D&C-LI

CADD Specification Manual

Technical Services

City of Toronto

Version 1.3

Design & Construction – Linear Infrastructure

CADD Specification Manual

Version 1.3

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TORONTO

The Design & Construction – Linear Infrastructure CADD Specification Manual (Version 1.3) has been prepared by Data Integration Services, Technical Services, City of Toronto. For errors and/or omissions, please contact Data Integration Services. For contact information, please view the "City CADD Contacts" section of this manual.

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Introduction

The *D&C-LI CADD Specification Manual* has been prepared to assist City of Toronto Design and Construction – Linear Infrastructure (D&C-LI) staff along with consulting engineers retained by the City of Toronto when creating engineering drawings for capital projects in the Technical Services division.

This manual gives a general overview of the Design and Construction – Linear Infrastructure CADD drawing standards and specifications you will need when preparing any engineering drawing. Additional reference documents are available and will be noted, where applicable.

Version 1.3 Upgrade Notes

The following changes have been made to the Design and Construction – Linear Infrastructure (D&C-LI) CADD drawing standards and specifications for the release of Version 1.3:

Surrounds

- All drawing "**surrounds**" have been recreated at a scale of 1:1 to match drawing "surrounds" used by Design and Construction – Major Works Facilities. A scale factor of "200" is applied for "surround" placement when using "Task Manager" to ensure that the final drawing scale is 1:200.

- New "surround" levels were created to fix some issues when "surround" cells were dropped. All "surround" levels are now "by-level".

- All "**Executive Director**", "**Director**" and "**Manager**" names have been removed from drawing "surrounds". Nine (9) cells (models) have been created with the appropriate names. The appropriate name(s) can be selected through "Task Manager".

Levels

- The level structure for the "**Structures and Expressways**" component of the specification for *bridge work* was updated. The changes are listed in the table below:

Table I: Changes to "Structures & Expressways" Levels

Level Name	Change
Hidden_Linework_A_DES	*New*
Hidden_Linework_B_DES	*New*
Hidden_Linework_C_DES	*New*
Hidden_Linework_D_DES	*New*
Hidden_Linework_E_DES	*New*
Bridge_Cable_Proposed_DES	*Weight = 5*
Bridge_CL_Existing_DES	*Line Style = 4*
Bridge_CL_Proposed_DES	*Line Style = V8 centre* *Weight = 1*
Bridge_Dimension_Proposed_DES	*Weight = 1 ; Colour = 0*
Bridge_Hatching_Proposed_DES	*Weight = 2*
Bridge_Rebar_Existing_DES	*Line Style = 2*
Bridge_Rebar_Proposed_DES	*Weight = 5*
Bridge_Structural_Joints_Existing_DES	*Line Style = 2*
Bridge_Structural_Joints_Proposed_DES	*Line Style = 2*
Bridge_Title_Symbology_Proposed_DES	*Weight = 3*
Bridge_Notes_Proposed_DES	*Deleted*

Cells

- Certain "legend" and "note" cells have been recreated to ensure that when the cell is "dropped", all resulting levels are "by-level".

- Thirteen (13) new cells were created to deal with section "titles/notes" primarily for, but not limited to, "Structures and Expressways" bridge work. All cells were created at a scale of 1:1 and added to "Task Manager" under the "TEXT / SECTION NOTES" tab. The new cells are:
    1. sectno
    2. sectno1
    3. sectno2
    4. sectno3
    5. sectno4
    6. sectno5

7. sectno6
8. sectno7
9. sectno8
10. sectno9
11. sectno10
12. sectno11
13. sectno12

Task Manager & On-line Help File

- Four (4) videos have been added to the help file accessed through "Task Manger" and all associated documentation has been updated to reflect changes to the specification. The on-line help file, "Help.pdf" has been updated to include bookmarks to provide an index of available topics.

- Certain commands in "Task Manager" were placing elements with an attribute override resulting in "by-level" errors. This issue has been fixed.

- "**Existing**" utility labels and "**existing**" crossing utility labels have been moved to the appropriate discipline tabs. Specifically, "**Storm**", "**Sanitary**", "**Combined**", "**Watermain**" and "**Gas**" have now been moved to their respective tab.

- Discipline related **text** (i.e. "Storm", "Sanitary", "Combined", "Watermain", etc.) has been moved out of the "Text" tab and placed in the appropriate utility text tab.

- Some task descriptions have been modified to provide description consistency. Some tasks were missing the word "existing" or "proposed".

What This Manual Contains

Chapter 1 – Drawing Setup
This chapter covers drawing setup and settings for mapping co-ordinates, global origin, working units, drawing scale, level structure and DGNLIBs.

Chapter 2 – Project Setup
This chapter covers project setup (using the TIMS hierarchy), CADD file types, and CADD file naming conventions.

Chapter 3 – Title Blocks and Revision Notes
This chapter covers title blocks, consultant information and disclaimers, professional seals and drawing revision notes.

Chapter 4 – Drawing and Plotting
This chapter covers aspects of drawing and plotting CADD files.

Chapter 5 – Procedures for Consultants
This chapter covers the data transfer of outgoing files from the City, data incoming from consulting engineers, submission review and plotting of drawings.

Appendix A – Digital CADD Data Disclaimer
This appendix contains the standard digital data disclaimer notice regarding information supplied by the City.

Appendix B – Digital File Submission Form
This appendix contains the standard digital file submission form which must be completed and submitted with any corresponding digital files.

Appendix C – Bentley MicroStation Resources
This appendix contains a list of MicroStation resources and other files required for this version of the CADD specification.

Appendix D – Additional Documentation
This appendix contains a list of additional documents (some referred to in this manual) that may provide more information about the CADD specification and standards.

Appendix E – Digital CADD Contacts
This appendix gives a list of contacts in the City for specific issues dealing with the CADD specification.

Glossary
An alphabetical list of technical terms used in this manual relating to computer aided design and drafting and their definitions.

Chapter 1
Drawing Setup

Computer aided design and drafting (CADD) data produced by the Design & Construction – Linear Infrastructure section in the Technical Services division is subject to the standards, specifications and procedures as detailed in this manual. Additional documents mentioned should be used to supplement the information contained in this manual.

The Technical Services division creates and maintains CADD data in Bentley MicroStation design file (.dgn) format. Data files are provided and exchanged using the **MicroStation version 8 (V8)** file format.

Data originating from outside parties, such as contractors and suppliers, will be made available in its **original** format, without data conversion.

All CADD files provided to consulting engineers by the Design & Construction – Linear Infrastructure section use the "Pack and Go" utility (WinZip) in the Technical Information Management System (TIMS) software.

Recommended Software

The following software is utilized by staff in the Technical Services division for their day to day operations:

- Microsoft™ XP Professional Service Pack 3
- Microsoft™ Office XP 2007 (or better)
- Bentley™ MicroStation 8i (version 08.11.xx)
- Bentley™ InRoads 8i (version 08.11.xx)
- Bentley™ ProjectWise InterPlot Organizer (version 08.11.xx)
- Bentley™ ProjectWise InterPlot Server (version 08.11.xx)
- Adobe PDF Reader Version 6 (or better)

Seed File

All CADD files are created using City standard MicroStation seed files. These seed file are provided as part of the CADD information package. For more information on this package, see "*Chapter 5, Procedures for Consultants*" of this manual.

There are two (2) seed files available and they are listed in the following table.

Table 1: MicroStation Seed Files

Seed File Name	Usage
v8_seed_2d_1.3.dgn	2D design work
v8_seed_3d_1.3.dgn	3D design work

Global Origin

The global origin (GO) is a point in space indicating the origin of the Cartesian co-ordinate system used in design plane co-ordinates. All CADD files use a standard global origin in the seed file of **x = 0** and **y = 0** for **2D files** and **x = 0**, **y = 0** and **z = 0** for **3D files**. This places the origin (0,0) of the design plane in the bottom left corner making all co-ordinates in the design plane positive.

A change to the global origin is not permitted.

Working Units

All CADD files have units of resolution as per the City standard seed files. The table below shows the settings for working units in the seed files.

A change to the units of resolution is not permitted.

Table 2: MicroStation Working Units

Setting	Value
Master Unit	Meters (m)
Sub Unit	Centimeters (cm)
Format	MU (master units)
Resolution	2500 units per meter

Mapping Co-ordinates

The City of Toronto's operational co-ordinate system is the 3-degree Modified Transverse Mercator (MTM), Ontario Zone 10, North American Datum 1927 (NAD27). All CADD files are drawn using this co-ordinate system. The X and Y co-ordinates are related to real world grid co-ordinates.

Within the geographic vicinity of the City of Toronto, metric co-ordinate values are in the range ±4,800,000 metres (northing) along the Y-axis and ±300,000 metres (easting) along the X-axis.

City base mapping and subsequent reference files are co-ordinated to this grid system (3° MTM).

All CADD files, when referenced together, shall represent the final work in its entirety.

Table 3: City of Toronto Co-ordinate System

Setting	Value
Datum	North American Datum 1927 (NAD27)
Projection	3° Modified Transverse Mercator (MTM)
Zone	10

Drawing Scale

Linear Design Work

All CADD files should be drawn to scale using metric units. Design files are drawn exclusively to a scale of 1:1. Master design files are plotted at a scale of 1:200. Available surrounds are preset at 1:1 and must be scaled to plot at 1:200. Commands in "Task Manger" are available to perform this scaling.

The number of master files is dependent on the length and shape of the contract area.

Structures and Expressways Design Work

All CADD files should be drawn to scale using metric units. Certain areas and/or features may be shown as a "detail" with exaggerated scale. Reference files may be scaled at attachment. The scale must be clearly noted for the particular "detail" or reference file if not at the same scale as the final plot.

Master design files are plotted at a scale of 1:1. The available surround is preset to plot to 1:1. All general arrangements should be reference scaled and plotted at the same scale, as dictated by the City project manager.

The number of master files is dependent on the complexity of the project.

Level Structure

Levels (or layers) are used to separate various types of data. All elements in the design (drawing) files must be placed on their own pre-assigned level(s).

Technical Services uses a "by-level" approach in the level structure. Each level is assigned a unique symbology (colour, weight, line style, etc.) that must be adhered to.

The level structure is stored in the **V8_Levels_1.3.dgnlib** DGN library (DGNLIB). Attaching DGN libraries (DGNLIBs) is described in the next section, "*New Drawing, Making Resources Available*", of this manual.

All files in the project must adhere to the same level structure. Changes to the level structure are not permitted.

Additional Documentation

For more information about the D&C-LI level structure, please refer to the ***Design & Construction Linear Infrastructure – Version 1.3 MicroStation Levels*** reference document. Each level in the Version 1.3 graphic specification is documented with the following information:

- Level Name
- Level Number
- Level Description
- Level Line Style (by-level)
- Level Weight (by-level)
- Level Colour Number (by-level)
- Level RGB Colour Value

See "*Appendix D, Additional Documentation*" for document file name.

New Drawing

All resources required for new drawings are contained in various files, with three (3) main file types:

1. dgnlib (DGN library)
2. rsc (resource file)
3. ctb (colour table file)

The modification of any resource files is not permitted.

DGN Library (dgnlib)

The **DGN library**, or dgnlib, is a special design file that contains data that is shared throughout files and among users. These shared resources consist of things that you define and name, which are used as standards by members of a workgroup.

In general, the following data is stored in the supplied dgnlibs:

- level definitions
- cell definitions
- multi-line settings
- dimension settings
- text settings

The following table lists the dgnlibs required for Version 1.3.

Table 4: DGN Libraries (DGNLIBs)

DGN LIBRARY	CONTAINS
V8_levels_1.3.dgnlib	levels ; multi-line settings ; dimension settings ; text settings ; tasks ***This is the main dgnlib.***
V8_cells_master_1.3.dgnlib	cell models ; patterning models ; terminators
V8_cells200_1.3.dgnlib	miscellaneous models
V8_flags_1.3.dgnlib	models for InRoads resources
V8_surrounds_1.3.dgnlib	surrounds ; cover pages ; surround features
V8_utilities_1.3.dgnlib	utility models ; existing & proposed in plan & profile

Table 4: DGN Libraries (DGNLIBs) (continued)

DGN LIBRARY	CONTAINS
V8_wfittings_1.3.dgnlib	watermain fittings in plan & profile

Resource File (rsc)

The resource files, supplied with this version, contain various custom (user defined) *line styles* and *fonts*. The following table lists the resource files required for this version.

Table 5: Resource Files (rsc)

RESOURCE FILE	CONTAINS
svylstyl_1.3.rsc	engineering survey line styles
esm_udls_1.3.rsc	topographic mapping line styles
englstyl_1.3.rsc	engineering line styles (compatibility)
acadlstyl_1.3.rsc	AutoCAD line styles
v8_custom_linestyles_1.3.rsc	D&C-LI line styles
xfont_1.3.rsc	fonts

Colour Table File (ctb)

The colour table file defines the *colours* associated with the levels. The following table lists the colour table file.

Table 6: Colour Table File (ctb)

COLOUR TABLE FILE	CONTAINS
engcolor_1.3.ctb	engineering colour table

Making Resources Available

All resources should be attached (made available) through a "*WorkSpace*" defined in MicroStation. A user configuration file (ucf) should be used to load resource files that are required for the particular "*WorkSpace*".

A user configuration file (ucf) for this version, **v8_dcli_1.3.ucf**, is provided as part of the information package provided on the CD.

Chapter 2
Project Setup

Folder Structure

Project folders identify storage areas common for all project files. The folder structure may also be used to apply security to a single or group of files (drawings).

Project folders are created automatically using WinZip to unpack files created by the "Pack and Go" utility in the *Technical Information Management System (TIMS)* software. WinZip extraction should point to the **root directory (c:\)** for folders and files to be extracted.

Files are to remain in the originating directories and referenced into the master file. Reference files should be attached with the "Save Relative Path" check box checked in the "Attach Reference" form (the check box is near the bottom of the form).

The next figure shows a TIMS screen capture of a project directory structure.

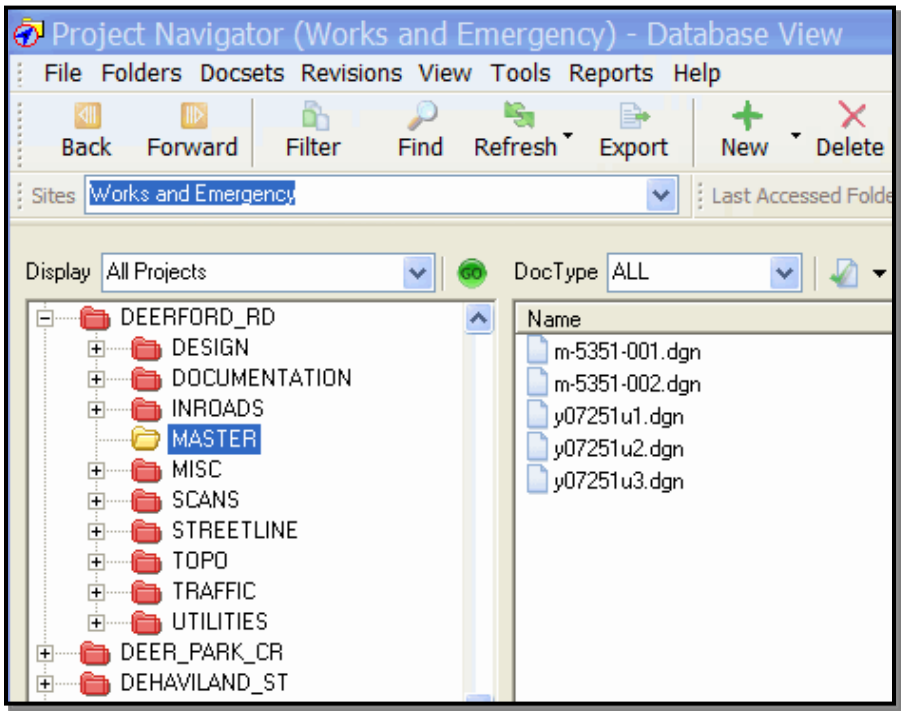

Figure 1: Project Directory Structure in TIMS

Additional Documentation

For more information about TIMS, please refer to the following reference documents:

- ***TIMS Overview – City Data Manager***
- ***TIMS Structure and Attribution***
- ***TIMS Indexing Protocols***
- ***TIMS Attributing for As-Builts***

See "*Appendix D, Additional Documentation*" for document file names.

CADD File Type

Master file and **reference** file are the two (2) CADD file types used for *linear* design work and *structures and expressways* work. There are some differences between linear design work and structures and expressways work in terms of the master and reference files. These differences will be noted when required.

Master File

A master file contains a surround title block, legend, north arrow and key map. The project street name or structure and limits with applicable information about the project must be included in the title block.

All graphic data for the project area will be drawn in real size that is at a scale of 1:1. Design work will be completed in separate MicroStation design files and referenced into the master file. Reference scaling may be required for structures and expressways work. *At no time should any of these files be merged.*

The consulting engineer will be provided with one master MicroStation design file for each project. For example — y11254u1.dgn. Additional copies of this design file will have to be created depending on the length, complexity and/or layout of each particular project. Sequential numbers are used for this purpose. For example — y11254u**2**.dgn ; y11254u**3**.dgn ; y11254u**4**.dgn ; etc.

Only D&C-LI staff is authorized to create original master file drawing numbers.

Preliminary file names are a combination of year of project, project number, work type and sequential number (as discussed above). Both linear design work and structures and expressways design work use the same syntax for preliminary master file names.

The table on the next page gives an example of this file naming syntax for delivered preliminary master files.

Table 7: Delivered (Preliminary) Master File Name Syntax

Filename: y11245u1.dgn	Description
y11254u1.dgn	Required "**y**" (year) character
y**11**254u1.dgn	Last 2 digits of year project added to program
y11**254**u1.dgn	Project number (starts at 001 for each project year) assigned by City staff
y11254**u**1.dgn	Designator where: "**u**" is for utility work "**p**" is for road work "**s**" is for structures and expressways work "**m**" is for miscellaneous master sheets
y11254u**1**.dgn	Sequential number for multiple sheets (as discussed)

Master File Name Change

Once the design is ready to proceed to the tender stage, the master file name is changed. The name change is different, depending on whether the project is linear design work or structures and expressways design work. The next sections will detail these master file name changes.

Master File Name Change – Linear

For **linear design** work, the change of name will include a unique *street code identifier*, referred to as the "*lfn_id*". The change of name also includes a *sequential number* based on construction projects previously completed on the street, a useful history of past construction projects for that street. This sequential number can only be assigned by D&C-LI administrative staff and does not necessarily start at "001".

The next table outlines the syntax for the master file name change for linear design work.

Table 8: Linear Design Master File Name Change for Tender

Filename: U-6907-001.dgn	**Description**
U-6907-001.dgn	Designator where: "**U**" is for utility work "**P**" is for road work "**M**" is for miscellaneous master sheets
U-6907-001.dgn	Dash "-" separator character between designator and "lfn_id"
U-**6907**-001.dgn	"lfn_id" (unique street code identifier) for Tinder Crescent
U-6907-001.dgn	Dash "-" separator character between "lfn_id" and sequential number
U-6907-**001**.dgn	Next available sequential number for projects on this street, assigned by authorized D&C-LI staff

The following table shows examples of master file naming at both the preliminary and tender stage for linear design work.

Table 9: Master Files Names for Linear Design Work

Filename	**Example**	**Description**
<*job#*>p?.dgn	y11254p1.dgn y11254p2.dgn	**Preliminary** (pre-tender) master file name for road work. (?=sequential number)
P-*lfn_id*-???.dgn	P-6907-001.dgn P-6907-002.dgn	**Final** contract master file name for road work. (???=sequential number)
<*job#*>u?.dgn	y11254u1.dgn y11254u2.dgn	**Preliminary** (pre-tender) master file name for utility work. (?=sequential number)
U-*lfn_id*-???.dgn	U-6907-001.dgn U-6907-002.dgn	**Final** contract master file name for utility work. (???=sequential number)
<*job#*>m?.dgn	y11254m1.dgn y11254m2.dgn	**Preliminary** (pre-tender) master file name for miscellaneous master sheets. (?=sequential number)
M-*lfn_id*-???.dgn	M-6907-001.dgn M-6907-002.dgn	**Final** contract master file name for miscellaneous master sheets. (???=sequential number)

Master File Name Change – Structures and Expressways

For **structures and expressways design** work, the name change will include a unique *structural identifier* and a unique *bridge number*. A *sequential number*, similar to that for linear design work, is also part of the name change. The next table outlines the syntax for the master file name change.

Table 10: Structures & Expressways Design Master File Name Change for Tender

Filename: 123-S-456-001.dgn	**Description**
123-S-456-001.dgn	Structural identifier
123-S-456-001.dgn	Dash "-" separator character between structural identifier and designator
123-**S**-456-001.dgn	Designator where: "**S**" is for structures and expressways work
123-S-456-001.dgn	Dash "-" separator character between designator and bridge number
123-S-**456**-001.dgn	Bridge number
123-S-456-001.dgn	Dash "-" separator character between bridge number and sequential number
123-S-456-**001**.dgn	Next available sequential number, assigned by authorized D&C-LI staff

The following table shows examples of master file naming at both the preliminary and tender stage for structures and expressways design work.

Table 11: Master File Names for Structures & Expressways Design Work

Filename	**Example**	**Description**
<*job#*>s?.dgn	y11254s1.dgn y11254s2.dgn	**Preliminary** (pre-tender) master file name for structures and expressways work. (?=sequential number)
si-S-*bn*-???.dgn	123-S-456-001.dgn 123-S-456-002.dgn	**Final** contract master file name for structures and expressways work. (si=structural identifier) (bn= bridge number) (???=sequential number)

Reference File

Generally, there is only one (1) reference file from the various types for each project, regardless of the number of master files required. When attached to a master file, the required area in the reference file will be visible based on the location of the master file.

The naming convention for reference files is indicated in the following tables. Tables are broken into the following categories:

- Design (proposed features) reference files
- InRoads (proposed features) reference files
- Property line (existing features) reference files
- Topographic (existing features) reference files
- Utilities (existing features) reference files
- Miscellaneous reference files

Reference files listed in the following tables are valid for both *linear design* work and *structures and expressways design* work.

The "*Logical Name*" column in the tables contains the logical name that should be used when design files are attached as references to the master file(s).

In the tables on the following pages, an example file name is given, based on the job number (<*job#*>) from the previous section, namely "y11254".

Table 12: DESIGN (Proposed) Reference Files

General File Name	Logical Name	Description & Example File Name
<*job#*>arch.dgn	arch	Architectural design for structural work. Example: **y11254arch.dgn**
<*job#*>comb.dgn	comb	Combined sewer design (plan view). Example: **y11254comb.dgn**
<*job#*>combda.dgn	combda	Combined sewer drainage areas design (plan view). Example: **y11254combda.dgn**
<*job#*>combpf.dgn	combpf	Combined sewer design profile. Example: **y11254combpf.dgn**
<*job#*>det.dgn	det	Details and sections. Example: **y11254det.dgn**
<*job#*>elec.dgn	elec	Electrical design for structural work (plan view). Example: **y11254elec.dgn**
<*job#*>eupl.dgn	eupl	TTC electrical design including pole layout, conduits & handwells, communication ducts & handwells, splicing chambers, etc. (plan view). Example: **y11254eupl.dgn**
<*job#*>pd.dgn	pd	Road and sidewalk design (plan view). Example: **y11254pd.dgn**
<*job#*>pf.dgn	pf	Road and sidewalk design profile. Example: **y11254pf.dgn**
<*job#*>pvm.dgn	pvm	Permanent pavement marking design (plan view). Example: **y11254pvm.dgn**
<*job#*>rem.dgn	rem	Removals for large scale projects (plan view). Example: **y11254rem.dgn**
<*job#*>row.dgn	row	TTC track allowance design (plan view). Example: **y11254row.dgn**
<*job#*>san.dgn	san	Sanitary sewer design (plan view). Example: **y11254san.dgn**
<*job#*>sanda.dgn	sanda	Sanitary sewer drainage areas design (plan view). Example: **y11254sanda.dgn**
<*job#*>sanpf.dgn	sanpf	Sanitary sewer design profile. Example: **y11254sanpf.dgn**

Table 12: DESIGN (Proposed) Reference Files (continued)

General File Name	Logical Name	Description & Example File Name
<*job#*>sel.dgn	sel	Street lighting design including lighting & pole layout, conduit runs, handwells, etc. (plan view). Example: **y11254sel.dgn**
<*job#*>sh.dgn	sh	Shapes and patterning for design (plan view). Example: **y11254sh.dgn**
<*job#*>ssc.dgn	ssc	Streetscaping and landscaping design (plan view). Example: **y11254ssc.dgn**
<*job#*>stm.dgn	stm	Storm sewer design (plan view). Example: **y11254stm.dgn**
<*job#*>stmda.dgn	stmda	Storm sewer drainage areas design (plan view). Example: **y11254stmda.dgn**
<*job#*>stmpf.dgn	stmpf	Storm sewer design profile. Example: **y11254stmpf.dgn**
<*job#*>tcs.dgn	tcs	Traffic control signals design including pole layout, conduits & handwells, communication ducts & handwells, splicing chambers, etc. (plan view). Example: **y11254tcs.dgn**
<*job#*>tsp.dgn	tsp	Traffic staging plan design (plan view). Example: **y11254tsp.dgn**
<*job#*>ud.dgn	ud	Third party utility design (plan view). Example: **y11254ud.dgn**
<*job#*>wat.dgn	wat	Watermain design (plan view). Example: **y11254wat.dgn**
<*job#*>watpf.dgn	watpf	Watermain design profile. Example: **y11254watpf.dgn**

Table 13: INROADS (Proposed) Reference Files

General File Name	Logical Name	Description & Example File Name
<*job#*>inr.dgn	inr	InRoads working file. Example: **y11254inr.dgn**
<*job#*>inrxs.dgn	inrxs	InRoads working profiles and cross sections. Example: **y11254inrxs.dgn**

Table 14: PROPERTY LINE (Existing) Reference Files

Filename	Logical Name	Description & Example File Name
<*job#*>psl.dgn	psl	Property line and addresses. Example: **y11254psl.dgn**

Table 15: TOPOGRAPHIC (Existing) Reference Files

Filename	Logical Name	Description & Example File Name
<*job#*>asb.dgn	asb	Design file updated by surveys, as-built notes or field inspection. Example: **y11254asb.dgn**
<*job#*>elv.dgn	elv	Elevations from survey field pickup. Example: **y11254elv.dgn**
<*job#*>top.dgn	top	ESM topographic mapping. Example: **y11254top.dgn**
<*job#*>con.dgn	con	ESM contours. (Available on request). Example: **y11254con.dgn**
<*job#*>tfc.dgn	tfc	Topographic field checks and adjustments. Example: **y11254tfc.dgn**
<*job#*>track.dgn	track	Existing TTC track allowance and devices from survey pickup. Example: **y11254track.dgn**
<*job#*>svy2d.dgn	svy	Survey field pickup (2D). Example: **y11254svy2d.dgn** **See note below*
<*job#*>svy.dgn	3d	Survey field pickup (3D). Example: **y11254svy.dgn** **See note below*

*Any supplemental engineering survey files completed in the future should not be merged with previous engineering survey files and should be attached as reference files only. The naming convention for additional survey files would be to add sequential numbers to the existing survey file name. For example, if additional 2D survey data was available (based on the table example), the file name for the additional survey data might be something like y11254syv2d_2.dgn.

Table 16: UTILITIES (Existing) Reference Files

General File Name	Logical Name	Description & Example File Name
<*job#*>sue.dgn	sue	Subsurface underground evaluation used to supplement "ugs" file. Example: **y11254sue.dgn**
<*job#*>ugs.dgn	ugs	Existing underground utility information from TPUCC data files, utility circulation or "sue" file. Example: **y11254ugs.dgn**

Table 17: MISCELLANEOUS Reference Files

General File Name	Logical Name	Description & Example File Name
<*job#*>jpg.dgn		Digital picture files. Example: **y11254jpg.dgn**

Cover Sheet

For large projects a cover sheet, or sheets, may be required. Generally, there should be a key map showing locations of master files and administrative information about the project.

For *linear design* work, cover sheets follow a similar naming convention as for master files (discussed earlier in this section). The only difference is a change in the project type field. For cover sheets the designator is "**m**" or "**M**" (miscellaneous master sheet). All cover sheets should start at one (1), or at the next number if an "m" or "M" drawing already exists. This number is incremented sequentially if multiple cover sheets are required.

For *structures and expressways* work, cover sheets continue using the "**s**" or "**S**" designator as for all other master sheets. A sequential number is increased and appended for multi-sheet cover pages. This sequential number does not necessarily start at "1".

Final drawing numbers will be assigned by D&C-LI staff at 90% completion.

Cover sheets must be included in the "Digital Submission Form".

Base Plan Data

Base plan data (ESM, DMOG, CUMAP, etc.) is available for use in linear design work. Designers in D&C-LI can obtain required base mapping through the "*CapitalWorks Basemap Template*" application developed and maintained by DIS. External consultants will be provided base mapping as part of the deliverables provided in the information package.

Information copied from base mapping into design files must be transcribed to the correct D&C-LI level structure.

Additional Documentation

For more information about obtaining and preparing base plan data, please refer to the ***Base Plan Preparation*** reference document.

See "*Appendix D, Additional Documentation*" for document file name.

CADD File Naming Convention

The City file naming convention used must be applied throughout the entire project.

File Renaming

Renaming previously created digital files must be avoided. The exception to this rule is when the master file(s) will be renamed prior to the tendering stage. This change must be authorized only by the respective district Design CADD Plans Administrative Supervisor or authorized staff in Design & Construction – Linear Infrastructure.

Chapter 3
Title Blocks and Revisions

Title Block

All master design files must have a title block. A standardized title block is created by placing the appropriate "surround" cell from the **v8_surrounds_1.3.dgnlib** cell DGN library (dgnlib). The blank fields in the standard surround cell, generally "tagged" text, must be filled in or edited accordingly. A blank title block is shown in Figure 2 below.

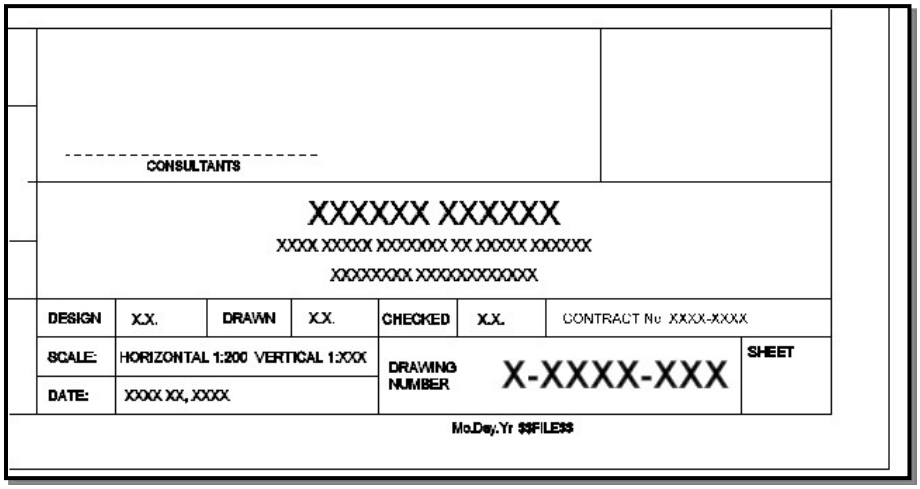

Figure 2: Blank Title Block

Main Information

The "**Main Information**" area contains the following "tagged" text fields to fill in:

- project street name or structure name
- limits (from | to) shown on the particular sheet
- project work type

Figure 3 (next page) shows the "Main Information" area field in the title block.

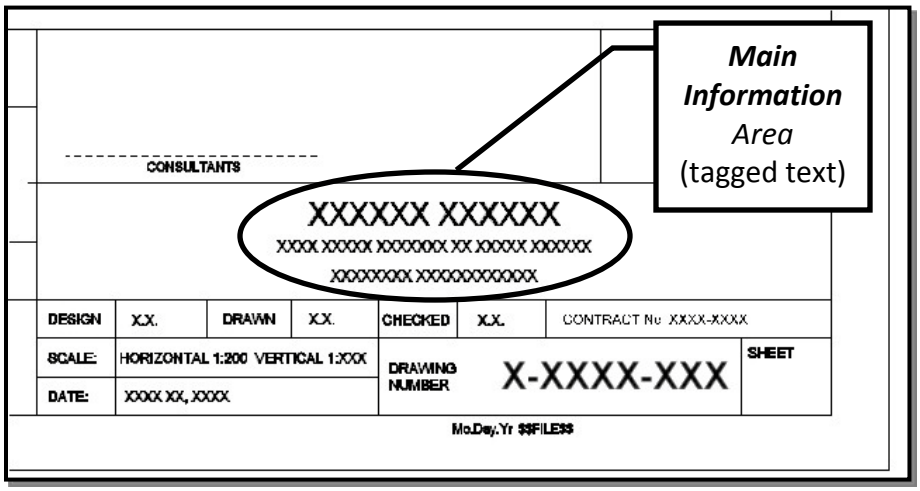

Figure 3: Blank Title Block Showing "Main Information" Area

Date

The "**Date**" area field has the date of the last change made and is shown using the "*month day, year*" format (for example — **July 11, 2011**). All submitted drawings will include the latest up-to-date "Date". The "Date" is a "tagged" text field

Figure 4 shows the "Date" area field in the title block.

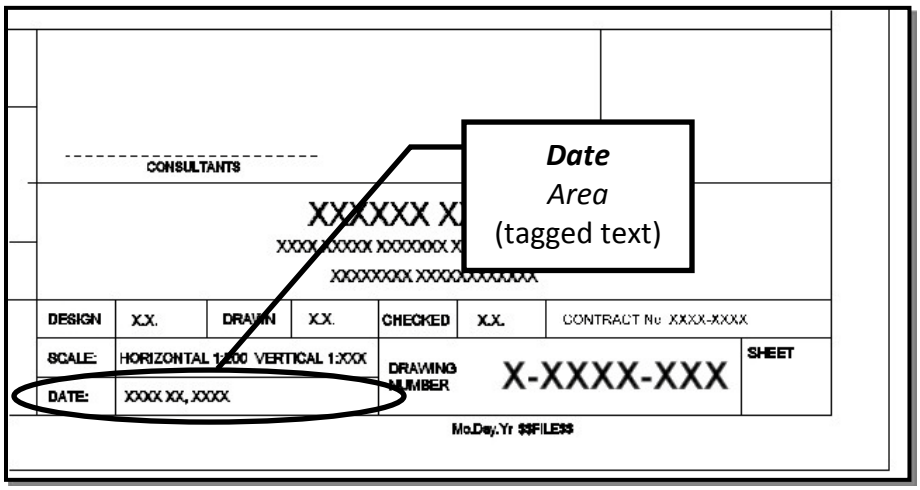

Figure 4: Blank Title Block Showing "Date" Area

Drawing Number

The "**Drawing Number**" area "tagged" text field must be populated with the *correct* drawing number. The drawing number naming convention for the title block drawing number is described in detail in the previous chapter, "*Chapter 2, Drawing Setup*" of this manual.

Figure 5 shows the "Drawing Number" area field in the title block.

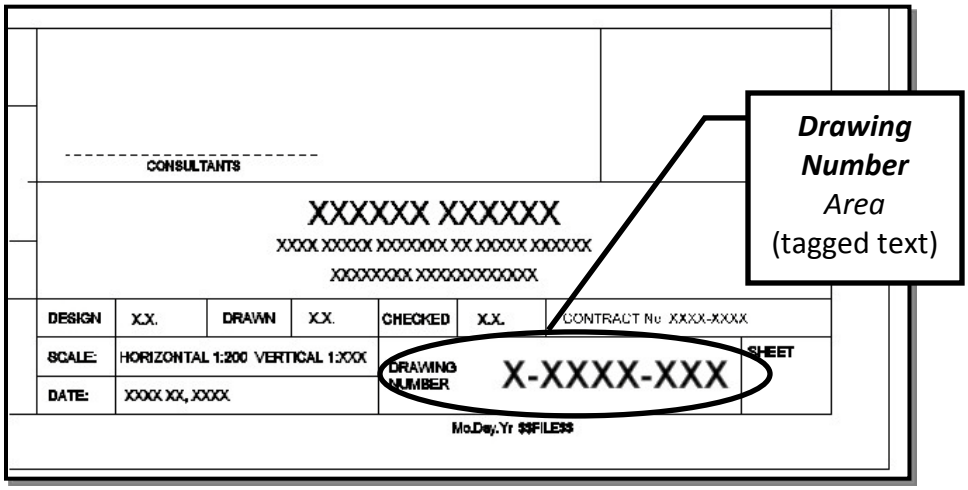

Figure 5: Blank Title Block Showing "Drawing Number" Area

Scale – Linear Design Work

For linear work the "**Scale**" area field is shown in **horizontal** for plan view and **vertical** for profile view. All Design & Construction – Linear Infrastructure plans will be drawn to the following scales:

- Horizontal 1 : 200
- Vertical 1 : 100

If only "horizontal" information is shown on the drawing, then the "vertical" component can be excluded (i.e. deleted). If only "vertical" information is shown on the drawing, then the "horizontal" component can be excluded (i.e. deleted). The "Scale" area field is not a "tagged" text field.

Figure 6 (next page) shows the "Scale" area field in the title block of the linear design surround.

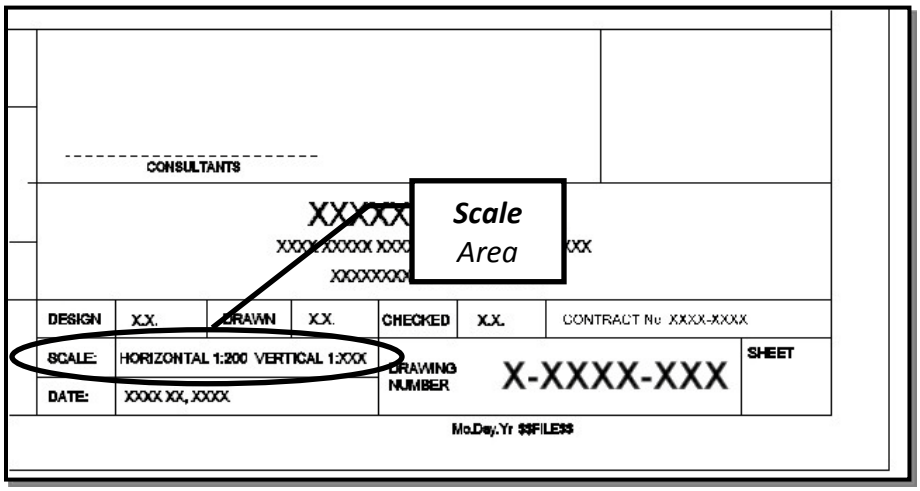

Figure 6: (LI) Blank Title Block Showing "Scale" Area

Scale – Structures and Expressways Design Work

For structures and expressways work all "details" should have the scale noted unambiguously. All scaled reference attachments should have the scale noted. Final plot scales are at the discretion of the City's project manager.

The "**Scale**" area field in the surround for Structures and Expressways differs slightly from the one pictured in Figure 6. If only one scale is used throughout the drawing, then this scale can be noted in the area field. If the drawing shows multiple details at different scales, then "**as noted**" should be placed in the "Scale" area field. See Figure 7.

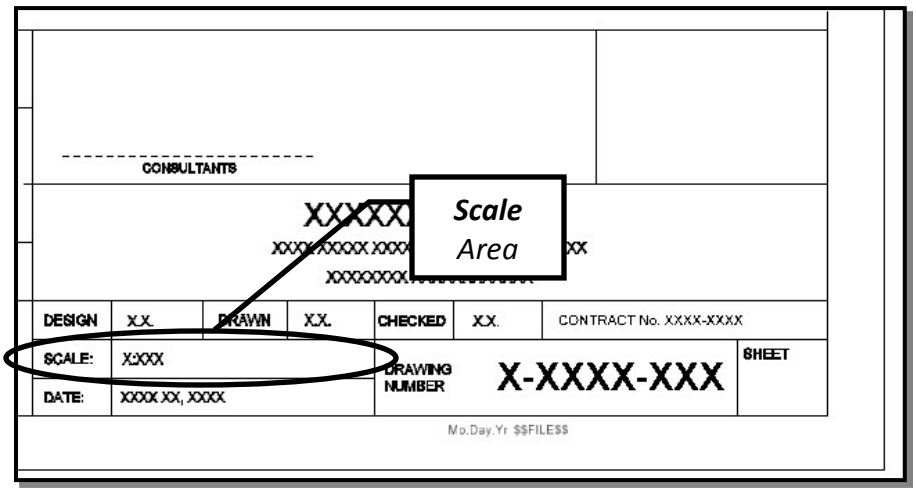

Figure 7: (S&E) Blank Title Block Showing "Scale" Area

Design, Drawn and Checked

The "**Design, Drawn and Checked**" area fields must include the names of any individuals who performed these tasks. Use the first initial with full last name whenever possible. The "Design, Drawn and Checked" area is a "tagged" text field.

Figure 8 shows the "Design, Drawn and Checked" area fields in the title block.

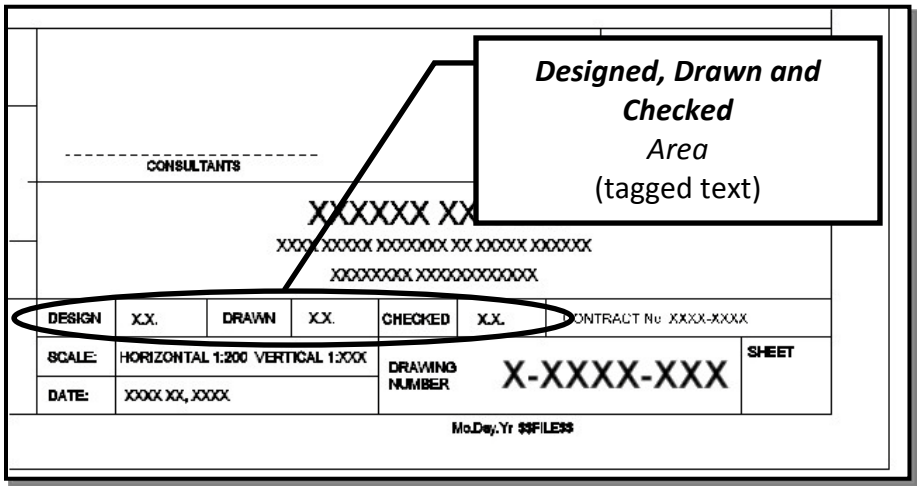

Figure 8: Blank Title Block Showing "Design, Drawn and Checked" Area

Contract Number

The "**Contract Number**" area field is only filled in for final tendered contract drawings. There may be more than one contract number for a given project (depending on the type of work). Contract numbers should be obtained from the D&C-LI district supervisor in the project area. The "Contract Number" area is a "tagged" text field.

Figure 9 (next page) shows the "Contract Number" area field in the title block.

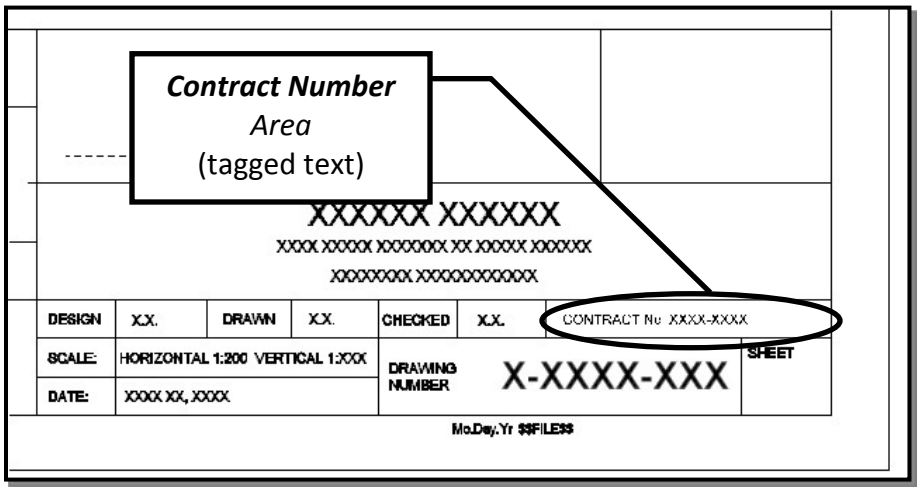

Figure 9: Blank Title Block Showing "Contract Number" Area

Sheet

The "**Sheet**" area field is for tracking multiple sheets for the same project. This is an optional field but should be used for larger projects. The "Sheet" area is a "tagged" text field.

For linear design work, something like "*1 of xx*" should be used to indicate the number of sheets.

For structures and expressways work, a discipline identifier and sequential number can be used. For example, if electrical work is featured on the drawings, something like "*E1, E2, E3, etc.*" can be used. Discipline identifier naming is not enforced as long as there is no ambiguity.

Figure 10 (next page) shows the "Sheet" area field in the title block.

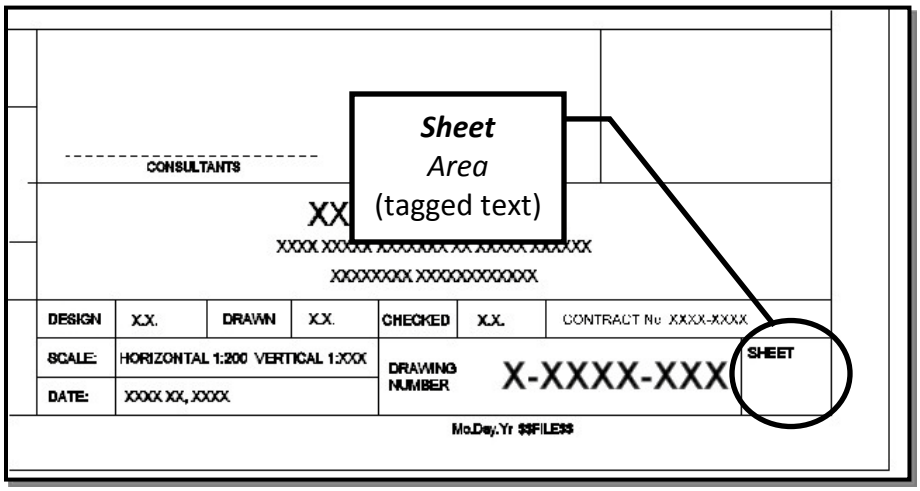

Figure 10: Blank Title Block Showing "Sheet" Area

Professional Seals

Drawings that require a professional signature will be sealed, signed and dated by a professional engineer licensed to practice in the province of Ontario. Apply seal, sign and date by hand.

Signature and date must be applied by hand. The seal and date must be clearly legible.

Figure 11 shows the "Professional Seals" area.

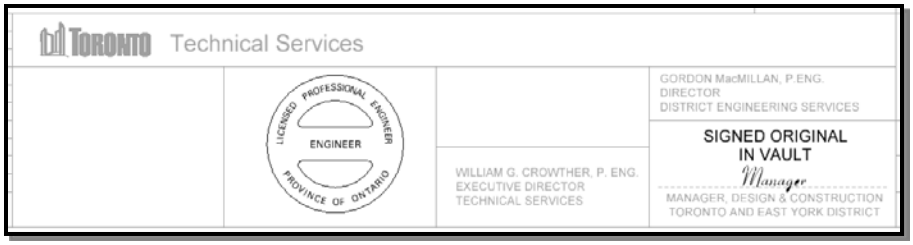

Figure 11: Engineer's Professional Seal

Engineering Consultant's Information and Disclaimer

The engineering consultant seal area of the title block shall be filled in if the design is produced by the consulting engineer retained by the City.

Revisions

All revisions to any CADD drawing will be made to the respective CADD digital file. Hand drawn modifications are not permitted.

Revision Notes

The revision notes box must have the fields filled in after the revision to the CADD digital drawing is completed.

The following table lists the fields and gives a brief description of the contents.

Table 18: Revision Notes Fields

Field Name	Description
No.	Sequential number beginning at the number one (1)
DATE	Current date in month-day-year format (06-25-2011)
REVISIONS	Short description of the revision made
INITIAL	Initials of the individual that completed the revision
SIGNED	Signature of individual that completed the revision

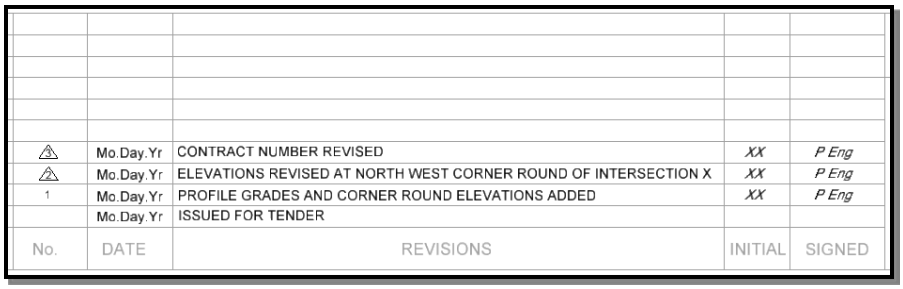

Figure 12: Revision Notes

A revision symbol will be placed in the body of the drawing indicating the location to which the title block revision note applies to. This revision symbol will be shown as a triangle with the corresponding revision number inside the triangle.

Chapter 4
Drawing and Plotting

Drawing

Task Manager

The MicroStation "**Task Manager**" is a tool to facilitate automatic drawing functions associated with design within D&C-LI. It is part of the available MicroStation tools.

All linear features such as multi-lines, cells, models, text settings, dimension settings, etc. have been incorporated into the "Task Manager" to enable design staff to automatically place design features and to manage various CADD settings associated with design. The "Task Manager" has been configured to allow element placement without having to set any graphic attributes (level, line style, colour, weight, etc.). The designer need only to select the required task and "Task Manager" will automatically place elements with the correct settings and attributes.

It is recommended that the MicroStation "Task Manager" be used for all design work. Comprehensive on-line help is available through the "Task Manager" detailing all tasks and showing some sample drawings.

Additional Documentation

For more information about the "Task Manager" and its use for D&C-LI design, please refer to the following reference documents:

- ***City of Toronto Task Manager***
- ***City of Toronto Design & Construction – Linear Infrastructure MicroStation Linear Tasks (Tree Structure) – v1.3***

See "*Appendix D, Additional Documentation*" for document file names.

Cells and Cell Libraries

Standard cells are grouped in various DGN libraries (cell libraries). Cell libraries have a "dgnlib" extension and can be used as libraries or models.

The consulting engineer will attach the appropriate cell library, choose an active cell, and place it with in the design drawing. Only cells contained in the approved DGN libraries should be used.

Shared cells are not to be used. Cells should not be dropped (broken into individual graphic components). The exception to dropping cells is for "surround" cells which require the title block information to be modified for each project.

The following table lists the available cell DGN libraries delivered in the information package.

Table 19: Cell DGN Libraries

DGN Library	Contains
v8_cells_master_1.3.dgnlib	cell models ; patterning models ; terminators
v8_cells200_1.3.dgnlib	miscellaneous models
v8_flags_1.3.dgnlib	models for InRoads resources
v8_surrounds_1.3.dgnlib	surrounds ; cover pages ; surround features
v8_utilities_1.3.dgnlib	utility models ; existing & proposed in plan & profile
v8_wfittings_1.3.dgnlib	watermain fittings in plan & profile

Additional Documentation

For more information about the D&C-LI cells, please refer to the ***Design & Construction Linear Infrastructure – Version 1.3 MicroStation Cells*** reference document. All cells from the cell DGN libraries are shown in the document.

See "*Appendix D, Additional Documentation*" for document file name.

Orientation

Some notes on orientation follow.

- Orient plans so that stationing progresses from *right to left*. This is south to north.

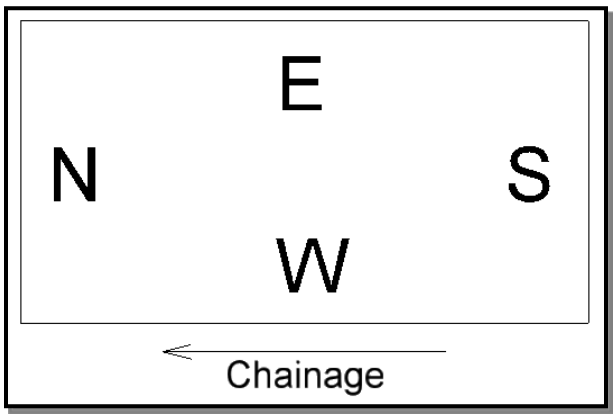

Figure 13: Orientation from South to North

- Orient plans so that stationing progresses from *left to right*. This is west to east.

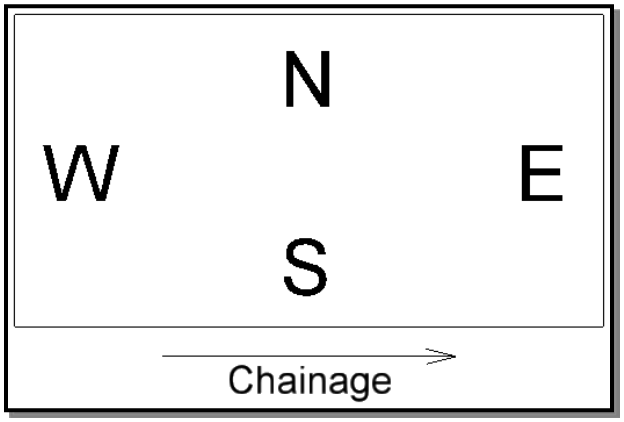

Figure 14: Orientation from West to East

- Orient plans so that north points up the sheet, wherever possible.

- Insert a standard north arrow in the top right corner, unless included in the key plan.

- If true geographic north cannot be used, establish and insert a project north arrow.

- Orient views in the same direction.
- Orient drawings, notes, and dimensions so that they can be read from the bottom right hand side of the sheet.
- Rotate MicroStation views so as to orient drawings horizontally or vertically.
- Do not move, rotate or scale plan view CADD data for "linear" work.
- Move, scale, and rotate referenced border file as required.

Scale

Elements placed within a MicroStation design file should be drawn at a scale of 1:1 (no scaling). This is the case for all linear design work.

For structures and expressways design work, "detail" information should be drawn at 1:1 and then reference scaled accordingly. The scale of the "detail" must be noted unambiguously.

Line Weight

Line weight differences must be clearly visible on both full and half size plots. The following table is to be used as a guide.

Table 20: MicroStation Line Weight to Metric Width Chart

MicroStation Line Weight (wt=)	Metric Width (mm)
0	0.13
1	0.18
2	0.20
3	0.25
4	0.30
5	0.35
6	0.40
7	0.45
8	0.50
9	0.60
10	0.70
11	0.80
12	1.00
13	1.20
14	1.40
15	1.50
16	1.60
17	1.80
18	2.00
19	2.25
20	3.00

For information about the recommended line weights and corresponding metric width when plotted in full size, please see the "*Plotting*" section in this chapter.

Line Styles

Line styles are stored in resource (rsc) files and should be loaded through a MicroStation "*WorkSpace*" (as previously discussed). The following table lists the resource line style files delivered in the information package.

Table 21: Line Style Resource Files

RESOURCE FILE	CONTAINS
svylstyl_1.3.rsc	engineering survey line styles
esm_udls_1.3.rsc	topographic mapping line styles
englstyl_1.3.rsc	engineering line styles (compatibility)
acadlstyl_1.3.rsc	AutoCAD line styles
v8_custom_linestyles_1.3.rsc	D&C-LI line styles

Most custom line styles developed by the City for design work will be located in the **v8_custom_linestyles_1.3.rsc** file.

The creation of new line styles is not permitted.

Additional Documentation

For more information about the D&C-LI line styles, please refer to the ***Design & Construction Linear Infrastructure – Version 1.3 MicroStation Line Styles*** reference document. All line styles from the resource files are shown in the document.

See "*Appendix D, Additional Documentation*" for document file name.

Patterns and Hatching

Apply any necessary patterns to detail on small scale drawings. Use the standard patterns as delivered with MicroStation or as provided in the **v8_levels_1.3.dgnlib** DGN library.

Using MicroStation "Task Manager" will simplify drafting operations by setting the correct pattern or hatching based on the selected task. It is up to the designer to select the correct tool for patterns and hatching, depending on the type of element(s) that is to be patterned or hatched.

Text Style and Size

Fill text nodes, data fields and tags with text using uppercase letters only. Use standard fonts as delivered with MicroStation or as provided in the **v8_levels_1.3.dgnlib** DGN library.

All text attributes are pre-set in the MicroStation "Task Manager".

Additional Documentation

For more information about the D&C-LI text styles, please refer to the ***Design & Construction Linear Infrastructure – Version 1.3 MicroStation Text Styles*** reference document. Text styles from the DGN library are shown in the document.

See "*Appendix D, Additional Documentation*" for document file name.

Drafting Abbreviations

Use abbreviations only when space restricts the spelling of the full word.

Match Lines

Where partial working areas are shown, display sheet limits by including match lines. Coordinate match lines with adjacent sheets by including the drawing name along the match line and outside of the working area.

Key Plan

The key plan will be used to show the extent of the working area and spatially relate the project to the surrounding area.

Some things to note about key plans:

- The key plan is to be located in the top right corner of the surround.
- The key plan is to include a north arrow.

- The key plan is to highlight the project street and have a least two (2) major arterial roads visible.
- Outline the extent of work covered by each sheet and pattern the working area accordingly.
- Show the location of shut-off valves and hydrants (for watermain projects only).
- Key plans must match the D&C-LI level structure.

Leader Lines

Leader lines should have a short horizontal bar leading in and leading out from the text. Use filled arrowheads.

Leader lines and auto dimensioning is pre-set in the MicroStation "Task Manager". The **v8_levels_1.3.dgnlib** DGN library contains these settings.

Multi-Lines

Multi-lines are pre-set in the MicroStation "Task Manager". These settings reside in the **v8_levels_1.3.dgnlib** DGN library.

Additional Documentation

For more information about the D&C-LI multi line styles, please refer to the ***Design & Construction Linear Infrastructure – Version 1.3 MicroStation Multi Line Styles*** reference document. Multi line styles from the DGN library are shown in the document.

See "*Appendix D, Additional Documentation*" for document file name.

Dimensions

All dimensions should be shown in *millimetres*. Geodetic elevations, chainages, alignments and site drawings should be shown in *metres*.

Dimensions settings are contained in the **v8_levels_1.3.dgnlib** DGN library.

Using MicroStation "Task Manager" will simplify drafting operations by setting the correct dimension style based on the selected task. It is up to the designer to select the correct tool for the dimensioning, depending on where or type of dimension to be placed (eg. linear, angular, etc.).

Some things to note about dimensioning:

- Use automatic dimensioning — real size length.
- Use filled arrowheads for dimension terminators.
- Stagger and offset dimension lines from each other starting with minor dimensions placed close to the working area, then major dimensions and then overall dimension lines.
- Use three (3) decimal places for proposed features (182.137) and two (2) decimal places for existing features (182.14).

Additional Documentation

For more information about the D&C-LI dimension styles, please refer to the ***Design & Construction Linear Infrastructure – Version 1.3 MicroStation Dimension Styles*** reference document. Dimension styles from the DGN library are shown in the document.

See "*Appendix D, Additional Documentation*" for document file name.

InRoads

"**InRoads**" is a vertical application for road design from Bentley Systems Incorporated that is used in conjunction with MicroStation.

Features in InRoads will be generated using the level names and symbology provided.

The following table shows files that must be delivered by the consulting engineer on completion of the project.

Table 22: Required InRoads Files

File Type	Extension	Description	Required
Geometry Projects	alg	All related alignments	yes
Surfaces	dtm	All digital terrain models, existing and proposed	yes
Template Libraries	itl	All template files	yes
Roadway Design	ird	All roadway files	yes
Reports	(various)	All supporting reports	yes
InRoads Projects	rwk prj	All InRoads projects	optional

A copy of the City "**XIN file**" for InRoads version 08.11.xx is available on request. For more information about using InRoads for design work, please contact the D&C-LI district supervisor in the project area.

Additional Documentation

For more information about setting up InRoads, please refer to the ***Setting up of InRoads Project Defaults Versions XM, 8iSS1 and (8i in V7 Mode)*** reference document.

See "*Appendix D, Additional Documentation*" for document file name.

Specification Checker

To ensure that design CADD files adhere to the graphic specification defined by this version, a specification checker is available for this purpose. The specification checker, developed by Data Integration Services, is a VBA macro launched from MicroStation. Single files or multiple files can be checked with a report generated to indicate any discrepancies. The specification checker can be launched from "Task Manager".

The following table lists the files required for the specification checker.

Table 23: Files Required for Specification Checker

File Name	Purpose
Design_Spec_Checker_v6.mvba	MicroStation VBA macro application.
spec_checker_file_v1.3_local.txt	Settings file stipulating DGNLIBs to be scanned.

All generated CADD files should be scanned by the specification checker before submission.

Additional Documentation

For more information about the D&C-LI specification checker, please refer to the ***Technical Services CADD Graphic Specification Checker for Bentley MicroStation Design Files*** user guide. All aspects of the specification checker are covered in this document.

See "*Appendix D, Additional Documentation*" for document file name.

Plotting

The plotting environment includes the modified Bentley InterPlot (Iplot) pen tables for large format and tabloid size devices. The following table lists files available for the plotting environment.

Table 24: Files Available for Iplot Plotting Environment

File	Description
plot_des.pen	Pen table for large format plotting
bw.ctb	Colour table for black and white plotting

Sheet Size

Surround cells include outer selection points which can be used to place a fence block for Bentley InterPlot (Iplot). When these selection points are used and Bentley InterPlot (Iplot) activated, the settings file will attach the default attributes to produce plots on 24 inch paper at a scale of 1:200. Sheet sizes of 24 inch x 36 inch, 24 inch x 48 inch or 24 inch x 60 inch will determine the length of each plot.

Each set of plots for a project must contain the same size plots.

The default is 36 inch sheets which is comparable to a 22 inch x 34 inch ANSI-D sheet.

Drawing Path and File Name

City Bentley InterPlot (Iplot) users will have a plot label added automatically by the Iplot server at the end of each plot using the following label string format:

$qpr_reqname submitted by $qpr_orig_user from $qpr_host on $date at $time

Plot Material

The project check plot submission will be plotted on 20 pound minimum bond paper.

For the final submission, plots will be plotted on 4-mil thick mylar with a matte finish. Plotting should be "*mirrored*".

Master File Plot

Each project is to have its master file(s) with reference attachments plotted.

The plot limit will be set to the surround outer neat line.

For Bentley InterPlot (Iplot) users, the colour table **bw.ctb** and pen table **plot_des.pen** should be used (see Table 24 on previous page).

For non-Iplot users, the next table shows the recommended line weights and corresponding metric width, when plotted in full size.

Table 25: Recommended Line Weights when Plotted in Full Size

MicroStation Line Weight (wt=)	Metric Width (mm)
0	0.13
1	0.18
3	0.25
4	0.35
7	0.50
10	0.70
15	1.50

Chapter 5
Procedures for Consultants

At the project start-up meeting, the consulting engineer will receive all files required to complete the assignment on CD-ROM.

The CD will contain the following:

- D&C-LI CADD Specification Manual prepared by the Technical Services division for use on D&C-LI sewer, watermain and road construction projects.
- Supporting documents referred to in the D&C-LI CADD Specification Manual.
- City MicroStation files required for the project.

Data Format and Conversion

All computer aided design and drafting (CADD) data is provided in Bentley MicroStation version 8 (V8) design file (dgn) format. Any conversion of digital data is not allowed, and may be rejected by the City.

The City is not responsible for any inaccuracies, discrepancies or missing information derived from data that is converted outside of the Bentley MicroStation format.

Data Transfer — Data Outgoing from the City

All CADD data transfers outgoing from the City will be completed by staff in the Data Integration Services (DIS) unit.

Data will be transferred and delivered on CD-ROM or DVD-ROM.

Design & Construction – Linear Infrastructure Disclaimer

All data file transfers come with a City CADD disclaimer. The full text of the disclaimer is shown in "*Appendix A, Digital CADD Data Disclaimer*" of this manual.

Digital Data Submitted to the City

The consulting engineer is required to submit a CADD digital file at each contract milestone as specified in the project documentation. This includes a full submission at the time when the project reaches any of the following milestones, if any such milestones are identified in the contract specification:

- 100% design review
- Issue for tender
- Issue for construction
- As-built

Additional milestones may be applicable. All file submissions will be delivered to the project engineer, who in turn forwards the digital file to the district CADD administrator.

All CADD data submitted must be delivered in Bentley MicroStation version 8 (V8) design file (dgn) format. CADD data in formats other than MicroStation will not be accepted.

Data shall be submitted on CD-ROM or DVD-ROM.

Any milestone submission will include a complete set of all digital files prepared by the consulting engineer, including any files that have not been modified since any previous submissions, as long as such files are still significant to the project as a whole.

A "**Digital Submission Form**" must be completed by the consultant for each submission made. A sample of a completed form may be found in "*Appendix B, Digital File Submission Form*" of this manual.

Submission Review

The submission of all digital files will be reviewed by City staff to ensure compliance with the standards and specifications identified in this manual.

Files submitted will be checked with a MicroStation specification checker macro developed for Design & Construction – Linear Infrastructure. Submissions failing to meet any of the standards and specifications will be returned to the Design & Construction – Linear Infrastructure unit project engineer along with a listing of all the non-compliant items which will need to be resolved by the consulting engineer.

Plotting of Drawings

The City utilizes Bentley InterPlot (Iplot) to produce all hard copy plots of CADD data. For more information about plotting, please refer to "*Chapter 4, Drawing and Plotting*" of this manual.

For details regarding submission of drawings in hard copy format, such as frequency and quantities, refer to the specific requirements for your project, or contact the D&C-LI district supervisor in the project area.

Appendix A
Digital CADD Data Disclaimer

Digital Data Disclaimer:

Information supplied by the City of Toronto, on portable media or transmitted by electronic means, is provided for convenience only. While efforts are made to see that the information contained hereon is accurate and up-to-date;

- neither the City of Toronto nor any of its employees, officers or servants shall be liable for damages arising from any errors or inaccuracies therein, nor from any misuse, misinterpretation or misapplication thereof; and

- the consultant accepts full responsibility for verifying the accuracy and completeness of the data supplied hereon and assumes full responsibility for any risk associated with the use, misuse, misinterpretation or misapplication thereof; and

- the said information is not included under the seals or certificates, if any, on any accompanying plans or printed material; and

- in the event of inconsistencies between said information and hard copy data, the hard copy data shall govern.

The City of Toronto considers any information that is not part of the public domain, such as parts of drawings that identify non-public areas to be confidential. Any confidential information is transmitted subject to the terms of your contract with the City, or subject to the non-disclosure agreement executed with the City for this purpose.

Appendix B
Digital File Submission Form

TORONTO Technical Services
District Engineering Services

Digital File Submission Form

Contract: SAMPLE

Disks (#) or Other: DISK 1 of 3

Project Description: DONINO COURT FROM DONINO AVENUE TO 60M E OF DONINO AVENUE – LOCAL ROAD RECONSTRUCTION /WATERMAIN

SAMPLE

Submitted By: CONSULTANT

File Particulars

Hard Copy Plan Number	Digital File Name	Type of File	Description
P-5408-001	P-5408-001	MASTER	PLAN SURROUND
	Y07273PD	REFERENCE	PAVEMENT DESIGN
	Y07273SD	REFERENCE	SEWER DESIGN

PLEASE COMPLETE THE ABOVE TABLE.
List all hard copy plan numbers for this project and the corresponding digital files which comprise each individual drawing.

(Also include all reference files, if applicable)

Appendix C
Bentley MicroStation Resources

File Locations

For the table below in the "*Folder Location*" column:

- Folder **A** refers to c:\f\projects\microstation\v8_resources_version_1_3\
- Folder **B** refers to c:\f\projects\microstation\v8_resources_version_1_3\models
- Folder **C** refers to c:\f\projects\microstation\v8_resources_version_1_3\help

Table 26: MicroStation File Locations

File Name	Folder Location	Description
v8_seed_2d_1.3.dgn	A	Main 2D seed file.
v8_seed_3d_1.3.dgn	A	Main 3D seed file.
v8_dcli_1.3.ucf	A	MicroStation user configuration file.
acadlstyl_1.3.rsc	A	AutoCAD line styles.
englstyl_1.3.rsc	A	Engineering line styles.
esm_udls_1.3.rsc	A	Topographic mapping line styles.
svylstyl_1.3.rsc	A	Engineering survey line styles.
v8_custom_linestyles_1.3.rsc	A	D&C-LI custom line styles.
xfont_1.3.rsc	A	Text fonts.
engcolor_1.3.ctb	A	Engineering colour table.
v8_levels_1.3.dgnlib	A	Levels ; multi-line settings ; dimension settings ; text settings ; tasks
plot_des.pen	A	Iplot pen table for large format plotting
bw.ctb	A	Colour table for black and white plotting
v8_cells_master_1.3.dgnlib	B	Cell models ; patterning models ; terminators.
v8_cells200_1.3.dgnlib	B	Miscellaneous models.
v8_flags_1.3.dgnlib	B	Models for InRoads resources.
v8_surrounds_1.3.dgnlib	B	Surrounds ; cover pages ; surround features.
v8_utilities_1.3.dgnlib	B	Utility models ; existing &proposed in plan & profile.
v8_wfittings_1.3.dgnlib	B	Watermain fitting in plan & profile.
Design_Spec_Checker_v6.mvba	A	Specification checker VBA macro.
spec_checker_file_v1.3_local.txt	A	Settings file for specification checker macro.

Table 26: MicroStation File Locations (continued)

File Name	Folder Location	Description
help.pdf	C	On-line help file for "Task Manager".
Tasks_1.3.html	C	On-line help file for "Task Manager".

Appendix D
Additional Documentation

Additional documentation is available to supplement this manual. This documentation can be found in the following folder location:

- c:\f\projects\microstation\v8_resources_version_1_3\help

The following table lists the supplementary documentation.

Table 27: Available Additional Documentation for Version 1.2

Document Title	Document File Name	Document Contents
Design & Construction Linear Infrastructure Version 1.3 MicroStation Levels	LI_Level_Names_V103000.pdf	List of all D&C-LI level names and associated graphic attributes.
Design & Construction Linear Infrastructure Version 1.3 MicroStation Cells	LI_Cells_V103000.pdf	List of all D&C-LI cells and their graphic representation.
Design & Construction Linear Infrastructure Version 1.3 MicroStation Line Styles	LI_LineStyles_V103000.pdf	List of all D&C-LI line styles and their graphic representation.
Design & Construction Linear Infrastructure Version 1.3 MicroStation Multi Line Styles	LI_MultiLineStyles_V103000.pdf	List of all D&C-LI multi line styles and their graphic representation.
Design & Construction Linear Infrastructure Version 1.3 MicroStation Text Styles	LI_TextStyles_V103000.pdf	List of all D&C-LI text styles and their graphic representation.
Design & Construction Linear Infrastructure Version 1.3 MicroStation Dimension Styles	LI_DimensionStyles_V103000.pdf	List of all D&C-LI dimension styles and their graphic representation.
City of Toronto Task Manager	City_of_Toronto_Task_Manager.pdf	User guide for the MicroStation Task Manager

Table 27: Available Additional Documentation for Version 1.2 (continued)

Document Title	Document File Name	Document Contents
City of Toronto Design & Construction – Linear Infrastructure MicroStation Linear Tasks (Tree Structure) – v1.3	Tasks_1.3.html	List of all tasks associated with "Task Manager" and their hierarchy. *This is also an on-line help file.*
Technical Services CADD Graphic Specification Checker for Bentley MicroStation Design Files	TS_Specification_Checker_User_Guide .pdf	User guide for the specification checker.
TIMS Overview – City Data Manager	TIMS_File_Extractions.pdf	Brief overview of the TIMS file structure and consultant "Pack and Go" package.
TIMS Structure and Attribution	TIMS_Attribution_Structure.pdf	Brief overview of the TIMS attribution structure.
TIMS Indexing Protocols	TIMS_Indexing_Protocols.pdf	Comprehensive overview of many aspects of TIMS.
TIMS Attributing for As-Builts	TIMS_AsBuilt.pdf	Brief overview of attributing "as-built" files in TIMS.
Base Plan Preparation	Base_Plan_Prepration.pdf	Brief overview for D&C-LI staff of base plan preparation.
Setting up of InRoads Project Defaults Versions XM, 8iSS1 and (8i in V7 Mode)	Setting_Up_InRoads_DCLI.pdf	Brief overview of InRoads setup and configuration for D&C-LI design work.
<no title>	Miscellaneous_Help_DCLI.pdf	Various examples of labels, lines styles, design notes and other information. *This is also an on-line help file.*
<no title>	Cover_Sheet_Example.pdf	Example cover sheet.
<no title>	Detail_Sheet_Example.pdf	Example detail sheet.
<no title>	Watermain_Design_Example.pdf	Example watermain design drawing.
<no title>	TTC_Road_Resurfacing_Example.pdf	Example TTC road resurfacing drawing.

Appendix E
City CADD Contacts

CADD Digital File and Specification Manual Contacts

Design & Construction – Linear Infrastructure CADD Administrators

For district specific digital data, contact the respective supervisor in the Design & Construction – Linear Infrastructure office your project is located in. The following table lists the district Design/CADD/Plans Administration Supervisors.

Table 28: District Design/CADD/Plans Administration Supervisors

Name	District	Phone Number	E-mail Address
Tasha Cheng	Etobicoke/York	416-338-1185	tdcheng@toronto.ca
Carmine Scopelliti	North York	416-395-1113	cscopell@toronto.ca
Tony Rodrigues	Scarborough	416-396-7140	trodrig@toronto.ca
Fausto Robalino	Toronto/East York	416-392-8855	frobali@toronto.ca
Bill Tsomokos	TTC/Special Projects	416-338-5535	btsomok@toronto.ca

CADD Specification Manual and Related Documentation

For errors and omissions or other questions relating to CADD documentation and/or general information about the CADD graphic specification, the following table lists the contact in Data Integration Services.

Table 29: Contact for CADD Documentation

Name	Title	Phone Number	E-mail Address
Ryk Karczuga	Supervisor, Graphic Data	416-392-9067	rkarczu@toronto.ca

TIMS and Consultant Information Package

For information about TIMS or the consultant information package, the following table lists the contact in Data Integration Services.

Table 30: Contact for TIMS Administration

Name	Title	Phone Number	E-mail Address
Phil Fishenden	Supervisor, Design/CADD/Plans Administration	416-392-9313	pfishen@toronto.ca

Survey and Utility Mapping Services

The following tables list miscellaneous contacts in Survey and Utility Mapping Services.

Table 31: Contact for Utility Mapping (DMOG and CUMAP)

Name	Title	Phone Number	E-mail Address
Mike Kolominsky	Supervisor, Utility Mapping	416-338-5023	mkolomi1@toronto.ca

Table 32: Contact for Parcel Mapping

Name	Title	Phone Number	E-mail Address
John House	Supervisor, Property Records	416-392-8338	jhouse@toronto.ca

Table 33: Contact for Engineering Survey Operations

Name	Title	Phone Number	E-mail Address
Craig Morris	Supervisor, Engineering Survey	416-392-0355	cmorris@toronto.ca

Table 34: Contact for Engineering Survey Graphic Specification

Name	Title	Phone Number	E-mail Address
Ryk Karczuga	Supervisor, Graphic Data	416-392-9067	rkarczu@toronto.ca

Geospatial Competency Centre

The following table lists the contact for Enterprise Stereographic Model (ESM) topographic mapping. This mapping product is no longer under the jurisdiction of Technical Services.

Table 35: Contact for Topographic (ESM) Mapping

Name	Title	Phone Number	E-mail Address
Desmond Christopher	Supervisor, Street & Parcel Mapping	416-392-1831	dchristo@toronto.ca

Design & Construction – Major Works Facilities

For information on trunk sewers and/or transmission watermains, contact the Supervisor, CADD Services in the Design & Construction – Major Works Facilities. The following table lists the contact.

Table 36: Contact for Trunk Sewers and Transmission Watermains

Name	Title	Phone Number	E-mail Address
Chris Zolcinski	Supervisor, CADD Services	416-397-5358	czolcin@toronto.ca

Transportation Services

For information on intersection traffic control devices contact the Supervisor, Traffic Drafting in Transportation Services. The following table lists the contact.

Table 37: Contact for Transportation Services

Name	Title	Phone Number	E-mail Address
Edith Matay-Swan	Supervisor, Traffic Drafting	416-338-5393	emataysw@toronto.ca

Glossary

American National Standards Institute (ANSI) – A private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the United States.

Bentley Systems Incorporated or **Bentley –** The developer and vendor of CADD software (MicroStation, InRoads, etc.) used for design by the *Technical Services* division of the City of Toronto.

By-Level – MicroStation methodology where symbology is explicitly defined for each level. Only that symbology can be used for the level.

CADD – Computer Aided Design and Drafting.

CADD Administrators – These are contact persons in the *Technical Services* division, *Design and Construction – Linear Infrastructure* section.

CapitalWorks Basemap Template – A *Technical Services* web application for downloading City base mapping (topo, utilities, legal, etc.).

City – The *City of Toronto*—the corporation—and will be referred to as the *City* for the purposes of this document.

Consultant – Consulting engineering firm retained by, or on behalf of the city. This reference may also include municipal staff depending on the context.

Consulting Engineer – A professional engineer, firm of engineers or a developer retained by the City, skilled and experienced in municipal work and land development projects and registered with the Professional Engineers of Ontario.

Contract Administrator – The individual or firm responsible for overseeing the construction of the works and representing the city's interest.

CTB or **.CTB –** Bentley Systems Incorporated MicroStation colour table file used to define a colour palette for design files.

CUMAP – Combined Utility Mapping. This mapping product contains water and sewer information (and some miscellaneous features) for areas outside the former City of Toronto.

D&C-LI or **DCLI –** *Design & Construction – Linear Infrastructure* section in the *Technical Services* division of the City of Toronto. This section was previously called *District Engineering Services* (DES).

D&C-MWF – *Design & Construction – Major Works Facilities* section in the *Technical Services* division of the City of Toronto.

DES – *District Engineering Services* section in the *Technical Services* division renamed to *Design & Construction – Linear Infrastructure* (see D&C-LI).

DGN or **.DGN –** Bentley Systems Incorporated MicroStation design (drawing) file.

DGNLIB or **.DGNLIB –** Bentley Systems Incorporated MicroStation design library file.

DIS – *Data Integration Services* unit in the *Survey & Utility Mapping Services* section in the *Technical Services* division of the City of Toronto.

DMOG – Digital Map Owners Group. This mapping product contains water, sewer and other utility information (cable, telephone, gas, etc.) for the former City of Toronto.

Engineer – The licensed individual or firm responsible for the design of the works or their designate. Also may be referred to as the design engineer.

ESM – Enterprise Stereo Model. This is the topographic mapping data set.

InRoads – A CADD road design vertical application from Bentley Systems Incorporated.

InterPlot or **Iplot –** Bentley Systems Incorporated printing and plotting application for CADD designs.

lfn_id – A unique number assigned to each street in the City of Toronto.

Linear Design Work – CADD design for watermain, sewer and road projects.

LI – Linear Infrastructure.

MicroStation – A CADD product from Bentley Systems Incorporated.

New project – CADD data based upon standards and specifications included in this manual.

S&E – Structures and Expressways.

Structures and Expressways Design Work – CADD design for bridges and expressways and associated structures.

TIMS – Technical Information Management System software from Ingenium Group.

TPUCC – Toronto Public Utilities Coordinating Committee.

TTC – Toronto Transit Commission.

V7 – Version 7 of Bentley MicroStation. This is an obsolete MicroStation CADD engine using integers for calculations and is no longer used by the *Technical Services* division.

V8 – Version 8 of Bentley MicroStation. This is the current MicroStation CADD engine using floating point for calculations and is the format used by the *Technical Services* division.

ZIP – PkZip compressed archive file

City of Toronto
Technical Services

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