



CADD Guidelines Manual

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TABLE OF CONTENTS

SECTION 1 - INTRODUCTION

- 1.1 PURPOSE
- 1.2 SCOPE
- 1.3 DISTRIBUTION
- 1.4 PROCEDURE FOR REVISIONS AND UPDATES

SECTION 2 - TAMPA BAY WATER CADD SOFTWARE

- 2.1 GENERAL
- 2.2 PROCUREMENT OF ENGINEERING/CADD HARDWARE AND SOFTWARE
- 2.3 SOFTWARE PROGRAMS
- 2.4 PRODUCT SUPPORT
- 2.5 TRANSLATION OF FILES

SECTION 3 - AUTOCAD RESOURCE AND SUPPORT FILES

- 3.1 GENERAL
- 3.2 DRAWING TEMPLATE
- 3.3 TEXT STYLE
- 3.4 FONT
 - 3.3.1 Document and Figure Sheet Fonts
 - 3.3.2 Engineering Sheet Fonts
- 3.5 TEXT SIZES
 - 3.3.1 Cover Sheet
 - 3.3.2 Title Block
 - 3.3.3 Detail Sheet
 - 3.3.4 Figures
- 3.6 LINETYPES
- 3.7 PLOT STYLE & LINE WEIGHTS
 - 3.3.1 Color Table Selection
- 3.8 PRINTER DRIVERS

SECTION 4 - PROJECT DIRECTORY STRUCTURE

- 4.1 GENERAL
- 4.2 DATA DIRECTORY STRUCTURE
 - 4.3.1 Project Data Directory Structure

- 4.3.2 Finalize Data Directory Structure
- 4.3 CADD DRAWING FILE NAMES**
- 4.3.1 Professional Codes
- 4.3.2 Drawing Codes

SECTION 5 - FILE LAYER STANDARDS

- 5.1 GENERAL
- 5.2 LAYER NAMING

SECTION 6 - DELIVERY PROCEDURE

- 6.1 GENERAL
- 6.2 PROJECT DOCUMENTS DELIVERED
 - 6.3.1 AUTOCAD ENGINEERING DRAWINGS
 - 6.3.2 RETURNED ENGINEERING DRAWINGS

SECTION 7 - DEFINITION & FILE FORMATS

- 7.1 DEFINITIONS
- 7.2 FILE FORMATS
- 7.3 AUTOCAD FILE FORMATS
- 7.4 MICROSTATION FORMATS

SECTION 8 - TEMPLATES

- 8.1 COVER SHEET
- 8.2 TITLE BLOCK
- 8.3 DETAIL SHEET 1
- 8.4 DETAIL SHEET 2
- 8.5 DETAIL SHEET 3
- 8.6 DETAIL SHEET 4
- 8.7 DETAIL SHEET 5
- 8.8 DETAIL SHEET 6
- 8.9 DETAIL SHEET 7

SECTION 1 - INTRODUCTION Computer-Aided Design and Drafting Manual

1.1 PURPOSE

Tampa Bay Water is a special district created by an interlocal agreement to supply wholesale water year round to its member of governments, who in turn provide water to people in the tri-county area. It is Tampa Bay Water's and its member of government's responsibility for planning and development of Tampa Bay Water's infrastructure for future growth of the service area.

This manual sets forth standards and procedures to be used for all technical and engineering drawings, or Computer-Aided Design & Drafting (CADD) files and drawings, and related work performed for Tampa Bay Water. These standards must be followed to ensure a quality product. Many individuals from different departments reference these guidelines to support their needs. All Computer-Aided Design (CAD) services shall be performed under the supervision of a Florida licensed Professional Engineer or Architect whose responsibilities shall include seeing that all services are in compliance with the current Florida State Statutes.

The CADD Guidelines create a balanced intergraded system establishing minimum requirements that must be met for Tampa Bay Water CADD projects, to protect the safety and general welfare to the people of the service area. While the Tampa Bay Water CADD Guidelines provide a standard for all CADD projects, situations will occur where these guidelines can NOT apply. If variances from the CADD Guidelines are required to a project, the variables must be approved in writing by the Tampa Bay Water Project Manager and documented.

1.2 SCOPE

The CADD Guidelines Manual is to be used by all in-house personnel producing engineering projects. It is to be included in all contracts requiring engineering plans preparation. This manual will affect Tampa Bay Water and all consultants, contractors and others who utilize engineering CADD applications, or engineering data produced by these applications.

1.3 DISTRIBUTION

The CADD Guidelines Manual is distributed in electronic form and may be downloaded from the following website:

http://www.tampabaywater.org/documents/working/CADD_Guidelines_Manual.pdf

1.4 PROCEDURES FOR REVISIONS AND UPDATES

Users of the CADD Guidelines are encouraged to send comments and suggestions for changes or improvements to: cadd@tampabaywater.org. The comments and suggestions will be reviewed by staff before approval, with a revision number and date. After approval, all updates shall be posted at the link above with the revision number and date.

SECTION 2 -SYSTEM REQUIREMENTS

2.1 GENERAL

This section establishes the minimum requirements for procurement, maintenance, and technical support of Tampa Bay Water's Engineering/CADD hardware and software systems. The Tampa Bay Water CADD software is updated on a bi-yearly basis, and distributed to the proper computers and users.

2.2 PROCUREMENT OF ENGINEERING/CADD HARDWARE AND SOFTWARE

The CADD Users and IT personnel will annually evaluate the needs for computer hardware, and to provide recommendations for procurement of any CADD hardware where appropriate, to insure consistency with current technology. The IT department will begin an evaluation of hardware to be procured for use in CADD.

2.3 SOFTWARE PROGRAMS

There are multiple software programs used by Tampa Bay Water; AutoCAD, MicroStation, Bentley View, and Design Review. AutoCAD and MicroStation are commercial programs that Tampa Bay Water has purchased a license(s) to be used. Tampa Bay Water is not responsible for the use of any software used by a consultant or any other agency, company, or member of government.

2.4 PRODUCT SUPPORT

Currently, Windows operating system, AutoCAD version 2008 is the required software. Other software (MicroStation V8) can be used, but is not accepted as a final deliverable for Tampa Bay Water projects. Staff from the IS Support department maintains all CADD software licenses, updates to the CADD server, and installations of the software. If support is needed, contact IS Support Department.

2.5 TRANSLATION OF FILES

Tampa Bay Water requires AutoCAD version 2008 format for the delivery of all CADD design files except when specified by the Project Manager. The data producer is solely responsible for any translation required to convert non-AutoCAD files to the AutoCAD design format (dwg). All translated design files shall conform to the file naming convention and symbology standards adopted by Tampa Bay Water for electronic plans as specified herein and mandated by the CADD Guidelines Manual. It is the responsibility of the data producer to ensure correct translation of the design files, including adherence to the specifications contained herein and the validity of the geometric elements.

SECTION 3 - AUTOCAD RESOURCE AND SUPPORT FILES

3.1 GENERAL

Tampa Bay Water requires a uniform or balanced project layout of fonts, text styles, symbols, linetypes, colors, line weight, title blocks, detail sheets, and plots. The resource and support file standards herein are a minimum requirement that shall be followed for all Tampa Bay Water CADD projects, but are subject to change. Variances shall occur due to project requirements, but must be signed and approved in writing by the Project Manager.

3.2 DRAWING TEMPLATE

A standard drawing template is necessary to maintain project consistency. The Tampa Bay Water drawing template contains the standard fonts, line types, colors, layers, and printer drivers associated with the agency. The template must maintain the model space projection set to NAD 83 State Plane Florida West FIPS U.S. Feet. To be used with ESRI (ArcGIS). Drawings with relative spatial units will NOT be accepted.

A zip file shall be delivered to the awarded project Consultant, Contractor, and/or Sub-Contractor consisting of Tampa Bay Water's standard electronic CADD files. See Figure 12

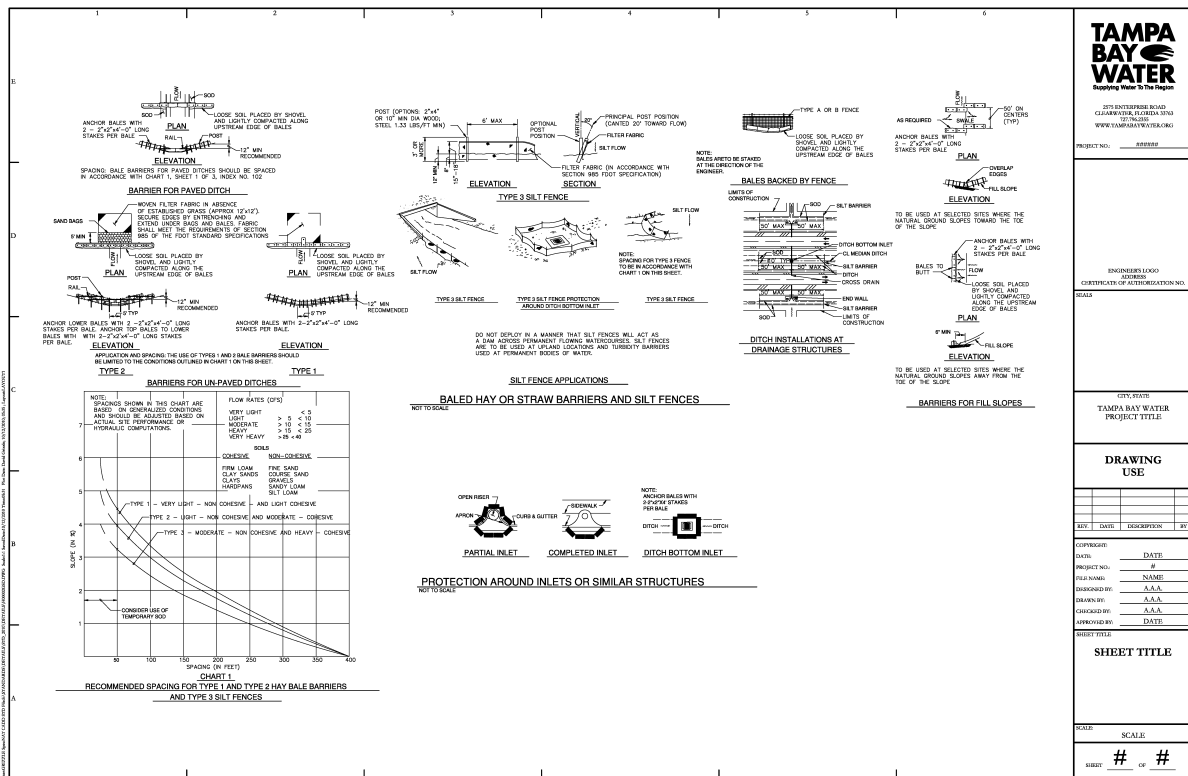


Figure 12

3.3 TEXT STYLE

In AutoCAD there are two different types of text, single-line and multiline text. Single-line text shall be used for simple entries, single line labeling, leader lines, and vertical text and not used for notes, tables, paragraphs, and labels & leader lines with multiple lines. Multiline text shall be used for long and complex entries, notes, tables, paragraphs, and labels and leader lines with multiple lines to maintain proper alignment, justification, and spacing. *See Figure 1*

3.4 FONT

There are many different prefaces of font types in addition to the different types of fonts, TrueType fonts, SHX fonts, Adobe fonts, Mac and PC Postscript fonts, and cross platform fonts. All these prefaces contain many groups of fonts. The font may be book, regular, heavy, bold, light, italic, bold italic, and underlined.

For example **Futura: Futura Bk BT, Futura HV BT, Futura LT BT, Futura LTCn Bt, and Futura XBlkCnlt BT.**

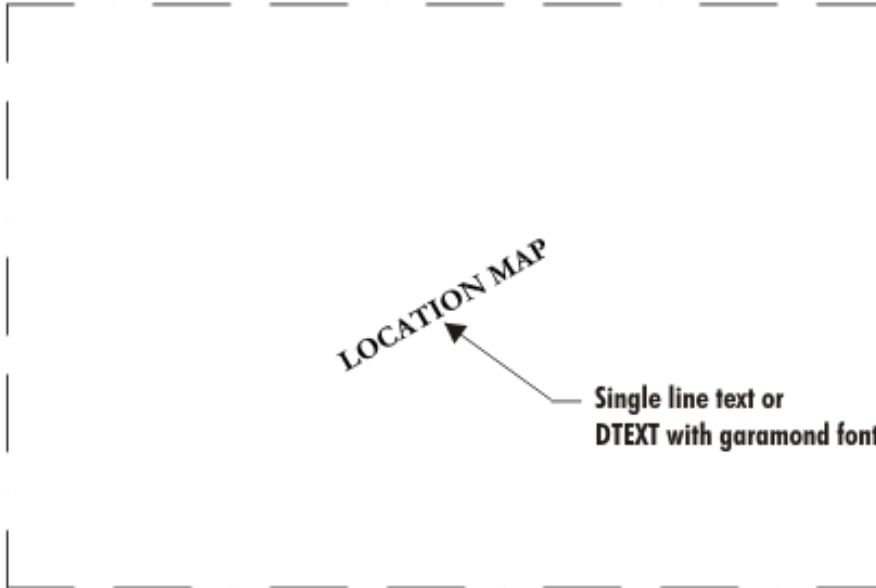
3.4.1 Document and Figure Sheet Fonts

Tampa Bay Water's standard fonts are Garamond and Futura. For examples of spacing, size, layouts, and uses of documents that are not engineering drawings, refer to the *Tampa Bay Water Identity Manual*.

3.4.2 Engineering Sheet Fonts

Tampa Bay Water requires Garamond to be used in the title blocks, detail titles, and project titles; Futura to be used for notes, labels, and dimensions. *See Figures 1 and 2*

PROJECT TITLE
PROJECT DESCRIPTION



PROJECT LOCATION



2575 Enterprise Road
Clearwater, Florida 33763
Ph: 727.796.2355
www.tampabaywater.org

CONSULTANT'S LOGO
ADDRESS
CERTIFICATION NUMBER

**Multiline text or
MTEXT with garamond font**



TAMPA BAY WATER PROJECT No.: XXXXXXXXX
DRAWING SET No.: ## OF ####

1" = 1'

Friday, May 08, 2009 7:00:58 AM

S:\STANDARDS\TEMPLATES\COVER SHEETS.DWG

Figure 1

3.5 TEXT SIZES

All CADD projects are required to have the correct size text for the scale of the design or drawing. The size of the text makes one text a higher focal point than another to represent a priority, or a different group. The Tampa Bay Water CADD Guidelines must be followed to maintain a uniform project and design. The correct text size of each drawing template shown below and in the Appendix is properly scaled in each AutoCAD or electronic file. *See Figures 3 through 7*

3.5.1 Cover Sheet

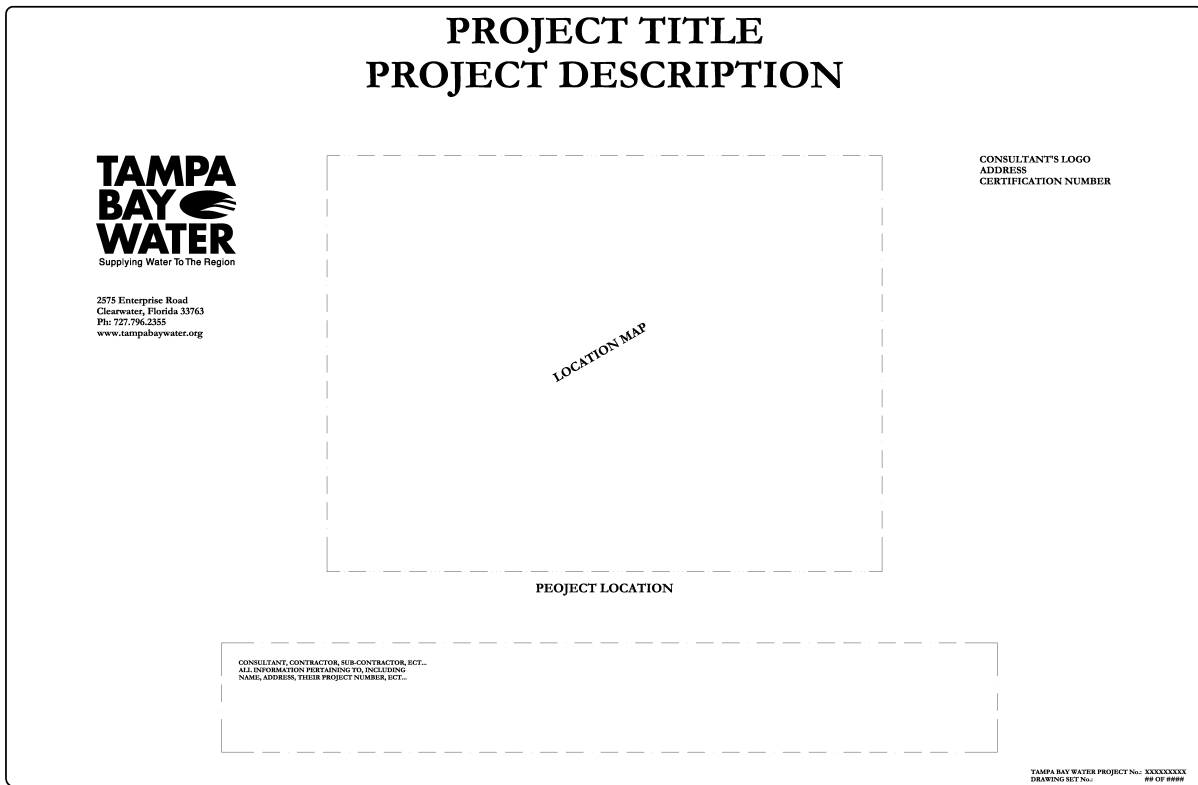


Figure 3

3.5.2 Title Block


1 2 3 4 5 6 B D C B A	 <small>200 EASTWATER BLVD CLEARWATER, FLORIDA 34616 757-7500 WWW.TAMPABAYWATER.COM</small>																
	PROJECT NO. _____																
	<small>ENGINEER'S LOGO ADDRESS CERTIFICATE OF AUTHORIZATION NO.</small>																
	SCALE																
	<small>CITY, STATE TAMPA BAY WATER PROJECT TITLE</small>																
	DRAWING USE																
	<table border="1"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	REV	DATE	DESCRIPTION	BY												
	REV	DATE	DESCRIPTION	BY													
<small>COPY/DATE:</small> <small>DATE: _____</small> <small>PROJECT NO.: _____</small> <small>FILE NAME: _____</small> <small>DESIGNED BY: _____</small> <small>DRAWN BY: _____</small> <small>CHECKED BY: _____</small> <small>APPROVED BY: _____</small>																	
<small>SHEET TITLE</small> SHEET TITLE																	
<small>SCALE</small> SCALE																	
<small>SHEET</small> # # <small>OF</small>																	

Figure 4

3.6 LINETYPES

A linetype is a repeating pattern of dashes, dots, and blank spaces displayed in a line or curve, used to distinguish the difference between elements in a drawing. For example different linetypes display graphical difference between a boundary line and power line by the different repeating design but they can be the same color. *See Figure 7 thru 8.*

3.7 PLOT STYLE & LINE WEIGHTS

A standard plot style is necessary to allow users to visually identify elements with ease in shared files and for consistency in color plotting. The AutoCAD plot style or color table defines 256 colors from which an active color can be selected and applied to an element. The most important aspect for the standardization of colors is the number that is applied.

The plot style defined by Tampa Bay Water is a selection of colors to be used for specific objects, lines, text, and dimensions. The different colors make the layers of a drawing more apparent and easier to share, review, and modify for future use.

3.7.1 BLACK & WHITE TABLE SELECTION

Listed below, *See Figure 9* is the Tampa Bay Water black and white table (tbw2009-bw.ctb) that is required to be used herein, for all CADD projects, unless written approval is authorized by the Project Manager.

TBW2009-BW.CTB		
Color	Pen Size (in.)	Plotted Color
1	0.003	7
2	0.008	7
3	0.01	7
4	0.015	7
5	0.02	7
6	0.025	7
7	0.03	7
8	0.035	7
9	0.01	7
10	0.003	7
11	0.008	7
12	0.01	7
13	0.015	7
14	0.02	7
15	0.025	7
16	0.03	7
17	0.035	7
Repeat pen size.003-.035 until color 241		
242	0.003	251
243	0.008	251
244	0.01	251
245	0.015	251
246	0.02	251
247	0.025	251
248	0.03	251
249	0.035	251
250	0.01	250
251	0.01	251
252	0.01	252
253	0.01	253
254	0.01	254

Figure 9

3.8 PRINTER DRIVERS

The printer drivers included in the required drawing templates contain the proper scale, dimensions, colors, and line weights for each Tampa Bay Water printer. For examples, the HP Designjet 4500ps is a large document plotter designated to print engineering drawings 36" x 48", 24" x 36", and other custom sizes larger than 11" x 17", with the maximum size of 42" width and length of the paper roll (approximately 300 feet.) Another printer is the HP Laserjet 5500 color printer designated to print reduced size engineering drawings and figure sheets 11" x 17", 8.5" x 14", and 8.5" x 11". To view a list of available printers and a list of plot drivers. See *Figure 10*

Printer Name	Print Sizes	Description
HP Color LaserJet 3800	8.5x11, 8.5x14, 11x17	A color laser printer (raster image compatible)
HP Color LaserJet 5500	8.5x11, 8.5x14, 11x17	A color laser printer (raster image compatible)
HP Designjet 2500cp	11x17and larger, Max 36"x Roll	A color plotter 36" x 100' roll (raster image compatible)
HP Designjet 4500ps	11x17and larger, Max 42"x Roll	A color plotter 42" x 300' roll (raster image compatible)
HP LaserJet 2200	8.5x11, 8.5x14, 11x17	A black and white laser printer (raster image compatible)
HP LaserJet 2300d	8.5x11, 8.5x14, 11x17	A black and white laser printer (raster image compatible)
HP LaserJet 2420	8.5x11, 8.5x14, 11x17	A black and white laser printer (raster image compatible)
HP LaserJet 2840	8.5x11, 8.5x14, 11x17	A black and white laser printer (raster image compatible)
HP LaserJet 3055	8.5x11, 8.5x14, 11x17	A black and white laser printer (raster image compatible)
HP LaserJet 4100 tn	8.5x11, 8.5x14, 11x17	A black and white laser printer (raster image compatible)
HP LaserJet 4250 dtn	8.5x11, 8.5x14, 11x17	A black and white laser printer (raster image compatible)
HP Photosmart 8450	5x7, 8.5x11, 8.5x14, 11x17	A color photo printer able to print without margins (raster image compatible)
Lanier 5222 Copier	8.5x11, 8.5x14, 11x17	A black and white laser printer, scanner, and copier (raster image compatible)
Lanier 5485	8.5x11, 8.5x14, 11x17	A black and white laser printer, scanner, and copier (raster image compatible)
Lanier 5635 Copier	8.5x11, 8.5x14, 11x17	A black and white laser printer, scanner, and copier (raster image compatible)
Lanier 5645	8.5x11, 8.5x14, 11x17	A black and white laser printer, scanner, and copier (raster image compatible)
Lanier LD135	8.5x11, 8.5x14, 11x17	A black and white laser printer, scanner, and copier (raster image compatible)
Lanier LD160	8.5x11, 8.5x14, 11x17	A black and white laser printer, scanner, and copier (raster image compatible)
Lanier LP138c	8.5x11, 8.5x14, 11x17	A color laser printer, scanner, and copier (raster image compatible)
Lexmark Optra T612	8.5x11, 8.5x14, 11x17	A black and white laser printer (raster image compatible)
Lexmark Optra T614	8.5x11, 8.5x14, 11x17	A black and white laser printer (raster image compatible)
Ricoh MP 2550	8.5x11, 8.5x14, 11x17	A black and white laser printer, scanner, and copier (raster image compatible)

Figure 10

SECTION 4 - DIRECTORY STRUCTURE

4.1 GENERAL

Many projects are designed, built, and referenced over a long period of time and must stay organized. To maintain organization, each project must have its own project number and name placed in a directory system with files and folders. Projects may have the same or similar names, causing confusion and poor management. To resolve this issue a unique alphanumeric character system assigned to each file was created and must be followed.

4.2 DATA DIRECTORY STRUCTURE

The engineering drawing files shall be organized and maintained in a standard file directory structure. The file folder shall be spelled without any spaces, requiring the use of underline spaces and/or dashes between numbers, words, and names. The reason for no spacing is due to programs creating %% for every space between a character in a directory or name. The discipline of sub-directory folders and files varies between Project Managers, and must meet the Project Manager's requirements.

4.2.1 PROJECT DATA DIRECTORY STRUCTURE

The project engineering drawing files shall be organized in a standard file directory structure. The project folders are required to be established in a hierarchy structure with the project name as the primary or parent folder. Then the project number as the first sub-folder or child, followed by the Project Manager's directory structure requirements.

4.2.2 FINALIZED CAD DATA DIRECTORY STRUCTURE

Finalized Tampa Bay Water CADD drawings are stored, maintained, and referenced on the network server under the S: directory and separated into 6 more detailed sub-folders. These folders contain Tampa Bay Water's standards, projects, and blocks; Member of Government drawings; other utility's drawings; miscellaneous drawings; and deliverables of projects. *See Figure 11*

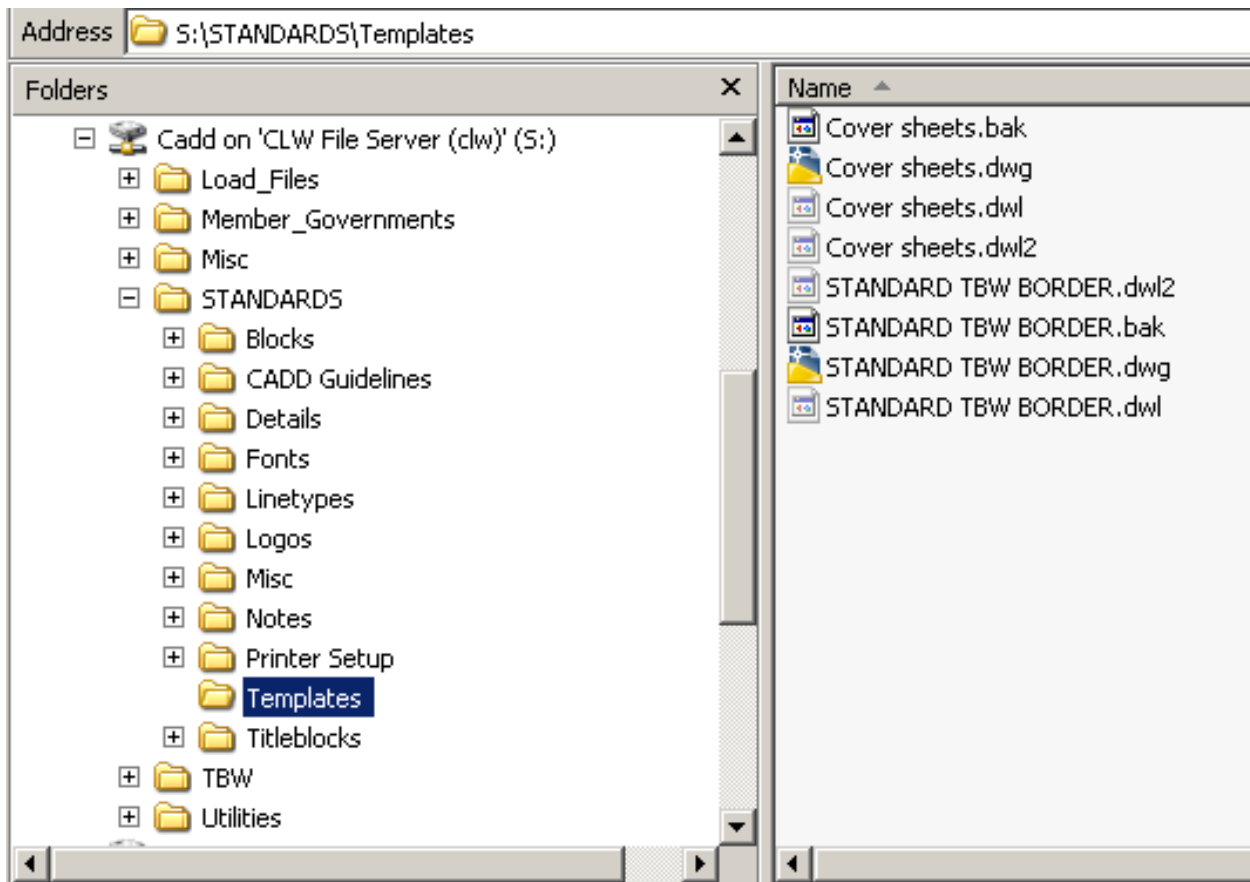


Figure 11

4.3 CADD DRAWING FILE NAMES

The CADD drawing file names are divided into five sections. The drawing name must start with the project number and continue as follows, professional code, sheet number, drawing code, and revision number. *See Figure 12*

Example:

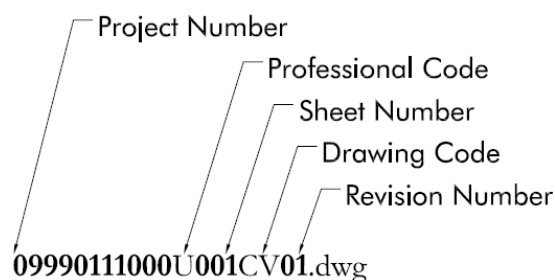


Figure 12

4.3.1 PROFESSIONAL CODES

The professional codes must be used to define the category of the project file. *See list below.*

Description	
A	ARCHITECTURE
B	PLANNING
C	CIVIL ENGINEERING
M	MECHANICAL
L	LANDSCAPE ARCHITECTURE
N	ENVIRONMENTAL
S	SURVEYING
U	UTILITIES

4.3.2 DRAWING CODES

The drawing codes describe the type of drawing and must be used to represent the file. *See lists below.*

Drawing Code	Description
CV	COVER SHEET
EH	EXHIBIT DRAWING
KS	KEY SHEET
LM	LOCATION MAP
GN	GENERAL NOTES

Engineering	
AP	AERIAL SITE PLAN
BP	BEST MANAGEMENT PRACTICE
CC	CONCEPTUAL DESIGN
CR	CROSS SECTION
DB	POST DEVELOPED BASIN MAP
DP	DEMOLITION PLAN
DR	DRAINAGE PLAN
EX	EXISTING CONDITIONS
LS	LIFT STATION
LD	LIFT STATION DETAILS
MA	MASTER DRAINAGE PLAN
MP	MASTER PLAN
MS	MASTER SANITARY PLAN
MU	MASTER UTILITY PLAN

Engineering Continued	
MW	MASTER WATER PLAN
PE	PERMIT DRAWING
PG	PAVING GRADING & DRAINAGE
PM	PRELIMINARY SITE PLAN
PO	PROPOSED CONDITIONS
PP	PLAN & PROFILE
PV	PAVING GARDENING & DRAINAGE
RD	RECORD DRAWING
RE	PRE-DEVELOPED BASIN MAP
SD	SANITARY SEWER SYSTEM DETAILS
SM	SOILS MAP
SN	SITE PLAN
SU	SITE AND UTILITY PLAN
SW	SURFACE WATER
UT	UTILITY
WD	WATER DETAILS
WS	WATER AND SANITARY SYSTEM

Survey	
BR	BOUNDARY
BT	BOUNDARY & TOPO
CN	CONTROL SURVEY
CO	COORDINATE GEOMETRY
CS	CONSTRUCTION SURVEY
FS	FINAL SURVEY
FT	FOUNDATION/TIE IN SURVEY
HY	HYDROGRAPHIC SURVEY
LT	LOT SURVEY
PL	PLAT
RS	RECORD SURVEY
QS	QUANTITY SURVEY
SF	SPECIFIC PURPOSE
SK	SKETCH
ST	STAKEOUT PLAN
TP	TOPOGRAPHIC SURVEY
US	UTILITY SURVEY

Architecture	
AS	ARCHITECTURAL SITE PLAN
DE	ARCHITECTURAL DETAILS
EE	ARCHITECTURAL EXTERIOR
FD	ARCHITECTURAL DIMENSION
FN	ARCHITECTURAL NOTE FLOOR
FO	ARCHITECTURAL FOUNDATION
FP	FIRE PROTECTION PLAN
FU	ARCHITECTURAL FURNITURE PLAN
IE	ARCHITECTURAL INTERIOR
RC	ARCHITECTURAL REFLECTED
RF	ARCHITECTURAL ROOF/FRAMING
SC	ARCHITECTURAL SCHEDULES
SE	ARCHITECTURAL SECTIONS

Electrical	
ED	ELECTRICAL DETAILS
EF	ELECTRICAL FLOOR PLANS
EP	ELECTRICAL SITE PLAN

Mechanical	
MD	MECHANICAL DETAILS
ME	MECHANICAL SITE PLAN
MF	MECHANICAL FLOOR PLANS

Plumbing	
PD	PLUMBING DETAILS
PF	PLUMBING FLOOR PLANS
PS	PLUMBING SITE PLAN

Landscape Architecture	
ID	IRRIGATION DETAILS
IR	IRRIGATION PLAN
LA	LANDSCAPE PLAN
LE	LANDSCAPE DETAILS
LL	LANDSCAPE LIGHTING PLAN

Environmental Analysis Permitting	
DK	DOCKS/SEAWALLS/DREDGING
HT	HABITAT PLAN
MG	MITIGATION PLAN
MN	MANAGEMENT PLAN

Planning	
CD	CONCEPTUAL DESIGN
CT	CROSS SECTION
MT	MITIGATION PLAN
PN	PRELIMINARY DESIGN
SP	SITE PLAN

SECTION 5 - FILE LAYER STANDARDS

5.1 GENERAL

Layers are the foundation of an engineering drawing and its uses. This section will describe how layers functions and shall be used. Layering a drawing can manipulate the drawing and make it appear different, and can create structure for a design. Layers allow different objects to be selected, become visible, invisible, printed, exported, grouped etc.

5.2 LAYER NAMING

Layer names use different codes similar to the file naming convention. The structure of the folders, file names, and layers use these codes to describe each section of the project, and allow an easier use with other programs like ESRI ArcGIS and COGO.

Layer names have three important sections; professional codes, prefixes, and suffixes, that must be followed. *See lists below*

Professional Codes	
A	ARCHITECTURE
B	PLANNING
C	CIVIL ENGINEERING
L	LANDSCAPE ARCHITECTURE
M	MECHANICAL
N	ENVIRONMENTAL
S	SURVEYING
U	UTILITIES

Prefixes	
P	PROPOSED
D	DEMOLITION
E	EXISTING
X	XREF'S

Suffixes	
TXT	TEXT
PTS	POINTS
DIM	DIMENSIONS
HTH	HATCH PATTERNS
OLD	OLD-LAYOUT
EASE	EASEMENT
STRC	STRUCTURES
#	123

Examples:

S-E-BORE-PTS Survey-Existing-Soil Bore Hole-Points

S-E-ROAD-HTH Survey-Existing-Road-Hatch

C-P-BL Engineering-Proposed-Baseline

B-P-DRIVEWAY Planning-Proposed-Driveway

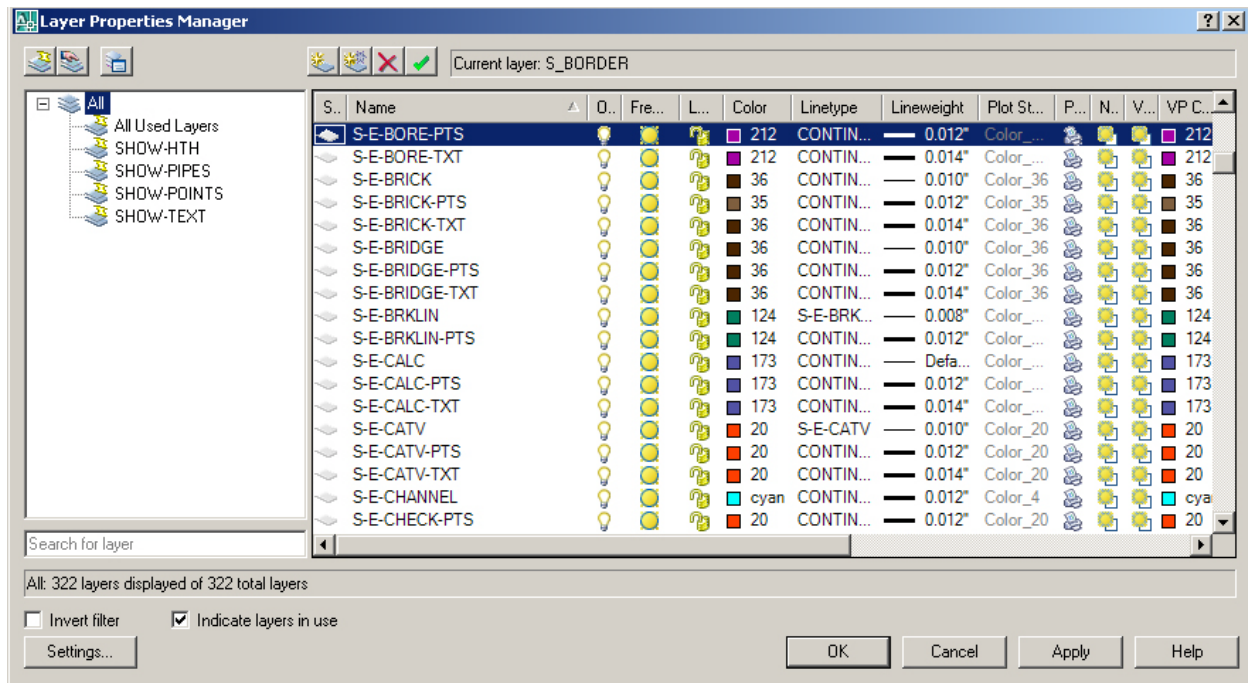


Figure 13

A list of layer names is shown below, and can be viewed in Appendix A. See Figure 14

LAYER NAME	LAYER DESCRIPTION	SURVEY / UTILITIES				ENGINEERING				ARCHITECTURE / LANDSCAPE ARCHITECTURE / PLANNING				ENVIRONMENTAL			
		EXISTING		PROPOSED		EXISTING		PROPOSED		EXISTING		PROPOSED		EXISTING		PROPOSED	
		Color	Linetypes	Color	Linetypes	Color	Linetypes	Color	Linetypes	Color	Linetypes	Color	Linetypes	Color	Linetypes	Color	Linetypes
ACC TREE	Accent Tree																
A-CEILING	Architectural Ceilings							251	CONTINUOUS	1	5						
A-CENTER	Centerline for Architecture							251	CONTINUOUS								
A-DASHED	Architectural Dashed Lines																
AREA	Area Calculations							251	CONTINUOUS	5	CONTINUOUS				150	CONTINUOUS	
APPLNCE	Appliances							251	CONTINUOUS	7	CONTINUOUS						
AREA	Area Calculations							251	CONTINUOUS	1	CONTINUOUS						
A-TRIM	Architectural Trim							251	CONTINUOUS	251	CONTINUOUS						
BANK	Bank	44	S-E-BANK			42	CONTINUOUS	6	CONTINUOUS	251	CONTINUOUS	251	CONTINUOUS				
BARS/SCALE	Bar Scale	60	CONTINUOUS					60	CONTINUOUS	60	CONTINUOUS						
BASELINE-TXT	Baseline Text							4	CONTINUOUS								
BASIN	Basin							9	DASHED								
BASIN/NUM	Basin Number							9	CONTINUOUS								
BEAM	Beams							251	CONTINUOUS	2	CONTINUOUS						
BEAM/HID	Beams/Hidden							251	HIDDEN	3	HIDDEN						
BENCH	Bench							251	CONTINUOUS	6	CONTINUOUS						
BERM	Berm							251	CONTINUOUS	12	DASHED						
BFO	Buried Fiber Optic Cable	20	S-E-BFO					251	DASHED	251	CONTINUOUS						
BL	baseline	6	CONTINUOUS			42	CONTINUOUS	6	CONTINUOUS	251	CONTINUOUS	251	CONTINUOUS				
BLDG	Building	30	CONTINUOUS			42	HIDDEN	7	CONTINUOUS	251	CONTINUOUS	251	CONTINUOUS				
BLDG-COLUMN	Building Column							9	CONTINUOUS								
BLDG-DOOR	Building Door							2	CONTINUOUS								
BLDG-DOWNSPOUT	Building Downspout							1	CONTINUOUS								
BLDG-HTH	Building Hatch Pattern							11	CONTINUOUS								
BLDG-NUM	Building Number							4	CONTINUOUS								
BLDG-SETBACK	Building Setback							6	DASHED								
BLDG-TXT	Building Text							9	CONTINUOUS								
BM	Benchmark	3	CONTINUOUS			42	CONTINUOUS	9	CONTINUOUS	251	CONTINUOUS	251	CONTINUOUS				
BRDY	Boundary	232	CONTINUOUS			7	PHANTOM	8	PHANTOM	4	PHANTOM	4	PHANTOM				
BOLLARD	Bollards							2	CONTINUOUS	251	CONTINUOUS	2	CONTINUOUS				
BORER	Borer	5	CONTINUOUS					6	CONTINUOUS	4	CONTINUOUS	4	CONTINUOUS				
BORH	Bore Hole	212	CONTINUOUS			42	CONTINUOUS	128	CONTINUOUS	251	CONTINUOUS	251	CONTINUOUS				
BOX	Box							9	CONTINUOUS								
BRICK	Bricks	38	CONTINUOUS			42	HIDDEN2	3	CONTINUOUS	251	CONTINUOUS	251	CONTINUOUS				
BRIDGE	Bridge	36	CONTINUOUS			42	HIDDEN	4	CONTINUOUS	251	CONTINUOUS	251	CONTINUOUS				
BRKLY	Brick Breakline	124	S-E-BRKLIN							251	DASHED	251	DASHED				
BUF	Buffer																
BUFFER-LA	Buffer Landscape							5	DASHED								
BUF-SHRUB	Buffer Shrub																
BUF-TREE	Buffer Tree																
CABINET-BASE	Base Cabinets									251	CONTINUOUS	1	CONTINUOUS				
CABINET-WALL	Wall Cabinets									251	CONTINUOUS	6	HIDDEN				
CALC	Calculations	173	CONTINUOUS			42	CONTINUOUS	1	CONTINUOUS								
CAN-TREE	Canopy Tree																
CASE	Case							2	CONTINUOUS								
CASEWORK	Casework / Millwork									251	CONTINUOUS	2	CONTINUOUS				
CATV	Cable TV	20	S-E-CATV			42	E-CATV	20	R-CATV	251	DASHED	251	DASHED				
CERTIFY	Certification Information	3	CONTINUOUS					3	CONTINUOUS	3	CONTINUOUS	3	CONTINUOUS				
CHANNEL	Hydro Channel	4	CONTINUOUS			42	DASHED	7	CONTINUOUS	251	CONTINUOUS	251	CONTINUOUS				
CL	Center Line	20	S-E-CL			42	CL	3	CL	251	CENTER	251	CENTER				
CL	Center Line							3	CENTER2								
CLG	Ceiling									251	CONTINUOUS	2	CONTINUOUS				
CLG-CIRCUIT	Ceiling Circuit									251	CENTER2	1	CENTER2				
CLG-GRID	Ceiling Grids									251	CONTINUOUS	6	CONTINUOUS				
CLG-LIGHT	Ceiling Light Fixtures									251	CONTINUOUS	2	CONTINUOUS				
CLG-TXT	Ceiling Text									251	CONTINUOUS	2	CONTINUOUS				
CMU	Concrete Masonry Unit in Plan									251	CONTINUOUS	1	CONTINUOUS				
CMU-HTH	Concrete Masonry Unit Hatch Patterns									251	CONTINUOUS	251	CONTINUOUS				
CMU-SECT	Concrete Masonry Unit in Section									251	CONTINUOUS	1	CONTINUOUS				
CONTR	Survey Control	20	CONTINUOUS			42	CONTINUOUS	3	CONTINUOUS	251	CONTINUOUS	2	CONTINUOUS				
COL	Columns									251	CONTINUOUS	2	CONTINUOUS				
COL-ACC	Column Accessories									251	CONTINUOUS	1	CONTINUOUS				
COL-GRID	Column Grid									251	CENTER2	6	CENTER				
COL-GRID-TAG	Column Grid Callouts									251	CONTINUOUS	3	CONTINUOUS				
CON	Concrete Construction Lines																
CONC	Concrete	186	CONTINUOUS			42	HIDDEN2	80	CONTINUOUS	251	CONTINUOUS	251	CONTINUOUS				
CONC-C	Control Joint									251	CONTINUOUS	6	CONTINUOUS				
CONC-EJ	Expansion Joint									251	CONTINUOUS	6	CONTINUOUS				
CONC-EPT	Conceptual Drawing									251	CONTINUOUS	251	CONTINUOUS				
CONC-HTH	Concrete Hatch Patterns							11	CONTINUOUS	251	CONTINUOUS	251	CONTINUOUS				

Figure 14

SECTION 6 - PROJECT DELIVERY PROCEDURES

6.1 GENERAL

This section addresses engineering drawings that are required to be delivered to Tampa Bay Water prior to a project's final acceptance. The drawings (.dwg) shall be reviewed and commented by the Engineer and Tampa Bay Water staff, to meet the requirements in the CADD Guidelines Manual.

6.2 PROJECT DOCUMENTS DELIVERED

Electronic formats and templates of fonts, title blocks, line types, and line weights shall be delivered by Tampa Bay Water to the Contractor, as a standards package prior to the beginning of a project, that must be followed and applied, throughout the project engineering drawings. The engineering drawings shall be delivered by the Contractor to Tampa Bay Water with all fonts, title blocks, Xref files, and blocks to complete the .dwg files and meet final acceptance.

6.2.1 STANDARD AUTOCAD ENGINEERING DRAWINGS DELIVERED

Three paper 24" x 36" size sets of drawings, or other size stated by the OWNER, each signed and sealed by the Engineer(s) of Record, shall be delivered to the OWNER. In addition, one electronic file of each drawing in Win. OS - AutoCAD 2008 format shall be provided to the OWNER in the most logical format listed by judging the size of the project. The formats are CD, DVD, Blu-Ray DVD, Flash Cards or memory sticks, USB Drive, and/or portable Hard Drive.

6.2.2 RETURNED ENGINEERING DRAWINGS

It is the responsibility of the Contractor to review and confirm the engineering drawings meet Tampa Bay Water's CADD Guidelines Manual. After the project engineering drawings are delivered to Tampa Bay Water, the drawing shall be reviewed by Tampa Bay Water staff for approval. If the drawings do not meet Tampa Bay Water's CADD Guidelines Manual, the drawing shall be commented with corrections in writing, and sent back to the Contractor to be corrected and redelivered to Tampa Bay Water at the Contractor's expense.

SECTION 7 - DEFINITIONS AND FILE FORMATS

7.1 DEFINITIONS

The AutoCAD definitions described below are listed to serve as a quick reference, and allow users to better understand CADD terminology.

- **ANSI (American National Standards Institute)** – Coordinator of voluntary standards development for both private and public sectors in the United States. Standards pertain to programming languages, Electronic Data Interchange (EDI), telecommunications, and the physical properties of diskettes, cartridges, and magnetic tapes.
- **Block** – A generic term for one or more objects that are combined to create a single object. Commonly used for either *block definition* or *block reference*. (Block definition – The name, base point, and set of objects that are combined and stored in the symbol table of a drawing.
- **CADD (Computer Aided Design and Drafting)** – A Software and methods used to analyze and represent designs graphically.
- **CADD Hardware** – The workstations, servers, printers, plotters and all other computer equipment used in Tampa Bay Water’s production effort.
- **CMYK (Cyan, Magenta, Yellow, and Key Color)** – A system of defining colors by specifying the percentages of cyan, magenta, yellow, and the key color, which is typically black. (typically used in printing devices)
- **Electronic Project** – All electronic files, reports, documents, databases, images and other electronic information representing a complete contract document package for a Department construction project. Sometimes called a CADD project.
- **Engineering Data** – The digital files which support or represent the intent of the engineering design, or the engineering analysis.
- **Font** – A character set, comprising letters, numbers, punctuation marks, and symbols of a distinctive proportion and design.

- **Freeze** – A setting that suppresses the display of an object on selected layers. Objects on frozen layers are not displayed, regenerated, or plotted. Freezing layers shortens regenerating time.
- **Geometry** – All graphical objects such as lines, circles, arcs, polylines, and dimensions. Nongraphical objects, such as linetypes, lineweights, text styles, and layers are not considered geometry.
- **CADD Software** – Any software procured, developed, distributed and supported by IS Support.
- **CADD Support** – The technical and operational support necessary to ensure that a production environment is maintained within Tampa Bay Water, which includes: (a) Selection, development and distribution of production software, related procedures, criteria and standard operating instructions, (b) Providing training opportunities to CADD users. (c) Managing engineering data produced with the software.
- **CADD Server** – A computer dedicated to the management of Tampa Bay Water’s Engineering / CADD applications.
- **CADD Systems** – All of the CADD hardware and CADD software that support the CADD production effort.
- **CADD Workstation** – A computer running CADD software used for the development of CADD drawings and documents.
- **Layer** – A logical grouping of data that are like transparent acetate overlays on a drawing. You can view layers individually or in combination.
- **Leader Line Text** – A leader object is a line or spline with an arrowhead at one end and a multiline text object at the other.
- **Linetypes** – How a line or curve is displayed. For example, a continuous line has a different linetype than a dashed line. Also called *line font*.
- **Lineweight** – A width value that can be assigned to all graphical objects except

TrueType fonts and raster images.

- **Multiline Text** – *MTEXT* command to create one or more paragraphs of text that can be modified as a single object.
- **Object** – One or more graphical elements, such as text, dimensions, lines, circles, or polylines, treated as a single element for creation, manipulation, and modification.
- **Plot Style** – An object property that specifies a set of overrides for color, dithering, gray scale, pen assignments, screening, linetype, lineweight, endstyles, jointstyles, and fill styles. Plot styles are applied at plot time.
- **Reference** – A definition, known as an external reference or block reference, that is used and stored in the drawing. *See also* block (block) *and* external reference(xref)
- **RGB (Red, Green, and Blue)** – A system of defining colors by specifying percentages of red, green, and blue. (typically used in lighting devices)
- **Single-Line Text** – The *TEXT* command to create one or more lines of text, ending each line with an *ENTER* command. Each text line is an independent object that can be rotated, reformed, or otherwise modified.
- **Substitute Font** – If a font is not currently on your system, AutoCAD accommodates that font by substituting it with another font.
- **Symbol** – A representation of an item commonly used in drawings. In AutoCAD symbols are inserted in drawings as blocks.
- **Template Drawing** – Drawing file with preestablished settings for new drawings such as *acad.dwt* and *acadiso.dwt*; however, any drawing can be used as a template.
- **Text Style** – A named, saved collection of settings that determines the appearance of text characters-for example, stretched, compressed, oblique, mirrored, or set in a vertical column.
- **Tilemode** – A system variable that controls whether viewports can be created as

movable, resizable objects (layout viewports), or as non-overlapping display elements that appear side-by-side (model viewports.) *See also* viewport.

- **Viewport** – A bounded area that displays some portion of the model space of a drawing. The TILEMODE system variable determines the type of viewport created.
- **World Coordinate System (WCS)** – A coordinate system used as the basis for defining all objects and other coordinate systems.

7.2 FILE FORMATS

- ***.PLT (Plot)** – File format used by applications to print 2D drawings.
- ***.PS (PostScript)** – PostScript is primarily designed to present publication-quality text. A PostScript file consists of a set of images of pages.
- ***.XML (Extensible Markup Language)** – A general-purpose specification for creating custom markup languages.
- ***.RPT (Report)** – An Output file, or report, created by Crystal Reports reporting software; can include data from multiple data sources and many different types of databases.

7.3 AUTOCAD FORMATS

The AutoCAD formats describe each abbreviation and the section of AutoCAD it affects.

- ***.CTB (Custody Toolbox Data)** – A file format is an AutoCAD color-dependent plot style table. Plot style tables contain user-defined plot styles.
- ***.DSD (Drawing Set Descriptions)** – A file format for saving a description of a drawing set that has been assembled using the Published dialog box.
- ***.DST (Sheet Set Data)** – The XML file format used to store the associations and information that define a sheet set.
- ***.DWF (Design Web Format)** – A highly compressed file format that is created from a DWG file. DWF files are easy to published and view on the web.

- ***.DWG (Drawing)** – Standard file format for saving vector graphics from within AutoCAD.
- ***.DXF (Drawing Interchange Format)** – An ASCII or binary file format of an AutoCAD drawing file for exporting AutoCAD drawings to other applications or for importing drawings from other applications.

7.4 MICROSTATION FORMATS

The MicroStation formats describe each abbreviation and the section of MicroStation it affects.

- ***.CEL (Cell)** – A complex element composed of a group of primary elements or other complex elements. Cells are stored in a cell library.
- ***.DGN (Design)** – The standard file format for saving vector graphics or CAD designs from within Bentley Systems, MicroStation.
- ***.RSC (Resource)** – The resource file format for font in MicroStation
- ***.TBL (Table)** – The color palettes created in MicroStation for an elements print size and color.

SECTION 8 - TEMPLATES

This section shall consist of reference figures used in CADD Manual. The files are located on Tampa Bay Water's network at S:\STANDARDS\Details\STD_2010\DETAILS.

8.1 COVER SHEET TEMPLATES

PROJECT TITLE
PROJECT DESCRIPTION

TAMPA BAY WATER
Supplying Water To The Region
2575 ENTERPRISE ROAD
CLEARWATER, FLORIDA 33763
727.796.2355
WWW.TAMPABAYWATER.ORG

LOCATION MAP

PROJECT LOCATION

CONSULTANT'S LOGO
ADDRESS
CERTIFICATION NUMBER

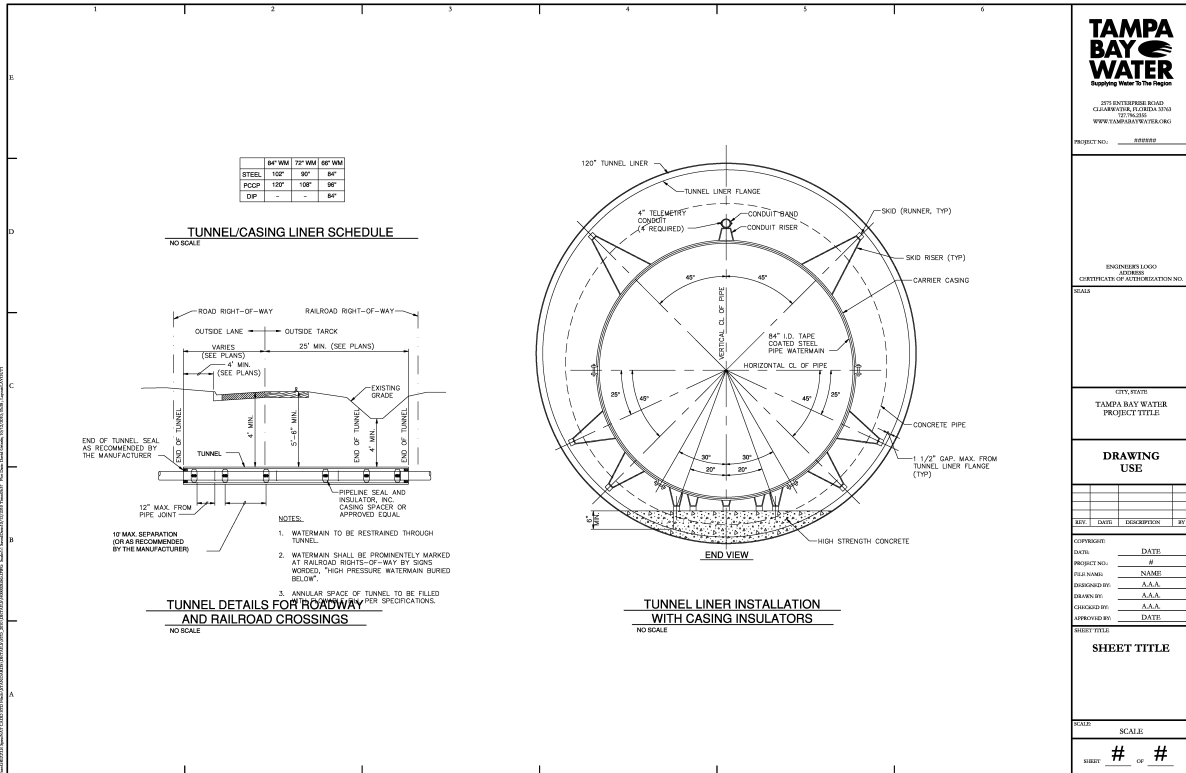
CONSULTANT, CONTRACTOR, SUB-CONTRACTOR, ETC.
ALL INFORMATION PERTAINING TO: HOLDING NAME, ADDRESS,
THEIR PROJECT NUMBER, ETC.

TAMPA BAY WATER PROJECT NO.:
DRAWING SET NO.:

8.2 TITLE BLOCK

1	2	3	4	5	6		 <p>TAMPA BAY WATER Supplying Water To The Region</p> <p>270 ENTERPRISE ROAD CLEARWATER, FLORIDA 34615 TEL: 727-766-1000 WWW.TAMPABAYWATER.ORG</p>															
E							PROJECT NO. _____															
D							ENGINEER'S LOGO OR CERTIFICATE OF AUTHORIZATION NO.															
C							SCALE															
B							CITY, STATE TAMPA BAY WATER PROJECT TITLE															
A							DRAWING USE															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>							REV.	DATE	DESCRIPTION	BY												
REV.	DATE	DESCRIPTION	BY																			
COPIES: _____ DATE: _____ DATE: _____ # _____ PROJECT NO.: _____ # _____ DESIGNED BY: _____ DRAWN BY: _____ CHECKED BY: _____ APPROVED BY: _____ DATE: _____																						
SHEET TITLE SHEET TITLE																						
SCALE: _____ SHEET # OF #																						

8.3 DETAIL SHEET 1



2701 ENTERPRISE ROAD
CLEARWATER, FLORIDA 34615
(813) 765-1100
WWW.TAMPABAYWATER.ORG

PROJECT NO. #####

ENGINEER'S LOGO

CERTIFICATE OF AUTHORIZATION NO.

SCALE

CITY/STATE

TAMPA BAY WATER

PROJECT TITLE

DRAWING USE

REV. DATE DESCRIPTION BY

DATE

PROJECT NO. #

DESIGNED BY: A.A.A.

DRAWN BY: A.A.A.

CHECKED BY: A.A.A.

APPROVED BY: DATE

SHEET TITLE

SHEET TITLE

SCALE

SHEET # OF #

8.4 DETAIL SHEET 2

AIR VALVE FLUSHING ASSEMBLY (SEE DETAIL)

TYPE 1

TYPE 2

AIR VALVE ASSEMBLY DETAILS

DUPLIX BODY COMBINATION AIR VALVE DETAIL

ACCESS MANHOLE DETAIL

ADJUSTABLE VALVE BOX AND COVER DETAILS

TAMPA BAY WATER (PROJECT NAME)	
STATION	214+00
SITEID	7500
C.P. TEST STATION	
LATITUDE	XXXX.XXX
LONGITUDE	XXXX.XXX

TAMPA BAY WATER (PROJECT NAME)	
STATION	214+00
SITEID	7500
AIR RELEASE VALVE	2"
MANUFACTURER	APCO
SIZE	No. 300
MODEL	214-00
VACUUM VALVE	2"
SIZE	APCO
MANUFACTURER	No. 200
MODEL	214-00
STATION	XXXX.XXX
PIPE SIZE	12"
LATITUDE	XXXX.XXX
LONGITUDE	XXXX.XXX

TAMPA BAY WATER (PROJECT NAME)	
STATION	214+00
SITEID	7500
SERVICE WATER	2"
TYPE	BUTTERFLY VALVE
MFR.	AMERICAN, ETC
OPEN	CGW
TURNS	150, ETC
NORMAL POSITION	OPEN
LATITUDE	XXXX.XXX
LONGITUDE	XXXX.XXX

2215 ENTERPRISE ROAD
CLEARWATER FLORIDA 34615
TEL: 727-255-1000
WWW.TAMPABAYWATER.ORG

PROJECT NO. #####

ENGINEER'S LOGO
CERTIFICATE OF AUTHORIZATION NO.

SCALE:

CITY, STATE
TAMPA BAY WATER
PROJECT TITLE

DRAWING USE

REV	DATE	DESCRIPTION	BY

DESIGNED BY: A.A.A.
DRAWN BY: A.A.A.
CHECKED BY: A.A.A.
APPROVED BY: DATE


SHEET # OF #

SHEET TITLE

SCALE:

SHEET # OF #

8.5 DETAIL SHEET 3



2515 ENTERPRISE ROAD
CLEARWATER, FLORIDA 34615
WWW.TAMPABAYWATER.COM

PROJECT NO. _____

ENGINEER'S LOGO
CERTIFICATE OF REGISTRATION NO. _____

CITY/STATE
TAMPA BAY WATER
PROJECT TITLE _____

DRAWING USE

REV	DATE	DESCRIPTION	BY

DATE: _____ DATE: _____
 PROJECT NO. # _____
 DESIGNER: NAME: _____
 DRAWING BY: A.A.A.
 CHECKED BY: A.A.A.
 APPROVED BY: DATE: _____

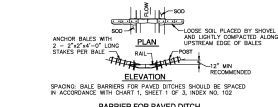
SHEET FILE _____

SHEET TITLE

SCALE: _____

SHEET # of #

BARRIER FOR PAVED DITCH



SOIL PLACEMENT

SOIL TO BE PLACED BY SHOVEL AND LIGHTLY COMPACTED ALONG UPSTREAM EDGE OF BALE.

POST (OPTIONS: 2"x4" OR 10" MIN DIA WOOD, STEEL 1.5" DIA (7" MIN))

8' MAX

OPTIONAL POST POSITION

PRINCIPAL POST POSITION (GATED 50' TOWARD FLOW)

FILTER FABRIC

SILT FLOW

NOTE: SILT FENCES TO BE SPACED IN THE DIRECTION OF THE ENGINEER.

BALES BACKED BY FENCE

LOOSE SOIL PLACED BY SHOVEL AND LIGHTLY COMPACTED ALONG THE UPSTREAM EDGE OF BALES.

TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES TOWARD THE TOE OF THE SLOPE.

AND/OR BALES WITH 2" x 24" x 48" LONG STAKES PER BALE

OVERLAP STAKES

FULL SLOPE

TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TOE OF THE SLOPE.

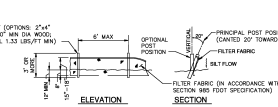
AND/OR BALES WITH 2" x 24" x 48" LONG STAKES PER BALE

LOOSE SOIL PLACED BY SHOVEL AND LIGHTLY COMPACTED ALONG THE UPSTREAM EDGE OF BALES

FALL SLOPE

TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TOE OF THE SLOPE.

TYPE 3 SILT FENCE



POST (OPTIONS: 2"x4" OR 10" MIN DIA WOOD, STEEL 1.5" DIA (7" MIN))

8' MAX

OPTIONAL POST POSITION

PRINCIPAL POST POSITION (GATED 50' TOWARD FLOW)

FILTER FABRIC

SILT FLOW

NOTE: SILT FENCES TO BE SPACED IN THE DIRECTION OF THE ENGINEER.

BALES BACKED BY FENCE

LOOSE SOIL PLACED BY SHOVEL AND LIGHTLY COMPACTED ALONG THE UPSTREAM EDGE OF BALES.

TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES TOWARD THE TOE OF THE SLOPE.

AND/OR BALES WITH 2" x 24" x 48" LONG STAKES PER BALE

OVERLAP STAKES

FULL SLOPE

TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TOE OF THE SLOPE.

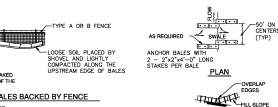
AND/OR BALES WITH 2" x 24" x 48" LONG STAKES PER BALE

LOOSE SOIL PLACED BY SHOVEL AND LIGHTLY COMPACTED ALONG THE UPSTREAM EDGE OF BALES

FALL SLOPE

TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TOE OF THE SLOPE.

TYPE 1 SILT FENCE



POST (OPTIONS: 2"x4" OR 10" MIN DIA WOOD, STEEL 1.5" DIA (7" MIN))

8' MAX

OPTIONAL POST POSITION

PRINCIPAL POST POSITION (GATED 50' TOWARD FLOW)

FILTER FABRIC

SILT FLOW

NOTE: SILT FENCES TO BE SPACED IN THE DIRECTION OF THE ENGINEER.

BALES BACKED BY FENCE

LOOSE SOIL PLACED BY SHOVEL AND LIGHTLY COMPACTED ALONG THE UPSTREAM EDGE OF BALES.

TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES TOWARD THE TOE OF THE SLOPE.

AND/OR BALES WITH 2" x 24" x 48" LONG STAKES PER BALE

OVERLAP STAKES

FULL SLOPE

TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TOE OF THE SLOPE.

AND/OR BALES WITH 2" x 24" x 48" LONG STAKES PER BALE

LOOSE SOIL PLACED BY SHOVEL AND LIGHTLY COMPACTED ALONG THE UPSTREAM EDGE OF BALES

FALL SLOPE

TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TOE OF THE SLOPE.

BALE HAY OR STRAW BARRIERS AND SILT FENCES

NOT TO SCALE

SILT FENCE APPLICATIONS

OPEN INLET

APPROX

CLOSE & BUTTER

SEALMAK

NOTE: AND/OR BALES WITH 2" x 24" x 48" LONG STAKES PER BALE

PARTIAL INLET

COMPLETED INLET

DITCH BOTTOM INLET

PROTECTION AROUND INLETS OR SIMILAR STRUCTURES

NOT TO SCALE

RECOMMENDED SPACING FOR TYPE 1 AND TYPE 2 HAY BALE BARRIERS AND TYPE 3 SILT FENCES

FLOW RATES (CFS)	COHESIVE		NON-COHESIVE	
	VERY LIGHT	LIGHT	VERY LIGHT	LIGHT
< 3	> 5	< 10	> 5	< 10
3 - 10	> 10	< 15	> 10	< 15
10 - 40	> 15	< 20	> 15	< 20

NOTE: SPACING SHOWN IN THIS CHART ARE BASED ON GENERALIZED CONDITIONS AND SHOULD BE ADJUSTED BASED ON ACTUAL SITE PERFORMANCE OR HYDRAULIC COMPUTATIONS.

APPLICATIONS WHERE THE USE OF TYPE 1 AND BALE BARRIERS SHOULD BE LIMITED TO THE CONDITIONS OUTLINED IN CHART 1 ON THIS SHEET.

CONSIDER USE OF TEMPORARY ROD

SOIL TO BE PLACED BY SHOVEL AND LIGHTLY COMPACTED ALONG THE UPSTREAM EDGE OF BALE.

POST (OPTIONS: 2"x4" OR 10" MIN DIA WOOD, STEEL 1.5" DIA (7" MIN))

8' MAX

OPTIONAL POST POSITION

PRINCIPAL POST POSITION (GATED 50' TOWARD FLOW)

FILTER FABRIC

SILT FLOW

NOTE: SILT FENCES TO BE SPACED IN THE DIRECTION OF THE ENGINEER.

BALES BACKED BY FENCE

LOOSE SOIL PLACED BY SHOVEL AND LIGHTLY COMPACTED ALONG THE UPSTREAM EDGE OF BALES.

TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES TOWARD THE TOE OF THE SLOPE.

AND/OR BALES WITH 2" x 24" x 48" LONG STAKES PER BALE

OVERLAP STAKES

FULL SLOPE

TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TOE OF THE SLOPE.

AND/OR BALES WITH 2" x 24" x 48" LONG STAKES PER BALE

LOOSE SOIL PLACED BY SHOVEL AND LIGHTLY COMPACTED ALONG THE UPSTREAM EDGE OF BALES

FALL SLOPE

TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TOE OF THE SLOPE.

8.7 DETAIL SHEET 5

CHAIN LINK FENCE DETAIL
NOT TO SCALE

ITEM	DESCRIPTION
TYPE	CHAIN LINK
HEIGHT	6 FEET
FABRIC	3 GAUGE GALVANIZED - 2 INCH MESH
LINE POST	2 INCH DIAMETER - 0.154 INCH WALL THICKNESS
TOP RAILS	1 1/4 INCH DIAMETER - 0.140 INCH WALL THICKNESS
GATE	5/8" TYPE WITH 3 1/2 INCH DIAMETER - 0.228 INCH WALL THICKNESS
LATCH	FORN. TYPE - PATENT LOCK COMPATIBLE
END CORNER POST	2 1/2 INCH DIAMETER - 0.203 WALL THICKNESS

NOTE: EXISTING CHAIN LINK FENCE REMOVED DURING CONSTRUCTION SHALL BE REPLACED BY KIND MATERIALS TABLE LISTED BELOW IS FOR NEW CONSTRUCTION ONLY.

BUTTERFLY VALVE
NOT TO SCALE

PIPE	VALVE	REDUCER
60"	66"	-
72"	72"	-
84"	72"	84"x72"
84"	84"	-

* CONTRACTOR TO SUPPLY TWO 66"x64" REDUCERS ONE TO EACH SIDE OF BUTTERFLY VALVE. IF PIPELINE IS 64-INCH DUCTILE IRON.

PAVEMENT REPLACEMENT DETAIL
NOT TO SCALE

NOTES:

- SHELL OR LIMEROCK BASE MATERIAL SHALL BE COMPACTED TO 98% DENSITY A.A.S.H.T.O. T-180.
- APPROVED SUB-BASE MATERIAL SHALL BE COMPACTED IN 6" LAYERS MAXIMUM TO 98% DENSITY A.A.S.H.T.O. T-180.
- ASPHALT CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED.
- SURFACE TREATED PAVEMENT JOINTS SHALL BE LAPPED AND FEATHERED.
- SURFACE MATERIAL SHALL BE CONSISTENT WITH EXISTING SURFACE.
- SUB-BASE MATERIAL SHALL BE APPROVED BY THE ENGINEER.
- 7" EQUALS EXISTING BASE THICKNESS.
- SHELL OR LIMEROCK SURFACE ROADS SHALL BE COMPACTED TO 98% DENSITY A.A.S.H.T.O. T-180.
- OTHER MATERIALS SHALL BE IN ACCORDANCE WITH APPLICABLE FOOT STANDARD SPECIFICATIONS, LATEST EDITION.

UNPAVED ROAD REPLACEMENT DETAIL
NOT TO SCALE

NOTES:

- BEFORE TO CONSTRUCTION CONTRACTOR SHALL CROSS SECTION THE ROAD SURFACE FROM SHOULDER TO SHOULDER THIS INFORMATION SHALL BE FURNISHED TO THE ENGINEER BEFORE CONSTRUCTION AND SHALL BE USED BY THE CONTRACTOR TO RECONSTRUCT THE ROADWAY.
- UNPAVED STREETS, ALLEYS AND DRIVEWAYS SHALL BE RESTORED WITH 6" OF COMPACTED BASE MATERIAL PLACED IN THE TOP OF THE COMPLETED TRENCH. SHELL SURFACE ROADS SHALL BE COMPACTED TO 98% DENSITY, A.A.S.H.T.O. T-180.

TAMPA BAY WATER
Supplying Water To The Nation

270 ENTERPRISE ROAD
CLEARWATER FLORIDA 34615
(813) 947-7300
WWW.TAMPABAYWATER.ORG

PROJECT NO. _____

ENGINEER'S LOGO
ADDRESS
CERTIFICATE OF AUTHORIZATION NO. _____

CITY, STATE
TAMPA BAY WATER
PROJECT TITLE

DRAWING USE

REV.	DATE	DESCRIPTION	BY

DATE: _____ DATE: _____
 PROJECT NO.: _____ #
 DESIGNER: _____ NAME: _____
 DRAWING NO.: _____ A.A.A.
 CHECKED BY: _____ A.A.A.
 APPROVED BY: _____ DATE: _____

SHEET TITLE

SCALE: _____

SHEET # OF #

8.8 DETAIL SHEET 6

PLAN

SECTION

TREE STAKING DETAIL
NOT TO SCALE

TREE BARRIER PROTECTION DETAIL
NOT TO SCALE

NOTES:

- A STABILIZED CONSTRUCTION ENTRANCE SHALL BE INSTALLED IN THE FOLLOWING LOCATIONS:
 - WHENEVER VEHICLES ARE LEAVING A CONSTRUCTION SITE TO ENTER ONTO A PUBLIC ROAD.
 - AT ANY UNPAVED ENTRANCE/EXIT LOCATION WHERE THERE IS A RISK OF TRANSPORTING MUD OR SEDIMENT ONTO PAVED ROADS.
 - WHENEVER NECESSARY TO MAINTAIN ACCESS TO EXISTING PROPERTY.
- CONSTRUCTION SPECIFICATIONS:
 - CLEAR ALL VEGETATION, ROOTS AND ALL OTHER OBSTRUCTIONS IN PREPARATION FOR GRADING.
 - PRIOR TO PLACING GEOTEXTILE (FILTER FABRIC) MAKE SURE THAT THE ENTRANCE IS PROPERLY GRADED AND COMPACTED. SEE GEOTEXTILE REQUIREMENTS.
 - TO REDUCE MAINTENANCE AND LOSS OF AGGREGATE PLACE GEOTEXTILE (FILTER FABRIC) OVER THE EXISTING GROUND BEFORE PLACING THE STONE FOR THE ENTRANCE.
 - STONE SHOULD BE PLACED TO A DEPTH OF 6 INCHES OR GREATER FOR THE ENTIRE WIDTH AND LENGTH OF THE STABILIZED CONSTRUCTION ENTRANCE.
 - THE WIDTH SHOULD BE AT LEAST 12 FEET OR AS MUCH AS THE ENTIRE WIDTH OF THE ACCESS.
 - THE LENGTH SHOULD BE BETWEEN 50 TO 75 FEET IN LENGTH.
 - FLARE THE ENTRANCE WHERE IT MEETS THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
 - RUNOFF FROM A STABILIZED CONSTRUCTION ENTRANCE SHOULD DRAIN TO A SEDIMENT TRAP OR SEDIMENT BASIN.
 - SUST CONTROL SHOULD BE PROVIDED IN ACCORDANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN.
- MAINTENANCE:
 - INSPECT ON A REGULAR BASIS AND AFTER THERE HAS BEEN A HIGH VOLUME OF TRAFFIC OR STORM EVENT.
 - APPLY ADDITIONAL STONE PERIODICALLY AND WHEN REPAIR IS REQUIRED.
 - IMMEDIATELY REMOVE SEDIMENT OR ANY OTHER MATERIALS TRACKED ONTO THE PUBLIC ROADWAY.
 - ENSURE THAT ASSOCIATED SEDIMENT CONTROL MEASURES ARE IN GOOD WORKING CONDITION.

GEOTEXTILE REQUIREMENTS

PHYSICAL PROPERTY	REQUIREMENTS
GRAB TENSILE STRENGTH	200 LBS (ASTM D4632)
ELONGATION AT BREAK	50 % (ASTM D4632)
MULLEN BURST STRENGTH	320 LBS (ASTM D5786)
PUNCTURE STRENGTH	80 LBS (ASTM D4633)
ACD	80% MIN. (ASTM D4791)
PERMEABILITY	1x10 CMSEC 2
TRAPEZOIDAL TEAR	50 LBS (ASTM D4633)
SEAM STRENGTH	180 LBS
UV RESISTANCE (MIN ALLOWED)	80 % 800 HOURS

NOTE:
WORKING MONOFILAMENT ONLY
MINIMUM ELONGATION 15%.

*** ACD DESIGN GUIDE**
SOL WITH 10% PASSING NO. 200 SIEVE.
AGS RANGE IS 10-140.
SOL WITH 10% PASSING NO. 300 SIEVE.
AGS RANGE IS 75-100.
SOL WITH 10% PASSING NO. 200 SIEVE.
AGS RANGE IS 45-70.

TREE PRUNING NOTES

- ALL ROOTS MEASURING THREE INCHES IN DIAMETER OR GREATER SHALL BE PRUNED CLEAN WITH NO JAGGED/SHREDED EDGES.
- ROOT PRUNING SHALL BE PERFORMED USING CLEAN SHARP TOOLS.
- ROOT PRUNING CUTS SHALL BE PERPENDICULAR TO THE ROOT.
- FINAL ROOT PRUNING CUTS SHALL RESULT IN FLAT SURFACE.
- EXPOSED ROOTS SHALL BE BACKFILLED AS SOON AS POSSIBLE.
- LOW BRANCHES THAT MAY INTERFERE WITH MACHINERY AND CONSTRUCTION EQUIPMENT SHALL BE PRUNED IN ACCORDANCE WITH A-300.
- COMPACT MACHINERY SHALL BE UTILIZED AROUND TREES TO MINIMIZE DISTURBANCE TO TREE TRUNKS AND ROOTS.

STABILIZED CONSTRUCTION ENTRANCE DETAIL
NOT TO SCALE

BARRIER SPECIFICATIONS FOR TREES:

- CONTRACTOR TO COMPLY WITH ALL LOCAL TREE ORDINANCES IN ADDITION TO THE SPECIFICATION NOTES BELOW.
- FOUR CORNER UPRIGHT STAKES OF NO LESS THAN 2x4 LUMBER CONNECTED BY HORIZONTAL MEMBERS OF NO LESS THAN 2x4 LUMBER OR UPRIGHT STAKES SPACED AT 5' INTERVALS OF NO LESS THAN 2x4 LUMBER CONNECTED BY BELT SCREEN FABRIC OR MATERIAL OF COMPARABLE DURABILITY.

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8.9 DETAIL SHEET 7

TYPE 2

SLOTTED PVC CONNECTOR PIPE (METAL COLLAR REINFORCED)
18 OZ NYLON REINFORCED PVC FABRIC (300 PSI TEST)

5/16" VINYL SHEATHED SAW STEEL CABLE (6000 LB BREAKING STRENGTH) WITH GALVANIZED CONNECTORS (HOOK FREE BUSHING)

STRESS PLATE

5/16" GALVANIZED CHAIN

CLOSED CELL SOLID PLASTIC FOAM (EQUATION OF 240 EQM) (12 LB PER FT BUOYANCY)

2x4 POSTING (BOLTS 3000 LB BREAKING STRENGTH)

18 OZ NYLON REINFORCED PVC FABRIC (300 PSI TEST) WITH LACING (DIAMETER)

TYPE 2

21-5 STD SINGLE PANEL FOR DEPTHS 5' OR LESS
21-5 STD ADDITIONAL PANEL FOR DEPTHS 5' THRU 10'
CURTAIN TO REACH BOTTOM UP TO DEPTHS OF 10 FEET
TWO 21-5 PANELS TO BE USED FOR DEPTHS GREATER THAN 10 FEET UNLESS SPECIAL DEPTH CURTAINS SPECIFICALLY CALLED FOR IN THE PLANS OR AS DIRECTED BY THE ENGINEER

NOTES:
COMPONENTS OF TYPES 1 AND 2 MAY BE SIMILAR OR IDENTICAL TO NECESSARY AVOID ANY INTERFERENCE ON THE NEIGHBORLY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES 1 AND 2 SHALL BE AS APPROVED BY CONSTRUCTION MANAGER.

FLOATING TURBIDITY BARRIER

POST (OPTIONAL) 2x4 OR 2 3/4" DIA WOOD STEEL 1.33 LB/FT (MAX)

6" MAX

18 OZ NYLON REINFORCED PVC FABRIC (300 PSI TEST)

2' OR MORE

SHORE LINE

UNITS OF CONSTRUCTION

TURBIDITY BARRIERS

SHORE LINE

UNITS OF CONSTRUCTION

SHORE LINE

EXISTING CAUSEWAY

PROPOSED TO OF SLOPE

CURRENT

STRUCTURE ALIGNMENT

NOTE:
TURBIDITY BARRIERS ARE TO BE USED IN ALL PERMANENT BODIES OF WATER AND SUBSTITUTIONS WILL BE MADE BASED UPON WATER DEPTH.
NUMBER AND SPACING OF ANCHORS DEPENDENT ON CURRENT VELOCITIES.
DEPLOYMENT OF BARRIERS AND FIELD LOCATIONS MAY VARY TO ACCOMMODATE CONSTRUCTION OPERATIONS.
INSTALLATION MAY REQUIRE SEGMENTING BARRIERS DURING CONSTRUCTION OPERATIONS.
FOR ADDITIONAL INFORMATION SEE SECTION 104 OF THE PROJECT STANDARD SPECIFICATIONS.

STAKED TURBIDITY BARRIER

LEGEND

- FILE LOCATION
- DREDGE OF FILL AREA
- ANCHORING BUSH WITH ANCHOR
- ANCHOR
- BARRIER MOVEMENT DUE TO CURRENT ACTION

TURBIDITY BARRIER APPLICATIONS FOR BALED HAY OR STRAW BARRIERS AND SILT FENCES

NOT TO SCALE

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