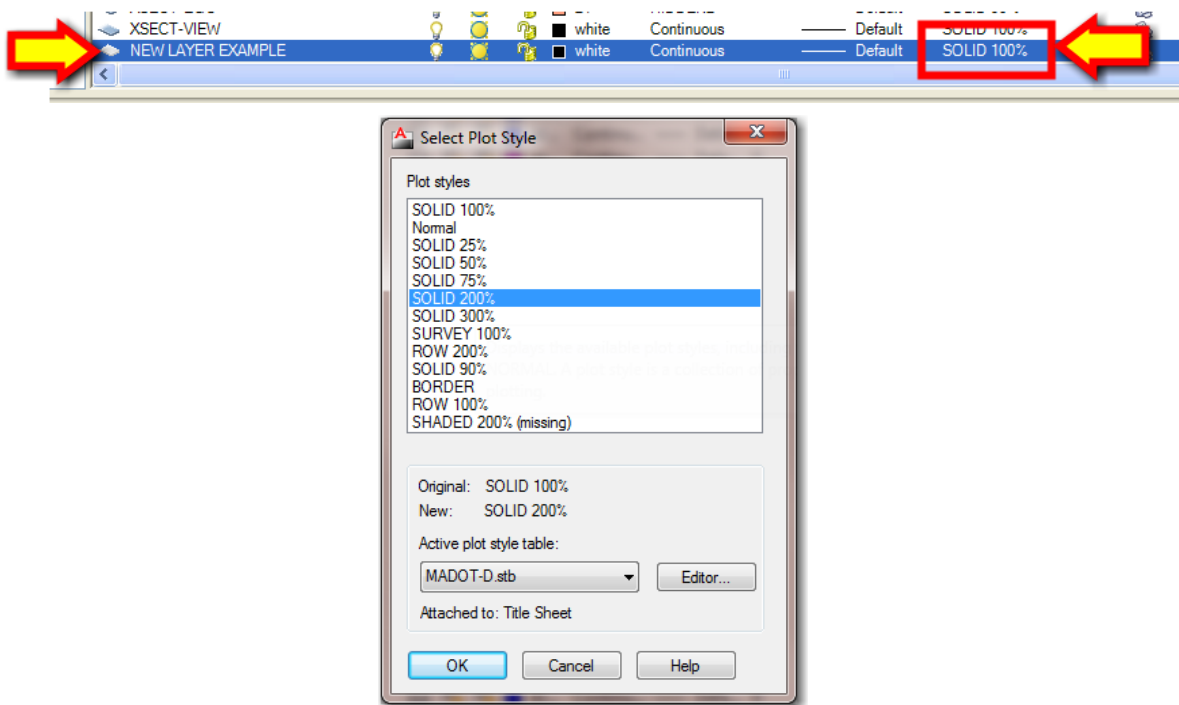
Using Plot Styles

All of the default Civil 3D objects and/or layers contained within the MassDOT drawing template have all the appropriate styles pre-assigned to them.

The plot styles have been created to ensure that each Section can maintain their own plotting requirements without affecting the plotting within other Sections.

For example, a survey base plan will be plotted dark and solid within the Survey Division (using the MADOT-S.stb file), while within the Design Divisions, (using the MADOT-D.stb file), the survey base plan information will be automatically plotted grayscale/shaded, and the proposed design information will be plotted dark and solid. Right of Way and Layouts drawings will be plotted (using the MADOT-R.stb file) showing the survey base plan information grayscale/shaded, the proposed design information as dark and solid, and the Right of Way information (boundary lines, easement lines and text etc) as bold.

When creating NEW layers or objects, users will need to assign plot styles appropriately using the following suggested steps. After the layer has been created inside the Layer Properties Manager, select the plot style entry, as shown.



PLEASE NOTE:

The user will need to migrate existing CAD drawings to use these new standards before plotting. Doing so will provide the appropriate plot settings adopted by MassDOT.

If the drawing is set to color-based plot styles, use the command CONVERTPSTYLES to switch your drawing and assign the appropriate plot styles to each layer.

Converting Land Desktop drawings to Civil 3D

Please refer to the Migration of Land Desktop to Civil 3D help document located within the Resources Page. **DO NOT MERELY OPEN AN EXISTING LAND DESKTOP DRAWING IN CIVIL 3D AND DO A “SAVE-AS”.**

Policy on Model Space vs. Paper Space

The use of both Model Space and Paper Space is necessary to create clean looking drawing files and a more consistent document within the AutoCAD environment, and therefore, it is a requirement that all DWG files in use, or in support of projects, at the MassDOT Highway Division shall use these environments.

Model Space -

One of the two primary spaces in which objects reside. A geometric model is placed in a three-dimensional coordinate space called model space. It is within model space where a project will be created, annotated, and dimensioned.

All drawing models shall be drawn in model space and shall be drawn to actual scale. Any additional item that helps define the model or add model data such as details, dimensions, elevations, names, descriptive text, etc. shall be drawn in model space.

Paper Space -

One of the two primary spaces in which objects reside. It is within paper space where a layout of specific views of the project model, border and title block, and general notes are placed in order to print a clean and consistent document.

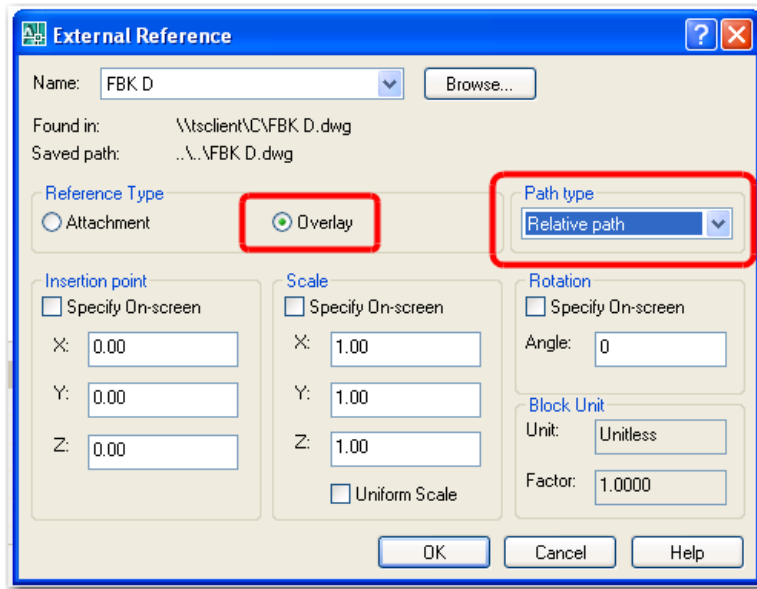
All secondary drawing elements shall be placed in Paper Space. Title block, sheet notes, titles, and legends shall be considered secondary drawing elements.

Note: Any information referenced in design drawings shall not be moved or rotated from the original coordinates used in the drawing. When copying model space information between drawings (NON-CIVIL 3D OBJECTS), verify that the UCS coordinates in both drawings are set to “World” prior to executing the copy-paste commands.

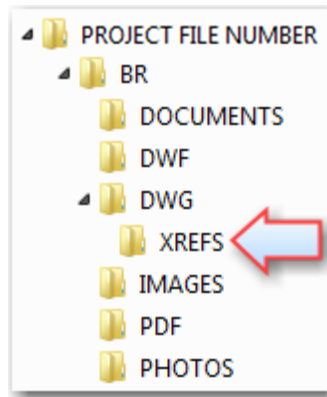
Policy on External References

All externally referenced source drawings (XREF's) shall be inserted on layer GE-XREF, and this layer shall remain locked to avoid accidentally moving or erasing the reference drawing.

All externally referenced source drawings shall be inserted as OVERLAYS and set to RELATIVE PATH. The use of XREF's as "attachments" or "full path" will not be accepted.



All external referenced files (DWG, DWF, DGN, PDF, TIFF, MrSID, JPG, etc.) shall be stored within the Discipline specific XREF folder, found within each Discipline's DWG folder.



The use of temporary XREF's is allowed. However, when the temporary XREF is no longer needed, DETACH the temporary XREF properly through the External Reference Manager.

DO NOT SIMPLY DELETE THE XREF WITHIN THE DWG FILE.

*Note: Externally referenced data shall not be moved or rotated from the original coordinates used in the drawing.

Optional CAD Standard Review Process

Prior to submitting any project, a CAD Standard Review should be performed as described below to assist with conformance to the MassDOT CAD Standard. This process will notify the user of any deviations from the required standards.

All project drawings should be checked using the supplied drawing standards file (MassDOT_version_release.dws) located [here](#).

The Batch Standards Checker, found within AutoCAD, shall be used to perform this check. A Standards Audit Report will be generated and will provide a list of deviations from the MassDOT CAD Standard.

Please use the following procedures to create the Standards Audit Report.

Launch the Batch Standards Checker, found in the Start Menu > Programs > Autodesk > Product folder.

- Add all project drawings to be audited
- Choose the version of the drawing standards file (.dws file) which corresponds to the version of the drawing template used.
- Execute Start Check command
- Once the check has completed, a Standards Audit Report is displayed
- Select “SHOW > PROBLEMS” on the left side of the report
- Export this Report to HTM, if you wish to save the report.

STANDARDS AUDIT REPORT

C:\MassDOT Projects\606705\25Stage(20120201)\Check1.chx

Show:

Overview

Plug-ins

Standards

Problems

Ignored Problems

All

For:

All Drawings

606705[25%]HD1.dwg

606705SV(Ashfield Road).dwg

Problems

C:\MassDOT Projects\606705\25Stage(20120201)\SV\DWG\606705[25%]HD1.dwg

The following problems were encountered in this drawing:

Name	Description		
Layers			
EX-LO-CT	Property	Current Value	Standard Value
	Linetype	CENTER2	CENTERX2
	Standards File C:\MassDOT Projects\MassDOT_v2007_r2.dws		
PR-BR-DIMS	Property	Current Value	Standard Value
	Plot Style Name	SOLID 100%	SOLID 90%

Bridge

File Submission Requirements

All file submissions shall include the following file types:

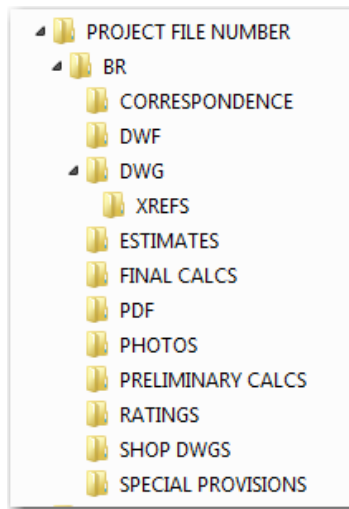
- AutoCAD Drawing format (.dwg)
- AutoCAD Drawing Web Format (.dwf)
- Adobe Portable Document Format (.pdf)

Actual software version used by MassDOT internally will change from time to time; therefore please refer to the specific project contract or check with the Project Manager for actual version and submission requirements.

Prior versions of the CAD Standard, including drawing templates, are available on the Resources page.

Folder Structure

All Bridge electronic file submissions shall be submitted within the following Folder Structure. Please see the Default Folder Structure in the General Section for descriptions of folders not listed here.



Bridge Layer List

The following is a sub-set of the Master Layer List showing all Bridge Layers.

No other layers and/or linetypes will be accepted for creation of Bridge Construction Drawings, other than shown below.

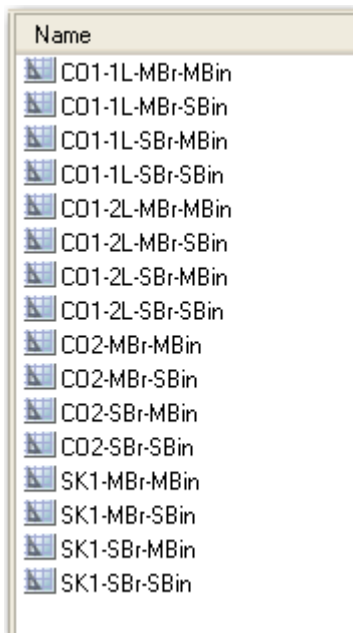
LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-BR-COMP	8	DASHDOT2	BR 50%	Existing Bridge Components
EX-BR-COMP-HIDN	8	HIDDEN	BR 50%	Existing Bridge Components - Hidden
EX-BR-HATCH	8	Continuous	SOLID 25%	Existing Bridge Hatching
EX-BR-REBAR	magenta	DASHDOT2	BR 100%	Existing Bridge Rebar
EX-BR-TEXT	yellow	Continuous	BR 50%	Existing Bridge Text
PR-BR-CENTER	cyan	CENTER	BR 100%	Proposed Centerline of Components
PR-BR-COMP	red	Continuous	BR 100%	Proposed Bridge Components
PR-BR-COMP-HIDN	red	HIDDEN	BR 100%	Proposed Bridge Features - Hidden
PR-BR-CONST-CENTER	cyan	CENTER	BR 150%	Prop. Centerline of Const. and Survey Baseline
PR-BR-CONSTJT	white	ZIGZAG	BR 100%	Prop. Const. Joint and Prop. Conc. Surface Cut Line
PR-BR-DIMS	cyan	Continuous	BR 100%	Proposed Bridge Dimensions
PR-BR-HATCH	blue	Continuous	Greyscale	Proposed Bridge Hatching
PR-BR-REBAR	magenta	Continuous	BR 200%	Proposed Bridge Rebar
PR-BR-TEXT	yellow	Continuous	BR 100%	Proposed Bridge Text
PR-BR-TEXT-D	yellow	Continuous	BR 175%	Proposed Bridge Section/Detail Text
PR-BR-TEXT-S	yellow	Continuous	BR 150%	Proposed Bridge Sub-Title Text

Bridge Plan Requirements

All Bridge Construction Drawings shall conform to the MassDOT LRFD Bridge Manual and Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide. This CAD Standard is the sole location for all MassDOT Highway Division CAD related standards. Where inconsistencies occur between this CAD Standard document and any other MassDOT Highway Division manuals currently in use, this CAD Standard document must be adhered to. It is not intended to remove any requirements from other MassDOT Highway Division manuals, currently in use, which are not specifically addressed herein.

All Bridge Construction Drawings must be created using the current version of the MassDOT drawing template. The version number of the drawing template is listed within the lower right corner of each paper space border and placed on a no-plot layer. All necessary layers, text styles, plot styles, and dimension styles are included within this template.

When creating Paper Space layouts, a default set of sheets, i.e. layouts, have been created within the “BRIDGE_SHEETS.dwg” CAD file. This file contains standard borders and title blocks for all Bridge Construction Drawings. The following layouts are included,



Default naming convention

CO1 = Construction First Sheet

CO2 = Construction Subsequent Sheets

SK1 = Sketch Plan First Sheet

1L = 1 Line Description

2L = 2 Line Description

MBr = Multi Bridge Number

MBin = Multi BIN

SBr = Single Bridge Number

SBin = Single BIN

No other borders will be accepted.

The use of DesignCenter to drag-n-drop these layouts into a project DWG is recommended.

ATTENTION

Do not use the BRIDGE_SHEETS.dwg for any design related AutoCAD work. They do not contain the necessary layers, text styles, dimension styles or plot styles.

BRIDGE_SHEETS.dwg can be found in the Resources Section by clicking [here](#).

Bridge Symbols and Blocks

A Bridge Section symbol and block library is available within the “BRIDGE_SYMBOLS.dwg” which can be found on the Resources page by clicking [here](#).

NOTE: The use of DesignCenter to drag-n-drop these symbols and blocks into a project DWG is recommended.

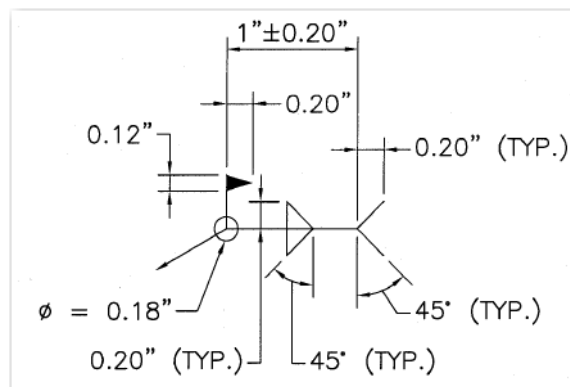
Section Symbols and Section Tails

These symbols (found in the BRIDGE_SYMBOLS.dwg) are used together to indicate the plane along which a section view is being taken. The section symbol is comprised of a split circle superimposed on an arrow. This arrow, along with the tail arrow, indicates the direction of the section view. The line which divides the split circle into two text blocks is always drawn horizontal. The top text block gives the section number; the bottom text block gives the sheet number on which the section view is shown. Sections shall be numbered in consecutive order from the start to the end of the bridge construction drawings. The first section that appears on the bridge construction drawings shall be Section 1 and there shall be no repetition of any section number.

Welding Symbols

Weld and welding symbols (found in the BRIDGE_SYMBOLS.dwg) shall be consistent with AWS 2.4 Standard Symbols for Welding, Brazing, and Nondestructive Examination. The symbol provided within the BRIDGE_SYMBOLS.dwg CAD file shall be modified as required to convey all information necessary to construct the welded joint as designed.

Standard Welding Symbol



Bridge Graphical Standards

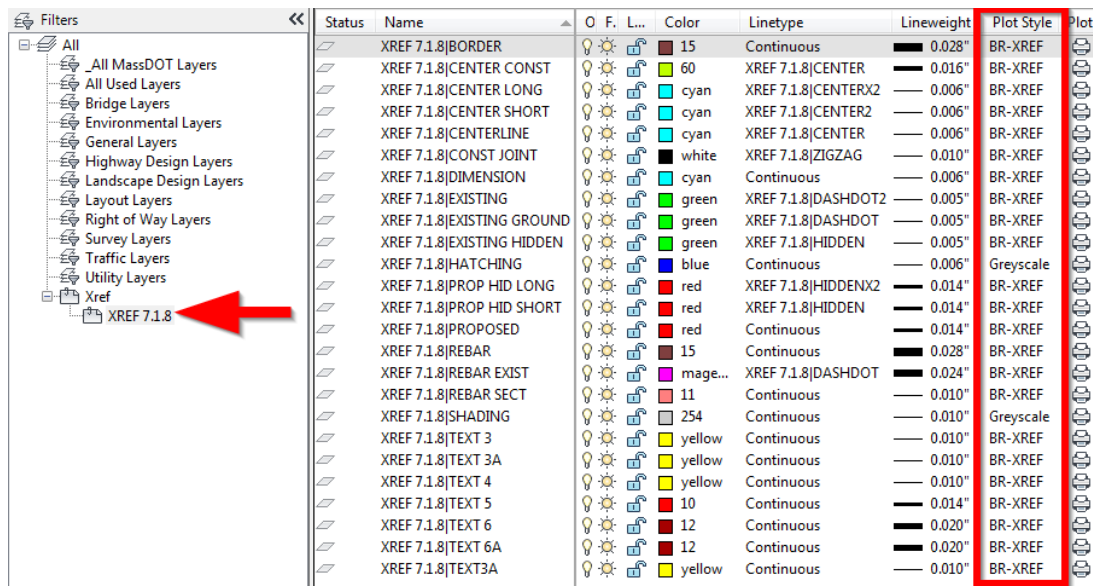
Temporary Addendum

Bridge Standard Detail Drawings

Bridge Standard Detail Drawings shall be inserted as external references in accordance with the policy explained previously in this document.

Bridge Standard Detail layers have the appropriate lineweights pre-assigned. These layers may differ from the Master Layer List. To ensure that all Bridge Standard Detail Drawings are plotted with accurate lineweights use the following steps:

- After inserting the external references open Layer Properties Manager
- Expand the Xref Layer Filter
- Change the plot style for all layers, in every Bridge Standard Detail Drawing inserted, to plot style BR-XREF, with the exception of the following:
 - SHADING, HATCH, HATCHING layers shall be set to plot style Greyscale



Filters	Status	Name	O	F	L...	Color	Linetype	Lineweight	Plot Style	Plot
All		XREF 7.1.8 BORDER				15	Continuous	0.028"	BR-XREF	
↳ All MassDOT Layers		XREF 7.1.8 CENTER CONST				60	XREF 7.1.8 CENTER	0.016"	BR-XREF	
↳ All Used Layers		XREF 7.1.8 CENTER LONG				cyan	XREF 7.1.8 CENTERX2	0.006"	BR-XREF	
↳ Bridge Layers		XREF 7.1.8 CENTER SHORT				cyan	XREF 7.1.8 CENTER2	0.006"	BR-XREF	
↳ Environmental Layers		XREF 7.1.8 CENTERLINE				cyan	XREF 7.1.8 CENTER	0.006"	BR-XREF	
↳ General Layers		XREF 7.1.8 CONST JOINT				white	XREF 7.1.8 ZIGZAG	0.010"	BR-XREF	
↳ Highway Design Layers		XREF 7.1.8 DIMENSION				cyan	Continuous	0.006"	BR-XREF	
↳ Landscape Design Layers		XREF 7.1.8 EXISTING				green	XREF 7.1.8 DASHDOT2	0.005"	BR-XREF	
↳ Layout Layers		XREF 7.1.8 EXISTING GROUND				green	XREF 7.1.8 DASHDOT	0.005"	BR-XREF	
↳ Right of Way Layers		XREF 7.1.8 EXISTING HIDDEN				green	XREF 7.1.8 HIDDEN	0.005"	BR-XREF	
↳ Survey Layers		XREF 7.1.8 HATCHING				blue	Continuous	0.006"	Greyscale	
↳ Traffic Layers		XREF 7.1.8 PROP HID LONG				red	XREF 7.1.8 HIDDENX2	0.014"	BR-XREF	
↳ Utility Layers		XREF 7.1.8 PROP HID SHORT				red	XREF 7.1.8 HIDDEN	0.014"	BR-XREF	
↳ Xref		XREF 7.1.8 PROPOSED				red	Continuous	0.014"	BR-XREF	
↳ XREF 7.1.8		XREF 7.1.8 REBAR				15	Continuous	0.028"	BR-XREF	
		XREF 7.1.8 REBAR EXIST				mage...	XREF 7.1.8 DASHDOT	0.024"	BR-XREF	
		XREF 7.1.8 REBAR SECT				11	Continuous	0.010"	BR-XREF	
		XREF 7.1.8 SHADING				254	Continuous	0.010"	Greyscale	
		XREF 7.1.8 TEXT 3				yellow	Continuous	0.010"	BR-XREF	
		XREF 7.1.8 TEXT 3A				yellow	Continuous	0.010"	BR-XREF	
		XREF 7.1.8 TEXT 4				yellow	Continuous	0.010"	BR-XREF	
		XREF 7.1.8 TEXT 5				10	Continuous	0.014"	BR-XREF	
		XREF 7.1.8 TEXT 6				12	Continuous	0.020"	BR-XREF	
		XREF 7.1.8 TEXT 6A				12	Continuous	0.020"	BR-XREF	
		XREF 7.1.8 TEXT3A				yellow	Continuous	0.010"	BR-XREF	

Concrete Excavation Surface Cut Line

The PR-BR-CONSTJT layer shall be used as follows:

- To represent the concrete cut line (on elevation views) or the concrete cut surface (in section views) on existing concrete construction when defining limits of concrete excavation.
- On details with existing and proposed construction, to represent the interface between old and new concrete, and ONLY if this interface was created through the excavation of the existing concrete construction.
- To represent the raked finish given to a concrete surface against which a second pour of concrete will be placed, such as the top of a bridge deck under the sidewalk slab.

The PR-BR-COMP layer shall be used as follows:

- If proposed concrete is cast onto an existing un-excavated concrete surface.

Centerlines

The PR-BR-CENTER layer shall be used to indicate the following:

- The centerlines of beams, both for dimensioning purposes and for indicating the location of beams on the plan view of an abutment or pier.
- The centerlines of bearings, on abutment or pier plan views, on bridge seat cross sections, on framing Construction Drawings, and elsewhere.
- The centerlines of bolts, holes, and any other object for the purpose of dimensioning.

The PR-BR-CONST-CENTER layer shall be used wherever the centerline of construction or the baseline of survey needs to be indicated.

Witness/Hatch Lines

The PR-BR-HATCH layer shall be used for drawing witness lines when dimensioning, and for hatching and cross hatching.

Dimension Lines

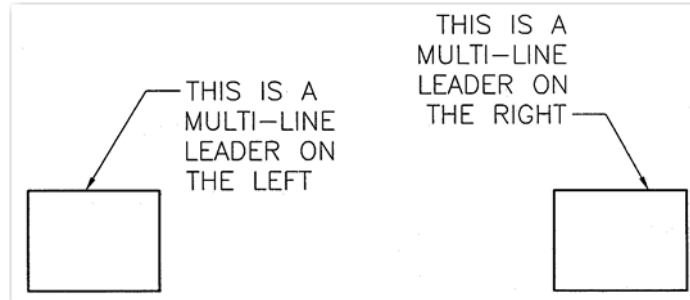
The PR-BR-DIMS layer shall be used for all dimensions. The dimension style, "DOT-BR", found within the MassDOT drawing template, shall be used.

Off Detail Dimension Lines

The PR-BR-DIMS layer shall be used with two ARROW symbol (found in the BRIDGE_SYMBOLS.dwg) at one end to indicate that a particular dimension or spacing of objects continues beyond the edge of the given detail in the direction of the double arrows.

Text with Leaders (2012 version only)

The PR-BR-DIMS layer shall be used for all text with leaders. The multi-leader style, “DOT-BR”, found within the MassDOT drawing template, shall be used.



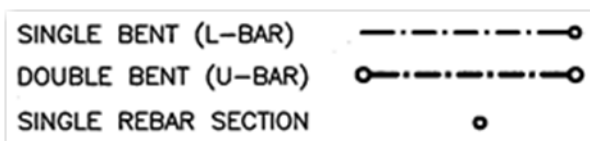
Proposed Rebar Sections

These symbols represent the end view of a proposed rebar in section views and also represent bent bars, such as L or U bars, where the bent leg is not in the plane of the drawing. The filled circle of the given diameter is used to represent all rebars in the specified scale regardless of the actual diameter.



Existing Rebar Sections

These symbols represent the end view of an existing rebar in section views where existing and proposed rebars are shown together and also represent bent bars, such as L or U bars where the bent leg is not in the plane of the drawing. The open circle of the given diameter is used to represent all existing rebars in the specified scale regardless of the actual diameter.



Text Styles and Usage

The text style to be used on Bridge Section Construction Drawings shall be as shown below,

DOT-BR4 (placed on EX-BR-TEXT or PR-BR-TEXT layers)

To be used for all lettering on the Construction Drawings. This includes annotating details, notes, dimensions, etc.

DOT-BR5 (placed on PR-BR-TEXT-S layer)

Subtitles on individual detail drawings.

DOT-BR6 (placed on PR-BR-TEXT-D layer)

Individual detail drawing titles, including section designations.

DOT-BR8 (predefined within BRIDGE_SHEETS.dwg)

When giving a title to an entire sheet.

DOT-BR4	$\frac{1}{8}"$	STANDARD TEXT
DOT-BR5	$\frac{5}{32}"$	SUBTITLE TEXT
DOT-BR6	$\frac{3}{16}"$	DETAIL/SECTION TEXT
DOT-BR8	$\frac{1}{4}"$	SHEET TITLE TEXT

Abbreviations

Abbreviations may be used on MassDOT Bridge Construction Drawings. A standard list of abbreviations has been provided below. Periods, where shown, are not to be omitted so that the reader can be sure that these abbreviations are intentional rather than being misspelled words.

When using abbreviations, the following guidelines will be adhered to:

1. An abbreviation may be used when there is no doubt of its meaning and when it saves significant space on the drawings.
2. Avoid abbreviations on the plan and elevation sheet.
3. Do not abbreviate important words in titles.
4. For words whose abbreviations are not universally recognized in the construction industry the word should be spelled out and followed with the abbreviation in parenthesis the first time it appears on the Construction Drawings.
5. Abbreviations should not be used in the text of notes unless they are conventional abbreviations, such as H.S. Bolt for High Strength Bolt.

List of Standard Abbreviations

A

Abutment	ABUT.
Alternate	ALT.
And	&
Annual Average Daily Traffic	AADT
Approach slab	APPR. SLAB
Approximate	APPROX.
At	@
Avenue	AVE.

B

Barrels	BBL.
Beam Number 1	BM. #1
Bearing, Bearings	BRG., BRGS.
Bench mark	B.M.
Bituminous	BIT.
Bottom	BOT.
Boulevard	BLVD.
Bridge Number A-01-001	BR. NO. A-01-001

C

Catch basin	C.B.
Cast-in-place	C.I.P.
Cast iron pipe	C.I. PIPE
Cement	CEM.
Center To Center	C. TO C.
Clearance, Clear	CL.
Concrete	CONC.
Construction	CONST.
Culvert	CULV.
Chamfer	CHAMF.

D

Degrees (angular)	°
Degrees (thermal)	°F
Diameter	DIA. or ∅
Distance	DIST.
Dowel	DWL.

Drive

DR.

E

Each	EA.
East	E.
East (for survey bearings)	E
Eastbound	E.B.
Elevation	EL.
Equal (as in equal spaces)	EQ.
Expansion	EXP.
Existing	EXIST.
Exterior	EXT.

F

Far Face	F.F.
Federal Highway Administration	FHWA
Figure, Figures	FIG., FIGS.
Floor Beam Number 1	F.B. #1

G

Galvanized	GALV.
Gage	GA.

H

Hexagonal Head	HEX. HEAD
High Performance Concrete	H.P.Concrete
High Performance Steel	H.P.S.
High Strength	H.S.
Highway	HWY.
Horizontal	HORIZ.
Hot Mix Asphalt	HMA

I

Inside Diameter	I.D.
Interior	INT.

STANDARD ABBREVIATIONS (CONT.)

J

Joint JT.

K

Kips K
Kips per square inch KSI
Kips per square foot KSF

L

Latex Modified Concrete L.M.C.
Longitudinal LONGIT.
Lump sum L.S.

M

Manhole M.H.
Massachusetts Department of Transportation MassDOT
Maximum MAX.
Miles per Hour MPH
Minimum MIN.
Miscellaneous MISC.
Modified MOD.

N

Near Face N.F.
New Jersey Barrier N.J. BARRIER
North N.
North (for survey bearings) N
Northbound N.B.
Northeast(erly) N.E.
Northwest(erly) N.W.
Not to scale N.T.S.
Number NO. or #
Numbers NOS.

O

On Center O.C.

Outside Diameter O.D.
Outside To Outside O. TO O.

P

Pavement PVMT.
Perpendicular PERP.
Point of Compound Curvature P.C.C.
Point of Curvature P.C.
Point of Intersection P.I.
Point of Tangency P.T.
Point of vertical curvature P.V.C.
Point of vertical intersection P.V.I.
Point of vertical tangency P.V.T.
Polyvinyl chloride pipe P.V.C. PIPE
Pounds per square inch PSI
Proposed PROP.

R

Radius = R =
Railroad RR.
Reinforced, Reinforcing REINF.
Remove REM.
Remove and Reset R. & R.
Required REQ'D
Retaining Wall RET. WALL
Right Of Way R.O.W.
Road RD.
Roadway RDWY.
Route RTE.

S

Seconds SEC.
Section SECT.
Sheet number 1 SH. #1
Sidewalk SDWK.
South S.
South (for survey bearings) S
Southeast(erly) S.E.
Southwest(erly) S.W.
Southbound S.B.
Spaces SP.

STANDARD ABBREVIATIONS (CONT.)

S (cont)

Specification	SPEC.
Speed (design speed)	V
Square	SQ.
Square feet	SF
Square inches	SI
Stainless steel	S.S.
Station	STA.
Stay-In-Place Forms	S.I.P. FORMS
Street	ST.
Surfacing	SURF.
Symmetrical	SYM.

T

Tangent	TAN.
Temporary	TEMP.
Tons per square foot	TSF
Typical	TYP.

V

Variable	VAR.
Vertical	VERT.
Vertical Curve	V.C.

W

Wearing Surface	W.S.
West	W.
West (for survey bearings)	W
Westbound	W.B.
Wingwall	W.W.
Working Point	W.P.
Wrought Iron Pipe	W.I. PIPE

Environmental

File Submission Requirements

MassDOT Highway Division – Environmental Section requires that all file submissions shall include the following file types.

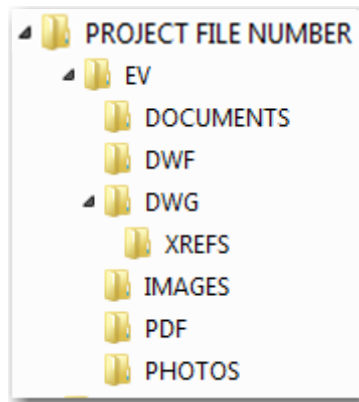
- AutoCAD Drawing format (.dwg)
- AutoCAD Drawing Web Format (.dwt)
- Adobe Portable Document Format (.pdf)

Actual software version used by MassDOT internally will change from time to time, therefore please refer to the specific project contract or check with the project manager for actual version and submission requirements.

Prior versions of the CAD Standard, including drawing templates, are available on the Resources page.

Folder Structure

All electronic file submissions shall be submitted within the following Folder Structure. Please see the Default Folder Structure in the General Section for descriptions of folders not listed here.



Environmental Layer List

The following is a sub-set of the Master Layer List showing all Environmental Layers.

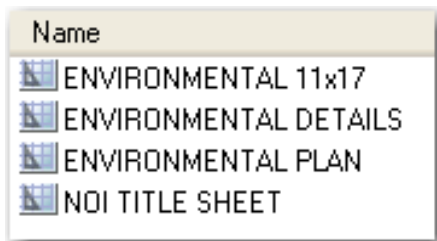
LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-EV-REGL-BUFFER-100	240	DASHEDX2	ENVR EXIST	Regulatory – 100 ft Buffer Zone
EX-EV-REGL-FLOOD	magenta	BORDERX2	ENVR EXIST	Regulatory – Flood Zones
EX-EV-REGL-MHW	212	BORDER	ENVR EXIST	Regulatory – Mean High Water - Tidal
EX-EV-REGL-OHWL	212	BORDER2	ENVR EXIST	Regulatory – Ordinary High Water – Non-Tidal
EX-EV-REGL-RIVR-FRNT	221	BORDER2	ENVR EXIST	Regulatory – Riverfront Protection Zones
EX-EV-TEXT	magenta	Continuous	ENVR EXIST	Environmental – Text
PR-EV-EROS	131	Continuous	ENVR PROP	Proposed Environmental - Erosion Control
PR-EV-REGL-MITG	131	Continuous	ENVR PROP	Regulatory – Mitigation Areas
PR-EV-TEXT	131	Continuous	ENVR PROP	Proposed Environmental - Text

Environmental Plan Requirements

All Environmental Drawings shall conform to Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide. This CAD Standard is the sole location for all MassDOT Highway Division CAD related standards. Where inconsistencies occur between this CAD Standard document and any other MassDOT Highway Division manuals currently in use, this CAD Standard document must be adhered to. It is not intended to remove any requirements from other MassDOT Highway Division manuals, currently in use, which are not specifically addressed herein.

All Drawings must be created using the current version of the MassDOT drawing template. The version number of the drawing template is listed within the lower right corner of each paper space border and placed on a no-plot layer. All necessary layers, text styles, plot styles, and dimension styles are included within this template.

When creating Paper Space layouts, a default set of sheets, i.e. layouts, have been created within the “ENVIRONMENTAL_SHEETS.dwg” CAD file. This contains standard borders for all Design related plans. The following layouts are included,



No other borders will be accepted.

The use of DesignCenter to drag-n-drop these layouts into a project DWG is recommended.

ATTENTION

Do not use the ENVIRONMENTAL_SHEETS.dwg for any design related AutoCAD work. They do not contain the necessary layers, text styles, dimension styles or plot styles.

ENVIRONMENTAL_SHEETS.dwg can be found in the Resources Section by clicking [here](#).

Geotechnical

File Submission Requirements

MassDOT Highway Division – Geotechnical Section requires that all file submissions shall include the following file types.

AutoCAD Drawing format (.dwg)
AutoCAD Drawing Web Format (.dwf)
Adobe Portable Document Format (.pdf)

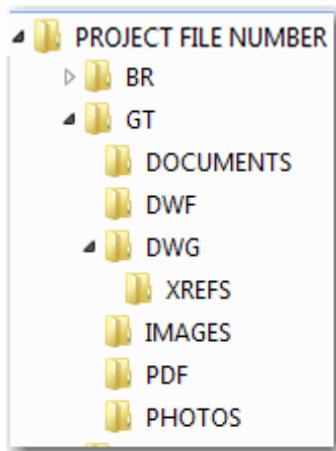
PLEASE NOTE:

Actual software version used by MassDOT internally will change from time to time, therefore please refer to the specific project contract or check with the project manager for actual version and submission requirements.

Prior versions of the CAD Standard, including drawing templates, are available on the Resources page.

Folder Structure

MassDOT Highway Division – Geotechnical Section requires that all electronic file submissions shall be submitted within the following Folder Structure. Please see the Default Folder Structure in the General Section for descriptions of folders not listed here.



PHOTOS – files associated with site photographs, pictures
IMAGES – scanned field notes, research, etc...
(Non-externally referenced images)

Geotechnical Layer List

The following is a sub-set of the Master Layer List showing all Geotechnical Layers.

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-GT-FEAT	9	Continuous	BR 50%	Existing Geotechnical Features
PR-GT-FEAT	white	Continuous	BR 100%	Geotechnical - Proposed Features and Text

Geotechnical Plan Requirements

All Geotechnical Drawings shall conform to Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide. This CAD Standard is the sole location for all MassDOT Highway Division CAD related standards. Where inconsistencies occur between this CAD Standard document and any other MassDOT Highway Division manuals currently in use, this CAD Standard document must be adhered to. It is not intended to remove any requirements from other MassDOT Highway Division manuals, currently in use, which are not specifically addressed herein.

All Drawings must be created using the current version of the MassDOT drawing template. The version number of the drawing template is listed within the lower right corner of each paper space border and placed on a no-plot layer. All necessary layers, text styles, plot styles, and dimension styles are included within this template.

The use of Paper Space is now a requirement. Please refer to the *[“Policy on Model Space vs. Paper Space”](#)* located earlier within this document.

When creating Paper Space layouts, a default set of sheets, i.e. layouts, have been created within the “GEOTECH_SHEETS.dwg” CAD file. This contains standard borders and title blocks for all Design related plans. The following layouts are included,



No other borders will be accepted.

The use of DesignCenter to drag-n-drop these layouts into a project DWG is recommended.

ATTENTION

Do not use the GEOTECH_SHEETS.dwg for any design related AutoCAD work. They do not contain the necessary layers, text styles, dimension styles or plot styles.

GEOTECH_SHEETS.dwg can be found in the Resources Section by clicking [here](#).

Geotechnical Symbols and Blocks

Symbols have been developed for the proposed construction items to closely represent those provided in Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide, 2006. These symbols must be used for plans prepared for MassDOT. No substitute symbols will be accepted. Additional symbols may be added for items not listed. However, the list of additional symbols with descriptions must be included with the plan submission to MassDOT.

A Geotechnical Section symbol and block library is available within the “GEOTECH_SYMBOLS.dwg” which can be found on the Resources page by clicking [here](#).

NOTE: The use of DesignCenter to drag-n-drop these symbols and blocks into a project DWG is recommended.

Highway Design

File Submission Requirements

MassDOT Highway Division – Highway Design Section requires that all file submissions shall include the following file types.

- AutoCAD Drawing format (.dwg)
- AutoCAD Drawing Web Format (.dwf)
- Adobe Portable Document Format (.pdf)

Actual software version used by MassDOT internally will change from time to time, therefore please refer to the specific project contract or check with the project manager for actual version and submission requirements.

Prior versions of the CAD Standard, including drawing templates, are available on the Resources page.

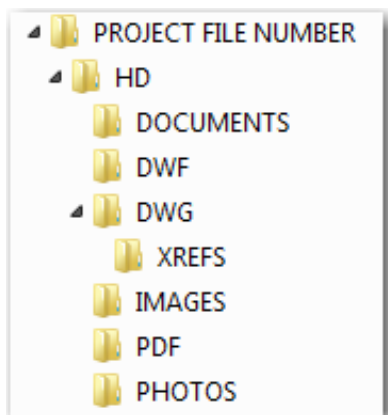
Civil 3D Objects

The following design items must be created as AutoCAD Civil 3D objects and must be assigned MassDOT Civil 3D Object Styles using the provided MassDOT Civil 3D drawing template.

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

Folder Structure

All electronic file submissions shall be submitted within the following Folder Structure. Please see the Default Folder Structure in the General Section for descriptions of folders not listed here.



PHOTOS – files associated with site photographs, pictures
IMAGES – scanned field notes, research, etc
(Non-externally referenced images)

Highway Design Layer List

The following is a sub-set of the Master Layer List showing all Highway Design Layers.

Civil 3D OBJECT LAYERS	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
OB-BASELINE	white	Continuous	ROW 100%	Boundary Line – CIVIL 3D OBJECT
OB-FEATURE-LINE	white	Continuous	SOLID 100%	Feature Line - CIVIL 3D OBJECT
OB-INTERFER	white	Continuous	SOLID 100%	Interference - CIVIL 3D OBJECT
OB-PARCEL	white	Continuous	ROW 100%	Parcel - CIVIL 3D OBJECT
OB-SURFACE	white	Continuous	SOLID 100%	Surface - CIVIL 3D OBJECT
OB-SURVEY	white	Continuous	SOLID 100%	Survey - CIVIL 3D OBJECT
OB-UTILITY	white	Continuous	SOLID 100%	Utility Line - CIVIL 3D OBJECT
PROPOSED LAYERS				
PR-HD-ASSM	white	Continuous	SOLID 100%	Proposed Assembly
PR-HD-ASSM-LINK	white	Continuous	SOLID 100%	Proposed Assembly: corridor and section links
PR-HD-ASSM-XSECT	white	Continuous	SOLID 100%	Proposed Assembly: corridor cross section
PR-HD-BL-CT	white	DASHED	ROW 200%	Proposed Baseline - County
PR-HD-BL-RR	white	DASHEDX2	ROW 200%	Proposed Baseline - Railroad
PR-HD-BL-SHLO	white	DASHED	ROW 200%	Proposed Baseline - State Highway
PR-HD-BL-TEXT	white	Continuous	ROW 100%	Proposed Baseline - Proposed Text
PR-HD-BL-TN	white	DASHED2	ROW 200%	Proposed Baseline - City/Town
PR-HD-BL-XX	white	DASHED2	ROW 200%	Proposed Baseline - Miscellaneous
PR-HD-CONT	30	Continuous	SOLID 100%	Proposed Contours

PROPOSED LAYERS (CONT)

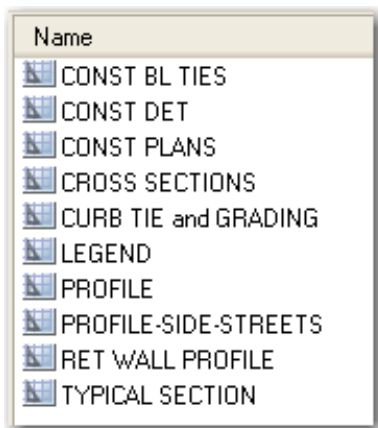
LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
PR-HD-CORR	white	Continuous	SOLID 100%	Proposed Corridor
PR-HD-CORR-PATT	141	Continuous	SOLID 100%	Proposed Corridor: corridor patterns
PR-HD-CORR-SHAP	32	Continuous	SOLID 100%	Roadways: corridor and section shapes
PR-HD-CORR-SHAP-PATT	white	Continuous	SOLID 100%	Roadways: corridor and section shapes hatching
PR-HD-CURB	20	Continuous	SOLID 100%	Proposed Curbing
PR-HD-DAYL	white	HIDDEN	SOLID 200%	Proposed Daylight
PR-HD-DETL	141	Continuous	SOLID 100%	Proposed Miscellaneous Items
PR-HD-EPAV	white	Continuous	SOLID 100%	Proposed Edge of Pavement
PR-HD-FNCE-CLF	62	FENCE – CHAIN LINK	SOLID 100%	Proposed Fence – Chain Link
PR-HD-FNCE-WRF	62	FENCE – WOOD RAIL	SOLID 100%	Proposed Fence – Wood Rail
PR-HD-GRAD	white	Continuous	SOLID 100%	Proposed Grade
PR-HD-GRDL-STBM	71	GUARDRAIL – STEEL	SOLID 100%	Proposed Guardrail – Steel Posts
PR-HD-GRDL-WOOD	71	GUARDRAIL – WOOD	SOLID 100%	Proposed Guardrail – Wood Posts
PR-HD-GRVL	white	Continuous	SOLID 100%	Proposed Gravel
PR-HD-SSLP	white	Continuous	SOLID 100%	Proposed Sideslope
PR-HD-WALK	white	Continuous	SOLID 100%	Proposed Sidewalks
PR-HD-WALL-RETW	200	RETWALL	SOLID 100%	Proposed Walls - Retaining
PR-HD-WALL-STONE	200	STONEWALL	SOLID 100%	Proposed Walls – Balanced Stone

Highway Design Plan Requirements

All Highway Design Drawings shall conform to Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide. This CAD Standard is the sole location for all MassDOT Highway Division CAD related standards. Where inconsistencies occur between this CAD Standard document and any other MassDOT Highway Division manuals currently in use, this CAD Standard document must be adhered to. It is not intended to remove any requirements from other MassDOT Highway Division manuals, currently in use, which are not specifically addressed herein.

All Drawings must be created using the current version of the MassDOT drawing template. The version number of the drawing template is listed within the lower right corner of each paper space border and placed on a no-plot layer. All necessary layers, text styles, plot styles, and dimension styles are included within this template.

When creating Paper Space layouts, a default set of sheets, i.e. layouts, have been created within the “HWYDESIGN_SHEETS.dwg” CAD file. This contains standard borders and title blocks for all Design related plans. The following layouts are included,



No other borders will be accepted.

The use of DesignCenter to drag-n-drop these layouts into a project DWG is recommended.

ATTENTION

Do not use the HWYDESIGN_SHEETS.dwg for any design related AutoCAD work. They do not contain the necessary layers, text styles, dimension styles or plot styles.

HWYDESIGN_SHEETS.dwg can be found in the Resources Section by clicking [here](#).

Highway Design Symbols and Blocks




























Symbols have been developed for the proposed construction items to closely represent those provided in Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide, 2006. These symbols must be used for plans prepared for MassDOT. No substitute symbols will be accepted. Additional symbols may be added for items not listed. However, the list of additional symbols with descriptions must be included with the plan submission to MassDOT.

A Highway Design Section symbol and block library is available within the “HWYDESIGN_SYMBOLS.dwg” which can be found on the Resources page by clicking [here](#).

NOTE: The use of DesignCenter to drag-n-drop these symbols and blocks into a project DWG is recommended.

Highway Design Assemblies

A standard set of modifiable typical roadway cross sections is included in the MassDOT assemblies. MassDOT developed assemblies for all standard roadway cross sections. These assemblies shall be used whenever possible. Each assembly can be modified for non-standard sections. They can be found on the Resources Page by clicking [here](#).

 MassDOT Assemblies.dwg	<u>Default naming convention</u>
 RD-AR-1.dwg	RD = Rural Developed
 RD-CO-1.dwg	RN = Rural Natural
 RD-FR-2.dwg	RV = Rural Village
 RD-LO-1.dwg	SH = Suburban High Density
 RN-AR-1.dwg	SL = Suburban Low Density
 RN-CO-1.dwg	SV = Suburban Village
 RN-FR-2.dwg	UR = Urban
 RN-LO-1.dwg	
 RV-AR-1.dwg	AR = Arterial
 RV-CO-1.dwg	CO = Collector
 RV-LO-1.dwg	FR = Freeway
 SH-AR-1.dwg	LO = Local
 SH-CO-1.dwg	
 SH-FR-2.dwg	1 = 1 Lane
 SH-LO-1.dwg	2 = 2 Lane
 SL-AR-1.dwg	
 SL-CO-1.dwg	
 SL-FR-2.dwg	
 SL-LO-1.dwg	
 SV-AR-1.dwg	
 SV-CO-1.dwg	
 SV-LO-1.dwg	
 UR-AR-1.dwg	
 UR-CO-1.dwg	
 UR-FR-2.dwg	
 UR-LO-1.dwg	

Landscape Design

File Submission Requirements

MassDOT Highway Division – Landscape Section requires that all file submissions shall include the following file types.

AutoCAD Drawing format (.dwg)
AutoCAD Drawing Web Format (.dwf)
Adobe Portable Document Format (.pdf)

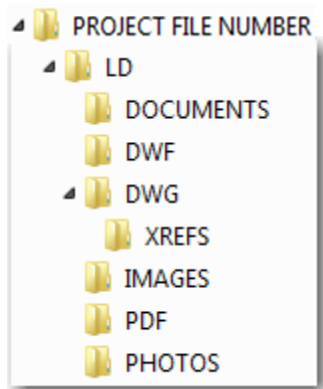
PLEASE NOTE:

Actual software version used by MassDOT internally will change from time to time, therefore please refer to the specific project contract or check with the project manager for actual version and submission requirements.

Prior versions of the CAD Standard, including drawing templates, are available on the Resources page.

Folder Structure

MassDOT Highway Division – Landscape Section requires that all electronic file submissions shall be submitted within the following Folder Structure. Please see the Default Folder Structure in the General Section for descriptions of folders not listed here.



PHOTOS – files associated with site photographs, pictures
IMAGES – scanned field notes, research, etc
(Non-externally referenced images)

Landscape Design Layer List

The following is a sub-set of the Master Layer List showing all Landscape Design Layers.

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-LD-SITE-FEAT	170	Continuous	SURVEY 100%	Existing Landscape Site Features
EX-LD-VEGE	green	Continuous	SURVEY 100%	Existing Trees, Shrubs, and Vegetation
EX-LD-VEGINV	12	Continuous	SURVEY 100%	Existing Invasive Vegetation
PR-LD-DETAILS	white	Continuous	SOLID 100%	Proposed Landscaping Details
PR-LD-DIMS	240	Continuous	SOLID 100%	Proposed Landscaping Dimensions
PR-LD-GRCOVER	green	Continuous	SOLID 100%	Proposed Ground Cover
PR-LD-HATCH	white	Continuous	SOLID 100%	Proposed Hatching
PR-LD-ORNGRASS	yellow	Continuous	SOLID 100%	Proposed Ornamental Grass
PR-LD-PERNNL	red	Continuous	SOLID 100%	Proposed Perennial
PR-LD-PLNT-TAG	240	Continuous	SOLID 200%	Proposed Plant Tag
PR-LD-SEED	green	Continuous	SOLID 100%	Proposed Seed - Standard
PR-LD-SHRUB	white	Continuous	SOLID 100%	Proposed Shrubs
PR-LD-SITE-FURNISH	182	Continuous	SOLID 100%	Proposed Site Furnishings
PR-LD-TEXT	240	Continuous	SOLID 100%	Proposed Landscaping Text
PR-LD-TREE	white	Continuous	SOLID 200%	Proposed Trees
PR-LD-TREE-PROT	182	Continuous	SOLID 200%	Proposed Tree Protection

Landscape Design Plan Requirements

All Landscape Design Drawings shall conform to Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide. This CAD Standard is the sole location for all MassDOT Highway Division CAD related standards. Where inconsistencies occur between this CAD Standard document and any other MassDOT Highway Division manuals currently in use, this CAD Standard document must be adhered to. It is not intended to remove any requirements from other MassDOT Highway Division manuals, currently in use, which are not specifically addressed herein.

All Drawings must be created using the current version of the MassDOT drawing template. The version number of the drawing template is listed within the lower right corner of each paper space border and placed on a no-plot layer. All necessary layers, text styles, plot styles, and dimension styles are included within this template.

The use of Paper Space is now a requirement. Please refer to the *[“Policy on Model Space vs. Paper Space”](#)* located earlier within this document.

When creating Paper Space layouts, a default set of sheets, i.e. layouts, have been created within the “LANDSCAPE_SHEETS.dwg” CAD file. This contains standard borders and title blocks for all Design related plans. The following layouts are included,



No other borders will be accepted.

The use of DesignCenter to drag-n-drop these layouts into a project DWG is recommended.

ATTENTION

Do not use the LANDSCAPE_SHEETS.dwg for any design related AutoCAD work. They do not contain the necessary layers, text styles, dimension styles or plot styles.

LANDSCAPE_SHEETS.dwg can be found in the Resources Section by clicking [here](#).

Landscape Design Symbols and Blocks

Symbols have been developed for the proposed construction items to closely represent those provided in Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide, 2006. These symbols must be used for plans prepared for MassDOT. No substitute symbols will be accepted. Additional symbols may be added for items not listed. However, the list of additional symbols with descriptions must be included with the plan submission to MassDOT.

A Landscape Section symbol and block library is available within the “LANDSCAPE_SYMBOLS.dwg” which can be found on the Resources page by clicking [here](#).

NOTE: The use of DesignCenter to drag-n-drop these symbols and blocks into a project DWG is recommended.

Landscape Planting Plans

Existing Vegetation

Ensure that existing trees and other vegetation within the project limits are shown on the plans, including size and type.

Invasive Plants

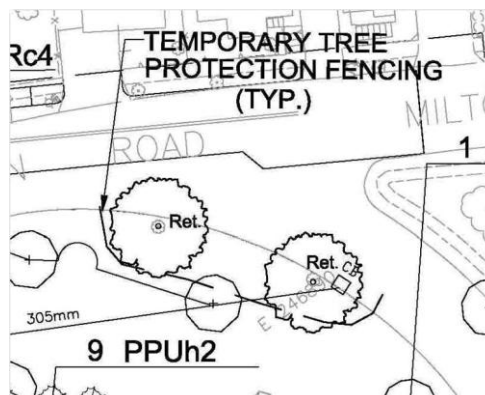
If applicable, identify and delineate invasive plant species within and bordering the project limits. Include approximate area of plants.

Survey Layers

Show all layers such as utilities, signs, signals and lighting to avoid plant placement conflicts.

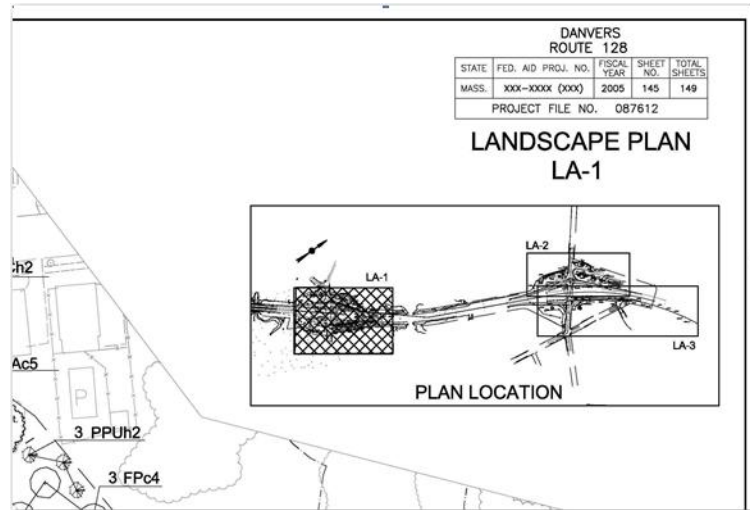
Tree Protection

Show tree protection measures on the Construction and Landscape Plans. Include tree protection for existing trees within or adjacent to construction staging areas.



Key Plan

Landscape key plans are useful on interchange, large corridor and shared-use path projects. Show a smaller key plan on each sheet with the corresponding sheet highlighted for reference (Optional).



North Arrow

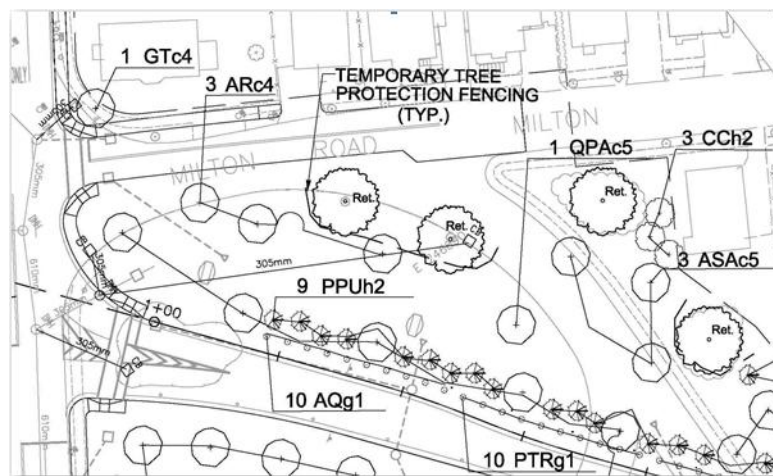
Show a north arrow on all landscape plans except detail sheets.

Bar Scale

Show a bar scale on all landscape plans. Detail sheets may include bar scales as needed.

Plant Symbols

Show plant symbol graphics to accurately show proper plant spacing of plant material based on the species type and specified size. Link groups of the same plant species together with a continuous leader line and label with a quantity and an alphanumeric symbol that corresponds to the plant list. (See *Plant List* below).



Plant List

Provide a plant list on each sheet that corresponds to plants for that sheet. Include a summary plant list with the landscape details.

Plant lists will include the following:

- Quantity for each species
- Symbol (alphanumeric)
- Description (per *MassDOT-Nomenclature & List of Standard Items*)
- Botanical Name
- Specified Size
- Comments/Notes
- Quantity per area (where applicable)

<u>PLANT LIST-SHEET</u>					
SYM	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
TREES					
AMCh3	3	<i>Amelanchier canadensis</i>	Shad Tree	1-1.5" caliper	
MCRBh2	5	<i>Malus 'Red Baron'</i>	Crabapple-Columnar 'Red Baron'	6-8 FT	
TONh2	14	<i>Thuja occidentalis 'Nigra'</i>	Arborvitae-Eastern 'Nigra'	6-8 FT	

Legend

Provide a legend on each sheet for symbols, hatch patterns and other relevant information.

LEGEND	
	EXIST. TREE TO BE RETAINED & PROTECTED w/ TEMP. FENCING
	PROPOSED DECIDUOUS TREE
	PROPOSED EVERGREEN TREE
	PROPOSED FLOWERING TREE

Notes

Add or remove notes from the standard note block as necessary. Notes should avoid repeating information contained in specifications to avoid conflicts.

Supplemental Sheet Numbers (Optional)

Limit supplemental sheet references to the landscape set (LA 1, LA 2, etc.).

DANVERS ROUTE 128				
STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
MASS.	XXX-XXXX (XXX)	2005	145	149
PROJECT FILE NO. 087612				
LANDSCAPE PLAN LA-1				

Wetland Replication Plans

Show the following (where applicable):

Existing Conditions

- Legend
- Existing Wetland Delineation limits
- Impacted Area limits
- Impacted Area size
- 100 Ft Buffer Zone
- 100 Ft Floodplain
- 200 Ft Riverfront Area
- Existing Vegetation Limits (include inventory of plant species)
- Invasive Species (where applicable)
- Non-tidal Wetlands-Include elevation:
 - Ordinary High Water
- Tidal Wetlands- Include elevation for each:
 - Mean Low Water line (MLW)
 - Mid Tide line
 - Mean High Tide line (MHW)
 - High Tide line (HTL) Also known as: Mean Higher High Water or Spring Tide line
- Hydrologic monitoring location: Tide gauges, piezometers, etc. (where applicable)
- Reference wetland area (where applicable)

Proposed

- Legend
 - Notes
 - Erosion control measures
 - Existing trees to remain (include protection measures)
 - Wetland mitigation limits & area (restoration, replication, enhancement)
 - Grading contours- (typically 1 foot intervals) Include proposed water line for non-tidal wetlands and proposed intertidal zones for tidal wetlands, including:
 - Mean Low Water line (MLW)
 - Mid Tide line
 - Mean High Tide line (MHW)
 - High Tide Line (HTL) Also known as: Mean Higher High Water or Spring Tide line
- Also, include this information in a table format on the plan.
- Plantings (See Landscape Plan requirements)
 - Seeding limits and type
 - Invasive Species treatment areas
 - Temporary Wildlife barriers- Goose exclusion Fence, Turtle Barriers, etc. (where applicable)
 - Hydrologic monitoring locations: tidal gauges, piezometers, etc. (where applicable)

Layouts

File Submission Requirements

MassDOT Highway Division – Layouts Section requires that all file submissions shall include the following file types.

- AutoCAD Drawing format (.dwg)
- AutoCAD Drawing Web Format (.dwf)
- Adobe Portable Document Format (.pdf)

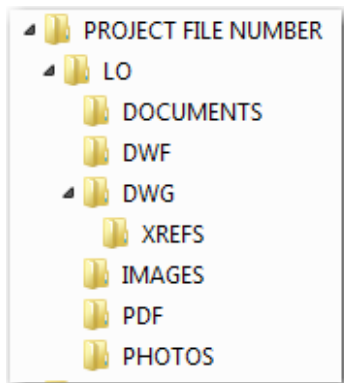
PLEASE NOTE:

Actual software version used by MassDOT internally will change from time to time, therefore please refer to the specific project contract or check with the project manager for actual version and submission requirements.

Prior versions of the CAD Standard, including drawing templates, are available on the Resources page.

Folder Structure

MassDOT Highway Division – Layouts Section requires that all electronic file submissions shall be submitted within the following Folder Structure. Please see the Default Folder Structure in the General Section for descriptions of folders not listed here.



PHOTOS – files associated with site photographs, pictures
IMAGES – scanned field notes, research, etc
(Non-externally referenced images)

Layer Naming Requirement specific to Layout layer use

It is a requirement that all layers include at least one of their references, such as Layout Number, Recorded Book and Page, and/or Year of layout. Please use the following examples:

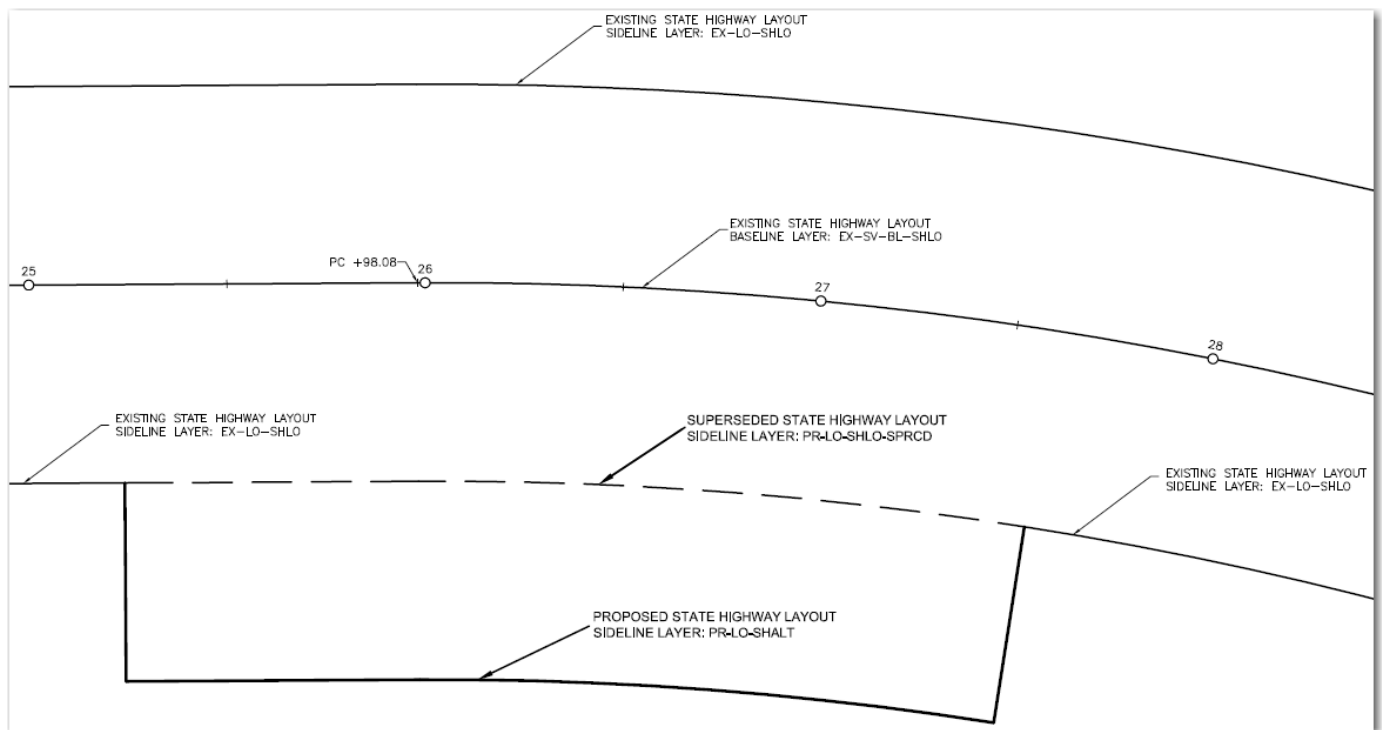
EX-LO-SHLO-1923-BK12-PG45

EX-LO-SHLO-1977

EX-LO-SHLO-1944-LO1234.

State Highway Layout (and Alteration) – Linestyle Graphic

- An alteration line to a State Highway Layout (SHLO) is a BOLD continuous line/curve with bearing and distance or radius and length indicated on the outside of the line/curve. Use layer PR-LO-SHALT.
- The superseded State Highway Layout line is a thin dashed line. Use layer PR-LO-SHLO-SPRCD.
- The existing State Highway Layout line is a thin continuous line. Use layer EX-LO-SHLO.
- The existing State Highway Layout Baseline is a thin continuous line. Use layer EX-SV-BL-SHLO and the Civil 3D Alignment Object Style MassDOT_Record_Baseline.



Layouts Layer List

The following is a sub-set of the Master Layer List showing all Layouts Layers.

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-LO-CT	yellow	CENTERX2	ROW 100%	Existing County Layout Lines
EX-LO-RR	yellow	EXIST RR SIDELINE	ROW 100%	Existing Railroad Layout Lines
EX-LO-SHLO	yellow	Continuous	ROW 100%	Existing State Highway Layout Lines
EX-LO-TEXT	yellow	Continuous	ROW 100%	Existing Text for Layout Information
EX-LO-TN	yellow	PHANTOM	ROW 100%	Existing Town/City Layout Lines
EX-LO-TP	yellow	PHANTOM2	ROW 100%	Existing Turnpike Authority Layout Lines
PR-LO-CT	231	Continuous	ROW 200%	Proposed County Layout Lines
PR-LO-RR	231	Continuous	ROW 200%	Proposed Railroad Layout Lines
PR-LO-SHALT	231	Continuous	ROW 200%	Proposed State Highway Alteration Lines
PR-LO-SHDISC	231	Dashed	ROW 200%	Proposed State Highway Discontinuance Lines
PR-LO-SHLO	231	Continuous	ROW 200%	Proposed State Highway Layout Lines
PR-LO-SHLO-SPRCD	231	Dashed	ROW 100%	Proposed State Highway Superseded Layout Lines
PR-LO-TEXT	231	Continuous	ROW 200%	Proposed Text for Layout Information
PR-LO-TN	231	Continuous	ROW 200%	Proposed Town/City Layout Lines

Layouts Plan Requirements

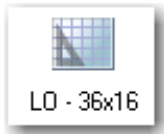
All Layouts Drawings shall conform to Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide. This CAD Standard is the sole location for all MassDOT Highway Division CAD related standards. Where inconsistencies occur between this CAD Standard document and any other MassDOT Highway Division manuals currently in use, this CAD Standard document must be adhered to. It is not intended to remove any requirements from other MassDOT Highway Division manuals, currently in use, which are not specifically addressed herein.

All Drawings must be created using the current version of the MassDOT drawing template. The version number of the drawing template is listed within the lower right corner of each paper space border and placed on a no-plot layer. All necessary layers, text styles, plot styles, and dimension styles are included within this template.

The use of Paper Space is now a requirement. Please refer to the *[“Policy on Model Space vs. Paper Space”](#)* located earlier within this document.

Layouts Section title blocks can be obtained from the “LAYOUT_SYMBOLS.dwg”

When creating Paper Space layouts, a default set of sheets, i.e. layouts, have been created within the “LAYOUT_SHEETS.dwg” CAD file. This contains standard borders for all Layouts Section related plans. The following layouts are included,



No other borders will be accepted.

The use of DesignCenter to drag-n-drop these layouts into a project DWG is recommended.

ATTENTION

Do not use the LAYOUTS_SHEETS.dwg for any design related AutoCAD work. They do not contain the necessary layers, text styles, dimension styles or plot styles.

LAYOUT_SHEETS.dwg can be found in the Resources Section by clicking [here](#).

Layouts Symbols and Blocks

Symbols have been developed for the proposed construction items to closely represent those provided in Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide, 2006. These symbols must be used for plans prepared for MassDOT. No substitute symbols will be accepted. Additional symbols may be added for items not listed. However, the list of additional symbols with descriptions must be included with the plan submission to MassDOT.

A Layouts Section symbol and block library is available within the “LAYOUT_SYMBOLS.dwg” which can be found on the Resources page by clicking [here](#).

NOTE: The use of DesignCenter to drag-n-drop these symbols and blocks into a project DWG is recommended.

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Right of Way

File Submission Requirements

MassDOT Highway Division – Right of Way Section requires that all file submissions shall include the following file types.

AutoCAD Drawing format (.dwg)
AutoCAD Drawing Web Format (.dwf)
Adobe Portable Document Format (.pdf)

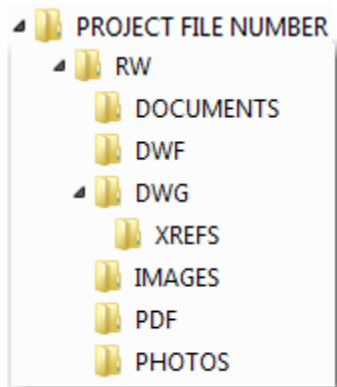
PLEASE NOTE:

Actual software version used by MassDOT internally will change from time to time, therefore please refer to the specific project contract or check with the project manager for actual version and submission requirements.

Prior versions of the CAD Standard, including drawing templates, are available on the Resources page.

Folder Structure

MassDOT Highway Division – Right of Way Section requires that all electronic file submissions shall be submitted within the following Folder Structure. Please see the Default Folder Structure in the General Section for descriptions of folders not listed here.



PHOTOS – files associated with site photographs, pictures
IMAGES – scanned field notes, research, etc
(Non-externally referenced images)

Right of Way Layer List

The following is a sub-set of the Master Layer List showing all Right of Way Layers.

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
PR-RW-FEE-CITY	32	Continuous	ROW 200%	Proposed Town/City Fee Taking
PR-RW-FEE-DRAIN	163	Continuous	ROW 200%	Proposed Drainage Fee Taking
PR-RW-FEE-STATE	51	Continuous	ROW 200%	Proposed State Fee Taking
PR-RW-MISC	211	Continuous	ROW 200%	Proposed Miscellaneous Items
PR-RW-MONU	84	Continuous	ROW 100%	Proposed Monuments
PR-RW-PERMEASE-CITY	32	LINE OF EASE	ROW 200%	Proposed Permanent Easement CITY
PR-RW-PERMEASE-DRAIN	141	LINE OF EASE	ROW 200%	Proposed Permanent Drainage Easement
PR-RW-PERMEASE-STATE	41	LINE OF EASE	ROW 200%	Proposed Permanent Easement STATE
PR-RW-TEMPEASE	42	LINE OF EASE	ROW 200%	Proposed Temporary Easement
PR-RW-TEXT	211	Continuous	ROW 100%	Proposed Right of Way Text

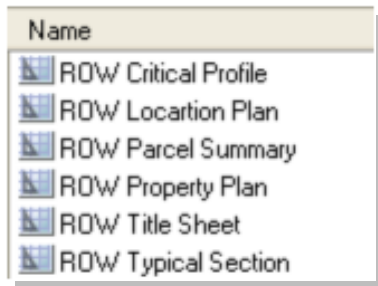
Right of Way Plan Requirements

All Right of Way Drawings shall conform to Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide. This CAD Standard is the sole location for all MassDOT Highway Division CAD related standards. Where inconsistencies occur between this CAD Standard document and any other MassDOT Highway Division manuals currently in use, this CAD Standard document must be adhered to. It is not intended to remove any requirements from other MassDOT Highway Division manuals, currently in use, which are not specifically addressed herein.

All Drawings must be created using the current version of the MassDOT drawing template. The version number of the drawing template is listed within the lower right corner of each paper space border and placed on a no-plot layer. All necessary layers, text styles, plot styles, and dimension styles are included within this template.

The use of Paper Space is now a requirement. Please refer to the *[“Policy on Model Space vs. Paper Space”](#)* located earlier within this document.

When creating Paper Space layouts, a default set of sheets, i.e. layouts, have been created within the “ROW_SHEETS.dwg” CAD file. This contains standard borders and title blocks for all Design related plans. The following layouts are included,



No other borders will be accepted.

The use of DesignCenter to drag-n-drop these layouts into a project DWG is recommended.

ATTENTION

Do not use the ROW_SHEETS.dwg for any design related AutoCAD work. They do not contain the necessary layers, text styles, dimension styles or plot styles.

ROW_SHEETS.dwg can be found in the Resources Section by clicking [here](#).

Survey

File Submission Requirements

MassDOT Highway Division – Survey Section requires that all file submissions shall include the following file types.

- AutoCAD Drawing format (.dwg)
- AutoCAD Drawing Web Format (.dwf)
- Adobe Portable Document Format (.pdf)

PLEASE NOTE:

Actual software version used by MassDOT internally will change from time to time, therefore please refer to the specific project contract or check with the project manager for actual version and submission requirements.

Prior versions of the CAD Standard, including drawing templates, are available on the Resources page.

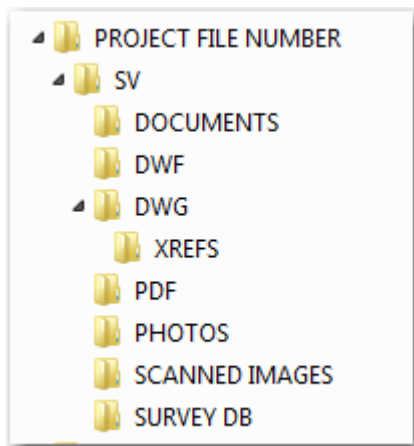
Civil 3D Objects

The following design items must be created as AutoCAD Civil 3D objects and must be assigned MassDOT Civil 3D Object Styles using the provided MassDOT Civil 3D drawing template.

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

Folder Structure

MassDOT Highway Division – Survey Section requires that all electronic file submissions shall be submitted within the following Folder Structure. Please see the Default Folder Structure in the General Section for descriptions of folders not listed here.



PHOTOS – files associated with site photographs, pictures
SCANNED IMAGES – scanned field notes, research, etc
(Non-externally referenced images)
SURVEY DB – location for the Civil 3D Survey Database

Survey Layer List

The following is a sub-set of the Master Layer List showing all Survey Layers.

EXISTING LAYERS	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-SV-BL-CT	red	DASHED	ROW 100%	Existing Baseline - County
EX-SV-BL-RR	red	EXIST RR SIDELINE	ROW 100%	Existing Baseline - Railroad
EX-SV-BL-SHLO	red	CONST BASELINE	ROW 100%	Existing Baseline - State Highway
EX-SV-BL-TEXT	red	Continuous	ROW 100%	Existing Baseline - Text
EX-SV-BL-TN	red	DASHED2	ROW 100%	Existing Baseline - City/Town
EX-SV-BL-TP	red	DASHED	ROW 100%	Existing Baseline - Turnpike Authority
EX-SV-BL-XX	red	DASHED2	ROW 100%	Existing Baseline - Miscellaneous
EX-SV-BLDG	9	Continuous	SURVEY 100%	Existing Buildings, Decks
EX-SV-BP-ALL	253	Continuous	SURVEY 100%	Survey Point - Default Point Layer
EX-SV-BP-TEXT	253	Continuous	SURVEY 100%	Survey Point - Text Labels
EX-SV-BR-DETL	9	Continuous	SURVEY 50%	Existing Bridge Items and Structures
EX-SV-CONT-MJR	142	DASHED	SOLID 50%	Existing Contours - MAJOR
EX-SV-CONT-MNR	54	DASHED2	SURVEY 100%	Existing Contours - MINOR
EX-SV-CONT-TXT	red	Continuous	SURVEY 100%	Existing Contours - Text
EX-SV-CONT-USER	172	Continuous	SOLID 50%	Existing User-Defined Contours
EX-SV-DETL	8	Continuous	SURVEY 100%	Existing Miscellaneous Detail
EX-SV-DRWY	9	Continuous	SURVEY 100%	Existing Driveway Items
EX-SV-EROS	55	Continuous	SURVEY 100%	Existing Erosion Control

EXISTING LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-SV-FIGURE	white	Continuous	SOLID 100%	Existing Survey Figure
EX-SV-FNCE-CLF	9	FENCE-CHAIN LINK	SURVEY 100%	Existing Chain Link or Metal Fences
EX-SV-FNCE-WRF	9	FENCE-WOOD RAIL	SURVEY 100%	Existing Wood Fences
EX-SV-GRDL-STBM	9	GUARDRAIL-STEEL	SURVEY 100%	Existing Steel Post Guardrail and Barrier
EX-SV-GRDL-WOOD	9	GUARDRAIL-WOOD	SURVEY 100%	Existing Wood Post Guardrail and Barrier
EX-SV-GRND	9	Continuous	SURVEY 100%	Existing Ground Surface
EX-SV-GRVL	9	Continuous	SURVEY 100%	Existing Soil, Gravel, and Stone
EX-SV-LN-EASE	white	LINE OF EASE	ROW 100%	Existing Easement Lines
EX-SV-LN-PROP	cyan	PROP LINE	ROW 100%	Existing Abutting Property Lines
EX-SV-LN-STATE	yellow	STATE BNDY LINE	ROW 100%	Existing State Boundary Lines
EX-SV-LN-TEXT	white	Continuous	ROW 100%	Existing Boundary Line Text
EX-SV-LN-TN	yellow	CENTERX2	ROW 100%	Existing Town/City Boundary Lines
EX-SV-MONU	red	Continuous	SURVEY 150%	Existing Monuments, Survey Points
EX-SV-PM	9	Continuous	SURVEY 50%	Existing Pavement Markings
EX-SV-RDWY	9	Continuous	SURVEY 100%	Existing Roadway Items
EX-SV-RRTR	9	Continuous	SURVEY 100%	Existing Railroad Items
EX-SV-SRF-BDR	white	Continuous	SURVEY 100%	Existing Surface - Border
EX-SV-SRF-FLT	white	Continuous	SURVEY 100%	Existing Surface - Faults, Breaklines
EX-SV-SRF-VIEW	8	Continuous	SURVEY 100%	Existing Surface - TIN lines
EX-SV-TEXT	104	Continuous	SURVEY 100%	Existing Text

EXISTING LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-SV-TR-FEAT	31	Continuous	SURVEY 100%	Existing Traffic Items
EX-SV-VEGE	104	Continuous	SURVEY 100%	Existing Vegetation
EX-SV-WALK	9	Continuous	SURVEY 100%	Existing Walkways
EX-SV-WALL-RETW	163	RETWALL	SURVEY 100%	Existing Walls - Retaining
EX-SV-WALL-STONE	163	STONEWALL	SURVEY 100%	Existing Walls – Balanced Stone
EX-SV-WETL	blue	DASHED	ENVR BOLD	Existing Wetlands, Ponds, Rivers

Civil 3D OBJECT LAYERS

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
OB-BASELINE	white	Continuous	ROW 100%	Boundary Line – CIVIL 3D OBJECT
OB-FEATURE-LINE	white	Continuous	SOLID 100%	Feature Line - CIVIL 3D OBJECT
OB-INTERFERENCE	white	Continuous	SOLID 100%	Interference - CIVIL 3D OBJECT
OB-PARCEL	white	Continuous	ROW 100%	Parcel - CIVIL 3D OBJECT
OB-SURFACE	white	Continuous	SOLID 100%	Surface - CIVIL 3D OBJECT
OB-SURVEY	white	Continuous	SOLID 100%	Survey - CIVIL 3D OBJECT
OB-UTILITY	white	Continuous	SOLID 100%	Utility Line - CIVIL 3D OBJECT

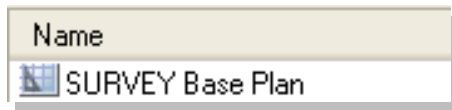
Survey Plan Requirements

All Survey Drawings shall conform to Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide. This CAD Standard is the sole location for all MassDOT Highway Division CAD related standards. Where inconsistencies occur between this CAD Standard document and any other MassDOT Highway Division manuals currently in use, this CAD Standard document must be adhered to. It is not intended to remove any requirements from other MassDOT Highway Division manuals, currently in use, which are not specifically addressed herein.

All Drawings must be created using the current version of the MassDOT drawing template. The version number of the drawing template is listed within the lower right corner of each paper space border and placed on a no-plot layer. All necessary layers, text styles, plot styles, and dimension styles are included within this template.

The use of Paper Space is now a requirement. Please refer to the *[“Policy on Model Space vs. Paper Space”](#)* located earlier within this document.

When creating Paper Space layouts, a default set of sheets, i.e. layouts, have been created within the “SURVEY_SHEETS.dwg” CAD file. This contains standard borders and title blocks for all Design related plans. The following layouts are included,



No other borders will be accepted.

The use of DesignCenter to drag-n-drop these layouts into a project DWG is recommended.

ATTENTION

Do not use the SURVEY_SHEETS.dwg for any design related AutoCAD work. They do not contain the necessary layers, text styles, dimension styles or plot styles.

SURVEY_ SHEETS.dwg can be found in the Resources Section by clicking [here](#).

Survey Symbols and Blocks

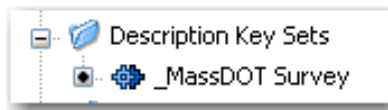
Symbols have been developed for the existing survey items to closely represent those provided in Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide, 2006. These symbols must be used for plans prepared for MassDOT. No substitute symbols will be accepted. Additional symbols may be added for items not listed. However, the list of additional symbols with descriptions must be included with the plan submission to MassDOT.

A Survey Section symbol and block library is available within the “SURVEY_SYMBOLS.dwg” which can be found on the Resources page by clicking [here](#).

NOTE: The use of DesignCenter to drag-n-drop these symbols and blocks into a project DWG is recommended.

Description Key Sets

A standard MassDOT Description Code set is included within the MassDOT drawing template.



All survey projects shall use the _MassDOT Survey description key set. An asterisk (*) has been appended to each description key code in order to allow the use of Civil 3D multi-code capability for field-to-finish line work.

The file *MassDOT Data Collector File.txt* is available on the Resources page. This file is a text file of the MassDOT Description Key Codes that can be transferred to a data collector. The list of Description Key Codes must be used for MassDOT Baseplan preparation. All listed features must be described with the corresponding code. No substitute codes will be accepted.

There are no codes for bottom of berm, edging, or curb. Instead, use the codes corresponding to edge pavement, concrete, etc. for those features. Additional codes may be added for features not listed. However, the list of additional codes with descriptions must be included with the baseplan submission to MassDOT.

Figure Prefixes

A standard figure prefix database has been provided which automatically places field-to-finish line work onto the proper MassDOT layers. Please refer to the Resource Section for the appropriate version.

A sample point file, *MassDOT TESTPNTS.txt*, and sample field book, *MassDOT Points and Figures.FBK* are available on the Resource Section for testing.

The *MassDOT Testpnts.txt* file contains data for point codes, each with a different MassDOT description code. You may wish to import these points into a drawing as an example of the layers, description codes, and symbols.

The *Points and Figures.fbk* file contains data for point codes and figure codes, each with a different MassDOT description code. You may wish to import this file into a drawing as an example of the layers, description codes, symbols, and figures.

The following table contains both Description Keys and Figure Prefixes. Since the field-to-finish functionality uses the same codes, codes which do not have Figure Prefixes associated with them are SHADED. Any code that is not shaded is both a Description Key and a Figure Prefix.

BD	BUILDING
BLCL	BOUNDARY - CONSTRUCTION LIMIT
BLCT	BOUNDARY - COUNTY LINE
BLEA	BOUNDARY - EASEMENT
BLPL	BOUNDARY - PROPERTY
BLST	BOUNDARY - STATE LINE
BLTN	BOUNDARY - CITY OR TOWN
BRAB	BRIDGE - ABUTMENT BOT
BRAT	BRIDGE - ABUTMENT TOP
BRCB	BRIDGE - CONCRETE BEAM
BRCL	BRIDGE - COLUMN
BRCN	BRIDGE - CONCRETE
BRDK	BRIDGE - DECK
BRFB	BRIDGE - EXPOSED FOOTING BOTTOM
BRFT	BRIDGE - EXPOSED FOOTING TOP
BRIB	BRIDGE - I BEAM
BRJB	BRIDGE - JERSEY BARRIER
BRMP	BRIDGE - METAL PLATE
BROT	BRIDGE - OTHER
BRPR	BRIDGE - PIER TOP
BRPS	BRIDGE - PIER (POINT)
BRRL	BRIDGE - RAILING
BRSM	BRIDGE - STRUCT MEMBER
BRSS	BRIDGE - STRUCT MEMBER (POINT)
BRST	BRIDGE - STEEL
BRWB	BRIDGE - WINGWALL BOTTOM
BRWD	BRIDGE - WOOD
BRWT	BRIDGE - WINGWALL TOP
BRXJ	BRIDGE - EXPANSION JOINT
BS	BOTTOM OF SLOPE
BWLL	BROKEN WHITE LANE LINE
BYLL	BROKEN YELLOW LANE LINE
CB	CATCH BASIN
CC	CONCRETE COVER
CH	CATCH BASIN HEADWALL
CI	CURB INLET
CL	CENTER LINE - MISCELLANEOUS
CR	CROWN OF ROAD
CS	CHANGE IN SLOPE
CUBC	CULVERT - CONCRETE BOX
CUBS	CULVERT - STONE BOX

CUCC	CULVERT - CONCRETE CIRCULAR
CUCS	CULVERT - STONE CIRCULAR
CUTB	CURB - BERM CURB CUT
CUTC	CURB - GRANITE CURB CUT
CUTE	CURB - SLOPED GRANITE CURB CUT
CUTN	CURB - CONCRETE CURB CUT
CX	CENTER OF ROAD
DAMC	DAM - CONCRETE
DAMO	DAM - OTHER
DBEN	BENCH - (e.g. PARK BENCH)
DBIN	STORAGE BIN
DBKR	BIKE RACK
DBPT	BITUMINOUS PATCH
DBUOY	BUOY
DBW	BORROW SITE
DCAN	TRASH CAN
DCNE	CONC PAD - ELEC TRANS
DCNP	CONC PAD
DCSITE	CONSTRUCTION SITE
DECK	DECK - HSE OR BLDG
DFNT	FOUNTAIN
DFPL	FLAG POLE
DGC	GOLF COURSE
DGFP	GAS PUMP
DGP	GRAVEL PIT
DI	DROP INLET
DL	DITCH LINE
DMBX	MAIL BOX
DMHR	METAL HAND RAIL
DOC	OIL CAP
DPCN	POST - CONC
DPCR	PILLAR - CIRCULAR
DPGR	POST - GRANITE
DPLE	PILE
DPLN	PLANTER
DPMT	POST - METAL
DPOO	POOL
DPSQ	PILLAR - SQUARE
DPST	POST - OTHER
DPWD	POST - WOOD
DREC	RECREATION EQUIPMENT

DROC	ROCK OUTCROP
DRVB	DRIVE - BITUMINOUS CONC
DRVC	DRIVE - CEMENT CONC
DRVG	DRIVE - GRAVEL/DIRT/OTHER
DRVO	DRIVE - RANDOM SHOT
DRVX	DRIVE - CENTER
DSAT	SATELLITE DISH
DSBR	STAIRS - BRICK
DSCN	STAIRS - CONC
DSPP	STAND PIPE
DSWD	STAIRS - WOOD
DTBH	TELEPHONE BOOTH
DTNK	TANK
DTOW	TOWER
DVLT	VAULT UNDERGROUND
DVLV	VALVE
DVPP	VENT PIPE
DWEL	WELL
DWHL	CONCRETE WHEEL STOP
DYCL	DBL YELLOW CENTERLINE
DYLL	DBL YELLOW LANE LINE
EC	EDGE COBBLESTONE
EG	EDGE GRAVEL
EHH	ELEC HANDHOLE
EL	EDGE GRASS/LAWN
EM	EDGE MATERIAL PILE
EN	EDGE CEMENT CONC
EP	EDGE PAVE - BITUMINOUS
ERED	EDGE ROAD - EDGE DRIVE
ERP	EDGE RIPRAP
ESDE	EDGE OF STONE FOR DRAINAGE END
ESDG	EDGE OF DENSE GRADED CRUSHED STONE
ESOIL	EDGE SOIL/DIRT/SAND
FCBW	FENCE - BARBED WIRE
FCCL	FENCE - CHAIN LINK
FCCR	FENCE - CEDAR RAIL
FCGA	FENCE - GATE (BOTH ENDS)
FCIP	FENCE - IRON PIPE
FCOT	FENCE - OTHER
FCS	FENCE - SEDIMENTATION
FCWD	FENCE - WOOD

FL	STREAM/RIVER FLOW LINE
FN	FOUNDATION
GCSL	GUARD RAIL - CABLE - STL POSTS LEFT OF DIR OF SURVEY
GCSR	GUARD RAIL - CABLE - STL POSTS RIGHT OF DIR OF SURVEY
GCTL	GUARD RAIL - CABLE - TRIA POSTS LEFT OF DIR OF SURVEY
GCTR	GUARD RAIL - CABLE - TRIA POSTS RIGHT OF DIR OF SURVEY
GFL	GAS FILL
GGT	GAS GATE
GMT	GAS METER
GPL	GUY POLE
GPV	PAVED GUTTER
GRET	GUARD RAIL - END TREATMENT
GRTD	GUARD RAIL - STL THRIE BEAM DBL FACED
GRTL	GUARD RAIL - STL THRIE BEAM POSTS LEFT OF DIR OF SURVEY
GRTR	GUARD RAIL - STL THRIE BEAM POSTS RIGHT OF DIR OF SURVEY
GRWD	GUARD RAIL - STL W BEAM DBL FACED
GRWL	GUARD RAIL - STL W BEAM POSTS LEFT OF DIR OF SURVEY
GRWR	GUARD RAIL - STL W BEAM POSTS RIGHT OF DIR OF SURVEY
GTBH	BORE HOLE
GTOW	OBSERVATION WELL
GTPZ	PIEZOMETER
GTPP	TEST PIT
GWA	GUY WIRE ANCHOR
HB	HAYBALES FOR EROSION CONTROL
HC	HEADWALL - CONC
HHL	HANDHOLE
HO	HEADWALL - OTHER
HRCB	GRANITE TRANSITION CURB - WHEEL CHAIR RAMP
HS	HEADWALL - STONE
HYD	HYDRANT
JBDF	PRECAST CONC BARRIER (DBL FACED)
JBSF	PRECAST CONC BARRIER (SINGLE FACED)
KB	EDGE WALK - BIT CONC
KC	EDGE WALK - CEMENT CONC
KF	EDGE WALK - FLAGSTONE
KG	EDGE WALK - GRAVEL/DIRT/OTHER
KO	WALK - RANDOM SHOT

KR	EDGE WALK - BRICK
KWA	WHEELCHAIR RAMP - ASPHALT
KWC	WHEELCHAIR RAMP - CEMENT CONC
KX	WALK - CENTER
LOAM	LOAM
LPDL	LIGHT POLE - DOUBLE LIGHT
LPL	LIGHT POLE - SINGLE LIGHT
MBMK	MON - BENCHMARK
MCTB	MON - COUNTY BOUND
MDHL	MON - DRILL HOLE
MELP	MON - ESCUTCHEON PIN LEAD PLUG
MFLY	MON - SURVEY CHECK SHOT
MGPS	MON - GPS CONTROL POINT
MHC	MANHOLE - CATV
MHD	MANHOLE - DRAINAGE
MHE	MANHOLE - ELECTRIC
MHG	MANHOLE - GAS
MHM	MANHOLE - STEAM
MHO	MANHOLE - OTHER
MHS	MANHOLE - SEWER
MHT	MANHOLE - TELEPHONE
MHW	MANHOLE - WATER
MIPE	MON - IRON PIPE
MMHB	MON - MASS HIGHWAY BOUND
MMON	MON - MONUMENT
MPHH	MON - PHOTO CONTROL POINT - HORIZONTAL
MPHV	MON - PHOTO CONTROL POINT - VERTICAL
MPKN	MON - PK NAIL
MRRS	MON - RAILROAD SPIKE
MRST	MON - TOWN LINE ROAD STONE
MSBD	MON - STONE BOUND
MSTN	MON - STAKE & NAIL
MTBD	MON - TOWN CORNER BOUND OR WITNESS
MTRV	MON - TRAVERSE STATION
MTSN	MON - MASS TRIANGULATION STATION
MXCT	MON - CROSS CUT
OS	ON SLOPE
OW	OVERHEAD WIRE
PELH	SPOT ELEV - HIGH POINTS
PELL	SPOT ELEV - LOW POINTS
PELV	SPOT ELEV - INTER SHOTS

R1	RIGHT EDGE OF WATER
R2	LEFT EDGE OF WATER
RRRM	RUBBER MAT
RRSG	RAILROAD SIGNAL
RRSW	RAILROAD SWITCH
RRTK	RAILROAD TRACKS
SI	SILL - DOOR, BUILDING, FOUNDATION
SLCT	SIDELINE - COUNTY HIGHWAY LAYOUT
SLMH	SIDELINE - MASS HIGHWAY LAYOUT
SLRR	SIDELINE - RAILROAD LAYOUT
SLTN	SIDELINE - TOWN OR CITY LAYOUT
SLTP	SIDELINE - MASS TURNPIKE LAYOUT
SWA	SWALE
SWEL	SOLID WHITE EDGE LINE
SWGL	SOLID WHITE GORE LINE
SWLL	SOLID WHITE LANE LINE
SYEL	SOLID YELLOW EDGE LINE
SYGL	SOLID YELLOW GORE LINE
SYLL	SOLID YELLOW LANE LINE
TACB	ASPHALT CURB
TB	TOP OF BERM - BITUMINOUS
TC	TOP OF CURB - GRANITE
TE	TOP OF EDGING - SLOPED GRANITE
TFCC	TRAFFIC SIGNAL CONTROLLER CABINET
TFFB	FLASHING BEACON
TFHS	PARKING HANDICAP SPACE - SIGNAL POINT
TFMA	TRAFFIC SIGNAL MAST ARM POLE
TFMT	PARKING METER
TFPB	PULL BOX
TFPD	TRAFFIC SIGNAL PEDESTRIAN
TFRR	RAILROAD SIGNAL
TFS1	SMALL SIGN - SINGLE POST
TFS2	SMALL SIGN - DOUBLE POST
TFSC	SIGNAL CONDUIT
TFSG	TRAFFIC SIGNAL POST MOUNTED
TFSN	BILLBOARD OR OTHER LARGE GROUND SIGN
TFSO	OVERHEAD SIGN (LOCATION OF OVRHNG)
TFSS	OVERHEAD SIGN (LOCATION OF SUPPORT)
TFSW	TRAFFIC SIGNAL SPAN WIRE ASSEMBLY POLE
TFUL	LOOP DETECTOR
TL	TRAILER

TN	TOP OF CONC CURB
TPCE	CONC EDGING
TPL	TROLLEY POLE
TRNP	CROSS COUNTRY TRANSMISSION POLE
TS	TOP OF SLOPE
UC	UTILITY - CABLE LINE
UDDI	UTILITY - DUCTILE IRON
UDMP	UTILITY - METAL
UDOT	UTILITY - DRAINAGE, OTHER
UDPP	UTILITY - CORRUGATED PLASTIC
UDRC	UTILITY - REINFORCED CONCRETE
UE	UTILITY - ELECTIRC
UFB	UTILITY POLE WITH FIRE BOX
UG	UTILITY - GAS
ULT	UTILITY POLE WITH SINGLE LIGHT
UM	UTILITY - STEAM
UO	UTILITY - MISCELLANEOUS
UPDL	UTILITY POLE WITH DOUBLE LIGHT
UPL	UTILITY POLE
USOT	UTILITY - SEWER, OTHER
USPC	UTILITY - POLYVINYLCHLORIDE SEWER
USRC	UTILITY - REINFORCED CONC SEWER
UT	UTILITY - TELEPHONE
UWDI	UTILITY - DUCTILE IRON WATER
UWOT	UTILITY - WATER, OTHER
VF	ELEVATION FINISH FLOOR
VGBU	BUSH
VGCA	CULTIVATED AREA EDGE
VGHE	HEDGE
VGST	STUMP
VG1	SMALL DIAMETER TREE (<12)
VG2	MEDIUM DIAMETER TREE (12-24)
VG3	LARGE DIAMETER TREE (>24)
VGTO	UNKNOWN DIAMETER TREE
VGWA	SWAMP/MARSH OR WETLAND OUTLINE
VGWF	WETLAND FLAG (with number)
VGWL	WOODS OR BRUSH LINE
WC	WOOD CHIP MULCH
WGT	WATER GATE
WLBR	WALL - BRICK (FACE @ GROUND)
WLCN	WALL - CONCRETE (FACE @ GROUND)

WLDF	WALL - DOUBLE FACED (FACE @ GROUND)
WLOT	WALL - OTHER (FACE @ GROUND)
WLPT	WALL - POINTED WALL (FACE @ GROUND)
WLRT	WALL - RETAINING (FACE @ GROUND)
WLSM	WALL - STONE MASONRY
WLST	WALL - STONEWALL
WLTP	WALL - TOP (ANY TYPE)
WMT	WATER METER
WO	EDGE OF WATER (RIVER,POND)
WWPV	PAVED WATERWAY

Traffic

File Submission Requirements

MassDOT Highway Division - Traffic Section requires that all file submissions shall include the following file types.

AutoCAD Drawing format (.dwg)
AutoCAD Drawing Web Format (.dwt)
Adobe Portable Document Format (.pdf)

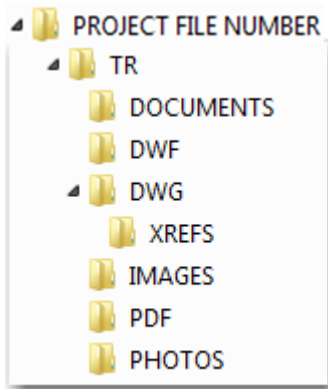
PLEASE NOTE:

Actual software version used by MassDOT internally will change from time to time, therefore please refer to the specific project contract or check with the project manager for actual version and submission requirements.

Prior versions of the CAD Standard, including drawing templates, are available on the Resources page.

Folder Structure

MassDOT Highway Division – Traffic Section requires that all electronic file submissions shall be submitted within the following Folder Structure. Please see the Default Folder Structure in the General Section for descriptions of folders not listed here.



PHOTOS – files associated with site photographs, pictures
IMAGES – scanned field notes, research, etc
(Non-externally referenced images)

Traffic Layer List

Layers for Existing and Proposed features not found herein, please refer to the Master Layer List.

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-TR-FEAT	31	Continuous	SURVEY 100%	Existing Traffic Items
EX-UT-TR-UGND	31	CONDUIT	UTILITY EXIST	Existing Traffic Items - Underground
PR-TR-FEAT	31	Continuous	SOLID 100%	Proposed Traffic Items
PR-TR-LGHT	31	Continuous	SOLID 100%	Proposed Traffic Lighting
PR-TR-PVMK	31	Continuous	SOLID 100%	Proposed Traffic Pavement Markings
PR-TR-SGNL	31	Continuous	SOLID 100%	Proposed Traffic Signals
PR-TR-SGNS	31	Continuous	SOLID 100%	Proposed Traffic Signs
PR-TR-TEXT	31	Continuous	SOLID 100%	Proposed Traffic Text
PR-TR-UGND	30	CONDUIT	UTILITY PROP	Proposed Traffic Items - Underground

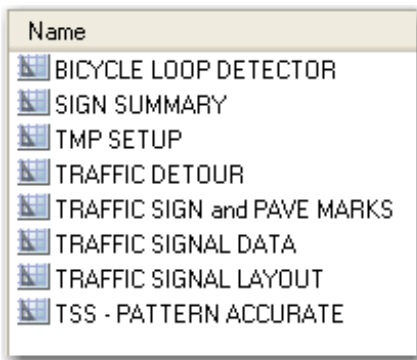
Traffic Plan Requirements

All Traffic Drawings shall conform to Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide. This CAD Standard is the sole location for all MassDOT Highway Division CAD related standards. Where inconsistencies occur between this CAD Standard document and any other MassDOT Highway Division manuals currently in use, this CAD Standard document must be adhered to. It is not intended to remove any requirements from other MassDOT Highway Division manuals, currently in use, which are not specifically addressed herein.

All Drawings must be created using the current version of the MassDOT drawing template. The version number of the drawing template is listed within the lower right corner of each paper space border and placed on a no-plot layer. All necessary layers, text styles, plot styles, and dimension styles are included within this template.

The use of Paper Space is now a requirement. Please refer to the *[“Policy on Model Space vs. Paper Space”](#)* located earlier within this document.

When creating Paper Space layouts, a default set of sheets, i.e. layouts, have been created within the “TRAFFIC_SHEETS.dwg” CAD file. This contains standard borders and title blocks for all Design related plans. The following layouts are included,



No other borders will be accepted.

The use of DesignCenter to drag-n-drop these layouts into a project DWG is recommended.

ATTENTION

Do not use the TRAFFIC_SHEETS.dwg for any design related AutoCAD work. They do not contain the necessary layers, text styles, dimension styles or plot styles.

TRAFFIC_SHEETS.dwg can be found in the Resources Section by clicking [here](#).

Traffic Symbols and Blocks

Symbols have been developed for the proposed construction items to closely represent those provided in Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide, 2006. These symbols must be used for plans prepared for MassDOT. No substitute symbols will be accepted. Additional symbols may be added for items not listed. However, the list of additional symbols with descriptions must be included with the plan submission to MassDOT.

A Traffic Section symbol and block library is available within the “TRAFFIC_SYMBOLS.dwg” which can be found on the Resources page by clicking [here](#).

NOTE: The use of DesignCenter to drag-n-drop these symbols and blocks into a project DWG is recommended.

Utilities

File Submission Requirements

MassDOT Highway Division - Utilities Section requires that all file submissions shall include the following file types.

- AutoCAD Drawing format (.dwg)
- AutoCAD Drawing Web Format (.dwf)
- Adobe Portable Document Format (.pdf)

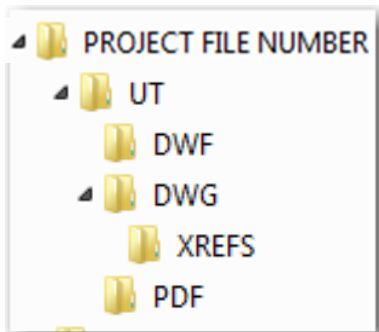
PLEASE NOTE:

Actual software version used by MassDOT internally will change from time to time, therefore please refer to the specific project contract or check with the project manager for actual version and submission requirements.

Prior versions of the CAD Standard, including drawing templates, are available on the Resources page.

Folder Structure

MassDOT Highway Division – Utilities Section requires that all electronic file submissions shall be submitted within the following Folder Structure. Please see the Default Folder Structure in the General Section for descriptions of folders not listed here.



Utilities Layer List

Layers for Existing and Proposed features not found herein, please refer to the Master Layer List.

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-UT-CATV-STRC	30	Continuous	UTILITY EXIST	Existing Cable TV Structures
EX-UT-CATV-TXT	30	Continuous	UTILITY EXIST	Existing Cable TV Text
EX-UT-CATV-UGND	30	HIDDEN2	UTILITY EXIST	Existing Cable TV Underground
EX-UT-DRAIN-STRC	252	Continuous	UTILITY EXIST SV	Existing Drainage Items
EX-UT-DRAIN-TEXT	252	Continuous	UTILITY EXIST SV	Existing Drainage Text
EX-UT-DRAIN-UGND	252	HIDDEN2	UTILITY EXIST SV	Existing Drainage Underground
EX-UT-ELEC-STRC	10	Continuous	UTILITY EXIST	Existing Electric Structures
EX-UT-ELEC-TXT	10	Continuous	UTILITY EXIST	Existing Electric Text
EX-UT-ELEC-UGND	10	HIDDEN2	UTILITY EXIST	Existing Electric Underground
EX-UT-GAS-STRC	42	Continuous	UTILITY EXIST	Existing Gas Items
EX-UT-GAS-TXT	42	Continuous	UTILITY EXIST	Existing Gas Text
EX-UT-GAS-UGND	42	HIDDEN2	UTILITY EXIST	Existing Gas Underground
EX-UT-OIL-STRC	42	Continuous	UTILITY EXIST	Existing Oil Structures
EX-UT-OIL-TXT	42	Continuous	UTILITY EXIST	Existing Oil Text
EX-UT-OIL-UGND	42	HIDDEN2	UTILITY EXIST	Existing Oil Underground
EX-UT-OTHR-STRC	42	Continuous	UTILITY EXIST	Existing Utility - OTHER Structures
EX-UT-SEWER-STRC	80	Continuous	UTILITY EXIST	Existing Sewer Items
EX-UT-SEWER-TXT	80	Continuous	UTILITY EXIST	Existing Sewer Text

EXISTING LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
EX-UT-SEWER-UGND	80	HIDDEN2	UTILITY EXIST	Existing Sewer Underground
EX-UT-STEAM-STRC	42	Continuous	UTILITY EXIST	Existing Steam Structures
EX-UT-STEAM-TXT	42	Continuous	UTILITY EXIST	Existing Steam Text
EX-UT-STEAM-UGND	42	HIDDEN2	UTILITY EXIST	Existing Steam Underground
EX-UT-TELE-STRC	30	Continuous	UTILITY EXIST	Existing Telephone/Communication Structures
EX-UT-TELE-TXT	30	Continuous	UTILITY EXIST	Existing Telephone/Communication Text
EX-UT-TELE-OVHD	30	HIDDEN	UTILITY EXIST SV	Existing Telephone/Communication Overhead
EX-UT-TELE-UGND	30	HIDDEN2	UTILITY EXIST	Existing Telephone/Communication Underground
EX-UT-TR-UGND	30	HIDDEN2	UTILITY EXIST	Existing Traffic Underground
EX-UT-WATERSYS-STRC	blue	Continuous	UTILITY EXIST	Existing Water Systems Structures
EX-UT-WATERSYS-TXT	blue	Continuous	UTILITY EXIST	Existing Water Systems Text
EX-UT-WATERSYS-UGND	blue	HIDDEN2	UTILITY EXIST	Existing Water Systems Underground

PROPOSED LAYERS

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
PR-UT-CATV	40	Continuous	UTILITY PROP	Proposed Communication/CATV
PR-UT-CATV-TXT	40	Continuous	UTILITY PROP	Proposed Communication/CATV Text
PR-UT-CATV-UGND	40	Continuous	UTILITY PROP	Proposed Communication/CATV Underground
PR-UT-DRAIN	254	Continuous	UTILITY PROP	Proposed Drainage
PR-UT-DRAIN-DITCH	254	Continuous	UTILITY PROP	Proposed Drainage Ditch
PR-UT-DRAIN-UGND	254	Continuous	UTILITY PROP	Proposed Drainage Pipes
PR-UT-DRAIN-UGND-PATT	white	Continuous	UTILITY PROP	Proposed Drainage Hatching
PR-UT-DRAIN-PROF	254	Continuous	UTILITY PROP	Proposed Drainage Profile
PR-UT-DRAIN-TXT	254	Continuous	UTILITY PROP	Proposed Drainage Text

PROPOSED LAYERS (CONT)

LAYER NAME	COLOR	LINETYPE	PLOT STYLE	DESCRIPTION
PR-UT-ELEC	11	Continuous	UTILITY PROP	Proposed Electric Structures
PR-UT-ELEC-TXT	11	Continuous	UTILITY PROP	Proposed Electric Text
PR-UT-ELEC-UGND	11	Continuous	UTILITY PROP	Proposed Electric Underground
PR-UT-GAS	44	Continuous	UTILITY PROP	Proposed Gas Items
PR-UT-GAS-TXT	44	Continuous	UTILITY PROP	Proposed Gas Text
PR-UT-GAS-UGND	44	Continuous	UTILITY PROP	Proposed Gas Underground
PR-UT-SEWER	93	Continuous	UTILITY PROP	Proposed Sewer Structures
PR-UT-SEWER-UGND	93	Continuous	UTILITY PROP	Proposed Sewer Pipes
PR-UT-SEWER-UGND-PATT	white	Continuous	UTILITY PROP	Proposed Sewer Hatching
PR-UT-SEWER-PROF	93	Continuous	UTILITY PROP	Proposed Sewer Profile
PR-UT-SEWER-TXT	93	Continuous	UTILITY PROP	Proposed Sewer Text
PR-UT-TELE	40	Continuous	UTILITY PROP	Proposed Telephone/Communication Structures
PR-UT-TELE-OVHD	40	HIDDEN	UTILITY PROP	Proposed Telephone/Communication Overhead
PR-UT-TELE-TXT	40	Continuous	UTILITY PROP	Proposed Telephone/Communication Text
PR-UT-TELE-UGND	40	Continuous	UTILITY PROP	Proposed Telephone/Comm. Underground
PR-UT-WATERSYS	150	Continuous	UTILITY PROP	Proposed Water System
PR-UT- WATERSYS-UGND	150	Continuous	UTILITY PROP	Proposed Water System Pipes
PR-UT- WATERSYS-UGND-PATT	white	Continuous	UTILITY PROP	Proposed Water System Hatching
PR-UT- WATERSYS -PROF	150	Continuous	UTILITY PROP	Proposed Water System Profile
PR-UT- WATERSYS -TXT	150	Continuous	UTILITY PROP	Proposed Water System Text

Utilities Plan & Plotting Requirements

All Utility Drawings shall conform to Chapter 18 (Plans, Specifications, & Estimates) of the Massachusetts Highway Department Project Development & Design Guide and the Engineering Directive No. E-11-003. This CAD Standard is the sole location for all MassDOT Highway Division CAD related standards. Where inconsistencies occur between this CAD Standard document and any other MassDOT Highway Division manuals currently in use, this CAD Standard document must be adhered to. It is not intended to remove any requirements from other MassDOT Highway Division manuals, currently in use, which are not specifically addressed herein.

All Drawings must be created using the current version of the MassDOT drawing template. The version number of the drawing template is listed within the lower right corner of each paper space border and placed on a no-plot layer. All default layers, text styles, plot styles, and dimension styles are included within this template.

All base utility layers and colors have been defined within the drawing template. Where additional utility layer names are needed to further define a utility, please conform to the Layer Naming requirements defined previously in this document. Please use the default color assigned to the base utility. No other colors will be accepted.

All Utility Plans must have a color coded Legend located on each sheet.

All utility lines shall be clearly labeled as follows:

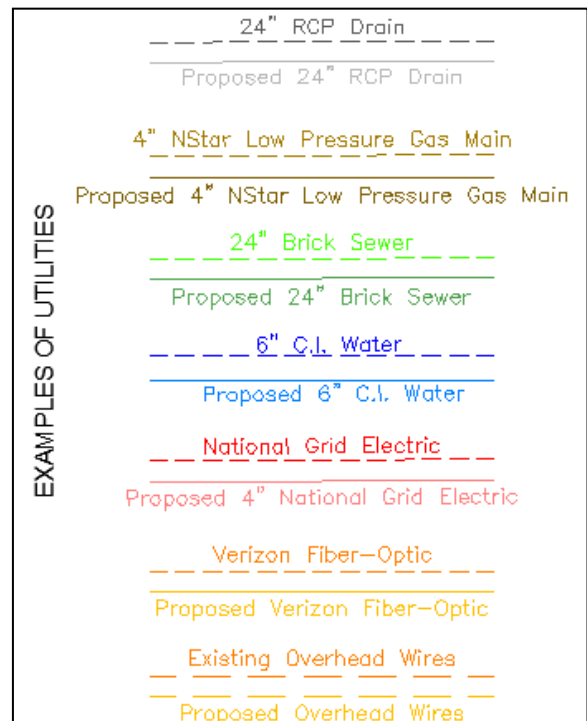
Size of Utility

Utility Type

Utility Owner

The Designer shall be responsible for contacting the utility companies to verify the location and type of utilities found within the project limits that may or may not be on the Survey Base Plan.

Pursuant to a requirement for printing color utility plans listed within the Engineering Directive E-11-003, a color plot style has been provided. When producing color utility prints, please use the MADOT-U.stb file. See the Resource Section for all plot styles [here](#).



Resource Section – Support Files

The Resource Section of the MassDOT CAD Standard website shall be used for direct download of the following files which shall be used in design and plan preparation.

Please Note – These files will be updated periodically. Please check for updates and download the latest versions of all files prior to beginning any project.

Civil 3D Drawing Template

Current and Prior versions of the drawing template are listed here. The information can be found and downloaded by clicking [here](#).

NOTE Only the current version of the drawing template will be updated with improvements and additions, as they occur. Older versions will be available but will not be updated.

MassDOT_v2012_release.dwt

MassDOT_v2007_release.dwt

Drawing Standards Files

Current and Prior versions of the drawing standards files are listed here. The information can be found and downloaded by clicking [here](#).

MassDOT_v2012_release.dws

MassDOT_v2007_release.dws

Plot Styles

The currently available plot styles are listed here. The information can be found and downloaded by clicking [here](#).

MADOT-C.stb for Color Plotting

MADOT-D.stb for Design Sections Plotting

MADOT-E.stb for Environmental Color Plotting

MADOT-R.stb for Right of Way Plotting

MADOT-S.stb for Survey Plotting

MADOT-U.stb for Utility Color Plotting

Highway Design Assembly Library

The sample assemblies can be found in a single DWG file (MassDOT_Assemblies.dwg) and downloaded by clicking [here](#).

Symbol Libraries

Each discipline has a standard set of pre-defined symbols, blocks, and title blocks, as listed below. The information can be found and downloaded by clicking [here](#).

BRIDGE_SYMBOLS.dwg
 HWYDESIGN_SYMBOLS.dwg
 GEOTECH_SYMBOLS.dwg
 LANDSCAPE_SYMBOLS.dwg
 LAYOUT_SYMBOLS.dwg
 SURVEY_SYMBOLS.dwg
 TRAFFIC_SYMBOLS.dwg

Paper Space Layout Sheets

Each discipline has a standard set of pre-defined layout sheets, as listed below. The information can be found and downloaded by clicking [here](#).

BRIDGE_SHEETS.dwg
 HWYDESIGN_SHEETS.dwg
 GEOTECH_SHEETS.dwg
 LANDSCAPE_SHEETS.dwg
 LAYOUT_SHEETS.dwg
 ROW_SHEETS.dwg
 SURVEY_SHEETS.dwg
 TRAFFIC_SHEETS.dwg

Survey Support Files

The Survey Section of the MassDOT Highway Division has provided the following files in support of performing survey base plans. The information can be found in a single ZIP file (MassDOT_Survey.zip) and downloaded by clicking [here](#).

Figure Prefix Database	MassDOT_Survey.fdb_xdef	*coming soon*	2012 version
	MassDOT_Survey.fdb		2007 version
Sample Datasets	MassDOT_TESTPNTS.txt		
	MassDOT_Points_N_Figures.fbk		
	MassDOT_Data_Collector_File.txt		