

CITY OF WINNIPEG

WATER AND WASTE DEPARTMENT

WATER AND WASTEWATER TREATMENT

PROCESS – DRAWING STANDARD

REVISIONS AND APPROVALS

DATE	REV	PAGE	APPROVED BY	SIGNATURE
2004/04/14	0	1,7,8,9	E.M.R.	
2004/05/26	1	6 - 9	E.M.R.	
2004/06/24	2	6, 7	E.M.R.	
2005/05/27	3	6, 7		
2005/09/29	4	6, 7		
2005/11/28	5	7		
2006/02/14	6	7, 8		
2006/03/17	7	7		
2006/07/28	8	7, 8		
2007/11/05	9	6 to 10		
2007/12/12	10	7		
2008/03/19	11	8		
2009/07/07	12	9, 10		
2009/11/25	13	9 – 11, 13		
2009/12/16	14	9-12		
2010/11/08	15	12, 13		
2010/11/26	16	12		
2010/12/14	17	12, 13		
2012/09/07	18	11, 14		
2012/10/19	19	11 -15		

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1.0 PURPOSE

The purpose of this manual is to facilitate and standardize the production of drawings at the City of Winnipeg, Water and Waste Department.

2.0 SCOPE

This manual applies to all new drawings of the City of Winnipeg, Water and Waste Department.

3.0 DRAWING FORMAT AND SETTINGS

3.1 Layout

Paper space / model space will be used, with the border inserted in paper space at 1:1 scale and the drawing drawn in model space.

3.2 Units

Metric units will be used for paper space and model space, as well as all drawing symbols (blocks).

3.3 File Format

All files will be saved in AutoCAD version R2006 format.

3.4 Typical Drawing Formats

SYSTEM	FORMAT	SHEET SIZE	UNITS
METRIC	A0	841 x 1189	mm
	A1	594 x 841	mm
	A2	420 x 594	mm
	A3	297 x 420	mm
	A4	210 x 297	mm
	A5	148 x 210	mm
	A6	105 x 148	mm
IMPERIAL (ANSI)	E	34 x 44	inch
	D	22 x 34	inch
	C	17 x 22	inch
	B2	11 x 38.5	inch
	B1	11 x 23.5	inch
	B	11 x 17	inch
	A	8.5 x 11	inch

3.5 Lettering and Fonts

STYLE NAME	TEXT HEIGHT	WIDTH FACTOR	FONT NAME	DESCRIPTION
TEXT6MM	6 mm (1/4")	0.75	Romans	LARGE – for titles of equipment and drawing numbering
TEXT5MM	5 mm (3/16")	0.75	Romans	MEDIUM – for note titles, legends or descriptions
TEXT3MM	3 mm (1/8")	0.75	Romans	SMALL – for completing title blocks, secondary subtitles, notes and general text
TEXT2-5MM	2.5 mm (1/16")	0.75	Romans	MINIMUM – for title block label text

3.5.1 Drawing Title Description

The five title lines in the title block should be as follows:

1. Location
2. Project Name/Description
3. Type of Arrangement
4. Drawing Content
5. This fifth line can be used for overflow of any of the previous 4 titles. For example if line 4 needs to be 2 lines then you can enter it as follows:

1. Location

2. Project Name/Description
3. Type of Arrangement
4. Drawing Content
5. Drawing Content

3.5.2 Path, Date and Time Last Modified

The AutoCAD command RTEXT was used to create the Path, Date and Time Last Modified text in the bottom left corner. This command is available with the ACAD2000 and above Express Tools menu.

3.6 Title Block Drawing Additional Settings

These are some additional settings for the title block
COW_TITLE_BLOCK_A1.dwt

Drawing Format : A1 size, 594 mm x 841 mm (22" x 34")
 Paper space scale : 1:1
 Viewport scale : 1:1
 Units : metric
 Snap : 0.2

The snap was chosen to make the transition from metric to imperial if needed. This snap applies to insertion of symbols into schematic drawings.

4.0 AUTOCAD LAYERS

4.1 Intro

The layer naming system will be used for all disciplines of the City of Winnipeg, Water and Waste Department. A layer naming and use convention is detailed below that will be utilized by all disciplines.

4.2 Layer Naming

Layer names are created by the following convention:

Discipline Code		Major Group		Minor Group*
X	-	XXXX	-	XXXX

* Optional

This naming convention can be used by all disciplines without conflict, has the needed flexibility and is easy to understand.

4.2.1 Discipline Code

- G. Site
- B. Building/Architectural
- C. Civil
- S. Structural (Piling)
- M. Mechanical
- E. Electrical
- P. Process
- A. Automation / Instrumentation and Control
- D. General*
- F. Electronic Security / Emergency Exits*
- H. Piping / Plumbing / HVAC*

4.2.2 Major Group

Defined as a major component, assembly, or construction system. 4 digits are used to describe the information contained in the layer. Some examples of major group names are as follows:

4 DIGIT NUMBER	DESCRIPTION
TEXT	Used for text ex. Headings, notes, descriptions or any text except tags
IDEN	Used for identification of labels or tags
DIMS	Used for dimensions
LINE	Used for drawing process lines
LITE	Used for drawing lights
POWR	Used to draw any element for electrical power
GRID	Used to draw grid lines
SLAB	Used to draw slabs
ANNO	Miscellaneous, doesn't really have a category or can have multiple components
XXXX	Customized to suit users needs

4.2.3 Minor Group (optional)

Used to further define the major group. If you have more than one option for the major group, then the minor group will handle the task.

4 DIGIT NUMBER	DESCRIPTION
MAJR	Used for major process
MINR	Used for minor process
JBOX	Used for a junction box
NEWW	Used to show new work
EXST	Used to show existing
FUTR	Used to show future
DEMO	Used to show existing to be demolished
XXXX	Customized to suit users needs

4.3 Layer Colours and Linetype Thickness

The thickness of the line will be determined by associating a colour with a lineweight in the Plot Style Table (CTB file or pen assignments). You can choose which CTB file you want to use when you plot your drawing. Then you associate a colour with a layer to give you the proper lineweight when you plot your drawing. The layer colours and lineweights are yet to be determined. Two standard CTB files will be used, COW_STANDARD and COW_STANDARD_50%. The 50% CTB file will be used for plotting larger drawings onto B size paper.

4.4 Layer Naming Example

This example is used with Process and Instrument Diagrams (P&ID):

LAYER NAME	COLOUR	COLOUR #	LINE TYPE	LINE WEIGHT	DESCRIPTION
A-LINE-MAJR	TBD	TBD	CONTINUOUS	TBD	Major process line
A-LINE-MINR	TBD	TBD	CONTINUOUS	TBD	Minor process line
A-LINE-PNEU	TBD	TBD	PNEUMATIC	TBD	Pneumatic signal
A-LINE-ELEC	TBD	TBD	DASHED	TBD	Electrical signal
A-LINE-ELCB	TBD	TBD	ELECBIN	TBD	Electrical binary signal
A-TEXT-6-0M	RED	1	CONTINUOUS	TBD	6.0 mm high text
A-TEXT-5-0M	RED	1	CONTINUOUS	TBD	5.0 mm high text
A-TEXT-3-0M	RED	1	CONTINUOUS	TBD	3.0 mm high text
A-TEXT-2-5M	RED	1	CONTINUOUS	TBD	2.5 mm high text
A-IDEN	TBD	TBD	CONTINUOUS	TBD	Labels or tags
A-ANNO-NEWW	TBD	TBD	CONTINUOUS	TBD	New
A-ANNO-EXST	TBD	TBD	DASHED	TBD	Existing
A-ANNO-FUTR	TBD	TBD	CENTER	TBD	Future
A-ANNO-DEMO	TBD	TBD	CONTINUOUS	TBD	Existing to be Demolished

5.0 DRAWING NUMBERING SYSTEM

CITY OF WINNIPEG, WATER AND WASTE DEPARTMENT, CORPORATE NUMBERING SYSTEM

Source Code		Facility Code	Process Area		Discipline Code	Dwg. Number		Sheet Number		Revision Number	Doc. Size *(Unused)
N	-	NNNN	A	-	A	NNNN	-	NNN	-	NN	A

- Used only as part of CAD file name.

Example: 1-0101A-A0001-001-00

5.1.1 Source Codes

- 1 – Design Drawing
- 2 – Manufacturer’s Drawing

5.1.2 Facility Codes

- 0010 – 0099 Unused (future)
- 0100 – 0109 **Wastewater** Treatment Facilities
 - 0101 North Plant*
 - 0102 South Plant*
 - 0103 West Plant*
- 0110 – 0399 **Wastewater** Collection Facilities
- 0110 – 0399 Flood OR **Wastewater** Collection Facilities
- 0111 PERIMETER ROAD PUMPING STATION - WASTEWATER
- 0112 ALEXANDER - PUMPING STATION - WASTEWATER
- 0113 ARMSTRONG - PUMPING STATION - WASTEWATER
- 0114 ASH - PUMPING STATION - FLOOD / WASTEWATER
- 0115 ASSINIBOINE - PUMPING STATION – FLOOD
- 0116 AUBREY - PUMPING STATION - FLOOD / WASTEWATER
- 0117 BALTIMORE - PUMPING STATION - FLOOD / WASTEWATER
- 0118 BANNATYNE - PUMPING STATION – FLOOD
- 0119 BARKER - PUMPING STATION - WASTEWATER
- 0120 BOURNAIS / MISSION GARD - PUMPING STATION - WASTEWATER
- 0121 BURROWS - PUMPING STATION - WASTEWATER
- 0122 CAMIEL - PUMPING STATION - WASTEWATER
- 0123 CHATAWAY - PUMPING STATION – WASTEWATER
- 0124 CLARENCE - PUMPING STATION - WASTEWATER
- 0125 CLIFTON - PUMPING STATION - FLOOD / WASTEWATER
- 0126 CLOUTIER - PUMPING STATION - WASTEWATER
- 0127 COCKBURN - PUMPING STATION - FLOOD / WASTEWATER
- 0128 COLONY - PUMPING STATION - FLOOD
- 0129 COLONY - PUMPING STATION - WASTEWATER
- 0130 COMMUNITY - PUMPING STATION - WASTEWATER

0131 CONWAY / MOORGATE - PUMPING STATION - WASTEWATER
0132 CORNISH - PUMPING STATION - FLOOD
0133 CORNISH - PUMPING STATION - WASTEWATER
0134 CRANE - PUMPING STATION - WASTEWATER
0135 DARCY - PUMPING STATION - WASTEWATER
0136 DESPINS - PUMPING STATION - FLOOD / WASTEWATER
0137 DUBLIN - PUMPING STATION - WASTEWATER
0138 DUGALD - PUMPING STATION - WASTEWATER
0139 DUMOULIN - PUMPING STATION - FLOOD / WASTEWATER
0140 ELMHURST - PUMPING STATION - WASTEWATER
0141 FERRY ROAD - PUMPING STATION - WASTEWATER
0142 GALT PUMPING STATION - FLOOD
0143 GRANDMONT - PUMPING STATION - WASTEWATER
0144 HART - PUMPING STATION - FLOOD / WASTEWATER
0145 HAWTHORNE - PUMPING STATION - FLOOD / WASTEWATER
0146 HERITAGE - PUMPING STATION - WASTEWATER
0147 HOLLAND - PUMPING STATION - WASTEWATER
0148 JEFFERSON - PUMPING STATION - FLOOD / WASTEWATER
0149 JESSIE - PUMPING STATION - FLOOD / WASTEWATER
0150 KILKENNY - PUMPING STATION - FLOOD
0151 KILKENNY - PUMPING STATION - WASTEWATER
0152 KING EDWARD - PUMPING STATION - WASTEWATER
0153 LARCHDALE - PUMPING STATION - WASTEWATER
0154 LAVERENDRYE - PUMPING STATION - FLOOD
0155 LINDEN - PUMPING STATION - FLOOD / WASTEWATER
0156 LOUELDA - PUMPING STATION - WASTEWATER
0157 MAGER DR - PUMPING STATION - FLOOD / WASTEWATER
0158 MANITOBA - PUMPING STATION - WASTEWATER
0159 MARION - PUMPING STATION - FLOOD / WASTEWATER
0160 Mayfair PUMPING STATION - FLOOD / WASTEWATER
0161 METCALFE - PUMPING STATION - FLOOD
0162 METCALFE - PUMPING STATION - WASTEWATER
0163 Mission PUMPING STATION - FLOOD
0164 MONTCALM - PUMPING STATION - WASTEWATER
0165 MUNROE - PUMPING STATION - WASTEWATER
0166 NEWTON - PUMPING STATION - FLOOD / WASTEWATER
0167 NOTRE DAME - PUMPING STATION - WASTEWATER
0168 OAKGROVE - PUMPING STATION - WASTEWATER
0169 OLIVE - PUMPING STATION - WASTEWATER
0170 PANDORA - PUMPING STATION - WASTEWATER
0171 PARKLANE - PUMPING STATION - WASTEWATER
0172 PARKWOOD - PUMPING STATION - WASTEWATER
0173 POLSON - PUMPING STATION - FLOOD / WASTEWATER
0174 PORTSMOUTH - PUMPING STATION - WASTEWATER
0175 PULBERRY - PUMPING STATION - WASTEWATER
0176 RAVELSTON - PUMPING STATION - LAND DRAINAGE
0177 RIDGEDALE - PUMPING STATION - WASTEWATER
0178 RIVERBEND - PUMPING STATION - WASTEWATER
0179 ROLAND - PUMPING STATION - FLOOD
0180 RYAN - PUMPING STATION - WASTEWATER
0181 SELKIRK - PUMPING STATION - FLOOD / WASTEWATER
0182 SOMERVILLE - PUMPING STATION - WASTEWATER

0183 SOMMERVILLE / WILLOW - PUMPING STATION - WASTEWATER
0184 ST. CHARLES - PUMPING STATION - WASTEWATER
0185 ST. JOHNS - PUMPING STATION - FLOOD
0186 ST. NORBERT - PUMPING STATION - FLOOD
0187 ST. NORBERT - PUMPING STATION - WASTEWATER
0188 STRATHMILLAN - PUMPING STATION - WASTEWATER
0189 SYNDICATE - PUMPING STATION - FLOOD / WASTEWATER
0190 THIBAUT - PUMPING STATION - WASTEWATER
0191 TRAPPISTE - PUMPING STATION - WASTEWATER
0192 TUXEDO - PUMPING STATION - WASTEWATER
0193 TYLEHURST - PUMPING STATION - WASTEWATER
0194 WESTWOOD - PUMPING STATION - WASTEWATER
0195 WEXFORD - PUMPING STATION - WASTEWATER
0196 WILLOW - PUMPING STATION - WASTEWATER
0197 WINDSOR PARK - PUMPING STATION - WASTEWATER
0198 WOODHAVEN - PUMPING STATION - WASTEWATER
0199 CHIEF PEGUIS - PUMPING STATION - FLOOD (PRIVATE)

0400 – 0499 Solid Waste
0400 Brady Road

0500 – 0599 Unused (future)

0600 – 0799 Water System Facilities
0600 Shoal Lake Intake
0601 Water Treatment Plant
0620 Deacon Pumping Station
0630 MacLean Pumping Station
0640 McPhillips Pumping Station
0650 Hurst Pumping Station
0660 Tache Pumping Station
0670 WILKES PUMPING STATION

0800 – 0999 Unused (future)

5.1.3 Process Area

Wastewater Treatment Plant Process Area	
A	General or process area is not applicable (WEWPCC – Area L)
B	Boilers
C	Centrate Treatment (Nitrogen Removal facility)
D	Digesters
F	<i>Phosphorous Removal Facility / Primary Sludge Fermenters / BIOLOGICAL NUTRIENT REMOVAL</i>
G	Pre-Aeration / Grit Removal / (WEWPCC – Headworks – Area H)
H	Sludge Gas (<i>Thermal Oxidizer</i>)
M	Main Building
P	Primary Clarifiers
R	Oxygen Reactors
S	Secondary Clarifiers / BioReactors / (WEWPCC – Area S)
U	<i>UV Disinfection Facility / Effluent Disinfection Facility / SEWPCC Outfall</i>
T	Was Sludge Thickening / DAF – Dissolved Air Flotation
V	WEWPCC – AREA U (Blowers, TUNNELS, Mechanical Bay)
W	Sludge Dewatering
X	Leachate Receiving Facility
Y	Hauled Wastewater Receiving Facility

Water Process Area	
A	Administration
B	Main Treatment Plant Building
C	Chemical Feed Systems
D	Deacon Booster Pump Station Modifications
E	Electrical Substation
F	Filtration
G	Standby Power Generator
H	Plant Utilities
I	Inlet Works and Raw Water Pumping
J	Hypochlorite Generation and Feed Building
K	Enclosed Bridge
L	Dewatering Cells (Freeze Thaw Pond)
M	General Plant Services / Miscellaneous (incl Fire Pump Room and Electrical Room No.1);
N	Aqueduct Bridges
O	Ozone
Q	Deacon Phosphoric and Hydrofluosilicic Acid Storage and Feed Building
P	Flocculation and DAF
R	Residuals Handling /
S	Bulk Chemical Storage and Feed Building
T	Treatment Water Storage (Clearwell)
U	Ultraviolet Light Disinfection
V	Future
W	Future
X	Disinfection
Y	Yard Piping and Valve Chamber /
Z	Forcemain

5.1.4 Discipline Codes

- G. Site
- B. Building/Architectural
- C. Civil
- S. Structural (Piling)
- M. Mechanical
- E. Electrical
- P. Process
- A. Automation / Instrumentation and Control
- D. General*
- F. Electronic Security / Emergency Exits*
- H. Piping / Plumbing / HVAC*

5.1.5 Drawing Number

Sequential number assignment is per Facility Code, *Process Area* and Discipline Code. Sequential numbers are selected and issued to achieve a unique drawing number in each instance.

5.1.6 Sheet Number

In the event that a single drawing is insufficient to describe the drawing subject, additional sheets may be used. The sheets are numbered sequentially beginning at 001.

5.1.7 Revision Number

The two character revision number is used to track the revisions made to drawings. The revision number starts at 00 and ends at 99. This practice ensures that the drawing records of the physical plant remain accurate and current.

5.1.8 Document Size

- A. 210 x 297 mm (8.5 x 11 Inches)
- B. 297 x 420 mm (11 x 17 Inches)
- C. 420 x 594 mm (17 x 22 Inches)
- D. 594 x 841 mm (22 x 34 Inches)
- E. 707 x 1000 mm (28 x 40 Inches)
- F. 841 x 1189 mm (34 x 44 Inches)

5.1.9 Drawing Number Example

Here is an example of how to use the drawing numbering system. The drawing is a Design Drawing, at a Sewage Treatment Facility (North End Treatment Plant), process area not applicable, legend sheet (general drawing), piping and instrument diagram, first drawing for this facility code and discipline code, first sheet of this series and revision 0.

Example: 1-0100A-A0001-001-00

5.2 CADD File Name

The electronic file name is identical to the standardized drawing and the extension “.DWG” as required by AutoCAD. The drawing number from the above example is used.

Example: 1-0100A-A0001-001-00.dwg

The filename is shown in the title block by using the ACAD2000 and above command RTEXT. The command RTEXT is available when the Express Tools menu is loaded.

5.3 Referencing Drawings

When referencing drawings from other documents or drawings, only the part of the drawing number from the beginning to the end of the drawing number is required. Optionally, the sheet number may be referenced as well. However, the revision number or size should not be referenced, as these could change.

Examples: 1-0100A-A0001 or 1-0100A-A0001-001