Once editing is complete and printed to a pdf, the cover page can be inserted into the manual and then saved as a complete pdf for distribution.
Also, the cell and Pcode libraries included in this manual will require updating at such time that the libraries are updated.
This page should be deleted prior to printing the completed manual for distribution.

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## CADD Standards Committee

### Background

In February of 2008 the CADD (Computer Aided Drafting and Design) Standards Committee was formed by soliciting membership from Manitoba Infrastructure and Transportation **(MIT)** Highway Planning and Design Branch **(HPD)**, Construction Support Services **(CSS)** and Regional Operations Offices. The committee was directed to evaluate the existing Standard Engineering Drawings and propose corrections and or changes to these documents. The committee was also directed to develop a CADD Standards and Drawing Preparation Manual, and also create a process of continuous improvement whereby those standards would be updated on a regular basis to reflect changes in software, hardware and design processes and requirements.

### Mission

It is the mission of the CADD Standards Committee to create, coordinate and implement uniform standards, procedures and guidelines to make better use of CADD and related programs in the completion of drawings for Manitoba Infrastructure and Transportation Projects.

Suggestions for changes, corrections or improvements to this manual are welcome. Correspondence should be presented in writing to a CADD Standards Committee representative. The CADD Standards Committee representative is responsible to bring all suggestions to the attention of the committee for review and action. Each CADD Standards Committee representative is also responsible to ensure that items available for review are distributed to all interested parties and inform users of the committee's activities. This committee meets on an annual basis to discuss these suggestions and review new standards and procedures for CADD users.

## CADD Standards Committee members

Eric Christiansen – Director, Highway Planning and Design Branch
Derek Durant – Senior Functional Design Engineer, Highway Planning and Design Branch
Vacant – Senior Geographic Technologist, Highway Planning and Design Branch
Manny Bairos – Senior Geomatics & Civil Design Technologist, Construction Support Services
Silvester Sodja – Drafting Technician, Highway Planning and Design Branch
Bill Jago – Regional Design Technologist, Region 1 Steinbach
Prokopis Papadimitropoulos – Regional Technical Services Engineer, Region 2 Portage la Prairie
Shane Zapotochny – Regional Design & Drafting Technologist, Region 2 Portage la Prairie
Jamie Ramsey – Regional Design Technologist, Region 3 Brandon
Corey Smigelsky – Senior Regional Design Technologist, Region 4 Dauphin

The CADD Standards Committee would like to acknowledge previous committee members for their contribution to the completion of the above mentioned documents. Their experience, expertise and overall commitment to the project have been invaluable.

Dan Miller – Senior Geographic Technologist, Highway Planning and Design Branch
Len Mikolash – Draftsman, Highway Planning and Design Branch
Keith Schneider – Regional Design Technologist, Region 2 Portage la Prairie

## CADD Standards and Plans Preparation Manual For Roadway Projects

This manual is intended to establish uniform standards and procedures to use when preparing the various drawings for MIT roadway projects.

The standards given in this manual are primarily intended to improve CADD drawing quality and readability. To be effective, an engineering drawing must be clear, concise, complete, accurate, easily understood, and functional. It is essentially a graphic set of instructions.

MIT produces CADD files in Bentley System's MicroStation (dgn) format only. In support of this software, this manual will focus on MicroStation operations and procedures only. MIT also uses Bentley System's GEOPAK software that works within the MicroStation environment, for earthwork design requirements.

This manual is not intended for use as a textbook or a substitute for engineering knowledge, experience, or judgment. It establishes uniform standards and procedures to use when preparing project plans and drawings. The content of this manual includes techniques and procedures specific to the drawings produced for MIT.
Many of the instructions given here are subject to amendment or change as conditions, experience and technology warrant.

This manual is intended to be used in conjunction with the **MIT Standard Engineering Drawing** examples. For the purpose of this manual they will be referred to as the Standard Engineering Drawings. In the event of contradictions between this manual and the Standard Engineering Drawings, the Standard Engineering Drawings will prevail.

The Project Manager will advise CADD personnel as to what drawings will be required for the project. These drawings could be in the form of a simple **Sketch Plan (S.P.)** to a complete **Detailed Design Drawing (DDD)** and Profile package.

A scoping meeting should be held to determine the CADD requirements and design strategy for a project. Attendees at this meeting should vary depending on the specific requirements of the project. The meeting should typically include the Project Manager, Regional Design Engineer, Regional Design Technologist, Design & Drafting Technician, Regional Project Engineer, and Survey Crew Chief.
Generally drawings are prepared in three phases: Preliminary, Final and Approved.

## 1.1 PRELIMINARY DRAWINGS

Preliminary drawings are developed in consultation with the Project Manager and are compiled according to the specific details and complexity of the project.
Horizontal alignment, existing ground lines, tentative design gradelines, soils logs, and any other basic information required for the purpose of completing the drawings should be gathered.
The Project Manager should also have a Geometric Design Criteria report **(GDC)** approved, which outlines design criteria for the specific area of road to be constructed. **An explanation of the GDC can be found in the Design Management Guide.**

A consensus should be reached at the scoping meeting regarding the amount of survey detail that is required to complete the project. Depending on the complexity of the project, CADD personnel will complete a set of preliminary drawings that may be altered and refined several times. With input from the Regional Management team, a set of final drawings will be developed.

CADD personnel shall ensure all details conform to the Standard Engineering Drawing examples for the specific sheet title being produced and should review the MIT Drafting Standards Quality Assurance Checklists prior to plotting for Regional review. Examples of the Standard Engineering Drawings and the Checklists are available to be printed out for reference at:
***T:\ HPD/ CADD/ CADD STANDARDS/***

## 1.2 FINAL DRAWINGS

Final drawings are to be complete in all details, with the appropriate **Title Blocks** (cells) attached. Except where noted on the Standard Engineering Drawings, Title Blocks are **NOT** to be altered. No extraneous information is to be added to the title block area. This strict control on the title blocks is to facilitate MIT's standardization of CADD drawings.
Final drawings are not sealed or signed and are still considered "Preliminary". If prints of these drawings are distributed to any outside agency, they should be stamped with the MIT cell **"PRELIMINARY for discussion purposes only"** with a date of issue included in the Title Block. An example of the **"PRELIMINARY"** cell is in **APPENDIX "A".**

Final drawings shall have all reference files detached and all extraneous drawing information deleted from the final CADD file; if necessary a working copy can be retained in the working folder.
They should be plotted on paper, so they can be checked for accuracy, and approved by the Regional Design Team. Files are to be moved to the **FINAL** folder on the MIT server and saved such that when opened the entire first page of the drawing is displayed. CADD personnel shall ensure that the path on the Title Block matches the path on the server and notify the Regional Design Tech or the Design Engineer upon their completion.

After Regional review, various MIT head office branches will be notified (electronically) via a **Quality Management Head Office Sign Off Sheet (QMS).** The drawings will be reviewed for completeness and engineering accuracy. The Project Manager or the Regional Design Engineer will be notified of any required corrections or changes.

## 1.3 APPROVED DRAWINGS

Once the QMS approvals have been received, the drawings will be plotted full size on mylar. They will be sealed by the Engineer in charge and signed by all appropriate parties. These mylared drawings will be used to produce hard copies for tendering and construction purposes. There can be no changes made to these drawings after they have been sealed and signed. More on approvals and mylars can be found in Section 5 of this manual.

## 1.4 CADD DIARY

A text file containing CADD information should be created during the project set-up stage and maintained throughout the life of the project. This file is to be located in the Project ID folder of the project on the MIT CADD database.
The CADD Diary File is used for storing and clarifying CADD information that is specific to the project and is available to anyone who may have to "take charge" of the project prior to completion of the drawings and or design. This file should be created with Microsoft Word and should contain information related to all pertinent files used in creating the drawings and if applicable the earthwork design. An example of information recorded into this file is shown below.

- Network Path on the MIT server, starting with the Region (R1, R2, R3, etc.).
- The Project Manager and CADD personnel assigned to the project.
- Design Information, any pertinent CADD information, e.g. information provided by PM such as GDC, Structure Design, design exceptions, special instructions from PM or Senior Managers, include date new information is provided.
- GEOPAK and MicroStation files, x-sections, reports as they are created, e.g. alignments (roadlines, profiles), superelevation reports, staking reports, volume files, etc.

Project drawings and files become permanent records for future reference, so keeping files organized is extremely important. All miscellaneous working files should be stored in the **WORKING** folder and recorded in the Diary if they are significant to the project. Any temporary files no longer needed for CADD work should be deleted from the project folders.
Section 6 of this manual describes project creation and file naming procedures.

## 1.5 CONTROL SECTIONS

Highways in Manitoba with the designations of TCH, PTH, PR and PA, are divided and identified by control section numbers. In general, control section segments for a West/East highway would start at the Saskatchewan/Manitoba provincial boundary (010) and increase eastward. On a North/South highway, the sections start at the USA/Manitoba boundary (010) and increase northward. An example of a control section number would be 03001010HU (HA/HB). Whereas;
03 = Region, 001 = Highway, 010 = Section, HU = Highway Undivided, HA = Highway Ahead direction (East/North bound), HB = Highway Back direction (West/South bound).
In general, the chainage/stationing for MIT surveys run from West to East and South to North.

MIT's Highway Planning and Design Branch produce and update the provincial control section maps; they can be plotted from the Manitoba Gov't. Intranet site.
For more information on data related to Control Sections, contact the Lead GIS Technologist at HPD.

## 1.6 CONTROL AREA

A Control Area is the area between the edge of the right-of-way of a limited access highway and the control line in relation to that highway, as set out in The Highways Protection Act.
The purpose of this Act is to control the erection of structures (including signs and crossings) along certain highways; with the objective of protecting the interests of the public on the highways, promoting the safety of persons using the highways and generally furthering the amenities of travel on the highways.

The Act designated structure-free control areas adjacent to the rights-of-way of these Provincial Trunk Highways. These controlled areas vary from 38.1 m (125 ft) to 76.2 m (250 ft) adjacent to Provincial Trunk Highway rights-of-way. This area increases to 152.4 m (500 ft), 304.8 m (1000 ft) and 457.2 m (1500 ft) radii control circles at intersections.
Permission may be granted to individuals completing a permit and obtaining approval from the Highway Traffic Board.
For more information see the **Standard Permit Information Package and the New Advertising Sign Policy Booklet** available in the MIT offices. Also see Section 4.23 PERMIT APPLICATIONS for information on completing the associated Sketch Plans.

## 1.7 ELECTRONIC FILE MANAGEMENT

### ProjectWise

In 2015, MIT began using ProjectWise to control access to and manage documents stored in various locations on the MIT network.

### ProjectWise background

ProjectWise is a Bentley product that provides security for MIT documents by controlling access to documents based on a user's Network Managed Environment (ME) domain username and group membership.
ProjectWise is an easy to use tool for transferring documents to and from a network storage location.
It has the functionality to communicate with field inspectors using an IPad, IPhone or other handheld device.

All file editing is done on a local copy of the file that is first checked out from the ProjectWise file server and checked back in after completion.
One unique feature is that ProjectWise will only update the files on the server, if the files were modified. Thereby speeding up the process of updating server files.

ProjectWise with Descartes, will stream large LiDAR or Image files to the local workstation, this alone will be very time saving.
ProjectWise also provides tools to group documents together into Document Sets.

### ME Users and Groups

ProjectWise users are defined within the Managed Environment (ME) network profile system by special user classes. Most users are grouped into their respective branch or region and can also be grouped by user class. One or more regional or branch managers are given manager class privileges' for their specific region or branch, which allow them to set permissions for their general users.

Each user must first be given an ME login. Each user will then be added to their branch or regional group(s). These groups will have predefined permissions already set. The users and groups are set up by the ME Administrator not the ProjectWise Manager.

### ProjectWise Development

ProjectWise (originally TeamMate) was acquired by Bentley Systems in 1996 from Opti Inter-Consult. In 1998 Bentley renamed it to ProjectWise and it is now used by 25 of 50 USA Departments of Transportation.
Being a Bentley product, it will interact very well with all other Bentley products, AutoCAD and GIS products as well.

ProjectWise is the only project collaboration and information software developed explicitly for the design and construction of architecture, engineering, construction, and operations (AECO) infrastructure projects.

The 'check-out' 'check-in', as well as other user options are accessed from the ProjectWise Explorer user interface. For more information on the ProjectWise Explorer, see the ProjectWise Manuals on file in the MIT offices.
For any issues with ProjectWise or files stored in ProjectWise on the MIT servers, users should contact their region or branch ProjectWise manager.

## 1.8 FILE BACKUP AND RESTORATION

### File Backup

Data stored on computers can be lost or damaged due to user error, viruses, software failure, hardware failure or damage caused to computer hardware by fire, theft or vandalism. The most valuable part of any computer system is the user's data. The expense in recreating the user's data can be far greater than the expense of replacing the hardware and application software. In the event of a disaster it is important to be able to restore a user's working environment as quickly as possible to allow the continuation of work.

Backups of all MIT data are done electronically and automatically. The use of tapes and other hardware are no longer required.
As noted in the previous section, ProjectWise is the program MIT uses to control access to and manage documents stored in various locations on the MIT network.

It is important that when working on files checked out of the MIT server database, that they are checked back in on a daily basis. This ensures that the files get backed up and also that if another person has to work on a file they will be able to work on the most recent version. This will also ensure that in the event of a hardware failure of a user's computer, the user will not have lost a significant amount of work. The user will be able to request a file be restored as noted below.

### Restoring Files

Restoration can consist of specific files or complete directories including sub directories. File restoration is done in coordination with the Regional CADD office; the regional ProjectWise (data) manager, usually the Regional Design Technologist should be contacted to initiate the restoration. An electronic Service Order Request **(eSOR)** is required to facilitate the restoration process.

## 2.1 SURVEY INFORMATION

Complete and accurate survey information is an essential element of any project. Prior to the start of the project drawings and highway designs, a survey of the project area will have been completed or will be completed. This section applies to all surveys done for MIT.
All survey files given to CADD personnel shall be stored with the project on the MIT server for the purpose of saving the survey data for future reference. Survey personnel may submit the data in a variety of ways, e.g. emailed Zip files, on CD, on flash drive or they may upload them directly to the appropriate project folder on the server. An electronic **Survey Diary** will also be submitted with the data; this document will have detailed survey information and should also be stored in the applicable folder on the MIT server.

## 2.2 RESPONSIBILITIES

The Project Manager is responsible for all work done on a project. This includes coordinating with the Survey Crew Chief and CADD team as to the scope and requirements of the project. The responsibilities for obtaining terrain data are the responsibility of the Survey Crew Chief and are outlined in the **MIT Survey Operations Handbook**. The Project Manager will schedule a scoping meeting early in the project development to determine CADD and survey requirements for the project.

## 2.3 COORDINATE SYSTEM

MIT drawings are drawn in real world coordinates. The terms **easting** and **northing** are geographic Cartesian coordinates for a point. Easting refers to the eastward-measured distance (or the *x*-coordinate), while northing refers to the northward-measured distance (or the *y*-coordinate). The coordinates are commonly measured in metres from a horizontal datum.
The normal highway detailed design or pre-design drawing will be in **Universal Transverse Mercator (UTM),** Zone 14 or 15, North American Datum (NAD) 83 system co-ordinates.
A local co-ordinate system is NOT acceptable. The surveyor will notify CADD personnel of any pertinent information concerning the coordinate system. The drawings produced by MIT staff shall indicate that the coordinate system is UTM and shall include Zone, Datum, Scale Factor and Geoid Model as required. CSS staff shall provide this information upon completion of the primary control survey.

## 2.4 SURVEY MONUMENTS

In producing all design drawings for MIT, CADD personnel must ensure that the survey monuments are located accurately on the drawing, this is crucial to the project layout work. Information is to be derived from registered legal survey plans. The survey crew will utilize legal plans in locating monuments and will capture each one to the coordinate system. This **"control"** will be used to capture and layout all pertinent information for the construction of the project.

If during the course of the field survey, many of the monuments are determined to be missing or damaged, a retracement survey should be requested, whereby a Legal Land Surveyor would go out and re-establish the missing monuments.
Once all the information from the survey is entered into GEOPAK, a topography file can be produced. This will be the co-ordinate file for the project and its location in this file should not be altered, otherwise the co-ordinates will not match the original survey and the file will be useless.
Open another file and reference the above dgn file to it. You can then do whatever you want in this new file without altering the original coordinates.
In accordance with MIT's policy of April 2015, drafting standards relating to identifying Legal Pins for layout purposes has been changed so as not to reflect any inference to pins, brass caps, monuments, etc.
Legal Pins on all drawings shall be identified by using the cell **"MIT Control Point"** and labeled as MIT Control Points. Legal Pins are still required and will continue to be captured and processed as is currently in practise. Their true identity will still be retained in the project topography file (dgn) for clarification during project construction. Further information and clarification can be obtained from MIT's Highway Planning and Design branch.

## 2.5 DOMINION LAND SURVEY

The following information is offered as a brief overview of Legal Surveys and how they relate to MIT projects.
The Dominion Land Survey (DLS) is the method used to divide most of Western Canada into one square-mile sections for agricultural and other purposes.
The most important north–south lines of the survey are the **Meridians**:
Meridians are theoretical lines joining the north and south poles at right angles to the equator, designated by degrees of longitude from 0° to 180°.
The **First** (or Principal) Meridian at 97°27′28.41″ west, just west of Winnipeg, Manitoba.
The **Second** Meridian at 102° west, which forms the northern part of the Manitoba–Saskatchewan boundary.
The **Third** Meridian at 106° west, near Moose Jaw and Prince Albert, Saskatchewan.
The **Fourth** Meridian at 110° west, which forms the Saskatchewan–Alberta boundary and bisects Lloydminster.
The **Fifth** Meridian at 114° west, which runs through Calgary, Alberta (Barlow Trail is built mostly on the fifth meridian) and Stony Plain, Alberta (48th Street).
The **Sixth** Meridian at 118° west, near Grande Prairie, Alberta and Revelstoke, British Columbia.
The **Seventh** Meridian at 122° west, between Hope and Vancouver, British Columbia.

The Meridians were determined by painstaking survey observations and measurements, and in reference to other benchmarks on the continent, but were determined using nineteenth century technology. The only truly accurate benchmarks at that time were near the prime meridian in Europe. Benchmarks in other parts of the world had to be estimated by the positions of the sun and stars. Consequently, although they were remarkably accurate for the time, today they are known to be several hundred metres in error. Before the survey was even completed it was established that for the purposes of laws based on the survey, the results of the physical survey would take precedence over the theoretically correct position of the meridians

The main east–west lines are the **Base Lines**. The First Base Line is at 49° north, it forms much of the Canada–United States border in the west. Each subsequent base line is slightly more than 24 miles (about 39 km) to the north of the previous one.
Starting at each intersection of a meridian and a base line and working west (also working east of the First Meridian), nearly square **townships** are surveyed, which are about six miles (9.8 km) in

both north–south and east–west extent. There are two tiers of townships to the north and two tiers to the south of each base line.
Because the east and west edges of townships (**range lines**) are meridians of longitude, they converge towards the North Pole. Therefore, the north edge of every township is slightly shorter than the south. Only along the base lines do townships have their nominal width from east to west. The two townships to the north of a base line gradually narrow as one moves north, and the two to the south gradually widen as one moves south. The east and west boundaries of these townships therefore do not align, and north–south roads that follow the survey system have to jog to the east or west. These east–west lines halfway between base lines are called **correction lines**.
Townships are designated by their **township number** and **range number**. Township one (1) is the first north of the First Base Line, and the numbers increase to the north.

## 2.6 SECTION / TOWNSHIP / RANGE / LEGAL SUBDIVISIONS / CORRECTION LINES / BASELINES

**Range** lines are theoretical north-south lines (meridians). The widths of road allowances along range lines are consistent unless they occur at a change of survey systems. Ranges cover 6 miles (more or less) in width and are numbered from the nearest governing meridian. The numbers are normally accompanied by the letters “W” or “WPM” if the range lies west of the Principal (First) Meridian and “E” or “EPM”, if they lie to the east of the Principal (First) Meridian. For ranges east of the Second Meridian East “E2ME” is used.

**Townships** are theoretical east-west lines and run perpendicular to Range Lines. In the prairie provinces a township is a land division unit of the Dominion Land Survey. Townships are for the most part, 6 miles (9.7 km) by 6 mile squares - about 36 square miles (95 sq km) in area. These townships are not political units (although political boundaries often follow township boundaries), but exist only to define parcels of land in a relatively simple way. Townships are divided into thirty-six (36) equal one (1) mile by one (1) mile square (1.6 sq.km) parcels known as sections.

A **Section** is a land division unit of a Dominion Land Survey (DLS) township of one square mile, 640 acres or 239 hectares in size (more or less). A section is surrounded by a government road allowance on each side of either one (1) chain (66 feet) or one and one half (1.5) chains (99 feet) in width depending on which system of survey was used to layout the township. There are thirty-six (36) sections in a standard DLS township and sixteen (16) legal subdivisions in a section. The numbering follows the pattern shown in figure 1 on the following page.

A **Legal Subdivision** is a DLS surveying unit being one sixteenth ($1/16^{th}$) of a standard DLS section and forty (40) acres or sixteen point eight (16.8) hectares in size (more or less). Subdivision of land into legal subdivisions is not recommended due to the complexity and high cost of their legal survey. Legal subdivisions and sections, are numbered according to the pattern shown in Figure 1 on the following page.

**Base Lines** occur at the north limits of townships divisible by four (4) with the exception of the first base line which is the international boundary between Canada & USA.
Base lines are monumented on the south side of the road allowance.

A **Road Allowance** is land reserved by the government to be used for public roads. Road allowances run between certain sections of a township (not all road allowances have had an actual road built on them). The road allowances add to the size of the township (they do not cut down the size of the sections): this is the reason base lines are not exactly twenty-four (24) miles (39 km)

apart. In townships surveyed from 1871 to 1880 (most of southern Manitoba, part of southeastern Saskatchewan and a small region near Prince Albert, Saskatchewan), there are 1.5-chain-wide (30.2 m) road allowances surrounding every section.

**Correction Lines** can occur at the north limits of townships divisible by two (2) but not by four (4), e.g. 2, 6, 10, and 14. They are theoretical straight lines from the north-east corner of the township to the north-east corner of the adjacent township.
Widths between correction lines vary along the length of the line. Monuments are posted on each limit of the road allowance.

In townships surveyed from 1881 to the present, road allowances are reduced both in width and in number. They are one (1) chain wide (20.12m) and run north–south between all sections; however, there are only three (3) east–west road allowances in each township, on the north side of sections 7 to 12, 19 to 24 and 31 to 36. This results in a road allowance every mile going east-west, and a road allowance every two (2) miles going north-south. This arrangement reduced land allocation for roads, but still provides road-access to every quarter-section.
Historically, a political unit called a Rural Municipality, in general, is three (3) townships by three (3) townships in size, or eighteen (18)-mile squares - about three hundred and twenty-four (324) square miles (839.16 sq km).
Deflections can occur at any section of quarter line in a township. Some reasons why this might occur are: original survey errors, calculation errors, poor equipment, etc.
Chainages are rarely exactly that shown on a township diagram. Some reasons are: the type of equipment used, no standard tapes available, terrain, lakes, marsh, chaining error, i.e. temperature correction, sag tension, etc.
In 2014/2015, many municipalities in Manitoba were amalgamated and their sizes and boundaries changed. For more information and or clarification of municipal and provincial boundaries, please refer to The Municipal Act which can be found on the internet.

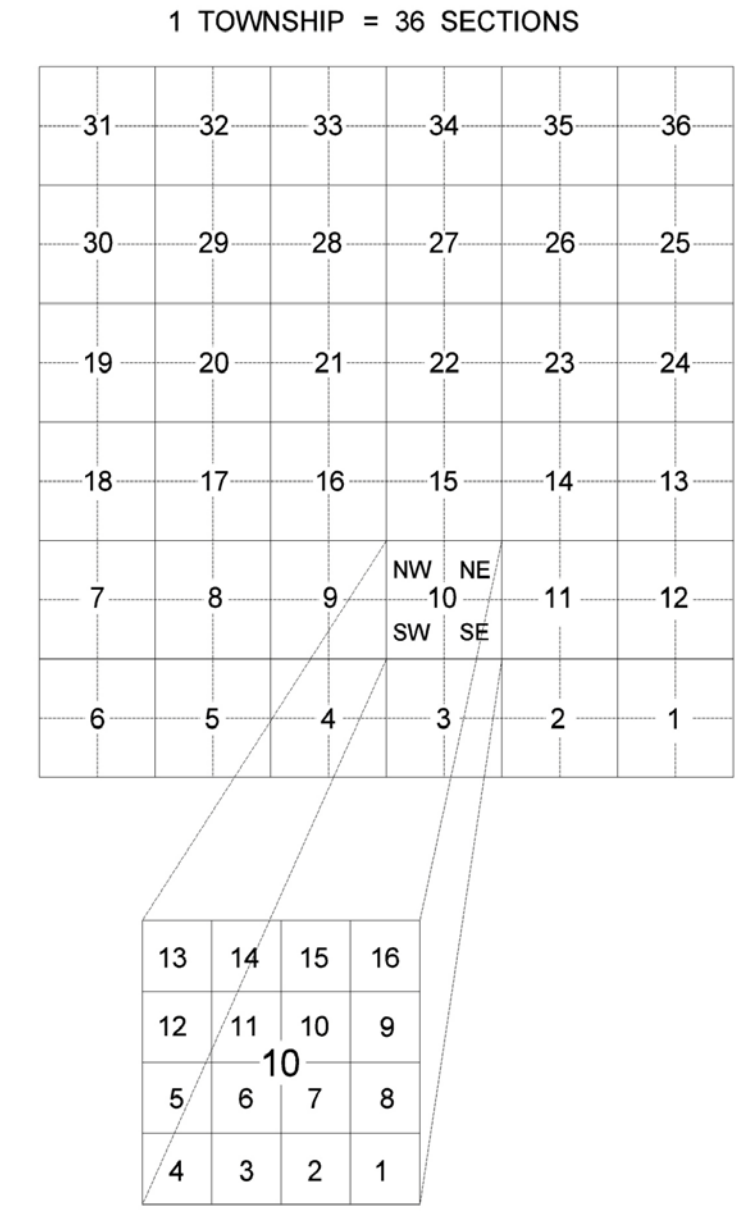

1 TOWNSHIP = 36 SECTIONS
31 32 33 34 35 36
30 29 28 27 26 25
19 20 21 22 23 24
18 17 16 15 14 13
7 8 9 10 11 12
NW NE
SW SE
6 5 4 3 2 1
13 14 15 16
12 11 10 9
10
5 6 7 8
4 3 2 1
1 SECTION = 16 LEGAL SUBDIVISIONS

**Figure 1**

## 2.7 LEGAL PLANS - LOCATING AND ORDERING

The Regional and Sub-Offices have an inventory of legal plans that are used for reference to produce MIT drawings. CADD personnel are responsible for ordering and filing these plans.

If a plan is required and not on file in the CADD office, it can be ordered electronically from the Land Titles Office. A paper copy can still be ordered, however, the Regions would prefer the plans be ordered in electronic format and added to the database on the MIT server. This saves storage space and also gives everyone in the Region easy access to the plans electronically.

Land Titles Surveys, is a branch of the Land Titles Office. The Surveys Index provides the public with access to the database of survey plans available at the Land Titles Office. Clients can search the complete record of all plans filed at the Land Titles Office and place an order for a copy.

To order a plan you must first be registered with The Property Registry Land Titles Branch. Personnel should contact the Regional Data Manager or Regional Design Tech. for instructions on registering. You can immediately download the electronic version; it should then be moved to the appropriate regional folder on the MIT server.

Some of the Regions are using an excel file for the database, to organize and search for plans, it indicates where they are located, be it a paper or electronic copy. **NOTE:** This database should be checked prior to ordering any plans.

## 2.8 LAND TITLES OFFICES

Land Titles Offices are located in Winnipeg, Portage La Prairie, Brandon, Morden, Neepawa and Dauphin. At one time there were also offices located in Boissevain and Carman.

The Land Titles Office forms part of *The Property Registry*, a Special Operating Agency of the Province of Manitoba. The Land Titles Offices keep all records of land ownership and survey plans and maintains the written and drawn legal descriptions of all land in the Province of Manitoba.
In addition to the legal survey plans, the office also keeps Certificate of Title documents that record interests in land. A Certificate of Title **(C.T.)** is a legal document created by the Land Titles branch pursuant to *The Real Property Act* and are guaranteed by the Government of Manitoba. Along with identifying the current owner, a C.T. will also provide other valuable information about the status of the property, including any existing easements or encumbrances on the land and buildings located on the property.

## 2.9 DEPOSIT PLANS

When a Location Plan is created for land appropriation, a survey will be done by a Legal Land Surveyor (LLS). The LLS will then create a Deposit Plan and send it to the Regional MIT office. The Regional Planning Tech will check it for accuracy. If no errors are found the plan will be put into the office database and LLS will be advised. The plan will then be processed by the Land Titles Office and a registered copy sent to the Region.

When the registered copy comes in, the Deposit Plan will be removed and destroyed, the registered copy filed in its place and the electronic database updated.
The Regional Office will get two (2) copies. One is kept on file and the other goes to the applicable sub-region office.
CADD personnel can check if they have been assigned a Registered Plan Number by going to the **Land Titles Survey Plan Index** on the intranet at **https://direct.gov.mb.ca/lto/jsp/findPlans.jsp**

## 2.10 REGISTERED PLANS

Plans are both filed and registered in the Land Titles Offices for a variety of purposes. Generally plans are filed to provide a precise location for an interest in land; these include easement and explanatory plans.
Plans are registered to provide an accurate location for the issuance of title; these include: plans of subdivision, public road, condominium, special surveys and public drains. Once the plans are registered, they are available in the District Offices for viewing. The Winnipeg office maintains a complete set of plans for the entire province. Sometime in the 1990's a universal numbering system was incorporated and all plans were assigned a consecutive running number in the Winnipeg office and sent out to the appropriate rural offices.
L.T.O. office abbreviations:

- Neepawa – N.L.T.O. handled mostly Northern plans.
- Morden – M.L.T.O.
- Carman – Plans were moved to Morden so a plan with M.L.T.O. (C. Div.) indicates the plan was originally stored in Carman.
- Dauphin - D.L.T.O.
- Brandon – B.L.T.O.
- Boissevain – Plans were moved to Brandon, (B.O. Div.).
- Winnipeg – W.L.T.O.
- Portage – Some of the plans will have P.L.T.O. (N. Div.) indicating they came from the Neepawa office.

**NOTE:** If an error is found on a registered plan, contact the Regional Design Engineer or Regional Design Technologist. They will contact MIT HPD and they will arrange to have it corrected.

## 2.11 UNDERSTANDING LEGAL DESCRIPTIONS

A land description is comprised of words, terms, or phrases (metes and bounds) that identify and locate the individual holdings within the survey system; its purpose is to clearly and unmistakably describe one parcel of land. To ensure that a land description is useful there must be, in place, within the system, the means to tie the description to its physical location.

Survey monuments establish the various survey systems within Manitoba and govern all plan and title boundaries within those systems.
The purpose of the original Dominion government surveys was to re-establish existing Hudson Bay Co. lots, generate new river lots (wherever there was an indicated preference) and to lay out new one hundred and sixty (160) acre farm sites across Manitoba and the North West Territories.

The monuments placed by the original surveys physically located the sites and thus facilitated the descriptions of land in letters patent. The plans resulting from the surveys provided the settler with surety in the location of their homestead and much needed topographical information, which included useable acreage.

The descriptions found in the patents form the basis of today's descriptive formats and they are categorized as 'conventional' land descriptions.

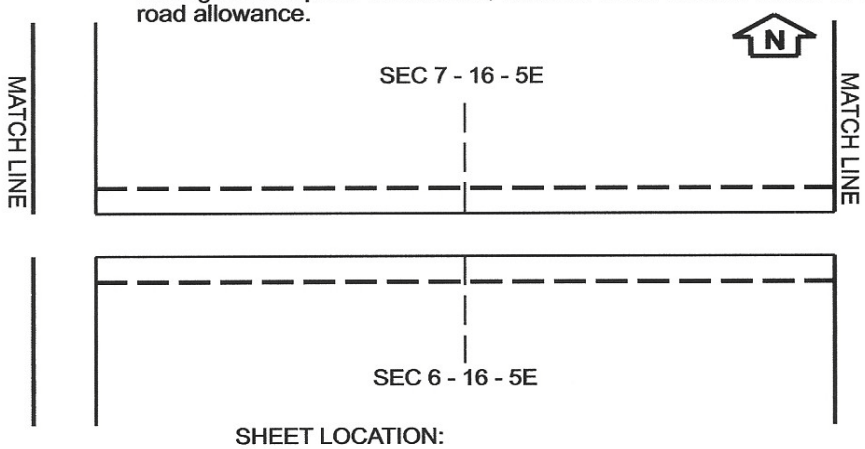
In June of 1983, the Land Titles Office introduced the 'abbreviated' land description. The intent was to formulate a modern, less wordy approach to writing descriptions. A simple way to achieve this objective was to shorten certain descriptive formats and to abbreviate key words that are common to most land descriptions.

A List of **Abbreviations for Land Title Plans** can be found in **APPENDIX "F".**

The MIT Highway Planning and Design branch have prepared a few examples of legal descriptions as they relate to highway construction projects. The examples on the following pages form the basis for describing a road construction project in the Province of Manitoba. These legal descriptions are noted in the **SHEET LOCATION** portion of the title block on the Standard Engineering Drawings.

## 2.12 EXAMPLES OF LEGAL DESCRIPTIONS FOR ROAD PROJECTS (ROW required)

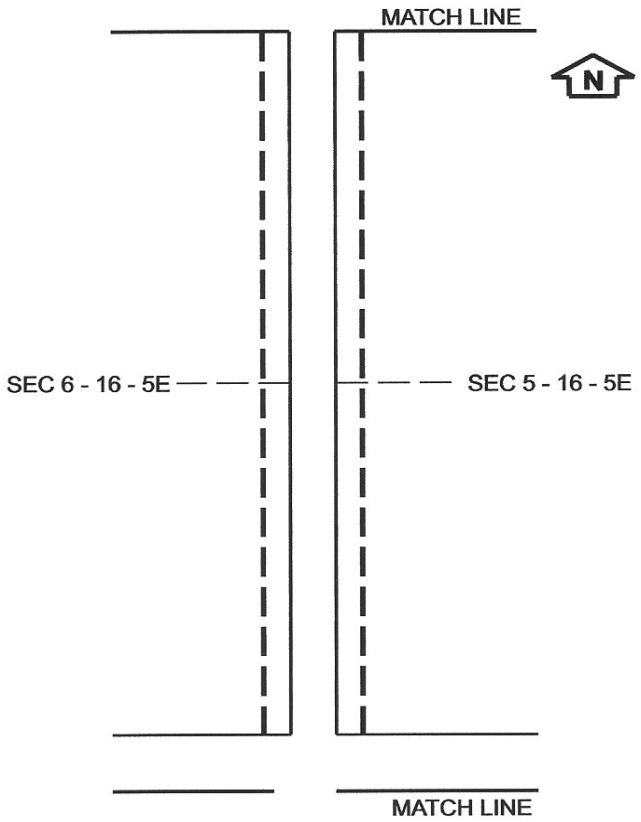
Projects running along WEST to EAST road allowances;
the legal description would read; NORTH of the section on the south side of the road allowance.




SHEET LOCATION:

NORTH OF SEC 6 - TWP 16 - RGE 5E
RM OF ST CLEMENTS

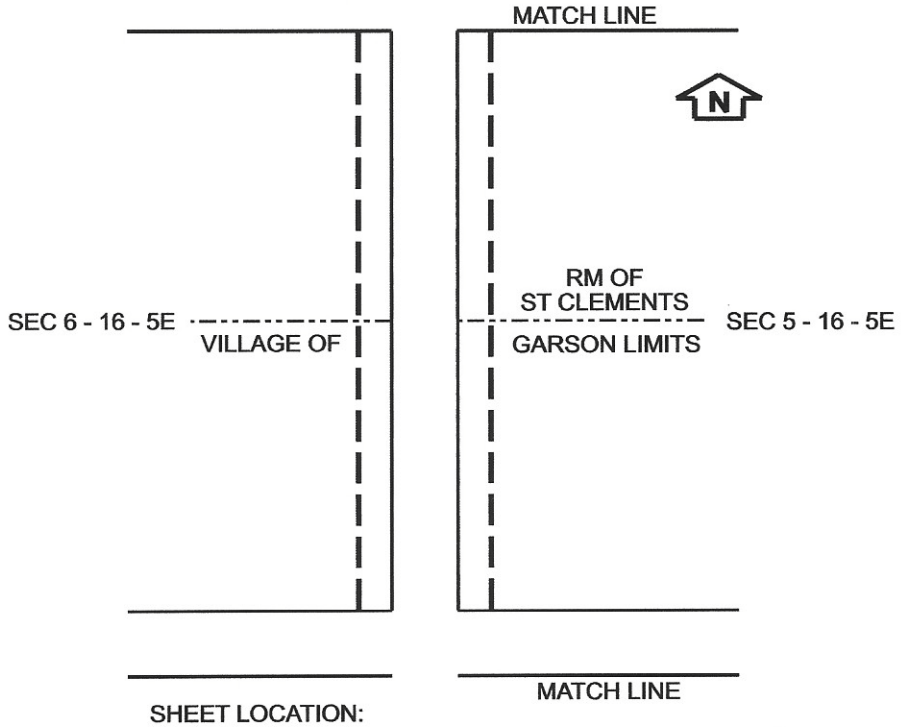
Projects running along SOUTH to NORTH road allowances;
the legal description would read; EAST of the section on the WEST side of the road allowance.




SHEET LOCATION:

EAST OF SEC 6 - TWP 16 - RGE 5E
RM OF ST CLEMENTS

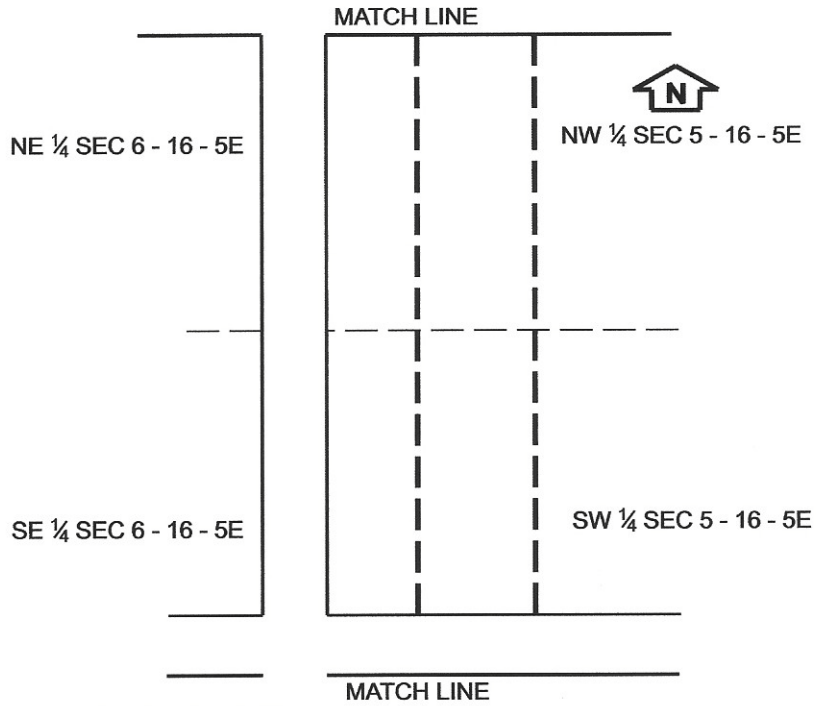
Projects running along road allowances where a change in the jurisdiction changes the legal description, is broken to reflect the change in jurisdiction. i.e. rural municipality to town limits.




SHEET LOCATION:

EAST OF SE ¼ SEC 6 - TWP 16 - RGE 5E VILLAGE OF GARSON
EAST OF NE ¼ SEC 6 - TWP 16 - RGE 5E RM OF ST CLEMENTS

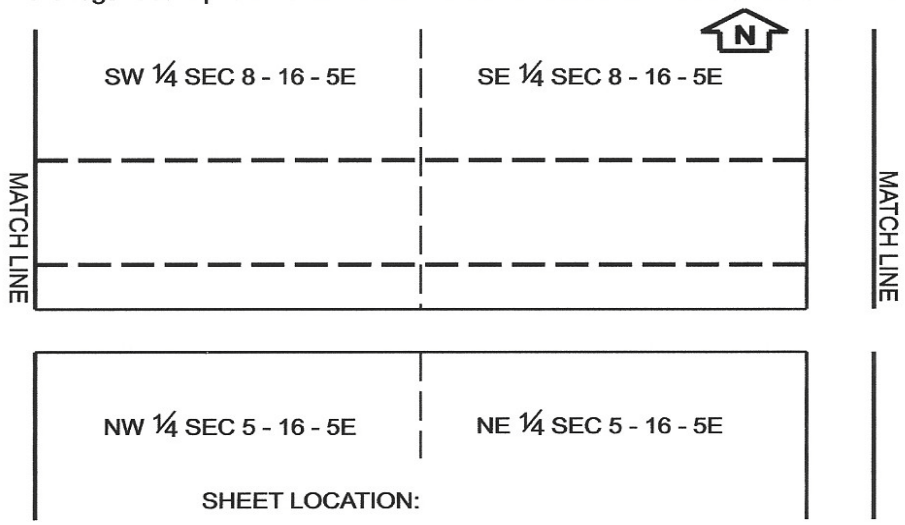
Projects running North/South thru the half of a section;
the legal description would read; THRU WEST/EAST half of the section.




SHEET LOCATION:

THRU WEST ½ SEC 5 - TWP16 - RGE 5E RM OF ST CLEMENTS

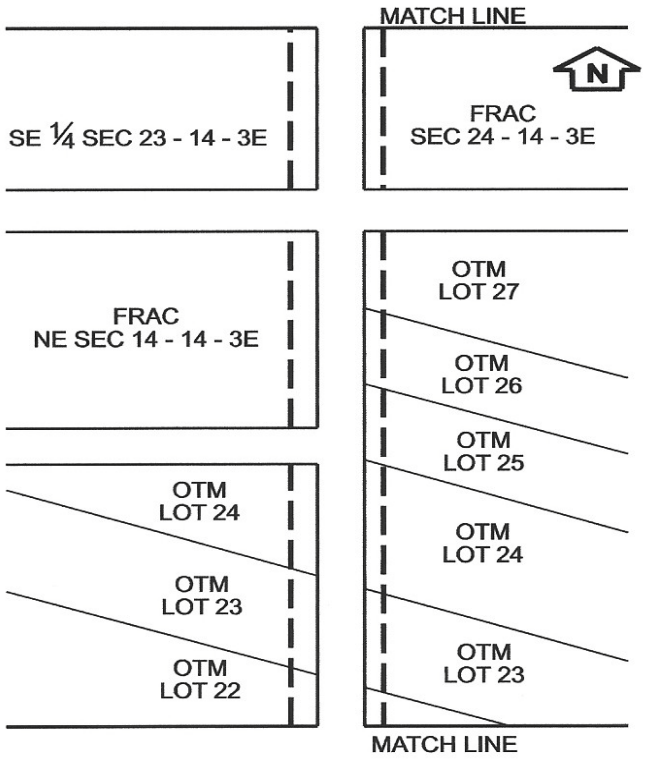
Projects running east/west thru the half of a section;
the legal description would read THRU SOUTH/NORTH half of the section.




SHEET LOCATION:

THRU SOUTH ½ SEC 8 - TWP16 - RGE 5E
RM OF ST CLEMENTS

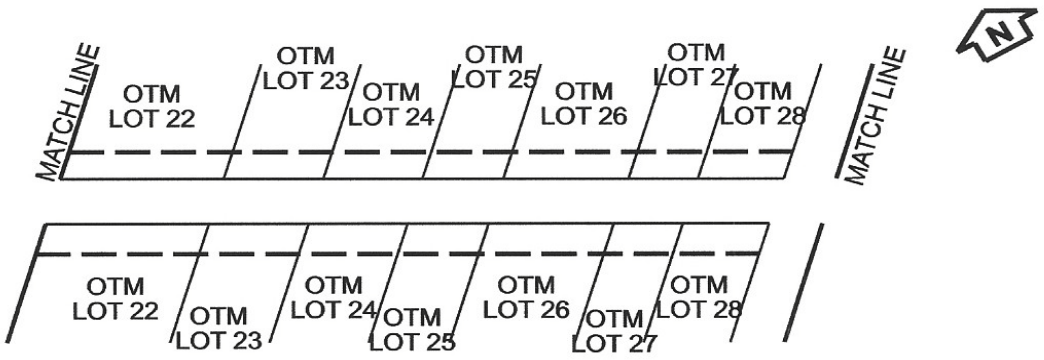
Projects running North/South thru sections and lots;
the legal description would read EAST of sections and THRU lots.




SHEET LOCATION:

IN OTM LOT 22 & THRU OTM LOTS 23 TO 27 INCL
(PARISH OF ST ANDREWS) & EAST OF FRAC NE ¼ SEC 14 & EAST
OF SE ¼ SEC 23 - TWP 14 - RGE 3E RM OF ST ANDREWS

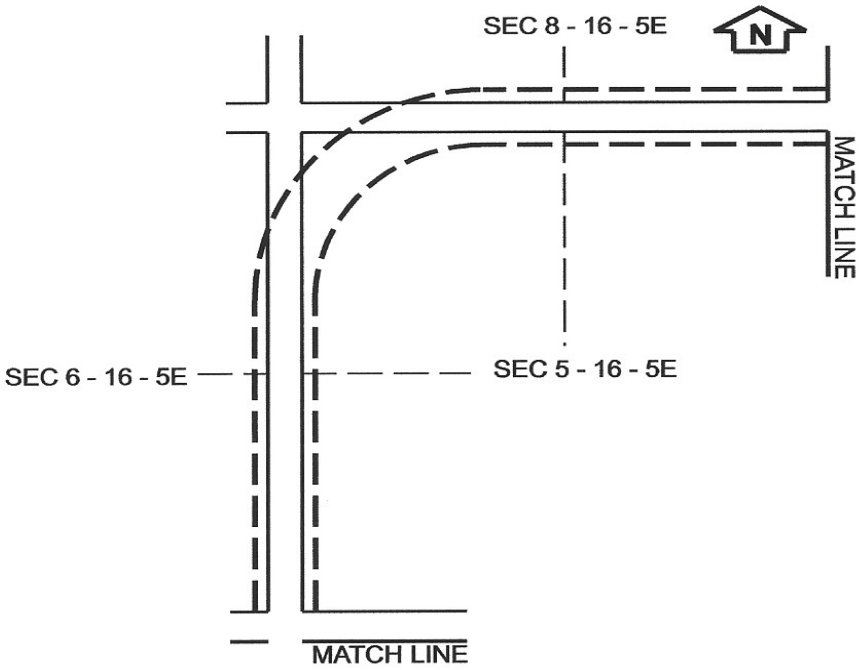
Projects running North/South thru river lots and outer two mile lots;
the legal description would read; THRU river lots and outer two mile lots.




SHEET LOCATION:

THRU RIVER LOTS 22 TO 28 INCL
(PARISH OF ST ANDREWS) RM OF ST ANDREWS
THRU OTM LOTS 22 TO 28 INCL
(PARISH OF ST ANDREWS) RM OF ST ANDREWS

Projects running along South to North road allowances and then curve thru a quarter section and continue along a West to East road allowance;
the legal description would read; EAST of the section on the WEST side of the road allowance and THRU and NORTH of the section on the SOUTH side of the road allowance.




SHEET LOCATION:

EAST OF SEC 6 - TWP16 - RGE 5E
THRU & NORTH OF SEC 5 - TWP16 - RGE 5E
RM OF ST CLEMENTS

## 3.1 MICROSTATION WORKSPACE

When you start MicroStation from Windows; the MicroStation Manager dialog box will appear with various options in the Workspace section, see Figure 2 below. The combination of **User, Project** and **Interface** determines the user's working environment for MicroStation. The significance of these options is explained below.

### User

The user can use the supplied MIT User Configuration File **(MIT.ucf)** or create their own. The user configuration file specifies the Project configuration file and the interface to use. It stores any variables that are set within MicroStation, e.g. MS_TMP can be changed C:\TEMP and this would be recorded in the MIT.ucf.

### Project

The MIT Project Configuration File **(MIT.pcf)** is required because this option delivers the MIT CADD standards and should be selected for all projects. The MIT project configuration file setting is used in-house to define certain discipline specific settings and standards. The MIT file is set up to point MicroStation variables to the location of the department's standard files, as set by the CADD Standards Committee and is updated by MIT Construction Support Services **(CSS)**.

### Interface

The choice of Interface determines what custom pull down menus and toolboxes a user will receive. The user may customize the tool settings, but cannot move the customization to another workstation. Other users would not have access to the same customized tool settings unless the interface was saved to a network server. After a user is happy with how they have the MicroStation workspace set up, it can be saved, and used for subsequent files.

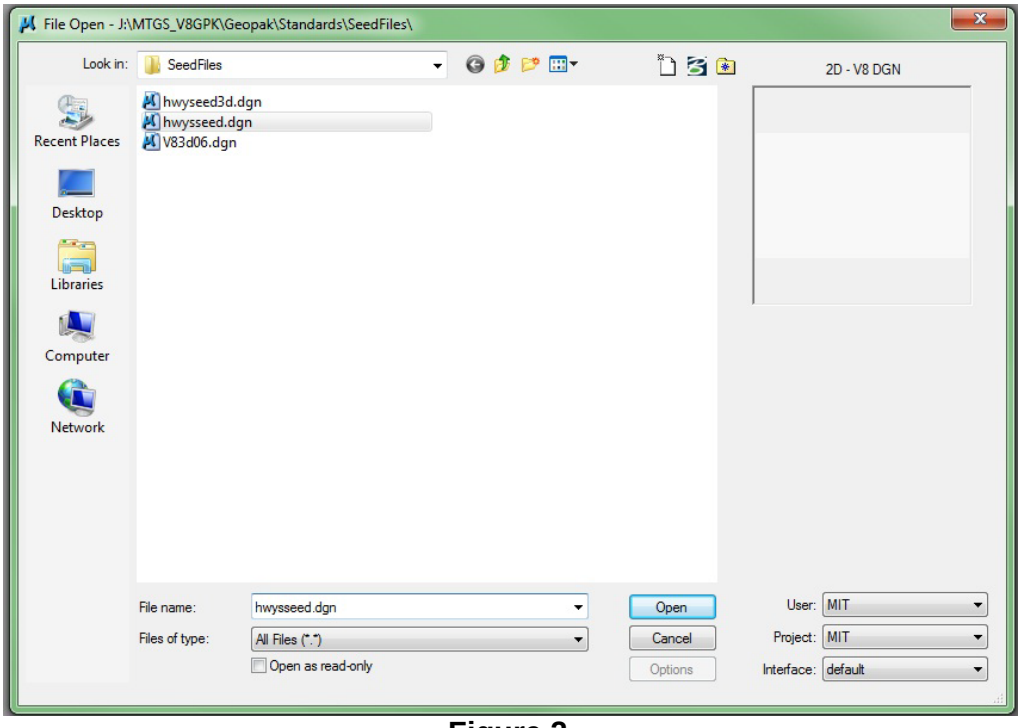



**Figure 2**

## 3.2 DRAWING BASICS

MicroStation has the ability to use a unique **"seed file"** to create design files. A seed file is a template in which standard parameters are set. Seed files do not typically contain elements, but like other design files they do contain settings like working units and view configurations. Using a standard, customized seed file helps maintain uniformity and keeps the user from having to adjust design file settings each time a file is created.
MIT CADD personnel should use the **hwyseed.dgn** file when creating new files, this seed file has been set up with all the appropriate settings, colour table and cell libraries that are specific to MIT drawings. This file can be found in the **STANDARDS** folder on T: drive or J: drive, (regional CADD server) located at …**\MTGS_V8GPK\Geopak\Standards\Seedfiles**.

A **Model** is a container that is stored in a design file. A single design file can contain multiple models. This means you can contain more than one MicroStation file (model) in the same file with its own set of view parameters, reference attachments, etc., stored within the same dgn file. **NOTE:** You can only view and edit one model at a time in a design file.

The Models dialog box is used to create, manage, and open specific models in the dgn file. Double-clicking a model within the dialog box makes the model active. The icons under the Type column show what type of model exists.
The Models dialog box can be accessed several ways:

Key in: model manager, or
From the Main Menu bar Select File > Models, or
Select the Models icon in the Primary Tools box

CADD personnel are encouraged to utilize the model spaces when creating dgns that will have multiple pages, such as the DDD. In this way all the pages are in the same dgn file and the user is able to easily move from one page to the next.
This is also a time saver accessing the MIT server, as the user has only to check out one file as opposed to all the pages of the DDD, if a separate dgn file was used for each page.

## 3.3 LETTERING

- Except where shown on the Standard Engineering Drawings, all lettering is to be done in capitals, except metric unit symbols, which are to be done in lower case, e.g. mm, m, and km. Unit symbols (mm, m, kg, etc.) represent the unit. They are not abbreviations.

- The use of abbreviations should be avoided, however when necessary, the end user of the information must always be considered. If the abbreviation is misunderstood, confusion and errors can occur. If abbreviations are required the **List of Standard Abbreviations** in **APPENDIX "E"** should be used.

- Except where shown on the Standard Engineering Drawings, the use of periods with abbreviations is not recommended.

- When possible, annotations will be in full and in a position that is readable without overcrowding.

- River and stream names should follow the shape of the feature where ever possible.

- Condensed letters should be avoided, but may be used where space considerations warrant, e.g. the path on the Title Block.

- Condensed and normal types of lettering should never be intermixed in a word or a sentence.

- Symbols do not change in plural, e.g. 25km, not 25 kms, 100mm, not 100 mms.

- Except where shown on the Standard Engineering Drawings, a space is never used between numbers and units.

- Symbols are written in lower case, always upright, e.g. kg, mm, etc., except when the unit is derived from a proper name, e.g. N (North), W (West), etc.

- When associated with a number, symbols (not name) shall always be used, e.g. 16m, not 16 metres. In text, the unit shall be spelled out in full.

- In describing a dimension as opposed to the actual dimension, the measurement should read as follows: 100mm, 575mm etc.

- When describing in metre measurements use a period (dot) as a decimal marker, e.g. 1.575.

- A space should not be used for four digit numbers, e.g. 5634 not 5 634.

- No stick-on decals or letraset is allowed.

- Text orientation should be placed to conform to the orientation of the symbol or line. Text should be placed so as to be read with stationing increasing. There may be situations where the lettering will have to be placed vertically or diagonally, in those situations **see Figures 3 & 4.**

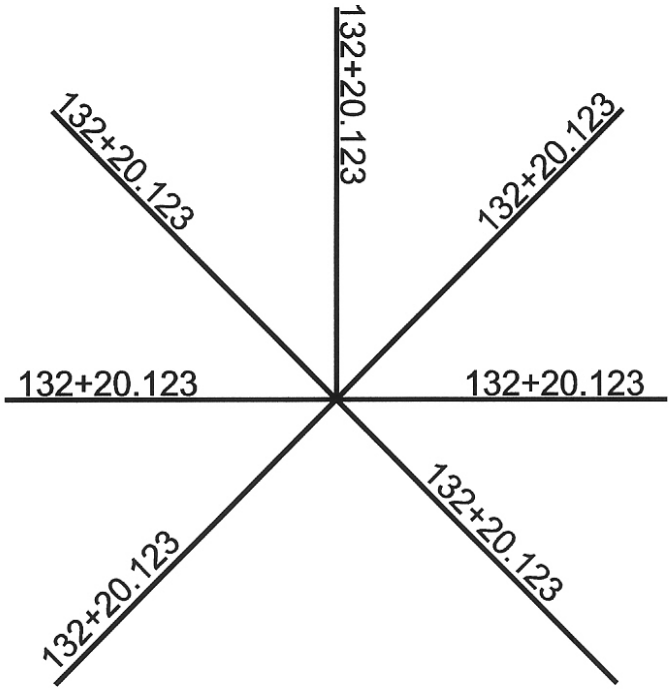



**Figure 3**

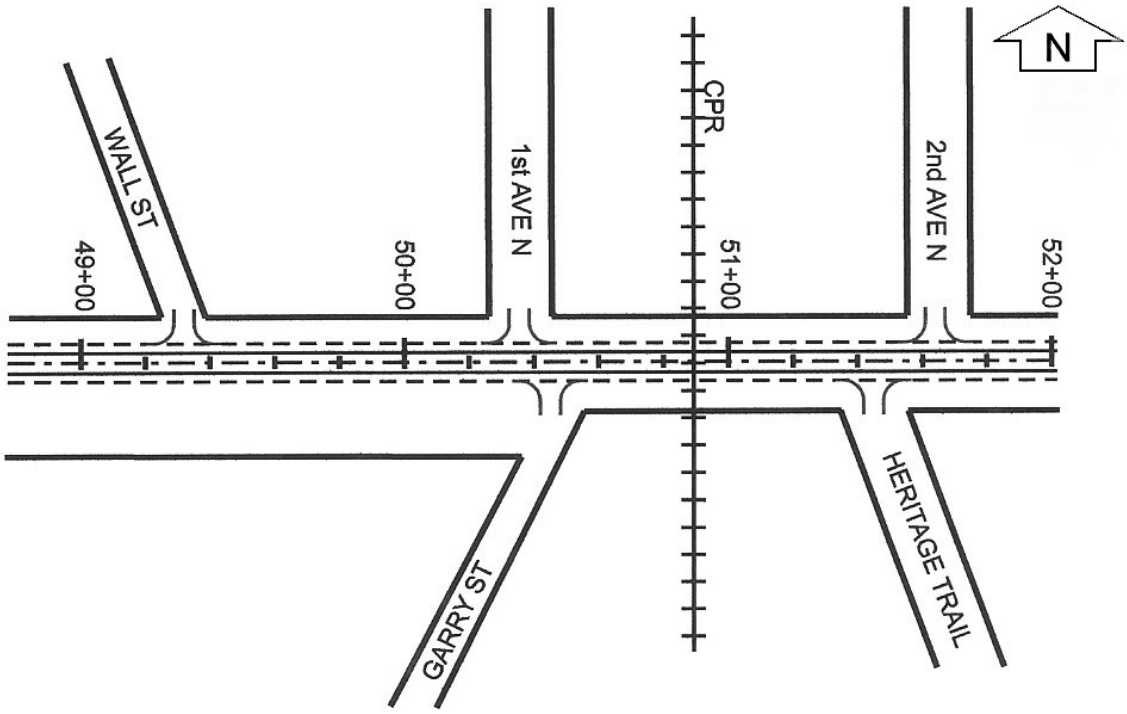



**Figure 4**

## 3.4 TEXT SIZES / FONT

The MIT standard font is **Arial (151)** and is used for all drawings. Standard text sizes have been defined to ensure uniform legibility of all drawing sheets. Standard text size refers to the size of the text on the finished plot, not the text size in the design file. The correct design file text size is dependent upon the intended plot scale. MIT standard text sizes for the finished plot scale are shown on the Standard Engineering Drawings.
Text sizes smaller or larger than the recommended text sizes are not acceptable.
In general, text line spacing should be one-half (0.5) the text height. The 151 Arial font also has special characters developed for MIT and they are:

^ = °, ~ = Δ, | = ℄.

For drawings with an air photo background on a sheet scale of 1:2000, the text size that is normally 4 is to be increased to 5. All other text sizes would remain as per the Standard Engineering Drawings. This increase in size is only for drawings produced on air photos and only affects the one size of text. This is proportional to other sheet scales, so that if you were using a scale of 1:1000 the size of font would be 2.5 and if 1:3000 the size of font would be 7.5. This is just for dimensions, landowners, notes, etc. that are normally the smaller size.

## 3.5 NORTH ARROW ORIENTATION

The MIT standard **"North Arrow"** cell shall be used for all drawings, **see Figure 5.**
The drawing shall be orientated to allow pointing of the north arrow to the top or to the right of the sheet for the major portion of the alignment. Assuming the top of the sheet as due north, the range within which the north arrow may point is from 45° westerly of north to 135° easterly of north **(see Figure 6).**


**Figure 5**

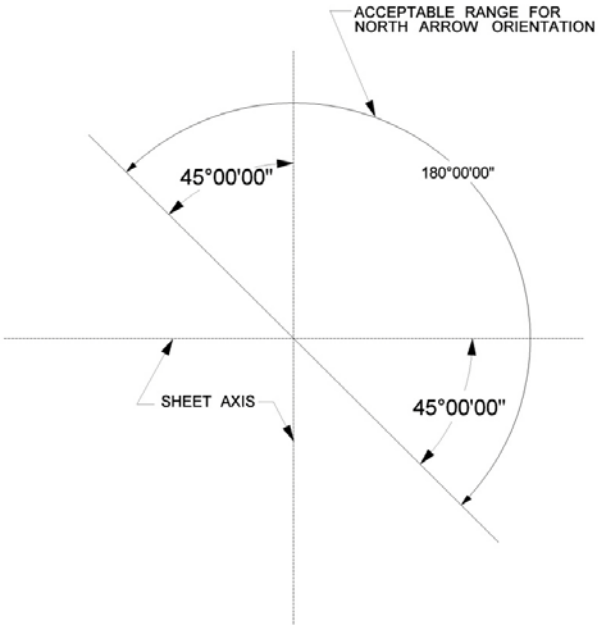



**Figure 6**

## 3.6 DRAWING UNITS

All MIT drawings will utilize the Metric system.
The MIT standard working units in MicroStation are:
Master Units = m (metres)
Sub-Units = cm (centimetres)
All drawings in MicroStation are to be done at a scale of 1:1, except in cases where cross sections are being produced. In that situation the recommended scales noted below should be followed.

## 3.7 SCALES

Metric scales are a unit-less ratio, such as, 1:500, 1:1000, or 1:2000. This means that one (1) of any unit on a metric unit map or drawing sheet equals 500, 1000, or 2000 of the same unit on the ground. One (1) metre on the drawing, equals 500, 1000, or 2000 metres on the ground.

The recommended sheet scale for MIT project drawings is 1:1000. For typical cross section details, to show greater detail use 1:50V, 1:150H or 1:100V, 1:300H. To measure the actual length of an element in a given plotted scale, it must be plotted at the standard sheet size, 1000 x 708 mm. If objects of different sizes are to be shown on the same CADD drawing sheet, the detail for each object may be drawn to a different scale to provide a balanced appearance. If an object is cross-sectionally uniform and the full length of the object cannot be shown at the scale being used, the lines representing the length of the object may be broken and the dimensions indicated on the drawing.
The standard **"BREAK LINE"** cell shall be used for these types of breaks. For examples of commonly used cells see **APPENDIX "A".** Refer to the Standard Engineering Drawings for the appropriate use of scales.

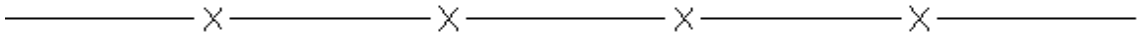
## 3.8 LINE WORK

Line quality is extremely important to the readability of CADD drawings. Line widths are varied to distinguish certain classes of features from others. To simplify the use of line work, MIT utilizes the line weights, colours and line styles as they appear in the MIT level naming convention and also as detailed graphically in the Standard Engineering Drawings. The line work for MIT drawings are set "Bylevel" according to the object to be drawn, (Bylevel means the symbology is predefined for line weight, colour, and line style, as set by the level library file). This can be overwritten for plotting or other circumstances, but it is recommended that the line work be left set to Bylevel.

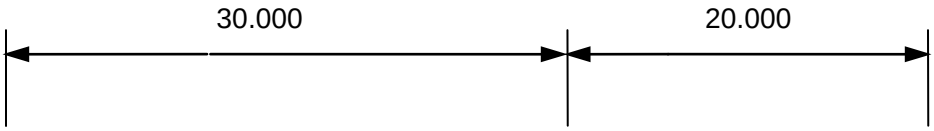
Unnecessary lines should be eliminated. Annotations should be placed as close as possible to relative items so that clarity is achieved.

**Line styles** are used to differentiate linear elements in the design file and on the plotted sheet. There are eight default line styles available in MicroStation using the values zero (0) through seven (7).

**Cosmetic line styles** are used to represent the location of an item, but not the actual size or spacing of the item. The fence line shown below, is an example of a cosmetic line style.



**Physical line styles** are used to represent the location of an item, and the linear spacing of the components of the item, such as in dimensioning, as shown below.




**Line weights** are used to differentiate graphical elements in the design file and on the plotted sheet. In MicroStation, line weights range from weight 0 (narrowest) to weight 31 (widest) and designate the thickness of the line used to draw or plot a graphic element. With the exception of dimension lines, which are all to be set to a WT=0, the line weights for MIT drawings are to be set “by level” according to the object to be drawn.

For proper application of line weights, refer to the Standard Engineering Drawings.

## 3.9 PATTERNS / HATCHING

Patterning and hatching is used to add material or textural information to a drawing in the form of hatch or pattern symbols. MIT has developed special patterns to be used for various soil logs and aggregates. Asphalt surfaces are generally shaded black or grey. Similarly, hatch and cross hatch lines are also used to distinguish various elements and areas in a drawing.
These patterns can be found in the **MTGS_PD.cel** library, the specific applications for patterns and hatching are identified in the Standard Engineering Drawings.

## 3.10 COLOURS / COLOUR TABLE

Standard colours are specified by MIT to ensure consistency and to enable users to easily identify drawing elements. Each element in a MicroStation design file is assigned a colour number. MicroStation reads a colour table to determine the correct colour to display for the specified number.

The MIT standard colour table, **650C** is automatically attached in the hwyseed.dgn file. The colour may vary or appear different on screen due to graphic cards, monitor brand or display capability, etc. CADD personnel may be asked to plot plans in colour, however, on approved drawings (Location Plans, DDDs and Profiles) information is shown in black and grayscale. The colour black (number one, on the colour table), should not be used as it won't be visible on a computer screen with a black background. For most drawings, the colour number "0" is recommended. On approved drawings, the line types, colours and weights are defined in the Standard Engineering Drawings.
If the 650C colour table is not attached, it can be found on ***J:\MTGS_GPK\Geopak\Standards\Tables\650C.tbl (for Regional Offices)*** or on T: drive at the same path for Head Office staff.

## 3.11 SHADING

Shading is primarily used to show paving limits on the Key Plan and the Intersection Details sheet of a DDD package. To shade an area it has to be a "shape" or "complex shape". This can be done with the **Create Complex Shape** command. The appropriate colour (CO=9) should be selected first and also set for outline if required. Then it is only a matter of selecting the outline of the area that shading is required in and the area will be filled. These shapes should be drawn on the "shade_shape" level and set to a negative priority value. This will ensure that the shape is "behind or below" other elements within that shape's area.
It should also be noted that shapes and elements can be made transparent to allow other elements or shapes to display through it. Transparency is a display setting that lets you apply transparency to elements in a model. Transparency may vary from 0% to 100%. A value of 0 indicates no transparency, while a value of 100% indicates almost complete transparency. To print a file with transparent elements, you will need to check off the rasterized box in the print menu.

**For more help on shading, patterning and hatching, see the MicroStation help file. For information regarding where shading is required, see the Standard Engineering Drawings.**

## 3.12 CELLS / SYMBOLS

A cell is a complex element composed of a group of primary elements or other complex elements. Specific cells have been created and stored in the MIT cell libraries.
The hwyseed.dgn file should be used to create new drawings. This seed file has the MIT cell libraries attached and is automatically "pathed" to the MIT Standards folder.
The path for the MIT cell libraries, if they are not attached, is: ***J:\ MTGS_V8GPK\ Geopak\ Standards\ Cell_Lib\ MTGS_PD.cel and MTGS_Pcode.cel (for Regional Offices).*** Or on the T: drive at the same path for Head Office.

The cells created in MIT's cell libraries have been created as graphic cells or points. The symbology (colour, line style, line weight and level) of a graphic cell is determined when it is created. When graphic cells are placed, they are level-independent, i.e., they keep the settings that were active when they were created. By default in the **Place Active Cell** dialogue, **Relative** is checked. When **Relative** is checked the cell is placed on the active named level not the level the cell was created for. Therefore the cell will take on the attribute settings for that named level. At this point changing to the correct named level for the cell will display the cell properly. Or deselect **Relative** (recommended) and the cell will be placed on the correct named level with the correct attributes. **See figure 7 below.**

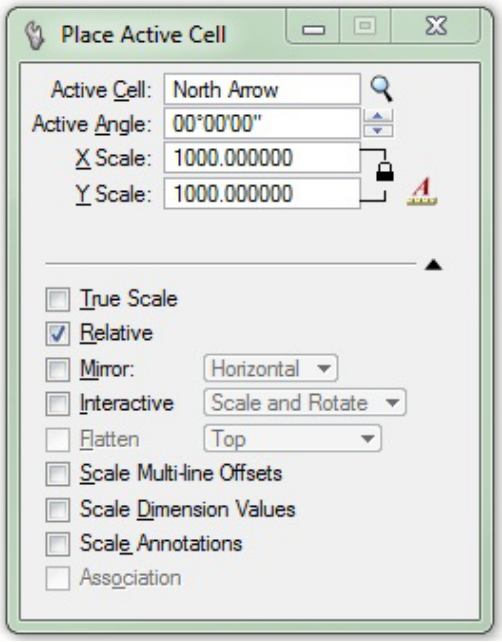



**Figure 7**

Cell size is set when it is being placed into the document. The scale of the cell is set according to the sheet scale size, e.g. if the sheet scale is 1:1000, then the active cell x and y scale should be set at 1000. The use of non-standard cells or symbols is discouraged, however, If one is required, it must be clearly noted and defined in the sheet legend. If the non-standard cell is frequently required it should be brought to the attention of a CADD Standards Committee member, where it will be considered for addition to the MIT standard cell library.

When the legend is shown on a drawing, all cells or symbols used to create the drawing, including non-standard cells, should be shown and defined. Any that are not used should be deleted from the legend. Cell use and size (scale) shall be shown as indicated in the Standard Engineering Drawings. For examples of commonly used cells see **APPENDIX "A".**

## 3.13 LEVEL ASSIGNMENTS

To maintain uniformity among different drawing files, it is essential that an organized leveling system be used. MicroStation permits data to be organized in any fashion on an unlimited number of drawing levels. MIT has developed a standard set of levels to be used with all design files. When developing drawings for MIT, CADD personnel should set elements to be drawn **"by-level"** which defines the attributes for each element automatically.
Users should not create their own levels for use in any design; MIT has created User Defined Levels for use when a non standard level is required.

The path to the excel file describing the MIT Level symbology is, (this can be printed), ***J:\ MTGS_V8GPK\ Geopak\ Standards\ DGNLib\ MITLevels-20XX.xls (for Regional Offices).*** Or T: drive at the same path for Head Office. The name of level library file used by MIT is **MITLevels.dgnlib**. This file is also located in the same location as the excel file. The file should already be attached to the MIT's hwyseed.dgn file. If you are using an older dgn file, you may have to attach the library. This can be done within the dgn file by clicking on *>Settings >Levels >Manager* and then clicking on *>Levels >Library >Attach,* and then path to ***J:or T:\ MTGS_V8GPK\ Geopak\ Standards\ DGNLib\ MITLevels.dgnlib.***

**It should be noted that the paths given in this manual can change from time to time, however, the drive letters shouldn't change and the paths should be similar.**

## 3.14 DIMENSION STYLES

A dimension is a label that shows the linear, radial or angular measurement of an element. Line terminators shall be a filled arrow created with a width to height ratio of 2.5:1. The terminator width shall equal the text height.
Leader Lines **must** be broken when crossing dimension lines. In order to keep broken lines to a minimum, it is recommended that the user relocate the dimension callout or reposition the dimension.
The user is also able to edit the dimension text to contain a label as part of the dimension element. This is advantageous in the cases where the dimension is moved or modified since the text is part of the dimension and not a separate text string that must be moved manually. The **MicroStation Edit Text** command is used to edit the dimension text.

Leader lines and text sizes for dimensions shall use a WT= 0 and follow the recommended text sizes for the scale of drawing produced and shall be placed as shown in the Standard Engineering Drawings.

## 3.15 ANGULAR MEASUREMENTS

Angular measurements shall retain Degrees-Minutes-Seconds and shall be shown as indicated in the Standard Engineering Drawings.

## 3.16 CROSS SLOPES / SIDE SLOPES

Pavement cross slopes and superelevation rates shall be shown as a percent to two (2) decimal places.
Side slopes and back slopes, shall be expressed in non-dimensional ratios. The horizontal component is shown first and then the vertical, e.g., 3:1, 4:1.

## 3.17 MACROS / MDL APPLICATIONS

**Macros**
MicroStation BASIC macros are small programs created using MicroStation's BASIC programming language that automates often-used, usually short, sequences of operations. This is slowly being replaced by MicroStation VBA macros that use the MicroStation standard Visual Basic Application programming language, which makes interacting with other Microsoft programs easier. MicroStation VBA macros can also record various short sequences of commands. Some MicroStation BASIC and VBA macros that could be used when using MicroStation or GEOPAK are:

The following BASIC macros are accessed from the main toolbar **Utilities/ Macros/ MicroStation Basic:**

**plot_v8** - helps in choosing a correct sheet size for long plots.
**crd2elem** - joins points to create a line – using current symbology.
**pt2cel** - place scaled cells over points and allow the point to be removed.
**chgOrder** - changes the order of elements (move to back).

The following VBA Macros are accessed from **Utilities/ Macros/ Project Manager:**

**Viewlevel** - view only one level on screen (hide others) – can scroll through levels.
**changecase** -change case of text.
**Shape to LineString** – converts a shape element into a linestring element. This is useful if elements are required in a GIS application.

**MDL Applications**
MDL applications are extensions to MicroStation. MDL stands for MicroStation Development Language. Essentially the C language executed by MicroStation. Many parts of the standard MicroStation are actually MDL applications.

The following MDL Applications are accessed from **Utilities/ MDL Applications:**

**CELLUTIL** – Used to plot the cells of a cell library or just the ones used in the dgn file.
To plot just the ones in the dgn file, run the mdl and select **<Tag All>.** Then select **<Tools> Plot> 2x1** or **4x2** or **8x4** for the number of cells you would like on a sheet. Click somewhere on your window to identify the bottom left corner of the plot. Then print as usual.
**CELLTOOL** – This application provides some useful extensions to the standard cell placement tools.
**ATOOLS** – Identify, trace or place areas and measure them.
**CIVTOOLS** – An application for Surveying and Civil/Site users, it has some useful commands for displaying coordinates.
**CHNGTXT** - Opens the Find/Replace dialog box, which is used to search all the text in a design file for any sequence of letters and numbers and replace some or all instances of the text with other text.

## 3.18 REFERENCE FILES

Reference files are design or raster files that can be attached, displayed and plotted. They improve efficiency by displaying the contents of one or more files within the active design file. When a change is made in a reference file, that change is reflected in every file that has the reference file attached.
The most common use of references is to display base plan information in a design file that will be used to generate the various drawing sheets used in a typical MIT highway project. They can also be used to copy elements of one drawing into another, thereby saving drawing time. For approved drawing files (Location Plans, DDDs, Profiles) only the essential reference files shall be included. When referencing these files the "Save Relative Path" option should be selected to keep the reference path integrity when files are moved from on drive to another. Temporary, alternative or interim drawing files used to create the final drawing shall be detached and not submitted.

## 3.19 AIR PHOTOS / RASTER IMAGES

Air photos and raster images, are regularly used for mosaics on Location Plans which depict a clearer picture of the project area. This is especially useful when designing a project in a remote area where site visits are not always possible.
The digital copy (raster image) can be created by scanning the air photo or using digital photos referenced to the MicroStation design file with MicroStation's Raster Manger.
The Raster Manager is used to display images in MicroStation files. It provides the user with limited image manipulation tools, such as warping, image navigation, interactive placement modification and raster clipping tools. Raster Manager does not edit the original image file; it only manipulates the display in MicroStation.

Aerial photography is contracted out on an annual basis of need. Air photo coverage is requested by the Regional Planning Tech in consultation with the Technical Services Engineer. An example of need would be an upcoming major road project or other special situation.
The more recent photos in digital format, either tiff or jpeg, are on CD in the CADD office. If the area required is not on file the photos can be ordered. CADD personnel should check the coverage map for availability prior to ordering.

The coverage map, indicating the highway and year the coverage was flown, can be found on the T: drive at; ***T: / Maps From P & D/ Aerial Photography Maps/.***
For more information on and the paths to MIT's digital photo database, please refer to Appendix "K".

Historical air photos are also available, some date back to the 1940s. These can be ordered individually if a unique situation was to arise. The photos are usually sent to the regional office that ordered them and distributed to the sub offices as required.
Historical photos are ordered by email from the Dept. of Conservation Product Distribution Branch. The exact legal description is required along with the Region's account No. and the format you want, electronic by email or on CD. Hard copies can also be ordered.

For approved drawing files (Location Plans, DDDs) only the essential raster files shall be included. When referencing these files the "Save Relative Path" option should be selected to keep the reference path integrity when files are moved from on drive to another. Temporary, alternative or interim drawing files used to create the final drawing shall be detached and not submitted.

## 3.20 TOPOGRAPHY (TOPO) PLANS

A topographic (site plan) dgn file, shall be completed with the survey data collected within the Provincial right-of-way (ROW). This file will also have the legal (survey) monuments tied-in to the project coordinate system and will be used as a reference file when the Location Plan is being developed.
Topography covers the collection of all survey data necessary to develop the site plan, and a Digital Terrain Model (DTM), encompassing; the existing highway, (including intersections and approaches), existing structures (bridges and culverts), stream channels and floodplain, features (trees or tree lines, fence lines, buildings, all utilities (above and below ground). And any other pertinent features that will augment the detail required to develop a DTM. This level of detail is necessary to plan ROW acquisition, placement and cost of bridges, detours, guardrail installations, culvert installations, erosion control, excavation and embankment construction, etc.

## 3.21 DTM - DIGITAL TERRAIN MODEL

Once all the survey data, including cross sections and or radial survey information has been processed, the DTM can be created.

The DTM will be created using the Topography file containing all survey data with the exception of certain elements that do not represent ground elevations such as bridge decks, culvert obverts, guardrail, etc. The evaluation of the DTM prior to design is a critical step in the development of a project. An understanding by CADD personnel of the type of survey and corresponding accuracy is important. The quality of the design produced is directly dependent on the type of survey used. Since survey data is often ordered prior to the project scope closure, the details of the design requirements are often not known at the time of the survey request.

The level of accuracy of the drawings forwarded to construction must correspond to the level of accuracy of the survey. This does not imply that CADD personnel must always receive or order the most accurate survey available. More accurate survey can be obtained in critical areas of the project during design if required.

CADD personnel should take the following steps to become familiar with the DTM:

- Determine if any supplemental topography is needed, all holes in the DTM should be examined. Critical holes (in roadways, critical proposed work areas, etc.) in the DTM(s) should be filled where necessary through supplemental survey collection.

- All additional survey work necessary should be accomplished as soon as possible so the project schedule is not compromised.

Due to the complexity of developing a DTM(s), specific instructions in the GEOPAK manual should be followed.

## 4.1 LIST OF DRAWINGS COVERED BY THIS MANUAL

MIT CADD personnel may be asked to produce a wide variety of drawings; however the drawings covered in detail by this manual will be the large format drawings submitted with contract tenders. They are: **LOCATION PLAN, DDD** and **PROFILE**. A brief description and outline of Sketch Plans is also covered.

## 4.2 LOCATION PLAN

The main objective of the Location Plan is to define the horizontal alignment and or layout of a highway. The Location Plan will also show the project location and existing right-of-way and indicates where proposed right-of-way is being acquired or revested. It also shows detailed engineering information required to build that portion of highway. There is usually more than one sheet to complete a project. The drawing sheets are read from left to right along the centreline. The stationing is in ascending order showing tie-ins to all pertinent survey monuments. The existing and required widths of right-of-way should be shown opposite the survey monuments as these are the governing factors when a legal survey is done.
All cadastral information pertinent to the highway right-of-way should be shown, including intersecting, adjoining and adjacent right-of-ways, lots, blocks, easements, etc. along with their legal descriptions, plan numbers, etc. where applicable. Attention to detail is required when preparing a Location Plan since the agreements with land owners and many of the dimensions shown on the legal plan depend on the information shown on the Location Plan.
If proposed right-of-way taking is suspected to be contaminated e.g. old service station sites, a note should be added to the plan stating the acquisition is subject to an environmental clearance.

In the past, unneeded sections of highway were simply abandoned because of the cost of removing the old roadbed. Now, it is generally the Department's practice to remove the roadbed, rehabilitate the land and revest the right-of-way where possible. Therefore, sections of highways and right-of-ways that are deemed surplus to our requirements should have notes indicating how they are to be treated. Some of the possibilities are; remove the old roadbed, rehabilitate the land, close legally and revest or close legally and revest (this would occur in a case where right-of-way exists but the road has not been developed or remove the old roadbed, close as public road and maintain parcel held in the name of the crown.

On all intersecting road right-of-ways, indicate if there is a developed road or not. If developed show centreline of road and indicate the surface type, e.g. earth, gravel, or paved. If it is undeveloped, note that, but do not show centreline of road or right-of-way.
In addition to the normal public road intersections, show all accesses, including existing, proposed and existing to be removed. When only the centreline of the proposed highway is shown, the accesses should be shown abutting it. When the lane lines and or shoulders are shown, the accesses should be shown abutting the outermost line.

The Location Plan will also show important topographical information such as adjacent buildings and fences. Dimensions from centreline or right-of-way are indicated only if those buildings are pertinent to the right-of-way considerations. Homes that are obviously abandoned should be indicated as such. Other structures and features such as gas pumps and sheds with main doors facing the

proposed right-of-way should be dimensioned if they may affect either the right-of-way taking or the operations on site. Significant terrain features such as drainages, rock outcrops, shelter belts, cultivated fields, pasture, landscaping, etc. should be indicated and identified if they affect decisions on the highway design and right-of-way requirements. Actual dimensions to trees may be necessary, for example, an urban design with large trees in close proximity to the highway.
It is most desirable to use photo base plans whenever possible as most of the topographical features will be evident and not need detailing, although some critical features may have to be highlighted. On most drawings, judgment must be used to determine which topographic features need to be shown. Basically, physical features which affect the design of the highway and or right-of-way should be included.

The current land owner (name and certificate of title (C.T.) number) of any affected properties as well as the hectares quantity of the property affected, should be shown. Use **"Hectares"** cell.
The C.T. numbers have the Land Title's Office (L.T.O.) number included on the title and shall also be shown on the drawings, e.g. C.T. No. is 7563421/2, the /2 is the L.T.O. number.
If the parcels are Crown Land, they should be identified as such, by noting the word "CROWN" on the parcel. If the parcel has a C.T. number associated with it, the C.T. number and H.M.Q. as the owner should also be shown.
L.T.O. plan numbers, legal descriptions, quarter lines, road allowances, river lots etc. are to be shown and labelled according to the Standard Engineering Drawings. Units shown on Location Plans are to be shown to 3 decimal places.

If the locations of proposed borrow areas are known at the time of plan preparation, this information should be included on the drawing. Information to be shown should include type (dugout or landscaped), boundaries and approximate hectares (ha) quantity. In special cases it may be necessary to include typical cross sections.

Above and below ground utilities should be shown. Most of this information can be referenced in from the Topography file created with the captured survey data. When utilities are shown, the **"Utility Disclaimer"** cell shall be placed on each sheet in the lower right hand corner.

The recommended scale of the Location Plan is 1:2000. This scale when used with the standard Location Plan Title Block cell, allows for a one mile section of highway to be depicted. If desired, two miles of straight highway can be shown stacked one on top of the other. Where it is more appropriate, scales other than 1:2000 may be used. For example, in an undeveloped area where there is very little detail to be shown, a scale of 1:4000 may be more suitable. Similarly, in a more developed rural area such as the suburban fringe adjacent to towns and villages, a larger scale such as 1:1000 may be required because of the amount of information to be presented.
For a 1:2000 scale, only those geometric features needed to define the horizontal alignment of the highway should be shown. Lane widths, shoulders and other geometric features should not be shown unless they are necessary to better illustrate the right-of-way needs. If detailed road layouts need to be illustrated they should be shown separately on the DDD paving limits plan. For larger scale drawings, the geometric features described above may be included as desired.

The guidelines for Location Plans for urban highways located in heavily developed areas generally follow those for the rural highways, with some exceptions. The horizontal geometry is generally constrained with little, if any right-of-way being purchased. The Location Plans for urban highways tend to be more of a Detailed Design Drawing because of the emphasis on showing detailed geometric and topographical features. Base scales of 1:250, 1:500, or 1:1000 are generally more appropriate for these highways.

A Base Plan of the existing right-of-way can be referenced in, to develop the Location Plan. The base plan can usually be found in the Permits folder for that section of highway on the MIT server. Legal plans should be referred to for confirmation of the base files and if there is no base plan, the area in question will have to be drawn from the legal plans.
All standards for this drawing should follow the MIT Standard Engineering Drawings for Location Plans. The MIT checklist for Location Plans should also be referred to, prior to submission to the regional team for review.

Note: **Sketch Plans (S.P.)** will continue to be appropriate for the purchase of individual properties that are not associated with an overall project. The Project Manager will advise as to which is needed for a specific project. The Title Block for sketch plans can also be found in the MIT cell library. More on Sketch Plans is discussed in Section 4.22.

As noted in Section 2.4, Legal Pins on all drawings shall be identified by using the cell **"MIT Control Point"** and labeled as MIT Control Points. Legal Pins are still required and will continue to be captured and processed as is currently in practise. Their true identity will still be retained in the project topography file (dgn) for clarification during project construction. Further information and clarification can be obtained from MIT's Highway Planning and Design branch.

## 4.3 DDD - DETAILED DESIGN DRAWINGS

The intent of the DDD, when used in conjunction with the other two drawings, (Location Plan and Profile) provides all the necessary engineering information to unambiguously detail any given highway facility's design.
The DDD is primarily intended as a catchall to accommodate all highway engineering information that cannot appropriately be conveyed on the Location Plan and Profile. The overriding guideline in its use is that it supplements the information on the Location Plan and Profile.

It is anticipated that the largest use of the DDD will be to illustrate detailed engineering information in a cross section format.
Again, the intent is that the DDD is for engineering information, such that all of the information described must be dimensioned and drawn to scale. Cross sections should be cut from the full width of the ROW. A standard drawing aspect ratio of 3:1 will be employed for cross sections but the actual scales may vary depending on the level of detail. It is suggested that scales of 1:50V (vertical), 1:150H (horizontal) or 1:100V, 1:300H should suffice for most purposes.

Show the location of all cross section cuts and direction. Cross sections shall be shown looking in the direction of ascending stationing.
The standard **"CROSS SECTION VIEW"** or **"CROSS SECTION VIEW CUT LINE"** cells shall be used to show locations where a typical cross section is described on the **CROSS SECTION DETAILS** sheet.
For an example of these cells see **APPENDIX "A".** Layout of items should be balanced and orderly. References to other drawings or specifications must be clear and dominant.

The cross sections in the DDD will illustrate the exact dimensions at a specific station. The DDD will only list one exact station point to apply to a given cross section. Therefore, the location and number of cross sections must be carefully chosen. Taken together, they must convey all of the information necessary to completely define the illustrated attributes over the entire extent of the

project. The final decision on the number and layout of cross sections shall be arrived at through consultations with the Project Manager or Design Engineer.
To reduce the number of sections required, it is not necessary to generate a new cross section if the only purpose would be to illustrate a change in one attribute that is described on an accompanying Location Plan or Profile. For example, the Location Plan illustrates the ROW widths throughout a project. While an individual cross section should include the ROW at the specific station it is cut from for completeness, it is not necessary to generate a new cross section for each change in ROW width.
There is an exception to the rule: **one DDD cross section, one station point;** where more than one section has the exact same dimensions, but is separated by sections with differing cross sections, the additional stationing may be listed underneath a common cross section. The intent is to indicate that a given cross section extends over a continuous section of road. In such a case, only one section is to be illustrated and located at the approximate midpoint of the stretch in question. CADD personnel should refer to the MIT Standard Engineering Drawings for DDDs for more information on completing these sheets.
The following is a partial list of specialized engineering features that are suited for illustration on the DDD but are generally not cross section based. These features are largely anticipated to be displayed in plan view on attached detail sheets.

- Paving limits
- Construction Signing
- Pavement Marking
- Intersection Details
- Detour Details
- Specialized Drainage Facilities
- Extent of Erosion Control Facilities
- Extent of Curbing
- Coordinate Layout

## 4.4 USE OF DDD IN CONJUNCTION WITH LOCATION PLAN

The Location Plan is produced in advance of the detailed design and the DDDs will be produced as a stand-alone drawing set. When land acquisition precedes completion of the detailed design, a Location Plan will have been completed. In this case it should be noted on the DDD title block in the BASE DATA-Proposed Location Plan No._____.
When the detailed design is undertaken at the same time as production of the Location Plan, the DDDs will form a standard part of that plan. The proposed alignment will be shown on the Location Plan.

## 4.5 USE OF DDD WITHOUT LOCATION PLAN

It is recognized that there are projects that occur with no need for a Location Plan. Pavement reconstruction is a primary example of this. In such cases, DDDs will form the primary engineering document and will be packaged under a Key Plan cover sheet that identifies the location of all the details included in the DDD. It also includes an index of the attached detail sheets. Such an approach can also accommodate land acquisition where isolated parcels are being acquired. These isolated parcels can be illustrated separately and referenced to the Key Plan.

## 4.6 ORDER OF SHEETS

The DDD is made up of a number of different detail sheets, each with its own title to cover the various details involved on a project.
To ensure consistency in the layout of DDDs and to eliminate confusion with the other two drawings (the Location Plan and Profile); the following drawing titles are to be used for the individual drawing sheets depending on their content. The actual titles to be employed on a specific project will be determined by the complexity of the project and in consultation with the Project Manager/Design Engineer. Text sizes and level assignments will be as per the **MIT Standard Engineering Drawings for DDDs.**

In general, the order they appear in the DDD package, should be as follows;

1. **KEY PLAN** –Base plan showing location of project and key areas of work.
2. **PROPOSED RIGHT-OF-WAY & ROAD LAYOUT DETAILS** – Spot ROW acquisition and or road alignment layout details.
3. **INTERSECTION DETAILS** – Plan view of proposed intersection treatment details.
4. **CROSS-SECTION DETAILS** – Sheets containing all cross-section elements including embankment and structure information as described in Section 4.11.
5. **PLAN PROFILE** – Spot profile improvements, i.e. urban street or drainage work.
6. **CULVERT INSTALLATION DETAILS** – Usually site specific, contact Project Manager.
7. **CURB & GUTTER DETAILS** - Usually site specific, contact Project Manager.
8. **INTERCHANGE LAYOUT & COORDINATE DETAILS** – Survey layout details.
9. **EROSION CONTROL DETAILS** - Project Manager will advise which details are required.
10. _**XXXX**_____ **DETAILS** – Any other engineering details requiring illustration where the first word of the sheet title corresponds to the type of information illustrated, (e.g. Rumble Strips = RUMBLE STRIP DETAILS, etc.).

Please note that not all sheets will be applicable to every project. The actual titles to be employed in a specific DDD package will be determined by the type of project and in consultation with the Project Manger and the Design Engineer.
Please see the **MIT Standard Engineering Drawings for DDDs** for more detail and layout of content.

## 4.7 KEY PLAN SHEET

The KEY PLAN SHEET is a simple base plan, indentifying the location and layout of the project. It includes a full map of the project in plan view, an index of the additional detail sheets, the project description, the limits of construction, specific areas of construction work with reference to the appropriate detail sheets, drawing scale and page number. Features such as typical cross sections, construction details and drainage details, will be shown on the attached detail sheets. The type of work should not be identified; however the location of construction details by either symbol or labelling will be shown.
Title Block layout and project description shall conform to the MIT Standard Engineering Drawings for DDDs. Title Blocks shall be orientated so that stationing progresses from left to right and from top to bottom.
The Title Block headers for all the sheets begin with the phrase “Detailed Design Drawings” and continue with a description indicating the type of construction and the project location.

As previously indicated, the use of a Key Plan cover sheet is mandatory if the DDD is to be used as a stand-alone drawing package without a location plan. However, there may be cases where it is beneficial to include the Key Plan even when the DDDs are being added to an existing Location Plan. It is mandatory in the case where the Location Plan does not include stationing.

Where the Location Plan and DDDs are being developed simultaneously, it is recommended that a common Key Plan be employed to illustrate the sheet layout of the Location Plan and the location of details illustrated on the DDDs.

A suggested scale for the Key Plan is 1:10,000. However, this scale may vary depending on the level of detail and length of the project. The Key Plan may be developed on an air photo base if required.

Similar to a Location Plan, the location of all cross sections shall be illustrated on the Key Plan using **"CROSS SECTION VIEW"** or **"CROSS SECTION VIEW CUTLINE"** (cells) and labelling the station as it is represented on the CROSS SECTION DETAILS sheet. Plan views in the DDD such as intersection details and isolated right-of-way parcels shall also be located on the Key Plan. Those areas are to be identified with the **"REFER TO"** cells to indicate that the constructions details are shown on an attached sheet.
The Key Plan will also be used to illustrate the extent of paving. The highway in the Key Plan will be shaded where paving is to occur, CO=9. Due to the small scale of the Key Plan, the highway width can be drawn "not to scale" to allow the shading to be readily visible.

The following information is typical on the Key Plan sheet.

- For the Key Plan sheet the appropriate Title Block cell is; **"DDD"** Detailed Design Drawing Title Block Key Plan.

- Legal information, i.e. section – township – range, river lot, outer two miles lot, parish etc.

- Use standard abbreviations for section, township and range descriptions, as outlined in the Standard Engineering Drawings.

- Boundaries of cities, towns, parks, Indian reserves, wild life management areas, etc, must be clearly shown with the boundary lines identified by text.

- Centreline of the existing and proposed highway and access roads if applicable.

- The location of bridge sites should be shown and noted with the appropriate bridge site number; this can be obtained from either the Project Manager or from the **TEAMS** site. This site is the MIT internal (intranet site) and also includes links to other MIT departments that may be helpful to CADD personnel.

- The standard **"NORTH ARROW"** cell is required in the top right of the sheet. An additional North Arrow is required any time the highway on the Key Plan is cut and should include a **"MATCH LINE"** to show continuity, **(see Standard Engineering Drawings).** The North Arrow should be located so as not to cover any features. **See section on North Arrow Orientation, for more information.**

- Existing ROW for the highway, municipal or provincial government road allowances, railway, utility and drains. Any other ROW that will impact the project, e.g. Street ROW when the project is in an urban area.

- All names that appear on the Key Plan must be complete (abbreviations should be kept to a minimum). If unavoidable see **APPENDIX "E"** for a List of Standard Abbreviations.

- Location of other detailed design elements with reference to the appropriate drawing sheet.

- Existing and proposed curve radius and emax information. If complete curve data is to be shown, use appropriate cell see the MIT Standard Engineering Drawings for Location Plans.

- Communities are shown in greyscale CO=9 for background information if available or required.

- Stations for the project are to be shown at start of project, mile roads, road allowances, ¼ lines and end of project.

- Major topographical features should include names, i.e. rivers, mountains, etc.

- Reference to work being done in a community the recommended scale is 1:4000.

- For the Detail pages the appropriate Title Block cell is **"DDD Sheets"** Detailed Design Drawing Title Block Sheets.

CADD personnel should perform a spell check on the dgn, this can be done by selecting TOOLS> TEXT> SPELL CHECKER. The Checklist for the DDD should also be referred to, prior to submission to the regional design team for review.

Shown below in Figure 8, is the header from the Title Block for the Key Plan sheet. The text in the Title block sheets can be edited without having to "drop" the sheets. The date format shown must be used (day/month/year). The Plan No. in the lower right corner is assigned later by HPD.

MANITOBA INFRASTRUCTURE and TRANSPORTATION

PROPOSED DETAILED DESIGN DRAWINGS

OF

P.T.H. No. 00

(P.T.H. No. 00 TO 0.0km WEST OF P.R. No. 000)

BASE AND BITUMINOUS PAVEMENT

| PREPARED BY | DATE DRAWN | SCALE | SHEET | PLAN No. |
|---|---|---|---|---|
| REGION No. 00 | 00 MONTH 2010 | 1:10000 | 0 OF 00 | |

**Figure 8**

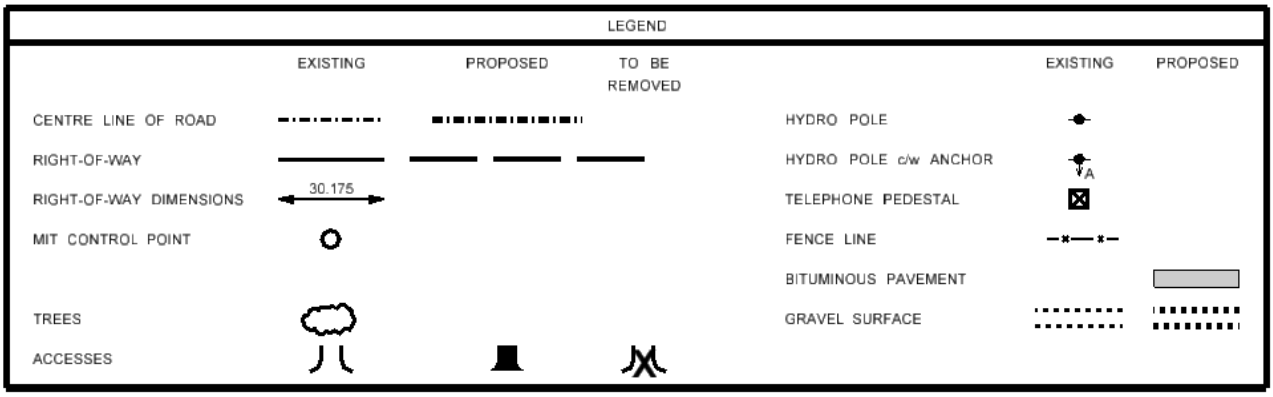



**Figure 9**

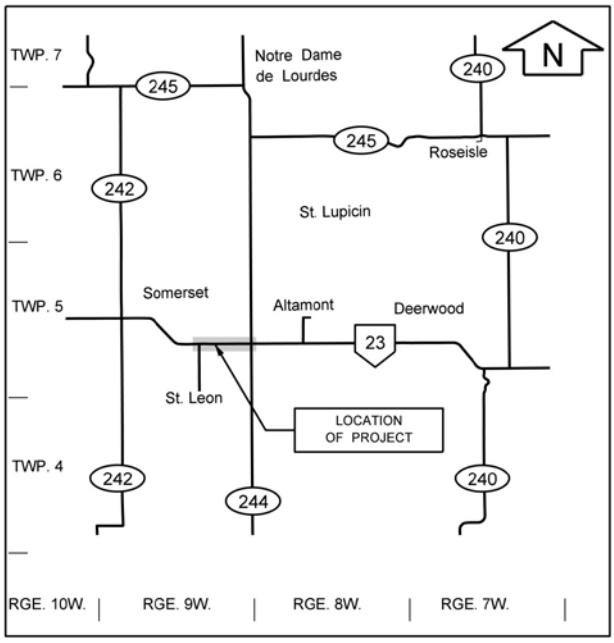
Shown above in Figure 9, is the standard legend as it appears on the Title Block for the DDD sheets. It will have to be edited to include all symbols or cells used for the project. Symbols and cells should be deleted if not applicable.

## 4.8 SKETCH of LOCATION

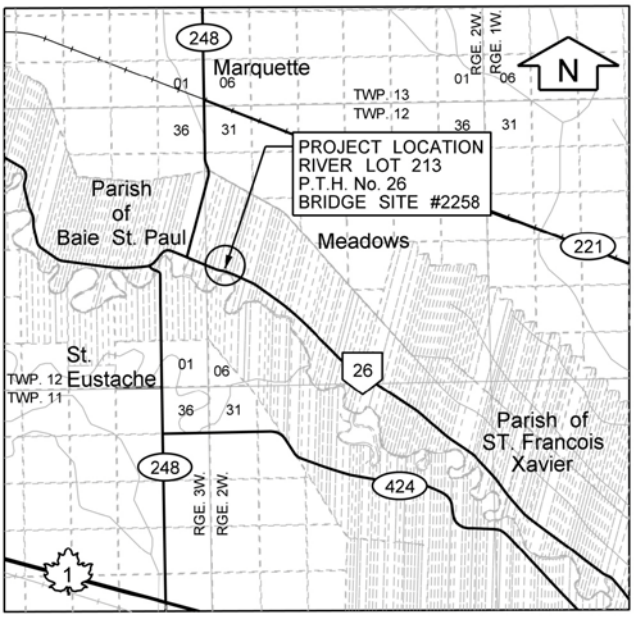
When a Key Plan sheet in a DDD set is not required, a smaller map called a **"Sketch of Location"** can be used. The Sketch of Location is also used on the Profile Title Blocks; see the MIT Standard Engineering Drawing for Profiles.

The Sketch of Location is more suited to projects that are site specific as opposed to a large grading project. It can be produced using a variety of different methods; however, the following information is required:

The North Arrow and the Project Site should be clearly shown as well as nearby highways. The legal descriptors should also be shown. It does not have to be "to scale", however, its size should be large enough to clearly define the project location, generally, a physical size of 150X150mm will be sufficient for most projects. See example in Figure 10:




**SKETCH OF LOCATION**
(NOT TO SCALE)




**SKETCH OF LOCATION**
(NOT TO SCALE)

**Figure 10**

## 4.9 PROPOSED RIGHT-OF-WAY & ROAD LAYOUT SHEET

The **PROPOSED RIGHT-OF-WAY & ROAD LAYOUT** sheet, details spot right-of-way acquisitions and road alignment layout details. The requirements for this sheet are very similar to the Location Plan. The Standard Engineering Drawings should be referred to when completing these sheets.

## 4.10 INTERSECTION DETAILS SHEET

The **INTERSECTION DETAILS** sheet, defines the construction details of the proposed intersection treatment and layout. Design elements should include; radius returns, lane widths, tapers for

acceleration/deceleration lanes and turning lanes, as well as paving limits, etc. They should be drawn at a scale large enough to show the details of the intersection treatment clearly (i.e. 1:500 or 1:1000).
Stations of significant points such as B.C. and E.C. etc. will be shown to 3 decimal places. Station notations are dependent on the detail being shown and will be as per the **MIT Standard Engineering Drawings for DDDs.**

The Project Manager will advise as to the type of intersection treatment required at each intersection. Information for developing intersection treatments can be found in the **Design Guide, Warrants and Standards for Intersection Treatments of Rural Two-Lane Highways** and the **Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads**. Copies of these manuals can be found in the MIT offices.

## 4.11 CROSS SECTION DETAILS SHEET

The **CROSS SECTION DETAILS** sheet is commonly used in the DDD package, this sheet describes the structural elements of the highway. Typical cross sections are a graphical representation of existing conditions and the work to be performed, as they predominantly appear within the station limits. In general the cross section will show the existing and if applicable proposed embankment, the existing and proposed structure along with text notation to identify the said information.

Original ground cross sections are done during the preliminary survey and will be used in the design to determine earthwork quantities. For information on processing original ground cross sections **see the GEOPAK manual.** The information here will cover typical cross sections for the DDD. In most circumstances, the vertical scale of the cross sections will be exaggerated to clearly show the thickness of the various layers of the structural section. Thickness of the layers, within any one typical section, shall be shown proportionally.
The vertical dimensions of the typical cross sections shall be expressed in millimetres, horizontal dimensions shall be expressed in metres.

Dimensions should be referenced to the centreline, baseline or layout lines. Show the percent of slope or where applicable show as “match existing slope”. If dimensions vary, give maximum and minimum values. Side slopes are to be identified as vertical to horizontal (3:1, 4:1). Right-of-way lines shall also be dimensioned to the centreline.
The ROW dimensions can be obtained from the base plan, but should be confirmed by legal plans. **(See Section 2, Locating and Ordering Legal Plans).**
Sheet orientation; starting in the upper left corner with the first cross section and continuing down to the bottom of the sheet and starting a second and third row or a new sheet as required. The stationing runs from the lowest to the highest station.
Any additional cross sections for connector roads would be shown at the end. The reason for this is because they are not continuous with the project stationing and so should be shown separately.

Depending on the project, stationing for MIT projects can be at 20, 40 and 100 metre intervals. The CROSS SECTION DETAILS sheet should not contain information concerning geometric elements, which are adequately shown on layout sheets.
The following is a general list of required information, the details of each can be found in the MIT Standard Engineering Drawings for CROSS SECTION DETAILS.

- Existing ground line.

- Final outline of proposed cross section.
- All cross sections are to be the full width of the right-of-way.
- All dimensions are from the centreline to the edge of the ROW. If a break is required due to a very wide ROW, i.e. T.C.H., the **"Break Line"** cell shall be used.
- Base courses or surface materials shall be identified with the applicable patterns.
- Use the standard description for the differing types of lifts.
- Final surface with percent shown for crown or superelevation.
- Bench cuts, Subcuts, Rock Cuts/Fill.
- Direction of the cross section is to follow stationing, left and right sides of centreline would be West/East, for South to North roads and North/South for West to East roads.
- Scale at which the cross section was drawn.

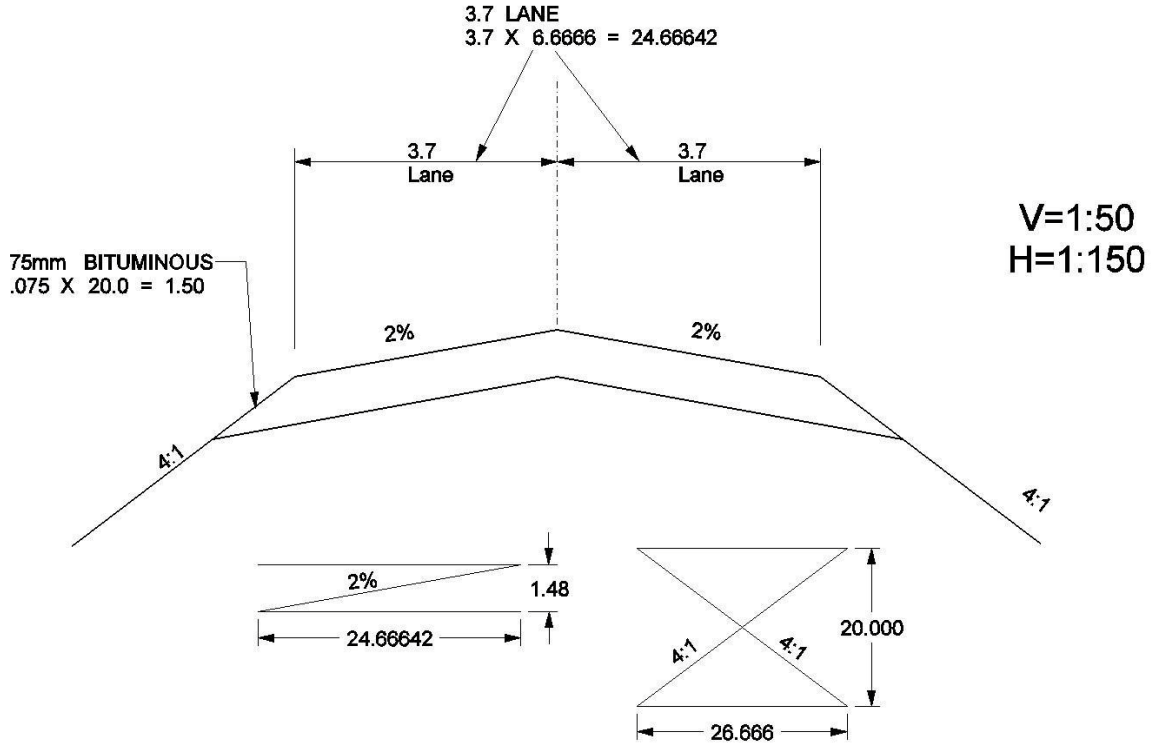
## 4.12 DEVELOPING CROSS SECTIONS ON DDDs

### METHOD 1

Cross sections on DDDs are drawn to scale as a ratio, in accordance with the sheet size to be plotted. The scales used by MIT are generally a ratio of 3:1, where V= 1:50 H= 1:150 or V= 1:100 H= 1:300, V= Vertical and H= Horizontal.

The following method can be used to create these cross sections.
For a sheet size of 1:1000, you want to use the V=1:50 and H=1:150 scale, on screen to draw a 1m vertical line, (V=50), the formula would be: 1000/50 = 20.0 therefore, 1x20 = 20.0m, so 1m = 20.0. And for 1m horizontal line, (H=1:150), the formula is 1000/150 = 6.6666, therefore, 1m = 1 x 6.6666= 6.6666.

For a 1:2000 sheet size, the formula would be, V= 2000/50, H= 2000/150.
Example:
If a lane is 3.7m wide and a depth of 75mm of Bituminous on a 1:1000 sheet size, on screen your lines would be drawn as follows: 75mm = 0.075m = 0.075 x 20.0 = 1.50, 3.7 x 6.6666 = 24.66642




For a 2% crown, draw a line 3.7m = 24.66642, copy it parallel down 1.43 (3.7 x 2% = 0.074 x 20.0 = 1.48). Draw a line diagonally to join them; this is the 2% crown for the top of a lane.

For a 4:1 side slope, draw a line 4.0 (26.6664), copy it parallel down 1m (20.0). Draw a line diagonally to join them; this is the 4:1 slope.
Remember, this is for a scale of V=1:50, H=1:150 and sheet size of 1:1000. For a 1:2000 sheet size: 0.075 x 20.0 x 2 = 3.0, 3.7 x 6.6666 = 24.66642 x 2 = 49.33284

For V= 1:100 and H= 1:300, for a 1:1000 sheet size, the formula would be:
1000/100 = 10.0 therefore 1x10 = 10.0m, so 1m = 10.0 on screen. And for 1:300, the formula is 1000/300 = 3.333333 therefore 1m = 1 x 3.333333 = 3.333333 on screen.

## 4.13 RESCALING CROSS SECTIONS FOR USE ON DDDs

### METHOD 2

When developing cross sections on DDDs, it is not always necessary to draw them manually; if available the design cross sections generated by GEOPAK can be rescaled and used.

STEP 1
Reference the GEOPAK cross section dgn file to the DDD dgn file.
Determine the scale of the design cross sections generated by GEOPAK (3:1 or 4:1).
Fence in desired cross section including original ground line.
Copy it into the DDD sheet.

STEP 2
Rescale cross section to full scale (1:1).

STEP 3
Depending on the sheet scale required (1:1000, 1:2000 etc.) and the desired scale of the cross section, (1:50V and 1:150H) Scale the cross section ensuring the 3:1 ratio (vertical: horizontal).

EXAMPLE
Sheet scale = 1:1000, Desired vertical scale = 1:50, Desired horizontal scale = 1:150,
V = 1000/50 = 20.000, H = 1000/150 = 6.6666, (see METHOD 1).
Rescale cross section so that 1m Horizontal = 6.6666 and 1m Vertical = 20.000

STEP 4
Ensure line codes and weights are correct:
Existing Ground Line should be shown as Lc=1, Wt=0.
Proposed Design Template should be shown as Lc=0, Wt=1.
Use the MTGS_PD.cel library for standard patterns for proposed structure materials.

## 4.14 PLAN PROFILE SHEET

Urban profiles are generally best illustrated with a plan profile format. The plan portion is illustrated on top and may have a legal survey base or an airphoto legal base. The latter is preferable as it best illustrates all of the pertinent information in an easily recognizable and understandable manner. Horizontal scales are generally 1:500 or 1:250 with a vertical scale of 1:10, 1:25 or 1:50. Profile lines should be drawn for all gutters and the centreline of roads or where a curbed median is provided, along the bottom of the face of the median curb. Where underground drainage is provided, catch basin elevations and drainage pipe profiles should be included.

The plan portion should show both existing and proposed driveways, parking lots, access points, sidewalks and extent of curbing. Topographic information should include all relevant buildings, utilities and drainage features.

Details for this sheet shall follow the MIT Standard Engineering Drawings for Profiles and DDDs.

## 4.15 COORDINATE LAYOUT SHEET

This sheet is mainly used for survey layout details for the project area.

## 4.16 CULVERT INSTALLATION DETAILS SHEET

Specific information will be given to CADD personnel from the Project Manager regarding culvert sizes and types as well as installation details. MIT has a number of standard details created to expedite the drawing time.

For detailed information, refer to the MIT Standard Engineering Drawings for DDDs, CULVERT INSTALLATION DETAILS. Most culvert installations will have specific details for each site explained in the contract tender, so consultation with the Project Manager is very important when CADD personnel are producing these sheets for a DDD package.

_____ **DETAILS** – Any other engineering details requiring illustration where the first word of the title corresponds to the type of information illustrated, e.g. erosion control = EROSION CONTROL DETAILS, etc.

## 4.17 PROFILE (VERTICAL ALIGNMENT)

The Profile shows in more detail the elevations along the existing centreline, existing ditch and prairie, as well as the proposed subgrade and proposed ditch profiles. Geometric attributes of the profile shall be illustrated in such a manner that the vertical geometry can be mathematically defined from the information illustrated.
The top drawing on the Profile, details the left side of the highway and the bottom drawing, details the right side. The Profile is also read from left to right along centreline.
All elevations shall be referenced to Geodetic benchmarks. Except where shown on the MIT Standard Engineering Drawing for Profiles, elevations shall be shown to two (2) decimal places. Geodetic and permanent benchmarks may be shown on the profile but not temporary benchmarks.

The Profile shall include all information related to the proposed subgrade profile, such as vertical curve information. Vertical curve stations and elevations should be shown at the beginning and end of each vertical curve (BVC, EVC & VPI) and at all calculated elevation points.
Vertical curve information, including vertical curve lengths and K and A values, as well as all tangent gradients is to be shown.
The very bottom of the profile is used to show, in stick plan form, a plan view of the project extents. This stick plan will detail all existing and proposed crossings, existing and proposed culvert locations, existing and proposed centrelines, etc.
The names of all major intersecting streets, highways, bridges streams/rivers, quarter lines and all other pertinent information shall also be shown on the stick plan.
Generally, text on a profile shall be aligned horizontally except for the stick plan, text is shown vertically. **See the Section on Lettering for the proper alignment of text.**

The standards for two lane highways generally apply to four lane highways except that some additional information is required. However, space limitations may preclude the normal manner of depicting profile information. Additional information includes; profile lines for the centrelines of additional lanes and service roads along with the centrelines of the existing roadways. Profile lines are also required for all ditches, medians and prairie profiles which are generally taken at the edges of the overall right-of-way. It is desirable to plot all profiles together but it is recognized that where there are a great number of profile lines, it is not always possible to illustrate everything in a clear manner. In these cases, certain portions of the profile, such as service roads, may be plotted separately.
A typical scale for a profile is 1:4000 Horizontal and 1:50 Vertical. In rolling or mountainous terrain it may be desirable to use 1:2000 Horizontal and 1:50 Vertical to allow for greater detail of the grade lines to be shown. The standard “NORTH ARROW” cell should be shown on the stick plan at regular intervals and of course where the highway alignment curves.

Standard profile title blocks can be found in the cell library. The small title block shall be used on the left most area of the profile and the larger title block shall be added to the right most end. if the profile is less than one point five (1.5) metres in length, only the larger title block is required and it shall be added to the right most end.
**For more information, see the MIT Standard Engineering Drawing for Profiles.**

## 4.18 GRADE LINES

Grade lines are the lines drawn on profile sheet representing the established elevation of the completed work in a profile or longitudinal section, taken along a reference line established for the control of the work.
Grade lines are used to represent proposed elevations for centreline and ditches for grading projects and other profile improvement work. They may also be used to represent the finished elevation of the drainage path on offtake construction. Offtakes that require cleanout will be shown on the profile with the existing and proposed grade lines. Profile grade lines can also be used for finished elevations of asphalt overlays and base courses.

The tangent gradients (percent of grade) is to be shown for all profiles, the tangent gradient is the change in elevation between any two points on the grade line expressed as a percent of one hundred (100) metres in the direction of ascending stationing. The tangent gradient is considered to be positive when the grade is ascending and negative when the grade is descending.
The tangent gradient can be determined by the following formula: % grade = rise / run x 100.
**For more information on calculating tangent gradients, see the Highway Design Manual.**

## 4.19 SOIL LOGS ON PROFILE

The Department requires that all grading projects have geotechnical investigations completed, involving sampling, logging, and testing performed to Department standards. The soils logs from this analysis shall be included on all profiles. Any deviation from or omission of the Departments standard soils analysis must be at the request of the Regional Technical Services Engineer and approved in writing by the Director of Highway Planning and Design Branch. In such cases a soils log will not be illustrated on the profile when submitted to head office. This would be part of the QMS approvals (Section 5.2).

The log shall be illustrated along the top of the drawing separate from the actual profile but still in relation to the highway centreline stationing. A soils analysis is an important part of the design for a grading project. The results will be evaluated to determine the suitability of the material for highway embankment purposes.

A graphical representation of the soil type and depth for a particular location will be shown. This can be done using the appropriate soil log patterns in the MTGS_PD.cel library. The Project Manager should have a report from MIT's Materials Engineering Branch **(MEB)** with the soil logs compiled in conjunction with the stationing for the project area. From there the soil logs on the Profile can be developed using the tools in GEOPAK to automatically plot the graphic cells for the individual soil classifications in the report.

The following charts show standard abbreviations used in identifying test hole locations and classifying soils, as well as the standard soil patterns used to identify the soil on the profile.

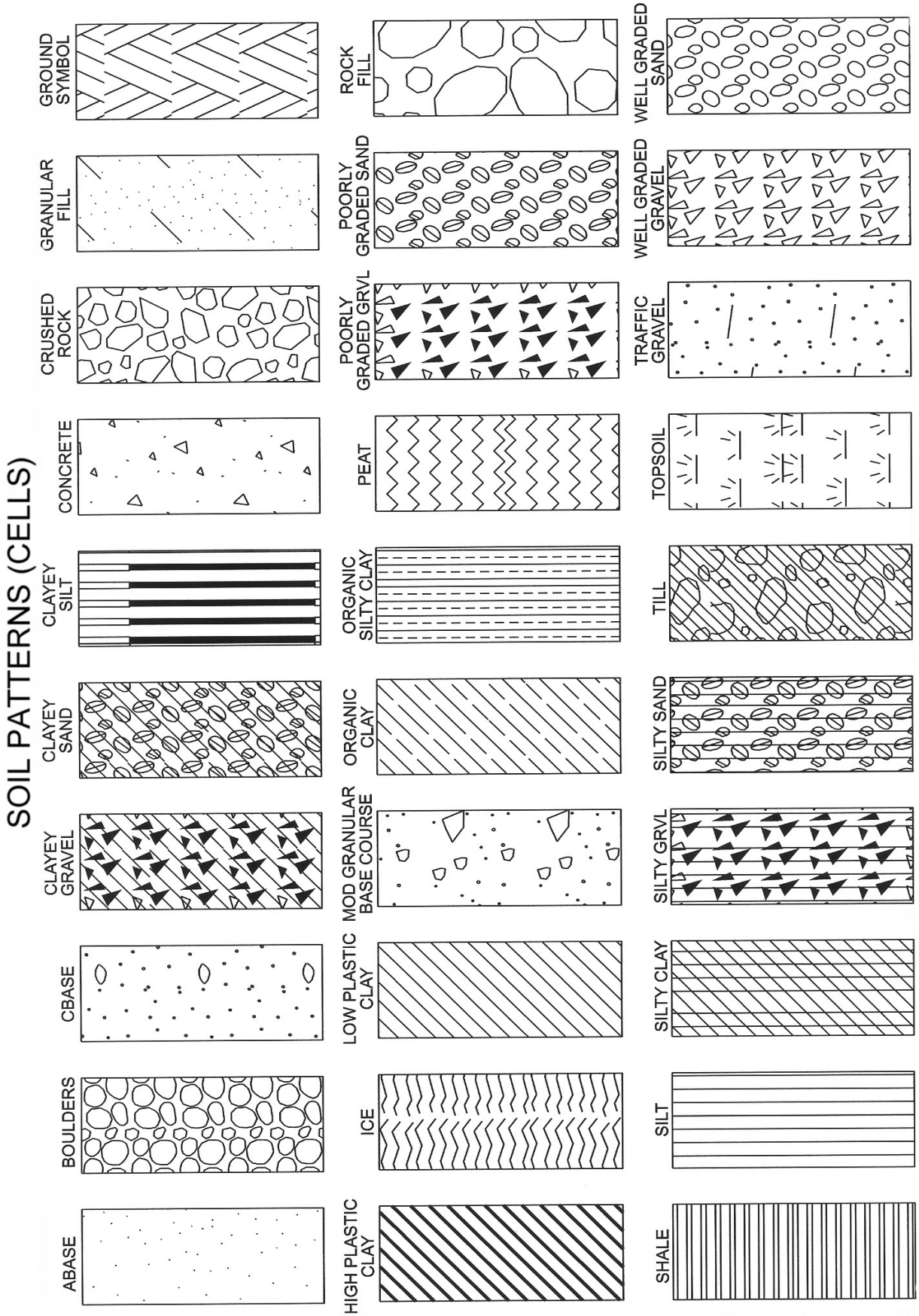
## STANDARD ABBREVIATIONS FOR LOCATION DESCRIPTIONS

| | | | | | |
|---|---|---|---|---|---|
| AVE | Avenue | INTCHG | Interchange | RM | Rural Municipality |
| BDR | Border | JCT | Junction | RR | Railroad |
| BD | Bound | km | Kilometer | RD | Road |
| BDRY | Boundry | L | Lane | ROW | Right–of–Way |
| BR | Bridge | L. | Lake | S | South |
| BR APP | Bridge Approach | LGD | Local Gov't. Dist. | SBL | South Bound Lane |
| CL | Centerline | MP | Mile Post | SHLDR | Shoulder |
| CR | Creek | N | North | SL | South Lane |
| XING | Crossing | NBL | North Bound Lane | SP | South Prairie |
| DIST | District | NL | North Lane | SS | South Side |
| DR | Drive | NP | North Prairie | ST | Street |
| E | East | NS | North Side | TL | Turning Lane |
| EBL | East Bound Lane | P | Prairie | W | West |
| EL | East Lane | PR | Provincial Road | WBL | West Bound Lane |
| EP | East Prairie | PROP | Proposed | WL | West Lane |
| ES | East Side | PTH | Prov. Trunk Highway | WP | West Prairie |
| EMB | Embankment | R | River | WS | West Side |

## STANDARD ABBREVIATIONS FOR FIELD COMMENTS

| SOIL CONDITION | | COLOUR | | MAJOR SOIL TYPES | | MATERIAL TYPES NOT REQUIRING DESCRIPTION OF CONDITION | |
|---|---|---|---|---|---|---|---|
| SFT | Soft | BRN | Brown | CLAY | Clay | BDRK | Bedrock |
| STF | Stiff | GRY | Grey | SILT | Silt | ROCK | Rock |
| HRD | Hard | GRN | Green | SAND | Sand | ROCKFILL | Rockfill |
| WET | Wet | BLK | Black | GRVL | Gravel | TOPSOIL | Topsoil |
| DRY | Dry | YLW | Yellow | PEAT | Peat | BASE | Base Course |
| FZN | Frozen | BLU | Blue | | | BIT | Bituminous |
| SAT | Saturated | | | | | CONCRETE | Concrete |
| ORG | Organic | | | | | | |

## 4.20 SOIL PATTERNS



## 4.21 BRIDGE SITE DETAILS

MIT CADD personnel may be asked to produce drawings for MIT's Bridges and Structures Branch; these will be in the form of a **Bridge Survey Details Plan**. The survey of the site will be done by regional survey personnel. This is to be done according to the standards found in the **Bridge Survey Manual**, on file in the MIT offices.
Once the Bridge Survey Details Plan is complete, the Bridge and Structures Branch is notified and the path to the pertinent files on the MIT server is submitted.

The general guidelines for interpreting bridge site numbers are as follows:
1) Site numbers always have four (4) site identification digits and a two (2) digit sequencer suffix. In construction projects, it is usually convention to drop the zero(s) in front of the site number, e.g. in our inventory 3rd Creek on the T.C.H. would be 0491-11, not 491-11, however everyone you talk to from WC and S should know what you are referring to when it comes to two and three digit site numbers.

2) The site number suffixes or "sequencer" numbers are determined as follows:

a. XXXX-10: 1st full structure replacement.

b. XXXX-20: 2nd full structure replacement, etc.

c. XXXX-01: 1st structure constructed at a site on a one way, two lane road way, e.g. Trans Canada West bound lanes or North bound lanes, 2nd full structure replacement: XXXX-11, etc.

d. XXXX-02: 1st structure constructed at a site on a one way, two lane road way, e.g. Trans Canada East bound lanes or South bound lanes, 2nd full structure replacement: XXXX-12, etc.

e. XXXX-03: 1st structure constructed at a site on a service road, e.g. Service road at 3rd Creek, Service road for West bound lanes or North bound lanes.

f. XXXX-04: 1st structure constructed at a site on a service road, e.g. service road for East bound lanes or South bound lanes.

These guidelines will cover most of the sites in the province; however there are sites that deviate from the guidelines. Personnel are encouraged to contact the Bridges and Structures Branch for clarification of any site numbers that may be contrary to the above guidelines. More information on bridge sites can be found on the MIT TEAMS intranet site at **http://teams/.**

## 4.22 SKETCH PLANS

MIT drafting staff will prepare a number of different Sketch Plans **(S.P.)** for MIT. The Title Blocks for these can be found in the MTGS_PD.cel library. The Title Block headings include a brief description of when to use the various types. These are provided as a guideline – there will always be anomalies. Use your discretion.

- **S.P. Showing RIGHT-OF-WAY Required**
- **S.P. Showing Property Required**
- **S.P. Showing Surplus Property**
- **S.P. Showing Proposed Borrow**
- **S.P. Showing Easement**
- **S.P. Showing Encroachment on to**
- **S.P. Showing Road to be Closed**
- **S.P. Showing Leased Property**
- **S.P. Showing Right of Entry**
- **S.P. Showing Land Required for Detour**
- **S.P. Showing Gravel Pit Location**
- **S.P. Showing Stockpile Location**
- *** S.P. Crossing Application (Title block)**

The **S.P. Showing RIGHT-OF- WAY Required** will follow the requirements shown on the Standard Engineering Drawings for Location Plans, some exceptions are shown below.

- Show only <u>one</u> land owner per S.P. The reason for this is, if you have multiple owners shown on an S.P. and there is a revision (due to negotiations with a landowner) the whole set of S.P.s has to be given a new file number. In the past, revising S.P.s has caused some confusion as to which is the most current sketch plan.
- Sketch Plans don't have an environmental approval box, **but an environmental approval is still required.**
- Sketch Plans can be used to purchase additional property required after a Location Plan is approved and the legal survey plan has been registered in Land Titles Office.
- As of November 2013, **a photo base background is no longer required on this type of S.P.**
- Information shown on a S.P. is the same as shown on a Location Plan. Use the same line styles, weights, text size, etc.
- Property shown on a S.P. is to be hatched. Above the title block, place a hatched box with "Subject Property" labelled adjacent to the hatched box.
- Scale is to be shown above the title block.
- Landowner C.T. No. and acreage (ha) is required, use the "Hectares" Cell.
- H.M.Q. property outside of highway R.O.W. is to be labeled as "CROWN".
- If revisions are required, a new S.P. is submitted with a note that this S.P. No. supersedes the other.

The **S.P. Showing Property Required** is used to purchase property in advance of an approved acquisition of right-of-way line item.

The **S.P. Showing Surplus Property** is used to show surplus property that can be disposed of, i.e. sale, transfer, revestment, exchange.

The **S.P. Showing Proposed Borrow** is used to show proposed borrow area required for highway construction projects.

The **S.P. Showing Easement** is to show Easement Required: when a right to cross the property is required but ownership of the right-of-way is not required. Example: easement required for culvert placement – the landowner can still use the surface.

The **S.P. Showing Encroachment on to**, is to show Easement Granted: to show private structures that encroach onto departmental right-of-way (extent of encroachment is determined by legal survey and shown on a legal survey certificate).

The **S.P. Showing Road to be Closed** is used to show portions of Public Road to be closed.

The **S.P. Showing Leased Property** is used to show property the department (H.M.Q.) owns that can be leased or proposed for lease.

The **S.P. Showing Right of Entry** is used to show Right of Entry for highway construction projects.

The *** S.P. Crossing Application (Title block)** is used to show the location of proposed access construction on a P.R or P.T.H. An air photo base is still required for this type of S.P.

## 4.23 PERMIT APPLICATIONS

Some of the Sketch Plans mentioned above are prepared in conjunction with Permit applications. For **Limited Access** highways under the jurisdiction of the **Highway Traffic Board**, Permits are required for:

- Construction of a new access, relocating, altering or changing the use of an existing access.
- Any structure placed on, under, or above ground level, including signs or a change in land use within a controlled area, i.e. 38.1m or 72.6m from edge of highway rights of way and or 152.4m – 457.2m radius control circle at various intersections throughout the province.
- The planting of any trees or shrubs within 15.2m of a P.T.H. or P.R. outside of an incorporated City, Town or Village.

For **Provincial Roads** under the jurisdiction of **MIT**, Permits are required for:

- Construction of a new access, relocating, altering or changing the use of an existing access.
- Any structure placed on, under, or above ground level, including signs within a controlled area, i.e. 38.1m or 72.6m from edge of highway rights of way and or 152.4m – 457.2m radius control circle at various intersections throughout the province.
- The planting of any trees or shrubs within 15.2m of a P.T.H. or P.R. outside of an incorporated City, Town or Village.

***** Any S.P.s prepared for permit applications will require an air photo base.
For more information see the **Standard Permit Information Package and the New Advertising Sign Policy Booklet** available in the MIT offices. For a map showing Control Areas, see ***T:\Maps From P & D\Statutory Controls on Provincial Highways***.

## 5.1 PLOTTING TO PAPER

MIT drawings can be plotted in the Regional or Sub Office on wide format plotters. Generally 2 sizes of paper media of 24 inches (600 mm) and 36 inches (914 mm) in width are used. These come in roll form in a variety of weights.
Sheet sizes for all drawings except profiles are 1000 mm x 708 mm. Profiles are generally 600 mm (24 inches) wide by whatever is required for length depending on the length of the project. Profiles can be plotted on 914 mm (36 inch) width media for areas in rolling or mountainous terrain, where splitting of the profile can be kept to a minimum.
Approved drawings are plotted on matte film (mylar) for reproduction purposes. Please refer to the section on Plotting To Mylar for more information.

Sketch Plans for ROW acquisition are printed on legal size paper. A pdf of the Sketch Plan is also created and forwarded on to the appropriate agencies. When creating the pdf, place the fence on the heavier weight line of the Title Block to maintain the proper scale.

## 5.2 PLOTTING DGNS / AIR PHOTOS / RASTER IMAGES

With the dgn file open, fence the area you want to print, select >**File** >**Print**, the print menu will open.
Select >**Windows Icon** > and select your printer and driver. MIT has created specific plot drivers to be used when plotting the Standard Engineering Drawings. These can be selected from the print menu, MIT_printer.pltcfg and MIT_pdf.pltcfg.
Select the Preferences button in the print menu and fill out all the pertinent information. When >**OK** is selected you will go back to the print menu, (it should still be open), select >Apply >Cancel. Then in the main print menu, fill in the appropriate information including the sheet scale for the size of sheet you want to plot.
For plotting Air Photos set the colour in the menus to greyscale, also set the plotter itself to greyscale. Then select the >**Printer** icon to initiate printing and close the menu.

## 5.3 COMMON TECHNICAL DRAWING PAPER SIZES

**MIT's Standard Sheet Size is 1000mm x 708mm,** from within the print menu, custom sizes can be created for commonly used MIT sheet sizes.

Other available sheet sizes are:

| **ANSI SIZES** | | **ARCHITECTURAL SIZES** | |
|---|---|---|---|
| A - 8.5 x 11in | 216 x 279mm | ARCH A - 9 x 12in | 229 x 305mm |
| B - 11 x 17in | 279 x 432mm | ARCH B - 12 x 18in | 305 x 457mm |
| C - 17 x 22in | 432 x 559mm | ARCH C - 18 x 24in | 457 x 610mm |
| D - 22 x 34in | 559 x 864mm | ARCH D - 24 x 36in | 610 x 914mm |
| E - 34 x 44in | 864 x 1118mm | ARCH E - 30 x 42in | 762 x 1067mm |
| E - 28 x 40in | 711 x 1016mm | ARCH F - 36 x48in | 914 x 1219mm |

## 5.4 DRAWING CHECKLISTS

The CADD committee has developed checklists to facilitate the completion of drawings. CADD personnel should use the MIT Drafting Standards Quality Assurance Checklists prior to notifying the regional team for final review. It should be noted that not all of the items in these lists will be applicable to every drawing and the Standard Engineering Drawings should be used in conjunction with the checklists. A copy of the checklists should be printed and added to the CADD manual. Copies can be found in the STANDARDS folder on the J and T drive.

## 5.5 APPROVALS - REGIONAL / HEAD OFFICE / QMS

Once all the drawings for a project have been completed a final set of paper copies will be made for review. After the regional team gives final approval, head office will be notified. A **QMS** form (Quality Management System Head Office Sign-Off sheet), along with the path to the drawing(s) on the MIT server is submitted (emailed) to Head Office by the Design Engineer or Project Manager. This form basically advises the pertinent offices that the project drawings are complete and ready for Head Office review and approval. When QMS approvals have been obtained, the mylars can be plotted.

## 5.6 PLOTTING TO MYLAR

Mylar shall be a polyester film reproducible mylar, 3-mil thickness, with a double or single (top side) matte. They shall be in good condition when submitted. The surface should not be highly reflective. Only black ink is permitted, except for cross section and profile grids, these can be coloured ink (CO=9). Unacceptable originals include: negatives, sepias, vellums, damaged sheets, dark backgrounds, pencil drawings, zipatone, stick-ons or bond papers. Decals are not permitted.
At the time of plotting, a note is to be added to the electronic file below the drawing in large text, noting that the drawings were plotted to mylar along with the date on which this was done. Only one copy will be plotted. Once plotting is complete, the appropriate Engineer and other staff will be notified to seal and sign the mylars.

Since the DDD is also intended as an approval document for specialized engineering details, the title blocks of the DDD sheets are developed so that drawing elements with a common approval authority are drawn on a common page. To facilitate the ease of this, the Title Blocks for the individual sheets have a section for the Engineer's seal and the appropriate signatures.
The mylars require a Professional Engineer's seal and are to be dated and signed by the appropriate personnel.
The mylars, along with a cover letter are then submitted to HPD. HPD will assign a tracking number and an electronic pdf of the drawing will be placed on ***T:\QMS Review\Approved Engineering Drawings\Region #***.
An email will be sent to notify the Design Engineer or Regional Design Technologist of approval, the file will then be moved to the regional database. The number and description will also be added to the regional inventory file and the assigned number will be recorded on the dgn file. Some regional offices may also plot a copy and add it to their stick plan inventory. Profiles and Location Plans are handled the same as the DDDs.

If paper copies are requested, regional drafting staff will be asked to plot them out.

To find out if the drawings or plans have been processed by HPD, a plan tracking list on T:drive can be checked. ***T:\plantracking\ and click on 'form plans received.xls' then look for applicable Highway Number.***

## 5.7 REVISIONS

After a set of drawings have been assigned a number and filed by HPD, any changes that are made are considered to be revisions and must be noted as such. The mylar will be sent back to the region with the revisions noted. All revisions must be made on the electronic file (dgn) and a new plot (mylar) must be generated. All revisions made must be done with consent of the person(s) who originally approved and signed the drawing.
If the change or correction affects the design information, new QMS approvals will be required. If there is only a spelling or similar error, HPD will advise as to what is the best way to handle the correction.

When CADD personnel have made the corrections on the electronic file and a new mylar plotted, the appropriate seal and signatures are again required. The note added to the revisions box on the Title Block sheet will briefly explain the changes. The Director of Regional Operations (DRO) is then required to initial beside the note in the space provided. The mylars can then be sent back to HPD for production of new prints.
If copies have already been distributed from the incorrect mylar, new copies of the drawings will be produced and sent out to the appropriate Regional Office and other individuals that had originally received a printed copy.

## 6.1 OVERVIEW

MIT uses Bentley Systems' GEOPAK software for processing survey data as well as for earthwork design. Due to the complexity of the program, only a brief overview will be covered here.

GEOPAK is a comprehensive software package for all survey processing needs: from raw field data to a finished drawing, all within the MicroStation environment. GEOPAK performs traverse entry/edit/reduction, coordinate geometry and mapping without having to leave MicroStation.
Using GEOPAK helps ensure consistency and accuracy of survey data from initial field collection all the way to construction staking.

GEOPAK is started after entering a MicroStation File. To verify that GEOPAK is active, look at the MicroStation menu bar where the "Applications" menu appears. When each GEOPAK tool is selected, the corresponding dialog appears. In addition, several dialogs may be opened simultaneously.
To close a dialog, simply click the X in the upper right corner of the dialog. In addition, the Coordinate Geometry dialog and Design and Computation Manager may be closed by selecting File > Exit. Other various dialogs have Cancel, which exits the dialog. Exiting the MicroStation file automatically closes all GEOPAK dialogs.

The following section describes a simple method for creating a new GEOPAK project on the MIT database. This should be done in the applicable Highway Number and Control Section folder. The Regional directory has a **TEMPLATE** folder which is set up for large projects with all the necessary sub-folders and GEOPAK files. For smaller projects the method on the following pages can be used.

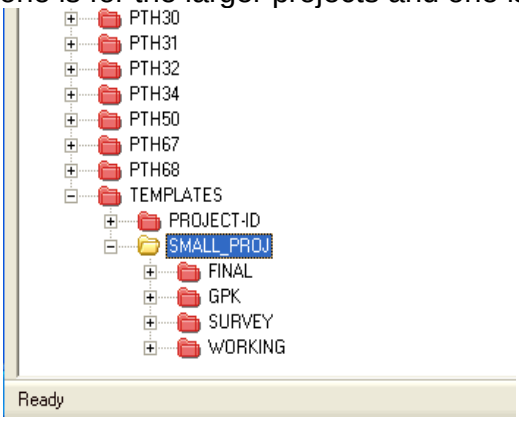
Due to the specialized aspects of this software, training for Bentley products, including MicroStation, Geopak and Projectwise, can be done individually over the internet. MIT has also developed in-house training courses, available to CADD personnel on a by-request basis.

For more information on the in-house training courses and registering for online training, go to the MIT GEOPAK intranet forum or contact your Region Design Technologist.

## 6.2 CREATING A NEW GEOPAK PROJECT

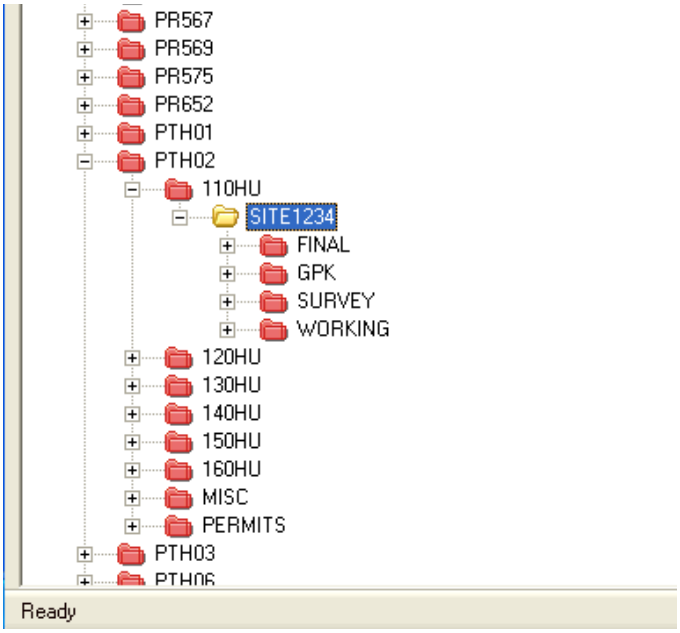
Here is a simple procedure for creating a new project with ProjectWise;

On the Region's folder structure (**R2\ for this example)** there are template folders that can be used, one is for the larger projects and one is for smaller jobs that may only require a few files.




**1. Drag** the **TEMPLATE** folder you wish to use into the folder where you want to create the new Project, i.e. let's say you want to create one in **R2\ PTH02\ 110HU\.**
This can be done just by dragging the TEMPLATE folder and dropping it into **110HU**.

2. Once ProjectWise is finished copying the Template files over, your project should now be displayed in the Projectwise database. You will then have to give it an **applicable name.**




4. You can then copy in the survey files and open the **plan.dgn** or **topo.dgn** and proceed with setting up your project preferences and processing data in **GEOPAK**.

## 6.3 FILE NAMING CONVENTIONS

The MIT CADD database requires the Project folder names be created using only letters, numbers, underscore, minus sign and spaces.
The rest of the characters shown below are not recognized:

**` ~ ! @ # $ % ^ & * ( ) + = { } [ ] | \ : ; “ ‘ < > ? , . /**

The **“+”** is not recognized in a project folder name and an error message will be displayed when trying to include it.

A suggested method of creating your new GEOPAK project folder name without the **“+”** character is **PAVING_PTH2_to_PR248**.

The following characters are also not recognized in filenames when adding files to the database.
**/ \ : * ? < > | " ;** All characters except for the last one **;** are not allowed (recognized) in a filename in Windows. Note: If you use **( )** to identify revisions, it's recommended to exclude these characters from the filenames.

**NOTE:**
The size limit of the project path including the filename depends on the length allowed in the database columns. The project and filenames should be as brief as possible. It is recommended to keep the path to a maximum of 60 characters, from and including the region number (R#).

The following folder and file naming convention is being suggested by MIT. CADD personnel should check with the Regional Design Engineer or Design Technologist for any region specific naming conventions.

**Suggested Final DGN file naming (not Geopak files)**

| Type ↓ unique project ↓ | Description |
|---|---|
| DDD-51001.dgn | DDD plan |
| BP-52001.dgn | Base Plan |
| LP-51001.dgn | Location Plan |
| PR-52001.dgn | Profile |
| XS-52001.dgn | Cross Section |
| SP-52001.dgn | Special Plans |
| RX-51001.dgn | Railway Crossing |
| UX-51001.dgn | Utility Crossing |

Type – Type of MicroStation drawing
1st unique number - represent the region (*this is a suggestion only*)
2nd unique number - represent the sub-office (*this is a suggestion only*)
Location would be identified by the file path.
Additional information can be stored in the DGN File's **Properties Summary** Tab

Historic Region Office / Sub-Office naming convention;

| ***Region No. 1*** | ***Region No. 2*** | ***Region No. 3*** | ***Region No. 4*** | ***Region No. 5*** |
|---|---|---|---|---|
| **1** - Steinbach | **1** - Portage la Prairie | **1** - Brandon | **1** - Dauphin | **1** - Thompson |
| **2** - Winnipeg | **2** - Carman | **2** - Minnedosa | **2** - Swan River | **2** - The Pas |
| **3** - Selkirk | **3** - Arborg | **3** - Birtle | **3** - Ashern | |
| **4** - Lac du Bonnet | | **4** - Boissevain | | |
| | | **5** - Virden | | |

## 6.4 AUTOTURN

AutoTURN is a CAD-based program that lets you analyze and evaluate vehicle manoeuvres for design projects such as intersections, roundabouts, bus terminals, loading bays or any on/off-street assignments involving access, clearance, and manoeuvrability checks.
AutoTURN works within the MicroStation program environment (dgn file). It can be activated from the windows start menu, the dialogue that opens will allow the user to path to their intersection design file and when opened the AutoTURN program will activate. An alternate way of accessing AutoTURN is from within a MicroStation file, select **Utilities=> <MDL Applications> <Browse>** to ***C:\ Program Files\Transoft Solutions\AutoTURN 7*** and Select **<atV8i.ma>** and select **<OK>.**

The following set of instructions is offered for a simple left turn intersection.
Once the intersection details have been drawn, AutoTURN will need a path to follow to determine if the intersection details will fit the intended vehicle (namely tractor-trailer configurations).

Determine the minimum turning radius from the TAC standards, for example: for a design vehicle such as a WB-20 (semi trailer) the minimum turning radius is 12.4 metres.

Copy the centreline of both tangents 1.3 metres parallel (1.3 is the approximately half of the vehicle axle width) while maintaining the vehicle in the appropriate travel lane. This distance will have to be modified depending on the design vehicle being used and it's axle width.

Construct a radius to join the two tangents with the circular fillet command set to 12.4.

In the AutoTURN menu select **<Run Forward Simulation>** and select the three line segments that were just drawn.

Then select **<Run Animation>** and then **<Import Envelope>,** if no errors occur, this will place the simulation in your design file.
If an error occurs, it means you will have to select either a larger radius for the vehicle to follow or make adjustments to the intersection design.

For the following example (Figure 11) we had to use a 20 metre radius and 1.6 metres parallel from the shoulder line (SL) in order to accommodate the vehicle around the turn without encroaching on the passing lane of the west bound lanes.

This describes a very basic use of AutoTURN, for more detailed use; consult the AutoTURN help files and tutorials.
AutoTURN libraries are available on the MIT network drive at T:\AutoTURN\ and by going to the Transoft Solutions website at www.transoftsolutions.com.

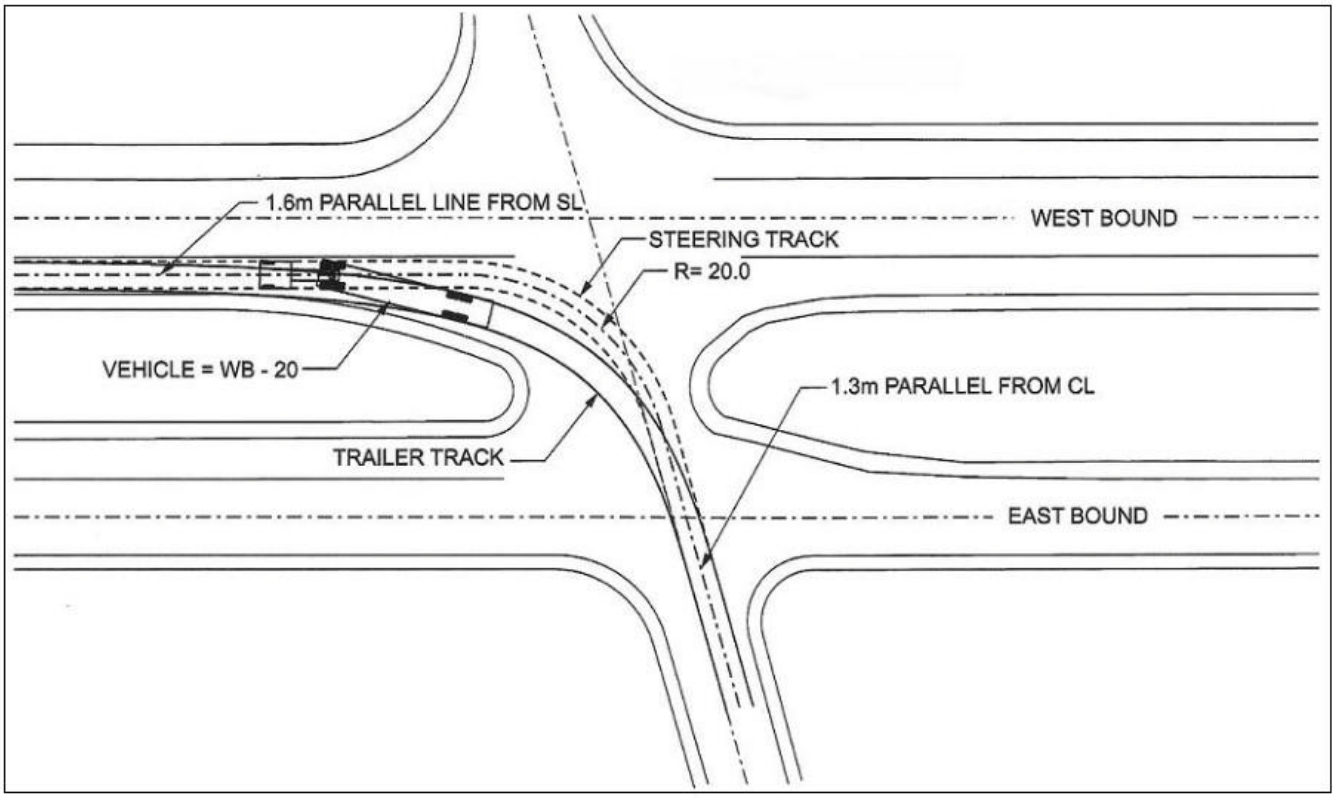

1.6m PARALLEL LINE FROM SL
WEST BOUND
STEERING TRACK
R= 20.0
VEHICLE = WB - 20
1.3m PARALLEL FROM CL
TRAILER TRACK
EAST BOUND

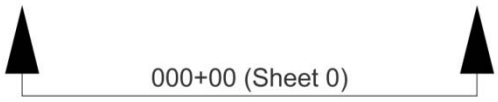
**Figure 11**

## 7.1 INTERNAL AUDIT OF DRAWINGS AND DESIGN PROCESS

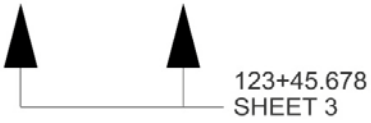
MIT's Highway Planning and Design Branch will periodically perform an internal audit of regional drafting work. The Regional Design Engineer or the Regional Design Technologist will be contacted and an appropriate meeting scheduled. All aspects of the drawings will be checked.

If applicable, MIT's Quality Assurance and Audit Branch will also audit the earthwork design of a project, as well as perform an audit at the completion of road construction projects.
This audit is done to ensure calculations and payments based on earthwork quantities, have been performed correctly.

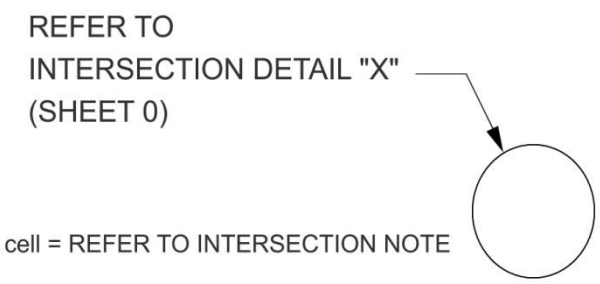
**COMMONLY USED CELLS** (These can be found in the MTGS_PD.cel library)




cell = CROSS SECTION VIEW CUTLINE



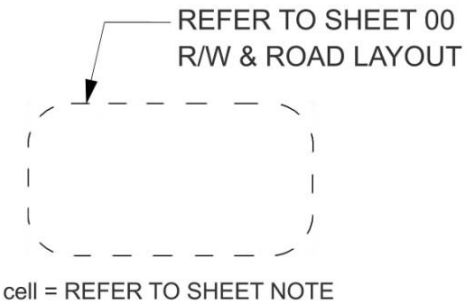

cell = CROSS SECTION VIEW




cell = REFER TO INTERSECTION NOTE


cell = TCH 16 SHIELD NUMBER


cell = TCH 1 SHIELD NUMBER

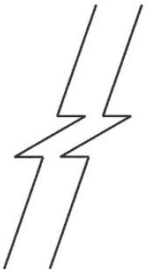



cell = REFER TO SHEET NOTE


cell = PR SHIELD NUMBER


cell = PTH SHIELD NUMBER


CELL = PRELIMINARY STAMP



cell = BREAKLINE


cell = Hectares

**NOTE:** Cells do not have to be "dropped" to edit text.

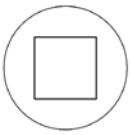
(These can be found in the MTGS_PCode.cel library)

CELL = IRON BAR

CELL = TELEPHONE PEDESTAL

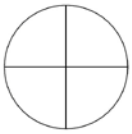
CELL = LEGAL SURVEY MARKER

CELL = HYDRO POLE

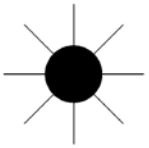


CELL = MB GOV SURVEY POST


CELL = HYDRO GUY ANCHOR



CELL = PROJECT SURVEY CONTROL POINT

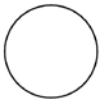


CELL = HYDRO LIGHT POLE

CELL = GEODETIC CONTROL MONUMENT

CELL = MB CONTROL MONUMENT

CELL = BENCH MARK



CELL = MIT CONTROL POINT

## HORIZONTAL CURVE TERMINOLOGY

| | |
|---|---|
| ℄ | CENTERLINE |
| △ | CENTRAL ANGLE (DELTA) |
| R | RADIUS |
| ST | SHORT TANGENT (SUB-TANGENT) |
| LC | **LENGTH OF CURVE** |
| T | TANGENT |
| e | **(e MAX) SUPERELEVATION AS A RATE PER METER, OBTAIN FROM METRIC CURVE TABLES IN THE RTAC MANUAL. SHOW THE CALCULATED e MAX IN THE CURVE DATA CELL.** |
| E | EXTERNAL |
| NC | NORMAL CROWN |
| RC | REMOVE ADVERSE CROWN & SUPERELEVATE AT NORMAL RATE |
| PI | POINT OF INTERSECTION |
| BC / PC | BEGINNING OF CURVE / POINT OF CURVE |
| EC / PT | END OF CURVE / POINT OF TANGENT |

| EXISTING | PROPOSED |
|---|---|
| ℄ CURVE DATA | ℄ CURVE DATA |
| △ = 00°00' 00" | △ = 00°00' 00" |
| R = 000.000 | R = 000.000 |
| ST = 00.000 | ST = 00.000 |
| LC = 000.000 | LC = 000.000 |
| e = 0.00 | e = 0.00 |

**Cell = CURVE DATA EXISTING OR PROPOSED**

**Figure 12**

## CALCULATIONS FOR HORZ. CURVE DATA (convert to decimal of degree first)

$$LC = \frac{\Delta}{180} \pi R$$

$$ST = R \tan \frac{\Delta}{2}$$

$$E = ST \tan \frac{1}{2}\Delta$$

## VERTICAL CURVE TERMINOLOGY

| | |
|---|---|
| LVC | LENGTH OF VERTICAL CURVE |
| g1 g2 | THE PERCENT GRADE IN THE DIRECTION OF STATIONING |
| A | ALGEBRAIC DIFFERENCE IN GRADE CHANGE (g2 - g1) |
| BVC | BEGINNING OF VERTICAL CURVE |
| EVC | END OF VERTICAL CURVE |
| VPI | VERTICAL POINT OF INTERSECTION |
| K | MEASURE OF SHARPNESS OF THE VERTICAL CURVE |

MIT uses the Geometric Method of Calculating Vertical Curves, A full explanation can be found in the MIT Design Manual. The formulae below are for information required on a Profile Plan.

$A = g_2 - g_1$

$$k = \frac{LVC}{A}$$

LVC = k (A) (where A = the absolute value of A)

## MATHEMATICAL FORMULAE AND TECHNICAL DATA

Diameter of a circle = circumference x 0.3183
Circumference of a circle = diameter x 3.1416
Area of a circle = diameter$^2$ x 0.7854
Surface of a sphere = diameter$^2$ x 3.1416

One imperial gallon of water (277.420 cu in) weighs 10lbs
One U.S. gallon = 0.8327 imperial gallons
One cu ft of water (1728 cu in) contains 6.24 imperial gals (7.5 U.S. gallons) and weighs 62.4lbs

One imperial gallon = 160 imp oz (fluid) or 153.6 U.S. oz
One U.S. gallon = 128 U.S. oz (fluid)
One imperial fluid oz = 0.9607 U.S. oz (fluid)
One U.S. fluid oz = 1.0416 imp oz (fluid)

The pressure of a column of water in lb/inch = height of column in ft x 0.434
Doubling the diameter of a pipe … increases its capacity 4 times

### Linear Measure

1/12 of a foot = 1 inch
12 inches = 1 foot
3 feet = 1 yard
$5^1/_2$ yards = 1 rod pole, perch or 16 ½ feet
40 rods = 1 furlong = 220 yards = 660 feet
8 furlongs = 1 statute mile = 1760 yd = 5280 feet
3 miles = 1 league = 5280 yd = 15840 feet
1 mile = 5280 feet
1 foot = 0.305 m
3.281 feet = 1 m
1 in = 25.4 mm
0.039 in = 1 mm

1 centimetre = 10 mm
1 decimetre = 10 cm
10 decimetres = 1 m
1000 metres = 1 kilometre
1 kilometre = 0.6214 miles
1 mile = 1.6093 kilometres
6 feet =1 fathom
120 fathoms = 1 cable length
6080.2 feet = 1 nautical mile

### Area Measure

1/144 sq ft = 1 sq in
144 sq in = 1 sq ft
9 sq ft = 1 sq yd = 1296 sq in
30 ¼ sq yd = 1 sq rod =272 ¼ sq ft
160 sq rods = 1 acre = 4840 sq yd = 43560 sq ft  640 acres = 1 square mile
1 mile square = 1 section (of land)
6 miles square = 1 township = 36 sections = 36 sq miles

1 hectare = 10000 m$^2$
1 acre = 43560 sq ft
1 ha = 2.471 acres
1 cu yd = 0.765 m$^3$
1.196 sq yd = 1 m$^2$
1 station = 100 m
1.196 sta yd = 1 sta m

1 sq km = 100 ha
1 acre = 0.405 ha

1.308 cu yd = 1 m$^3$
1 sq yd = 0.836 m$^2$
1 sta yd = 0.233 sta m

1 short ton = 0.907 t
1 ton mile = 1.460 t km

1.102 short ton = 1 t
0.685 ton mile = 1 t km

**Liquid Measure**

1000 gal = 4.546 kl
219.974 gal = 1 kl = 1 $m^3$
5 oz = 1 gill
4 gills = 1 pint = 20 oz
2 pints = 1 quart = 40 oz
4 quarts = 1 gal = 160 oz
9 gal = 1 firkin
31 ½ gal = 1 barrel
2 hogsheads = 1 butt or pipe

1 imperial gallon = 1.201 US gallons
1 imperial gallon = 4.546 litres
1 US gallon = 0.833 Imperial gallon
1 US gallon = 3.785 litres
1 litre = 0.264 US gallons
1 litre = 0.220 imperial gallons

2 barrels = 1 hogshead
4 hogsheads = 1 tun

**Circular Measure**

60 seconds = 1 minute
60 minutes = 1 degree
90 degrees = 1 quadrant
4 quadrants = 1 circle or circumference = 360 degrees

**Surveyors Chain**

7.92 inches = 1 link
25 links = 1 rod
4 rods = 1 chain = 66 feet
80 chains = 1 statute mile = 320 rods = 5280 ft

**Engineers Chain**

12 inches = 1 link
100 links = 1 chain = 100 feet
52.8 chains = 1 statute mile = 5280 ft

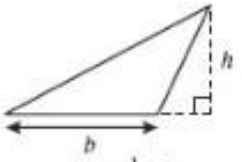
**Weights**

1 gram = 0.03527 ounce (oz)
1 oz = 28.35 grams
1 kilogram (kg) = 2.2046 pounds
1000 kilograms = 1 tonne
2000 pound = 1 short ton
2240 pounds = 1 long ton

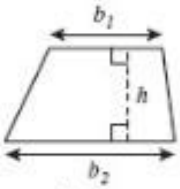
**Frequently used Units of Measure Abbreviations are listed below:**
(See **APPENDIX "E"** for a full List of Standard Abbreviations).

m – metre
cm – centimetre
$m^2$ - square metre
$m^3$ - cubic metre
km - kilometre
kg - kilogram
ha - hectare
h – hour

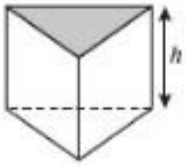
# GEOMETRY FORMULA SHEET




$A = \frac{1}{2}bh$

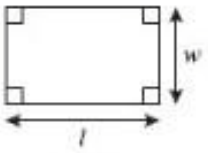



$A = \frac{1}{2}h(b_1 + b_2)$



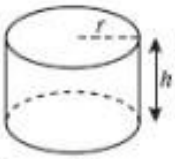

$V = Bh$
$L.A. = hp$
$S.A. = L.A. + 2B$


$V = \frac{1}{3}Bh$
$L.A. = \frac{1}{2}lp$
$S.A. = L.A. + B$



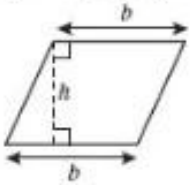

$A = lw$
$p = 2(l + w)$


$A = \pi r^2$
$C = 2\pi r$

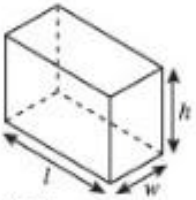



$V = \pi r^2 h$
$L.A. = 2\pi rh$
$S.A. = 2\pi r(h + r)$


$V = \frac{4}{3}\pi r^3$
$S.A. = 4\pi r^2$

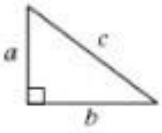



$A = bh$




$V = lwh$
$S.A. = 2lw + 2lh + 2wh$


$V = \frac{1}{3}\pi r^2 h$
$L.A. = \pi rl$
$S.A. = \pi r(l + r)$




$c^2 = a^2 + b^2$

## Geometric Symbols

| Example | Meaning |
|---|---|
| $\angle A$ | angle $A$ |
| $m\angle A$ | measure of angle $A$ |
| $\overline{AB}$ | line segment $AB$ |
| $AB$ | measure of line segment $AB$ |
| $\overleftrightarrow{AB}$ | line $AB$ |
| $\triangle ABC$ | triangle $ABC$ |
| $\square ABCD$ | rectangle $ABCD$ |
| $\square ABCD$ | parallelogram $ABCD$ |

| Example | Meaning |
|---|---|
| $\overrightarrow{AB}$ | vector $AB$ |
| | right angle |
| $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$ | Line $AB$ is parallel to line $CD$. |
| $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$ | Line $AB$ is perpendicular to line $CD$. |
| $\angle A \cong \angle B$ | Angle $A$ is congruent to angle $B$. |
| $\triangle A \sim \triangle B$ | Triangle $A$ is similar to triangle $B$. |
| | Similarly marked segments are congruent. |
| | Similarly marked angles are congruent. |

## Abbreviations

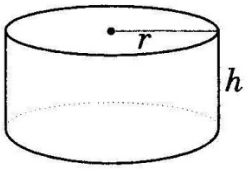
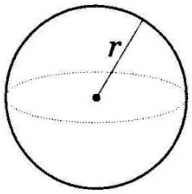
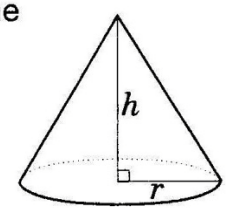
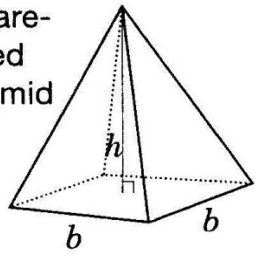
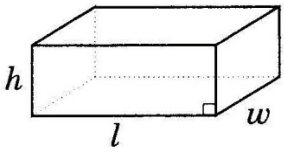
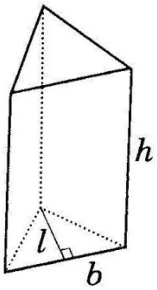
| | |
|---|---|
| Volume | $V$ |
| Lateral Area | $L.A.$ |
| Total Surface Area | $S.A.$ |
| Area of Base | $B$ |

## Pi

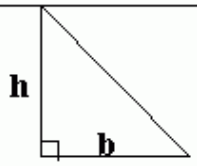
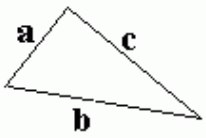
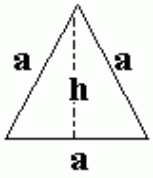
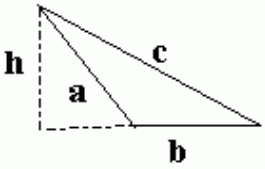
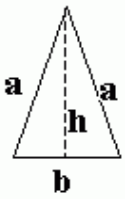
$\pi \approx 3.14$

$\pi \approx \frac{22}{7}$

## VOLUME FORMULA SHEET

| Geometric Figure | Volume |
|---|---|
| Cylinder   | $V = (\text{area of base})(\text{height})$<br>$V = \pi r^2 h$ |
| Sphere   | $V = \frac{4}{3}\pi r^3$ or $V = \frac{4\pi r^3}{3}$ |
| Cone   | $V = \frac{(\text{area of base})(\text{height})}{3}$<br>$V = \frac{1}{3}\pi r^2 h$ or $V = \frac{\pi r^2 h}{3}$ |
| Square-based pyramid   | $V = \frac{(\text{area of base})(\text{height})}{3}$<br>$V = \frac{1}{3} b^2 h$ or $V = \frac{b^2 h}{3}$ |
| Rectangular prism   | $V = (\text{area of base})(\text{height})$<br>$V = lwh$ |
| Triangular prism   | $V = (\text{area of base})(\text{height})$<br>$V = \frac{1}{2} blh$ or $V = \frac{blh}{2}$ |

# TRIANGLE FORMULA SHEET

| | | | |
|---|---|---|---|
| **Right Angle Triangle** |  | h = height<br>b = base | Area = 1/2 (b x h)<br>= 1/2 (Product of the sides containing the right angle) |
| **Scalene Triangle: with length a,b,c** |  | a = side<br>b = side<br>c = side | Area = $\sqrt{s(s-a)(s-b)(s-c)}$<br>Where $s = \frac{(a+b+c)}{2}$<br>Perimeter = a + b + c |
| **Equilateral Triangle** |  | a = three equal sides | Area = $\sqrt{3}/4 \times a^2$<br>Perimeter = a + a + a |
| **Obtuse Angle Triangle** |  | h = height<br>b = base | Area = 1/2 (b x h)<br>Perimeter = a + b + c |
| **Isosceles Triangle** |  | a = two equal sides<br>h = height<br>b = base | Area = 1/2 (b x h)<br>= 1/2 x a x b sin c<br>Perimeter = a + a + c |

**LIST OF STANDARD ABBREVIATIONS**
**--- See also Appendix "F" Abbreviations for Land Title Plans**

**A …**

Abandon (ed) - ABAN
Above Mean Sea Level - ASL
Abutment – ABT or ABUT
Acre – ac or A
Acceleration – ACCEL
Across – ACR
Access – ACS
Actual – ACT
Adjust, Adjacent – ADJ
Aggregate – AGGR
Agriculture – AGRIC
Ahead – AHD
Airport - APRT
Alberta - AB
Alternate, Alternative, Altitude - ALT
Algebraic Difference In Gradient - A%
Aluminum - ALUM
Allowance – ALW
Amber - AMB
American Association Of State Highway And Transportation Officials - AASHTO
American National Standards Institute - ANSI
American Society For Testing And Materials - ASTM
Ancillary - ANC
Angle – A or ANG
Approach Slab - APP
Approximate - APPROX
Approach Road - AR
Asphalt - AS
Asbestos Cement - AC
Asphalt Curb – ASC
Asphalt Concrete Pavement - ACP
Asphalt Stabilized Base Course - ASBC
Asphalt Sidewalk - ASW
Asphalt Wearing Surface - AWS
Asphalt Surface Treatment - AST
Auxiliary - AUX
Average - AVG
Average Daily Traffic – ADT
Average Annual Daily Traffic- AADT
Avenue - AVE
Azimuth - AZ

**B …**
Backsight - BS
Backfill – BKF
Back To Back - B to B
Baffle – BAF
Balance Point – BP
Baseline - B/L
Base of Rail - BOR
Barbed Wire Fence – BWF
Bearing – BG or BRG
Bedrock - BR
Beginning – BEG
Beginning of Curve - BC
Beginning of Vertical Curve - BVC
Benchmark - BM
Between - BET
Bell & Spigot - B&S
Bituminous – BIT
Black - BLK
Block - BLK
Bottom Of Bank (Stream) - BB
Bottom Of Ditch - BD
Boulevard - BLVD
Bottom - BOT
Borrow Pit - BP
Boundary – BDY or BNDY
Board Fence - BF
Bridge – BR or BRG
Brick - BK
Brown - BRN
Building - BLDG

**C …**
Calculated – CALC
Camber – CAM
Canada – CAN
Canada Lands Survey Records - CLSR
Canadian – CDN
Canadian Environmental Assessment Act - CEAA
Canadian Standards Association - CSA
Canadian Spatial Reference System - CSRS
Canadian National Railway - CNR
Canadian Pacific Railway - CPR
Cast Iron - CI
Cast-In-Place - C-I-P
Catch Basin – CB
Catch Basin Manhole – CBMH
Catch Basin Cover – CBCOV
Cattlepass – CP
Cattle Guard – CG
Cement, Cemetery – CEM
Cement Stabilized Base Course - CSBC

Centre - CTR
Centreline, Chain Link (Fence) – CL
Centre To Centre - C/C
Centre To Centre - C to C
Centre Port Canada Way - CCW
Central Western Railway – CWR
Chain – CH
Chain Link Fence - CLF
Chainage Equation - CHN EQN
Channel – CHAN
Chamfer – CHAM
Checked – CHKD
Check Chained - CHK CH
Circular - CIR
Circular Curve to Spiral - CCS
Chip Seal Coat Chip - CSP
Chord - CH
Chord Length, Centre, Cut, Curve, Curb – C
Chlorinated Polyvinyl Chloride -CPVC
Classification – CLASS
Clay - CL
Clearance, Clear, Collar – CLR
Coated - CID
Column - COL
Collector - Distributor – C/D
Community, Commercial - COM
Compacted - COMP
Company - CO
Complete With - C/W
Concrete - CONC
Concrete Floor – CF
Concrete Box Culvert – CBC
Concrete Box Structure – CBS
Concrete Manhole – CMH
Control Point - CP, CPT
Connector, Connection - CONN
Construct - CONST
Construction - CONSTR
Continuous, Continued - CONT
Coordinate - COORD
Corner - COR
Correction - CORR
Corporation - CORP
Cover - COV
Coupler - CPLR
Conduit – CDT
Coring - CRG
Corrugated Metal Pipe - CMP
Corrugated, Correction - CORR
Corrugated Aluminum Pipe – CAP
Corrugated Aluminum Pipe Arch – CAPA
Corrugated Steel Pipe Perforated - CSPP

Corrugated Polyethylene Pipe - CPP
Corrugated Steel Culvert – CSC
Corrugated Steel Pipe - CSP
Corrugated Steel Pipe Arch - CSPA
Corrugated Steel Pipe Manhole - CSPMH
Construction Joint – CJ
County - CTY
Creek – CR or CRK
Crescent – CRES
Cross Road - X-RD
Crossing - X-ING
Cross Section - X-SEC
Cross Over - X-OVER
Culvert - CULV
Cultivated Field - CULT
Curb Inlet, Centre Island – CI
Curb & Gutter - C&G
Curve To Tangent, Court - CT
Curve To Spiral - CS

**D …**
Datum - DAT
Dead Load - DL
Dead Haul – DH
Deceleration – DECEL
Deflect, Deflection – DEF or DEFL
Degree (Angle) – DEG
Degree Of Curvature (Imperial) - D or Dc
Design - DSGN
Design Data – DD
Design Hourly Volume – DHV
Designation – DES
Detail, Detour – DET
Department – DEPT
Departure - DEP
Diameter – DIA
Diaphragm – DIAPH
Diagram - DIAG
Disposal - DSPL
Distance - DIST
Distance From P.I. To Middle Of Arc - E
District - DIST
Ditch - DT
Ditch Block - DBLK
Director, Direction - DIR
Director of Regional Operations - DRO
Difference – DIFF
Dike, Dark - DK
Dimension - DIM
Division - DIV
Dominion Land Survey (Surveyor) - DLS
Double - DBL

Double Meridian Distance - DMD
Double Seal Coat - DSC
Downdrain - DNDRN
Downslope - DNSLP
Downstream - D/S
Drain, Drainage - DRN
Drafting – DFTG
Drawing - DWG
Drive, Driveway – DR or DRWY
Drop Inlet – DI
Drop Manhole - DMH

**E ...**
Each – EA
East Bound Lanes – EBL
East Bound, Earth Borrow – EB
Easement - ESMT
East - E
Edge Of Pavement - EOP
Edge of Shoulder - ESH
Elbow – ELB
Electric – ELEC
Electric Fence – EF
Electronic Distance Measurement – EDM
Elevation (View) – ELEV
Elevation (Above Datum) – EL or ELEV
Eliminate – ELIM
Elliptical – ELP
Embankment – EMB
End of Curve - EC
End of Vertical Curve - EVC
End Product Specifications - EPS
End To End - E to E
Entrance - ENT
Engineer - ENGR
Engineering Service Provider - ESP
Equalizer - EQ
Equipment - EQPT
Equivalent - EQUIV
Estimate - EST
Expressway - EWY
Excavation, Excavate - EXC
Existing - EXIST
Expansion - EXP
Extension, Exterior, Extend - EXT

**F ...**
Fabricate – FAB
Face To Face - F to F
Farm Entrance - FM ENT
Federal – FED
Fence Post - FP

Feeder Main - FM
Feet, Foot, Fort - FT
Fiberglass Reinforced Plastic - FRP
Fiberglass Reinforced Cement - FRC
Field Entrance - FLD ENT
Figure – FIG
Fixed - FXD
Fractional - FRAC
Frame - FR
Frame & Cover - FR & COV
Frame & Grate - FR & GRT
Freehaul, Fire Hydrant – FH
Freeway – FWY
Frontage Road - FR RD
Flange – FLG
Flood, Flow Line, Flow – FL
Found - FD
Found Iron Post (Or Pin) – FIP
Foundation – FDN
Foresight - FS
Force Main - FRM
Footing - FTG
Forward - FWD
Future - FUT

**G ...**
Gauge, Gage – GA
Gallon - GAL
Garage – GAR
Garden – GDN
Gas Valve – GVLV
Gasline, Gradeline, Ground Level – GL
Gate Valve - GV
Galvanized – GALV
Galvanized Steel – GALVS
Galvanized Iron – GALVI
Geodetic Bench Mark, Geodetic Control Monument, Geodetic Survey Monument – MON
Geographic Information System - GIS
Geometric Design Criteria - GDC
Geotextile Filter Fabric – GFF
Global Positioning System - GPS
Government – Supplied Material - GSM
Government - GOVT
Grade - GR
Grade Point - GP
Grade Separation - GS
Graphics Interchange File - GIF
Granular – GRAN
Granular Base Course – GBC
Grate - GRT
Gravel - GRL
Green - GRN

Ground – GR or GRD
Groove - GRV
Guard Rail – GDR
Guide Post - GP
Gutter - GUT

**H …**
Half-Round - 1/2 RD
Hand Rail - HI)/R
Headquarters - HQ
Headlight Sight Distance - HSD
Headwater – HDW
Headwall – HW or HDWL
Heavy - HVY
Hectare - ha
Height – HT or HGT
Height Of Instrument – HI
Helicopter – HEL
Hexagon – HEX
High Density Concrete – HDC
High Water -HW
High Water Level - HWL
High Water Mark - HWM
High Tension Line - HTL
Highway - HWY
Horizontal – HORIZ
Hospital - HOSP
Hot Mix - HM
Hot-In-Place Pavement Recycling –HIPPR
House - HSE
Hydrant - HYD
Hydraulic - HYDR
Hydro – H
Hydro Cable – HC
Hydro Pole - HP
Hydro Guy Pole - HGP

**I …**
Ice Level - IL
Imperial – IMP
Improvement District - ID
Inch – IN
Inclined, Included, Inclusive – INCL
Increment – INCR
Indian Reserve - IR
Inlet – INL
Inlet & Outlet - I&O
Inlet Manhole – IMH
Inside Diameter – ID
Institute Of Electric And Electronic Engineers –IEEE
Instrument (ation) - INSTM
Install - INSTL

Install And Remove (Temporary Installation) -I&R
Instrument, Instantaneous – INST
Installation – INSTL
Interval - INTVL
Intersection, Interior - INT
Intersection Equation - INT EQN
Intersection Sight Distance - ISD
Interchange - INTCH
International - INTL
International Electrotechnical Commission – IEC
International Organization For Standardization - ISO
In North West - INW
In North East – INE
In South West - ISW
In South East - ISE
Information – INFO
Inner – INR
Invert - INV
Invert Elevation – INV EL
Irrigation - IRR
Iron Pipe, Iron Pin, Iron Post - IP
Iron Bar – IB
Island - IS

**J …**
Jacking - JKG
Joint – JT
Joint Photographic Experts Group – JPEG / JPG
Junction – JCT
Junction Box – JB

**K …**
Kilometre – km
Kilometres Per Hour - kph
Kilovolt – KV
Kilowatt - KW

**L …**
Laboratory – LAB
Lake – LK
Land Drainage System - LDS
Landing – LDG
Landmark – LDMK
Lane - LN
Lateral – LATL
Latitude – LAT
Left - LT
Left Bank - LTBK
Left Hand Forward – LHF
Legal Subdivision - LS
Length, Long – LG
Length Of Spiral - Ls

Length Of Simple Curve – L
Length Of Circular Curve - Lc
Level Equation - LVL EQN
License – LIC
Light - LT
Light Pole - LP
Limit – LIM
Limited - LTD
Lining & Grouting - LNG & GTG
Line-Of-Sight, Level Of Service - LOS
Lineal Or Linear – LIN
Linear Referencing System - LRS
Link – LK
Local Road – LR
Local Urban District - LUD
Location - LOC
Long Chord – LC
Longitude, Longitudinal - LONG
Low Water - LW
Low Water Level - LWL
Low Water Mark - LWMK
Lookout - LKT

**M ...**
Main - MN
Maintenance – MAINT
Major – MAJ
Manager – MGR
Manual - MNL
Manhole – MH
Manhole Cover – MHC
Manitoba – MB
Manitoba Government Survey Post - MGSP
Manitoba Land Surveyor – MLS
Manitoba Infrastructure & Transportation – MIT
Manitoba Transportation & Government Services - MTGS
Mark - MK
Marked - MKD
Marker - MKR
Marker Post - MP
Material List - ML
Material – MATL
Maximum – MAX
Mechanical – MECH
Median, Medium – MED
Median Drain Inlet – MDI
Metre – m
Meridian – MER
Memorandum – MEMO
Mean Water Level - MWL
Mean Summer Water Level - MSWL
Mean Sea Level - MSL

Microwave Tower - MTWR
Mile - MI
Millimetre - mm
Miles Per Hour - MPH
Minimum, Minor, Minute – MIN
Miscellaneous - MISC
Miscellaneous Road - MR
Mobile Inspection Station – MIS
Modify, Modified, Modification - MOD
Monument - MON
Mortar - MOR
Mosaic - MOS
Mound – M
Mountain - MTN
Municipal District – MD

**N …**
Natural – NAT
Natural Resources Canada - NRC
Natural Resources Conservation Board - NRCB
National – NATL
National Transportation Agency - NTA
National Electrical Manufacturers Association – NEMA
Navigable Water Protection Act - NWPA
Negative – NEG
Nominal - NOM
Nonreinforced Concrete Pipe - NRCP
Normal Crown – NC
Normal Water Level - NWL
North – N
North East – NE
North American Datum – NAD
Northern Airports & Marine Operations - NAMO
North Bound Lanes – NBL
North West - NW
Northwest Territories - NT
Not to Scale - NTS
Not In Contract - NIC
Number – NO or No.

**O …**
Obliterate, Obliterated – OBL
Obsolete – OBS
Offset - O/S
Oil Line - OL
Orange - ORN
Organic - ORG
Origin, Original - ORIG
Original Ground – OG
On Centre - O/C
Opposite - OPP
Optimum, Optimal - OPT

Outlet - OUT
Outside Diameter – OD
Out To Out - O to O
Overpass - OP
Overhead - O/H or OH
Overhead Sign - OHS
Overhead Guy - OH GUY
Overhead Guy Pole – OHGP
Overhead Guy Structure - OHG STRUCT
Overhaul - OH or OVHL

**P …**
Pavement - PAVT
Percentage - %
Plan – PL
Planted - PTD
Pole – P
Point of Compound Curve – PCC
Point of Intersection – PI
Point of Vertical Curve Intersection – PVI
Poly Vinyl Chloride – PVC or PVCL
Portable Document Format - pdf
Prestressed Concrete – PC
Precast Concrete – PCC
Provincial Road – PR
Provincial Trunk Highway - PTH
Proposed - PROP

**Q …**
Quantity - QTY
Quarter – QTR
Quality Management System Head Office Sign-Off Sheet – QMS (MIT)
Quality Assurance and Audit - QA&A (MIT)

**R …**
Radar – RDR
Radius – R
Range - RGE
Rate Of Superelevation – e
Rate Of Change – RC
Rail – R or RL
Railway - RLY
Railroad - RR
Railway Overpass - RO
Railway Underpass - RU
Raised - RSD
Reclaim – RCLM
Reclaimed Asphalt Pavement – RAP
Re-Established - RE-EST
Reference – REF
Reference Line - REF/L
Reference Point - REF/P

Reinforced, Reinforcing - REINF
Reinforced Concrete Pipe - RCP
Reinforced Concrete Box – RCB
Reinforced Concrete Box Culvert – RCBC
Reinforced Concrete Pipe Arch - RCPA
Reinforcing Steel Bar– REBAR
Reinforcing Steel - RST
Region – REG
Regional Director – RDIR
Relocation - RELOC
Remove - RMV
Remove And Dispose Of, Research And Development - R&D
Remove And Salvage - R&S
Replace - REPL
Required - REQD
Retain, Retaining - RTN
Retaining Wall - RTNGW
Residence - RES
Resurface - RSF
Reservoir - RSVR
Revise, Revision - REV
Right - RT
Right Bank - RTBK
Right-Of-Way - ROW or R/W
Right Hand Forward - RHF
River - R
Road - RD
Roadway – RDWY
Road Allowance - R/A
Road Mixed - RM
Rounding – RND or RNDG
Rock - RK
Rock Quality Designation - RQD
Roller Compacted Concrete - RCC
Roof Slab - RS
Route – RTE
Rubber Gasket –RG
Runway - RWY
Runout - RO
Rural Arterial Divided – RAD
Rural Arterial Undivided – RAU
Rural Collector Undivided – RCU
Rural Expressway Divided – RED
Rural Freeway Divided - RFD
Rural Local Undivided - RLU
Rural Municipality - RM
Rural Route - RR

**S ...**
Salvage, Salvaged – SALV
Sanitary (Sewer) - SA
School – SCH

Secondary Approach (Road) – SA
Secondary Highway - SH
Section, Second – SEC
Service Road - SR
Sewer, Sewage – SEW
Shrinkage – SHR
Shrinkage Factor – SF
Shoulder – SHD or SHLD
Shoulder Edge Treatment - SET
Shore – SH
Shoreline – SHLN
Side Drain, Storm Drain, South Ditch – SD
Sidewalk, South West - SW
Signal Controller - SC
Single – SGL
Single Seal Coat Single Surface - SURF
Skew, Saskatchewan – SK
Slope – SLP
Slotted – SLTD
Smooth Wall Iron Pipe - SWIP
Smooth Wall Steel Pipe - SWSP
Snow Fence (Permanent) – SN
South, Sand - S
South Bound Lanes – SBL
South East – SE
Special Provisions, Spaces, Spacing - SP
Specifications - SPECS
Spike - SPK
Spiral - SP
Spiral To Curve – SC
Spiral To Tangent, Street – ST
Spillway - SPWY
Square - SQ
Standpipe – SP
Stabilized - STAB
Stainless Steel - SST
Standard - STD
Stake - STK
Station - STA
Storm Drain Grate – SDGRT
Storm Drain Inlet – SDI
Storm Relief Sewer - SRS
Storm (Sewer) - ST
Storm Water - STW
Stopping Sight Distance – SSD
Stream -STM
Streambed – SB
Stream, Strength, Structural, Straight - STR
Structure - STR
Structural Plate Corrugated Steel Pipe - SPCSP
Structural Plate Corrugated Steel Pipe Arch - SPCSPA
Steel - STL

Steel Beam Guardrail - SBGR
Stone Mound – SM
Subgrade – SG
Subsoil Drain - SSD
Substructure - SUBSTR
Sub-Tangent (Simple Curve) –ST
Sulphur Extended Asphalt Concrete Pavement – SEACP
Superelevation – SE or SUPEREL
Superstructure - SUPSTR
Supplier - SPLR
Supply & Install - S&I
Survey - SURV
Symbol, Symmetrical - SYM
System – SYS

**T ...**
Tagged Image File Format - TIFF
Tailwater - TW
Tangent – TAN
Tangent To Curve – TC
Tangent To Spiral - TS
Tank – TK
Taper - TPR
Target – TGT
Technical, Technologist – TECH
Tee – T
Terms of Reference - TOR
Telegraph – TLG
Telecommunication – TELECOM
Telephone – TEL
Telephone Booth – TB
Telephone Pole – TP
Temporary Bench Mark – TBM
Temporary, Temperature – TEMP
Tentative – TENT
Test Hole – TH
Theoretical – THEOR
Timber – TMBR
Traffic Signal - TS
Trail - TRL
Trans Canada Highway – TCH
Transportation Association of Canada – TAC
Transition - TRANS
Transverse - TRVS
Transformer - TRNSF
Transport, Transportation - TRANS
Treated Timber Culvert - TTC
Treated Timber Box Culvert - TTBC
Treatment - TREAT
Trench, Tree, Track – TR
Trenching - TRG
Truck - TRK

Tolerance - TOL
Tonne – t
Tongue - TNG
Tongue & Groove - T&G
Topography - TOPO
Top of Bank (Stream) – TOB or TOPBK
Top of Rail – TOR or TR
Total Sub-Tan (Spiral And Simple Curve) - TST
Township - TWP
Turnout - TO
Turning Point - TP
Typical - TYP

**U …**
Unadjusted - UNADJ
Uncoated - UNCTD
Undercut – UCUT
Underdrain – UD
Underpass - UP
Underground – UGRD
Unincorporated Village District - UVD
Universal Transverse Mercator - UTM
University of Manitoba Traffic Information Group - UMTIG
Upstream - U/S
Urban Arterial Divided – UAD
Urban Arterial Undivided – UAU
Urban Collector Divided – UCD
Urban Collector Undivided – UCU
Urban Freeway Divided - UFD
Urban Local Undivided - ULU
Utilities - UTIL

**V …**
Vacant, Vacate, Vacuum – VAC
Variable – VAR
Valve - VLV
Valve Box – VB
Vehicle – VEH
Vehicle Inspection Station - VIS
Velocity - VEL
Vent Valve - VV
Vertical - VERT
Vertical Curve – VC
Vertical Point Of Intersection - VPI
Village - VIL
Volume - VOL

**W …**
Waste Water Sewer - WWS
Waterproof - WPF
Waterwell - WW
Water Level, Waterline – WL

Water Main - WM
Water Meter, Wire Mesh – Wm
Water Pump - WP
Water Table, Watertight - WT
Water Valve - WV
Weight - WT
West, Waste, Water – W
West Bound Lanes – WBL
White – WHT
Width – WD
Wing Wall – WW
Wire Fence, Watchman Fence – WF
Witness – WIT
Wood Post (Fence) - WP
Wood Stave Pipe, Welded Steel Pipe - WSP

**X ...**
Distance East Referenced To Central Meridian (Easting Coordinate) – X

**Y ...**
Distance North Referenced To Equator (Northing Coordinate) – Y
Year - YR
Yard - YD

**Z ...**
Zone – Z
Elevation Above Mean Sea Level – (Elevation Coordinate) - Z

## ABBREVIATIONS FOR LAND TITLE PLANS

| Office | Abbreviation | District Office |
|---|---|---|
| Boissevain | BO | Brandon |
| Brandon | B | Brandon |
| Carman | C | Morden |
| Dauphin | D | Dauphin |
| Dufferin | DU | Morden |
| Dufferin-Lorne | DL | Morden |
| Lisgar | L | Winnipeg |
| Manchester | MN | Winnipeg |
| Marquette East | ME | Portage |
| Marquette West | MW | Portage |
| Morden | M | Morden |
| Morris | MO | Winnipeg |
| Neepawa | N | Neepawa/Portage |
| Norfolk | NO | Portage |
| Portage | P | Portage/Winnipeg |
| Provencher | PR | Winnipeg |
| Rock Lake | RL | Morden |
| Rockwood | R | Winnipeg |
| Selkirk | S | Winnipeg |
| Shoal Lake | SL | Neepawa |
| Souris River | SR | Brandon |
| Turtle Mountain | TM | Brandon |
| Virden | V | Brandon |
| Winnipeg | W | Winnipeg |

| Terms/General | Abbreviations |
|---|---|
| Canadian Lands Survey Records | CLSR |
| Division | (DIV) |
| Easterly | ELY |
| Excepting | EXC |
| Land Titles Office | LTO |
| Northerly | NLY |
| Northeasterly | NELY |
| Northwesterly | NWLY |
| Perpendicular | PERP |
| Southerly | SLY |
| Southeasterly | SELY |
| Southwesterly | SWLY |
| Special Plot | SP |
| Special Survey | SS |
| Westerly | WLY |

| Terms/Township System | Abbreviations |
|---|---|
| East of the Principal Meridian | EPM |
| West of the Principal Meridian | WPM |
| East of the Second Meridian East | E2ME |
| Northeast Quarter | NE ¼ |
| Northwest Quarter | NW ¼ |

| Terms/Township System | Abbreviations |
|---|---|
| Southeast Quarter | SE ¼ |
| Southwest Quarter | SW ¼ |
| North half | N ½ |
| South half | S ½ |
| East half | E ½ |
| West half | W ½ |
| Fractional | FRAC |
| River Lot | LOT (Township System Only) |

| Terms/Parish System | Abbreviations |
|---|---|
| River Lot | RL |
| Outer Two Mile Lots | OTM LOT(S) |
| Wood Lot | WL |
| Saint | ST |
| Sainte | STE |

## STANDARD LEVEL LIST 2015

**NOTE*: this list is updated periodically, for current list, check STANDARDS folder on J: or T: drives.***

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| Default | 0 | | 0 | 0 | 0 | 0 | 0 |
| GK_COGO_Elements | 62 | GEOPAK COGO Drawing Elements | 0 | 0 | 0 | 0 | 0 |
| GK_Cells | 63 | GEOPAK Cells | 2 | 0 | 0 | 0 | 0 |
| GK_Shapes_Ind_1 | 65 | GEOPAK Independent Shapes | 4 | 0 | 0 | 0 | 0 |
| GK_Shapes_Ind_2 | 66 | GEOPAK Independent Shapes | 4 | 0 | 0 | 0 | 0 |
| GK_Shapes_Ind_3 | 67 | GEOPAK Independent Shapes | 4 | 0 | 0 | 0 | 0 |
| GK_Shapes_Ind_4 | 68 | GEOPAK Independent Shapes | 4 | 0 | 0 | 0 | 0 |
| GK_Shapes_Ind_5 | 69 | GEOPAK Independent Shapes | 4 | 0 | 0 | 0 | 0 |
| GK_Shapes_Ind_6 | 70 | GEOPAK Independent Shapes | 4 | 0 | 0 | 0 | 0 |
| GK_Shapes_Ind_7 | 71 | GEOPAK Independent Shapes | 4 | 0 | 0 | 0 | 0 |
| GK_Shapes_Ind_8 | 72 | GEOPAK Independent Shapes | 4 | 0 | 0 | 0 | 0 |
| GK_Shapes_Dep_1 | 75 | GEOPAK Dependent Shapes | 7 | 0 | 0 | 0 | 0 |
| GK_Shapes_Dep_2 | 76 | GEOPAK Dependent Shapes | 7 | 0 | 0 | 0 | 0 |
| GK_Shapes_Dep_3 | 77 | GEOPAK Dependent Shapes | 7 | 0 | 0 | 0 | 0 |
| GK_Shapes_Dep_4 | 78 | GEOPAK Dependent Shapes | 7 | 0 | 0 | 0 | 0 |
| GK_Shapes_Dep_5 | 79 | GEOPAK Dependent Shapes | 7 | 0 | 0 | 0 | 0 |
| GK_Shapes_Dep_6 | 80 | GEOPAK Dependent Shapes | 7 | 0 | 0 | 0 | 0 |
| GK_Shapes_Dep_7 | 81 | GEOPAK Dependent Shapes | 7 | 0 | 0 | 0 | 0 |
| GK_Shapes_Dep_8 | 82 | GEOPAK Dependent Shapes | 7 | 0 | 0 | 0 | 0 |
| GK_Patterns_1 | 90 | Geopak Patterns | 6 | 0 | 0 | 0 | 0 |
| GK_Patterns_2 | 91 | Geopak Patterns | 6 | 0 | 0 | 0 | 0 |
| GK_Patterns_3 | 92 | Geopak Patterns | 6 | 0 | 0 | 0 | 0 |
| GK_Patterns_4 | 93 | Geopak Patterns | 6 | 0 | 0 | 0 | 0 |
| GK_Patterns_5 | 94 | Geopak Patterns | 6 | 0 | 0 | 0 | 0 |
| GK_Patterns_6 | 95 | Geopak Patterns | 6 | 0 | 0 | 0 | 0 |
| GK_Patterns_7 | 96 | Geopak Patterns | 6 | 0 | 0 | 0 | 0 |
| GK_Patterns_8 | 97 | Geopak Patterns | 6 | 0 | 0 | 0 | 0 |
| MB_Gov_Surv_Post | 1001 | Manitoba Government Survey Post | 0 | 0 | 0 | 0 | 0 |
| Iron_Bar | 1002 | Iron Bar | 0 | 0 | 2 | 0 | 0 |
| MB_Cont_Surv_Mon | 1003 | Manitoba Control Survey Monument | 0 | 0 | 0 | 0 | 0 |
| Geo_Cont_Surv_Mon | 1004 | Geodetic Control Survey Monument | 0 | 0 | 0 | 0 | 0 |
| Bench_Mark | 1005 | Bench Mark | 0 | 0 | 0 | 0 | 0 |
| Proj_Surv_Cont_Pt | 1006 | Project Survey Control Point | 0 | 0 | 0 | 0 | 0 |
| Leg_Sur_Mark | 1007 | Legal Survey Marker | 0 | 0 | 0 | 0 | 0 |
| Admin_Bndry | 1020 | City, Town, Village, LUD, FN, Forest, Park | 0 | 6 | 1 | 0 | 0 |
| Quarter_Sec_Line | 1021 | Quarter Section Line | 0 | 3 | 0 | 0 | 0 |
| Section_Line_B | 1022 | Section Line (Blind) | 0 | 0 | 0 | 0 | 0 |
| Certif_Title_Line | 1024 | Certificate Title Line | 0 | 2 | 0 | 0 | 0 |
| Un_Surv_Terr | 1025 | Unsurveyed Territory Section Township Range Lines | 0 | 3 | 0 | 0 | 0 |
| Lot_Lines | 1026 | River, OTM, RCMP, Wood & Lot Line | 0 | 0 | 0 | 0 | 0 |
| Mine_Claims | 1030 | Mining Claims Lines | 19 | 3 | 0 | 0 | 0 |
| Int_Bdry | 1032 | International Boundary Line | 0 | 6 | 3 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| Pipe_Line_ROW | 1034 | Pipe Line ROW (Wt=3 For Pipeline Plan) | 0 | 0 | 1 | 0 | 0 |
| RR_ROW | 1036 | Railway ROW (Wt=3 For Railway Plan) | 0 | 0 | 1 | 0 | 0 |
| Par_Bndry | 1038 | Parish Boundary | 0 | 3 | 1 | 0 | 0 |
| Prov_Bndry | 1040 | Provincial Boundary | 0 | 7 | 1 | 0 | 0 |
| Land_Owner | 1041 | Land Owner Information | 0 | 0 | 0 | 0 | 0 |
| Hectares | 1042 | Area Identified in Hectares | 0 | 0 | 0 | 0 | 0 |
| Ex_ROW | 1100 | Existing ROW Lines | 0 | 0 | 1 | 0 | 0 |
| Ex_Easement | 1102 | Existing Easement Lines | 0 | 0 | 0 | 0 | 0 |
| Prop_ROW | 1200 | Proposed ROW | 0 | Prop_ROW | 3 | 0 | 0 |
| Prop_Revest | 1210 | Property To Be Revested | 0 | 0 | 0 | 0 | 0 |
| Prop_Easement | 1220 | Proposed Easement Lines | 0 | 0 | 0 | 0 | 0 |
| TE_Traf_Sgn_Sin_Wood | 1501 | Traffic Sign - Single Wood | 158 | 0 | 0 | 0 | 0 |
| TE_Traf_Sgn_Mult_Wood | 1502 | Traffic Sign - Multiple Wood (min. 2 Pts shot from field) | 158 | 0 | 0 | 0 | 0 |
| TE_Traf_Sgn_Sin_Alum | 1503 | Traffic Sign - Single Aluminum | 158 | 0 | 0 | 0 | 0 |
| TE_Traf_Sgn_Mult_Alum | 1504 | Traffic Sign - Multiple Aluminum (min. 2 Pts shot from field) | 158 | 0 | 0 | 0 | 0 |
| TE_Overhead_Supp | 1505 | Overhead Support | 158 | 0 | 0 | 0 | 0 |
| TE_Private_Sign | 1506 | Private Sign | 158 | 0 | 0 | 0 | 0 |
| TE_Mail_Box_Individ | 1507 | Individual Mail Box | 158 | 0 | 0 | 0 | 0 |
| TE_Mail_Box_Group | 1508 | Group Mail Box | 158 | 0 | 0 | 0 | 0 |
| TE_Traf_Signal_Std | 1509 | Traffic Signal Standard | 158 | 0 | 0 | 0 | 0 |
| TE_Signal_Con_Unit | 1510 | Signal Control Unit | 158 | 0 | 0 | 0 | 0 |
| TE_Park_Meter | 1511 | Parking Meter | 158 | 0 | 0 | 0 | 0 |
| TE_Polypost | 1512 | Polypost | 158 | 0 | 0 | 0 | 0 |
| TE_Pave_Mark | 1513 | Pavement Markings | 158 | 0 | 0 | 0 | 0 |
| TE_Brdg_Mount_Sign | 1514 | Bridge Mount Sign | 158 | 0 | 0 | 0 | 0 |
| TE_Adv_Cant_Sign | 1515 | Advance Cantilever Sign | 158 | 0 | 0 | 0 | 0 |
| TE_Ped_Corridor | 1516 | Pedestrian Corridor | 158 | 0 | 0 | 0 | 0 |
| TE_Gdrail_Misc | 1517 | Guardrail Miscellaneous | 158 | 0 | 0 | 0 | 0 |
| TE_Prop_Pave_Mark | 1518 | Proposed Pavement Markings | 0 | 0 | 1 | 0 | 0 |
| Hyd_Pole | 2001 | Single Hydro Pole | 2 | 0 | 0 | 0 | 0 |
| Hyd_Mult_Pole | 2002 | NO LONGER USED - Multiple Hydro Pole Structure | 2 | 0 | 0 | 0 | 0 |
| Hyd_Tower | 2004 | Hydro Tower | 2 | 0 | 0 | 0 | 0 |
| Hyd_Guy_Pole | 2005 | Hydro Guy Pole | 2 | 0 | 0 | 0 | 0 |
| Hyd_Lite_Pole | 2006 | Hydro Light Pole | 2 | 0 | 0 | 0 | 0 |
| Hyd_Guy_Anchor | 2007 | Hydro Guy Anchor | 2 | 0 | 0 | 0 | 0 |
| Buried_Hyd_Cable | 2008 | Buried Hydro Cable | 2 | Hydro Cable | 0 | 0 | 0 |
| Grd_Transformer | 2009 | Ground Transformer | 2 | 0 | 0 | 0 | 0 |
| Lite_Standard | 2010 | Light Standard | 2 | 0 | 0 | 0 | 0 |
| MTS_Pole | 2011 | MTS Pole | 18 | 0 | 0 | 0 | 0 |
| MTS_Guy_Pole | 2012 | MTS Guy Pole | 18 | 0 | 0 | 0 | 0 |
| MTS_Guy_Anchor | 2013 | MTS Guy Anchor | 18 | 0 | 0 | 0 | 0 |
| MTS_Pedestal | 2014 | MTS Pedestal | 18 | 0 | 0 | 0 | 0 |
| Buried_MTS_Cable | 2015 | Buried MTS Wire Cable | 18 | MTS Cable | 0 | 0 | 0 |
| Buried_Fibre_Optic | 2016 | Buried MTS Fibre Optic Cable | 18 | Fibr | 0 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| | | | | e Opti c | | | |
| Phone_Booth | 2017 | Telephone Booth | 18 | 0 | 0 | 0 | 0 |
| Hydro_MH | 2018 | Hydro Manhole | 2 | 0 | 0 | 0 | 0 |
| MTS_MH | 2019 | MTS Manhole | 18 | 0 | 0 | 0 | 0 |
| Hyd_Pedestal | 2020 | Hydro Pedestal | 2 | 0 | 0 | 0 | 0 |
| MTS_Box | 2021 | MTS Box | 18 | 0 | 0 | 0 | 0 |
| Cable_TV_Line | 2022 | Cable TV Lines | 18 | 5 | 0 | 0 | 0 |
| Cable_TV_Box | 2023 | Cable TV Box | 18 | 0 | 0 | 0 | 0 |
| Telegraph_Pole | 2024 | Telegraph Pole | 18 | 0 | 0 | 0 | 0 |
| Hyd_Meter_Box | 2025 | Hydro Meter Box | 2 | 0 | 0 | 0 | 0 |
| Hyd_Cable_Marker | 2026 | Hydro Cable Marker | 2 | 0 | 0 | 0 | 0 |
| MTS_Cable_Marker | 2027 | MTS Cable Marker | 18 | 0 | 0 | 0 | 0 |
| Cable_TV_Marker | 2028 | Cable TV Marker | 18 | 0 | 0 | 0 | 0 |
| Fiber_Optic_Marker | 2029 | Fiber Optic Marker | 18 | 0 | 0 | 0 | 0 |
| Hyd_Trans_Line | 2030 | Hydro Transmission Line (points to locate the overhead line) | 2 | 0 | 0 | 0 | 0 |
| Micro_Tower | 2031 | Microwave Tower | 18 | 0 | 0 | 0 | 0 |
| TV_Tower | 2032 | Television Tower | 2 | 0 | 0 | 0 | 0 |
| Cell_Tower | 2033 | Cell Phone Tower | 18 | 0 | 0 | 0 | 0 |
| Hyd_Tran_Pole | 2034 | Hydro Transformer Pole | 2 | 0 | 0 | 0 | 0 |
| B_Tim_Bridge | 2501 | Timber Bridge | 137 | 0 | 0 | 0 | 0 |
| B_Conc_Bridge | 2502 | Concrete Bridge | 137 | 0 | 0 | 0 | 0 |
| B_Steel_Bridge | 2503 | Steel Bridge | 137 | 0 | 0 | 0 | 0 |
| B_Ford_Xing | 2504 | Ford Crossing | 137 | 0 | 0 | 0 | 0 |
| B_Brdg_Abutment | 2505 | Bridge Abutment | 137 | 0 | 0 | 0 | 0 |
| B_Brdg_Support | 2506 | NO LONGER USED - Bridge Supports or Piles | 137 | 0 | 0 | 0 | 0 |
| B_Gdrail_Post | 2507 | Guardrail Posts | 137 | 0 | 0 | 0 | 0 |
| B_Brdg_Pier_Conc | 2508 | Bridge Piers - Concrete | 137 | 0 | 0 | 0 | 0 |
| B_Brdg_Pier_Tim | 2509 | Bridge Piers - Timber | 137 | 0 | 0 | 0 | 0 |
| B_Brdg_Pier_Steel | 2510 | Bridge Piers - Steel | 137 | 0 | 0 | 0 | 0 |
| B_WingWalls | 2511 | WingWalls | 137 | 0 | 0 | 0 | 0 |
| B_WingWall_Gr | 2512 | WingWalls at Groundline | 137 | 0 | 0 | 0 | 0 |
| B_Stringers | 2513 | NO LONGER USED - Stringers | 137 | 0 | 0 | 0 | 0 |
| B_Bot_Toe_Str_Slope | 2514 | Toe of Stream Slope | 137 | 0 | 0 | 0 | 0 |
| B_Top_Bank | 2515 | Top of Bank | 137 | 0 | 0 | 0 | 0 |
| B_Flood_Plain_Bdry | 2516 | Flood Plain Boundary | 137 | 0 | 0 | 0 | 0 |
| B_Rapids | 2517 | Rapids | 137 | 0 | 0 | 0 | 0 |
| B_Ex_Water_Lvl | 2518 | Existing Water Level | 137 | 0 | 0 | 0 | 0 |
| B_High_Wat_Lvl | 2519 | High Water Level | 137 | 0 | 0 | 0 | 0 |
| B_Ice_Level | 2520 | Ice Level | 137 | 0 | 0 | 0 | 0 |
| B_In_Face_Bal_Wall | 2521 | NO LONGER USED - Inside Face Ballast Wall | 137 | 0 | 0 | 0 | 0 |
| B_In_Face_Abut_Wall | 2522 | Inside Face Abutment Wall | 137 | 0 | 0 | 0 | 0 |
| B_Conc_Pier | 2523 | NO LONGER USED - Concrete Pier | 137 | 0 | 0 | 0 | 0 |
| B_Scour_Hole | 2528 | Scour Holes | 137 | 0 | 0 | 0 | 0 |
| B_Expan_Joint | 2529 | Expansion Joints | 137 | 0 | 0 | 0 | 0 |
| B_Newel_Post | 2530 | Newel Post | 137 | 0 | 0 | 0 | 0 |
| B_WingWalls_Supp_Posts | 2531 | Wingwalls Support Posts - Piles | 137 | 0 | 0 | 0 | 0 |
| B_Bot_Stringer | 2532 | Bottom of Bridge Stringer | 137 | 0 | 0 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| B_Top_Deck | 2533 | Top of Bridge Deck | 137 | 0 | 0 | 0 | 0 |
| B_Top_Bear_Plate | 2534 | Top of Bearing Plate | 137 | 0 | 0 | 0 | 0 |
| B_Site_No | 2600 | Bridge Site Number | 0 | 0 | 0 | 0 | 0 |
| B_Misc_Border | 2601 | WC&S Titleblock Elements | 0 | 0 | 2 | 0 | 0 |
| B_Notes | 2602 | WC&S Additional Titleblock Notes | 0 | 0 | 2 | 0 | 0 |
| B_R_Reinf1 | 2701 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf2 | 2702 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf3 | 2703 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf4 | 2704 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf5 | 2705 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf6 | 2706 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf7 | 2707 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf8 | 2708 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf9 | 2709 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf10 | 2710 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf11 | 2711 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf12 | 2712 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf13 | 2713 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf14 | 2714 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf15 | 2715 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf16 | 2716 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf17 | 2717 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf18 | 2718 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf19 | 2719 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf20 | 2720 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf21 | 2721 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf22 | 2722 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf23 | 2723 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf24 | 2724 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Reinf25 | 2725 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc1 | 2751 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc2 | 2752 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc3 | 2753 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc4 | 2754 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc5 | 2755 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc6 | 2756 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc7 | 2757 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc8 | 2758 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc9 | 2759 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc10 | 2760 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc11 | 2761 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc12 | 2762 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc13 | 2763 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc14 | 2764 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc15 | 2765 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc16 | 2766 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc17 | 2767 | | 0 | 0 | 0 | 0 | 0 |
| B_R_Conc18 | 2768 | | 0 | 0 | 0 | 0 | 0 |
| Prop_Util | 2800 | Proposed Utilities | 5 | 6 | 1 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| Gas_Pipe_Line | 3001 | Gas_Pipe_Line | 4 | Gas Pipe Line | 0 | 0 | 0 |
| Gas_Valve | 3002 | Gas_Valve | 4 | 0 | 0 | 0 | 0 |
| Gas_Main_Line | 3003 | Gas Main Transmission Line | 4 | Main Gas Line | 1 | 0 | 0 |
| Gas_Trans_Pump | 3004 | Gas Transmission Line Pump | 4 | 0 | 0 | 0 | 0 |
| Fire_Hydrant | 3005 | Fire Hydrant | 7 | 0 | 0 | 0 | 0 |
| Water_Line | 3006 | Water Line | 7 | Wat er Line | 0 | 0 | 0 |
| Water_Valve | 3007 | Water Valve | 7 | 0 | 0 | 0 | 0 |
| Well | 3008 | NO LONGER USED - Well | 7 | 0 | 0 | 0 | 0 |
| Gas_Marker | 3009 | Gas Pipeline Marker | 4 | 0 | 0 | 0 | 0 |
| Gas_Meter | 3010 | Gas Meter | 4 | 0 | 0 | 0 | 0 |
| Oil_Pipe_Marker | 3011 | Oil Pipeline Marker | 4 | 0 | 0 | 0 | 0 |
| Oil_Pipe_Sta | 3012 | Oil Pipeline Station | 4 | 0 | 0 | 0 | 0 |
| Water_Pipe_Marker | 3013 | Water Pipeline Marker | 7 | 0 | 0 | 0 | 0 |
| Grdwater_Well | 3014 | Groundwater Well | 7 | 0 | 0 | 0 | 0 |
| Irr_Well | 3015 | Irrigation Well | 7 | 0 | 0 | 0 | 0 |
| Irr_Well_Pivot | 3016 | Irrigation Well Pivot | 7 | 0 | 0 | 0 | 0 |
| Irr_Pump | 3017 | Irrigation Pump | 7 | 0 | 0 | 0 | 0 |
| Piezometer | 3018 | Piezometer | 7 | 0 | 0 | 0 | 0 |
| Grdwater_Recdr | 3019 | Groundwater Recorder | 7 | 0 | 0 | 0 | 0 |
| Mid_Slope | 3501 | Mid-Slope (for long grade slopes) | 0 | 0 | 0 | 0 | 0 |
| Toe_Gra_Slope | 3502 | Toe of Grade Slope | 0 | 0 | 0 | 0 | 0 |
| Mid_Ditch | 3503 | Mid-Ditch (Wide Ditch Bottoms) | 0 | 0 | 0 | 0 | 0 |
| Toe_Bk_Slope | 3504 | Toe of Back Slope | 0 | 0 | 0 | 0 | 0 |
| Top_Bk_Slope | 3505 | Top of Back Slope | 0 | 0 | 0 | 0 | 0 |
| Prairie | 3506 | Prairie (long distance between Top of Back Slope and Edge of ROW) - Point | 0 | 0 | 0 | 0 | 0 |
| Toe_Berm | 3508 | Toe of Berm | 0 | 0 | 0 | 0 | 0 |
| Top_Berm | 3509 | Top of Berm | 0 | 0 | 2 | 0 | 0 |
| Fin_Subcut | 3510 | Final Subcut | 0 | 0 | 0 | 0 | 0 |
| Fin_Waste | 3511 | Final Waste | 0 | 0 | 0 | 0 | 0 |
| Fin_TSoil | 3512 | Final Topsoil | 0 | 0 | 0 | 0 | 0 |
| Fin_Grd | 3513 | Final Ground | 0 | 0 | 0 | 0 | 0 |
| Ex_Grd | 3514 | Existing Ground | 0 | 0 | 0 | 0 | 0 |
| Top_TSoil_Cut | 3515 | Top of Topsoil Cut | 145 | 0 | 0 | 0 | 0 |
| Toe_TSoil_Cut | 3516 | Toe of Topsoil Cut | 145 | 1 | 0 | 0 | 0 |
| Top_Subcut | 3517 | Top of Subcut | 66 | 0 | 0 | 0 | 0 |
| Toe_Subcut | 3518 | Toe of Subcut | 66 | 1 | 0 | 0 | 0 |
| Top_Waste_Cut | 3519 | Top of Waste Cut | 23 | 0 | 0 | 0 | 0 |
| Toe_Waste_Cut | 3520 | Toe of Waste Cut | 23 | 1 | 1 | 0 | 0 |
| Top_Borrow_Cut | 3521 | Top of Borrow Cut | 9 | 0 | 0 | 0 | 0 |
| Toe_Borrow_Cut | 3522 | Toe of Borrow Cut | 9 | 1 | 0 | 0 | 0 |
| Top_Rock_Cut | 3523 | Top of Rock Cut | 0 | 0 | 0 | 0 | 0 |
| Toe_Rock_Cut | 3524 | Toe of Rock Cut | 0 | 1 | 0 | 0 | 0 |
| Fin_Solid_Rock | 3525 | Final Solid Rock | 0 | 0 | 0 | 0 | 0 |
| Fin_Borrow_Strip | 3526 | Final Borrow Stripping | 6 | 0 | 0 | 0 | 0 |
| Fin_Borrow_Excav | 3527 | Final Borrow Excavation | 5 | 0 | 0 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| Semi-Final | 3528 | Semi-Final | 0 | 0 | 0 | 0 | 0 |
| Fin_Composite | 3529 | Final Composite | 0 | 0 | 0 | 0 | 0 |
| Fin_Overburden | 3530 | Final Overburden | 0 | 0 | 0 | 0 | 0 |
| Flow_Arrow | 3531 | Flow Arrow | 5 | 0 | 0 | 0 | 0 |
| Override_Lines | 3532 | Constrained, Override & Berm Lines | 0 | 0 | 0 | 0 | 0 |
| Prop_Sawcut_line | 3533 | Proposed Sawcut Line | 100 | 2 | 0 | 0 | 0 |
| XS_Lab_Distance | 3548 | XS - Label Distance | 0 | 0 | 0 | 0 | 0 |
| XS_Lab_Constraint | 3549 | XS - Labeling Constraint | 0 | 0 | 0 | 0 | 0 |
| XS_Lab_Irreg_Ex_Pavt | 3550 | XS - Labeling Irregular Existing Pavement | 0 | 0 | 0 | 0 | 0 |
| XS_Lab_Ex_Utilities | 3551 | XS - Labeling Existing Utilities | 0 | 0 | 0 | 0 | 0 |
| XS_Lab_Ex_SWalk | 3552 | XS - Labeling Existing Sidewalk | 0 | 0 | 0 | 0 | 0 |
| XS_Lab_Ex_Guardrail | 3553 | XS - Labeling Existing Guardrail | 0 | 0 | 0 | 0 | 0 |
| XS_Lab_Ex_Fence | 3554 | XS - Labeling Existing Fence | 0 | 0 | 0 | 0 | 0 |
| XS_Lab_Ex_Curb | 3555 | XS - Labeled Existing Curb | 0 | 0 | 0 | 0 | 0 |
| XS_Ex_Wetlands | 3556 | XS - Existing Wetlands | 0 | 0 | 0 | 0 | 0 |
| XS_Ex_Topsoil_Depth | 3557 | XS - Existing Topsoil Depth | 3 | 0 | 0 | 0 | 0 |
| XS_Lab_Ex_Sidewalk | 3558 | XS - Existing Sidewalk Label | 0 | 0 | 0 | 0 | 0 |
| XS_Ex_Sidewalk | 3559 | XS - Existing Sidewalk | 0 | 0 | 0 | 0 | 0 |
| XS_Ex_Retain_Wall | 3560 | XS - Existing Retaining Wall | 0 | 0 | 0 | 0 | 0 |
| XS_Earth_Shape | 3561 | XS - Earthwork Shapes | 66 | 0 | 0 | -400 | 60 |
| XS_Ex_Base | 3562 | XS - Existing Base | 44 | 0 | 0 | 0 | 0 |
| XS_Ex_Grd | 3563 | XS - Existing Ground | 0 | 0 | 0 | 0 | 0 |
| XS_Ex_Rock | 3564 | XS - Existing Rock | 250 | 0 | 0 | 0 | 0 |
| XS_Ex_ROW | 3565 | XS - Existing ROW | 0 | 0 | 2 | 0 | 0 |
| XS_Ex_TS | 3566 | XS - Existing Topsoil | 3 | 0 | 0 | 0 | 0 |
| XS_Exca_Limit | 3567 | XS - Excavation Limits | 6 | 3 | 2 | 0 | 0 |
| XS_Lab_Txt | 3568 | XS - Label Text | 0 | 0 | 0 | 0 | 0 |
| XS_Misc | 3569 | XS - Miscellaneous | 0 | 0 | 0 | 0 | 0 |
| XS_Misc_Txt | 3570 | XS - Miscellaneous Text | 0 | 0 | 0 | 0 | 0 |
| XS_Prop_Asph | 3571 | XS - Proposed Asphalt | 10 | 0 | 1 | 0 | 0 |
| XS_Prop_Base | 3572 | XS - Proposed Base | 7 | 0 | 1 | 0 | 0 |
| XS_Prop_Curb_SS | 3573 | XS - Proposed Curb Subsurface | 173 | 0 | 1 | 0 | 0 |
| XS_Prop_Fin_Grade | 3574 | XS - Proposed Finish Grade | 5 | 0 | 1 | 0 | 0 |
| XS_Prop_Med_SS | 3575 | XS - Proposed Median Subsurface | 62 | 0 | 1 | 0 | 0 |
| XS_Prop_Pav_ABase | 3576 | XS - Proposed Pavement A-Base | 133 | 0 | 1 | 0 | 0 |
| XS_Prop_Pav_BitC | 3577 | XS - Proposed Pavement Bit C | 180 | 0 | 1 | 0 | 0 |
| XS_Prop_Pav_CBase | 3578 | XS - Proposed Pavement C-Base | 133 | 0 | 1 | 0 | 0 |
| XS_Prop_Pav_Slope | 3579 | XS - Proposed Pavement Slopes | 140 | 0 | 1 | 0 | 0 |
| XS_Prop_Pav_Sur | 3580 | XS - Proposed Pavement Surface | 5 | 0 | 1 | 0 | 0 |
| XS_Prop_Pav_Sur_Bot | 3581 | XS - Proposed Pavement Surface Bottom | 146 | 0 | 1 | 0 | 0 |
| XS_Prop_Rock | 3582 | XS - Proposed Rock | 250 | 0 | 2 | 0 | 0 |
| XS_Prop_ROW | 3583 | XS - Proposed ROW | 0 | 3 | 3 | 0 | 0 |
| XS_Prop_SBase | 3584 | XS - Proposed Subbase | 73 | 0 | 1 | 0 | 0 |
| XS_Prop_SG | 3585 | XS - Proposed Subgrade | 66 | 0 | 1 | 0 | 0 |
| XS_Prop_Shd_Asph | 3586 | XS - Proposed Shoulder Asphalt | 10 | 0 | 1 | 0 | 0 |
| XS_Prop_Shd_Base | 3587 | XS - Proposed Shoulder Base | 7 | 0 | 1 | 0 | 0 |
| XS_Prop_Shd_SBase | 3588 | XS - Proposed Shoulder Subbase | 73 | 0 | 1 | 0 | 0 |
| XS_Prop_Shd_Sur | 3589 | XS - Proposed Shoulder Surface | 92 | 0 | 1 | 0 | 0 |
| XS_Prop_Shd_Sur_Bot | 3590 | XS - Proposed Shoulder Surface Bottom | 93 | 0 | 1 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| XS_Prop_Subcut | 3591 | XS - Proposed Subcut | 56 | 3 | 1 | 0 | 0 |
| XS_Prop_SW_SS | 3592 | XS - Proposed Sidewalk Subsurface - Bottom of Base | 173 | 0 | 1 | 0 | 0 |
| XS_Prop_TS | 3593 | XS - Proposed Topsoil | 3 | 0 | 1 | 0 | 0 |
| XS_Warn_Txt | 3594 | XS - Warning Text | 2 | 0 | 0 | 0 | 0 |
| XS_Fin_TSoil | 3595 | XS - Final Topsoil | 96 | 0 | 1 | 0 | 0 |
| XS_Fin_Grd | 3596 | XS - Final Ground | 0 | 0 | 1 | 0 | 0 |
| XS_Fin_Waste | 3597 | XS - Final Waste | 18 | 0 | 1 | 0 | 0 |
| XS_Fin_Subcut | 3598 | XS - Final Subcut | 56 | 0 | 1 | 0 | 0 |
| XS_Fin_Borrow | 3599 | XS - Final Borrow | 6 | 0 | 1 | 0 | 0 |
| XS_Fin_Borrow_Strip | 3600 | XS - Final Borrow Stripping | 7 | 0 | 1 | 0 | 0 |
| XS_Fin_Solid_Rock | 3601 | XS - Final Solid Rock | 0 | 0 | 1 | 0 | 0 |
| XS_Fin_Composite_Exc | 3602 | XS - Final Composite Excavation | 64 | 0 | 1 | 0 | 0 |
| XS_Fin_Overburden | 3603 | XS - Final Overburden | 65 | 0 | 1 | 0 | 0 |
| XS_Ex_Asphalt | 3604 | XS - Existing Asphalt | 10 | 0 | 0 | 0 | 0 |
| XS_Ex_Concrete | 3605 | XS - Existing Concrete | 0 | 0 | 0 | 0 | 0 |
| XS_Prop_Waste | 3606 | XS - Proposed Waste Cut | 42 | 0 | 1 | 0 | 0 |
| XS_Prop_Pav_BitB | 3607 | XS - Proposed Pavement Bit B | 180 | 0 | 1 | 0 | 0 |
| XS_Prop_Conc | 3608 | XS - Proposed Concrete | 173 | 0 | 1 | 0 | 0 |
| XS_Prop_Bench_Cut | 3609 | XS - Proposed Bench Cut | 17 | 0 | 1 | 0 | 0 |
| XS_Prop_Crush_Rock | 3610 | XS - Proposed Crush Rock | 18 | 0 | 1 | 0 | 0 |
| XS_Prop_Overburden | 3611 | XS - Proposed Overburden | 34 | 0 | 1 | 0 | 0 |
| XS_Prop_Gran_Fill | 3612 | XS - Proposed Granular Fill | 96 | 0 | 1 | 0 | 0 |
| XS_Prop_Solid_Rock_Exc | 3613 | XS - Proposed Solid Rock Excavation | 0 | 0 | 1 | 0 | 0 |
| XS_Prop_Rock_Embank | 3614 | XS - Proprosed Rock Embankment | 179 | 0 | 1 | 0 | 0 |
| XS_Prop_Milling | 3615 | XS - Proposed Milling | 199 | 0 | 1 | 0 | 0 |
| XS_Prop_Shld_Prep | 3616 | XS - Proposed Shoulder Preparation | 50 | 0 | 1 | 0 | 0 |
| XS_Prop_Surf_Prep | 3617 | XS - Proposed Surface Preparation | 51 | 0 | 1 | 0 | 0 |
| XS_Prop_Traf_Gravel | 3618 | XS - Proposed Traffic Gravel | 115 | 0 | 1 | 0 | 0 |
| XS_Prop_Intcep_Dtch | 3619 | XS - Proposed Interceptor Ditch | 5 | 0 | 1 | 0 | 0 |
| XS_Prop_TS_Place | 3620 | XS - Proposed Topsoil Placement | 3 | 0 | 1 | 0 | 0 |
| XS_Prop_OffSet_Elev_SG | 3621 | XS - Proposed OffSet Elev. Subgrade | 5 | 0 | 1 | 0 | 0 |
| XS_Prop_OffSet_Elev_Base | 3622 | XS - Proposed OffSet Elev. Base | 6 | 0 | 1 | 0 | 0 |
| XS_Prop_OffSet_Elev_Pave | 3623 | XS - Proposed OffSet Elev. Pavement | 5 | 0 | 1 | 0 | 0 |
| XS_Prop_Pav_BitA | 3624 | XS - Proposed Pavemant Bit A | 180 | 0 | 1 | 0 | 0 |
| XS_Prop_Curb_Surface | 3625 | XS - Proposed Curb Surface | 5 | 0 | 1 | 0 | 0 |
| XS_Median_Cover | 3626 | XS - Median Cover | 0 | 0 | 0 | 0 | 0 |
| XS_Prop_Excav_Limit | 3627 | XS - Proposed Cross Section Excavation Limits | 2 | 3 | 2 | 0 | 0 |
| XS_Prop_Composite_Exc | 3628 | XS - Proposed Composite Excavation | 65 | 3 | 1 | 0 | 0 |
| XS_Prop_Borrow | 3629 | XS - Proposed Borrow | 6 | 3 | 1 | 0 | 0 |
| XS_Prop_Borrow_Strip | 3630 | XS - Proposed Borrow Stripping | 7 | 3 | 1 | 0 | 0 |
| XS_Prop_Pav_Layer_1 | 3631 | XS - Proposed Pavement First Layer (User Defined) | 180 | 0 | 1 | 0 | 0 |
| XS_Prop_Pav_Layer_2 | 3632 | XS - Proposed Pavement 2nd Layer (User Defined) | 133 | 0 | 1 | 0 | 0 |
| XS_Prop_Pav_Layer_3 | 3633 | XS - Proposed Pavement 3rd Layer (User Defined) | 115 | 0 | 1 | 0 | 0 |
| XS_Prop_Pav_Layer_4 | 3634 | XS - Proposed Pavement 4th Layer (User Defined) | 166 | 0 | 1 | 0 | 0 |
| XS_Prop_Shd_Layer_1 | 3635 | XS - Proposed Shoulder First Layer (User Defined) | 180 | 0 | 1 | 0 | 0 |
| XS_Prop_Shd_Layer_2 | 3636 | XS - Proposed Shoulder 2nd Layer (User Defined) | 133 | 0 | 1 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| XS_Prop_Shd_Layer_3 | 3637 | XS - Proposed Shoulder 3rd Layer (User Defined) | 115 | 0 | 1 | 0 | 0 |
| XS_Prop_Shd_Layer_4 | 3638 | XS - Proposed Shoulder 4th Layer (User Defined) | 166 | 0 | 1 | 0 | 0 |
| XS_Slope_Ratio | 3640 | XS - Slope Ratio Text | 0 | 0 | 0 | 0 | 0 |
| XS_Percent_Crossfall | 3641 | XS - Percent Crossfall Text | 0 | 0 | 0 | 0 | 0 |
| XS_Prop_Cut-Fill_Quat | 3642 | XS - Proposed Cut/Fill Quatity | 0 | 0 | 0 | 0 | 0 |
| XS_Gen_Notes | 3643 | XS - Cross Sections Labels | 0 | 0 | 0 | 0 | 0 |
| XS_SW_Top | 3644 | XS - Top of Sidewalk | 5 | 0 | 1 | 0 | 0 |
| XS_SW_Bot | 3645 | XS - Bottom of Sidewalk | 13 | 0 | 1 | 0 | 0 |
| XS_Semi_Fin | 3650 | XS - Semi Finals | 84 | 0 | 1 | 0 | 0 |
| XS_Prop_Semi_Fin | 3652 | XS - Proposed Semi Final | 84 | 3 | 1 | 0 | 0 |
| XS_Comp_1 | 3661 | XS - Composite 1 | 2 | 0 | 2 | 0 | 0 |
| XS_Comp_2 | 3662 | XS - Composite 2 | 3 | 0 | 2 | 0 | 0 |
| XS_Comp_3 | 3663 | XS - Composite 3 | 5 | 0 | 2 | 0 | 0 |
| XS_Comp_4 | 3664 | XS - Composite 4 | 6 | 0 | 2 | 0 | 0 |
| XS_Comp_5 | 3665 | XS - Composite 5 | 7 | 0 | 2 | 0 | 0 |
| XS_Comp_6 | 3666 | XS - Composite 6 | 16 | 0 | 2 | 0 | 0 |
| XS_Comp_7 | 3667 | XS - Composite 7 | 17 | 0 | 2 | 0 | 0 |
| XS_Comp_8 | 3668 | XS - Composite 8 | 18 | 0 | 2 | 0 | 0 |
| XS_Comp_9 | 3669 | XS - Composite 9 | 19 | 0 | 2 | 0 | 0 |
| XS_Ex_Rock_Dummy_Line | 3670 | XS - Existing Rock Dummy Line | 250 | 2 | 0 | 0 | 0 |
| XS_Ex_Pipe_Approach | 3671 | XS - Existing Pipe (cell At Approach) | 3 | 0 | 1 | 0 | 0 |
| XS_Prop_Channel | 3672 | XS - Proposed Channel | 2 | 0 | 1 | 0 | 0 |
| XS_Prop_Dyke | 3673 | XS - Proposed Dyke | 2 | 0 | 1 | 0 | 0 |
| XS_Prop_Outside_Drain | 3674 | XS - Proposed Outside Drain | 2 | 0 | 1 | 0 | 0 |
| XS_Prop_Pipe_Approach | 3675 | XS - Proposed Pipe (Cell At Approach) | 2 | 0 | 1 | 0 | 0 |
| XS_Prop_Approach | 3676 | XS - Proposed Approach | 2 | 0 | 1 | 0 | 0 |
| XS_Spread | 3677 | XS - Proposed Spread | 2 | 0 | 1 | 0 | 0 |
| XS_Prop_Geotextile | 3678 | XS - Proposed GEOTEXTILE | 0 | 3 | 2 | 0 | 0 |
| Prop_CL_Sta | 3800 | Proposed Centerline Station | 0 | 0 | 2 | 0 | 0 |
| Prop_Limt_Const | 3801 | Proposed Limits of Construction | 2 | 0 | 2 | 0 | 0 |
| Ground_Sym | 3823 | Ground Earth Symbol | 0 | 0 | 0 | 0 | 0 |
| Bit_A_Pattern | 3850 | Bituminous A (Fill CO= 10) | 0 | 0 | 0 | 0 | 0 |
| Bit_B_Pattern | 3852 | Bituminous B (Fill CO= 1) | 0 | 0 | 0 | 0 | 0 |
| Bit_C_Pattern | 3854 | Bituminous C (Fill CO= 8) | 0 | 0 | 0 | 0 | 0 |
| Conc_Pattern | 3856 | Concrete Pattern (Pattern) | 0 | 0 | 0 | 0 | 0 |
| Traf_Grav | 3858 | Traffic Gravel (Pattern) | 0 | 0 | 0 | 0 | 0 |
| Gran_A_Base | 3860 | Granular A-Base (Pattern) | 0 | 0 | 0 | 0 | 0 |
| Gran_C_Base | 3862 | Granular C Base (Pattern) | 0 | 0 | 0 | 0 | 0 |
| Gran_Fill | 3864 | Granular Fill (Pattern) | 9 | 0 | 0 | 0 | 0 |
| Crushed_Rock | 3866 | Crushed Rock (Pattern) | 0 | 0 | 0 | 0 | 0 |
| Mod_Gran_Base | 3868 | Modified Granular Base Course (Pattern) | 0 | 0 | 0 | 0 | 0 |
| Rock_Fill | 3870 | Rock Fill (Pattern) | 0 | 0 | 0 | 0 | 0 |
| Boulders | 3871 | Boulders (Pattern) | 0 | 0 | 0 | 0 | 0 |
| Shale | 3872 | Shale (Pattern) | 0 | 0 | 0 | 0 | 0 |
| Till | 3873 | Till (Pattern) | 0 | 0 | 0 | 0 | 0 |
| Topsoil | 3874 | Topsoil (Pattern) | 0 | 0 | 0 | 0 | 0 |
| Ice | 3875 | Ice (Pattern) | 0 | 0 | 0 | 0 | 0 |
| DTM_Cont_Major | 3900 | Major Contour lines | 3 | 0 | 1 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| DTM_Cont_Minor | 3901 | Minor Contour lines | 6 | 0 | 0 | 0 | 0 |
| DTM_Cont_Major_Txt | 3902 | Major Contour text | 5 | 0 | 1 | 0 | 0 |
| DTM_Spots | 3903 | DTM Spots | 104 | 0 | 2 | 0 | 0 |
| DTM_Hull | 3904 | TIN Hull | 3 | 0 | 0 | 0 | 0 |
| DTM_Triangles | 3905 | DTM Triangles | 3 | 0 | 0 | 0 | 0 |
| DTM_Break_Lines | 3906 | DTM Break Lines | 7 | 5 | 1 | 0 | 0 |
| DTM_Voids | 3907 | DTM Voids | 11 | 0 | 1 | 0 | 0 |
| DTM_Islands | 3908 | DTM Islands | 3 | 2 | 1 | 0 | 0 |
| DTM_Vert_Edges | 3909 | DTM Vertical Edges | 2 | 0 | 2 | 0 | 0 |
| DTM_Holes | 3910 | DTM_Holes | 0 | 1 | 1 | 0 | 0 |
| DTM_Extd_Cont | 3911 | DTM Extd Contour | 6 | 5 | 2 | 0 | 0 |
| DTM_3D_Model | 3912 | 3D Model | 7 | 0 | 0 | 0 | 0 |
| SM_DTM_Vertics | 3919 | DTM Vertices used with Site Modeler - Model | 0 | 0 | 0 | 0 | 0 |
| SM_Constr_Element | 3920 | Site - Construction Elements | 66 | 0 | 0 | 0 | 0 |
| SM_Constr_Txt | 3921 | Site - Construction Text Vertices | 66 | 0 | 0 | 0 | 0 |
| SM_Bldg_Triangles | 3922 | Site - Building Object Triangles | 88 | 0 | 0 | 0 | 0 |
| SM_Bldg_Vertics | 3923 | Site - Building Object Vertices | 88 | 0 | 0 | 0 | 0 |
| SM_Bldg_Hull | 3924 | Site - Building Object Boundary | 88 | 0 | 2 | 0 | 0 |
| SM_Bldg_Cont_Mjr | 3925 | Site - Building Object Major Contour Lines | 88 | 0 | 1 | 0 | 0 |
| SM_Bldg_Cont_Mjr_Txt | 3926 | Site - Building Object Major Contour Text | 88 | 0 | 0 | 0 | 0 |
| SM_Bldg_Cont_Minor | 3927 | Site - Building Object Minor Contour | 89 | 0 | 0 | 0 | 0 |
| SM_PL_Triangles | 3928 | Site - Parking Object Triangles | 7 | 0 | 0 | 0 | 0 |
| SM_PL_Vertics | 3929 | Site - Parking Object Vertices | 7 | 0 | 0 | 0 | 0 |
| SM_PL_Hull | 3930 | Site - Parking Object Boundary | 7 | 0 | 2 | 0 | 0 |
| SM_PL_Cont_Mjr | 3931 | Site - Parking Object Major Contour Lines | 7 | 0 | 1 | 0 | 0 |
| SM_PL_Cont_Mjr_Txt | 3932 | Site - Parking Object Major Contour Text | 7 | 0 | 0 | 0 | 0 |
| SM_PL_Cont_Minor | 3933 | Site - Parking Object Minor Contour | 146 | 0 | 0 | 0 | 0 |
| SM_Pond_Triangles | 3934 | Site - Pond Object Triangles | 5 | 0 | 0 | 0 | 0 |
| SM_Pond_Vertics | 3935 | Site - Pond Object Vertices | 5 | 0 | 0 | 0 | 0 |
| SM_Pond_Hull | 3936 | Site - Pond Object Boundary | 5 | 0 | 2 | 0 | 0 |
| SM_Pond_Cont_Mjr | 3937 | Site - Pond Object Major Contour Lines | 5 | 0 | 1 | 0 | 0 |
| SM_Pond_Cont_Mjr_Txt | 3938 | Site - Pond Object Major Contour Text | 5 | 0 | 0 | 0 | 0 |
| SM_Pond_Cont_Minor | 3939 | Site - Pond Object Minor Contour Lines | 151 | 0 | 0 | 0 | 0 |
| SM_Rdwy_Triangles | 3940 | Site - Roadway Object Triangles | 0 | 0 | 0 | 0 | 0 |
| SM_Rdwy_Vertics | 3941 | Site - Roadway Object Vertices | 0 | 0 | 0 | 0 | 0 |
| SM_Rdwy_Hull | 3942 | Site - Roadway Object Boundary | 0 | 0 | 2 | 0 | 0 |
| SM_Rdwy_Cont_Mjr | 3943 | Site - Roadway Object Major Contour Lines | 0 | 0 | 1 | 0 | 0 |
| SM_Rdwy_Cont_Mjr_Txt | 3944 | Site - Roadway Object Major Contour Text | 0 | 0 | 0 | 0 | 0 |
| SM_Rdwy_Cont_Minor | 3945 | Site - Roadway Object Minor Contour | 8 | 0 | 0 | 0 | 0 |
| SM_Lot_Triangles | 3946 | Site - Lot Object Triangles | 11 | 0 | 0 | 0 | 0 |
| SM_Lot_Vertics | 3947 | Site - Lot Object Vertices | 11 | 0 | 0 | 0 | 0 |
| SM_Lot_Hull | 3948 | Site - Lot Object Boundary | 11 | 0 | 2 | 0 | 0 |
| SM_Lot_Cont_Mjr | 3949 | Site - Lot Object Major Contour Lines | 11 | 0 | 1 | 0 | 0 |
| SM_Lot_Cont_Mjr_Txt | 3950 | Site - Lot Object Major Contour Text | 11 | 0 | 0 | 0 | 0 |
| SM_Lot_Cont_Minor | 3951 | Site - Lot Object Minor Contour | 10 | 0 | 0 | 0 | 0 |
| SM_Chanl_Triangles | 3952 | Site - Channel Object Triangles | 54 | 0 | 0 | 0 | 0 |
| SM_Chanl_Vertics | 3953 | Site - Channel Object Vertices | 54 | 0 | 0 | 0 | 0 |
| SM_Chanl_Hull | 3954 | Site - Channel Object Boundary | 54 | 0 | 2 | 0 | 0 |
| SM_Chanl_Cont_Mjr | 3955 | Site - Channel Object Major Contour Lines | 54 | 0 | 1 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| SM_Chanl_Cont_Mjr_Txt | 3956 | Site - Channel Object Major Contour Text | 54 | 0 | 0 | 0 | 0 |
| SM_Chanl_Cont_Minor | 3957 | Site - Channel Object Minor Contour | 52 | 0 | 0 | 0 | 0 |
| SM_UD1_Triangles | 3958 | Site - User Defined - Triangles | 117 | 0 | 0 | 0 | 0 |
| SM_UD1_Vertics | 3959 | Site - User Defined - Vertices | 117 | 0 | 0 | 0 | 0 |
| SM_UD1_Hull | 3960 | Site - User Defined - Boundary | 117 | 0 | 2 | 0 | 0 |
| SM_UD1_Cont_Mjr | 3961 | Site - User Defined - Contour Lines | 177 | 0 | 1 | 0 | 0 |
| SM_UD1_Cont_Mjr_Txt | 3962 | Site - User Defined - Major Contour Text | 177 | 0 | 0 | 0 | 0 |
| SM_UD1_Cont_Minor | 3963 | Site - User Defined - Minor Contour | 179 | 0 | 0 | 0 | 0 |
| SM_UD2_Triangles | 3964 | Site - User Defined - Triangles | 232 | 0 | 0 | 0 | 0 |
| SM_UD2_Vertics | 3965 | Site - User Defined - Vertices | 232 | 0 | 0 | 0 | 0 |
| SM_UD2_Hull | 3966 | Site - User Defined - Boundary | 232 | 0 | 2 | 0 | 0 |
| SM_UD2_Cont_Mjr | 3967 | Site - User Defined - Contour Lines | 232 | 0 | 1 | 0 | 0 |
| SM_UD2_Cont_Mjr_Txt | 3968 | Site - User Defined - Major Contour Text | 232 | 0 | 0 | 0 | 0 |
| SM_UD2_Cont_Minor | 3969 | Site - User Defined - Minor Contour | 229 | 0 | 0 | 0 | 0 |
| SM_UD3_Triangles | 3970 | Site - User Defined - Triangles | 140 | 0 | 0 | 0 | 0 |
| SM_UD3_Vertics | 3971 | Site - User Defined - Vertices | 140 | 0 | 0 | 0 | 0 |
| SM_UD3_Hull | 3972 | Site - User Defined - Boundary | 140 | 0 | 2 | 0 | 0 |
| SM_UD3_Cont_Mjr | 3973 | Site - User Defined Major Contour Lines | 140 | 0 | 0 | 0 | 0 |
| SM_UD3_Cont_Mjr_Txt | 3974 | Site - User Defined Major Contour Text | 140 | 0 | 0 | 0 | 0 |
| SM_UD3_Cont_Minor | 3975 | Site - User Defined Minor Contours | 142 | 0 | 0 | 0 | 0 |
| RR_Track | 4001 | Railroad Track (CL Alignment) | 155 | Railroad | 0 | 0 | 0 |
| RR_Signal | 4002 | Railroad Signals | 155 | 0 | 0 | 0 | 0 |
| RR_Sign_Arm | 4003 | Railroad Signals with Arms | 155 | 0 | 0 | 0 | 0 |
| RR_Cont_Box | 4004 | Railroad Control Box | 155 | 0 | 0 | 0 | 0 |
| RR_Saw_Buck | 4005 | Railroad Saw Bucks | 155 | 0 | 0 | 0 | 0 |
| RR_Whistle_Sign | 4006 | Railroad Whistle Sign | 155 | 0 | 0 | 0 | 0 |
| RR_X-ing_Rub_Mat | 4007 | Railroad X-ing Rubber Mats | 155 | 0 | 0 | 0 | 0 |
| RR_X-ing_Plank | 4008 | Railroad X-ing Planks | 155 | 0 | 0 | 0 | 0 |
| RR_Rail_Top | 4009 | Railroad Top Rail for Profiles | 155 | 0 | 0 | 0 | 0 |
| RR_Diamond | 4010 | Railway Diamond | 0 | 3 | 0 | 0 | 0 |
| RR_Bridge | 4011 | Railroad Bridge | 155 | 0 | 0 | 0 | 0 |
| RR_Culvert | 4012 | NO LONGER USED - Railroad Culvert | 155 | 0 | 0 | 0 | 0 |
| RR_Crossing | 4014 | Railroad Crossing | 155 | 0 | 0 | 0 | 0 |
| Rnwy_Gravel | 4501 | Runway Gravel | 0 | 0 | 0 | 0 | 0 |
| Rnwy_Turf | 4502 | Runway Turf | 0 | 0 | 0 | 0 | 0 |
| Overrun_Gravel | 4503 | Overrun Gravel | 0 | 0 | 0 | 0 | 0 |
| Overrun_Turf | 4504 | Overrun Turf | 0 | 0 | 0 | 0 | 0 |
| Txway_Gravel | 4505 | Taxiway Gravel | 0 | 0 | 0 | 0 | 0 |
| Txway_Turf | 4506 | Taxiway Turf | 0 | 0 | 0 | 0 | 0 |
| Apron_Gravel | 4507 | Apron Gravel | 0 | 0 | 0 | 0 | 0 |
| Apron_Turf | 4508 | Apron Turf | 0 | 0 | 0 | 0 | 0 |
| Rnwy_Lite_White | 4509 | Runway Light - White | 0 | 0 | 0 | 0 | 0 |
| Rnwy_Lite_Blue | 4510 | NO LONGER USED - Runway Light - Blue | 0 | 0 | 0 | 0 | 0 |
| Rnwy_Lite_Amber | 4511 | Runway Light - Amber | 0 | 0 | 0 | 0 | 0 |
| Rnwy_Lite_R-G | 4512 | Runway Light - Red/Green | 0 | 0 | 0 | 0 | 0 |
| Windsock_Lit | 4513 | Windsock Lit | 0 | 0 | 0 | 0 | 0 |
| Windsock_Unlit | 4514 | Windsock Unlit | 0 | 0 | 0 | 0 | 0 |
| Rot_Beacon | 4515 | NO LONGER USED - Rotating Beacon | 0 | 0 | 0 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| Non-Dir_Beacon | 4516 | Non-Directional Beacon | 0 | 0 | 0 | 0 | 0 |
| Prec_Aproc_Path_Ind | 4517 | NO LONGER USED - Precision Approach Path Indicator | 0 | 0 | 2 | 0 | 0 |
| Weather_Coll_Area | 4518 | Weather Collection Area | 0 | 0 | 0 | 0 | 0 |
| Ceil_Projector | 4519 | Ceiling Projector | 0 | 0 | 0 | 0 | 0 |
| Radio_Tower | 4520 | Radio Tower | 0 | 0 | 0 | 0 | 0 |
| Air_Park_Pad | 4521 | Aircraft Parking Pad | 0 | 0 | 0 | 0 | 0 |
| Air_Run-up_Pad | 4522 | Aircraft Run-up Pad | 0 | 0 | 0 | 0 | 0 |
| Air_Term_Bldg | 4523 | Air Terminal Building (Northern Airports) | 0 | 0 | 0 | 0 | 0 |
| Bag_Facility | 4524 | Baggage Facility | 0 | 0 | 0 | 0 | 0 |
| Fire_Hall | 4525 | Fire Hall | 0 | 0 | 0 | 0 | 0 |
| Air_Hangar | 4526 | Aircraft Hangar | 0 | 0 | 0 | 0 | 0 |
| Comfort_Sta | 4527 | NO LONGER USED - Comfort Station | 0 | 0 | 0 | 0 | 0 |
| Fire_Train_Area | 4528 | Fire Training Area | 0 | 0 | 0 | 0 | 0 |
| Air_Info_Sign | 4529 | Airport Information Sign | 0 | 0 | 1 | 0 | 0 |
| Air_Mand_Sign | 4530 | Airport Mandatory Sign | 0 | 0 | 0 | 0 | 0 |
| Av_Fuel_Pump_Isle | 4531 | Aviation Fuel Pump Island | 0 | 0 | 0 | 0 | 0 |
| Av_Fuel_Line_Ab_Gr | 4532 | Aviation Fuel Line - Above Ground | 0 | 0 | 0 | 0 | 0 |
| Av_Fuel_Line_Buried | 4533 | Aviation Fuel Line - Buried | 0 | 0 | 0 | 0 | 0 |
| Leased_Parcel | 4534 | Leased Parcel (Crown Land Act) | 0 | 0 | 0 | 0 | 0 |
| Rnwy_Distrib_Panel | 4535 | Runway Distribution Panel | 0 | 0 | 0 | 0 | 0 |
| Term_Floor_El | 4536 | Terminal Floor Elevation | 0 | 0 | 0 | 0 | 0 |
| Apron_Lite | 4537 | Apron Lighting (Floodlights) | 0 | 0 | 0 | 0 | 0 |
| Rnwy_D_Sign_Lit | 4538 | Runway Designator Sign Illuminate | 0 | 0 | 0 | 0 | 0 |
| Rnwy_D_Sign_Unlit | 4539 | Runway Designator Sign - Non-Illuminated | 0 | 0 | 0 | 0 | 0 |
| Steve_Screen | 4540 | Stevenson Screen | 0 | 0 | 0 | 0 | 0 |
| Steve_Screen_V | 4541 | Steveson Screen Vented | 0 | 0 | 0 | 0 | 0 |
| Std_Rain_Gauge | 4542 | Standard Rain Gauge | 0 | 0 | 0 | 0 | 0 |
| Tip_Buc_Rain_Gauge | 4543 | Tipping Bucket Rain Gauge | 0 | 0 | 0 | 0 | 0 |
| Junct_Box | 4544 | Junction Box | 0 | 0 | 0 | 0 | 0 |
| Junct_Box_Ungr_Splic | 4545 | Junction Box Unground Splice | 0 | 0 | 0 | 0 | 0 |
| Air_Amp_Recep | 4546 | Aircraft Amp Receptacle | 0 | 0 | 0 | 0 | 0 |
| Altimeter | 4547 | Altimeter | 0 | 0 | 0 | 0 | 0 |
| Air_Spike | 4548 | NO LONGER USED - Airport Spike | 0 | 0 | 0 | 0 | 0 |
| Air_PAPI_Cable | 4549 | Underground PAPI Circuit Cable | 2 | 6 | 1 | 0 | 0 |
| Air_Lite_Cable | 4550 | Underground Light Curcuit Cable | 3 | 7 | 2 | 0 | 0 |
| Txway_Lite_Blue | 4551 | Taxiway Light - Blue | 0 | 0 | 0 | 0 | 0 |
| Air_PAPI_Lite | 4552 | Airport PAPI Light | 0 | 0 | 0 | 0 | 0 |
| Obstruct_Lite | 4553 | Obstruction Light | 0 | 0 | 0 | 0 | 0 |
| Air_Power_Box | 4554 | Airport Power Box | 0 | 0 | 0 | 0 | 0 |
| Air_Niper_Snw_Gauge | 4555 | Airport Niper Snow Gauge | 0 | 0 | 0 | 0 | 0 |
| ARB_Tower_Ex | 4556 | Existing ARB Tower | 0 | 0 | 1 | 0 | 0 |
| Air_Cont_Bolt | 4557 | NO LONGER USED - Airport Control Bolt | 0 | 0 | 1 | 0 | 0 |
| Air_Fuel_Tank | 4558 | Norther Airports Fuel Tank | 0 | 0 | 0 | 0 | 0 |
| Wind_Gauge | 4559 | Wind Gauge | 0 | 0 | 0 | 0 | 0 |
| Pull_Pit | 4560 | Northern airports Pull Pit | 0 | 0 | 0 | 0 | 0 |
| Txway_Mark_Blue | 4561 | Taxiway Marker - Blue | 0 | 0 | 0 | 0 | 0 |
| Aero_Strobe_Beacon | 4562 | Aerodrome Strobe Beacon | 0 | 0 | 0 | 0 | 0 |
| House | 5001 | House | 88 | 0 | 0 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| Garage | 5002 | Garage | 88 | 0 | 0 | 0 | 0 |
| Shed | 5003 | Shed | 88 | 0 | 0 | 0 | 0 |
| Barn | 5004 | Barn | 88 | 0 | 0 | 0 | 0 |
| Fuel_Tank_Above_Gr | 5005 | Fuel Tanks Above Ground | 88 | 0 | 0 | 0 | 0 |
| Wood_Granary | 5006 | Wood Granary | 88 | 0 | 0 | 0 | 0 |
| Steel_Granary | 5007 | Steel Granary | 88 | 0 | 0 | 0 | 0 |
| Silo | 5008 | Silo - Outside Edge | 88 | 0 | 0 | 0 | 0 |
| Com_Bldg | 5009 | Commercial Building | 88 | 0 | 0 | 0 | 0 |
| Hyd_Ser_Bldg | 5010 | Hydro Service Building | 88 | 0 | 0 | 0 | 0 |
| MTS_Ser_Bldg | 5011 | MTS Service Building | 88 | 0 | 0 | 0 | 0 |
| Fuel_Pump_Isle | 5012 | Fuel Pump Island | 88 | 0 | 0 | 0 | 0 |
| Mult_Dwel_Unit | 5013 | Multiple Dwelling Unit | 88 | 0 | 0 | 0 | 0 |
| Septic_Field | 5014 | Septic Mound or Field | 88 | 0 | 0 | 0 | 0 |
| Septic_Tank | 5015 | Septic Tank | 88 | 0 | 0 | 0 | 0 |
| Barbed_Wire_Fen | 5016 | Barbed Wire Fence | 88 | Barded Wire Fence | 0 | 0 | 0 |
| Page_Wire_Fen | 5017 | Page Wire Fence | 88 | Page Wire Fence | 0 | 0 | 0 |
| Ornament_Fen | 5018 | Ornamental Fence | 88 | Ornamental Fence | 0 | 0 | 0 |
| Fence_Gate | 5019 | Fence Gate | 88 | Fence Gate | 0 | 0 | 0 |
| ChainLink_Fen | 5020 | Chain Link Fence | 88 | ChainLink Fence | 0 | 0 | 0 |
| Conc_Fence | 5021 | Concrete Fence | 88 | Concrete Fence | 0 | 0 | 0 |
| Brick_Fence | 5022 | Brick Fence | 88 | Brick Fence | 0 | 0 | 0 |
| Stone_Fence | 5023 | Stone Fence | 88 | Stone Fence | 0 | 0 | 0 |
| Wood_Fence | 5024 | Wood Fence | 88 | Wood Fence | 0 | 0 | 0 |
| Fen_w_Plug-ins | 5025 | Fence with Plug-ins | 88 | Fence w Plugins | 0 | 0 | 0 |
| Elec_Fence | 5026 | Electric Fence | 88 | Electric Fence | 0 | 0 | 0 |
| Retain_Wall | 5027 | Retaining Wall | 88 | Reta | 0 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| | | | | in Wall | | | |
| Door_Sill | 5028 | Door Sill | 88 | 0 | 0 | 0 | 0 |
| Garb_Dumpster | 5029 | Garbage Dumpster | 88 | 0 | 0 | 0 | 0 |
| Grave_Site | 5030 | Grave Site | 88 | 0 | 0 | 0 | 0 |
| Cemetery | 5031 | Cemetery | 88 | 0 | 0 | 0 | 0 |
| Prop_Fences | 5032 | Proposed Fences | 88 | ChainLink Fence | 1 | 0 | 0 |
| Propane_Tank | 5033 | Propane Tank | 88 | 0 | 0 | 0 | 0 |
| Carin | 5034 | Carins, Points of Interest, Historical Sites | 88 | 0 | 0 | 0 | 0 |
| Septic_Field_Eject | 5035 | Septic Field Ejector | 88 | 0 | 0 | 0 | 0 |
| Water_Tower | 5036 | Water Tower | 88 | 0 | 0 | 0 | 0 |
| Look_Out_Tower | 5037 | Look Out Tower | 88 | 0 | 0 | 0 | 0 |
| Corral | 5038 | Corral | 88 | 0 | 0 | 0 | 0 |
| Conc_Post | 5039 | Concrete Post | 88 | 0 | 0 | 0 | 0 |
| Metal_Post | 5040 | Metal Post | 88 | 0 | 0 | 0 | 0 |
| Wood_Post | 5041 | Wooden Post | 88 | 0 | 0 | 0 | 0 |
| Fuel_Tank_Below_Gr | 5042 | Fuel Tank Below Ground | 88 | 0 | 0 | 0 | 0 |
| Wheel_Chair_Rmp | 5043 | Wheel Chair Ramp | 88 | 0 | 0 | 0 | 0 |
| Stairs | 5044 | Stairs | 88 | 0 | 0 | 0 | 0 |
| Pad | 5045 | Existing Pad | 88 | 0 | 0 | 0 | 0 |
| Air_Cond_Unit | 5046 | Air Condition Units on Ground | 88 | 0 | 0 | 0 | 0 |
| Ferry_Land | 5501 | Ferry Landing | 30 | 0 | 0 | 0 | 0 |
| Mar_Crew_Quart | 5502 | Marine Crew Quarters | 30 | 0 | 0 | 0 | 0 |
| Mar_Warehouse | 5503 | Marine Warehouse | 30 | 0 | 0 | 0 | 0 |
| Mar_Gen_Shed | 5504 | Marine Generator Shed | 30 | 0 | 0 | 0 | 0 |
| Mar_Warn_Sign | 5505 | Marine Cable Warning Sign | 30 | 0 | 0 | 0 | 0 |
| Mar_Shore_Lite | 5506 | Marine Shore Light Standard | 30 | 0 | 0 | 0 | 0 |
| Mar_Shore_Win | 5507 | Marine Shore Winch | 30 | 0 | 0 | 0 | 0 |
| Mar_Cbl_Stand | 5508 | Marine Cable Storage Stand | 30 | 0 | 0 | 0 | 0 |
| Boat_Launch | 5509 | Boat Launch | 30 | 0 | 0 | 0 | 0 |
| Bush_Line | 6001 | Bush Line | 3 | Bush Line | 0 | 0 | 0 |
| Tree_Line | 6002 | Tree Line | 3 | Row of Trees | 0 | 0 | 0 |
| Hedge_Line | 6003 | Hedge Line | 3 | Hedge Line | 0 | 0 | 0 |
| Deciduous_Tree_Pl | 6004 | Deciduous Tree - Planted by the Landowner | 3 | 0 | 0 | 0 | 0 |
| Deciduous_Tree | 6005 | Deciduous Tree - Maple, Oak | 3 | 0 | 0 | 0 | 0 |
| Garden | 6006 | Edge of Garden | 3 | 0 | 0 | 0 | 0 |
| Flower_Bed | 6007 | Edge of Flower Bed | 3 | 0 | 0 | 0 | 0 |
| Edge_Grass | 6008 | Edge of Grassed Area | 3 | 0 | 0 | 0 | 0 |
| Conifers_Tree | 6009 | Conifers Tree - Spruce, Pine, Fir | 3 | 0 | 0 | 0 | 0 |
| Conifers_Tree_Pl | 6010 | Conifers Tree - Planted by the Landowner | 3 | 0 | 0 | 0 | 0 |
| Farm_Land_Use | 6011 | Farm Land Use | 3 | 0 | 0 | 0 | 0 |
| Pasture | 6012 | Pasture | 3 | 0 | 0 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| Hayfield | 6013 | Hayfield | 3 | 0 | 0 | 0 | 0 |
| Prof_Ex_CL | 6500 | Profile - Existing Centerline | 0 | 4 | 1 | 0 | 0 |
| Prof_Ex_ROW | 6501 | Profile - Existing ROW | 0 | 0 | 2 | 0 | 0 |
| Prof_Ex_Dtch | 6502 | Profile - Existing Ditch | 0 | 3 | 0 | 0 | 0 |
| Prof_El_Sta | 6506 | Profile - Elevation and Stations | 0 | 0 | 1 | 0 | 0 |
| Prof_Ex_Cros_Stk | 6508 | Profile - Existing Crossing Stick Plan | 0 | 0 | 1 | 0 | 0 |
| Prof_Ex_Cross | 6510 | Profile - Existing Crossing | 0 | 0 | 1 | 0 | 0 |
| Prof_Ex_Pipe | 6512 | Profile - Existing Pipes for Profile | 0 | 0 | 1 | 0 | 0 |
| Prof_Ex_Pipe_Stk | 6514 | Profile - Existing Pipe Stick Plan | 0 | 0 | 1 | 0 | 0 |
| Prof_Ex_Wat_Blk | 6516 | Profile - Existing Water Block | 0 | 0 | 1 | 0 | 0 |
| Prof_Ex_Wat_Blk_Stk | 6518 | Profile - Existing Water Block Stick Plan | 0 | 0 | 1 | 0 | 0 |
| Prof_Prop_Blk | 6519 | Profile - Proposed Block Crossing | 0 | 0 | 1 | 0 | 0 |
| Prof_Ex_Prairie | 6520 | Profile - Existing Prairie | 0 | 0 | 0 | 0 | 0 |
| Prof_Ex_Median | 6522 | Profile - Existing Median | 0 | 0 | 0 | 0 | 0 |
| Prof_Ex_Curb_Gut | 6524 | Profile - Existing Curb & Gutter | 0 | 0 | 0 | 0 | 0 |
| Prof_Ex_Thru_Grade | 6526 | Profile - Existing Thru Grade | 0 | 0 | 1 | 0 | 0 |
| Prof_Rem_Cros_Stk | 6534 | Profile - Remove Crossing Stick Plan | 0 | 0 | 1 | 0 | 0 |
| Prof_Rem_Pipe_Stk | 6536 | Profile - Remove Pipe Stick Plan | 0 | 0 | 1 | 0 | 0 |
| Prof_Rem_Wat_Blk_Stk | 6538 | Profile - Remove Water Block Stick Plan | 0 | 0 | 1 | 0 | 0 |
| Prof_Rem_Wat_Blk | 6540 | Profile - Remove Water Block | 0 | 0 | 0 | 0 | 0 |
| Prof_Prop_CL | 6700 | Profile - Proposed Centerline | 0 | 0 | 1 | 0 | 0 |
| Prof_Prop_Dtch | 6705 | Profile - Proposed Ditch | 0 | 0 | 1 | 0 | 0 |
| Prof_Prop_Cross_Stk | 6720 | Profile - Proposed Crossing Stick Plan | 0 | 0 | 1 | 0 | 0 |
| Prof_Prop_Cross | 6722 | Profile - Proposed Crossing | 0 | 0 | 0 | 0 | 0 |
| Prof_Prop_Pipe | 6724 | Profile - Proposed Pipe | 0 | 0 | 0 | 0 | 0 |
| Prof_Prop_Pipe_Stk | 6726 | Profile - Proposed Pipe Stick Plan | 0 | 0 | 1 | 0 | 0 |
| Prof_Prop_Thru_Grade | 6728 | Profile - Proposed Thru Grade | 0 | 0 | 0 | 0 | 0 |
| Prof_Prop_Wat_Blk | 6730 | Profile - Proposed Water Block | 0 | 0 | 0 | 0 | 0 |
| Prof_Prop_Wat_Blk_Stk | 6732 | Profile - Proposed Water Block Stick Plan | 0 | 0 | 0 | 0 | 0 |
| Prof_Prop_Drain_Arr_Stk | 6740 | Profile - Proposed Drainage Arrow Stick Plan | 0 | 0 | 1 | 0 | 0 |
| Prof_Prop_Bot_SubCut | 6742 | Profile - Proposed Bottom Subcut | 0 | 0 | 0 | 0 | 0 |
| Prof_Prop_Bot_Waste | 6744 | Profile - Proposed Bottom Waste | 0 | 0 | 0 | 0 | 0 |
| Prof_Prop_Curb_Gut | 6746 | Profile - Proposed Curb & Gutter | 0 | 0 | 0 | 0 | 0 |
| Prof_Prop_Median | 6748 | Profile - Proposed Median | 0 | 0 | 0 | 0 | 0 |
| Prof_Prop_Intcep_Dtch | 6750 | Profile - Proposed Interceptor Ditch | 0 | 0 | 0 | 0 | 0 |
| Prof_Prop_Vert_Curv_Dat | 6752 | Profile - Proposed Verticle Curve Data | 0 | 0 | 0 | 0 | 0 |
| Prof_Gen_Notes | 6754 | Profile - General Notes | 0 | 0 | 0 | 0 | 0 |
| Prof_Slope_Percent | 6756 | Profile - Precent Slope | 0 | 0 | 0 | 0 | 0 |
| Prof_Slope_Elev | 6757 | Profile - Slope Elevation | 0 | 0 | 0 | 0 | 0 |
| Prof_Soil_Logs | 6760 | Profile - Soil Logs | 0 | 0 | 0 | 0 | 0 |
| Prof_CL_Channel | 6761 | Profile - Existing Channel Bottom CL | 7 | 0 | 2 | 0 | 0 |
| Prof_Ex_R_Chan_Prairie | 6762 | Profile - Existing Right Prairie | 2 | 0 | 2 | 0 | 0 |
| Prof_Ex_L_Chan_Prairie | 6763 | Profile - Existing Left Prairie | 3 | 0 | 2 | 0 | 0 |
| Prof_Ex_R_Berm | 6764 | Profile - Existing Right Berm | 6 | 6 | 2 | 0 | 0 |
| Prof_Ex_L_Berm | 6765 | Profile - Existing Left Berm | 5 | 6 | 2 | 0 | 0 |
| Prof_Ex_L_Dyke | 6766 | Profile - Existing Left Dyke | 22 | 3 | 2 | 0 | 0 |
| Prof_Ex_R_Dyke | 6767 | Profile - Existing Right Dyke | 17 | 3 | 2 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| Prof_Ex_L_OS_Drain | 6768 | Profile - Existing Left Outside Drain | 3 | 0 | 2 | 0 | 0 |
| Prof_Ex_R_OS_Drain | 6769 | Profile - Existing Right Outside Drain | 2 | 0 | 2 | 0 | 0 |
| Prof_Water_Surface | 6770 | Profile - Water Surface | 0 | 3 | 1 | 0 | 0 |
| Prof_Prop_CL_Channel | 6771 | Profile - Proposed Channel Bottom Centerline | 0 | 4 | 2 | 0 | 0 |
| Prof_Prop_LChan_Bot_Edge | 6772 | Profile - Proposed Left Channel Bottom Edge (Geopak_Lines) | 3 | 0 | 2 | 0 | 0 |
| Prof_Prop_RChan_Bot_Edge | 6773 | Profile - Proposed Right Channel Bottom Edge (Geopak_Lines) | 2 | 0 | 2 | 0 | 0 |
| Prof_Prop_R_Berm | 6774 | Profile - Left Berm | 5 | 4 | 1 | 0 | 0 |
| Prof_Prop_L_Berm | 6775 | Profile - Right Berm | 6 | 7 | 1 | 0 | 0 |
| Prof_Prop_L_Dyke | 6776 | Profile - Left Dyke | 22 | 3 | 1 | 0 | 0 |
| Prof_Prop_R_Dyke | 6777 | Profile - Right Dyke | 17 | 0 | 1 | 0 | 0 |
| Prof_Prop_L_OS_Drain | 6778 | Profile - Left Outside Drain | 3 | 0 | 1 | 0 | 0 |
| Prof_Prop_R_OS_Drain | 6779 | Profile - Right Outside Drain | 2 | 0 | 1 | 0 | 0 |
| Prof_Cul_Bridge | 6780 | Profile - Inline Culvert/Bridge | 7 | 0 | 1 | 0 | 0 |
| Prof_Thru_Dyke_Cul | 6781 | Profile - U/S Invert Thru Dyke Culvert | 7 | 0 | 1 | 0 | 0 |
| Prof_WC_Design_Block | 6782 | Profile - Design Block | 2 | 0 | 1 | 0 | 0 |
| Prof_Grad_Ctl_Strc | 6783 | Profile - Gradient Control Structure | 7 | 0 | 1 | 0 | 0 |
| Prof_Riffles | 6784 | Fisheries Riffle | 7 | 0 | 1 | 0 | 0 |
| Mass_Haul_Diag | 6800 | Mass Haul Diagram | 0 | 0 | 0 | 0 | 0 |
| Mass_Haul_Lab | 6802 | Mass Haul Labels | 0 | 0 | 0 | 0 | 0 |
| Mass_Haul_Bal_Pts | 6804 | Mass Haul Balance Points | 0 | 0 | 0 | 0 | 0 |
| Mass_Haul_Bal_Pts_Lab | 6806 | Mass Haul Balance Points Labels | 0 | 0 | 0 | 0 | 0 |
| ROW_Ditch | 7001 | ROW Ditch (Low Point of Ditch) | 5 | 0 | 0 | 0 | 0 |
| Offtake_Ditch | 7002 | Offtake Ditch | 5 | 0 | 0 | 0 | 0 |
| Swale | 7003 | Swale | 5 | Swale CL | 0 | 0 | 0 |
| CL_Stream | 7004 | Centerline of Stream | 5 | Stream Creek CL | 0 | 0 | 0 |
| Water_Edge | 7005 | Water Edge (All Bodies of Water) | 5 | Water Edge | 0 | 0 | 0 |
| River | 7006 | NO LONGER USED - River Edge | 5 | Water Edge | 0 | 0 | 0 |
| Lagoon | 7007 | Lagoon | 5 | Water Edge | 0 | 0 | 0 |
| Artesian_Spring | 7008 | Artesian Spring | 5 | 0 | 0 | 0 | 0 |
| Beaver_Dam | 7009 | Beaver Dam | 5 | 0 | 3 | 0 | 0 |
| Man_Made_Dam | 7010 | Man Made Dam | 88 | 0 | 0 | 0 | 0 |
| Wharf_Pier_Dock | 7011 | Wharf, Pier or Dock | 88 | 0 | 0 | 0 | 0 |
| Water_Level | 7012 | NO LONGER USED - Water Level | 88 | 0 | 0 | 0 | 0 |
| Stream_Gauge | 7013 | Stream Gauge | 88 | 0 | 0 | 0 | 0 |
| Weir | 7014 | Weir | 88 | Weir | 0 | 0 | 0 |
| Water_Block | 7015 | Water Block | 88 | 0 | 0 | 0 | 0 |
| Rip_Rap | 7016 | Rip Rap | 88 | Rip Rap | 0 | 0 | 0 |
| Dyke | 7017 | Dyke | 88 | Dyke | 0 | 0 | 0 |
| Corr_Steel_Pipe | 7018 | Corrugated Steel Pipe - Invert | 88 | 0 | 0 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| Arch_Steel_Pipe | 7019 | Arch Steel Pipe - Invert | 88 | 0 | 0 | 0 | 0 |
| Conc_Pipe | 7020 | Concrete Pipes - Invert | 88 | 0 | 0 | 0 | 0 |
| Other_Pipe | 7021 | Other Pipe - Invert | 88 | 0 | 0 | 0 | 0 |
| Tim_Box_Culvert | 7022 | Timber Box Culvert - Invert | 88 | 0 | 0 | 0 | 0 |
| Conc_Box_Culvert | 7023 | Concrete Box Culvert - Invert | 88 | 0 | 0 | 0 | 0 |
| MultiPlate_Culvert | 7024 | Multi-Plate Culvert -Invert | 88 | 0 | 0 | 0 | 0 |
| Auto_Flood_Gate | 7025 | Auto Flood Gate | 88 | 0 | 0 | 0 | 0 |
| Manhole | 7026 | Manhole | 88 | 0 | 0 | 0 | 0 |
| Catch_Basin | 7027 | Catch Basin | 88 | 0 | 0 | 0 | 0 |
| Curb_Inlet | 7028 | NO LONGER USED - Curb Inlet | 88 | 0 | 0 | 0 | 0 |
| CB_Invert | 7029 | Catch Basin Invert | 88 | 0 | 0 | 0 | 0 |
| Storm_Sewer | 7030 | Storm Sewer Line | 88 | Sewer Line | 0 | 0 | 0 |
| Prof_Pipe_Invert | 7031 | NO LONGER USED - Profile - Pipe Invert Elev. Label for Profile sheet | 88 | 0 | 0 | 0 | 0 |
| Pipe_Obvert | 7032 | Pipe Obvert | 88 | 0 | 0 | 0 | 0 |
| Flared_Invert | 7033 | Flared Invert | 88 | 0 | 0 | 0 | 0 |
| PVC_Pipe | 7034 | PVC Pipe Invert | 88 | 0 | 0 | 0 | 0 |
| HDPVC_Pipe | 7035 | HDPVC Pipe Invert | 88 | 0 | 0 | 0 | 0 |
| Prop_Corr_Steel_Pipe | 7036 | Proposed CSP | 88 | 0 | 1 | 0 | 0 |
| Prop_PC_Conc_Pipe | 7037 | Proposed PC Concrete Pipe | 88 | 0 | 1 | 0 | 0 |
| Prop_Rip_Rap | 7038 | Proposed Rip Rap | 88 | Rip Rap | 1 | 0 | 0 |
| Prop_Inlets | 7039 | Proposed Inlets | 88 | 0 | 1 | 0 | 0 |
| Curb_Gutter_Inlets | 7040 | Existing Curb & Gutter Inlets | 88 | 0 | 0 | 0 | 0 |
| Prop_CB | 7041 | Proposed Catch Basin | 88 | 0 | 1 | 0 | 0 |
| Prop_Drain_Tubing | 7042 | Proposed Drainage Tubing | 88 | 0 | 1 | 0 | 0 |
| Prop_MH | 7043 | Proposed Manhole | 88 | 0 | 0 | 0 | 0 |
| Culvert_Gravel | 7044 | Culvert Gravel | 88 | 0 | 0 | 0 | 0 |
| Cross_Sect_Pt | 7045 | NO LONGER USED - Drainage Cross Section Point | 88 | 0 | 0 | 0 | 0 |
| Drain | 7046 | Drain | 88 | 0 | 0 | 0 | 0 |
| Out_Drain | 7047 | Outside Drain | 88 | 0 | 0 | 0 | 0 |
| RD_Dyke | 7048 | Road Dyke | 0 | 4 | 0 | 0 | 0 |
| CL_River | 7049 | NO LONGER USED - Centerline of River | 5 | Stream Creek CL | 0 | 0 | 0 |
| CL_Creek | 7050 | NO LONGER USED - Centerline of Creek | 5 | Stream Creek CL | 0 | 0 | 0 |
| Conf_River_Creek | 7051 | NO LONGER USED - Confluence of River and Creek | 5 | 0 | 0 | 0 | 0 |
| Conf_River_River | 7052 | NO LONGER USED - Confluence of River and River | 5 | 0 | 0 | 0 | 0 |
| Conf_River_Drain | 7053 | NO LONGER USED - Confluence of River and Drain | 5 | 0 | 0 | 0 | 0 |
| Conf_Drain_Drain | 7054 | NO LONGER USED - Confluence of Drain and Drain | 5 | 0 | 0 | 0 | 0 |
| Conf_Creek_Creek | 7055 | NO LONGER USED - Confluence of Creek and Creek | 5 | 0 | 0 | 0 | 0 |
| Conf_Drain_Creek | 7056 | NO LONGER USED - Confluence of Drain and Creek | 5 | 0 | 0 | 0 | 0 |
| Conf_Drain_Lake | 7057 | NO LONGER USED - Confluence of Drain and Lake | 5 | 0 | 0 | 0 | 0 |
| Conf_Creek_Lake | 7058 | NO LONGER USED - Confluence of Creek and Lake | 5 | 0 | 0 | 0 | 0 |
| Pond | 7059 | Edge of Pond | 5 | Water Edge | 0 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| Dugout | 7060 | Edge of Dugout | 5 | Water Edge | 0 | 0 | 0 |
| Slough | 7061 | Edge of Slough | 5 | Water Edge | 0 | 0 | 0 |
| Grad_Ctrl_Struc | 7062 | Gradient Control Structure ie Con. Rock, stop log | 88 | 0 | 0 | 0 | 0 |
| Fail_Safe | 7063 | Fail Safe (ie. of dam or GCS) | 88 | 0 | 0 | 0 | 0 |
| Top_Conc_Dam | 7064 | NO LONGER USED - Top of Concrete (ie. of dam) | 88 | 0 | 0 | 0 | 0 |
| Top_Rock_Drain | 7065 | NO LONGER USED - Top of Rock (ie. of drain) | 88 | 0 | 0 | 0 | 0 |
| Screw_Flood_Gate | 7066 | Screw Type Flood Gate | 88 | 0 | 0 | 0 | 0 |
| Bottom_Slope | 7067 | Bottom of Slope - Channel | 88 | 0 | 0 | 0 | 0 |
| Top_Slope | 7068 | Top of Slope - Channel | 88 | 0 | 0 | 0 | 0 |
| CL_Channel | 7069 | Centerline of Main Channel | 88 | Stream Creek CL | 0 | 0 | 0 |
| Road_Drain | 7070 | NO LONGER USED - Road Drain | 88 | 0 | 0 | 0 | 0 |
| Field_Run-offs | 7071 | NO LONGER USED - Field Run-offs | 5 | 0 | 0 | 0 | 0 |
| Waste_Disp_Lagoon | 7072 | Waste Disposal Shoot (for Lagoon) | 88 | 0 | 0 | 0 | 0 |
| High_Water_Offtake | 7073 | NO LONGER USED - High Water taken on Off-Take Ditches | 88 | 0 | 0 | 0 | 0 |
| Ex_Approach | 7074 | Approach | 2 | 0 | 1 | 0 | 0 |
| Prop_Edge_Channel_Bot | 7075 | Proposed Edge of Channel Bottom (Geopak_lines) | 29 | 0 | 0 | 0 | 0 |
| Prop_Dyke_CL | 7076 | Proposed Dyke Designator (CL ONLY) | 5 | 0 | 0 | 0 | 0 |
| Prop_Berm_Designator | 7077 | Proposed Berm Designator (Geopak_Lines) | 44 | 0 | 0 | 0 | 0 |
| Spread_Designator | 7078 | Proposed Spreading Designator | 3 | 0 | 0 | 0 | 0 |
| Prop_Approach | 7079 | Proposed Approach | 2 | 0 | 1 | 0 | 0 |
| Prop_Slope_Tie_Down | 7080 | Proposed Slope Tie Down (Geopak_Lines) | 18 | 0 | 0 | 0 | 0 |
| Prop_CL_Channel | 7081 | Proposed Channel Alignment/CL | 7 | 4 | 1 | 0 | 0 |
| Chan_Seg_Line | 7082 | Channel Segment Line | 0 | 0 | 0 | 0 | 0 |
| Elev_Tie_Designator | 7083 | Elevation Tie Designator | 7 | 0 | 1 | 0 | 0 |
| Wat_Ctrl_Area_Needed | 7084 | Proposed Area Needed For Water Control Works | 6 | 1 | 0 | 0 | 0 |
| CB_Details | 7100 | Catch Basin Details | 0 | 0 | 0 | 0 | 0 |
| EC_Cabinet | 7201 | Environment Canada Cabinet | 7 | 0 | 0 | 0 | 0 |
| EC_Cableways | 7202 | Environment Canada Cableways | 7 | 0 | 0 | 0 | 0 |
| EC_Dog_House | 7203 | Environment Canada Dog House | 7 | 0 | 0 | 0 | 0 |
| EC_Down_Looker | 7204 | Environment Canada Down Looker | 7 | 0 | 0 | 0 | 0 |
| EC_Walk_In_Shelter | 7205 | Environment Canada Walk In Shelter | 7 | 0 | 0 | 0 | 0 |
| EC_Well_Shelter | 7206 | Environment Canada Well Shelter | 7 | 0 | 0 | 0 | 0 |
| Title_Block | 7500 | Title Block | 0 | 0 | 0 | 0 | 0 |
| PD_PTH_Declared | 7501 | Provincial Trunck Highway Declared | 8 | 0 | 0 | 0 | 0 |
| PD_PTH_Designated | 7502 | Provincial Trunck Highway Designated | 8 | 0 | 0 | 0 | 0 |
| PD_PR_Delcared | 7503 | Provincial Road Declared | 0 | 0 | 0 | 0 | 0 |
| PD_PR_Designated | 7504 | Provincial Road Designated | 0 | 0 | 0 | 0 | 0 |
| PD_GIA_Review | 7505 | Grant In Aid Review Date | 0 | 0 | 0 | 0 | 0 |
| PD_Highway_Designation | 7506 | Highway Designation for Town Maps | 0 | 0 | 0 | 0 | 0 |
| PD_GIA | 7507 | Grant In Aid Street | 0 | 0 | 0 | 0 | 0 |
| PD_Map_Window | 7508 | Title Block Town Map Window | 0 | 0 | 0 | 0 | 0 |
| PD_Title_Block_Edit_Te | 7509 | Town Map Title Block Text to be Edited | 0 | 0 | 0 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| xt | | | | | | | |
| Grid_Major2 | 7547 | Major Grid lines | 9 | 0 | 2 | -300 | 50 |
| Grid_Major1 | 7548 | Major Grid Lines | 9 | 0 | 3 | -300 | 50 |
| Grid_Minor | 7549 | Minor Grid lines | 9 | 0 | 0 | -300 | 50 |
| XS_CutLine_Sht | 7550 | Cross Section Cut Line on Sheet | 0 | 0 | 2 | 0 | 0 |
| N_Arrow | 7551 | North Arrow | 0 | 0 | 3 | 0 | 0 |
| Refer_Intsec_Note | 7552 | Reference to Interesction Note (sheet model) | 0 | 0 | 1 | 0 | 0 |
| Refer_Sht_Note | 7553 | Refer to Sheet Note (sheet model) | 0 | 3 | 1 | 0 | 0 |
| Curv_Data | 7554 | Curve Data, EC, BC Station | 0 | 0 | 1 | 0 | 0 |
| PR_Shield | 7555 | PR Shield Number | 0 | 0 | 1 | 0 | 0 |
| PTH_TCH_Shield | 7556 | PTH & TCH Shield Number or Text | 0 | 0 | 1 | 0 | 0 |
| Text_Box | 7557 | Text Box | 0 | 0 | 0 | 0 | 0 |
| Thru_Arrow | 7558 | Thru Arrow | 0 | 0 | 0 | 0 | 0 |
| Turn_Arrow | 7559 | Turning Arrow | 0 | 0 | 0 | 0 | 0 |
| Sec_CutLine | 7560 | Cross Section Cut Line (Design Model) | 0 | 0 | 1 | 0 | 0 |
| Arrow_Head | 7561 | Filled Arrow Head | 0 | 0 | 0 | 0 | 0 |
| Acc_Road_Txt | 7562 | Access Road Text | 0 | 0 | 0 | 0 | 0 |
| Ex_Misc_Notes | 7564 | Existing Miscellaneous Notes | 0 | 0 | 0 | 0 | 0 |
| Prop_Misc_Notes | 7566 | Proposed Miscellaneous Notes | 0 | 0 | 0 | 0 | 0 |
| Shade_Shape | 7568 | Surfacing Shading Shapes | 0 | 0 | 0 | 0 | 0 |
| Sheet_Notes | 7570 | Sheet Notes | 0 | 0 | 0 | 0 | 0 |
| Coord_Layout | 7572 | Coordinate Layout | 0 | 0 | 0 | 0 | 0 |
| Key_Map | 7574 | Key Map | 0 | 0 | 0 | 0 | 0 |
| Match_Line | 7576 | Match Lines | 0 | 0 | 2 | 0 | 0 |
| Prelim_Stamp | 7577 | Preliminary Stamp for Discussion Purposes Only | 2 | 0 | 0 | 0 | 0 |
| Point_Name | 7578 | Survey Point Name or Number | 0 | 0 | 0 | 0 | 30 |
| Point_EL | 7580 | Survey Point Elevation | 0 | 0 | 0 | 0 | 30 |
| Point_Comment | 7582 | Survey Point Comment | 0 | 0 | 0 | 0 | 30 |
| Point_Desc | 7584 | Survey Point Description | 0 | 0 | 0 | 0 | 30 |
| Cross_App_Prop | 7600 | Crossing Application Proposed | 0 | 0 | 0 | 0 | 0 |
| Cross_App_Con_Lin | 7601 | Crossing Application Control Line | 0 | 3 | 3 | 0 | 0 |
| Cross_App_Build_SetBack | 7602 | Crossing Application Building Set Back Line | 0 | 3 | 1 | 0 | 0 |
| Cross_App_2000km_ROW_Line | 7603 | Crossing Application 2000km Abandoned ROW line | 0 | 0 | 1 | 0 | 0 |
| Raster_Image_Grids | 7700 | Raster Images Grid Tiles | 16 | 0 | 0 | 0 | 0 |
| AutoTURN1 | 7800 | AutoTURN Level 1 | 0 | 0 | 0 | 0 | 0 |
| AutoTURN2 | 7801 | AutoTURN Level 2 | 0 | 0 | 0 | 0 | 0 |
| AutoTURN3 | 7802 | AutoTURN Level 3 | 0 | 0 | 0 | 0 | 0 |
| AutoTURN4 | 7803 | AutoTURN Level 4 | 0 | 0 | 0 | 0 | 0 |
| AutoTURN5 | 7804 | AutoTURN Level 5 | 0 | 0 | 0 | 0 | 0 |
| AutoTURN6 | 7805 | AutoTURN Level 6 | 0 | 0 | 0 | 0 | 0 |
| AutoTURN7 | 7806 | AutoTURN Level 7 | 0 | 0 | 0 | 0 | 0 |
| AutoTURN8 | 7807 | AutoTURN Level 8 | 0 | 0 | 0 | 0 | 0 |
| AutoTURN9 | 7808 | AutoTURN Level 9 | 0 | 0 | 0 | 0 | 0 |
| Soil_BHole_Loc | 8001 | Soil Bore Hole Location | 11 | 0 | 0 | 0 | 0 |
| Rock | 8002 | Rock | 11 | 0 | 0 | 0 | 0 |
| Rock_Outcrop | 8003 | Rock Outcrop | 11 | ROCK | 0 | 0 | 0 |
| Gravel_Pit | 8004 | Gravel Pit | 11 | 0 | 0 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| Quarry_Pit | 8005 | Quarry Pit | 11 | 0 | 0 | 0 | 0 |
| Borrow_Pit | 8006 | Borrow Pit | 11 | 0 | 0 | 0 | 0 |
| Stockpile | 8007 | Stockpile | 11 | 0 | 0 | 0 | 0 |
| Ex_CL | 9001 | Existing Roadway Centerline | 0 | 4 | 0 | 0 | 0 |
| Concrete_Rd | 9002 | Concrete Road | 7 | 0 | 0 | 0 | 0 |
| Bit_Road | 9003 | Bituminous Road | 7 | 0 | 0 | 0 | 0 |
| AST_Road | 9004 | AST Road | 7 | 0 | 0 | 0 | 0 |
| Gravel_Rd | 9005 | Gravel Road | 7 | 5 | 0 | 0 | 0 |
| Concrete_Shd | 9006 | Concrete Shoulder | 7 | 0 | 0 | 0 | 0 |
| Bit_Shoulder | 9007 | Bituminous Shoulder | 7 | 0 | 0 | 0 | 0 |
| Gravel_Shd | 9008 | Gravel_Shoulder | 7 | 5 | 0 | 0 | 0 |
| Culvert_Xing | 9009 | Culvert_Crossing | 7 | 0 | 0 | 0 | 0 |
| Block_Xing | 9010 | Block Crossing | 7 | 0 | 0 | 0 | 0 |
| Ditch_Xing | 9011 | Ditch Crossing | 7 | 0 | 0 | 0 | 0 |
| Conc_Driveway | 9012 | Concrete Driveway | 7 | 0 | 0 | 0 | 0 |
| Bit_Driveway | 9013 | Bituminous Driveway | 7 | 0 | 0 | 0 | 0 |
| Gravel_Drwy | 9014 | Gravel Driveway | 7 | 5 | 0 | 0 | 0 |
| Conc_Park_Lot | 9015 | Concrete Parking Lot | 7 | 0 | 0 | 0 | 0 |
| Asph_Park_Lot | 9016 | Asphalt Parking Lot | 7 | 0 | 0 | 0 | 0 |
| Gravel_Park_Lot | 9017 | Gravel Parking Lot | 7 | 5 | 0 | 0 | 0 |
| Conc_Curb | 9018 | Concrete Curb | 7 | 0 | 0 | 0 | 0 |
| Asph_Curb | 9019 | Asphalt Curb | 7 | 0 | 0 | 0 | 0 |
| Conc_Gutter | 9020 | Concrete Gutter | 7 | 0 | 0 | 0 | 0 |
| Asph_Gutter | 9021 | Asphalt Gutter | 7 | 0 | 0 | 0 | 0 |
| Sidewalk | 9022 | Sidewalk | 7 | 0 | 0 | 0 | 0 |
| F_Shp_Con_Barrier | 9023 | F Shaped Concrete Barrier | 7 | F Shape Concrete Barrier | 2 | 0 | 0 |
| Gdrail_Cable | 9024 | Guardrail Cable | 7 | Guardrail Cable | 0 | 0 | 0 |
| Gdrail_W_Beam_Traf_Side | 9025 | Guardrail W Beam Traffic Side | 7 | Guardrail W Beam | 0 | 0 | 0 |
| Gdrail_Thrie_Beam_Traf_Side | 9026 | Guardrail Thrie Beam Traffic Side | 7 | Guardrail Thrie Beam | 0 | 0 | 0 |
| Gdrail_End_Treat | 9027 | Guardrail End Treatment | 7 | 0 | 0 | 0 | 0 |
| Edge_of_Lane | 9028 | Edge of Lane | 7 | 0 | 0 | 0 | 0 |
| CL_Median | 9029 | CL of Median | 7 | 4 | 0 | 0 | 0 |
| Conc_Curb_Gutter | 9030 | NO LONGER USED - Concrete Curb & Gutter | 7 | 0 | 0 | 0 | 0 |
| Asph_Curb_Gutter | 9031 | NO LONGER USED - Asphalt Curb & Gutter | 7 | 0 | 0 | 0 | 0 |
| F_Half_Shp_Conc_Barrier | 9032 | Half F Shaped Concrete Barrier | 7 | Half F | 2 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| | | | | Conc Barrier | | | |
| Gdrail_Thrie_Beam_Both_Sides | 9033 | Guardrail Thrie Beam Both Sides | 7 | Guardrail Thrie 2 Beams | 0 | 0 | 0 |
| Gdrail_W_Beam_Both_Sides | 9034 | Guardrail W Beam Both Sides | 7 | Guardrail W 2 Beam | 0 | 0 | 0 |
| Conc_Bullnose | 9035 | Concrete Bullnose | 7 | 0 | 0 | 0 | 0 |
| Topsoil_Bdy | 9036 | Topsoil Boundary | 3 | 0 | 0 | 0 | 0 |
| Trail | 9037 | Trail | 7 | 1 | 0 | 0 | 0 |
| Foot_Path | 9038 | Foot Path | 7 | 5 | 0 | 0 | 0 |
| Typ_Curb | 9100 | Typical Curb Cross Section | 0 | 0 | 0 | 0 | 0 |
| Prop_CL | 9200 | Proposed Centerline | 0 | 4 | 1 | 0 | 0 |
| Prop_Shoulder | 9201 | Proposed Shoulder | 0 | 0 | 1 | 0 | 0 |
| Prop_Pavement | 9203 | Proposed Pavement | 0 | 0 | 1 | 0 | 0 |
| Prop_Curb | 9205 | Proposed Curb | 0 | 0 | 1 | 0 | 0 |
| Prop_Lane | 9208 | Proposed Lane | 0 | 3 | 0 | 0 | 0 |
| Prop_Concrete_Rd | 9210 | Proposed Concrete Road | 0 | 0 | 1 | 0 | 0 |
| Prop_Bit_Road | 9212 | Proposed Bituminous Road | 0 | 0 | 1 | 0 | 0 |
| Prop_AST_Road | 9214 | Proposed AST Road | 0 | 0 | 1 | 0 | 0 |
| Prop_Gravel_Rd | 9216 | Proposed Gravel Road | 0 | 5 | 1 | 0 | 0 |
| Prop_Concrete_Shd | 9218 | Proposed Concrete Shoulder | 0 | 0 | 1 | 0 | 0 |
| Prop_Bit_Shoulder | 9220 | Proposed Bituminous Shoulder | 0 | 0 | 1 | 0 | 0 |
| Prop_Gravel_Shd | 9222 | Proposed Gravel Shoulder | 0 | 5 | 1 | 0 | 0 |
| Prop_Culvert_Xing | 9224 | Proposed Culvert  Crossing | 0 | 0 | 1 | 0 | 0 |
| Prop_Block_Xing | 9226 | Proposed Block Crossing | 0 | 0 | 1 | 0 | 0 |
| Prop_Ditch_Xing | 9228 | Proposed Ditch Crossing | 0 | 0 | 1 | 0 | 0 |
| Prop_Conc_Driveway | 9230 | Proposed Concrete Driveway | 0 | 0 | 1 | 0 | 0 |
| Prop_Bit_Driveway | 9232 | Proposed Bituminous Driveway | 0 | 0 | 1 | 0 | 0 |
| Prop_Gravel_Drwy | 9234 | Proposed Gravel Driveway | 0 | 5 | 1 | 0 | 0 |
| Prop_Conc_Park_Lot | 9236 | Proposed Concrete Parking Lot | 0 | 0 | 1 | 0 | 0 |
| Prop_Asph_Park_Lot | 9238 | Proposed Asphalt Parking Lot | 0 | 0 | 1 | 0 | 0 |
| Prop_Gravel_Park_Lot | 9240 | Proposed Gravel Parking Lot | 0 | 5 | 1 | 0 | 0 |
| Prop_Conc_Curb | 9242 | Proposed Concrete Curb | 0 | 0 | 1 | 0 | 0 |
| Prop_Conc_Gutter | 9244 | Proposed Concrete Gutter | 0 | 0 | 1 | 0 | 0 |
| Prop_Asph_Curb | 9246 | Proposed Asphalt Curb | 0 | 0 | 1 | 0 | 0 |
| Prop_Asph_Curb_Gutter | 9247 | Proposed Asphalt Curb & Gutter | 0 | 0 | 1 | 0 | 0 |
| Prop_Asph_Gutter | 9248 | Proposed Asphalt Gutter | 0 | 0 | 1 | 0 | 0 |
| Prop_Conc_Curb_Gutter | 9249 | Proposed Concrete Curb & Gutter | 0 | 0 | 1 | 0 | 0 |
| Prop_Sidewalk | 9250 | Proposed Sidewalk | 0 | 0 | 1 | 0 | 0 |
| Prop_F_Shp_Con_Barrier | 9252 | Proposed F Shaped Concrete Barrier | 18 | F Shape Concret | 3 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| | | | | e Barrier | | | |
| Prop_F_Half_Shp_Conc_Barrier | 9253 | Proposed Half F Shaped Concrete Barrier | 18 | Half F Conc Barrier | 3 | 0 | 0 |
| Prop_Gdrail_Cable | 9254 | Proposed Guardrail Cable | 0 | Guardrail Cable | 1 | 0 | 0 |
| Prop_Gdrail_W_Beam | 9256 | Proposed Guardrail W Beam | 0 | Guardrail W Beam | 1 | 0 | 0 |
| Prop_Gdrail_W_Beam_Both_Sides | 9257 | Proposed Guardrail W Beam Both Sides | 0 | Guardrail W 2 Beam | 1 | 0 | 0 |
| Prop_Gdrail_Thrie_Beam | 9258 | Proposed Guardrail Thrie Beam | 0 | Guardrail Thrie Beam | 1 | 0 | 0 |
| Prop_Gdrail_Thrie_Beam_Both_Sides | 9259 | Proposed Guardrail Thrie Beam Both Sides | 0 | Guardrail Thrie 2 Beams | 1 | 0 | 0 |
| Prop_Gdrail_End_Treat | 9260 | Proposed Guardrail End Treatment | 0 | 0 | 1 | 0 | 0 |
| Prop_Edge_of_Lane | 9262 | Proposed Edge of Lane | 0 | 0 | 1 | 0 | 0 |
| Prop_Conc_Pave_Med | 9265 | Proposed Concrete Pavevement (Median) | 0 | 0 | 1 | 0 | 0 |
| Prop_Median | 9266 | Proposed Median | 0 | 0 | 1 | 0 | 0 |
| Prop_Base_Line | 9300 | Proposed Base Line | 0 | 7 | 2 | 0 | 0 |
| Prop_Gran_Key_Trench | 9301 | Proposed Granular Key Trenches | 0 | 0 | 1 | 0 | 0 |
| Prop_Eros_Ctrl | 9401 | Proposed Erosion Control feature | 0 | 0 | 1 | 0 | 0 |
| User_Defined_1 | 9501 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_2 | 9502 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_3 | 9503 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_4 | 9504 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_5 | 9505 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_6 | 9506 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_7 | 9507 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_8 | 9508 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_9 | 9509 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_10 | 9510 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_11 | 9511 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_12 | 9512 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_13 | 9513 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_14 | 9514 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |

Denotes Level no longer used

| Level Name | Level No. | Description | CO | LS | WT | Priority | Trans parency |
|---|---|---|---|---|---|---|---|
| User_Defined_15 | 9515 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_16 | 9516 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_17 | 9517 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_18 | 9518 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_19 | 9519 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_20 | 9520 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_21 | 9521 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_22 | 9522 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_23 | 9523 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_24 | 9524 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |
| User_Defined_25 | 9525 | User Defined Feature P-Code | 0 | 0 | 0 | 0 | 0 |

## STANDARD PCODE LIST 2015

**NOTE*: this list is updated periodically, for current list, check STANDARDS folder on J: or T: drives.***

| Numeric | Feature | Grouping | Symbol | V8 Level | CO | LC | WT |
|---|---|---|---|---|---|---|---|
| 1001 | Manitoba Government Survey Post | Survey Features | Cell | MB_Gov_Surv_Post | 0 | 0 | 0 |
| 1002 | Iron Bar | Survey Features | Cell | Iron_Bar | 0 | 0 | 0 |
| 1003 | Manitoba Control Survey Monument | Survey Features | Cell | MB_Cont_Surv_Mon | 0 | 0 | 0 |
| 1004 | Geodetic Control Survey Monument | Survey Features | Cell | Geo_Cont_Surv_Mon | 0 | 0 | 0 |
| 1005 | Bench Mark | Survey Features | Cell | Bench_Mark | 0 | 0 | 0 |
| 1006 | Project Survey Control Points | Survey Features | Cell | Proj_Surv_Cont_Pt | 0 | 0 | 0 |
| 1007 | Legal Survey Marker | Survey Features | Cell | Leg_Sur_Mark | 0 | 0 | 0 |
| 1020 | City, Town, Village, LUD, FN, Forest, Park | Survey Features | Point | Admin_Bndry | 0 | 6 | 1 |
| 1024 | Certificate Title Line | Survey Features | Point | Certif_Title_Line | 0 | 2 | 0 |
| 1026 | River, OTM, RCMP, Wood & Lot Line | Survey Features | Point | Lot_Lines | 0 | 0 | 0 |
| 1100 | Existing ROW Lines | Survey Features | Pt-Line | Ex_ROW | 0 | 0 | 1 |
| 1501 | Traffic Sign - Single Wood | Traffic Control | Cell | TE_Traf_Sgn_Sin_Wood | 158 | 0 | 0 |
| 1502 | Traffic Sign - Multiple Wood | Traffic Control | Cell | TE_Traf_Sgn_Mult_Wood | 158 | 0 | 0 |
| 1503 | Traffic Sign - Single Aluminum | Traffic Control | Cell | TE_Traf_Sgn_Sin_Alum | 158 | 0 | 0 |
| 1504 | Traffic Sign - Multiple Aluminum | Traffic Control | Cell | TE_Traf_Sgn_Mult_Alum | 158 | 0 | 0 |
| 1505 | Overhead Support | Traffic Control | Cell | TE_Overhead_Supp | 158 | 0 | 0 |
| 1506 | Private Sign | Traffic Control | Cell | TE_Private_Sign | 158 | 0 | 0 |
| 1507 | Individual Mail Box | Traffic Control | Cell | TE_Mail_Box_Individ | 158 | 0 | 0 |
| 1508 | Group Mail Box | Traffic Control | Cell | TE_Mail_Box_Group | 158 | 0 | 0 |
| 1509 | Traffic Signal Standard | Traffic Control | Cell | TE_Traf_Signal_Std | 158 | 0 | 0 |
| 1510 | Signal Control Unit | Traffic Control | Cell | TE_Signal_Con_Unit | 158 | 0 | 0 |
| 1511 | Parking Meter | Traffic Control | Cell | TE_Park_Meter | 158 | 0 | 0 |
| 1512 | Polypost | Traffic Control | Cell | TE_Polypost | 158 | 0 | 0 |
| 1513 | Pavement Markings | Traffic Control | Pt-Line | TE_Pave_Mark | 158 | 0 | 0 |
| 1514 | Bridge Mount Sign | Traffic Control | Cell | TE_Brdg_Mount_Sign | 158 | 0 | 0 |
| 1515 | Advance Cantilever Sign | Traffic Control | Cell | TE_Adv_Cant_Sign | 158 | 0 | 0 |
| 1516 | Pedestrian Corridor | Traffic Control | Cell | TE_Ped_Corridor | 158 | 0 | 0 |
| 2001 | Single Hydro Pole | Above Ground Utilities | Cell | Hyd_Pole | 2 | 0 | 0 |
| 2002 | Multiple Pole Structure | Above Ground Utilities | Cell | Hyd_Mult_Pole | 2 | 0 | 0 |
| 2004 | Hydro Tower | Above Ground | Cell | Hyd_Tower | 2 | 0 | 0 |

| Numeric | Feature | Grouping | Symbol | V8 Level | CO | LC | WT |
|---|---|---|---|---|---|---|---|
| | | Utilities | | | | | |
| 2005 | Hydro Guy Pole | Above Ground Utilities | Cell | Hyd_Guy_Pole | 2 | 0 | 0 |
| 2006 | Hydro Light Pole | Above Ground Utilities | Cell | Hyd_Lite_Pole | 2 | 0 | 0 |
| 2007 | Hydro Guy Anchor | Above Ground Utilities | Cell | Hyd_Guy_Anchor | 2 | 0 | 0 |
| 2008 | Buried Hydro Cable | Below Ground Utilities | Line Style | Buried_Hyd_Cable | 2 | Hydro Cable | 0 |
| 2009 | Ground Transformer | Above Ground Utilities | Cell | Grd_Transformer | 2 | 0 | 0 |
| 2010 | Light Standard | Above Ground Utilities | Cell | Lite_Standard | 2 | 0 | 0 |
| 2011 | MTS Pole | Above Ground Utilities | Cell | MTS_Pole | 18 | 0 | 0 |
| 2012 | MTS Guy Pole | Above Ground Utilities | Cell | MTS_Guy_Pole | 18 | 0 | 0 |
| 2013 | MTS Guy Anchor | Above Ground Utilities | Cell | MTS_Guy_Anchor | 18 | 0 | 0 |
| 2014 | MTS Pedestal | Below Ground Utilities | Cell | MTS_Pedestal | 18 | 0 | 0 |
| 2015 | Buried MTS Wire Cable | Below Ground Utilities | Line Style | Buried_MTS_Cable | 18 | MTS Cable | 0 |
| 2016 | Buried MTS Fibre Optic Cable | Below Ground Utilities | Line Style | Buried_Fibre_Optic | 18 | Fibre Optic | 0 |
| 2017 | Telephone Booth | Above Ground Utilities | Cell | Phone_Booth | 18 | 0 | 0 |
| 2018 | Hydro Manhole | Above Ground Utilities | Cell | Hydro_MH | 2 | 0 | 0 |
| 2019 | MTS Manhole | Above Ground Utilities | Cell | MTS_MH | 18 | 0 | 0 |
| 2020 | Hydro Pedestal | Below Ground Utilities | Cell | Hyd_Pedestal | 2 | 0 | 0 |
| 2021 | MTS Box | Above Ground Utilities | Cell | MTS_Box | 18 | 0 | 0 |
| 2022 | Cable TV Lines | Above Ground Utilities | Pt-Line | Cable_TV_Line | 18 | 5 | 0 |
| 2023 | Cable TV Boxes | Above Ground Utilities | Cell | Cable_TV_Box | 18 | 0 | 0 |
| 2024 | Telegraph Pole | Above Ground Utilities | Cell | Telegraph_Pole | 18 | 0 | 0 |
| 2025 | Hydro Meter Box | Above Ground Utilities | Cell | Hyd_Meter_Box | 18 | 0 | 0 |
| 2026 | Hydro Cable Marker | Above Ground Utilities | Cell | Hyd_Cable_Mark | 2 | 0 | 0 |
| 2027 | MTS Cable Marker | Above Ground Utilities | Cell | MTS_Cable_Marker | 18 | 0 | 0 |
| 2028 | Cable TV Marker | Above Ground Utilities | Pt-Line | Cable_TV_Marker | 18 | 0 | 0 |
| 2029 | Fiber Optic Marker | Above Ground Utilities | Cell | Fiber_Optic_Marker | 18 | 0 | 0 |
| 2030 | Hydro Transmission Line (points to locate the overhead line) | Above Ground Utilities | point | Hyd_Trans_Line | 2 | 0 | 0 |
| 2031 | Microwave Tower | Above Ground Utilities | Cell | Micro_Tower | 18 | 0 | 0 |
| 2032 | Television Tower | Above Ground Utilities | Cell | TV_Tower | 2 | 0 | 0 |
| 2033 | Cell Phone Tower | Above Ground Utilities | Cell | Cell_Tower | 18 | 0 | 0 |

| Numeric | Feature | Grouping | Symbol | V8 Level | CO | LC | WT |
|---|---|---|---|---|---|---|---|
| 2501 | Timber Bridge | Bridges | Point | B_Tim_Bridge | 137 | 0 | 0 |
| 2502 | Concrete Bridge | Bridges | Point | B_Conc_Bridge | 137 | 0 | 0 |
| 2503 | Steel Bridge | Bridges | Point | B_Steel_Bridge | 137 | 0 | 0 |
| 2504 | Ford Crossing | Bridges | Point | B_Ford_Xing | 137 | 0 | 0 |
| 2505 | Bridge Abutment | Bridges | Pt-Line | B_Brdg_Abutment | 137 | 0 | 0 |
| 2506 | Bridge Supports or Piles | Bridges | Pt-Line | B_Brdg_Support | 137 | 0 | 0 |
| 2507 | Guardrail Posts | Bridges | Pt-Line | B_Gdrail_Post | 137 | 0 | 0 |
| 2508 | Bridge Piles - Concrete | Bridges | Cell | B_Brdg_Pile_Conc | 137 | 0 | 0 |
| 2509 | Bridge Piles - Timber | Bridges | Cell | B_Brdg_Pile_Tim | 137 | 0 | 0 |
| 2510 | Bridge Piles - Steel | Bridges | Cell | B_Brdg_Pile_Steel | 137 | 0 | 0 |
| 2511 | WingWalls | Bridges | Pt-Line | B_WingWalls | 137 | 0 | 0 |
| 2512 | WingWalls at Groundline | Bridges | Pt-Line | B_WingWall_Gr | 137 | 0 | 0 |
| 2513 | Stringers | Bridges | Point | B_Stringers | 137 | 0 | 0 |
| 2514 | Bottom Toe of Stream Slope | Bridges | Pt-Line | B_Bot_Toe_Str_Slope | 137 | 0 | 0 |
| 2515 | Top of Bank | Bridges | Pt-Line | B_Top_Bank | 137 | 0 | 0 |
| 2516 | Flood Plain Boundary | Bridges | Pt-Line | B_Flood_Plain_Bdry | 137 | 0 | 0 |
| 2517 | Rapids | Bridges | Cell | B_Rapids | 137 | 0 | 0 |
| 2518 | Existing Water Level | Bridges | Cell | B_Ex_Water_Lvl | 137 | 0 | 0 |
| 2519 | High Water Level | Bridges | Cell | B_High_Wat_Lvl | 137 | 0 | 0 |
| 2520 | Ice Level | Bridges | Cell | B_Ice_Level | 137 | 0 | 0 |
| 2521 | Inside Face of Ballast Wall | Bridges | Pt-Line | B_In_Face_Bal_Wall | 137 | 0 | 0 |
| 2522 | Inside Face of Abutment Wall | Bridges | Pt-Line | B_In_Face_Abut_Wall | 137 | 0 | 0 |
| 2523 | Concrete Pier | Bridges | Pt-Line | B_Conc_Pier | 137 | 0 | 0 |
| 2528 | Scour Holes | Bridges | Pt-Line | B_Scour_Hole | 137 | 0 | 0 |
| 2529 | Expansion Joints | Bridges | Point | B_Expan_Joint | 137 | 0 | 0 |
| 2530 | Newel Post | Bridges | Point | B_Newel_Post | 137 | 0 | 0 |
| 2531 | Wingwalls Support Posts - Piles | Bridges | Point | B_WingWalls_Supp_Posts | 137 | 0 | 0 |
| 2532 | Bottom of Bridge Stringers | Bridges | Point | B_Bot_Stringer | 137 | 0 | 0 |
| 2533 | Top of Bridge Deck | Bridges | Point | B_Top_Deck | 137 | 0 | 0 |
| 3001 | Gas Pipe Line | Below Ground Utilities | Line Style | Gas_Pipe_Line | 4 | Gas Pipe Line | 0 |
| 3002 | Gas Valve | Below Ground Utilities | Cell | Gas_Valve | 4 | 0 | 0 |
| 3003 | Gas Main Transmission Line | Below Ground Utilities | Line Style | Gas_Main_Line | 4 | Main Gas Line | 0 & 1 |
| 3004 | Gas Transmission Line Pump | Above Ground Utilities | Cell | Gas_Trans_Pump | 4 | 0 | 0 |
| 3005 | Fire Hydrant | Above Ground Utilities | Cell | Fire_Hydrant | 7 | 0 | 0 |
| 3006 | Water Line | Below Ground Utilities | Line Style | Water_Line | 7 | Water Line | 0 |
| 3007 | Water Valve | Below Ground Utilities | Cell | Water_Valve | 7 | 0 | 0 |
| 3008 | Well | Below Ground Utilities | Cell | Well | 7 | 0 | 0 |
| 3009 | Gas Pipeline Marker | Above Ground Utilities | Cell | Gas_Marker | 4 | 0 | 0 |
| 3010 | Gas Meter | Above Ground Utilities | Cell | Gas_Meter | 4 | 0 | 0 |

| Numeric | Feature | Grouping | Symbol | V8 Level | CO | LC | WT |
|---|---|---|---|---|---|---|---|
| 3011 | Oil Pipeline Marker | Above Ground Utilities | Cell | Oil_Pipe_Marker | 4 | 0 | 0 |
| 3012 | Oil Pipeline Station | Above Ground Utilities | point | Oil_Pipe_Sta | 4 | 0 | 0 |
| 3013 | Water Pipeline Marker | Above Ground Utilities | Cell | Water_Pipe_Marker | 7 | 0 | 0 |
| 3014 | Groundwater Well | Below Ground Utilities | cell | Grdwater_Well | 7 | 0 | 0 |
| 3015 | Irrigation Well | Below Ground Utilities | cell | Irr_Well | 7 | 0 | 0 |
| 3016 | Irrigation Well Pivot | Above Ground Utilities | Cell | Irr_Well_Pivot | 7 | 0 | 0 |
| 3017 | Irrigation Pump | Above Ground Utilities | Cell | Irr_Pump | 7 | 0 | 0 |
| 3018 | Piezometer | Above Ground Utilities | Cell | Piezometer | 7 | 0 | 0 |
| 3019 | Groundwater Recorder | Above Ground Utilities | Cell | Grdwater_Recdr | 7 | 0 | 0 |
| 3501 | Mid-Slope (for long grade slopes) | Earthwork Features | Pt-Line | Mid_Slope | 0 | 0 | 0 |
| 3502 | Toe of Grade Slope | Earthwork Features | Pt-Line | Toe_Gra_Slope | 0 | 0 | 0 |
| 3503 | Mid-Ditch (wide ditch bottoms) | Earthwork Features | Pt-Line | Mid_Ditch | 0 | 0 | 0 |
| 3504 | Toe of Back Slope | Earthwork Features | Pt-Line | Toe_Bk_Slope | 0 | 0 | 0 |
| 3505 | Top of Back Slope | Earthwork Features | Pt-Line | Top_Bk_Slope | 0 | 0 | 0 |
| 3506 | Prairie (long distances between Top of Back Slope & Edge of ROW) - Point | Earthwork Features | Pt-Line | Prairie | 0 | 0 | 0 |
| 3508 | Toe of Berm | Earthwork Features | Pt-Line | Toe_Berm | 0 | 0 | 0 |
| 3509 | Top of Berm | Earthwork Features | Pt-Line | Top_Berm | 0 | 0 | 0 |
| 3510 | Final Subcut | Earthwork Features | Pt-Line | Fin_Subcut | 0 | 0 | 0 |
| 3511 | Final Waste | Earthwork Features | Pt-Line | Fin_Waste | 0 | 0 | 0 |
| 3512 | Final Topsoil | Earthwork Features | Pt-Line | Fin_TSoil | 0 | 0 | 0 |
| 3513 | Final Ground | Earthwork Features | Pt-Line | Fin_Grd | 0 | 0 | 0 |
| 3514 | Existing Ground | Earthwork Features | point | Ex_Grd | 0 | 0 | 0 |
| 3515 | Top of Topsoil Cut | Earthwork Features | Pt-Line | Top_TSoil_Cut | 145 | 0 | 0 |
| 3516 | Toe of Topsoil Cut | Earthwork Features | Pt-Line | Toe_TSoil_Cut | 145 | 1 | 0 |
| 3517 | Top of Subcut | Earthwork Features | Pt-Line | Top_Subcut | 66 | 0 | 0 |
| 3518 | Toe of Subcut | Earthwork Features | Pt-Line | Toe_Subcut | 66 | 1 | 0 |
| 3519 | Top of Waste Cut | Earthwork Features | Pt-Line | Top_Waste_Cut | 23 | 0 | 0 |
| 3520 | Toe of Waste Cut | Earthwork Features | Pt-Line | Toe_Waste_Cut | 23 | 1 | 1 |
| 3521 | Top of Borrow Cut | Earthwork Features | Pt-Line | Top_Borrow_Cut | 9 | 0 | 0 |

| Numeric | Feature | Grouping | Symbol | V8 Level | CO | LC | WT |
|---|---|---|---|---|---|---|---|
| 3522 | Toe of Borrow Cut | Earthwork Features | Pt-Line | Toe_Borrow_Cut | 9 | 1 | 0 |
| 3523 | Top of Rock Cut | Earthwork Features | Pt-Line | Top_Rock_Cut | 0 | 0 | 0 |
| 3524 | Toe of Rock Cut | Earthwork Features | Pt-Line | Toe_Rock_Cut | 0 | 1 | 0 |
| 3525 | Final Solid Rock | Earthwork Features | Pt-Line | Fin_Solid_Rock | 0 | 0 | 0 |
| 3526 | Final Borrow Stripping | Earthwork Features | Pt-Line | Fin_Borrow_Strip | 6 | 0 | 0 |
| 3527 | FIinal Borrow Excavation | Earthwork Features | Pt-Line | Fin_Borrow_Excav | 5 | 0 | 0 |
| 3528 | Semi-Final | Earthwork Features | Point | Semi-Final | 0 | 0 | 0 |
| 3529 | Final Composite | Earthwork Features | Pt-Line | Fin_Composite | 0 | 0 | 0 |
| 3530 | Final Overburden | Earthwork Features | Pt-Line | Fin_Overburden | 0 | 0 | 0 |
| 4001 | Railroad Track | Railroads | Line Style | RR_Track | 155 | Railroad | 0 |
| 4002 | Railroad Signals | Railroads | Cell | RR_Signal | 155 | 0 | 0 |
| 4003 | Railroad Signals with Arms | Railroads | Cell | RR_Sign_Arm | 155 | 0 | 0 |
| 4004 | Railroad Control Box | Railroads | Cell | RR_Cont_Box | 155 | 0 | 0 |
| 4005 | Railroad Saw Bucks | Railroads | Cell | RR_Saw_Buck | 155 | 0 | 0 |
| 4006 | Railroad Whistle Sign | Railroads | Cell | RR_Whistle_Sign | 155 | 0 | 0 |
| 4007 | Railroad X-ing Rubber Mats | Railroads | Point | RR_X-ing_Rub_Mat | 155 | 0 | 0 |
| 4008 | Railroad X-ing Planks | Railroads | point | RR_X-ing_Plank | 155 | 0 | 0 |
| 4009 | Railroad Top Rail for Profiles | Railroads | Point | RR_Rail_Top | 0 | 0 | 1 |
| 4011 | Railroad Bridge | Railroads | Point | RR_Bridge | 155 | 0 | 0 |
| 4012 | Railroad Culvert | Railroads | Point | RR_Culvert | 155 | 0 | 0 |
| 4014 | Railroad Crossing | Railroads | Point | RR_Crossing | 155 | 0 | 0 |
| 4501 | Runway Gravel | Northern Airports | Pt-Line | Rnwy_Gravel | 0 | 0 | 0 |
| 4502 | Runway Turf | Northern Airports | Pt-Line | Rnwy_Turf | 0 | 0 | 0 |
| 4503 | Overrun Gravel | Northern Airports | Pt-Line | Overrun_Gravel | 0 | 0 | 0 |
| 4504 | Overrun Turf | Northern Airports | Pt-Line | Overrun_Turf | 0 | 0 | 0 |
| 4505 | Taxiway Gravel | Northern Airports | Pt-Line | Txway_Gravel | 0 | 0 | 0 |
| 4506 | Taxiway Turf | Northern Airports | Pt-Line | Txway_Turf | 0 | 0 | 0 |
| 4507 | Apron Gravel | Northern Airports | Pt-Line | Apron_Gravel | 0 | 0 | 0 |
| 4508 | Apron Turf | Northern Airports | Pt-Line | Apron_Turf | 0 | 0 | 0 |
| 4509 | Runway Light - White | Northern Airports | Cell | Rnwy_Lite_White | 0 | 0 | 0 |
| 4510 | Runway Light - Blue | Northern Airports | Cell | Rnwy_Lite_Blue | 0 | 0 | 0 |
| 4511 | Runway Light - Amber | Northern Airports | Cell | Rnwy_Lite_Amber | 0 | 0 | 0 |
| 4512 | Runway Light - Red/Green | Northern Airports | Cell | Rnwy_Lite_R-G | 0 | 0 | 0 |
| 4513 | Windsock Lit | Northern | Cell | Windsock_Lit | 0 | 0 | 0 |

| Numeric | Feature | Grouping | Symbol | V8 Level | CO | LC | WT |
|---|---|---|---|---|---|---|---|
| | | Airports | | | | | |
| 4514 | Windsock Unlit | Northern Airports | Cell | Windsock_Unlit | 0 | 0 | 0 |
| 4515 | Rotating Beacon | Northern Airports | Cell | Rot_Beacon | 0 | 0 | 0 |
| 4516 | Non-directional Beacon | Northern Airports | Cell | Non-Dir_Beacon | 0 | 0 | 0 |
| 4517 | Precision Approach Path Indicator | Northern Airports | Cell | Prec_Aproc_Path_Ind | 0 | 0 | 2 |
| 4518 | Weather Collection Area | Northern Airports | Cell | Weather_Coll_Area | 0 | 0 | 0 |
| 4519 | Ceiling Projector | Northern Airports | Cell | Ceil_Projector | 0 | 0 | 0 |
| 4520 | Radio Tower | Northern Airports | Cell | Radio_Tower | 0 | 0 | 0 |
| 4521 | Aircraft Parking Pad | Northern Airports | Point | Air_Park_Pad | 0 | 0 | 0 |
| 4522 | Aircraft Run-up Pad | Northern Airports | Point | Air_Run-up_Pad | 0 | 0 | 0 |
| 4523 | Air Terminal Building (Northern Airports) | Northern Airports | Point | Air_Term_Bldg | 0 | 0 | 0 |
| 4524 | Baggage Facility | Northern Airports | Pt-Line | Bag_Facility | 0 | 0 | 0 |
| 4525 | Fire Hall | Northern Airports | Pt-Line | Fire_Hall | 0 | 0 | 0 |
| 4526 | Aircraft Hangar | Northern Airports | Point | Air_Hangar | 0 | 0 | 0 |
| 4527 | Comfort Station | Northern Airports | Pt-Line | Comfort_Sta | 0 | 0 | 0 |
| 4528 | Fire Training Area | Northern Airports | Pt-Line | Fire_Train_Area | 0 | 0 | 0 |
| 4529 | Airport Information Sign | Northern Airports | Cell | Air_Info_Sign | 0 | 0 | 1 |
| 4530 | Airport Mandatory Sign | Northern Airports | Cell | Air_Mand_Sign | 0 | 0 | 0 |
| 4531 | Aviation Fuel Pump Island | Northern Airports | Cell | Av_Fuel_Pump_Isle | 0 | 0 | 1 |
| 4532 | Aviation Fuel Line Above Ground | Northern Airports | Pt-Line | Av_Fuel_Line_Ab_Gr | 0 | 0 | 0 |
| 4533 | Aviation Fuel Line Buried | Northern Airports | Pt-Line | Av_Fuel_Line_Buried | 0 | 0 | 0 |
| 4534 | Leased Parcel (Crown Land Act) | Northern Airports | Point | Leased_Parcel | 0 | 0 | 0 |
| 4535 | Runway Distribution Panel | Northern Airports | Cell | Rnwy_Distrib_Panel | 0 | 0 | 0 |
| 4536 | Terminal Floor Elevation | Northern Airports | point | Term_Floor_El | 0 | 0 | 0 |
| 4537 | Apron Lighting (Floodlights) | Northern Airports | Cell | Apron_Lite | 0 | 0 | 0 |
| 4538 | Runway Designator Sign Illuminated | Northern Airports | Cell | Rnwy_D_Sign_Lit | 0 | 0 | 0 |
| 4539 | Runway Designator Sign Non Illuminated | Northern Airports | Cell | Rnwy_D_Sign_Unlit | 0 | 0 | 0 |
| 4540 | Stevenson Screen | Northern Airports | Cell | Steve_Screen | 0 | 0 | 0 |
| 4541 | Stevenson Screen Vented | Northern Airports | Cell | Steve_Screen_V | 0 | 0 | 0 |
| 4542 | Rain Gauge | Northern Airports | Cell | Std_Rain_Gauge | 0 | 0 | 0 |

| Numeric | Feature | Grouping | Symbol | V8 Level | CO | LC | WT |
|---|---|---|---|---|---|---|---|
| 4543 | Tipping Bucket Rain Gauge | Northern Airports | Cell | Tip_Buc_Rain_Gauge | 0 | 0 | 0 |
| 4544 | Junction Box | Northern Airports | Cell | Junct_Box | 0 | 0 | 0 |
| 4545 | Junction Box Underground Splice | Northern Airports | Cell | Junct_Box_Ungr_Splic | 0 | 0 | 0 |
| 4546 | Aircraft Amp Recepticle | Northern Airports | Cell | Air_Amp_Recep | 0 | 0 | 0 |
| 4547 | Altimeter | Northern Airports | Cell | Altimeter | 0 | 0 | 0 |
| 4548 | Spike | Northern Airports | Cell | Air_Spike | 0 | 0 | 0 |
| 4549 | Underground PAPI Circuit Cable | Northern Airports | point | Air_PAPI_Cable | 76 | 6 | 1 |
| 4550 | Underground Light Circuit Cable | Northern Airports | point | Air_Lite_Cable | 88 | 7 | 2 |
| 4551 | Taxiway Light - Blue | Northern Airports | Cell | Txway_Lite_Blue | 0 | 0 | 0 |
| 4552 | Airport PAPI Light | Northern Airports | Cell | Air_PAPI_Lite | 0 | 0 | 0 |
| 4553 | Obstruction Light | Northern Airports | Cell | Obstruct_Lite | 0 | 0 | 0 |
| 4554 | Airport Power Box | Northern Airports | Cell | Air_Power_Box | 0 | 0 | 0 |
| 4555 | Airport Niper Snow Gauge | Northern Airports | Cell | Air_Niper_Snw_Gauge | 0 | 0 | 0 |
| 4556 | Existing ARB Tower | Northern Airports | Cell | ARB_Tower_Ex | 0 | 0 | 0 |
| 4557 | Airport Control Bolt | Northern Airports | Cell | Air_Cont_Bolt | 0 | 0 | 0 |
| 4558 | Northern Airport Fuel Tank | Northern Airports | Cell | Air_Fuel_Tank | 0 | 0 | 0 |
| 4559 | Wind Gauge | Northern Airports | Cell | Wind_Gauge | 0 | 0 | 0 |
| 4560 | Northern Airports Pull Pit | Northern Airports | Cell | Pull_Pit | 0 | 0 | 0 |
| 5001 | House | Buildings & Structures | Pt-Line | House | 88 | 0 | 0 |
| 5002 | Garage | Buildings & Structures | Pt-Line | Garage | 88 | 0 | 0 |
| 5003 | Shed | Buildings & Structures | Pt-Line | Shed | 88 | 0 | 0 |
| 5004 | Barn | Buildings & Structures | Pt-Line | Barn | 88 | 0 | 0 |
| 5005 | Fuel Tanks Above Ground | Buildings & Structures | Point | Fuel_Tank_Above_Gr | 88 | 0 | 0 |
| 5006 | Wood Granary | Buildings & Structures | Point | Wood_Granary | 88 | 0 | 0 |
| 5007 | Steel Granary | Buildings & Structures | Point | Steel_Granary | 88 | 0 | 0 |
| 5008 | Silo | Buildings & Structures | Point | Silo | 88 | 0 | 0 |
| 5009 | Commercial Building | Buildings & Structures | Point | Com_Bldg | 88 | 0 | 0 |
| 5010 | Hydro Service Building | Buildings & Structures | Point | Hyd_Ser_Bldg | 88 | 0 | 0 |
| 5011 | MTS Service Building | Buildings & Structures | Point | MTS_Ser_Bldg | 88 | 0 | 0 |
| 5012 | Fuel Pump Islands | Buildings & Structures | Point | Fuel_Pump_Isle | 88 | 0 | 0 |

| Numeric | Feature | Grouping | Symbol | V8 Level | CO | LC | WT |
|---|---|---|---|---|---|---|---|
| 5013 | Multiple Dwelling Unit | Buildings & Structures | Point | Mult_Dwel_Unit | 88 | 0 | 0 |
| 5014 | Septic Mound or Field | Buildings & Structures | Pt-Line | Septic_Field | 88 | 0 | 0 |
| 5015 | Septic Tank | Buildings & Structures | Point | Septic_Tank | 88 | 0 | 0 |
| 5016 | Barbed Wire Fence | Buildings & Structures | Line Style | Barbed_Wire_Fen | 88 | Barded Wire Fence | 0 |
| 5017 | Page Wire Fence | Buildings & Structures | Line Style | Page_Wire_Fen | 88 | Page Wire Fence | 0 |
| 5018 | Ornamental Fence | Buildings & Structures | Line Style | Ornament_Fen | 88 | Ornament al Fence | 0 |
| 5019 | Fence Gate | Buildings & Structures | Line Style | Fence_Gate | 88 | Fence Gate | 0 |
| 5020 | ChainLink Fence | Buildings & Structures | Line Style | ChainLink_Fen | 88 | ChainLink Fence | 0 |
| 5021 | Concrete Fence | Buildings & Structures | Line Style | Conc_Fence | 88 | Concrete Fence | 0 |
| 5022 | Brick Fence | Buildings & Structures | Line Style | Brick_Fence | 88 | Brick Fence | 0 |
| 5023 | Stone Fence | Buildings & Structures | Line Style | Stone_Fence | 88 | Stone Fence | 0 |
| 5024 | Wood Fence | Buildings & Structures | Line Style | Wood_Fence | 88 | Wood Fence | 0 |
| 5025 | Fence with Plug-Ins | Buildings & Structures | Line Style | Fen_w_Plug-ins | 88 | Fence w Plugins | 0 |
| 5026 | Electric Fence | Buildings & Structures | Line Style | Elec_Fence | 88 | Electric Fence | 0 |
| 5027 | Retaining Wall | Buildings & Structures | Line Style | Retain_Wall | 88 | Retain Wall | 0 |
| 5028 | Door Sill | Buildings & Structures | Cell | Door_Sill | 88 | 0 | 0 & 2 |
| 5029 | Garbage Dumpster | Buildings & Structures | Cell | Garb_Dumpster | 88 | 0 | 0 |
| 5030 | Grave Site | Buildings & Structures | Cell | Grave_Site | 88 | 0 | 0 |
| 5031 | Cemetery | Buildings & Structures | Pt-Line | Cemetery | 88 | 0 | 0 |
| 5033 | Propane Tank | Buildings & Structures | Cell | Propane_Tank | 88 | 0 | 0 |
| 5034 | Cairns | Buildings & Structures | cell | Cairns | 88 | 0 | 0 |
| 5035 | Septic Field Ejector | Buildings & Structures | Cell | Septic_Field_Eject | 88 | 0 | 0 |
| 5036 | Water Tower | Buildings & Structures | cell | Water_Tower | 88 | 0 | 0 |
| 5037 | Look Out Tower | Buildings & Structures | cell | Look_Out_Tower | 88 | 0 | 0 |
| 5038 | Corral | Buildings & Structures | Pt-Line | Corral | 88 | 0 | 0 |
| 5039 | Concrete Post | Buildings & Structures | Point | Conc_Post | 88 | 0 | 0 |
| 5040 | Metal Post | Buildings & Structures | Point | Metal_Post | 88 | 0 | 0 |
| 5041 | Wooden Post | Buildings & Structures | point | Wood_Post | 88 | 0 | 0 |
| 5501 | Ferry Landing | Marine | Point | Ferry_Land | 30 | 0 | 0 |
| 5502 | Marine Crew | Marine | Point | Mar_Crew_Quart | 30 | 0 | 0 |

| Numeric | Feature | Grouping | Symbol | V8 Level | CO | LC | WT |
|---|---|---|---|---|---|---|---|
| | Quarters | | | | | | |
| 5503 | Marine Warehouse | Marine | Point | Mar_Warehouse | 30 | 0 | 0 |
| 5504 | Marine Generator Shed | Marine | Point | Mar_Gen_Shed | 30 | 0 | 0 |
| 5505 | Marine Cable Warning Sign | Marine | Point | Mar_Warn_Sign | 30 | 0 | 0 |
| 5506 | Marine Shore Light Standard | Marine | Cell | Mar_Shore_Lite | 30 | 0 | 0 |
| 5507 | Marine Shore Winch | Marine | Cell | Mar_Shore_Win | 30 | 0 | 0 |
| 5508 | Marine Cable Storage Stand | Marine | Point | Mar_Cbl_Stand | 30 | 0 | 0 |
| 5509 | Boat Launch | Marine | point | Boat_Launch | 30 | 0 | 0 |
| 6001 | Bush Line | Vegetation | Line Style | Bush_Line | 3 | Bush Line | 0 |
| 6002 | Tree Line | Vegetation | Line Style | Tree_Line | 3 | Row of Trees | 0 |
| 6003 | Hedge Line | Vegetation | Line Style | Hedge_Line | 3 | Hedge Line | 0 |
| 6004 | Planted Deciduous Tree | Vegetation | Cell | Deciduous_Tree_Pl | 3 | 0 | 0 |
| 6005 | Deciduous Tree | Vegetation | Cell | Deciduous_Tree | 3 | 0 | 0 |
| 6006 | Edge of Garden | Vegetation | Pt-Line | Garden | 3 | 0 | 0 |
| 6007 | Edge of Flower Bed | Vegetation | Pt-Line | Flower_Bed | 3 | 0 | 0 |
| 6008 | Edge of Grassed Area | Vegetation | Pt-Line | Edge_Grass | 3 | 0 | 0 |
| 6009 | Planted Conifers Tree | Vegetation | Cell | Conifers_Tree_Pl | 3 | 0 | 0 |
| 6010 | Conifers Tree | Vegetation | Cell | Conifers_Tree | 3 | 0 | 0 |
| 6011 | Cultivated Land | Vegetation | Pt-Line | Farm_Land_Use | 3 | 0 | 0 |
| 6012 | Pasture Area | Vegetation | Pt-Line | Pasture | 3 | 0 | 0 |
| 6013 | Hayfield | Vegetation | Pt-Line | Hayfield | 3 | 0 | 0 |
| 7001 | ROW Ditch (Low point of ditch) | Drainage | Pt-Line | ROW_Ditch | 5 | 0 | 0 |
| 7002 | Offtake Ditch | Drainage | Pt-Line | Offtake_Ditch | 5 | 0 | 0 |
| 7003 | Swale | Drainage | Line Style | Swale | 5 | Swale CL | 0 |
| 7004 | Centerline of Stream, Creek or River | Drainage | Line Style | CL_Stream | 5 | Stream Creek CL | 0 |
| 7005 | Water Edge (All Bodies of Water) | Drainage | Line Style | Water_Edge | 5 | Water Edge | 0 |
| 7006 | River Edge | Drainage | Line Style | River | 5 | Water Edge | 0 |
| 7007 | Lagoon Edge | Drainage | Line Style | Lagoon | 5 | Water Edge | 0 |
| 7008 | Artesian Spring | Drainage | Cell | Artesian_Spring | 5 | 0 | 0 |
| 7009 | Beaver Dam | Drainage | Pt-Line | Beaver_Dam | 5 | 0 | 3 |
| 7010 | Man Made Dam | Drainage | Pt-Line | Man_Made_Dam | 88 | 0 | 0 |
| 7011 | Wharf, pier or Dock | Drainage | Line | Wharf_Pier_Dock | 88 | 0 | 0 |
| 7012 | Water Level | Drainage | Point | Water_Level | 88 | 0 | 0 |
| 7013 | Steam Gauge | Drainage | Cell | Stream_Gauge | 88 | 0 | 0 |
| 7014 | Weir | Drainage | Line Style | Weir | 88 | Weir | 0 |
| 7015 | Water Block | Drainage | Cell | Water_Block | 88 | 0 | 0 |
| 7016 | Rip Rap | Drainage | Line Style | Rip_Rap | 88 | Rip Rap | 0 |
| 7017 | Dyke | Drainage | Line Style | Dyke | 88 | Dyke | 0 |
| 7018 | Corrugated Steel Pipe Invert | Drainage | Point | Corr_Steel_Pipe | 88 | 0 | 0 |
| 7019 | Arch Steel Pipe Invert | Drainage | Point | Arch_Steel_Pipe | 88 | 0 | 0 |
| 7020 | Concrete Pipe Invert | Drainage | Point | Conc_Pipe | 88 | 0 | 0 |
| 7021 | Other Pipe Invert | Drainage | Point | Other_Pipe | 88 | 0 | 0 |
| 7022 | Timber Box Culvert | Drainage | Point | Tim_Box_Culvert | 88 | 0 | 0 |

| Numeric | Feature | Grouping | Symbol | V8 Level | CO | LC | WT |
|---|---|---|---|---|---|---|---|
| | Invert | | | | | | |
| 7023 | Concrete Box Culvert Invert | Drainage | Point | Conc_Box_Culvert | 88 | 0 | 0 |
| 7024 | Multi-Plate Culvert Invert | Drainage | Point | MultiPlate_Culvert | 88 | 0 | 0 |
| 7025 | Auto Flood Gate | Drainage | Cell | Auto_Flood_Gate | 88 | 0 | 0 & 1 |
| 7026 | Manhole | Drainage | Cell | Manhole | 88 | 0 | 0 |
| 7027 | Catch Basin | Drainage | Cell | Catch_Basin | 88 | 0 | 0 |
| 7028 | Curb Inlet | Drainage | Cell | Curb_Inlet | 88 | 0 | 0 |
| 7029 | Catch Basin Invert | Drainage | Cell | CB_Invert | 88 | 0 | 0 |
| 7030 | Storm Sewer Line | Drainage | Line Style | Storm_Sewer | 88 | Sewer Line | 0 |
| 7031 | Profile - Pipe Invert | Drainage | Cell | Prof_Pipe_Invert | 88 | 0 | 0 |
| 7032 | Pipe Obvert | Drainage | Point | Pipe_Obvert | 88 | 0 | 0 |
| 7033 | Flared Invert | Drainage | Point | Flared_Invert | 88 | 0 | 0 |
| 7034 | PVC Pipe | Drainage | Point | PVC_Pipe | 88 | 0 | 0 |
| 7035 | HDPVC Pipe | Drainage | Point | HDPVC_Pipe | 88 | 0 | 0 |
| 7040 | Existing Curb & Gutter Inlets | Drainage | Point | Curb_Gutter_Inlets | 88 | 0 | 0 |
| 7045 | Drainage Cross Section Point | Drainage | point | Cross_Sect_Pt | 88 | 0 | 0 |
| 7046 | Drain | Drainage | Pt-Line | Drain | 88 | 0 | 0 |
| 7047 | Outside Drain | Drainage | Pt-Line | Out_Drain | 88 | 0 | 0 |
| 7048 | Road Dyke | Drainage | Pt-Line | Rd_Dyke | 0 | 4 | 0 |
| 7049 | Centerline of River | Drainage | Line Style | CL_River | 5 | Stream Creek CL | 0 |
| 7050 | Centerline of Creek | Drainage | Line Style | CL_Creek | 5 | Stream Creek CL | 0 |
| 7051 | Confluence of River and Creek | Drainage | Point | Conf_River_Creek | 5 | 0 | 0 |
| 7052 | Confluence of River and River | Drainage | Point | Conf_River_River | 5 | 0 | 0 |
| 7053 | Confluence of River and Drain | Drainage | Point | Conf_River_Drain | 5 | 0 | 0 |
| 7054 | Confluence of Drain and Drain | Drainage | Point | Conf_Drain_Drain | 5 | 0 | 0 |
| 7055 | Confluence of Creek and Creek | Drainage | Point | Conf_Creek_Creek | 5 | 0 | 0 |
| 7056 | Confluence of Drain and Creek | Drainage | Point | Conf_Drain_Creek | 5 | 0 | 0 |
| 7057 | Confluence of Drain and Lake | Drainage | Point | Conf_Drain_Lake | 5 | 0 | 0 |
| 7058 | Confluence of Creek and Lake | Drainage | Point | Conf_Creek_Lake | 5 | 0 | 0 |
| 7059 | Edge of Pond | Drainage | Line Style | Pond | 5 | Water Edge | 0 |
| 7060 | Edge of Dugout | Drainage | Line Style | Dugout | 5 | Water Edge | 0 |
| 7061 | Edge of Slough | Drainage | Line Style | Slough | 5 | Water Edge | 0 |
| 7062 | Gradient Control Structure ie Con. Rock, stop log | Drainage | Pt-Line | Grad_Ctrl_Struc | 88 | 0 | 0 |
| 7063 | Fail Safe (ie. of dam or GCS) | Drainage | Point | Fail_Safe | 88 | 0 | 0 |
| 7064 | Top of Concrete (ie. of dam) | Drainage | Point | Top_Conc_Dam | 88 | 0 | 0 |
| 7065 | Top of Rock (ie. of drain) | Drainage | Point | Top_Rock_Drain | 88 | 0 | 0 |

| Numeric | Feature | Grouping | Symbol | V8 Level | CO | LC | WT |
|---|---|---|---|---|---|---|---|
| 7066 | Screw Type Flood Gate | Drainage | Cell | Screw_Flood_Gate | 88 | 0 | 0 |
| 7067 | Bottom of Slope | Drainage | Pt-Line | Bottom_Slope | 88 | 0 | 0 |
| 7068 | Top of Slope | Drainage | Pt-Line | Top_Slope | 88 | 0 | 0 |
| 7069 | Centerline of Main Channel | Drainage | Line Style | CL_Channel | 88 | Stream Creek CL | 0 |
| 7070 | Road Drain | Drainage | point | Road_Drain | 88 | 0 | 0 |
| 7071 | Field Run-offs | Drainage | Pt-Line | Field_Run-offs | 5 | 0 | 0 |
| 7072 | Waste Disposal Shoot (for Lagoon) | Drainage | Point | Waste_Disp_Lagoon | 88 | 0 | 0 |
| 7073 | High Water taken on Off-Take Ditches | Drainage | Point | High_Water_Offtake | 88 | 0 | 0 |
| 7201 | Environment Canada Cabinet | Drainage | Cell | EC_Cabinet | 7 | 0 | 0 |
| 7202 | Environment Canada Cableways | Drainage | Cell | EC_Cableways | 7 | 0 | 0 |
| 7203 | Environment Canada Dog House | Drainage | Cell | EC_Dog_House | 7 | 0 | 0 |
| 7204 | Environment Canada Down Looker | Drainage | Cell | EC_Down_Looker | 7 | 0 | 0 |
| 7205 | Environment Canada Walk In Shelter | Drainage | Cell | EC_Walk_In_Shelter | 7 | 0 | 0 |
| 7206 | Environment Canada Well Shelter | Drainage | Cell | EC_Well_Shelter | 7 | 0 | 0 |
| 8001 | Soil Bore Hole Location | Geology | Cell | Soil_BHole_Loc | 11 | 0 | 0 |
| 8002 | Rock | Geology | Cell | Rock | 11 | 0 | 0 |
| 8003 | Rock Outcrop | Geology | Line Style | Rock_Outcrop | 11 | Rock | 0 |
| 8004 | Gravel Pit | Geology | Pt-Line | Gravel_Pit | 11 | 0 | 0 |
| 8005 | Quarry | Geology | Pt-Line | Quarry_Pit | 11 | 0 | 0 |
| 8006 | Borrow Pit | Geology | Pt-Line | Borrow_Pit | 11 | 0 | 0 |
| 8007 | Stockpile | Geology | Pt-Line | Stockpile | 11 | 0 | 0 |
| 9001 | Roadway Centerline | Roadway Features | Pt-Line | Ex_CL | 0 | 4 | 0 |
| 9002 | Concrete Road | Roadway Features | Pt-Line | Concrete_Rd | 7 | 0 | 0 |
| 9003 | Bituminous Road | Roadway Features | Pt-Line | Bit_Road | 7 | 0 | 0 |
| 9004 | AST Road | Roadway Features | Pt-Line | AST_Road | 7 | 0 | 0 |
| 9005 | Gravel Road | Roadway Features | Pt-Line | Gravel_Rd | 7 | 5 | 0 |
| 9006 | Concrete Shoulder | Roadway Features | Pt-Line | Concrete_Shd | 7 | 0 | 0 |
| 9007 | Bituminous Shoulder | Roadway Features | Pt-Line | Bit_Shoulder | 7 | 0 | 0 |
| 9008 | Gravel Shoulder | Roadway Features | Pt-Line | Gravel_Shd | 7 | 5 | 0 |
| 9009 | Culvert Crossing | Roadway Features | point | Culvert_Xing | 7 | 0 | 0 |
| 9010 | Block Crossing | Roadway Features | Pt-Line | Block_Xing | 7 | 0 | 0 |
| 9011 | Ditch Crossing | Roadway Features | Pt-Line | Ditch_Xing | 7 | 0 | 0 |
| 9012 | Concrete Driveway | Roadway Features | Pt-Line | Conc_Driveway | 7 | 0 | 0 |
| 9013 | Bituminous Driveway | Roadway Features | Pt-Line | Bit_Driveway | 7 | 0 | 0 |

| Numeric | Feature | Grouping | Symbol | V8 Level | CO | LC | WT |
|---|---|---|---|---|---|---|---|
| 9014 | Gravel Driveway | Roadway Features | Pt-Line | Gravel_Drwy | 7 | 5 | 0 |
| 9015 | Concrete Parking Lot | Roadway Features | Pt-Line | Conc_Park_Lot | 7 | 0 | 0 |
| 9016 | Asphalt Parking Lot | Roadway Features | Pt-Line | Asph_Park_Lot | 7 | 0 | 0 |
| 9017 | Gravel Parking Lot | Roadway Features | Pt-Line | Gravel_Park_Lot | 7 | 5 | 0 |
| 9018 | Concrete Curb | Roadway Features | Pt-Line | Conc_Curb | 7 | 0 | 0 |
| 9019 | Asphalt Curb | Roadway Features | Pt-Line | Asph_Curb | 7 | 0 | 0 |
| 9020 | Concrete Gutter | Roadway Features | Pt-Line | Conc_Gutter | 7 | 0 | 0 |
| 9021 | Asphalt Gutter | Roadway Features | Pt-Line | Asph_Gutter | 7 | 0 | 0 |
| 9022 | Sidewalk | Roadway Features | Pt-Line | Sidewalk | 7 | 0 | 0 |
| 9023 | F Shaped Concrete Barrier | Roadway Features | Line Style | F_Shp_Con_Barrier | 7 | F Shape Concrete Barrier | 0 |
| 9024 | Guardrail Cable | Roadway Features | Line Style | Gdrail_Cable | 7 | Guardrail Cable | 0 |
| 9025 | Guardrail W Beam Traffic Side | Roadway Features | Line Style | Gdrail_W_Beam_Traf_Side | 7 | Guardrail W Beam | 0 |

## DISTRIBUTION LIABILITY STATEMENT

Below is an example of a Distribution Liability Statement. The Distribution Liability Statement should be included with any electronic data that is being supplied to outside agencies, i.e. consultants, private contractors or utility suppliers.

Manitoba
Infrastructure and Transportation

For data delivered on-line or by physical media, by The Province of Manitoba, Manitoba Infrastructure and Transportation (MIT) _____ insert date of data delivered.

**Limitations:** Although extensive effort has been made to produce error free and complete data, all geographic information has limitations due to the scale, resolution, date and interpretation of the original source materials. You should consult available data documentation (metadata) for these particular data to determine their limitations and the precision to which they depict distance, direction, location or other geographic characteristics. These data may be subject to periodic change without prior notification.

**No Warranty:** This data is provided as is, without any warranty whatsoever, including but not limited to any warranty as to their performance, merchantability, or fitness for any particular purpose.

**Liability:** The user assumes the entire risk as to the results of the use of this data. MANITOBA INFRASTRUCTURE and TRANSPORTATION is not responsible for any interpretation or conclusions based on these data made by those who acquire or use it. MANITOBA INFRASTRUCTURE and TRANSPORTATION shall not be liable for any direct, indirect, special, incidental, compensatory or consequential damages or third party claims resulting from the use of this data, even if MANITOBA INFRASTRUCTURE and TRANSPORTATION has been advised of the possibility of such potential loss or damage.

Raster image(s) and Data from MANITOBA INFRASTRUCTURE and TRANSPORTATION are to be used for the current MANITOBA INFRASTRUCTURE and TRANSPORTATION project. Raster image(s) and Data must be removed from your system upon completion of the MANITOBA INFRASTRUCTURE and TRANSPORTATION project. Raster image(s) and Data from MANITOBA INFRASTRUCTURE and TRANSPORTATION cannot be distributed to others.

***A copy of the* DISTRIBUTION LIABILITY STATEMENT *can be found on J: and T: drives.***

## DIGITAL AIR PHOTO & RASTER IMAGE DATABASE

MIT now has access to a large database of new high resolution orthophotos for Central and Southern Manitoba. These images will be available to users of GeoMedia and MicroStation. They can also be viewed with other applications. Images are available in 0.1m, 0.5m and 1m resolutions in tif, sid and ecw format.
***Please note:*** *Regional offices were provided local copies of air photos / raster images in the past. Please contact your regional contact for locations of these local copies.*

### LISTING OF MIT`S DIGITAL AIR PHOTO / RASTER IMAGE DATABASE

- **1990's Era Original MR.SID images**
  - Located here: \\wpg969ap10\Imagery\Ortho_Images
  - Coverage: Southern Manitoba
  - Format: MRSID
  - Dates: varies (from the 90's)
  - Local Regional copies likely exist
  - Resolution: 2m, Black and White

- **Image Refresh Program**
  - Located here: \\wpg969ap10\Imagery\Ortho_Images_V2\MrSID
  - Coverage: Southern Manitoba
  - Format: MRSID
  - Dates: 2007-2014
  - Local Regional copies likely exist for some of this dataset
  - Resolution 50cm & 1m, Colour

- **Centreport images**
  - Located here: \\wpg969ap10\Imagery\Atlis_CentrePort\Rectified & \\wpg969ap10\Imagery\Atlis_CentrePort\Nov 4\p001 & \\wpg969ap10\Imagery\Atlis_CentrePort\Nov 4\p002
  - Coverage: Winnipeg (Centreport project area) and Headingley
  - Format: TIFF
  - Dates: June 2014
  - Resolution 50cm, Colour

- **City of Winnipeg images (courtesy of City of Winnipeg)**
  - Located here: \\wpg969ap10\Imagery\Wpg_10cm
  - Coverage: Winnipeg
  - Format: ECW
  - Dates: 2012 and 2014
  - Resolution 10cm, Colour

**IMAGE FOOTPRINT MAPS:**

Image footprint maps are provided in PDF and in Google Earth for easy image file name reference for the Image Refresh Program dataset. These maps are useful when loading images based on the file name. Please see the path below for access to the image footprint maps.

Path to image footprints and Google Earth files (T drive): \\ME\hwy\hwycom\imagery
When loading the footprint maps into Google Earth, you simply click on the image footprint to display the filename for the image. You can search for a specific image by clicking on the Edit menu and choosing Find. You can then search by image filename.

There is another map that can be loaded into Google Earth that identifies when the imagery was flown (Image Refresh Date.kml). When you load this into Google Earth, you simply click on the image footprint you are interested in and the date the image was flown will be displayed.

If you do not have Google Earth, you can submit an eSOR to have it installed on your computer.

*For the most up to date data on MIT's air photo / raster image database, please contact the Lead GIS Technician with Highway Planning and Design Branch.*

## REFERENCES

The following documents were consulted for content and composition of this manual. They can be found on file in the MIT offices or electronically on T: drive.

- Manitoba Highways, Highway Design Manual, 1980.
- Manitoba Highways, Project Supervisor Construction Guide, 1983.
- TAC, Geometric Design Guide for Canadian Roads, 1999.
- Manitoba Highways, Transportation Planning Manual, 1998.
- Manitoba Highways, Design Guide, Warrants & Standards for Intersection Treatments of Rural two-Lane Highways, 2001.
- Manitoba Transportation & Government Services, GEOPAK Road Guide.
- Manitoba Transportation & Government Services, GEOPAK Plans Production Guide.
- Manitoba Infrastructure & Transportation, Survey Operations Handbook, 2010.
- The Highway Traffic Board, New Advertising Sign Policy Booklet and Standard Permit Information Package.

Other CADD Background Informational Memos;

- Profile Standards, September 4, 1994.
- Legal Descriptions for Plans and Profiles, February 5, 1995.
- Total Station P-Codes and CADD Levels, September 14, 1995.
- Guidelines for the Preparation of Location Plans, January 5, 1998.
- Guidelines for the use of the Detailed Design Drawing, March 24, 1999.
- Detailed Design Drawing Standard, March 28, 2000.

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