

DESIGN MANUAL
CADD STANDARDS

Baltimore County Department of Public Works
Design Manual
CADD DRAFTING STANDARDS

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I. GENERAL INFORMATION

Computer Aid Drafting & Design (CADD) has become a significant part in the design process and review. In an effort to increase efficiency, maintain quality, and improve consistency of drawings, Baltimore County has developed the following CADD design standards. Strict adherence to these policies and recommendations is expected to ensure a thorough and expedient review and recordation of drawing submissions.

All drawings that are prepared for County submittal to other agencies for review shall meet the requirements of those agencies in addition to County requirements. Conflicts that arise between agency standards shall be discussed with the Project Manager and resolved before further time is spent on drafting.

The reader is referred to both the **General Instructions Section** and to applicable individual sections of this **Manual** for additional instructions regarding CADD drawings.

A. MEDIA

Ink and Media shall be used that allow sufficient adherence that information will not be lost due to ink flaking from the media. In the event that evidence of such flaking occurs during normal handling of the media, the Design Professional will be asked to take measures to correct this problem. These corrections may include replacement of finished drawings with media that has a stable and satisfactory surface.

B. LEGIBILITY

All drawings submitted to the County for review or for use by the County as contract documents shall be fully readable and legible. Text shall not overflow over other text or objects. Text shall be of sufficient size that it is readable by County reviewers on a half-scale print. The meaning of the drawing shall be clear and not subject to misinterpretation because of drafting practices.

II. SOFTWARE APPLICATIONS

Baltimore County maintains subscription support with Autodesk, the leading software provider in for (CADD) applications. Autodesk products read conversions made from most other proprietor CAD software solutions such as MicroStation, TurboCad, etc. If you have questions regarding a particular software application that you are using and its compatibility with AutoCad, please contact Autodesk.

Baltimore County prefers electronic submission of drawings as a digital AutoCad file submission with a file extension of (**.dwg**). Please check with your project manager regarding the version of AutoCad files to be submitted in order to avoid conversion issues.

Digital files submitted to the county should be named according to Job order number with a brief unique descriptor to identify the drawing for the Project Engineer reviewing the plan or drawing.

Example: 200-04-1234yorkrd.dwg.

III. BORDERS

Drawing borders have been constructed in accordance with Baltimore County and Baltimore City requirements. Typical borders are issued in a 24" X 36" landscaped sheet format. Borders may be obtained by contacting the County. Modifying the original layout of the border may be done with prior approval of the reviewing agency, if necessary. Submitted drawing with modified borders without prior approval of the reviewing agency may hinder approval or cause rejection of the drawing by the County. Because of various signature requirements the County has issued several border designations for approval and signatures.

- i. Architectural/Buildings
- ii. Storm Drains and Sewer
- iii. Highways (includes profile area)
- iv. Water (Includes Baltimore City signature block)
- v. Permits and Developers

Some borders have specific data requirements within the title block. Please verify that the border is appropriate for the type of submission being made with the project engineer assigned to your project.

IV. PROFESSIONAL CERTIFICATION STATEMENT, STAMP AND SEAL

Recently, the State of Maryland has issued new requirements for drawings issued by a professional engineer, architect or survey. These drawings requirements require a professional certification statement by signed and dated near the seal of any drawing to be sealed by an engineering professional. This statement has been incorporated into the official Baltimore County title block. In addition, a stamped Professional seal, with handwritten signature across the seal and registration number of the (Maryland) registered Design Professional responsible for the design shall be shown on the title block of each sheet. The name in the Engineer's block shall be printed rather than signed. This block shall be dated by the Design Professional.

Digital Signatures are currently not accepted by Baltimore County.

V. SCALES

See Section **V-A-6** in the **General Instructions Section** of this **Manual**.

VI. DIGITAL DRAWING REQUIREMENTS

In order to facilitate review and storage of project drawing files, this Bureau is implementing the following conventions and practices.

A. Layer Naming Convention

Baltimore County has established the following layer naming convention in an attempt to streamline the design process by creating a uniform drawing template. This naming convention is based upon CAD industry discipline codes, existing and proposed features,

and specific plan and profile features. The following table illustrates the layer naming convention.

Discipline	Code
Architecture	A
Civil	C
Electrical	E
Fire Protection	F
Mechanical	M

Existing	Proposed
Ex	Pr

File naming example:

B. Linetypes and Lineweights

Standard Linetypes and associated line widths are provided as part of our drawing templates (titleblock templates mentioned above) for use on our drawings. The Engineer is cautioned to use the Standard Linetype without deviation whenever possible. If additional or modified linetypes are required, that need and the nature of new or revised linetypes should be discussed with the County’s project manager.

See **Standard Plates C-A** and **C-B** included in this section of the Design Manual for examples of line types that can be expected to occur on County plans. Please note that the nature of lines representing existing features are of light line weight and are screened (grayed) in order to make them easily and immediately recognizable as existing features as opposed to proposed features.

C. Line Color

Line colors have also been set for each linetype within the County’s drawing template. The County’s Project Manager should be contacted prior to making changes to pre-set line colors, which are set to conform to County practices.

D. Hatching

Hatch patterns shall be as shown on Standard Plate C-A or as set within the County Drawing Templates. Scale of finished hatches shall be set to conform with the scale of the drawing so that the hatch neither “disappears” nor appears as a dense area that stands out unacceptably on the finished drawing. Wherever possible, hatches shall be associated with the object that they are hatching.

E. Standard Symbols

Symbols shall be shown as indicated on **Standard Plates C-A** and **C-B** following this Section. Symbols standard within AutoCad or other drawing packages shall NOT be substituted for these standard symbols. In cases where specific symbols are not indicated within this manual, symbols may be adopted from drafting program packages subject to the approval of the Design Professional and the County Project Manager.

Required symbols and designations which are not listed within this manual shall be shown in a legend on each drawing, where the symbols or designations appear.

F. Fonts

Standard fonts shall be used in all cases. Romanc is recommended for titles on title pages. Fonts shall be used as set in the template drawings.

G. Plotting and Plot Styles

Plot styles shall be set to produce a black line on paper or mylar film for proposed objects and an acceptably dense and readable gray line where required for existing objects. The two types of lines shall be readily distinguishable at a glance. There should be no difference in intensity on the plot between different color lines (on the drawing) representing either existing or proposed objects on the final drawing plot.

VII. Plan Revisions

See **General Instructions** Section **V-A-7** in this **Manual**.

VIII. Right-Of-Way Plats

Right-of-Way plats required for Capital projects shall be prepared as discussed in the **Land Acquisition section** of this **Manual**.

EXISTING NATURAL FEATURES

(ALL EXISTING FEATURES TO BE SCREENED)

WOODS, UNDERGROWTH AND BRUSH	
MARSH	
TREES -- EVERGREEN	
TREES -- DECIDUOUS	
DITCHES/STREAMS -NOTE DIRECTION OF FLOW	
V DITCH - NOTE DIRECTION OF FLOW	
EXCAVATION OR CUT	
EMBANKMENT OR FILL	
SINK HOLE, POT HOLE, ETC.	

ROADS AND STREETS

(ALL EXISTING FEATURES TO BE SCREENED)

EXISTING CURB *	
PROPOSED CURB	
EXISTING WALK *	
PROPOSED WALK	
PROPOSED CONCRETE VALLEY GUTTER	
EXISTING ASPHALT OR CONCRETE ROAD	
EDGE EXISTING DIRT OR GRAVEL ROAD	
EXISTING RIGHT-OF-WAY LINE	
PROPOSED RIGHT-OF-WAY LINE	
CENTERLINE/BASELINE OF EXISTING ROAD	
CENTERLINE/BASELINE OF PROP. ROAD	
P.I. BASELINE OR C/L	
P.I. FACE CURVE LINE (NOTE CORNER) PROFILE:	
ESTABLISHED TOP CURB GRADE (CIRCLES DESIGNATE VERTICAL CURVE POINTS, P.I.'S OF CURB LINES AND P.I.'S OF INTERSECTING STREETS & ALLEYS)	
CENTERLINE OF EXISTING ROAD	
PROPERTY LINES (LABEL EACH SIDE)	

SURVEY SYMBOLS

BENCH MARK		B.M. NO.
TRAVERSE STATION *		
PROPERTY PIPE OR BAR *		
NAIL OR SPIKE *		
BOUNDARY STONE OR MONUMENT *		
PROPERTY LINE		

MATERIAL SYMBOLS

CONCRETE	
GRAVEL	
SAND	
RIPRAP	
EARTH	

LAND ACQUISITION

TEMPORARY CONSTRUCTION AREA OR ADJUSTMENTS	
REVERTIBLE SLOPE EASEMENT	
AREA TO BE RELEASED	
EXISTING BALTIMORE COUNTY EASEMENT/ DESCRIPTION & R/W'S	
PROPOSED DRAINAGE & UTILITY EASEMENT	
EXISTING BALTIMORE CO. RIGHT OF WAY	
HIGHWAY WIDENING AREA OR HIGHWAY R/W AREA	
EXISTING R/W'S (AGENCIES OTHER THAN BALTIMORE COUNTY)	
TEMPORARY SLOPE EASEMENT	
ROAD CLOSING AREA	

* LABEL WITH DESCRIPTION
 ** INDICATE SIZE, PIPE TYPE, DWG REF#



DEPARTMENT OF PUBLIC WORKS
 GENERAL DESIGN

STANDARD SYMBOLS 1

ISSUED: AUGUST 23, 2005
 REVISED: _____
 REVISED: _____

PLATE

C-A

EXISTING UNDERGROUND UTILITIES

(ALL EXISTING FEATURES TO BE SCREENED)

SANITARY SEWER **	— — S — —
SANITARY SEWER MANHOLE	— — (S) — —
STORM DRAIN **	— — D — —
STORM DRAIN MANHOLE	— — (D) — —
WATER **	— — W — —
ELECTRIC SERVICE	— — E — —
GAS **	— — G — —
FIBER OPTIC	— — FO — —
TELEPHONE	— — T — —
CABLE TELEVISION	— — CTV — —
STORM DRAIN JUNCTION CHAMBER	— D — [diagram] — D —
STORM DRAIN INLET	— D — [diagram] — D —
WATER MAIN VALVE / VAULT	— W — (V) — W —
WATER FIRE HYDRANT	[diagram]
WATER VALVE & METER BOX	[diagram]
WATER VALVE, TEES AND CROSS	[diagram]
WATER REDUCER, WYE BRANCH & BEND	[diagram]
GAS VALVE	— — G — (V) — G —
FORCE MAIN	— — FM — —
PRESSURE SEWER	— — PS — —

CONTOURS

EXISTING MAJOR CONTOUR INTERVALS	———— 560 ————
EXISTING MINOR CONTOUR INTERVALS	———— 558 ————
PROPOSED MAJOR CONTOUR INTERVALS	———— 560 ————
PROPOSED MINOR CONTOUR INTERVALS	———— 558 ————

NOTES

COLORS OF UTILITY SYMBOLS ON PLANS SHALL MATCH COLORS USED BY MISS UTILITY.

SEDIMENT AND EROSION CONTROL SYMBOLS TO BE USED FROM LATEST EDITION OF THE "MARYLAND'S STANDARDS & SPECIFICATIONS MANUAL FOR SOIL EROSION AND SEDIMENTATION CONTROL", PUBLISHED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION.

PROPOSED UTILITIES

SANITARY SEWER **	==== S ====
SANITARY SEWER MANHOLE *	==== (S) ====
STORM DRAIN **	==== D ====
STORM DRAIN MANHOLE *	==== (D) ====
WATER **	==== W ====
ELECTRIC SERVICE	==== E ====
GAS *	==== G ====
FIBER OPTIC	==== FO ====
TELEPHONE	==== T ====
CABLE TELEVISION	==== CTV ====
SANITARY SEWER HOUSE CONNECTION	[diagram]
STORM DRAIN JUNCTION CHAMBER	== D — [diagram] — D ==
STORM DRAIN INLET	== D — [diagram] — D ==
WATER HOUSE SERVICE / METER BOX	== W — (M) — W ==
WATER VALVE, TEE & CROSS	[diagram]
WATER REDUCER, WYE BRANCH & BEND	[diagram]
FIRE HYDRANT	[diagram]
FORCE MAIN	==== FM ====
PRESSURE SEWER	==== PS ====

MISCELLANEOUS

(ALL EXISTING FEATURES TO BE SCREENED)

FENCE, WOOD	—— // —— // ——
FENCE, IRON, CHAIN LINK OR WIRE	— — — — x — — — — x — — — —
STONE, BRICK OR CONCRETE WALLS	[diagonal hatching]
HEDGES	[wavy line]
UTILITY POLES — NOTE UTILITY & NUMBER	< OR >
RAILROAD, LIGHT RAIL TRACKS	[cross-hatching]
STREET LIGHTS	[sun symbol]
ELEVATED WATER TANK	[circle with cross]

* LABEL WITH DESCRIPTION

** INDICATE SIZE, PIPE TYPE, DWG. REF. #



DEPARTMENT OF PUBLIC WORKS
GENERAL DESIGN

STANDARD SYMBOLS 2

ISSUED: AUGUST 23, 2005

REVISED: _____

REVISED: _____

PLATE

C-B