METROLINX

Topographic Features, Symbology and Conversion to InRoads Standards

Specification 02 21 11

Date: June 2019

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Amendment Record Sheet

Amendment	Amendment Page No.	Date of Amendment	Description of Changes

Preface

This Topographic Features, Symbology and Conversion to InRoads Standards document is a new standard to act in conjunction with the CADD BIM Drawing Standards.

The purpose of the standard is to provide guidance for consistently developing topographic surveys and to improve efficiencies. This document shall be followed for all design, construction, and commissioning survey drawings as well as BIM deliverables prepared for projects being implemented by Metrolinx. This standard will apply to all project surveyors, engineers, designers, consultants, and contractors supplying drawings to Metrolinx.

This document can be found on the internal and external Metrolinx websites.

For improvements to this document, contact the Director of Engineering Standards.

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APPENDICES

Supporting Digital Files

1. CADD drawing related files (see MX_TOPO-STD-CADD_2019.ZIP)

File Name	Description
a. MX_TOPO_TEMPLATE_REV0.DWG	AutoCAD R13 template
b. MX_TOPO_LTYPE _ACAD_REV0.SHX	AutoCAD R13 linestyle file in .shx format
c. MX_TOPO_LEGENDS_REV0.DWG	AutoCAD R13 containing topographic legend
d. MX_TOPO_SEED2D_REV0.DGN	Microstation V8i 2D seed file
e. MX_TOPO_SEED3D_REV0.DGN	Microstation V8i 3D seed file
f. MX_TOPO_LEGENDS_REV0.DGN	Microstation V8i containing topographic legend
g. MX_TOPO_LEGENDS_REV0-A1.PDF	Legend in .PDF format (A1 Size)
h. MX_TOPO_TEMPLATE_Rev0.lin	AutoCAD R13 linestyle file in .lin format

2. CADD to InRoads Conversion related files (See MX-CADD-to-INROADS.ZIP)

File Name	Description
a. MX_CADD_to_InRoads.mvba	Bentley Macro – conversion of CADD to InRoads
b. MX_TOPO_to_InRoads_Key_Codes.csv	Bentley Key codes for conversion to InRoads
c. MX_TOPO_to_InRoads_TIW _File_Format.tiw	InRoads Survey Import Wizard Format)
d. MX_TOPO_to_InRoads_Surface.xin	InRoads Feature Table Report

1.0 Introduction

Metrolinx (MX) has developed topographic feature codes and CADD layers based on a combination of current MTO standards, existing Metrolinx topographic surveys and new Metrolinx required features. The MTO source information is the primary source.

The MTO source information includes the following:

- MTO AutoCAD Standards Guide Version 2004
- MTO Engineering Survey Manual January 2016

The Topographic Feature Codes are illustrated in Table 2.1. The table specifies the source of each feature, including MTO features as modified by Metrolinx. The specific location survey pickup point has been identified on the attached Feature Sketches where applicable. Occasionally an object/feature is encountered which has not been identified in the standard feature code list. If the object cannot be accommodated by the standard list, the surveyor has the facility to use a 'user-defined' feature code. When a user defined code is used, a description and sketch of the object must be included in the Job Report. Also, the feature's use, type, horizontal and vertical accuracy, attributes, and AutoCAD® layer shall be reported.

The Topographic Drawing Symbology is illustrated in Table 2.2. The table illustrates the Layer/Level, Colour (ByLayer), Linetype (ByLayer), Thickness (ByLayer) and Description and includes both field and office generated information.

In the event that the Digital Terrain Model (DTM) is required in Bentley® InRoads® software, a conversion routine, conversion tables and instructions have been provided in Section 3 of this document.

2.0 Topographic Feature Codes and Drawing Symbology

2.1 Topographic Feature Codes

2.1.1 Source

MTO Taken from MTO Engineering Survey Manual Jan 2016
MTO* Modified from MTO Engineering Survey Manual Jan 2016
MX Created as per Metrolinx requirements

2.1.2 Code - Code for topographic features

2.1.3 Layer/Level Name:

The following CADD Layer/Level Names for existing topographic features are based on the MTO AutoCAD Standards Guide 2004 - Section 2.0 CADD Layer Naming. The feature group "RWY" has been added to the Metrolinx list.

AA-B-CCCC-CC-D Maximum of 31 characters for entire layer name, including dashes.

AA

SP - Surveys & Plans
MX - Metrolinx MTM (or UTM) Grid map projection

B

E - Existing
(MX) G- Mapping Grid
G- General
L- Legal Survey
Q- Quality Control/Assurance

CCC-CC - The feature portion of the layer name is defined by 2 components
- the 1st portion identifies a feature group
- the 2nd portion identifies the feature code

The following 'feature-group' abbreviations are used

ALI - Alignments BAR - Barriers BDY - Property Boundaries CTR - Contours DRN - Drainage GND - Ground MON - Survey Monuments & Control MSC - Miscellaneous	PTS - Survey/mapping points RDS - Roadways ROW - Right of Way RWY - Railway (New) SCANNED - Raster TIN-Triangulated Irregular Network forming DTM UTL - Utilities VEG - Vegetation

D - Annotation (The annotation portion is generally applied at the 'feature-group' level.)

D - Dimensions
P - Patterns (Hatching)
T - Text (Annotation)

For example
SP-E-VEG-TR (Tree Layer)
SP-E-VEG-TR-T (Tree Layer Text)

2.1.4 Use:

B - use for DTM modelling and Plans
M - use for DTM modelling only
P - use for Plan only
I - 3D information only

2.1.5 Type:

L - linear feature
P - point feature
I - 3D Information only

Note: DTM features may contain only 3D points (Nodes), 3Dlines, 3D polylines and pertinent blocks/cells. For pertinent blocks/cells, see Table 2.2, Note 1 – Topographic Drawing Symbology. Text, Arcs, Splines and non-pertinent blocks/cells are non-compliant DTM features and may not be used in the DTM.

2.1.6 Accuracy Requirements:

(Horizontal "Hacc" and Vertical "Vacc")
95% confidence level (2 Sigma)

- A=0.02m
- B=0.05m
- C=0.10m
- D=0.50m
- SP='Special Order': (see Metrolinx Control Surveys Supplement)

2.1.7 Attributes

Description of feature where applicable as text

- Size
- Type
- Date
- Identifier
- Diameter
- Height
- Width

2.1.8 Feature Description

Feature Description of each field code is included in the Feature Table together with the Use, Type, Horizontal and Vertical Accuracy as defined in sections 2.1.4 thru 2.1.6 as noted above. (ie. <feature description>_BLAA)

Table 2.1 – Topographic Feature Codes

Source	Code	Layer	Use	Type	Hacc	Vacc	Attributes	Feature Description
Note: Highlighted 'Use' indicates a DTM feature								
BARRIER FEATURES								
MTO	BB	SP-E-BAR-BB	B	L	A	A	type	Barrier Concrete (Bottom)_BLAA
MTO	BT	SP-E-BAR-BT	I	P	A	A		Barrier Concrete (Top)_IPAA
MTO*	FB	SP-E-BAR-FB	P	L	C	_	type, diameter,#, height	Fitch Barrier_PLC_
MTO	FL	SP-E-BAR-FL	B	L	C	C	type	Fence Line (Ground)_BLCC
MTO	FN	SP-E-BAR-FN	P	L	C	C	type	Fence Not for Ground Model_PLCC
MTO	GAT	SP-E-BAR-GAT	P	L	C	C	type	Gate_PLCC
MTO	GP	SP-E-BAR-GP-Z	I	P	A	A	type	Guide Rail (Top of Post)_IPAA
MTO	GU	SP-E-BAR-GU	B	L	A	A	type	Guide Rail (Ground)_BLAA
MTO	GW	SP-E-BAR-GW-Z	I	P	A	A	type	Guide Rail (Top of Wire)_IPAA
MTO	NB	SP-E-BAR-NB	B	L	A	A	type, height	Noise Barrier (Ground)_BLAA
Mx	SFB	SP-E-BAR-SFB	B	L	C	C		Stone Fence Bottom_BLCC
Mx	SFS	SP-E-BAR-SFS	M	L	C	C		Stone Fence String_MLCC
Mx	SWL	SP-E-BAR-SWL	B	L	A	A	type	Seawall (Top)_BLAA
DRAINAGE FEATURES								
MTO	BD	SP-E-DRN-BD	B	L	C	C		Bottom Of Ditch_BLCC
MTO*	CB	SP-E-DRN-CB	B	P	A	A	size (if non-standard) & type	Catch Basin_BPAA
Mx	CBS	SP-E-DRN-CBS	B	P	A	A	length	Catch Basin: Side Inlet_BPAA
MTO*	CVP	SP-E-DRN-CVP	P	P	A	A	size (or dimensions) & type	Culvert (One End)_PPAA
MTO	CVT	SP-E-DRN-CVT	P	L	A	A	size & type	Culvert Centreline (Top)_PLAA
MTO	CVZ	SP-E-DRN-CV-Z	I	P	A	A		Culvert Elevation_IPAA
MTO	DB	SP-E-DRN-DB-Z	I	P	A	A		Ditch Inlet (Bottom Elevation) _IPAA
MTO*	DC	SP-E-DRN-DC	B	L	C	C		Ditch Centerline_BLCC
MTO*	DI	SP-E-DRN-DI	P	P	A	A	size	Ditch Inlet_PPAA
MTO	DT	SP-E-DRN-DT-Z	I	P	A	A		Ditch Inlet (Top Elevation) _IPAA
MTO	EW	SP-E-DRN-EW	B	L	C	C	date & type	Edge of Water_BLCC
Mx	EWL	SP-E-DRN-EWL	B	L	C	C	type	Edge of Wetland_BLCC
MTO	FR	SP-E-DRN-FR-Z	I	P	A	A		Frustrum Elevation_IPAA
Mx	HDW	SP-E-DRN-HDW	B	L	B	B		Headwall_BLBB
MTO	RR	SP-E-DRN-RR	B	L	C	C		Rip-Rap_BLCC
MTO	SAN	SP-E-DRN-SAN	P	L	B	B	size & type	Sanitary Sewer Pipes_PLBB
MTO	SEW	SP-E-DRN-SEW	P	L	B	B	size & type	Storm Sewer Pipes_PLBB
Mx	SEWC	SP-E-DRN-SEWC	P	L	B	B	size & type	Sewer Pipes Combined_PLBB
MTO	SU	SP-E-DRN-SU-Z	I	P	B	B		Sump Elevation_IPBB
MTO*	WM	SP-E-DRN-WM	P	L	C	C		Water Mark_PLCC

Source	Code	Layer	Use	Type	Hacc	Vacc	Attributes	Feature Description
GROUND FEATURES								
MTO	AO	SP-E-GND-AO	B	L	A	A	description	Asphalt Outline_BLAA
MTO	AS	SP-E-GND-AS	M	L	A	A		Asphalt String_MLAA
MTO*	BA	SP-E-GND-BA	M	L	C	C		Bank of River or Stream_MLCC
MTO	BC	SP-E-GND-BC	B	L	C	C		Bottom of Rock Cut_BLCC
MTO	CO	SP-E-GND-CO	B	L	A	A	description	Concrete Outline _BLAA
MTO	CS	SP-E-GND-CS	M	L	A	A		Concrete String _MLAA
MTO	DS	SP-E-GND-DS	I	P	A	A		Door Sill _IPAA
MTO	EC	SP-E-GND-EC	M	L	A	A	description	Entrance Centerline_MLAA
Mx	EDS	SP-E-GND-EDS	B	L	C	C		Edge of Sand_BLCC
MTO*	GO	SP-E-GND-GO	B	L	B	B	description	Gravel Outline_BLBB
MTO	GS	SP-E-GND-GS	M	L	B	B		Gravel String_MLBB
MTO	OG	SP-E-GND-OG	M	L	C	C		Original Ground Line_MLCC
MTO	RKO	SP-E-GND-RKO	B	L	B	B		Rock Outline_BLBB
MTO	RKS	SP-E-GND-RKS	M	L	B	B		Rock String_MLBB
MTO*	SB	SP-E-GND-SB	M	L	C	C		River or Stream Bed_MLCC
MTO	SP	SP-E-GND-SP	B	L	C	C	description	Stock Piles - Gravel Pits_BLCC
Mx	SS	SP-E-GND-SS	M	L	C	C		Sand String_MLCC
MTO	TC	SP-E-GND-TC	B	L	C	C		Top of Rock Cut_BLCC
MTO	TS	SP-E-GND-TS	M	L	C	C		Toe of Slope_MLCC
MISCELLANEOUS FEATURES								
MTO	AU	SP-Q-MSC-AU	I	L	A	A		Audit Line_ILAA
MTO*	BLO	SP-E-MSC-BLO	P	L	*	_	description	Building Outline (Bottom)_PL*_
MTO	BN	SP-E-MSC-BN	M	P	A	A		Centre of Bull Nose_MPAA
MTO*	BO	SP-E-MSC-BO	P	P	A	A	identifier	Borehole_PPAA
Mx	BOL	SP-E-MSC-BOL	P	P	C	C		Bollard_PPCC
MTO	BRP	SP-E-MSC-BRP	P	P	C	C		Bridge Pillar _PPCC
Mx	BUS	SP-E-MSC-BUS	P	L	C	C		Bus Shelter_PLCC
MTO	CE	SP-E-MSC-CE	P	L	C	C		Cemetery _PLCC
Mx	CUP	SP-E-MSC-CUP	P	L	C	C		Curb - Parking_PLCC
MTO	DD	SP-E-MSC-DD	P	P	A	A		Deck Drain_PPAA
MTO	DK	SP-E-MSC-DK	P	L	C	C		Wooden Decks or Docks_PLCC
MTO	EJ	SP-E-MSC-EJ	B	L	A	A		Expansion Joint_BLAA
MTO*	EV	SP-E-MSC-EV-Z	I	P	A	A		Miscellaneous Elevation_IPAA
MTO*	EVD	SP-E-MSC-EVD-Z	B	P	A	A		Miscellaneous Elevation in DTM_BPAA
Mx	FPP	SP-E-MSC-FPP	P	P	B	B		Fuel Pump_PPBB
MTO	GAB	SP-E-MSC-GAB	B	L	C	C		Gabion Baskets_BLCC
MTO	HR	SP-E-MSC-HR	P	L	A	A		Bridge Hand Rails_PLAA
Mx	LMSC	SP-E-MSC-LMSC	M	L	A	A		Line_Misc in DTM_MLAA
Mx	MB	SP-E-MSC-MB	P	P	C	C		Mailbox_PPCC
MTO	OS	SP-E-MSC-OS	P	L	C	_		Overhead Sign_PLC_
Mx	PM	SP-E-MSC-PM	P	P	C	C		Parking Meter_PPCC
MTO	RW	SP-E-MSC-RW	B	L	A	A	type	Retaining Wall _BLAA
Mx	SHD	SP-E-MSC-SHD	P	L	*	_	description	Shed Outline (Bottom)_PL*_
MTO	SIGN	SP-E-MSC-SIGN	P	L	C	_		Commercial Sign_PLC_
MTO	SW	SP-E-MSC-SW	B	L	A	A	type	Sidewalk_BLAA
Mx	SWG	SP-E-MSC-SWG	B	L	A	A		Sidewalk Grate_BLAA
MTO	WW	SP-E-MSC-WW	B	L	C	C	type	Walkways - Trails - Paths_BLCC

Source	Code	Layer	Use	Type	Hacc	Vacc	Attributes	Feature Description
RAILWAY FEATURES								
MTO*	GFL	SP-E-RWY-GFL	P	P	C	C		Gate with Flashing Light_PPCC
MTO*	RBE	SP-E-RWY-RBE	B	L	C	C		Railway Ballast Edge_BLCC
Mx	RBS	SP-E-RWY-RBS	P	L	B	_		Railway Buffer Stop_PLB_
MTO*	RBT	SP-E-RWY-RBT	M	L	C	C		Railway Ballast Top_MLCC
Mx	RCL	SP-E-RWY-RCL	M	L	B	B		Railway Centreline_MLBB
MTO*	RCS	SP-E-RWY-RCS	P	P	C	C		Railway Crossing Sign_PPCC
Mx	RGR	SP-E-RWY-RGR	P	L	A	A		Railway Guard Rail_PLAA
MTO*	RLS	SP-E-RWY-RLS	P	P	C	C	sign(type) or signal	Railway Sign or signal_PPCC
MTO*	RLT	SP-E-RWY-RLT	P	L	A	A		Railway - Top of Rail_PLAA
Mx	RPF	SP-E-RWY-RPF	P	P	A	A		Point of Frog_PPAA
Mx	RSB	SP-E-RWY-RSB	P	L	A	A	pick up 3 points if curved: heel, middle & toe	Railway Switch Blade_PLAA
Mx	RSR	SP-E-RWY-RSR	P	L	B	B	Head or Back	Railway Switch Rod_PLBB
Mx	RSS	SP-E-RWY-RSS	P	P	C	C		Railway Switch Stand_PPCC
Mx	RST	SP-E-RWY-RST	P	P	B	B		Railway Stanchion_PPBB
Mx	RSX	SP-E-RWY-RSX	B	L	B	B		Railway Signal Box_BLBB
Mx	RWR	SP-E-RWY-RWR	P	L	A	A		Railway Wing Rail_PLAA
Mx	RWS	SP-E-RWY-RWS	P	P	C	C		Railway Wheel Stop_PPCC
ROADWAY FEATURES								
MTO	AE	SP-E-RDS-AE	B	L	A	A		Asphalt Edges_BLAA
MTO	BRD	SP-E-RDS-BRD	B	L	A	A		Bridge Deck_BLAA
MTO	CR	SP-E-RDS-CR	M	L	A	A		Crown of Road_MLAA
Mx	CUB	SP-E-RDS-CUB	B	L	A	A		Curb - back_BLAA
Mx	CUF	SP-E-RDS-CUF	B	L	A	A		Curb - front_BLAA
MTO	DL	SP-E-RDS-DL	M	L	A	A		Driving Lane - Edge_MLAA
MTO*	EG	SP-E-RDS-EG	B	L	A	A		Edge Of Gutter_BLAA
MTO	EP	SP-E-RDS-EP	B	L	A	A		Edge Of Pavement_BLAA
MTO	ES	SP-E-RDS-ES	B	L	B	B		Edge Of Shoulder_BLBB
MTO	NG	SP-E-RDS-NG	B	L	B	B		Entrance - Gravel_BLBB
MTO	NP	SP-E-RDS-NP	B	L	A	A		Entrance - Paved_BLAA
Mx	PS	SP-E-RDS-PS	B	L	A	A	type: arrow, crosswalk, parking, others	Painted Striping_BLAA
Mx	RDS	SP-E-RDS-RDS	P	P	C	C	type (STOP, curve etc)	Road Sign_PPCC
MTO	RS	SP-E-RDS-RS	B	L	B	B	material	Ripple Strip_BLBB
MTO	SR	SP-E-RDS-SR	B	L	A	A		Sideroads Paved_BLAA
MTO	UR	SP-E-RDS-UR	B	L	B	B		Gravel Sideroads_BLBB

Source	Code	Layer	Use	Type	Hacc	Vacc	Attributes	Feature Description
SURVEY MONUMENT FEATURES								
MTO	CC	SP-E-MON	P	P	A	A		Cut Cross_PPAA
MTO	CM	SP-E-MON	P	P	A	A		Concrete Monument_PPAA
MTO	CP	SP-E-MON	P	P	A	A		Concrete Pin_PPAA
MTO	HCM	SP-E-MON	P	P	SP	A	type, number	Primary Horizontal Control Point_PPSPA
MTO	HCP	SP-E-MON	P	P	SP	A	type, number	Horizontal Project Control Point_PPSPA
MTO	IB	SP-E-MON	P	P	A	A		Iron Bar_PPAA
MTO*	PK	SP-E-MON	P	P	A	A	type	Nail, Spike, Rock Rivet, etc_PPAA
MTO	RBR	SP-E-MON	P	P	A	A		Rock Bar_PPAA
MTO	RIB	SP-E-MON	P	P	A	A	size	Round Iron Bar_PPAA
MTO	RPL	SP-E-MON	P	P	A	A		Rock Plug_PPAA
MTO	RPO	SP-E-MON	P	P	A	A		Rock Post_PPAA
MTO	SIB	SP-E-MON	P	P	A	A		Standard Iron Bar_PPAA
MTO	SSIB	SP-E-MON	P	P	A	A		Short Standard Iron Bar_PPAA
MTO	VCM	SP-E-MON	P	P	_	SP	type, number	Primary Vertical Control Point_PP_SP
MTO	VCP	SP-E-MON	P	P	_	SP	type, number	Vertical Project Control Point_PP_SP
UTILITY FEATURES								
MTO	AN	SP-E-UTL-AN	P	P	C	C	type	Anchor_PPCC
Mx	AP	SP-E-UTL-AP	P	P	B	_		Anchor Pole_PPB_
Mx	BCG	SP-E-UTL-BCG-Z	I	P	B	B		Bell Crossing Ground Elev_IPBB
Mx	BCH	SP-E-UTL-BCH	P	L	B	_		Bell Chamber/Vault_PLB_
Mx	BCW	SP-E-UTL-BCW-Z	I	P	B	B		Bell Crossing Wire Elev_IPBB
MTO*	BH	SP-E-UTL-BH	P	P	B	_		Bell -w- Hydro Pole_PPB_
MTO*	BP	SP-E-UTL-BP	P	P	B	_		Bell Pole_PPB_
Mx	BTB	SP-E-UTL-BTB	P	P	B	_		Bell Terminal Box_PPB_
Mx	CT	SP-E-UTL-CT	P	L	B	_		Cell Tower_PLB_
MTO*	FH	SP-E-UTL-FH	P	P	B	_		Fire Hydrant_PPB_
Mx	FMP	SP-E-UTL-FMP	P	P	B	_		Fire Main Indicator Post_PPB_
Mx	GCH	SP-E-UTL-GCH	P	L	B	_		Gas Chamber/Vault_PLB_
Mx	GK	SP-E-UTL-GK	P	P	B	_		Gas Key_PPB_
Mx	GM	SP-E-UTL-GM	P	P	B	_		Gas Meter_PPB_
MTO	GV	SP-E-UTL-GV	P	P	B	_		Gas Valve_PPB_
MTO	HCG	SP-E-UTL-HCG-Z	I	P	B	B		Hydro Crossing Ground Elev_IPBB
Mx	HCH	SP-E-UTL-HCH	P	L	B	_		Hydro Chamber/Vault_PLB_
MTO	HCW	SP-E-UTL-HCW-Z	I	P	B	B		Hydro Crossing Wire Elev_IPBB
Mx	HM	SP-E-UTL-HM	P	P	B	_		Hydro Meter_PPB_
MTO*	HP	SP-E-UTL-HP	P	P	B	_		Hydro Pole_PPB_
MTO*	HT	SP-E-UTL-HT	P	L	B	_		Hydro Tower_PLB_
Mx	HTB	SP-E-UTL-HTB	P	P	B	_		Hydro Terminal Box_PPB_
Mx	HW	SP-E-UTL-HW	P	P	B	_		Handwell_PPB_
Mx	HYT	SP-E-UTL-HYT	P	L	B	_		Hydro Transformer_PLB_
MTO*	LS	SP-E-UTL-LS	P	P	B	_	description	Light Standard_PPB_
Mx	LSB	SP-E-UTL-LSB	P	P	B	_	description	Light Standard -w- Bell_PPB_
Mx	LSBH	SP-E-UTL-LSBH	P	P	B	_	description	Light Standard -w- Bell & Hydro_PPB_
Mx	LSH	SP-E-UTL-LSH	P	P	B	_	description	Light Standard -w- Hydro_PPB_

Source	Code	Layer	Use	Type	Hacc	Vacc	Attributes	Feature Description
Mx	LSTS	SP-E-UTL-LSTS	P	P	B	_	type	Light Standard -w - Traffic Signal_PPB_
Mx	MHB	SP-E-UTL-MHB	P	P	A	A		Maintenance Hole Bell_PPAA
Mx	MHH	SP-E-UTL-MHH	P	P	A	A		Maintenance Hole Hydro_PPAA
Mx	MHSA	SP-E-UTL-MHSA	P	P	A	A		Maintenance Hole Sanitary_PPAA
Mx	MHSC	SP-E-UTL-MHSC	P	P	A	A		Maintenance Hole Combined_PPAA
Mx	MHST	SP-E-UTL-MHST	P	P	A	A		Maintenance Hole Storm_PPAA
Mx	MHU	SP-E-UTL-MHU	P	P	A	A		Maintenance Hole Unknown_PPAA
Mx	MHW	SP-E-UTL-MHW	P	P	A	A		Maintenance Hole Water_PPAA
Mx	MW	SP-E-UTL-MW	P	P	A	_	diameter	Monitoring Well_PPA_
Mx	MWT	SP-E-UTL-MWT	P	L	B	_		Microwave Tower_PLB_
Mx	PB	SP-E-UTL-PB	P	L	B	_		Phone Booth_PLB_
MTO	PL	SP-E-UTL-PL	P	L	B	B	type, diameter	Pipeline_PLBB
MTO*	PO	SP-E-UTL-PO	P	P	B	_	type	Pole - other_PPB_
MTO*	PW	SP-E-UTL-PW	P	P	C	_	crib diameter	Pole Well_PPC_
Mx	SH	SP-E-UTL-SH	P	P	B	_		Sprinkler Head_PPB_
Mx	ST	SP-E-UTL-ST	P	L	B	_		Septic Tank (Outline)_PLB_
Mx	STA	SP-E-UTL-STA	P	P	B	_		Septic Tank Access_PPB_
Mx	STP	SP-E-UTL-STP	P	P	B	_		Standpipe_PPB_
Mx	SV	SP-E-UTL-SV	P	P	B	_		Sprinkler Valve_PPB_
MTO*	TB	SP-E-UTL-TB	P	P	B	_	type	Utility Terminal Box_PPB_
MTO*	TF	SP-E-UTL-TF	P	P	B	_		Traffic Signal Pole_PPB_
Mx	TSB	SP-E-UTL-TSB	P	P	B	_		Traffic Signal -w- Bell_PPB_
Mx	TSBH	SP-E-UTL-TSBH	P	P	B	_		Traffic Signal -w- Bell & Hydro_PPB_
Mx	TSC	SP-E-UTL-TSC	P	P	B	_		Traffic Signal Control_PPB_
Mx	TSH	SP-E-UTL-TSH	P	P	B	_		Traffic Signal -w- Hydro_PPB_
Mx	TVCG	SP-E-UTL-TVCG-Z	I	P	B	B		TV Cable Crossing Ground Elev_IPBB
Mx	TVCW	SP-E-UTL-TVCW-Z	I	P	B	B		TV Cable Crossing Wire Elev_IPBB
Mx	TVTB	SP-E-UTL-TVTB	P	P	B	_		TV Cable Terminal Box_PPB_
MTO	UB	SP-E-UTL-UB	P	L	C	_		Underground Bell_PLC_
Mx	UBM	SP-E-UTL-UBM	P	P	B	_		Underground Bell Marker_PPB_
MTO	UG	SP-E-UTL-UG	P	L	C	_		Underground Gas_PLC_
Mx	UGM	SP-E-UTL-UGM	P	P	B	_		Underground Gas Marker_PPB_
MTO	UH	SP-E-UTL-UH	P	L	C	_		Underground Hydro_PLC_
Mx	UHM	SP-E-UTL-UHM	P	P	B	_		Underground Hydro Marker_PPB_
MTO	UM	SP-E-UTL-UM	P	P	B	_	type	Underground Utility Marker_PPB_
Mx	USL	SP-E-UTL-USL	P	L	C	_		Underground Sprinkler Line_PLC_
MTO	UT	SP-E-UTL-UT	P	L	C	_	type	Underground Utility - other_PLC_
Mx	UTV	SP-E-UTL-UTV	P	L	C	_		Underground TV Cable_PLC_
MTO	UW	SP-E-UTL-UW	P	L	C	_		Underground_Watermain_PLC_
MTO*	VE	SP-E-UTL-VE	P	P	B	_		Vent_PPB_
Mx	WCH	SP-E-UTL-WCH	P	L	B	_		Water Chamber_PLB_
MTO*	WE	SP-E-UTL-WE	P	P	B	_	diameter	Well_PPB_
Mx	WK	SP-E-UTL-WK	P	P	B	_		Water Key_PPB_
MTO	WV	SP-E-UTL-WV	P	P	B	_		Water Valve_PPB_

Source	Code	Layer	Use	Type	Hacc	Vacc	Attributes	Feature Description
VEGETATION FEATURES								
Mx	FLB	SP-E-VEG-FLB	B	L	B	B		Flower Box_BLBB
MTO	HE	SP-E-VEG-HE	B	L	C	C	type, height, width	Hedge_BLCC
Mx	LC	SP-E-VEG-LC	B	L	C	C		Line of Cultivation_BLCC
Mx	SHB	SP-E-VEG-SHB	P	P	C	_	diam	Shrub_PPC_
MTO	TR	SP-E-VEG-TR	P	P	C	_	size & type	Trees_PPC_
Mx	VEGE	SP-E-VEG-VEGE	P	L	C	_		Vegetation Edge_PLC_
MTO	WD	SP-E-VEG-WD	P	L	D	_		Woods Detail_PLD_
MTO	WO	SP-E-VEG-WO	B	L	D	C		Woods Overhang (Ground)_BLDC
MTO	WT	SP-E-VEG-WT	I	L	D	_		Woods Trunkline_ILD_

2.2 Topographic Drawing Symbology

2.2.1 Template/Seed

a) The drawing symbology is detailed in Table 2.2 - Topographic Drawing Symbology. AutoCAD® Release 2013-2016 Drawing templates and Bentley® Microstation® V8i Seed files (2D and 3D) have been created. The Microstation Topo seed files are based on the MX_Seed2D and MX_Seed3D plus the associated layers, symbology and linetypes. The AutoCAD template includes the same layers, symbology and linestyles. Several of the specialized customized linetypes are contained in an external .shx file.

b) The symbols are placed on the corresponding layers in a one to one relationship with the exception of Survey Monuments. All Survey Monuments are placed on a common Layer. The Layer/Level structure within each of the symbols follows the graphics and text location as defined within the same section. Generally the text portion of the symbol is placed on the matching layer name of the group (ie. the symbol for SP-E-DRN-CB the graphics portion would be placed on the SP-E-DRN-CB layer) while the text portion would be placed on a generalized group based layer SP-E-DRN-T. The exception to this rule applies to Utilities. For improved functionality dealing with utility features, the text portion of the symbol is placed on the corresponding utility feature. For example when Block/Cell = BP, the symbol portion is placed on layer SP-E-UTL-BP and the text portion is placed on layer SP-E-UTL-BELL-T.

c) The symbols contained within the Template/Seed files have been created based on a plotting scale of 1:1000. If alternate scales are being used the symbols will require scaling.

2.2.2 Topo Drawing Legend

a) The Topo Legend file MX_TOPO_LEGENDS_REV0-A1.PDF illustrates the graphic elements (Layer, Colour, Linetypes and Feature Description) for each Layer/Level. The feature description contains the attributes Use, Type, Horizontal and Vertical Accuracy for all layers with associated Field Codes.

b) The Topo Legend has been produced for a plotting scale of 1:1000 and contains the following information.

1. All Topographic Layers - Plot (P), DTM Model (M), Both Plot and DTM Model (B) and 3D Information (I)
2. Plot Layers - Plot (P), Both Plot and DTM Model (B) and 3D Information (I)
3. DTM Model Layers - DTM Model (M), Both Plot and DTM Model (B)
4. Custom Linetypes

Table 2.2 – Topographic Drawing Symbology

Layer	Colour (AutoCAD Palette)	Linetype	Line Thickness (mm)	Feature Description
Data Collection Generated - Sorted by Layer				
SP-E-BAR-BB	200	CONTINUOUS	0.15	Barrier Concrete (Bottom)_BLAA
SP-E-BAR-BT	200	CONTINUOUS	0.15	Barrier Concrete (Top)_IPAA
SP-E-BAR-FB	90	CONTINUOUS	0.15	Fitch Barrier_PLC_
SP-E-BAR-FL	30	FENCE	0.15	Fence Line (Ground)_BLCC
SP-E-BAR-FN	90	FENCE	0.15	Fence Not for Ground Model_PLCC
SP-E-BAR-GAT	90	CONTINUOUS	0.15	Gate_PLCC
SP-E-BAR-GP-Z	140	CONTINUOUS	0.15	Guide Rail (Top of Post)_IPAA
SP-E-BAR-GU	140	GUIDERAIL	0.15	Guide Rail (Ground)_BLAA
SP-E-BAR-GW-Z	7	CONTINUOUS	0.15	Guide Rail (Top of Wire)_IPAA
SP-E-BAR-NB	210	CONTINUOUS	0.15	Noise Barrier (Ground)_BLAA
SP-E-BAR-SFB	40	HIDDEN2	0.15	Stone Fence Bottom_BLCC
SP-E-BAR-SFS	40	HIDDEN2	0.15	Stone Fence String_MLCC
SP-E-BAR-SWL	70	CONTINUOUS	0.15	Seawall (Top)_BLAA
SP-E-DRN-BD	150	DASHED2X	0.15	Bottom Of Ditch_BLCC
SP-E-DRN-CB	80	CONTINUOUS	0.15	Catch Basin_BPAA
SP-E-DRN-CBS	80	CONTINUOUS	0.15	Catch Basin: Side Inlet_BPAA
SP-E-DRN-CVP	220	CONTINUOUS	0.15	Culvert (One End)_PPAA
SP-E-DRN-CVT	150	CONTINUOUS	0.15	Culvert Centreline (Top)_PLAA
SP-E-DRN-CV-Z	150	CONTINUOUS	0.15	Culvert Elevation_IPAA
SP-E-DRN-DB-Z	50	CONTINUOUS	0.15	Ditch Inlet (Bottom Elevation) _IPAA
SP-E-DRN-DC	170	CONTINUOUS	0.15	Ditch Centerline_BLCC
SP-E-DRN-DI	170	CONTINUOUS	0.15	Ditch Inlet_PPAA
SP-E-DRN-DT-Z	7	CONTINUOUS	0.15	Ditch Inlet (Top Elevation) _IPAA
SP-E-DRN-EW	154	CONTINUOUS	0.15	Edge of Water_BLCC
SP-E-DRN-EWL	110	SHORTDASH	0.15	Edge of Wetland_BLCC
SP-E-DRN-FR-Z	140	CONTINUOUS	0.15	Frustrum Elevation_IPAA
SP-E-DRN-HDW	7	CONTINUOUS	0.15	Headwall_BLBB
SP-E-DRN-RR	70	HIDDEN2	0.15	Rip-Rap_BLCC
SP-E-DRN-SAN	31	UNDERGROUND_SANITARY_SEWER	0.15	Sanitary Sewer Pipes_PLBB
SP-E-DRN-SEW	80	UNDERGROUND_STORM_SEWER	0.15	Storm Sewer Pipes_PLBB
SP-E-DRN-SEWC	31	UNDERGROUND_COMBINED_SEWER	0.15	Sewer Pipes Combined_PLBB
SP-E-DRN-SU-Z	150	CONTINUOUS	0.15	Sump Elevation_IPBB
SP-E-DRN-WM	160	CONTINUOUS	0.15	Water Mark_PLCC
SP-E-GND-AO	50	CONTINUOUS	0.15	Asphalt Outline_BLAA
SP-E-GND-AS	40	CONTINUOUS	0.15	Asphalt String_MLAA
SP-E-GND-BA	140	CONTINUOUS	0.15	Bank of River or Stream_MLCC
SP-E-GND-BC	100	HIDDEN2	0.15	Bottom of Rock Cut_BLCC
SP-E-GND-CO	180	CONTINUOUS	0.15	Concrete Outline _BLAA
SP-E-GND-CS	150	CONTINUOUS	0.15	Concrete String _MLAA
SP-E-GND-DS	120	CONTINUOUS	0.15	Door Sill _IPAA
SP-E-GND-EC	20	LONGDASH	0.15	Entrance Centerline_MLAA
SP-E-GND-EDS	40	LONGDASH	0.15	Edge of Sand_BLCC
SP-E-GND-GO	40	HIDDEN2	0.15	Gravel Outline_BLBB
SP-E-GND-GS	40	CONTINUOUS	0.15	Gravel String_MLBB
SP-E-GND-OG	210	CONTINUOUS	0.15	Original Ground Line_MLCC
SP-E-GND-RKO	50	CONTINUOUS	0.15	Rock Outline_BLBB
SP-E-GND-RKS	50	CONTINUOUS	0.15	Rock String_MLBB

Layer	Colour (AutoCAD Palette)	Linetype	Line Thickness (mm)	Feature Description
SP-E-GND-SB	190	CONTINUOUS	0.15	River or Stream Bed_MLCC
SP-E-GND-SP	40	HIDDEN2	0.15	Stock Piles - Gravel Pits_BLCC
SP-E-GND-SS	40	CONTINUOUS	0.15	Sand String_MLCC
SP-E-GND-TC	100	CONTINUOUS	0.15	Top of Rock Cut_BLCC
SP-E-GND-TS	120	HIDDEN2	0.15	Toe of Slope_MLCC
SP-E-MON	20	CONTINUOUS	0.15	Cut Cross_PPAA
SP-E-MON	20	CONTINUOUS	0.15	Concrete Monument_PPAA
SP-E-MON	20	CONTINUOUS	0.15	Concrete Pin_PPAA
SP-E-MON	20	CONTINUOUS	0.15	Primary Horizontal Control Point_PPSPA
SP-E-MON	20	CONTINUOUS	0.15	Horizontal Project Control Point_PPSPA
SP-E-MON	20	CONTINUOUS	0.15	Iron Bar_PPAA
SP-E-MON	20	CONTINUOUS	0.15	Nail, Spike, Rock Rivet, etc_PPAA
SP-E-MON	20	CONTINUOUS	0.15	Rock Bar_PPAA
SP-E-MON	20	CONTINUOUS	0.15	Round Iron Bar_PPAA
SP-E-MON	20	CONTINUOUS	0.15	Rock Plug_PPAA
SP-E-MON	20	CONTINUOUS	0.15	Rock Post_PPAA
SP-E-MON	20	CONTINUOUS	0.15	Standard Iron Bar_PPAA
SP-E-MON	20	CONTINUOUS	0.15	Short Standard Iron Bar_PPAA
SP-E-MON	1	CONTINUOUS	0.15	Primary Vertical Control Point_PP_SP
SP-E-MON	1	CONTINUOUS	0.15	Vertical Project Control Point_PP_SP
SP-E-MSC-BLO	230	CONTINUOUS	0.15	Building Outline (Bottom)_PL*_
SP-E-MSC-BN	20	CONTINUOUS	0.15	Centre of Bull Nose_MPAA
SP-E-MSC-BO	4	CONTINUOUS	0.15	Borehole_PPAA
SP-E-MSC-BOL	7	CONTINUOUS	0.15	Bollard_PPCC
SP-E-MSC-BRP	180	CONTINUOUS	0.15	Bridge Pillar _PPCC
SP-E-MSC-BUS	1	CONTINUOUS	0.15	Bus Shelter_PLCC
SP-E-MSC-CE	180	CONTINUOUS	0.15	Cemetery _PLCC
SP-E-MSC-CUP	2	CONTINUOUS	0.15	Curb - Parking_PLCC
SP-E-MSC-DD	230	CONTINUOUS	0.15	Deck Drain_PPAA
SP-E-MSC-DK	40	CONTINUOUS	0.15	Wooden Decks or Docks_PLCC
SP-E-MSC-EJ	210	CONTINUOUS	0.15	Expansion Joint_BLAA
SP-E-MSC-EVD-Z	7	CONTINUOUS	0.15	Miscellaneous Elevation in DTM_BPAA
SP-E-MSC-EV-Z	80	CONTINUOUS	0.15	Miscellaneous Elevation_IPAA
SP-E-MSC-FPP	1	CONTINUOUS	0.15	Fuel Pump_PPBB
SP-E-MSC-GAB	70	CONTINUOUS	0.15	Gabion Baskets_BLCC
SP-E-MSC-HR	60	CONTINUOUS	0.15	Bridge Hand Rails_PLAA
SP-E-MSC-LMSC	211	CONTINUOUS	0.15	Line_Misc in DTM_MLAA
SP-E-MSC-MB	150	CONTINUOUS	0.15	Mailbox_PPCC
SP-E-MSC-OS	130	CONTINUOUS	0.15	Overhead Sign_PLC_
SP-E-MSC-PM	150	CONTINUOUS	0.15	Parking Meter_PPCC
SP-E-MSC-RW	70	CONTINUOUS	0.15	Retaining Wall _BLAA
SP-E-MSC-SHD	230	CONTINUOUS	0.15	Shed Outline (Bottom)_PL*_
SP-E-MSC-SIGN	132	CONTINUOUS	0.15	Commercial Sign_PLC_
SP-E-MSC-SW	20	CONTINUOUS	0.15	Sidewalk_BLAA
SP-E-MSC-SWG	2	DASHED	0.15	Sidewalk Grate_BLAA
SP-E-MSC-WW	40	SHORTDASH	0.15	Walkways - Trails - Paths_BLCC
SP-E-RDS-AE	50	CONTINUOUS	0.15	Asphalt Edges_BLAA
SP-E-RDS-BRD	230	CONTINUOUS	0.15	Bridge Deck_BLAA
SP-E-RDS-CR	130	CONTINUOUS	0.15	Crown of Road_MLAA
SP-E-RDS-CUB	2	CONTINUOUS	0.15	Curb - back_BLAA

Layer	Colour (AutoCAD Palette)	Linetype	Line Thickness (mm)	Feature Description
SP-E-RDS-CUF	3	CONTINUOUS	0.15	Curb - front_BLAA
SP-E-RDS-DL	130	DASHED	0.15	Driving Lane - Edge_MLAA
SP-E-RDS-EG	240	CONTINUOUS	0.15	Edge Of Gutter_BLAA
SP-E-RDS-EP	63	CONTINUOUS	0.15	Edge Of Pavement_BLAA
SP-E-RDS-ES	40	HIDDEN2	0.15	Edge Of Shoulder_BLBB
SP-E-RDS-NG	40	HIDDEN2	0.15	Entrance - Gravel_BLBB
SP-E-RDS-NP	50	CONTINUOUS	0.15	Entrance - Paved_BLAA
SP-E-RDS-PS	7	CONTINUOUS	0.15	Painted Striping_BLAA
SP-E-RDS-RDS	20	CONTINUOUS	0.15	Road Sign_PPCC
SP-E-RDS-RS	210	CONTINUOUS	0.15	Ripple Strip_BLBB
SP-E-RDS-SR	50	CONTINUOUS	0.15	Sideroads Paved_BLAA
SP-E-RDS-UR	40	GR-ROAD	0.15	Gravel Sideroads_BLBB
SP-E-RWY-GFL	20	CONTINUOUS	0.15	Gate with Flashing Light_PPCC
SP-E-RWY-RBE	40	SHORTDASH	0.15	Railway Ballast Edge_BLCC
SP-E-RWY-RBS	2	CONTINUOUS	0.15	Railway Buffer Stop_PLB_
SP-E-RWY-RBT	40	CONTINUOUS	0.15	Railway Ballast Top_MLCC
SP-E-RWY-RCL	1	DASHED	0.15	Railway Centreline_MLBB
SP-E-RWY-RCS	20	CONTINUOUS	0.15	Railway Crossing Sign_PPCC
SP-E-RWY-RGR	2	CONTINUOUS	0.15	Railway Guard Rail_PLAA
SP-E-RWY-RLS	20	CONTINUOUS	0.15	Railway Sign or signal_PPCC
SP-E-RWY-RLT	20	CONTINUOUS	0.15	Railway - Top of Rail_PLAA
SP-E-RWY-RPF	2	CONTINUOUS	0.15	Point of Frog_PPAA
SP-E-RWY-RSB	2	CONTINUOUS	0.15	Railway Switch Blade_PLAA
SP-E-RWY-RSR	5	DASHED	0.15	Railway Switch Rod_PLBB
SP-E-RWY-RSS	1	CONTINUOUS	0.15	Railway Switch Stand_PPCC
SP-E-RWY-RST	7	CONTINUOUS	0.15	Railway Stanchion_PPBB
SP-E-RWY-RSX	2	CONTINUOUS	0.15	Railway Signal Box_BLBB
SP-E-RWY-RWR	2	CONTINUOUS	0.15	Railway Wing Rail_PLAA
SP-E-RWY-RWS	2	CONTINUOUS	0.15	Railway Wheel Stop_PPCC
SP-E-UTL-AN	210	CONTINUOUS	0.15	Anchor_PPCC
SP-E-UTL-AP	7	CONTINUOUS	0.15	Anchor Pole_PPB_
SP-E-UTL-BCG-Z	30	CONTINUOUS	0.15	Bell Crossing Ground Elev_IPBB
SP-E-UTL-BCH	30	CONTINUOUS	0.15	Bell Chamber/Vault_PLB_
SP-E-UTL-BCW-Z	30	CONTINUOUS	0.15	Bell Crossing Wire Elev_IPBB
SP-E-UTL-BH	1	CONTINUOUS	0.15	Bell -w- Hydro Pole_PPB_
SP-E-UTL-BP	30	CONTINUOUS	0.15	Bell Pole_PPB_
SP-E-UTL-BTB	30	CONTINUOUS	0.15	Bell Terminal Box_PPB_
SP-E-UTL-CT	30	CONTINUOUS	0.15	Cell Tower_PLB_
SP-E-UTL-FH	150	CONTINUOUS	0.15	Fire Hydrant_PPB_
SP-E-UTL-FMP	150	CONTINUOUS	0.15	Fire Main Indicator Post_PPB_
SP-E-UTL-GCH	2	CONTINUOUS	0.15	Gas Chamber/Vault_PLB_
SP-E-UTL-GK	2	CONTINUOUS	0.15	Gas Key_PPB_
SP-E-UTL-GM	2	CONTINUOUS	0.15	Gas Meter_PPB_
SP-E-UTL-GV	2	CONTINUOUS	0.15	Gas Valve_PPB_
SP-E-UTL-HCG-Z	1	CONTINUOUS	0.15	Hydro Crossing Ground Elev_IPBB
SP-E-UTL-HCH	1	CONTINUOUS	0.15	Hydro Chamber/Vault_PLB_
SP-E-UTL-HCW-Z	1	CONTINUOUS	0.15	Hydro Crossing Wire Elev_IPBB
SP-E-UTL-HM	1	CONTINUOUS	0.15	Hydro Meter_PPB_
SP-E-UTL-HP	1	CONTINUOUS	0.15	Hydro Pole_PPB_
SP-E-UTL-HT	1	CONTINUOUS	0.15	Hydro Tower_PLB_

Layer	Colour (AutoCAD Palette)	Linetype	Line Thickness (mm)	Feature Description
SP-E-UTL-HTB	1	CONTINUOUS	0.15	Hydro Terminal Box_PPB_
SP-E-UTL-HW	150	CONTINUOUS	0.15	Handwell_PPB_
SP-E-UTL-HYT	1	CONTINUOUS	0.15	Hydro Transformer_PLB_
SP-E-UTL-LS	7	CONTINUOUS	0.15	Light Standard_PPB_
SP-E-UTL-LSB	30	CONTINUOUS	0.15	Light Standard -w- Bell_PPB_
SP-E-UTL-LSBH	1	CONTINUOUS	0.15	Light Standard -w- Bell & Hydro_PPB_
SP-E-UTL-LSH	1	CONTINUOUS	0.15	Light Standard -w- Hydro_PPB_
SP-E-UTL-LSTS	7	CONTINUOUS	0.15	Light Standard -w - Traffic Signal_PPB_
SP-E-UTL-MHB	30	CONTINUOUS	0.15	Maintenance Hole Bell_PPAA
SP-E-UTL-MHH	1	CONTINUOUS	0.15	Maintenance Hole Hydro_PPAA
SP-E-UTL-MHSA	31	CONTINUOUS	0.15	Maintenance Hole Sanitary_PPAA
SP-E-UTL-MHSC	31	CONTINUOUS	0.15	Maintenance Hole Combined_PPAA
SP-E-UTL-MHST	80	CONTINUOUS	0.15	Maintenance Hole Storm_PPAA
SP-E-UTL-MHU	170	CONTINUOUS	0.15	Maintenance Hole Unknown_PPAA
SP-E-UTL-MHW	150	CONTINUOUS	0.15	Maintenance Hole Water_PPAA
SP-E-UTL-MW	140	CONTINUOUS	0.15	Monitoring Well_PPA_
SP-E-UTL-MWT	30	CONTINUOUS	0.15	Microwave Tower_PLB_
SP-E-UTL-PB	30	CONTINUOUS	0.15	Phone Booth_PLB_
SP-E-UTL-PL	50	CONTINUOUS	0.15	Pipeline_PLBB
SP-E-UTL-PO	7	CONTINUOUS	0.15	Pole - other_PPB_
SP-E-UTL-PW	50	CONTINUOUS	0.15	Pole Well_PPC_
SP-E-UTL-SH	210	CONTINUOUS	0.15	Sprinkler Head_PPB_
SP-E-UTL-ST	31	CONTINUOUS	0.15	Septic Tank (Outline)_PLB_
SP-E-UTL-STA	31	CONTINUOUS	0.15	Septic Tank Access_PPB_
SP-E-UTL-STP	2	CONTINUOUS	0.15	Standpipe_PPB_
SP-E-UTL-SV	210	CONTINUOUS	0.15	Sprinkler Valve_PPB_
SP-E-UTL-TB	50	CONTINUOUS	0.15	Utility Terminal Box_PPB_
SP-E-UTL-TF	7	CONTINUOUS	0.15	Traffic Signal Pole_PPB_
SP-E-UTL-TSB	30	CONTINUOUS	0.15	Traffic Signal -w- Bell_PPB_
SP-E-UTL-TSBH	1	CONTINUOUS	0.15	Traffic Signal -w- Bell & Hydro_PPB_
SP-E-UTL-TSC	7	CONTINUOUS	0.15	Traffic Signal Control_PPB_
SP-E-UTL-TSH	1	CONTINUOUS	0.15	Traffic Signal -w- Hydro_PPB_
SP-E-UTL-TVCG-Z	30	CONTINUOUS	0.15	TV Cable Crossing Ground Elev_IPBB
SP-E-UTL-TVCW-Z	30	CONTINUOUS	0.15	TV Cable Crossing Wire Elev_IPBB
SP-E-UTL-TVTB	30	CONTINUOUS	0.15	TV Cable Terminal Box_PPB_
SP-E-UTL-UB	30	UNDERGROUND_BELL	0.15	Underground Bell_PLC_
SP-E-UTL-UBM	30	CONTINUOUS	0.15	Underground Bell Marker_PPB_
SP-E-UTL-UG	2	UNDERGROUND_GAS	0.15	Underground Gas_PLC_
SP-E-UTL-UGM	2	CONTINUOUS	0.15	Underground Gas Marker_PPB_
SP-E-UTL-UH	1	UNDERGROUND_HYDRO	0.15	Underground Hydro_PLC_
SP-E-UTL-UHM	1	CONTINUOUS	0.15	Underground Hydro Marker_PPB_
SP-E-UTL-UM	50	CONTINUOUS	0.15	Underground Utility Marker_PPB_
SP-E-UTL-USL	210	DASHED	0.15	Underground Sprinkler Line_PLC_
SP-E-UTL-UT	40	UNDERGROUND_UTILITY	0.15	Underground Utility - other_PLC_
SP-E-UTL-UTV	30	UNDERGROUND_CABLE_TV	0.15	Underground TV Cable_PLC_
SP-E-UTL-UW	150	UNDERGROUND_WATERMAIN	0.15	Underground_Watermain_PLC_
SP-E-UTL-VE	50	CONTINUOUS	0.15	Vent_PPB_
SP-E-UTL-WCH	150	CONTINUOUS	0.15	Water Chamber_PLB_
SP-E-UTL-WE	140	CONTINUOUS	0.15	Well_PPB_
SP-E-UTL-WK	150	CONTINUOUS	0.15	Water Key_PPB_

Layer	Colour (AutoCAD Palette)	Linetype	Line Thickness (mm)	Feature Description
SP-E-UTL-WV	150	CONTINUOUS	0.15	Water Valve_PPB_
SP-E-VEG-FLB	100	CONTINUOUS	0.15	Flower Box_BLBB
SP-E-VEG-HE	100	HEDGE	0.15	Hedge_BLCC
SP-E-VEG-LC	42	DASHED	0.15	Line of Cultivation_BLCC
SP-E-VEG-SHB	70	CONTINUOUS	0.15	Shrub_PPC_
SP-E-VEG-TR	90	CONTINUOUS	0.15	Trees_PPC_
SP-E-VEG-VEGE	90	DASHED	0.15	Vegetation Edge_PLC_
SP-E-VEG-WD	90	BUSH	0.15	Woods Detail_PLD_
SP-E-VEG-WO	90	BUSH	0.15	Woods Overhang (Ground)_BLDC
SP-E-VEG-WT	50	CONTINUOUS	0.15	Woods Trunkline_ILD_
SP-Q-MSC-AU	7	CONTINUOUS	0.15	Audit Line_ILAA
Graphics Generated - Sorted by Layer				
MX-G-GRID	171	CONTINUOUS	0.15	Mapping Grid
MX-G-GRID-T	171	CONTINUOUS	0.15	Grid Text
SP-E-BAR-T	2	CONTINUOUS	0.15	Barrier Features Grouping Text
SP-E-BDY-CITY	245	SUBGRADE	0.50	City Boundary
SP-E-BDY-LIN	24	LONGDASH	0.15	General Property Boundary Line
SP-E-BDY-LLC	20	CONTINUOUS	0.50	Lot Line - Concession Boundary
SP-E-BDY-LLS	24	LONGDASH	0.15	Lot Line - Subdivision Boundary
SP-E-BDY-T	2	CONTINUOUS	0.40	Property Boundary Text
SP-E-CTR-MAJR	54	CONTINUOUS	0.25	Major Contours
SP-E-CTR-MAJR-DEPO	1	DEP_OBS_CONTOUR	0.25	Major Depression Obscured Contours
SP-E-CTR-MAJR-DEPR	1	DEP_CONTOUR	0.25	Major Depression Contours
SP-E-CTR-MAJR-OBSC	1	OBSC_CONTOUR	0.25	Major Obscured Contours
SP-E-CTR-MINR	20	CONTINUOUS	0.15	Minor Contours
SP-E-CTR-MINR-DEPO	2	DEP_OBS_CONTOUR	0.15	Minor Depression Obscured Contours
SP-E-CTR-MINR-DEPR	2	DEP_CONTOUR	0.15	Minor Depression Contours
SP-E-CTR-MINR-OBSC	2	OBSC_CONTOUR	0.15	Minor Obscured Contours
SP-E-DRN-T	80	CONTINUOUS	0.15	Drainage Features Grouping Text
SP-E-GND-T	2	CONTINUOUS	0.15	Ground Feature Grouping Text
SP-E-LABELS	1	CONTINUOUS	0.15	String Labels
SP-E-MON-T	2	CONTINUOUS	0.15	Survey Monument Grouping Text
SP-E-MSC-T	2	CONTINUOUS	0.15	Miscellaneous Features Grouping Text
SP-E-PTS-INFO	121	CONTINUOUS	0.15	Points for elevation INFORMATION
SP-E-PTS-PLAN	7	CONTINUOUS	0.15	Points for Plan but not DTM
SP-E-PTS-TEXT	7	CONTINUOUS	0.15	Point label component
SP-E-PTS-UNKNOWN_CODE	7	CONTINUOUS	0.15	Default Layer for survey points with Non-Standard Point Code
SP-E-RDS-T	2	CONTINUOUS	0.15	Roadway Features Grouping Text
SP-E-RWY-T	2	CONTINUOUS	0.15	Railway Features Grouping Text
SP-E-SCANNED	21	CONTINUOUS	0.15	Raster Imagery
SP-E-TIN	254	CONTINUOUS	0.15	TIN Surface
SP-E-TIN-BNDY	121	CONTINUOUS	0.15	TIN Boundary
SP-E-TIN-BNDYOBSC	123	CONTINUOUS	0.15	TIN Boundary- Obscured Area
SP-E-TIN-PTS	122	CONTINUOUS	0.15	TIN Points
SP-E-TIN-TRIANGLES	128	CONTINUOUS	0.15	TIN Triangles
SP-E-UTL-BELL-T	30	CONTINUOUS	0.15	Utility Bell Text
SP-E-UTL-COMB-T	7	CONTINUOUS	0.15	Utility Pole Combined Text
SP-E-UTL-GAS-T	2	CONTINUOUS	0.15	Utility Gas Text

Layer	Colour (AutoCAD Palette)	Linetype	Line Thickness (mm)	Feature Description
SP-E-UTL-HYDRO-T	1	CONTINUOUS	0.15	Utility Hydro Text
SP-E-UTL-LIGHT-T	7	CONTINUOUS	0.15	Utility Light Text
SP-E-UTL-SAN-ST-COMB-T	31	CONTINUOUS	0.15	Utility Sanitary Storm Combined Text
SP-E-UTL-SAN-T	31	CONTINUOUS	0.15	Utility Sanitary Text
SP-E-UTL-STORM-T	80	CONTINUOUS	0.15	Utility Storm Text
SP-E-UTL-T	7	CONTINUOUS	0.15	Utility Features General Text
SP-E-UTL-TRAFFIC-T	7	CONTINUOUS	0.15	Utility Traffic Text
SP-E-UTL-TV-T	30	CONTINUOUS	0.15	Utility TV Text
SP-E-UTL-WATER-T	150	CONTINUOUS	0.15	Utility Water Text
SP-E-VEG-T	2	CONTINUOUS	0.15	Vegetation Features Grouping Text
SP-G-CONS	200	CONTINUOUS	0.15	General Construction Lines existing survey
SP-G-LINES	210	CONTINUOUS	0.15	General lines
SP-G-MON-T	2	CONTINUOUS	0.15	General survey monument text
SP-G-TEXT	2	CONTINUOUS	0.15	General Text - existing survey
SP-L-FABRIC-LINES	2	LONGDASH	0.15	Legal Survey adjoining linework
SP-L-FABRIC-TEXT	2	CONTINUOUS	0.15	Legal Survey adjoining property info
SP-L-LINES	2	CONTINUOUS	0.15	Legal Survey Lines
SP-L-PART	6	CONTINUOUS	0.15	Legal Survey Part Linework
SP-L-PART-TEXT	6	CONTINUOUS	0.70	Reference Plan Part text
SP-L-TEXT	2	CONTINUOUS	0.15	Legal Survey Text

Note 1	Symbols CB, CBS, EVD and BH are unique as these features are used to generate the DTM. The insert point of each of these symbols (blocks/cells) is used as the DTM point location. Each of these symbols contain a zero length line that is coincident with the insert point. In the event that the symbol is exploded, the zero length line remains on the DTM layer but the lines, circles and text are moved to a non DTM layer.

3.0 CADD Conversion to Bentley InRoads

This section describes the process used to extract the Digital Terrain Model "DTM" or surface model data from CADD topographical drawings and convert to Bentley InRoads for the purpose of creating a surface model. The supporting translation table and InRoads feature table report is based on the specifications, feature codes and symbology when generating CADD drawings in accordance with Section 2.1 and 2.2 of this document. Note that this process converts only the DTM data from the CADD drawings.

CADD conversion to Bentley InRoads process supports the following software versions. Processing platform includes Bentley Microstation .DGN (V8i Select Series 4) and Bentley InRoads (tested in 08.11.09.878)

Data source topographic surveys input includes AutoCAD .DWG™ (Release 13 through 16) and Bentley Microstation .DGN (V8i Select Series 4). In the event that source data is provided in later releases, then save to the releases as noted.

The process requires a number of customized control files and a Microstation mvba. These files can be copied into a single directory, either on the local PC or a shared network location to simplify the use of this process. In the following examples you will see that these files are stored in a shared network drive (drive m:).

The described procedure includes a customized script as illustrated in step 2 below. The remainder of the process describes standard tools that are incorporated in InRoads.

The procedure follows these five main steps:

1. Install the Bentley macro and associated tables
2. Execute the provided Custom VBA script to extract surface model data from delivered CADD Drawing.
3. Load XIN file in InRoads.
4. Import Survey Data.
5. Quality Control and Validation
6. Generate Surface Model and Contours.

Step 1 – Software Installation and File Locations

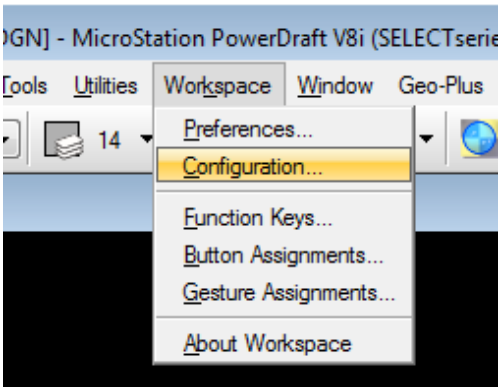
The CADD Conversion to Bentley InRoads software (macro) and associated control files must be installed in the locations as noted below. The installation would typically be performed by a person having access rights to the Microstation system variables. Manually install the following files as follows.

Software related files	
Filename	Location or File Path
MX_CADD_to_InRoads.mvba	Within one of the "*Visual Basic for Applications Settings*" – "*Directories to search for VBA projects*"
MX_TOPO_to_InRoads_Key_Codes.csv	Same location as .mvba (above) or Same location as CADD File (.dwg/.dgn)
MX_TOPO_to_InRoads_TIW _File_Format.tiw	Project Data or same location as CADD File (.dwg/.dgn)

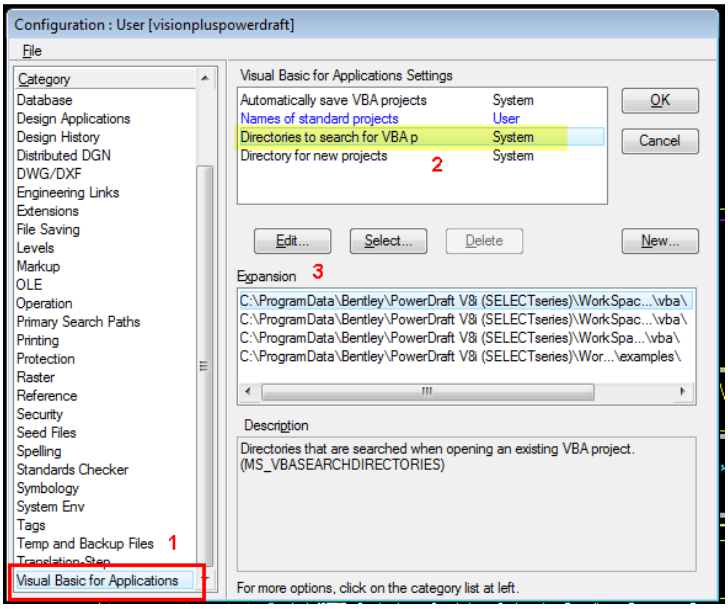
MX_TOPO_to_InRoads_Surface.xin	Project Data or same location as CADD File (.dwg/.dgn)

Process Input/Output files	
Filename	**Location or File Path**
CADD file (.dwg/.dgn) < filename>	User defined but typically in project folder.
Output file(Ascii) - < filename>**_2InRoads.out**	Same location as CADD File (.dwg/.dgn)
Error Report file - < filename>**_err_rpt.dgn**	Same location as CADD File (.dwg/.dgn)

Note:
The macro expects the location of this file to be in one of the directories defined by the MicroStation Configuration Variable "Directories to Search for VBA projects". The directories defined may or may not be the same for every install of MicroStation. It is best to check the directories defined on the individual computer. To see the list of directories go to the following in MicroStation:



A dialog for the Configuration variables will appear, select "Visual Basic for Applications Settings", then select directories to search for VBA projects. The directories the macro will search for the definition file will display in the list box at number three in the following screen capture.



Step 2 – Run Custom Bentley VBA Script

Launch Bentley MicroStation, open the CADD drawing and initiate the Custom VBA script MX_CADD_to_InRoads.mvba
This process scans the entire drawing and collects all elements that reside on Layers that are defined as being Layers that contain Surface Model Data. The definition of these Layers are contained in a Control file named "**MX_TOPO_to_InRoads_Key_Codes.csv**". Non DTM features are not converted.

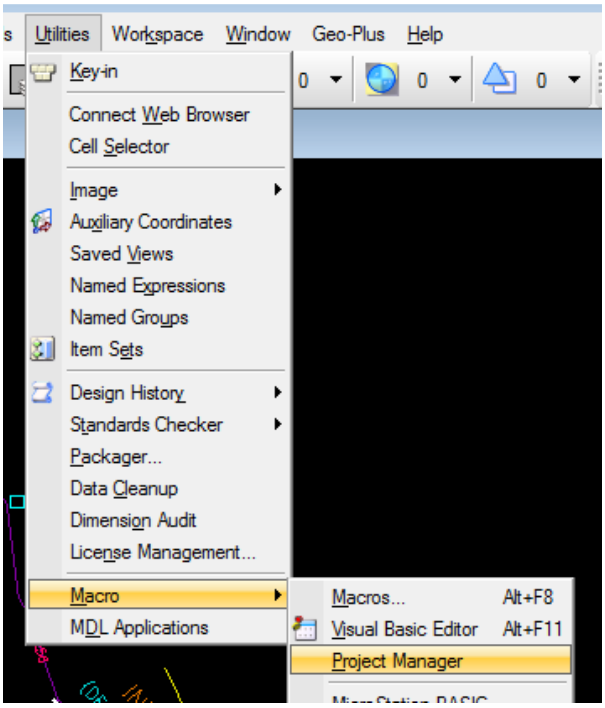
Surface Model Data is made up of either points or breaklines. Some symbols that reside on a Layer defined as a Surface Model Layer have point information that is derived from the symbols geometry by the VBA script, so as to only extract a single point for use in the Surface Model. A Catch Basin is an example of one of these symbols. A single point at the centre of the catch basin is used in the Surface Model.

All breaklines extracted are for elements that have linear (straight) components. This excludes Arcs, Bspline Curves, Symbols (except a select few as noted in Table 2.2), etc. All non-compliant elements residing on the Surface Model Layers are considered out of spec and will be flagged and displayed in an error report drawing.

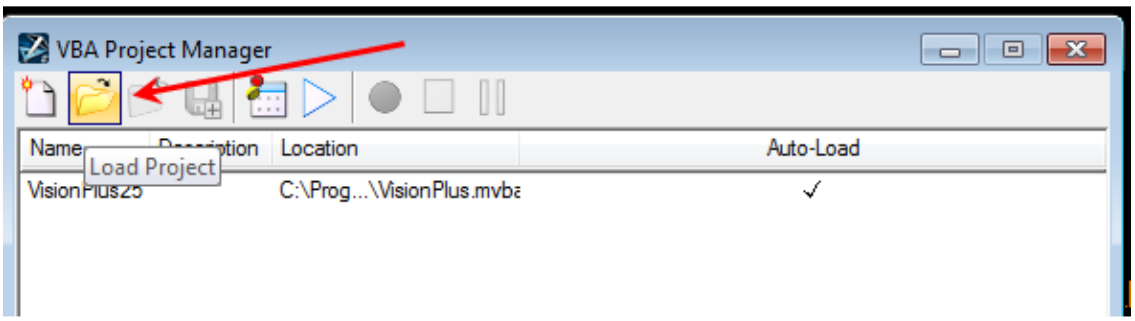
DTM breaklines within the CADD source file must not cross. In areas where features overlap such as bridge decks and rock overhangs, separate CADD source files would be required.

The CADD to InRoads conversion does not convert TIN boundaries. If TIN boundaries are required the closed polygons must be built within InRoads.

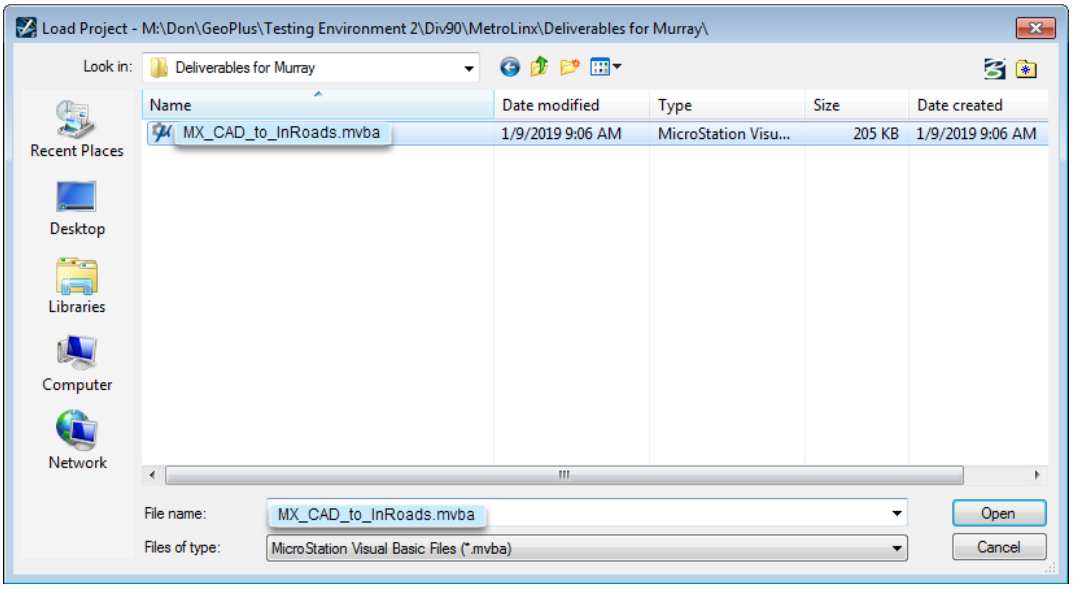
To execute the script the operator navigates to the 'Utilities' pulldown menu in MicroStation:



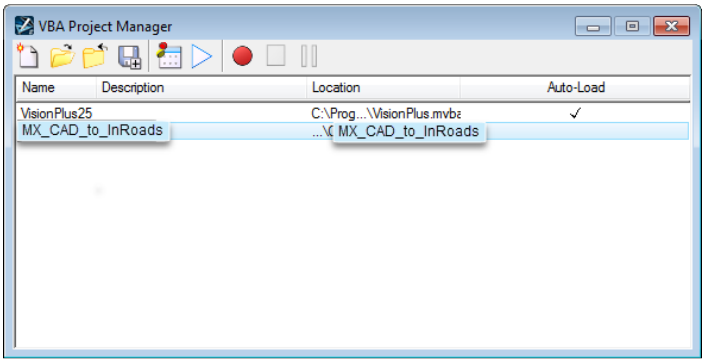
A dialog will open to allow the user to load the Custom VBA Script as a project.



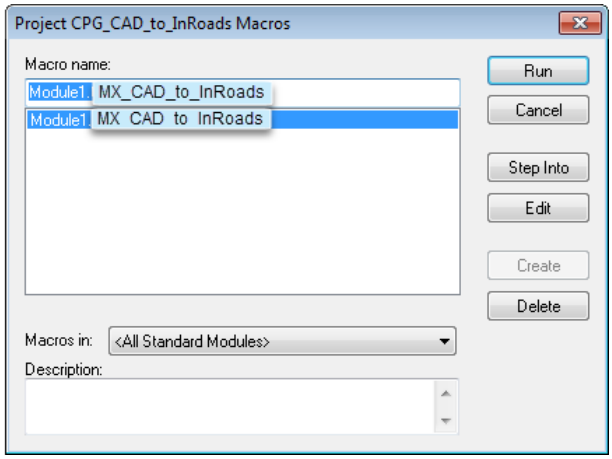
After pressing the Load Project Icon a file open dialog will open to allow the user to navigate to directory containing all the custom files for this process. The file extension filter will be for .mvba files. Select the file called "MX_CADD_toInRoads.mvba" and press open.



The macro will now appear in the VBA Project Manager dialog box. Double Click on this file.



This will then open another dialog that will list all the macro's that this .mvba file contains. In this case there should only be one called "MX_CADD_to_InRoads". Select this macro and press the Run button.

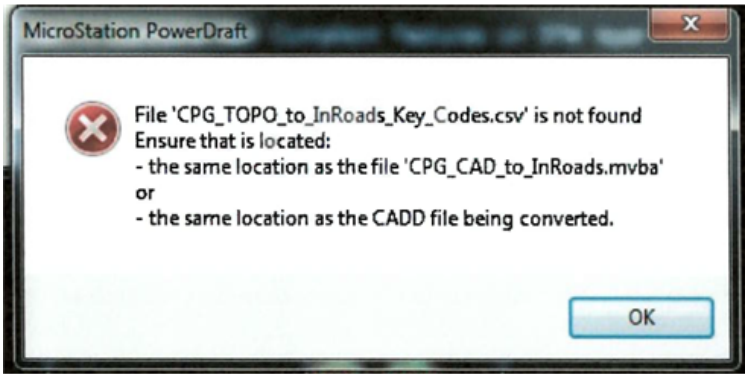


This macro uses a file named MX_TOPO_to_InRoads_Key_Codes.csv. This file defines the names of the Layers that contain Surface Model Data. This file also contains a description of what type of data is found on each Layer and whether a point or breakline is to be extracted from this Layer. If points and breaklines are extracted from the same Layer then there will be two entries in this file: one for each element type. The following example illustrates a few lines from this file:

This is a comma delimited file with the following fields.
Layer Name, Description, Feature Code, Element Type

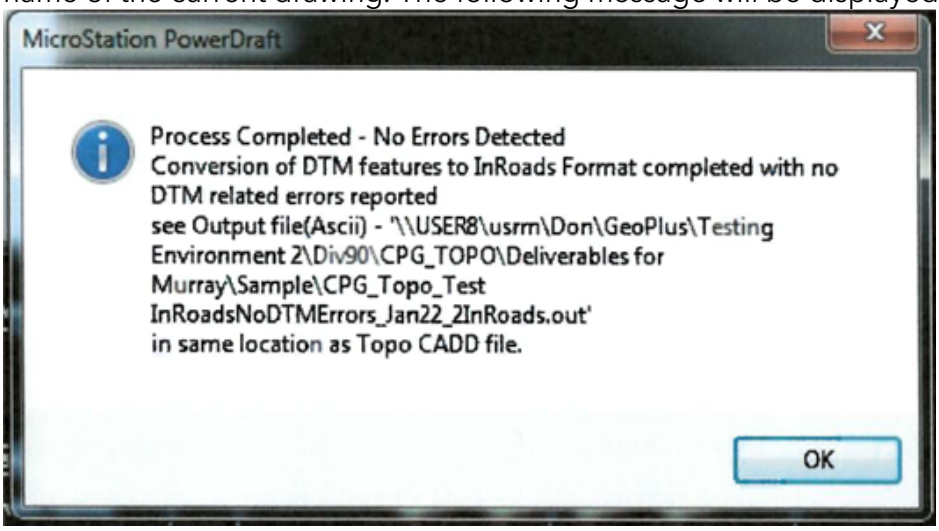
```
SP-E-BAR-BB,Barrier Concrete (Bottom)_BLAA,BB,LINE
SP-E-BAR-FL,Fence Line (Ground)_BLCC,FL,LINE
SP-E-BAR-GU,Guide Rail (Ground)_BLAA,GU,LINE
SP-E-BAR-NB,Noise Barrier (Ground)_BLAA,NB,LINE
SP-E-BAR-SFB,Stone Fence Bottom_BLCC,SFB,LINE
SP-E-BAR-SFS,Stone Fence String_MLCC,SFS,LINE
SP-E-BAR-SWL,Seawall (Top)_BLAA,SWL,LINE
SP-E-DRN-BD,Bottom Of Ditch_BLCC,BD,LINE
SP-E-DRN-DC,Ditch Centerline_BLCC,DC,LINE
SP-E-DRN-EM,Edge of Muskeg_BLCC,EM,LINE
SP-E-DRN-EW,Edge of Water_BLCC,EW,LINE
```

If the macro does not find the definition file in any of the above directories it will do one last search in the same directory as the currently open drawing.
If the macro finds no .csv definition file then an error message will be displayed and the macro will terminate.



When the macro finds the .csv a message displaying the estimated time to process will be displayed.

After the macro runs it will create an InRoads Import file in the same directory as the currently open drawing with the name "<drawing filename>_2InRoads.out" where <drawing filename> is the name of the current drawing. The following message will be displayed.



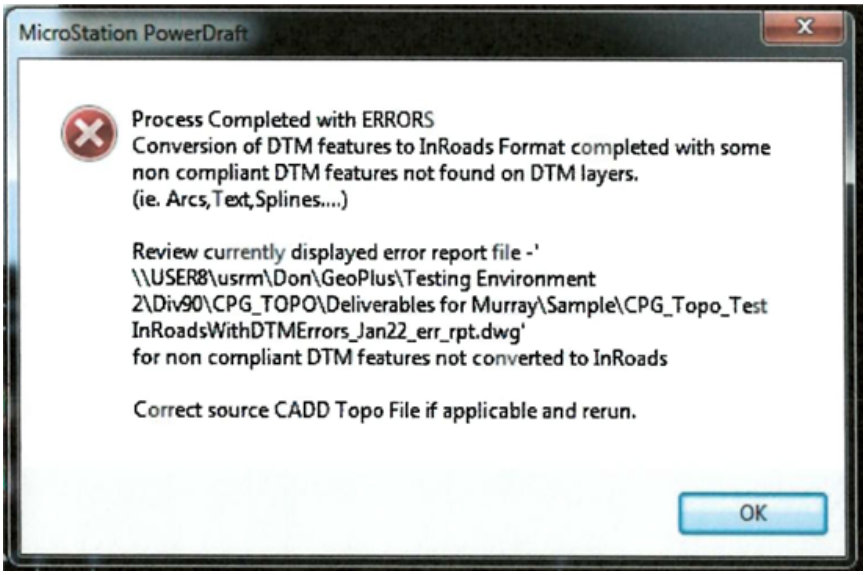
This output file generated by the above process is a standard Ascii Import file for InRoads and looks like this…

```
1000,4000,5014.82618290704,103.251,BB ST
1001,4005.67373456374,5013.69760693308,103.252,BB
1002,4010.48369447268,5010.48369447268,103.253,BB
1003,4013.69760693308,5005.67373456374,103.254,BB
1004,4014.82618290704,5000,103.255,BB
1005,4013.69760693308,4994.32626543626,103.254,BB

1006,4010.48369447268,4989.51630552732,103.253,BB
```

The fields defined are point number, X, Y, Z, Feature Code. The Feature Code is the feature code defined in the project spec and is also defined in the supplied InRoads XIN (MX_TOPO_to_InRoads_Surface.xin) file.

At the end of this process, if elements were found on Layers defined as Surface Model Layers that do not meet the DTM specification a new drawing will automatically open and display all elements that fall out of spec. This file will have the filename "<drawing filename>_err_rpt.<original drawing extension> where <drawing filename> is the name of the current drawing and <original drawing extension> is either .dgn or .dwg depending on the source CADD drawing. The user may now review the error report drawing "<drawing filename>_err_rpt" for any topographic features that do not meet the processes conversion criteria.



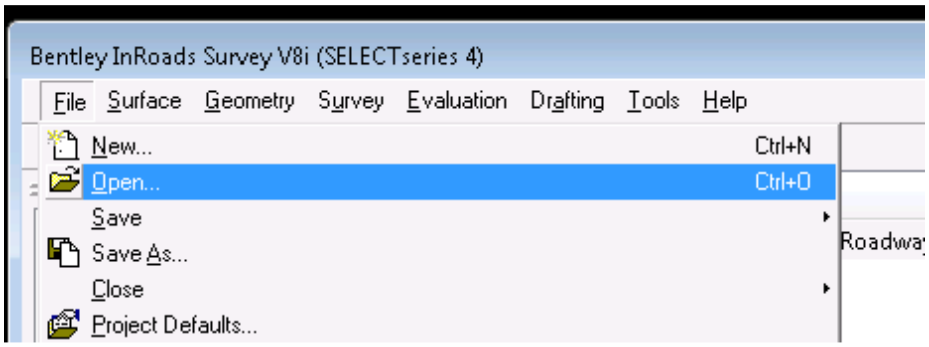
If the process finds no errors then no error report drawing "<drawing filename>_err_rpt" will be generated.

If this process is being rerun, then delete the "<drawing filename>_err_rpt" prior to rerunning process.

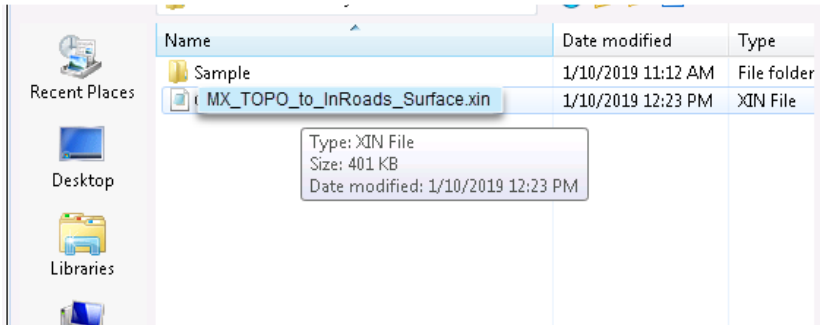
Step 3 –Assign the XIN File in InRoads

a) Start InRoads within Microstation.
Open a new empty DTM.dgn file utilizing the MX_Topo_Seed3D_Rev0.dgn file.
(ie . < filename>_dtm.dgn.

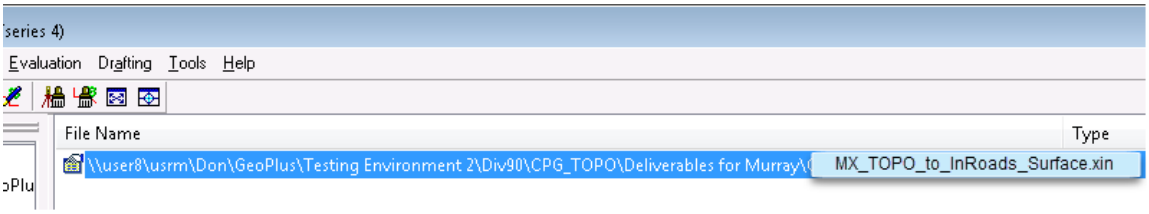
b) Assign the .XIN file
The supplied version of the .XIN file (MX_TOPO_to_InRoads_Surface.xin) has been prepared specifically to go with this process. It contains all the feature codes for Surface Features (DTM) as defined in the spec. As well, it defines the Layer and Symbology that imported Surface Features will have in the InRoads project.



Select the XIN file stored in the Supporting Files directory and press “Open”. The file will be assigned to the Import Process.
Press “Cancel”.



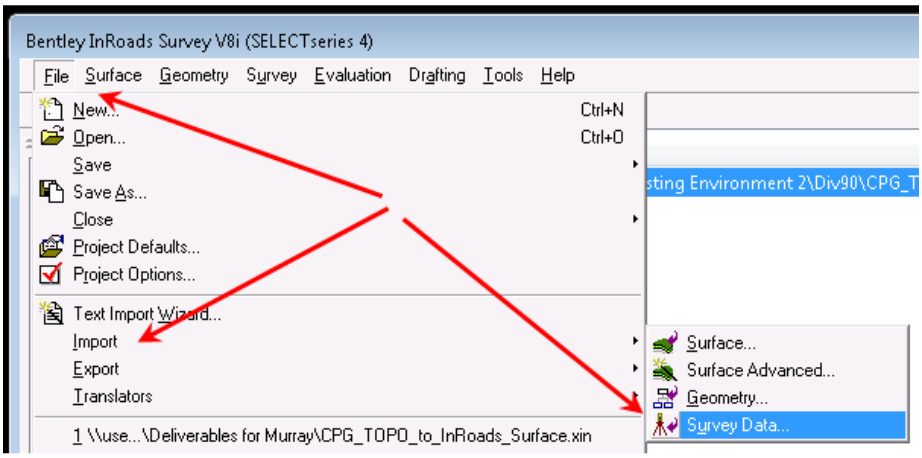
Verify that the XIN file has been assigned.



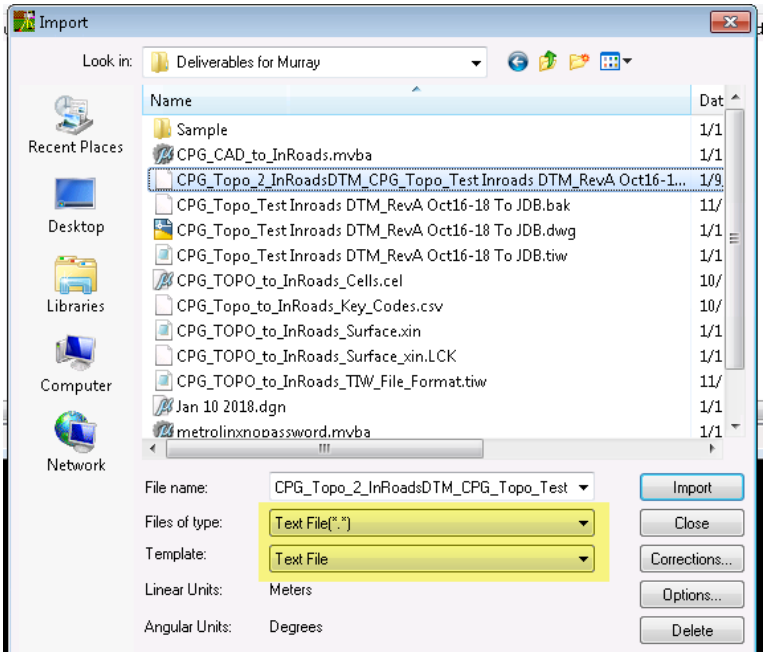
Step 4 – Import “DTM Only” Survey Data

This step imports the DTM data exported from the topographic data as described in Step 2 into InRoads.
Ensure that Survey Tools has been activated in InRoads. Go to "Tools - Product Add-ins" and check the Survey box.

To load the DTM data into InRoads go to “File” - “Import” – “Survey Data”



This will start a number of dialog boxes that will guide the user through the import process. This document will only focus on the what is needed to import the data. Other settings in the dialogs are left to the operator to define for the particular project.



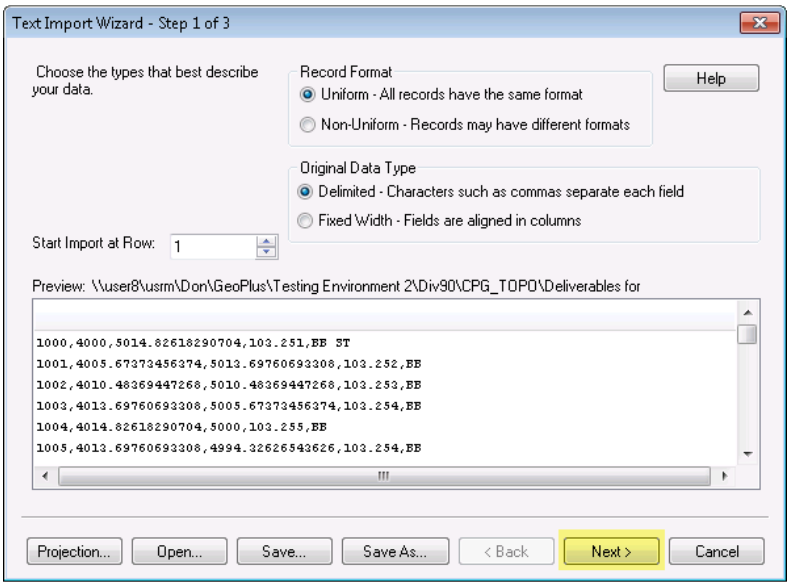
Ensure the file type is selected as “Text File” and the template as “Text File”. Select the .out file that was created previously and press “Import”.

The import wizard requires a control file that defines how the data is ordered in the .out file that was created previously in step 2. This file is named “MX_TOPO_to_InRoads_TIW_File_Format.tiw”. The TIW stands for (T)ext (I)mport (W)izard.

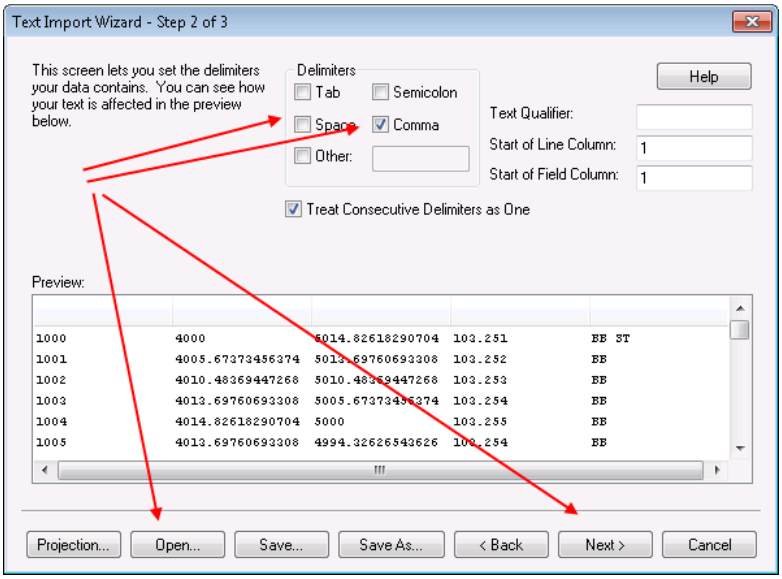
Uncheck space and check comma, press “Open”. A file open dialog will appear. Select the supplied MX_TOPO_to_InRoads_TIW_File_Format.tiw file and press “Open”.

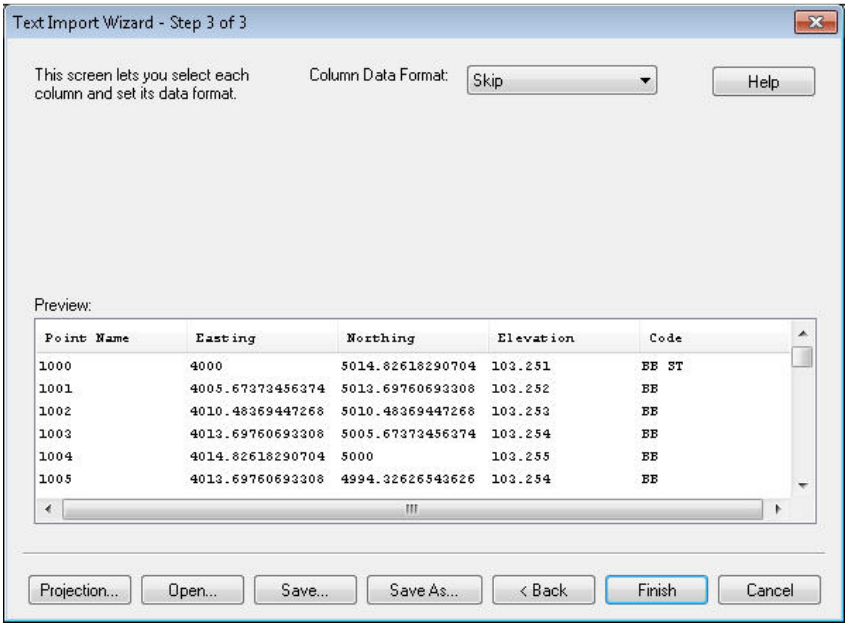
Note: It is recommended that the TIW file be imported before the first "Press Next" below. This will set the settings not only on each of the successive Text Import Wizard forms but will also set the settings of Space and Comma correctly on the second form, and the settings on the first form. The use of the TIW file is a recommended time saver, but its use is optional. However, the user is required to set the forms as shown in the instructions if the TIW file is not used.

The dialog will close, then press “Next”.



Press Next.



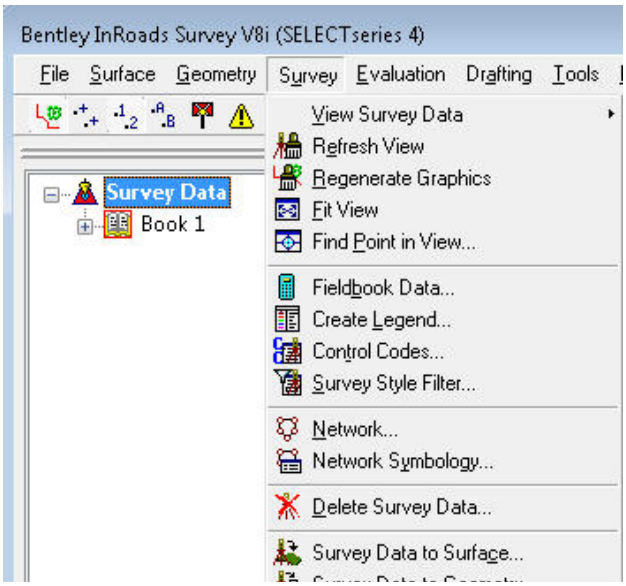


Press Finish
Press Close

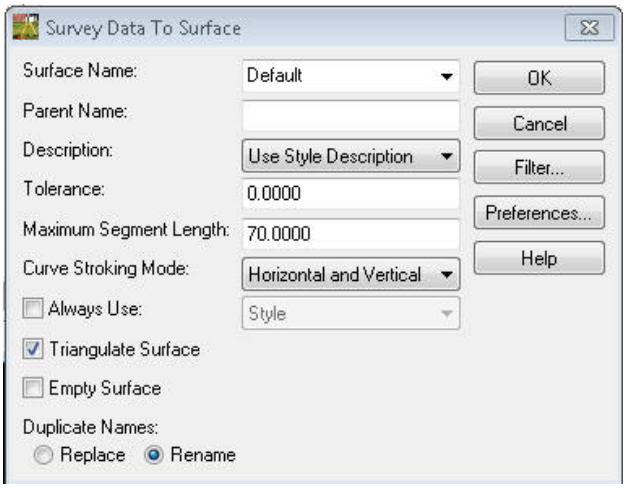
Note: The InRoads Fieldbook created by the step is has not been saved to file. If not saved, InRoads will request the use to save upon exit. If required, save to a file.

Step 5 – Export Survey Data to Surface

The imported survey data may be used to generate an InRoads surface model and contours. The following images illustrate the method to initiate the " Survey Data to Surface" using the InRoads default settings.



This document assumes that the technical user is familiar with the use of InRoads for the purpose of generating surfaces and contours from the imported DTM survey data. This may involve assigning appropriate project related parameters as illustrated in the image below.

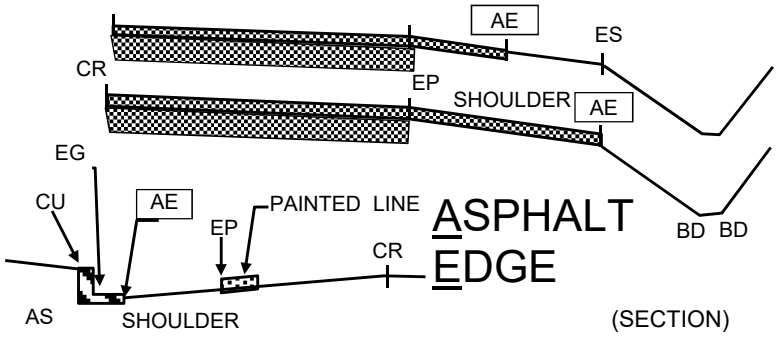
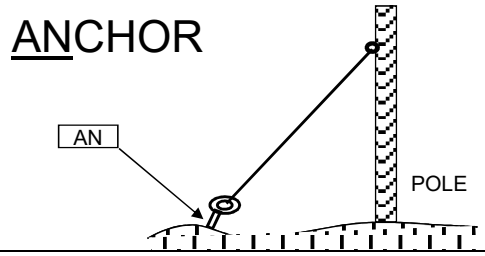
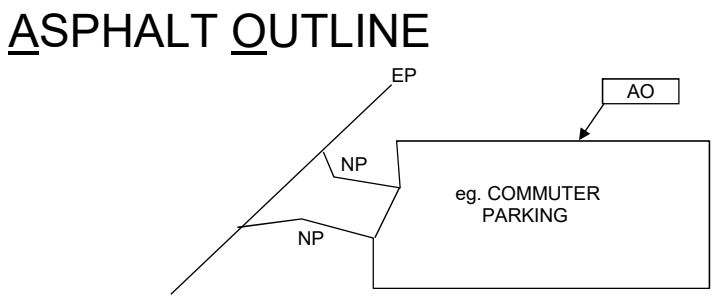
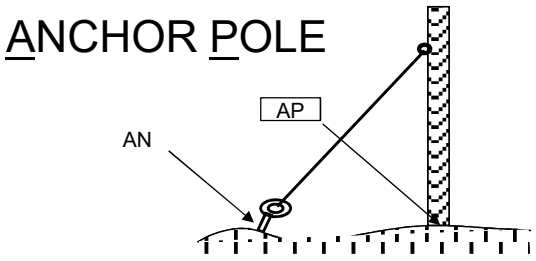
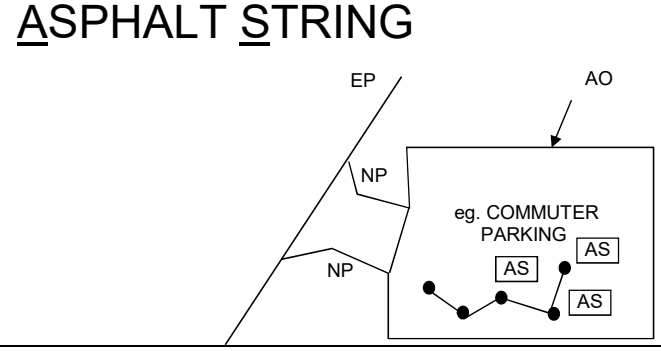


Step 6 – Quality Control and DTM Data Conversion Validation

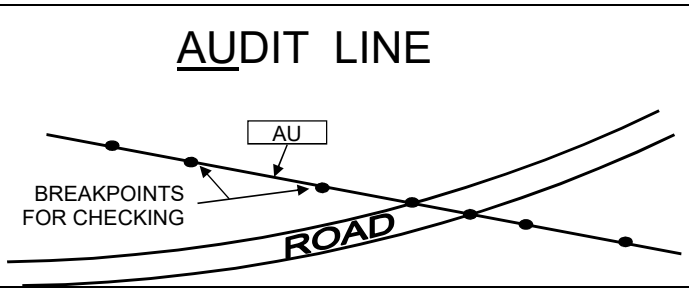
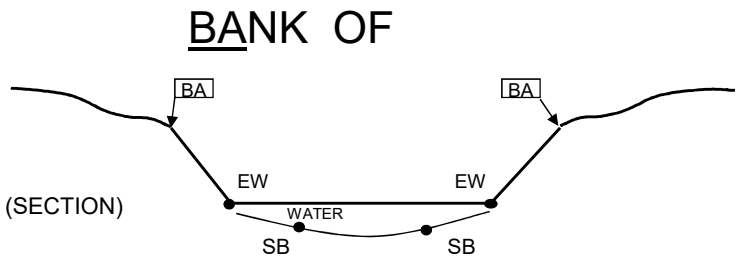
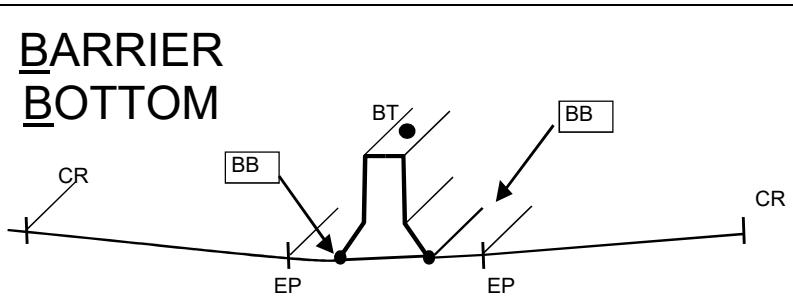
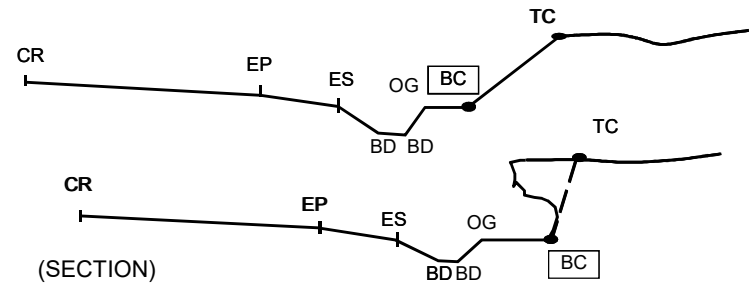
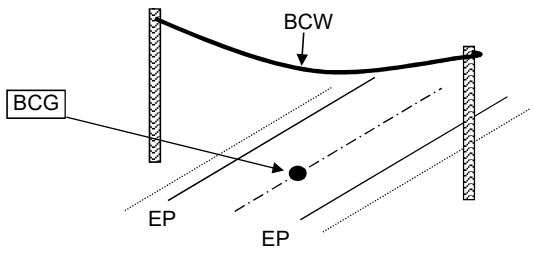
The MX CADD to InRoads conversion routine has been provided for use on Metrolinx projects only. The user is responsible for verifying and validating that the pertinent CADD DTM data has been converted to InRoads and that no errors have resulted in the conversion process.

Metrolinx accepts no liability or responsibility for the use of this "MX_CADD_to_InRoads" macro and associated conversion support files.

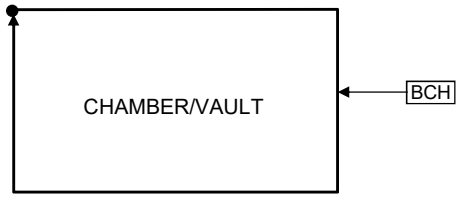
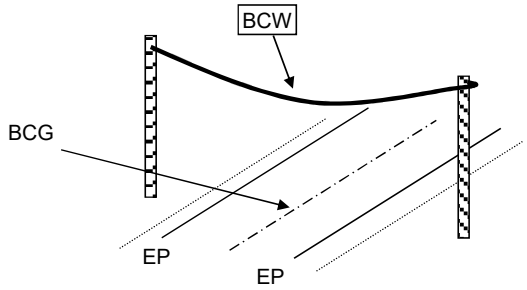
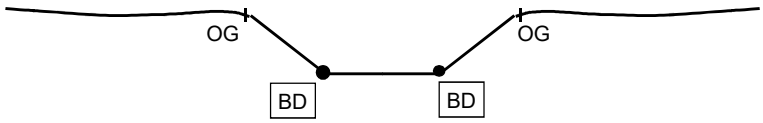
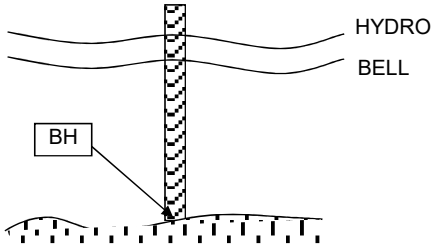
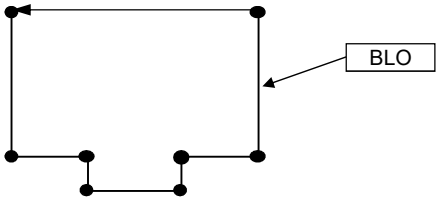
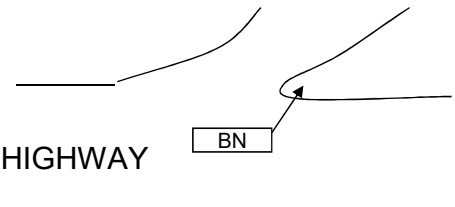
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
		Note: Shaded 'Use' (B and M) indicate DTM Features							
AE	SP-E-RDS-AE	**B**	**L**	A	A			THIS IS THE EDGE OF PAVED OR PARTIALLY PAVED SHOULDER ALSO SEE EP	**AE**
AN	SP-E-UTL-AN	**P**	**P**	C	C	type		NOTE: CONNECTION TO POLE SHOULD BE DETAILED IN CAD PLAN.	**AN**
AO	SP-E-GND-AO	**B**	**L**	A	A	description			**AO**
AP	SP-E-UTL-AP	**P**	**P**	B	–			CENTRE OF POLE	**AP**
AS	SP-E-GND-AS	**M**	**L**	A	A			POINTS SHOULD DEFINE BREAKLINES FOR SECTION IDENTIFICATION	**AS**

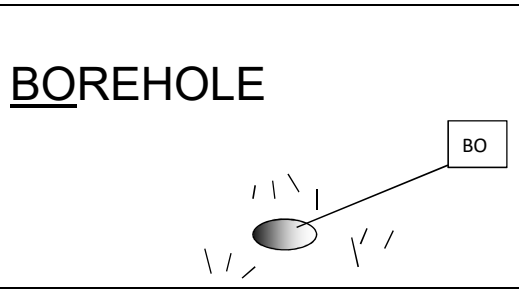
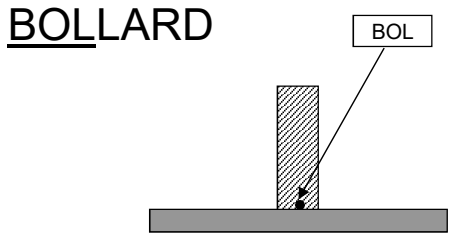
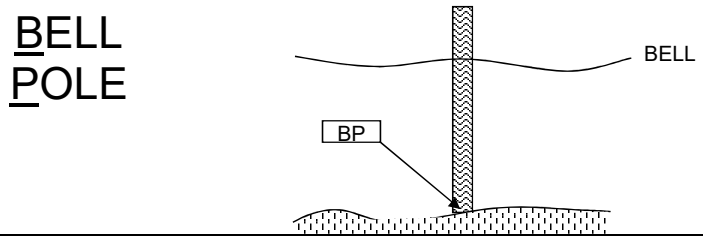
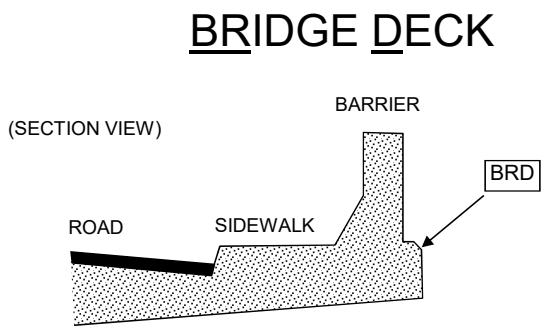
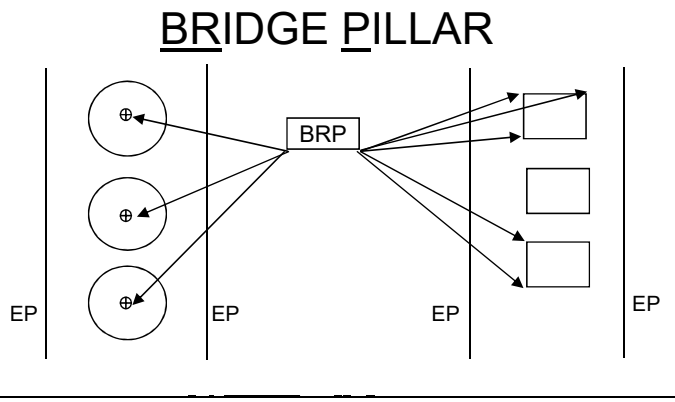
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
AU	SP-Q-MSC-AU	**I**	**L**	A	A				**AU**
BA	SP-E-GND-BA	**M**	**L**	C	C				**BA**
BB	SP-E-BAR-BB	**B**	**L**	A	A	type		OUTLINE BASE OF BARRIER. "type" SHOULD BE "TEMPORARY" WHERE THE BARRIER IS OF TEMPORARY PRE-CAST SECTIONS	**BB**
BC	SP-E-GND-BC	**B**	**L**	C	C			EXAGGERATE SEPARATION OF TOP AND BOTTOM IF NECCESARY TO AVOID CROSSING BREAKLINES, BUT NOTE LENGTH AND WIDTH OF ANY OVERHANGS. GENERALLY, DTM SOFTWARE WILL NOT HANDLE OVERHANGS.	**BC**
BCG	SP-E-UTL-BCG-Z	**I**	**P**	B	B				**BCG**

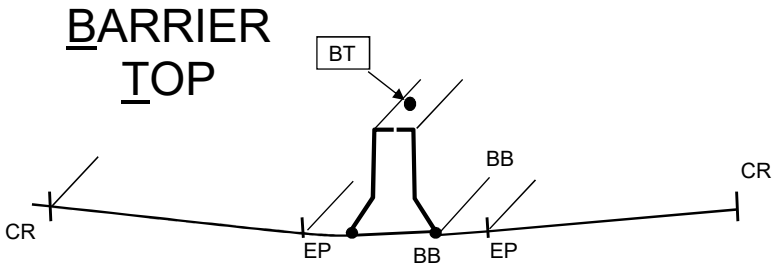
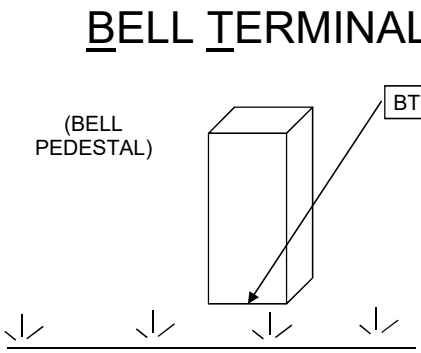
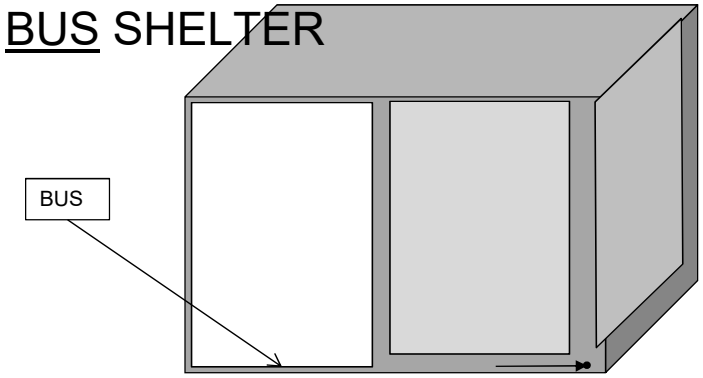
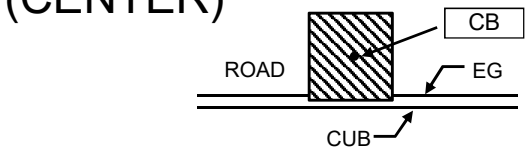
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
BCH	SP-E-UTL-BCH	**P**	**L**	B	_		BELL CHAMBER 	OUTLINE STRING	**BCH**
BCW	SP-E-UTL-BCW-Z	**I**	**P**	B	B		BELL CROSSING WIRE ELEV 		**BCW**
BD	SP-E-DRN-BD	**B**	**L**	C	C		BOTTOM OF DITCH 	LABEL WITH "RK" WHERE ROCK	**BD**
BH	SP-E-UTL-BH	**P**	**P**	B	_		BELL & HYDRO POLE 	CENTRE OF POLE AT GROUND LEVEL	**BH**
BLO	SP-E-MSC-BLO	**P**	**L**	*	_	description	BUILDING OUTLINE 	* ACCURACY TO REFLECT SURROUNDING SURFACE: EITHER A or B. COLLECT SURFACE STRINGS (OG, AS, CS etc) FOR DTM IN CLOSE PROXIMITY TO OR IN THE SAME PLACE AS THE BUILDING OUTLINE	**BLO**
BN	SP-E-MSC-BN	**M**	**P**	A	A		BULLNOSE CENTER 		**BN**

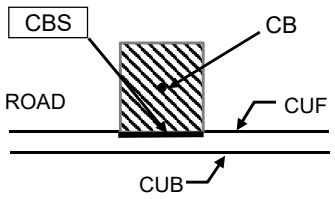
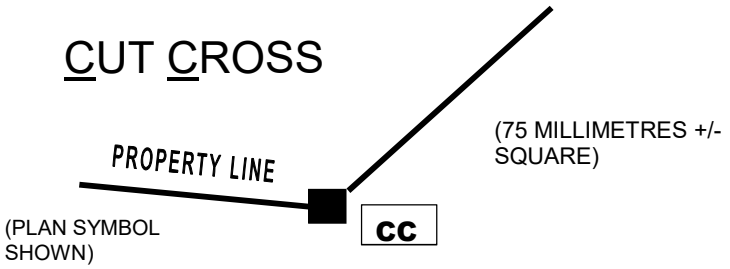
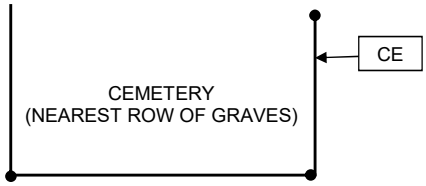
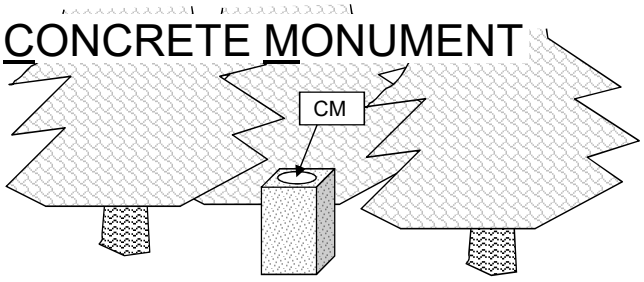
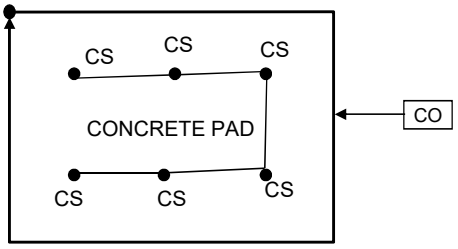
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
BO	SP-E-MSC-BO	**P**	**P**	A	A	identifier		CENTRE OF BOREHOLE AT GROUND LEVEL	**BO**
BOL	SP-E-MSC-BOL	**P**	**P**	C	C			CENTRE OF BOLLARD AT GROUND LEVEL	**BOL**
BP	SP-E-UTL-BP	**P**	**P**	B	–			CENTRE OF POLE AT GROUND LEVEL	**BP**
BRD	SP-E-RDS-BRD	**B**	**L**	A	A				**BRD**
BRP	SP-E-MSC-BRP	**P**	**P**	C	C			TAKE SUFFICIENT MEASUREMENTS TO PERMIT SCALE DRAWING OF PILLARS.	**BRP**

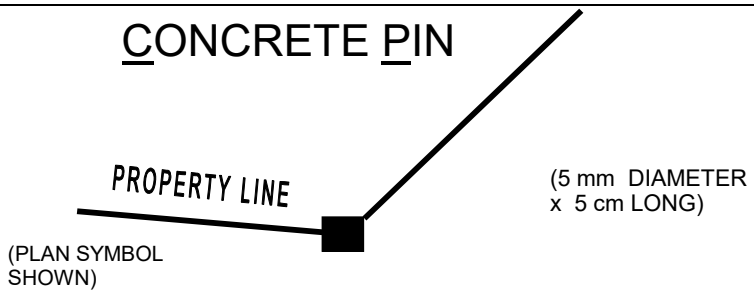
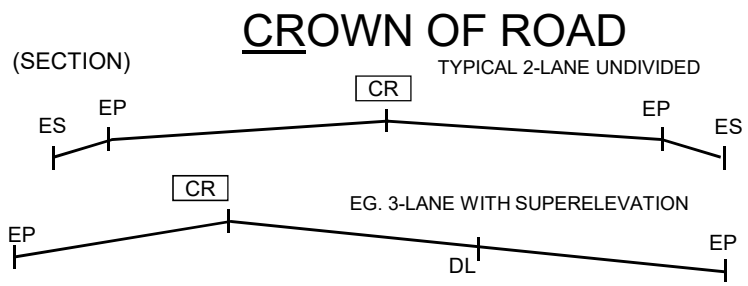
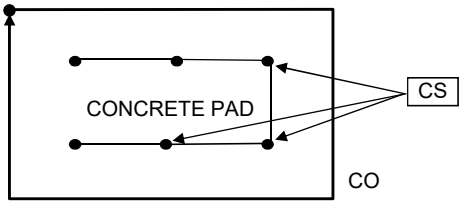
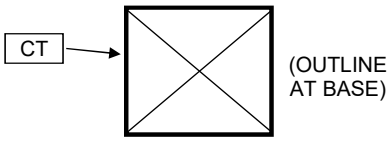
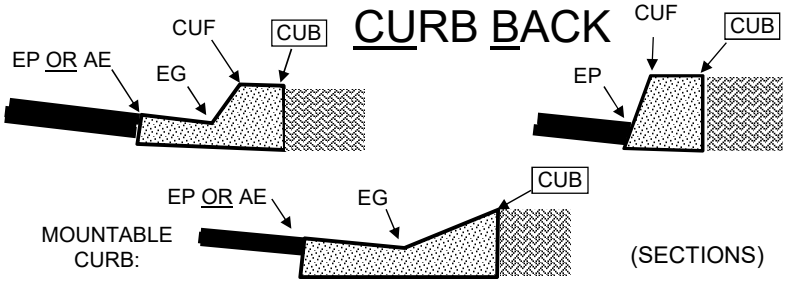
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
BT	SP-E-BAR-BT	**I**	**P**	A	A			(FORMERLY A STRING FEATURE. REVISED TO INFORMATION POINT FEATURE ONLY.)	**BT**
BTB	SP-E-UTL-BTB	**P**	**P**	B	_			CENTRE OF TERMINAL	**BTB**
BUS	SP-E-MSC-BUS	**P**	**L**	C	C			OUTLINE STRING ALONG BOTTOM	**BUS**
CB	SP-E-DRN-CB	**B**	**P**	A	A	size (if non-standard) & type		TYPE MAY BE STANDARD SINGLE OR **TICB** - TWIN INLET CATCH BASIN (COLLECT 2 POINTS: ONE FOR EACH GRATE) SEE ALSO DITCH INLETS	**CB**

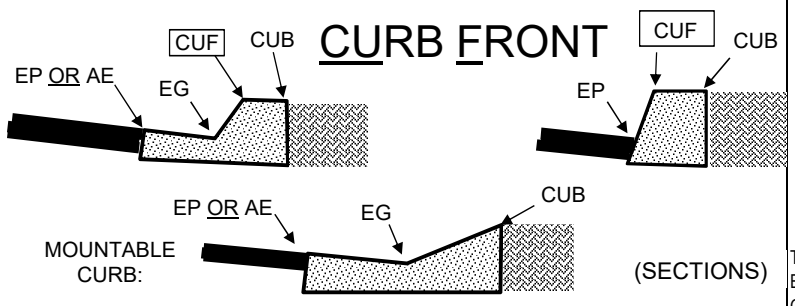
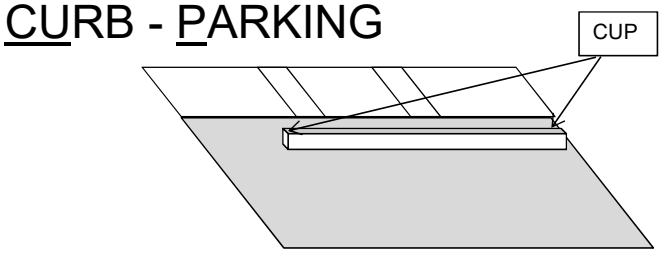
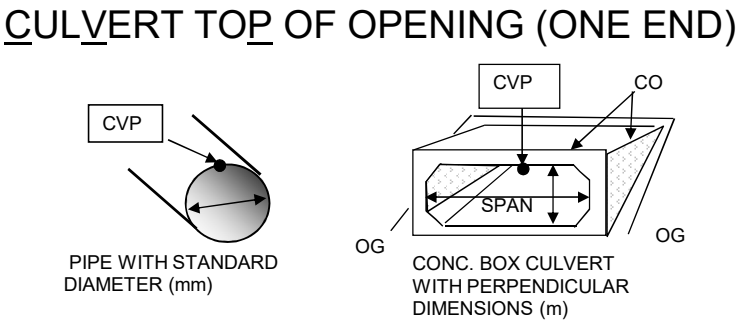
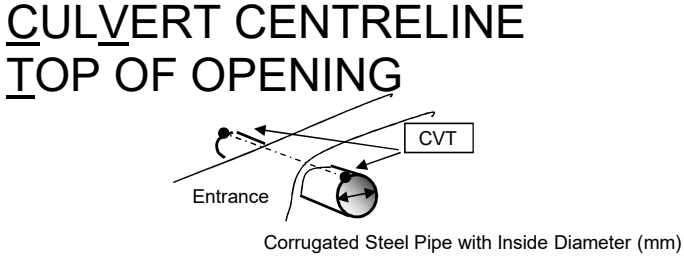
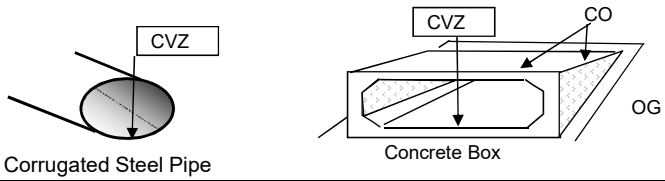
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
CBS	SP-E-DRN-CBS	**B**	**P**	A	A	length	CATCH BASIN SIDE INLET 	CATCHBASIN WITH SIDE INLET: COLLECT CENTRE OF GRATE (CB) AS WELL AS CENTRE OF SIDE INLET (CBS)	**CBS**
CC	SP-E-MON	**P**	**P**	A	A		CUT CROSS 		**CC**
CE	SP-E-MSC-CE	**P**	**L**	C	C		CEMETERY OUTLINE 		**CE**
CM	SP-E-MON	**P**	**P**	A	A		CONCRETE MONUMENT 		**CM**
CO	SP-E-GND-CO	**B**	**L**	A	A	description	CONCRETE OUTLINE 		**CO**

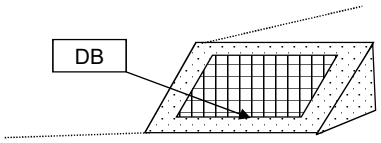
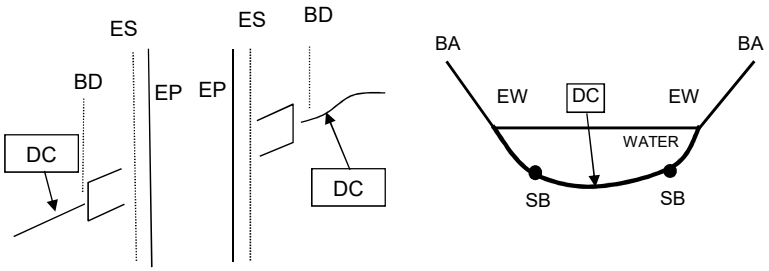
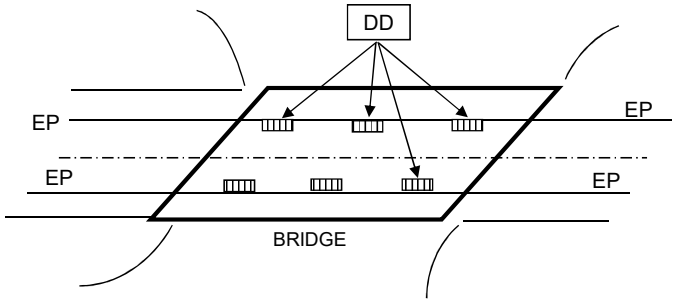
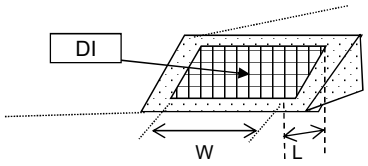
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
CP	SP-E-MON	**P**	**P**	A	A				**CP**
CR	SP-E-RDS-CR	**M**	**L**	A	A			SEE TERMS OF REFERENCE FOR FIELD COLLECTION REQUIREMENT	**CR**
CS	SP-E-GND-CS	**M**	**L**	A	A			(THIS WAS FORMERLY DESCRIBED AS A SINGLE POINT "SHOT")	**CS**
CT	SP-E-UTL-CT	**P**	**L**	B	_			OUTLINE STRING AT BASE	**CT**
CUB	SP-E-RDS-CUB	**B**	**L**	A	A			TAKE POINTS OPPOSITE EACH OTHER TO AVOID CROSSING STRINGS.	**CUB**

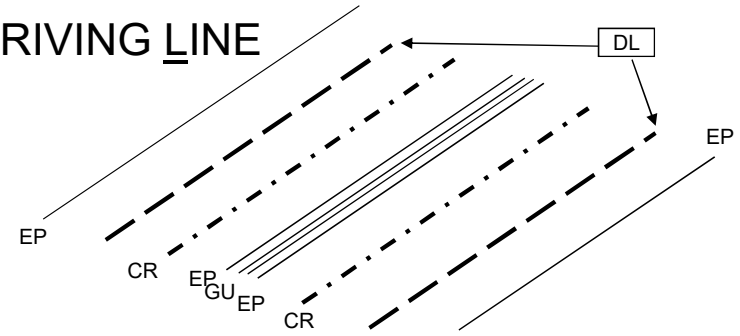
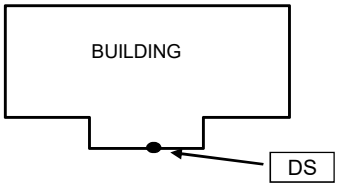
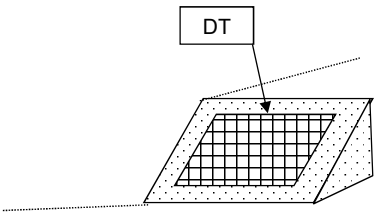
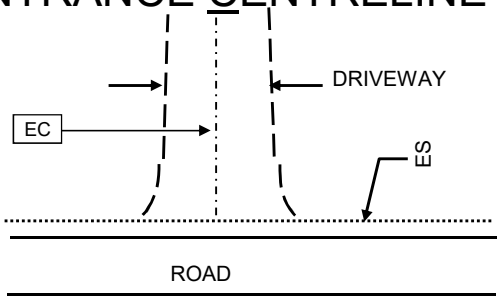
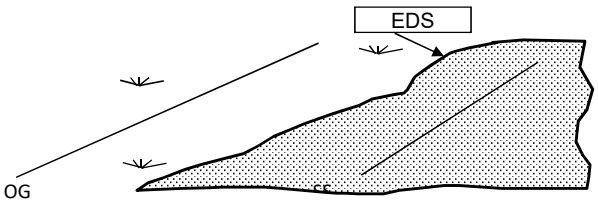
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
CUF	SP-E-RDS-CUF	**B**	**L**	A	A			TAKE POINTS OPPOSITE EACH OTHER TO AVOID CROSSING STRINGS.	**CUF**
CUP	SP-E-MSC-CUP	**P**	**L**	C	C			SURVEY 2 PT STRING ALONG MIDDLE OF TOP	**CUP**
CVP	SP-E-DRN-CVP	**P**	**P**	A	A	size (or dimensions) & type			**CVP**
CVT	SP-E-DRN-CVT	**P**	**L**	A	A	size & type		SEE LIST FOR STANDARD TYPES AND SIZES	**CVT**
CVZ	SP-E-DRN-CV-Z	**I**	**P**	A	A			DETAIL OG IF CO IS ALSO DETAILED SEE LIST FOR STANDARD TYPES AND SIZES	**CVZ**

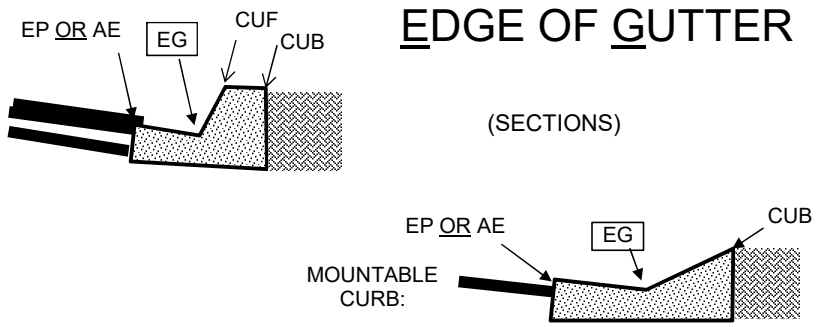
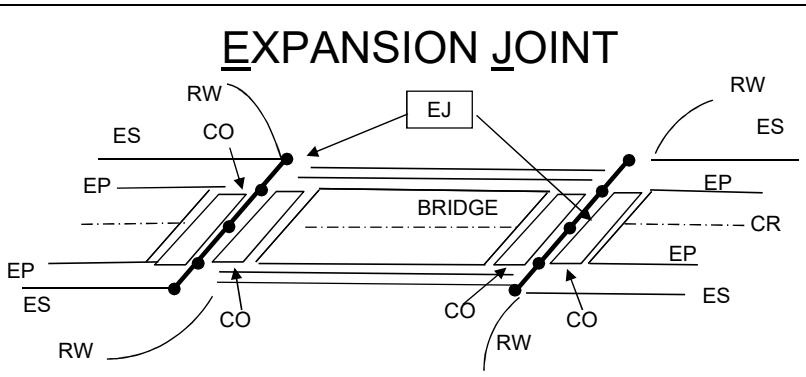
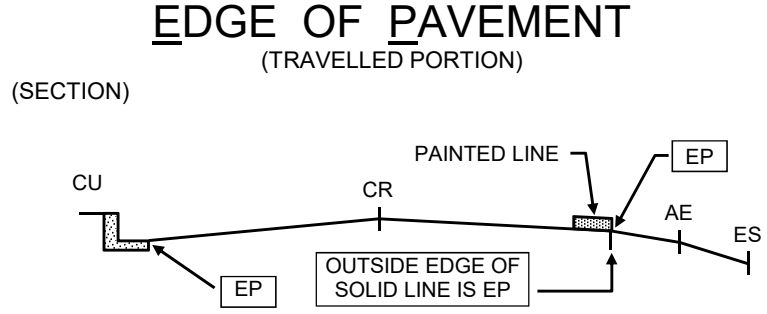
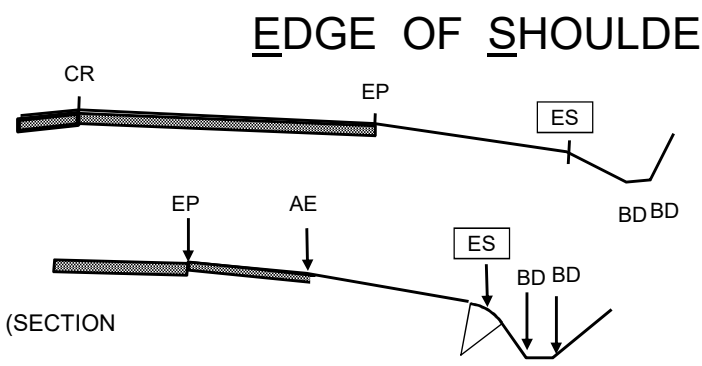
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
DB	SP-E-DRN-DB-Z	**I**	**P**	A	A		DITCH INLET BOTTOM OF OPENING 		**DB**
DC	SP-E-DRN-DC	**B**	**L**	C	C		DITCH CENTERLINE 		**DC**
DD	SP-E-MSC-DD	**P**	**P**	A	A		DECK DRAIN 	CENTRE OF DRAINS	**DD**
DI	SP-E-DRN-DI	**P**	**P**	A	A	size	 DITCH INLET (CENTER OF GRATE)	FOR SIZE, PROVIDE INSIDE PERPENDICULAR WIDTH AND LENGTH	**DI**
DK	SP-E-MSC-DK	**P**	**L**	C	C		WOODEN DECK / DOCK 	CHANGED TO PLAN ONLY FEATURE	**DK**

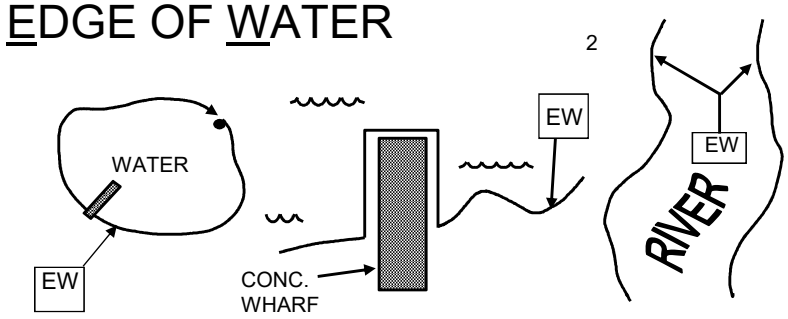
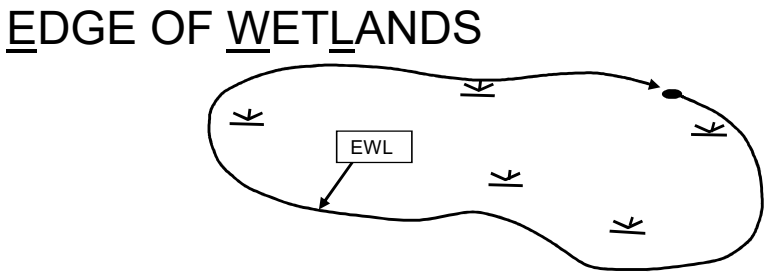
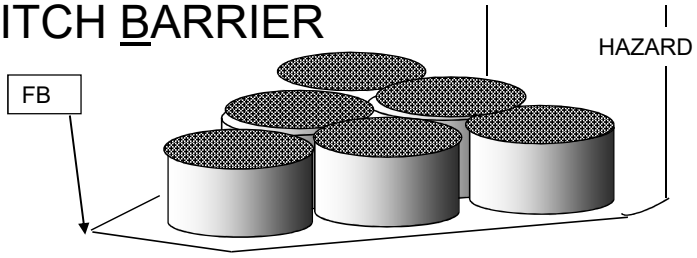
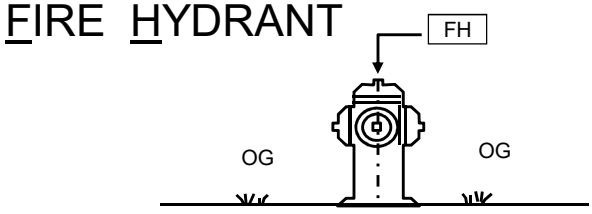
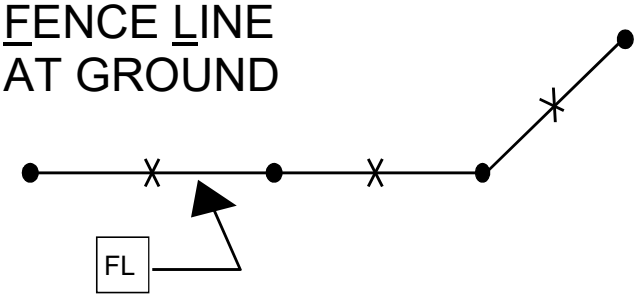
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
DL	SP-E-RDS-DL	**M**	**L**	A	A		DRIVING LINE 	THESE ARE THE PAINTED LINES BETWEEN LANES. SEE TERMS OF REFERENCE FOR FIELD COLLECTION REQUIREMENT	**DL**
DS	SP-E-GND-DS	**I**	**P**	A	A		DOOR SILL 	FINISHED FLOOR ELEVATION	**DS**
DT	SP-E-DRN-DT-Z	**I**	**P**	A	A		 DITCH INLET TOP OF OPENING	ALONG WITH "DB" ON BOTTOM, THIS PERMITS GRATE SLOPE DETERMINATION	**DT**
EC	SP-E-GND-EC	**M**	**L**	A	A	description	ENTRANCE CENTRELINE 	AVOID CROSSING BREAKLINES WHERE THE ENTRANCE MEETS THE HIGHWAY SEE ALSO ROAD FEATURES NG AND NP	**EC**
EDS	SP-E-GND-EDS	**B**	**L**	C	C		EDGE OF SAND 	COLLECT COMPLEMENTARY **OG** AND **SS** STRINGS	**EDS**

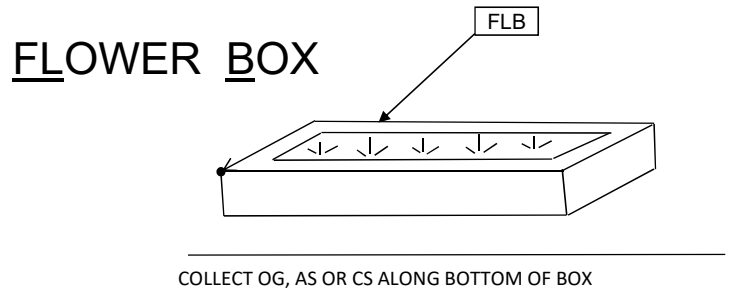
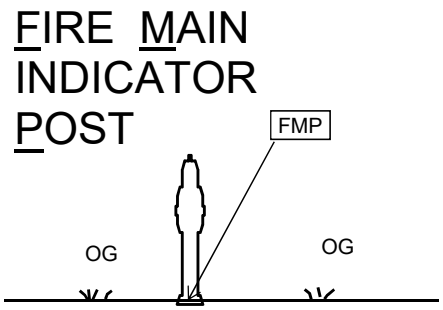
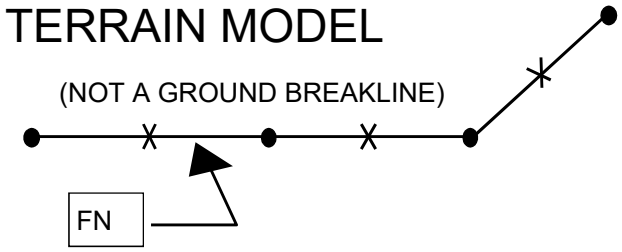
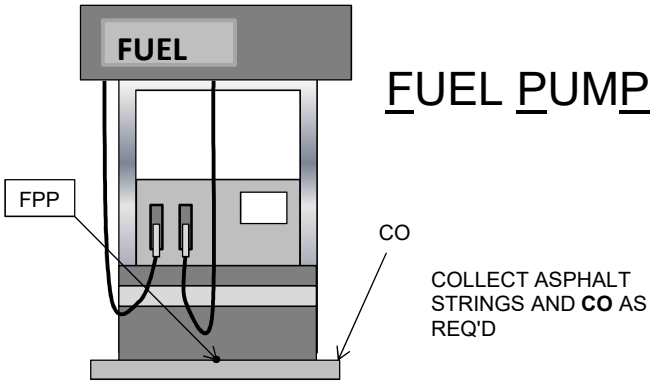
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
EG	SP-E-RDS-EG	B	L	A	A				EG
EJ	SP-E-MSC-EJ	B	L	A	A			NOTE: INCLUDE ALL BREAKPOINTS ALONG JOINT SEE ALSO BRIDGE DETAIL SKETCH ELSEWHERE. WHERE THERE ARE MORE THAN TWO EXPANSION JOINTS, SURVEY ONLY THE TWO OUTER ONES.	EJ
EP	SP-E-RDS-EP	B	L	A	A			THIS IS THE EDGE OF TRAVELLED LANE PAVEMENT. WHERE SHOULDER IS PAVED OR PARTIALLY PAVED, THE EP IS TYPICALLY APPROXIMATED BY THE PAINTED SOLID LINE.	EP
ES	SP-E-RDS-ES	B	L	B	B				ES
EV	SP-E-MSC-EV-Z	I	P	A	A		MISCELLANEOUS ELEVATION + 235.620	NOTE THAT THIS IS NOT INCLUDED IN DTM. SIGNIFICANT FIGURES TO MATCH ACCURACY OF MEASURED ELEVATION.	EV

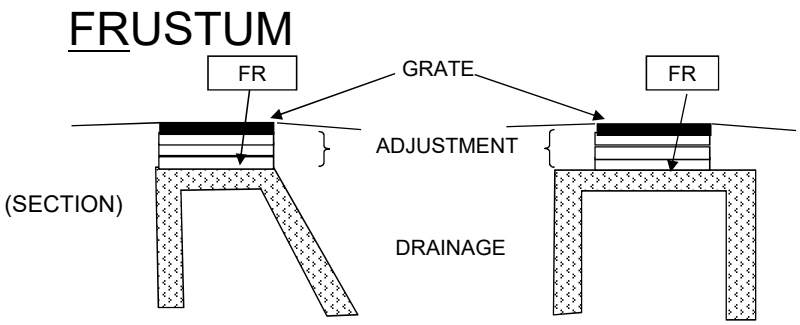
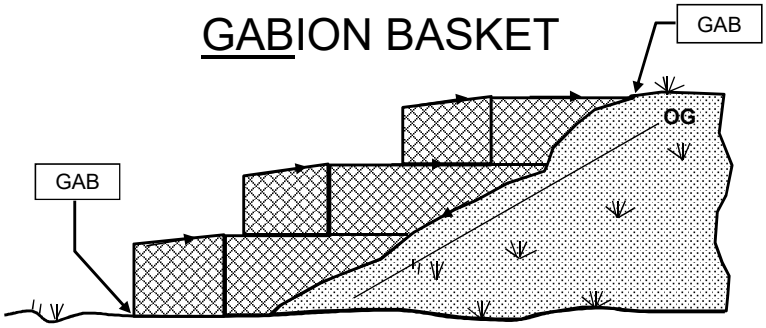
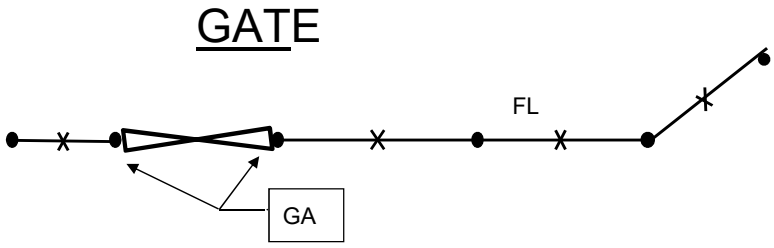
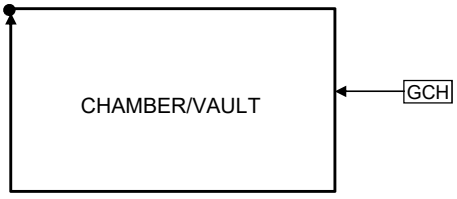
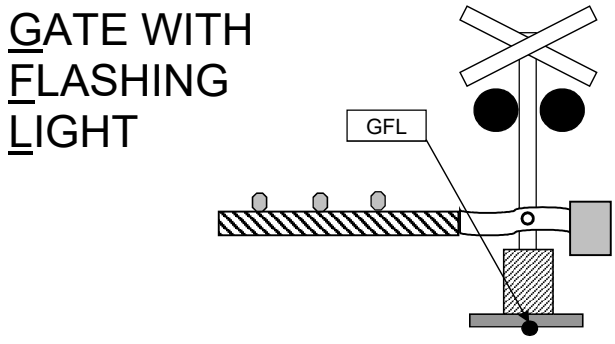
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
EVD	SP-E-MSC-EVD-Z	**B**	**P**	A	A		ELEVATION FOR DTM +	POINT ELEVATIONS FOR CLARIFICATION TO BE INCLUDED IN DTM. No text	**EVD**
EW	SP-E-DRN-EW	**B**	**L**	C	C	date & type		FOR TYPE, PROVIDE LAKE OR RIVER NAME	**EW**
EWL	SP-E-DRN-EWL	**B**	**L**	C	C	type		CLARIFY WETLAND WITH TYPE EG. MUSKEG SWAMP MARSH	**EWL**
FB	SP-E-BAR-FB	**P**	**L**	C	–	type, diameter,#,height		APPLIES TO ALL BARREL TYPE BARRIERS. OUTLINE ON GROUND. NOTE NUMBER, DIAMETER, AND HEIGHT OF INDIVIDUAL BARRELS.	**FB**
FH	SP-E-UTL-FH	**P**	**P**	B	–			COLLECT TOP OF FH AS WELL AS COMPLEMENTARY OG STRINGS SURROUNDING	**FH**
FL	SP-E-BAR-FL	**B**	**L**	C	C	type		**TYPES MAY INCLUDE** BWF-BARBED WIRE CLF - CHAIN LINK BF - BOARD RF - RAIL PF - PICKET SF - STONE WF - WIRE WMF - WIRE MESH WSF-WIRE SECURITY WIF-WROUGHT IRON EF-ELECTRIC	**FL**

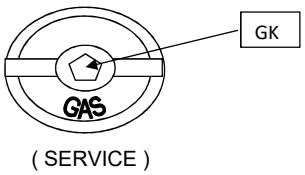
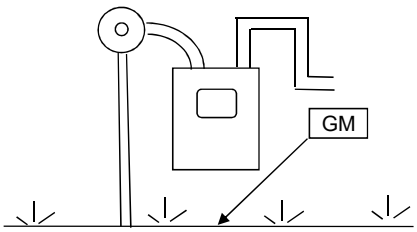
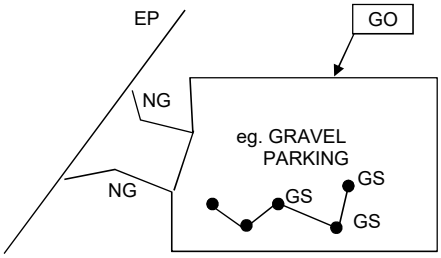
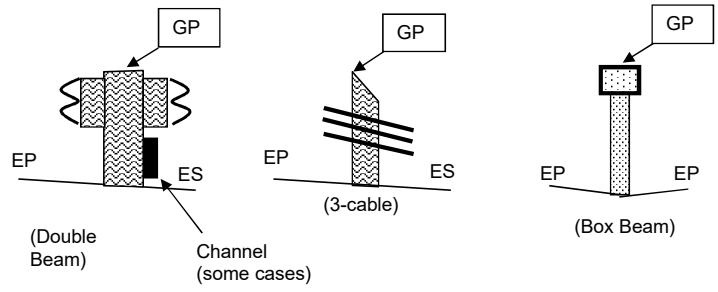
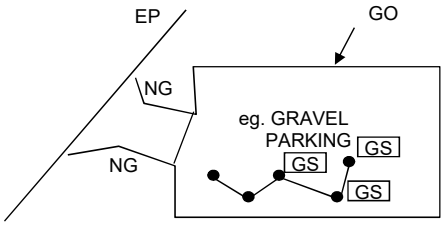
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
FLB	SP-E-VEG-FLB	**B**	**L**	B	B			COLLECT TOP OF BOX AS WELL AS SURROUNDING STRINGS (OG, AS, CS) AS REQ'D ALONG BOTTOM OF BOX AT GROUND	**FLB**
FMP	SP-E-UTL-FMP	**P**	**P**	B	_			COLLECT CENTRE AT GROUND	**FMP**
FN	SP-E-BAR-FN	**P**	**L**	C	C	type		**TYPES MAY INCLUDE** BWF-BARBED WIRE CLF - CHAIN LINK BF - BOARD RF - RAIL PF - PICKET SF - STONE WF - WIRE WMF - WIRE MESH WSF-WIRE SECURITY WIF-WROUGHT IRON EF-ELECTRIC	**FN**
FPP	SP-E-MSC-FPP	**P**	**P**	B	B			COLLECT CENTRE POINT AT CONCRETE LEVEL TOGETHER WITH CO AND ASPHALT OR CONCRETE STRINGS AS REQUIRED	**FPP**

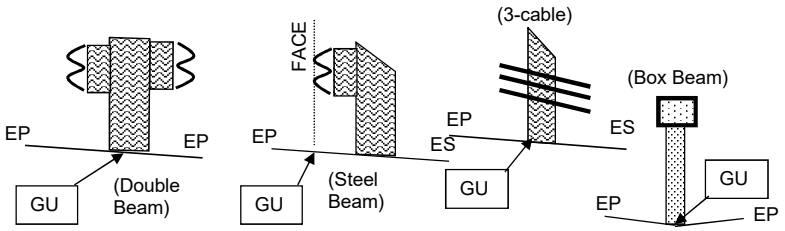
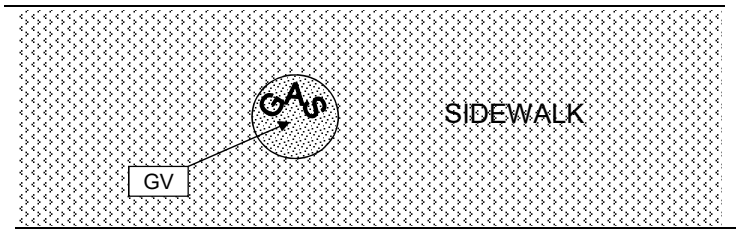
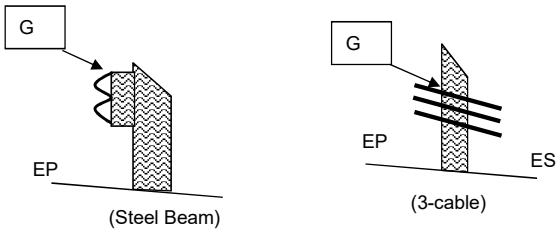
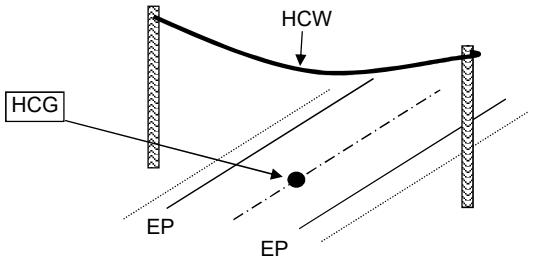
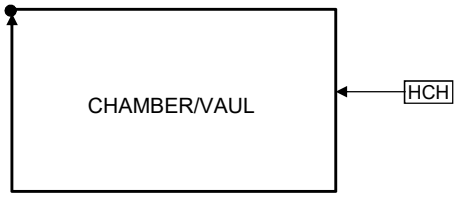
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
FR	SP-E-DRN-FR-Z	**I**	**P**	A	A			ALTERNATELY, JUST SHOW IN DRAINAGE FIELD NOTES	**FR**
GAB	SP-E-MSC-GAB	**B**	**L**	C	C			DETAIL BREAKLINES AND OG AROUND PERIMETER	**GAB**
GAT	SP-E-BAR-GAT	**P**	**L**	C	C	type			**GAT**
GCH	SP-E-UTL-GCH	**P**	**L**	B	_			OUTLINE STRING	**GCH**
GFL	SP-E-RWY-GFL	**P**	**P**	C	C			INDICATE IF BELL INCLUDED.	**GFL**

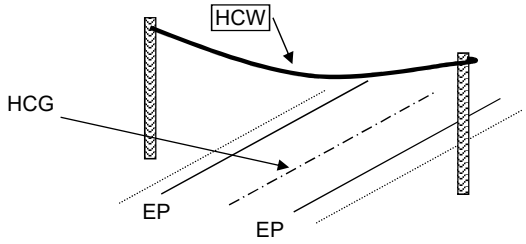
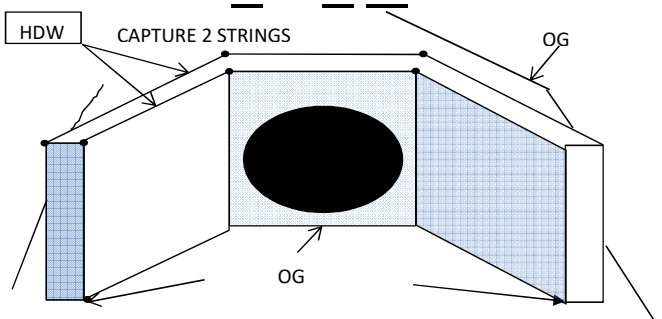
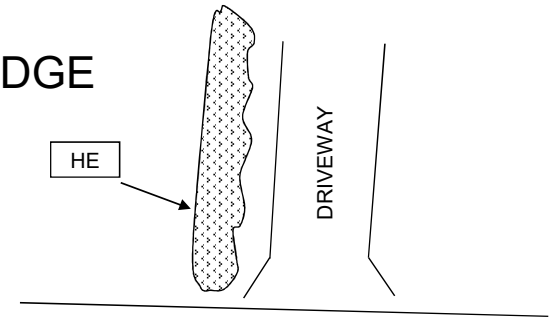
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
GK	SP-E-UTL-GK	**P**	**P**	B	–		GAS KEY 		**GK**
GM	SP-E-UTL-GM	**P**	**P**	B	–		GAS METER 	COLLECT GROUND POINT AT MIDDLE OF METER	**GM**
GO	SP-E-GND-GO	**B**	**L**	B	B	description	GRAVEL OUTLINE 		**GO**
GP	SP-E-BAR-GP-Z	**I**	**P**	A	A	type	GUIDE RAIL - TOP OF POST 	MEASURE TYPICAL POINTS AND WHERE THE HEIGHT CHANGES **TYPES MAY BE:** **SB** - STEEL BEAM **DBL** - DOUBLE BEAM **C3** - 3 CABLE **C6** - 6-CABLE **BB** - BOX BEAM ADD **WC** TO TYPE CODE WHERE THERE IS AN ADDITIONAL CHANNEL CONNECTING POSTS	**GP**
GS	SP-E-GND-GS	**M**	**L**	B	B		GRAVEL STRING 		**GS**

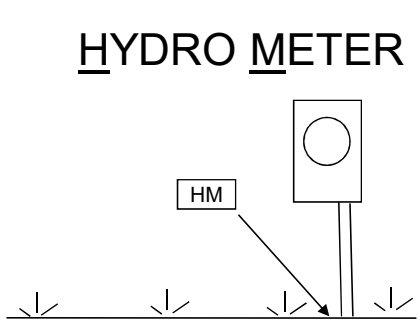
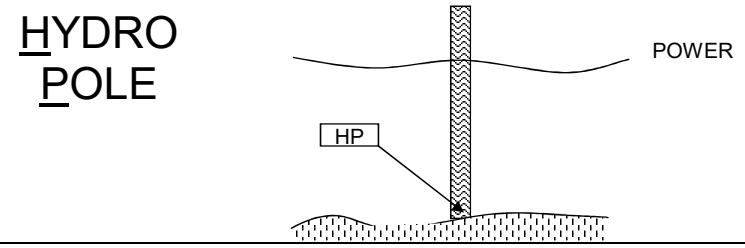
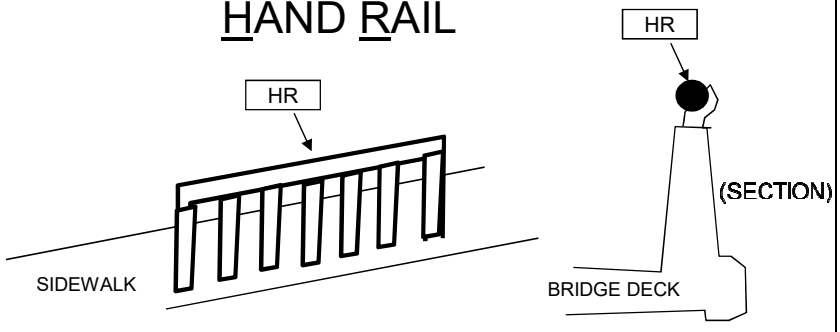
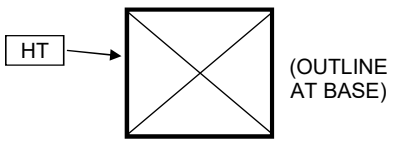
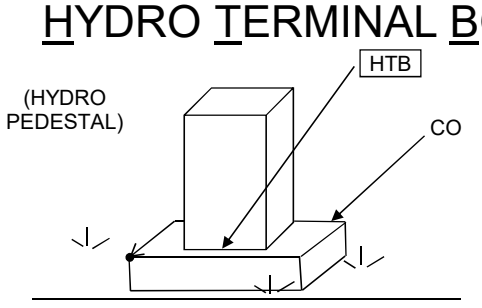
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
GU	SP-E-BAR-GU	**B**	**L**	A	A	type	GUIDE RAIL AT GROUND 	SEE ABOVE COMMENTS FOR DOUBLE BEAM GUIDE RAIL, SURVEY ONLY THE CENTRELINE AND PROVIDE BEAMS' FACE TO FACE DIMENSION.	**GU**
GV	SP-E-UTL-GV	**P**	**P**	B	_		GAS VALVE 		**GV**
GW	SP-E-BAR-GW-Z	**I**	**P**	A	A	type	GUIDE RAIL TOP OF WIRE OR RAIL 	MEASURE AT TYPICAL LOCATIONS, AS WELL AS START AND END.	**GW**
HCG	SP-E-UTL-HCG-Z	**I**	**P**	B	B		HYDRO CROSSING GROUND ELEV 		**HCG**
HCH	SP-E-UTL-HCH	**P**	**L**	B	_		HYDRO CHAMBER 	OUTLINE STRING	**HCH**

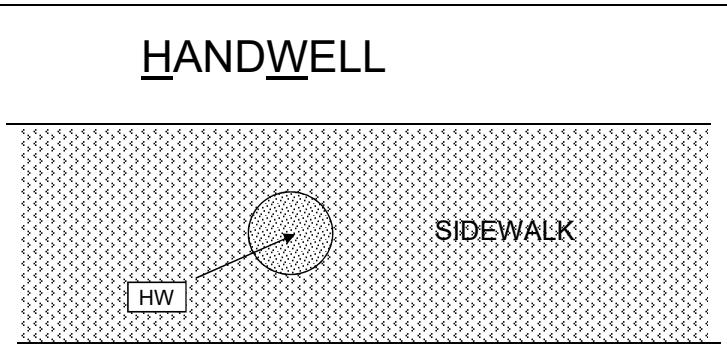
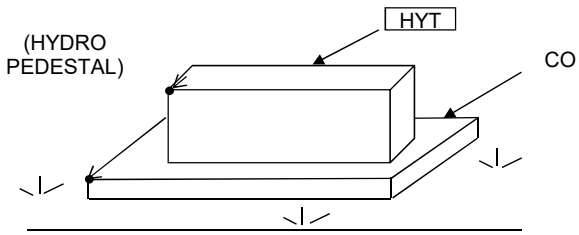
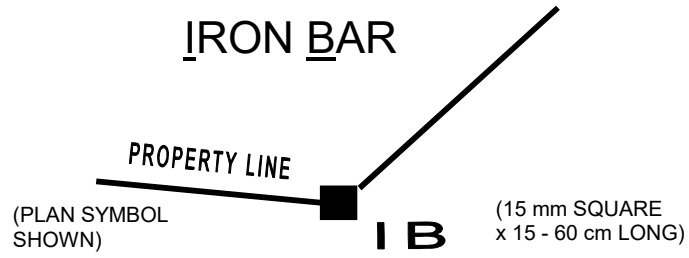
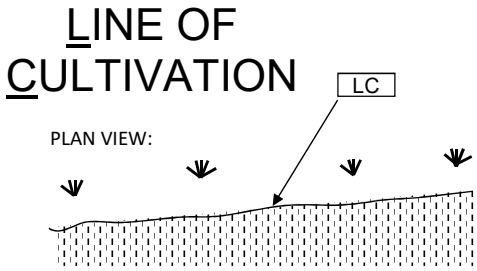
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
HCM	SP-E-MON	**P**	**P**	SP	A	type, number	PRIMARY HORIZONTAL CONTROL MONUMENT  **HCM** 00119673327 (PLAN SYMBOL SHOWN)	TYPE EG. BRASS CAP, PLUG IN ROCK ETC.	**HCM**
HCP	SP-E-MON	**P**	**P**	SP	A	type, number	HORIZONTAL PROJECT CONTROL POINT (PLAN SYMBOL SHOWN)  **HCP** 635 RIB	ALSO KNOWN AS TOTAL STATION POINT.	**HCP**
HCW	SP-E-UTL-HCW-Z	**I**	**P**	B	B		HYDRO CROSSING WIRE ELEV 	CAUTION: MEASURE BY REMOTE MEANS ONLY. DO NOT USE STEEL TAPE.	**HCW**
HDW	SP-E-DRN-HDW	**B**	**L**	B	B		HEAD WALL  CAPTURE **OG** STRINGS ALONG TOP & BOTTOM OF **HDW**	CAPTURE 2 STRINGS: INNER & OUTER, COLLECT SURROUNDING OG STRINGS INCLUDING ONE ALONG THE BOTTOM OF THE HEADWALL	**HDW**
HE	SP-E-VEG-HE	**B**	**L**	C	C	type, height, width	HEDGE 	OUTLINE HEDGE FOR PLOTTING WIDTH TO SCALE	**HE**

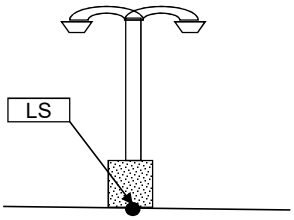
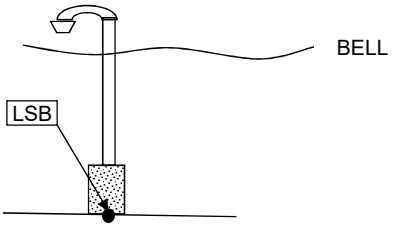
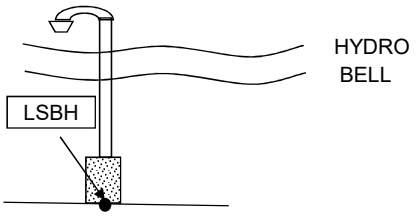
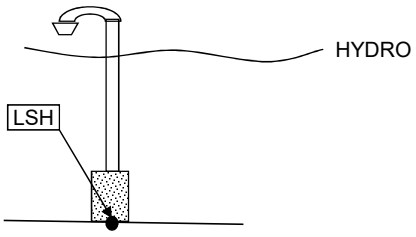
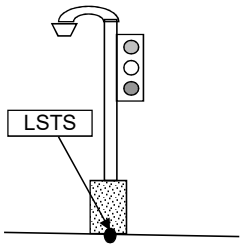
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
HM	SP-E-UTL-HM	**P**	**P**	B	_			MIDDLE OF METER AT GROUND LEVEL	**HM**
HP	SP-E-UTL-HP	**P**	**P**	B	_			CENTRE OF POLE AT GROUND LEVEL	**HP**
HR	SP-E-MSC-HR	**P**	**L**	A	A				**HR**
HT	SP-E-UTL-HT	**P**	**L**	B	_			OUTLINE STRING AT BASE	**HT**
HTB	SP-E-UTL-HTB	**P**	**P**	B	_			COLLECT CENTRE OF BOX. ALSO COLLECT CONCRETE OUTLINE (**CO**) STRING WHERE REQ'D AND SURROUNDING SURFACE STRINGS (OG, AS, CS etc)	**HTB**

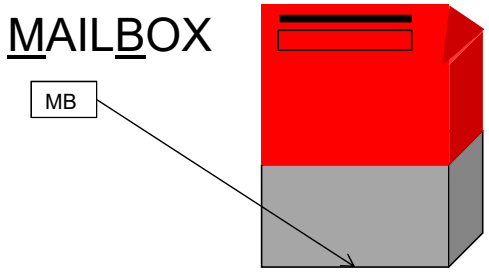
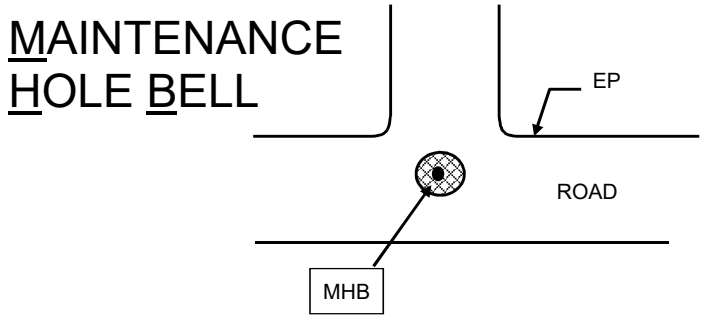
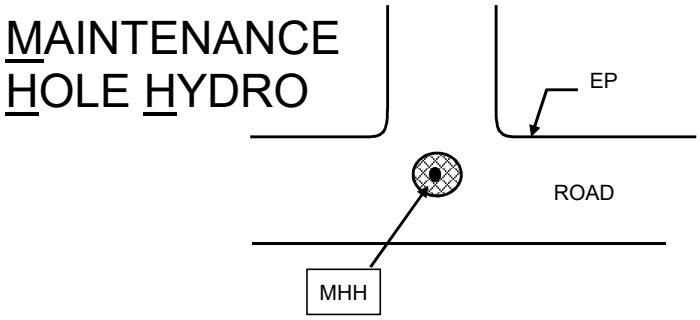
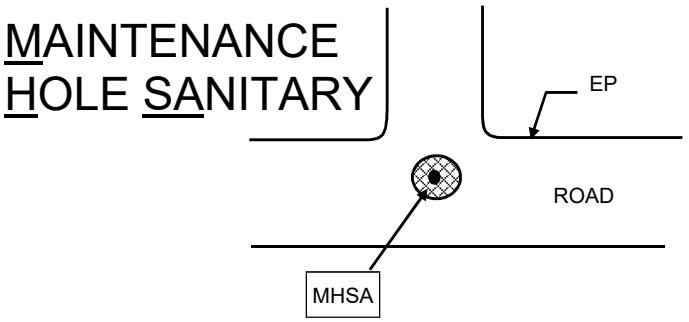
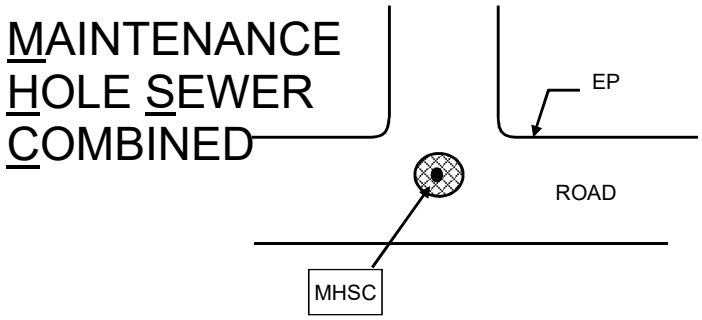
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
HW	SP-E-UTL-HW	**P**	**P**	B	_				**HW**
HYT	SP-E-UTL-HYT	**P**	**L**	B	_			COLLECT OUTLINE STRING OF TRANSFORMER BOX, COLLECT CONCRETE OUTLINE (**CO**) STRING WHERE REQ'D AND COLLECT SURROUNDING GROUND STRING (OG, AS, CS etc)	**HYT**
IB	SP-E-MON	**P**	**P**	A	A				**IB**
LC	SP-E-VEG-LC	**B**	**L**	C	C				**LC**
LMSC	SP-E-MSC-LMSC	**M**	**L**	A	A				**LMSC**

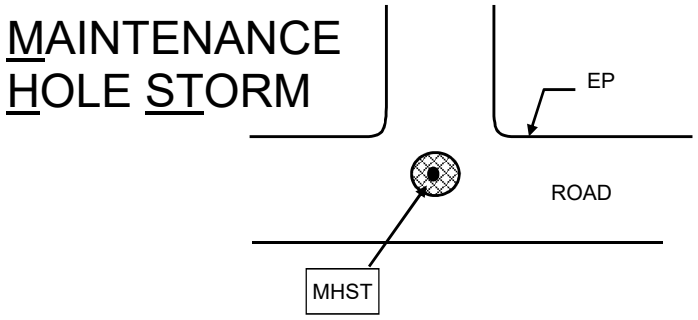
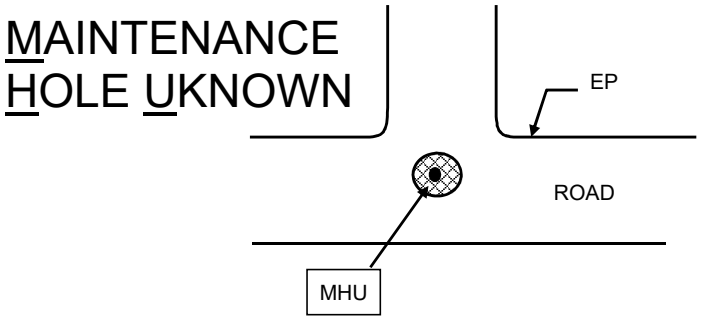
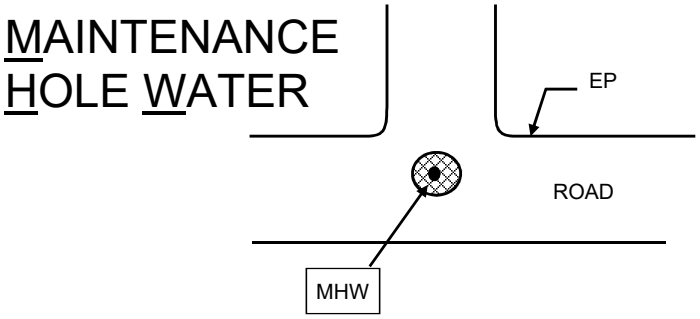
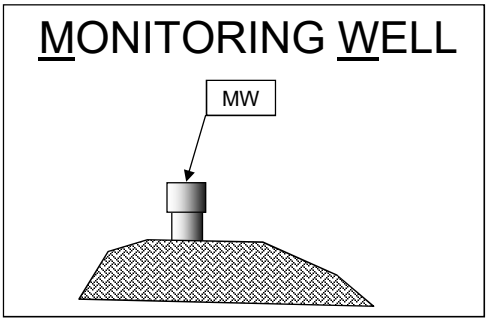
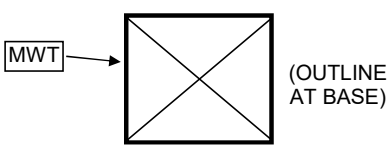
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
LS	SP-E-UTL-LS	**P**	**P**	B	_	description	LIGHT STANDARD 	COLLECT CENTRE OF POLE AT GROUND. NOTE ESPECIALLY IF SINGLE/DOUBLE OR HIGH MAST TYPE ETC.	**LS**
LSB	SP-E-UTL-LSB	**P**	**P**	B	_	description	LIGHT STANDARD BELL 	COLLECT CENTRE OF POLE AT GROUND. NOTE ESPECIALLY IF SINGLE/DOUBLE OR HIGH MAST TYPE ETC.	**LSB**
LSBH	SP-E-UTL-LSBH	**P**	**P**	B	_	description	LIGHT STANDARD BELL & HYDRO 	COLLECT CENTRE OF POLE AT GROUND. NOTE ESPECIALLY IF SINGLE/DOUBLE OR HIGH MAST TYPE ETC.	**LSBH**
LSH	SP-E-UTL-LSH	**P**	**P**	B	_	description	LIGHT STANDARD HYDRO 	COLLECT CENTRE OF POLE AT GROUND. NOTE ESPECIALLY IF SINGLE/DOUBLE OR HIGH MAST TYPE ETC.	**LSH**
LSTS	SP-E-UTL-LSTS	**P**	**P**	B	_	description	LIGHT STANDARD TRAFFIC SIGNAL 	COLLECT CENTRE OF POLE AT GROUND. NOTE ESPECIALLY IF SINGLE/DOUBLE OR HIGH MAST TYPE ETC.	**LSTS**

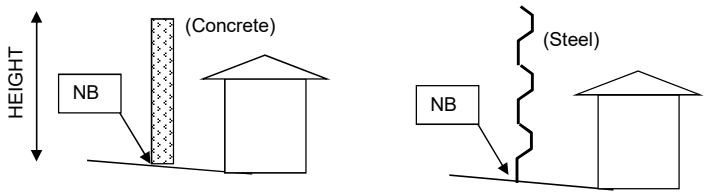
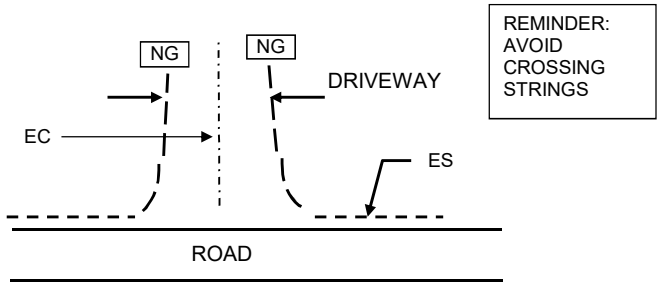
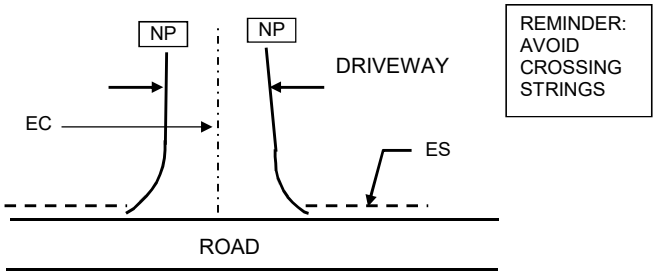
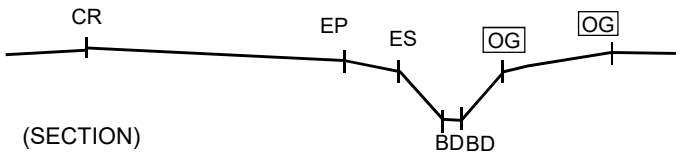
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
MB	SP-E-MSC-MB	**P**	**P**	C	C	shape, size		COLLECT CENTRE AT GROUND LEVEL	**MB**
MHB	SP-E-UTL-MHB	**P**	**P**	A	A			WHERE REQUIRED, ALSO SKETCH LOCATION,OFFSET, AND DIAMETER OF INVERTS AND SUBDRAIN, AND DIMENSIONS OF STRUCTURE	**MHB**
MHH	SP-E-UTL-MHH	**P**	**P**	A	A			WHERE REQUIRED, ALSO SKETCH LOCATION,OFFSET, AND DIAMETER OF INVERTS AND SUBDRAIN, AND DIMENSIONS OF STRUCTURE	**MHH**
MHSA	SP-E-UTL-MHSA	**P**	**P**	A	A			WHERE REQUIRED, ALSO SKETCH LOCATION,OFFSET, AND DIAMETER OF INVERTS AND SUBDRAIN, AND DIMENSIONS OF STRUCTURE	**MHSA**
MHSC	SP-E-UTL-MHSC	**P**	**P**	A	A			WHERE REQUIRED, ALSO SKETCH LOCATION,OFFSET, AND DIAMETER OF INVERTS AND SUBDRAIN, AND DIMENSIONS OF STRUCTURE	**MHSC**

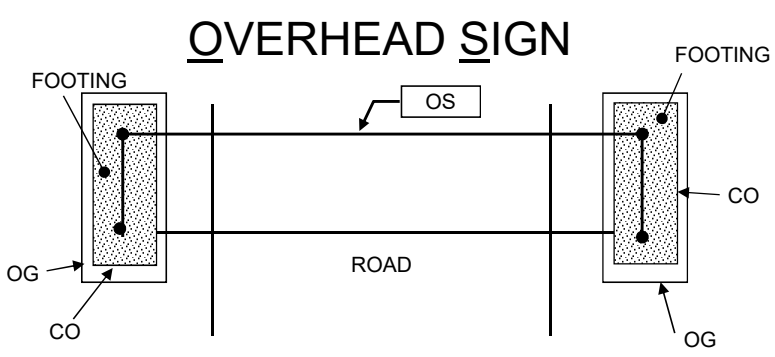
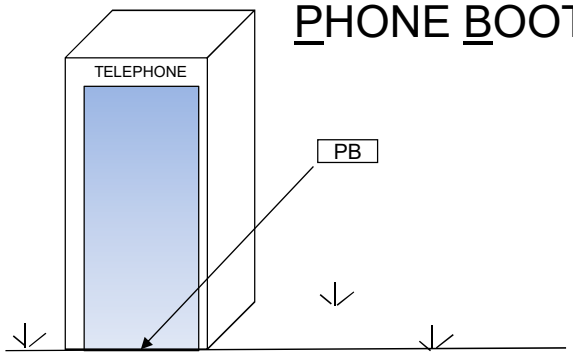
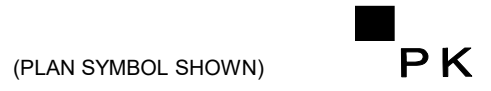
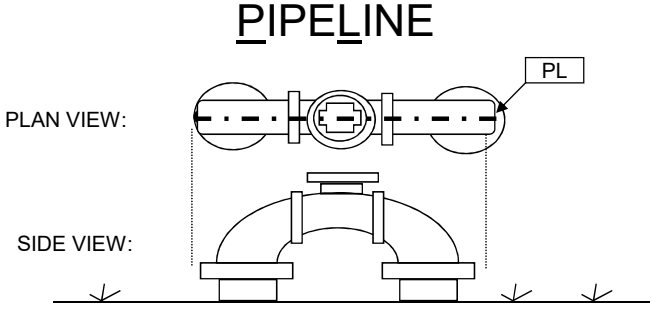
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
MHST	SP-E-UTL-MHST	**P**	**P**	A	A			WHERE REQUIRED, ALSO SKETCH LOCATION,OFFSET, AND DIAMETER OF INVERTS AND SUBDRAIN, AND DIMENSIONS OF STRUCTURE	**MHST**
MHU	SP-E-UTL-MHU	**P**	**P**	A	A			WHERE REQUIRED, ALSO SKETCH LOCATION,OFFSET, AND DIAMETER OF INVERTS AND SUBDRAIN, AND DIMENSIONS OF STRUCTURE	**MHU**
MHW	SP-E-UTL-MHW	**P**	**P**	A	A			WHERE REQUIRED, ALSO SKETCH LOCATION,OFFSET, AND DIAMETER OF INVERTS AND SUBDRAIN, AND DIMENSIONS OF STRUCTURE	**MHW**
MW	SP-E-UTL-MW	**P**	**P**	A	_	diameter		ATTRIBUTE DIAMETER	**MW**
MWT	SP-E-UTL-MWT	**P**	**L**	B	_			COLLECT OUTLINE STRING AT BASE	**MWT**

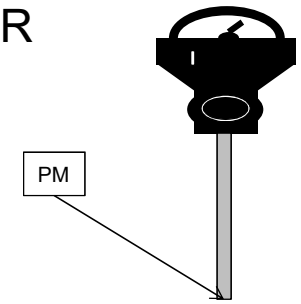
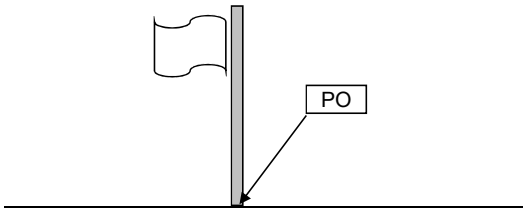
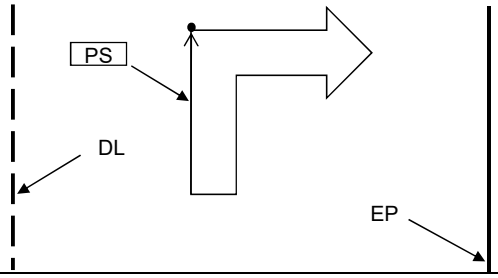
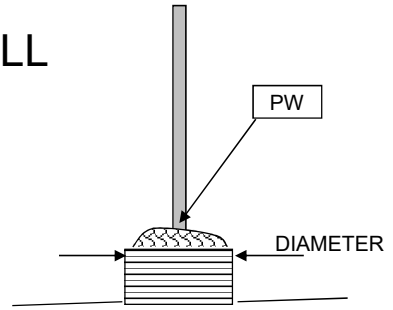
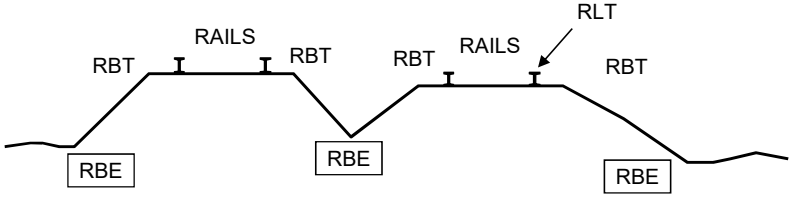
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
NB	SP-E-BAR-NB	**B**	**L**	A	A	type, height	NOISE BARRIER (AT GROUND) 	TYPE MAY BE C - CONCRETE M - METAL	**NB**
NG	SP-E-RDS-NG	**B**	**L**	B	B		ENTRANCE -GRAVEL 	SEE ALSO GROUND FEATURE EC	**NG**
NP	SP-E-RDS-NP	**B**	**L**	A	A		ENTRANCE - PAVED 	SEE ALSO GROUND FEATURE EC	**NP**
OG	SP-E-GND-OG	**M**	**L**	C	C		ORIGINAL GROUND LINE 	OG BREAKLINES SHOULD BE TRACED APPROXIMATELY PARALLEL TO THE HIGHWAY LABEL EARTH CUTS.	**OG**

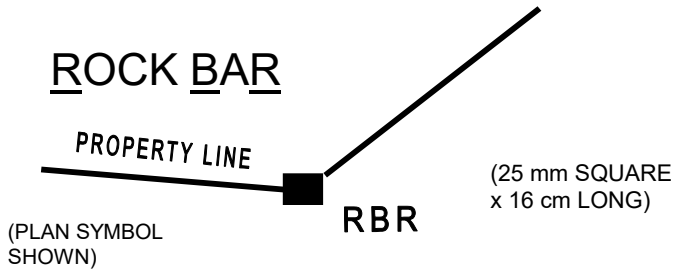
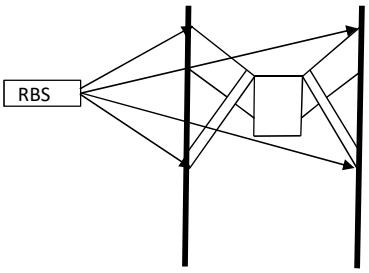
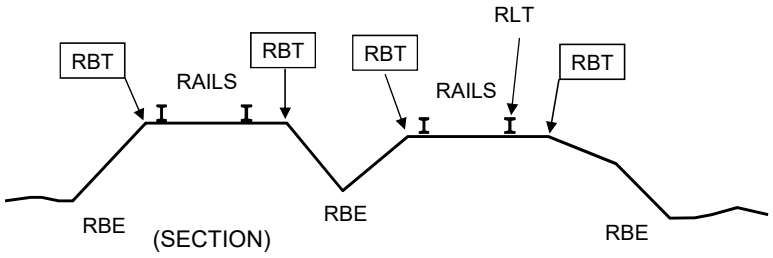
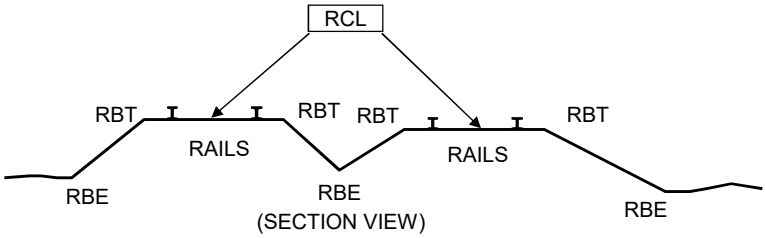
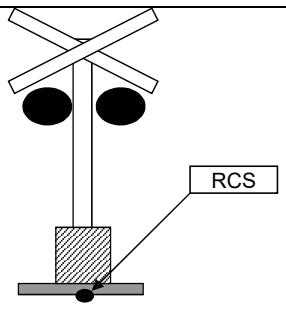
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
OS	SP-E-MSC-OS	**P**	**L**	C	–			CO ON TOP OF FOOTING OG AROUND FOOTING AT GROUND LEVEL	**OS**
PB	SP-E-UTL-PB	**P**	**L**	B	–	size, type (booth, wall-type)		COLLECT CENTRE	**PB**
PK	SP-E-MON	**P**	**P**	A	A	type		SPECIFY TYPE	**PK**
PL	SP-E-UTL-PL	**P**	**L**	B	B	type, diameter			**PL**

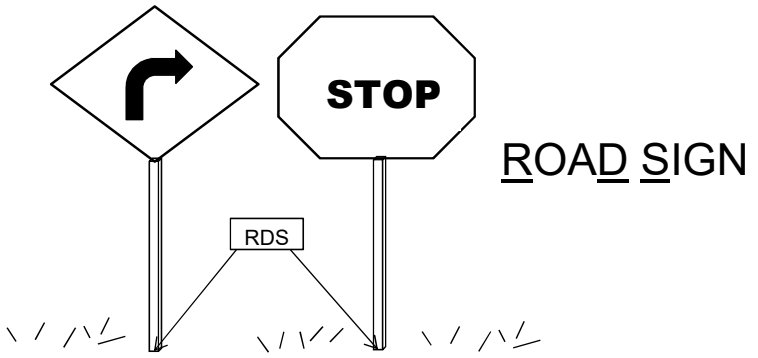
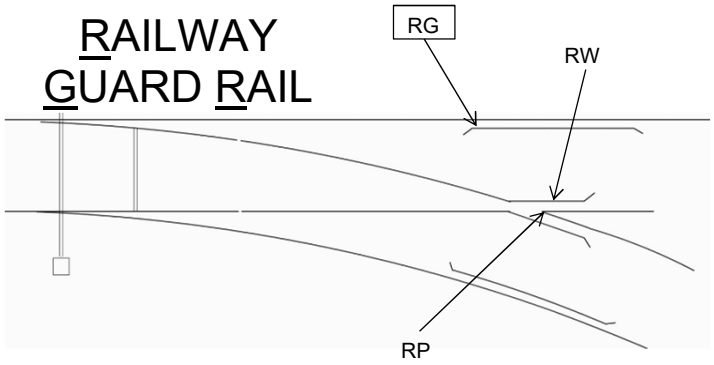
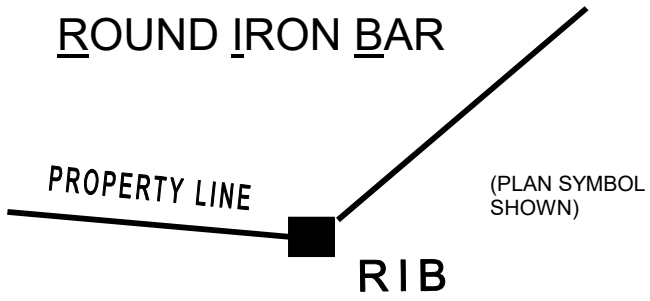
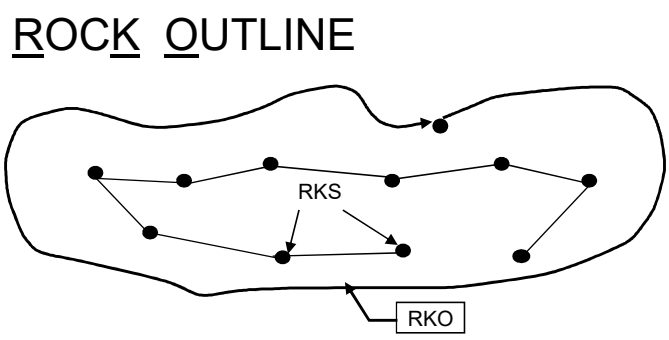
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
PM	SP-E-MSC-PM	**P**	**P**	C	C		PARKING METER 	COLLECT CENTRE AT GROUND LEVEL	**PM**
PO	SP-E-UTL-PO	**P**	**P**	B	_	type	POLE - OTHER 	COLLECT CENTRE AT GROUND LEVEL	**PO**
PS	SP-E-RDS-PS	**B**	**L**	A	A	type	PAINTED STRIPING 	FOR FEATURES OTHER THAN **EP** OR **DL**: ARROWS, CROSSWALKS, CHEVRONS. COLLECT STRING OUTLINE, AVOID CROSSING STRINGS	**PS**
PW	SP-E-UTL-PW	**P**	**P**	C	_	crib diameter	POLE WELL 	COLLECT CENTRE AND CRIB DIAMETER	**PW**
RBE	SP-E-RWY-RBE	**B**	**L**	C	C		 RAILWAY BALLAST EDGE (SECTION)	NOTE THAT RAILWAY AUTHORITY MAY HAVE TO BE CONTACTED FOR PERMIT OR FLAGMAN REQUIREMENTS FOR SAFETY PURPOSES	**RBE**

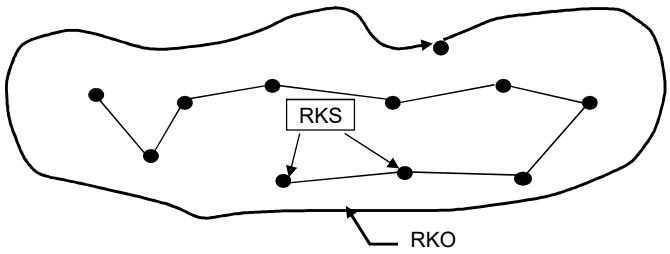
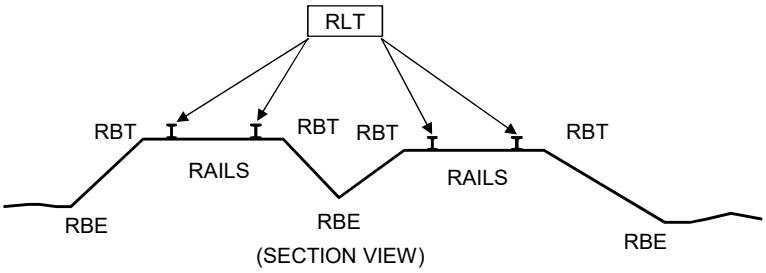
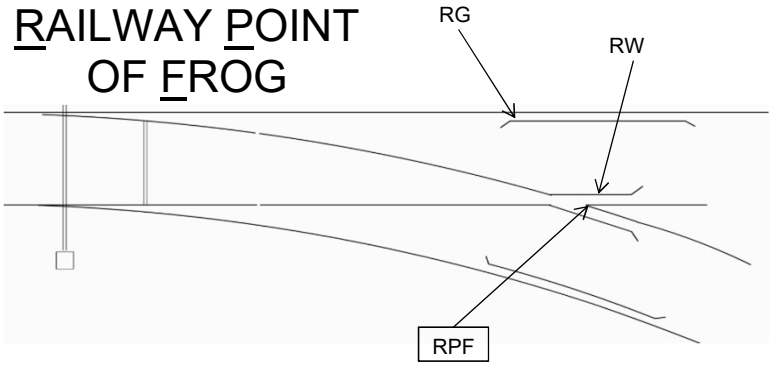
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
RBR	SP-E-MON	**P**	**P**	A	A				**RBR**
RBS	SP-E-RWY-RBS	**P**	**L**	B	_		 RAILWAY BUFFER STOP	COLLECT OUTLINE STRING AT CORNERS. NOTE THAT RAILWAY AUTHORITY MAY HAVE TO BE CONTACTED FOR PERMIT OR FLAGMAN REQUIREMENTS FOR SAFETY PURPOSES	**RBS**
RBT	SP-E-RWY-RBT	**M**	**L**	C	C		RAILWAY BALLAST TOP 	NOTE THAT RAILWAY AUTHORITY MAY HAVE TO BE CONTACTED FOR PERMIT OR FLAGMAN REQUIREMENTS FOR SAFETY PURPOSES	**RBT**
RCL	SP-E-RWY-RCL	**M**	**L**	B	B		RAILWAY CENTRELINE 	COLLECT STRING ON TOP OF TIES/SLEEPERS	**RCL**
RCS	SP-E-RWY-RCS	**P**	**P**	C	C		RAILWAY CROSSING SIGN 	COLLECT CENTRE AT GROUND LEVEL	**RCS**

Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
RDS	SP-E-RDS-RDS	**P**	**P**	C	C	type		COLLECT CENTRE OF POST AT GROUND AND SPECIFY TYPE (STOP, SPEED, PARKING, CURVE ETC.)	**RDS**
RGR	SP-E-RWY-RGR	**P**	**L**	A	A			COLLECT AS STRING IN SAME MANNER AS RLT. NOTE THAT RAILWAY AUTHORITY MAY HAVE TO BE CONTACTED FOR PERMIT OR FLAGMAN REQUIREMENTS FOR SAFETY PURPOSES	**RGR**
RIB	SP-E-MON	**P**	**P**	A	A	size		PROVIDE DIAMETER	**RIB**
RKO	SP-E-GND-RKO	**B**	**L**	B	B				**RKO**

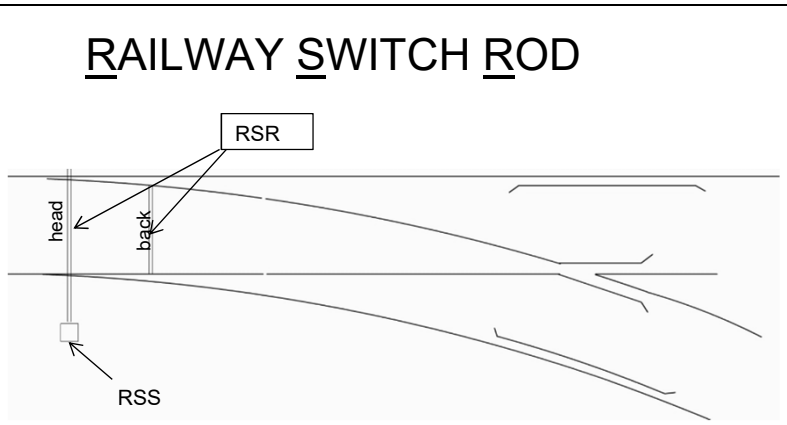
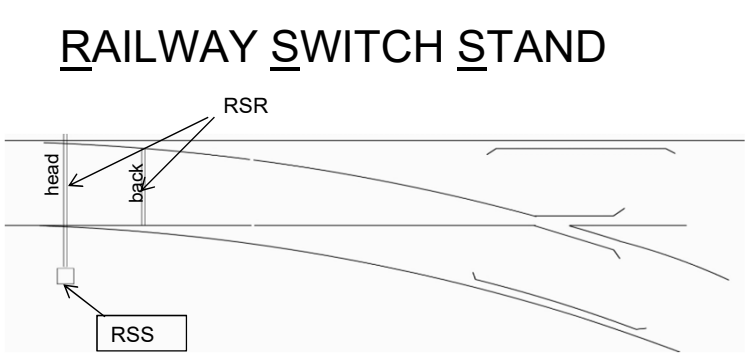
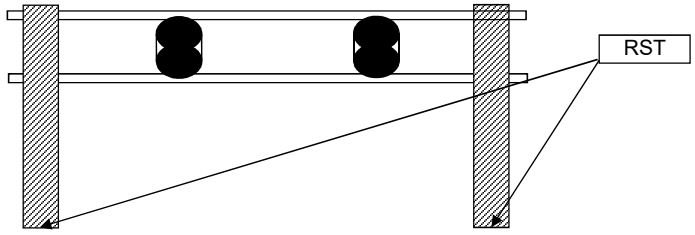
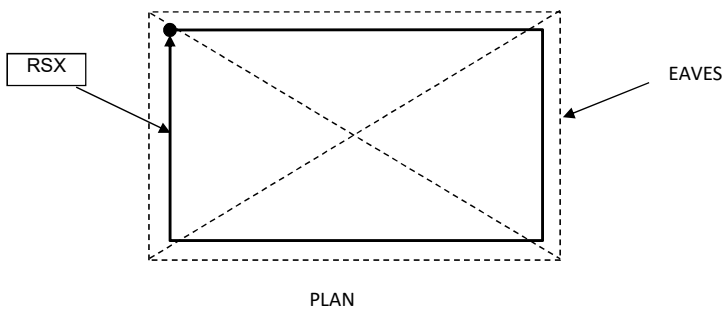
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
RKS	SP-E-GND-RKS	**M**	**L**	B	B		ROCK STRING 		**RKS**
RLS	SP-E-RWY-RLS	**P**	**P**	C	C		RAILWAY SIGN / SIGNAL 	RAILWAY SIGN OR SIGNAL: COLLECT CENTRE AT GROUND LEVEL. NOTE THAT RAILWAY AUTHORITY MAY HAVE TO BE CONTACTED FOR PERMIT OR FLAGMAN REQUIREMENTS FOR SAFETY PURPOSES	**RLS**
RLT	SP-E-RWY-RLT	**P**	**L**	A	A		RAILWAY TOP OF RAILS 	NOTE THESE ARE STRING FEATURES. NOTE THAT RAILWAY AUTHORITY MAY HAVE TO BE CONTACTED FOR PERMIT OR FLAGMAN REQUIREMENTS FOR SAFETY PURPOSES	**RLT**
RPF	SP-E-RWY-RPF	**P**	**P**	A	A		RAILWAY POINT OF FROG 	NOTE THAT RAILWAY AUTHORITY MAY HAVE TO BE CONTACTED FOR PERMIT OR FLAGMAN REQUIREMENTS FOR SAFETY PURPOSES	**RPF**

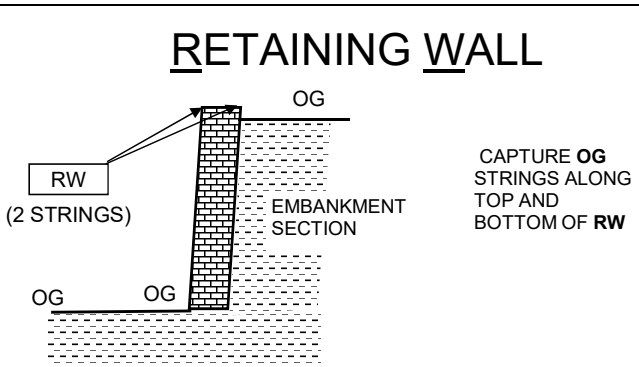
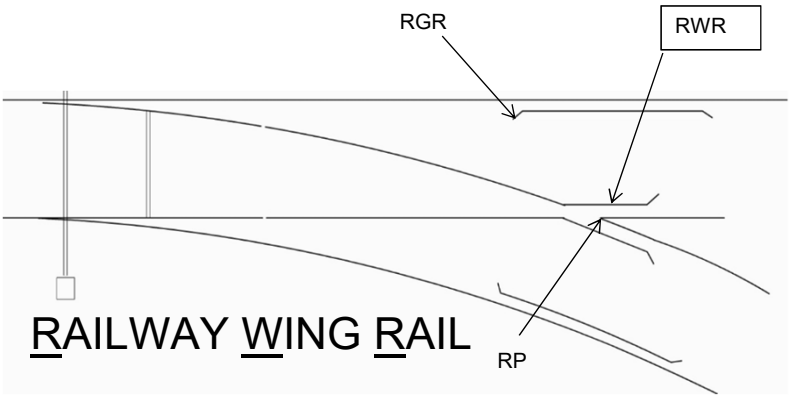
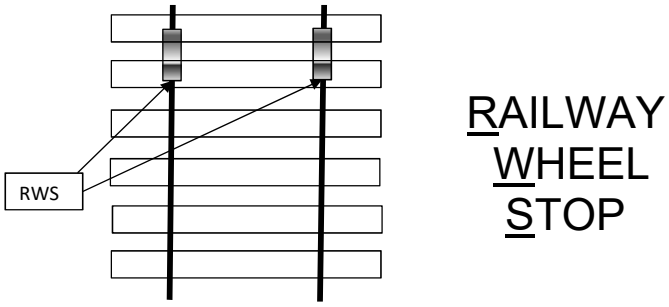
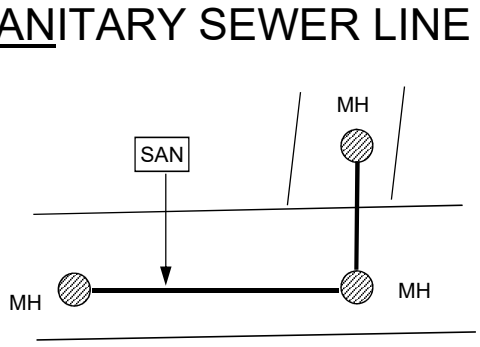
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
RPL	SP-E-MON	**P**	**P**	A	A		ROCK PLUG PROPERTY LINE RPL (PLAN SYMBOL SHOWN) (>= 15 mm SQUARE OR ROUND AND >= 7 cm LONG)		**RPL**
RPO	SP-E-MON	**P**	**P**	A	A		ROCK POST PROPERTY LINE RPO (PLAN SYMBOL SHOWN) (>= 15 mm SQUARE OR ROUND AND >= 7 cm LONG WITH IDENTIFICATION CAP)	RP is designation by monumentation regulation	**RPO**
RR	SP-E-DRN-RR	**B**	**L**	C	C		RIP - RAP OUTLINE RR OG DIGITIZE OUTLINE		**RR**
RS	SP-E-RDS-RS	**B**	**L**	B	B	material	RIPPLE STRIP EP RS CR EP	THIS IS A SLIGHTLY RAISED, GROOVED AREA IN PAVEMENT, OFTEN MADE OF CONCRETE. STRING OUTLINE AT PAVEMENT GRADE	**RS**
RSB	SP-E-RWY-RSB	**P**	**L**	A	A		RAILWAY SWITCH BLADE RSB toe heel RP	COLLECT AS STRING IN SAME MANNER AS RLT. PICKUP MIN. THREE POINTS IF CURVED. NOTE THAT RAILWAY AUTHORITY MAY HAVE TO BE CONTACTED FOR PERMIT OR FLAGMAN REQUIREMENTS FOR SAFETY PURPOSES	**RSB**

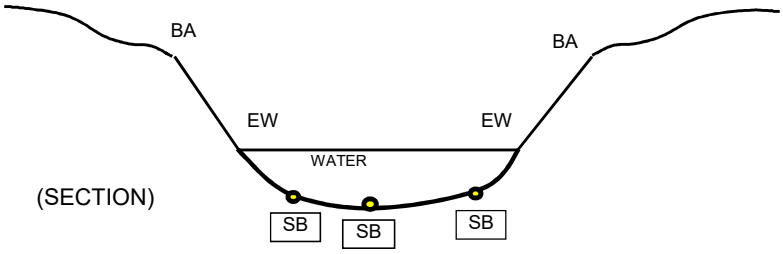
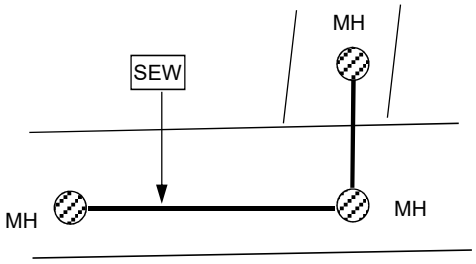
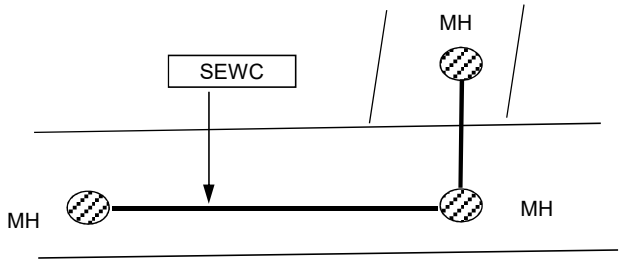
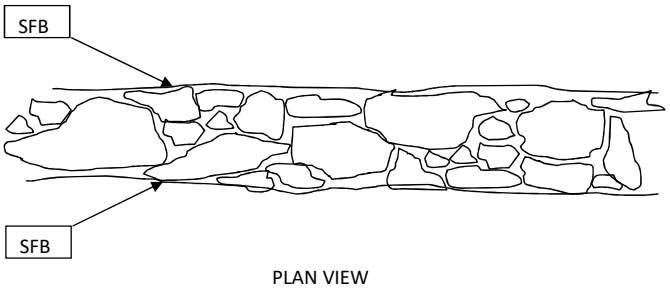
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
RSR	SP-E-RWY-RSR	**P**	**L**	B	B	head or back		NOTE THAT RAILWAY AUTHORITY MAY HAVE TO BE CONTACTED FOR PERMIT OR FLAGMAN REQUIREMENTS FOR SAFETY PURPOSES	**RSR**
RSS	SP-E-RWY-RSS	**P**	**P**	C	C	dimensions		COLLECT CENTRE AT GROUND LEVEL. NOTE THAT RAILWAY AUTHORITY MAY HAVE TO BE CONTACTED FOR PERMIT OR FLAGMAN REQUIREMENTS FOR SAFETY PURPOSES	**RSS**
RST	SP-E-RWY-RST	**P**	**P**	B	B	post dimensions		COLLECT CENTRES AT GROUND LEVEL. NOTE OVERHEAD CONNECTION. NOTE THAT RAILWAY AUTHORITY MAY HAVE TO BE CONTACTED FOR PERMIT OR FLAGMAN REQUIREMENTS FOR SAFETY PURPOSES	**RST**
RSX	SP-E-RWY-RSX	**B**	**L**	B	B			COLLECT BUILDING OUTLINE STRING. NOTE THAT RAILWAY AUTHORITY MAY HAVE TO BE CONTACTED FOR PERMIT OR FLAGMAN REQUIREMENTS FOR SAFETY PURPOSES	**RSX**

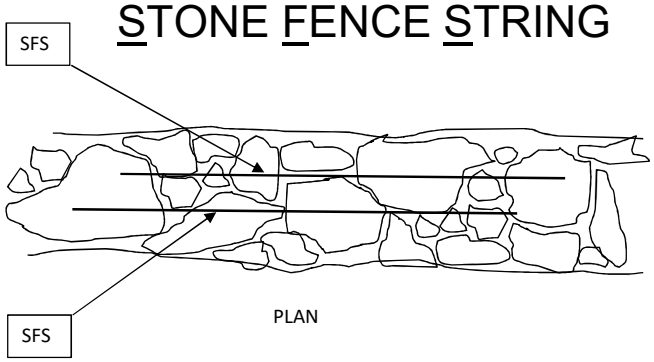
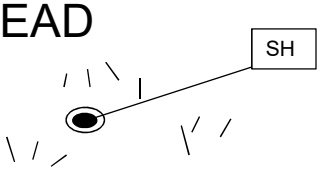
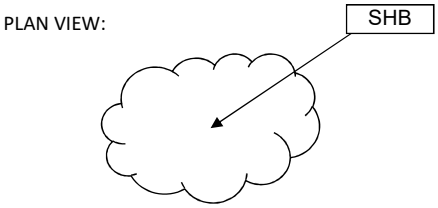
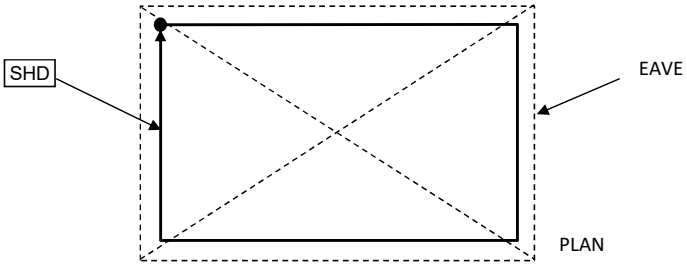
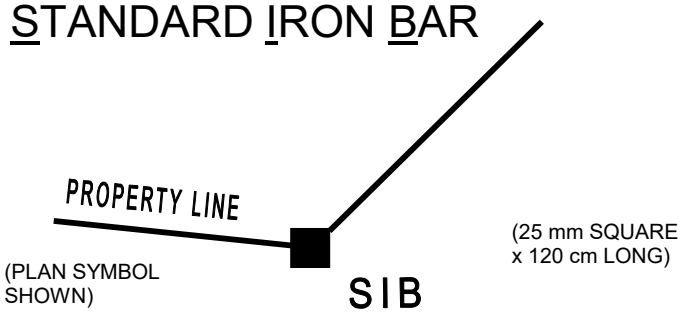
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
RW	SP-E-MSC-RW	**B**	**L**	A	A	type		TYPE COULD INCLUDE RECO (RE-INFORCED CONCRETE SECTIONS) CONC (CONCRETE) STONE, WOOD, OR BRICK	**RW**
RWR	SP-E-RWY-RWR	**P**	**L**	A	A			COLLECT AS STRING IN SAME MANNER AS RWT. NOTE THAT RAILWAY AUTHORITY MAY HAVE TO BE CONTACTED FOR PERMIT OR FLAGMAN REQUIREMENTS FOR SAFETY PURPOSES	**RWR**
RWS	SP-E-RWY-RWS	**P**	**P**	C	C	dimensions		COLLECT IN MIDDLE OF RAIL AT TRAVELLED RAIL SIDE. NOTE THAT RAILWAY AUTHORITY MAY HAVE TO BE CONTACTED FOR PERMIT OR FLAGMAN REQUIREMENTS FOR SAFETY PURPOSES	**RWS**
SAN	SP-E-DRN-SAN	**P**	**L**	B	B	size & type		PIPE DETAILS NORMALLY NOT REQUIRED FROM FIELD SURVEY, BUT SEE TERMS OF REFERENCE. DO NOT ACCESS WITHOUT SAFETY PRECAUTIONS.	**SAN**

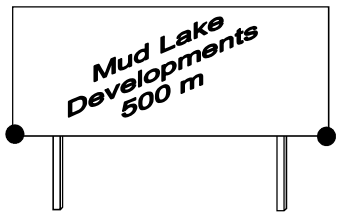
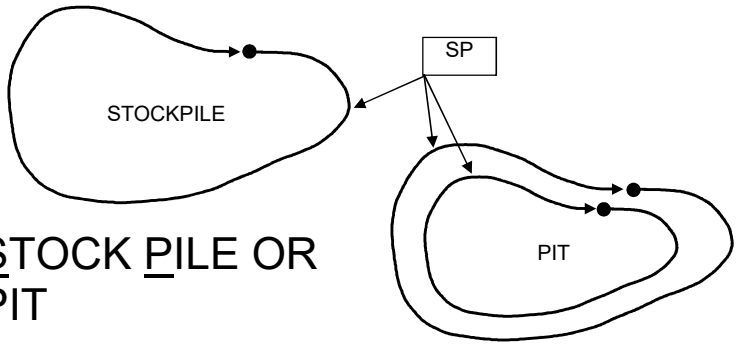
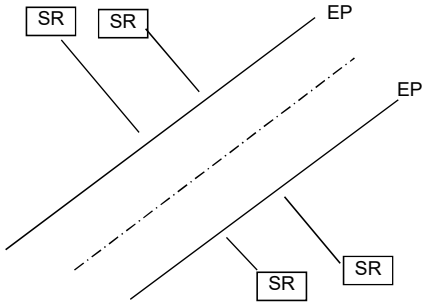
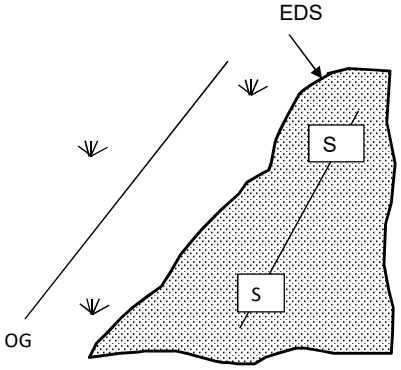
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
SB	SP-E-GND-SB	**M**	**L**	C	C		STREAM BED 	USE SB CODE TO DETERMINE UNDERWATER SURFACE	**SB**
SEW	SP-E-DRN-SEW	**P**	**L**	B	B	size & type	STORM SEWER LINE 	PIPE DETAILS NORMALLY NOT REQUIRED FROM FIELD SURVEY, BUT SEE TERMS OF REFERENCE. DO NOT ENTER WITHOUT SAFETY PRECAUTIONS.	**SEW**
SEWC	SP-E-DRN-SEWC	**P**	**L**	B	B	size & type	SEWER COMBINED LINE 	PIPE DETAILS NORMALLY NOT REQUIRED FROM FIELD SURVEY, BUT SEE TERMS OF REFERENCE. DO NOT ENTER WITHOUT SAFETY PRECAUTIONS.	**SEWC**
SFB	SP-E-BAR-SFB	**B**	**L**	C	C		STONE FENCE BOTTOM  PLAN VIEW		**SFB**

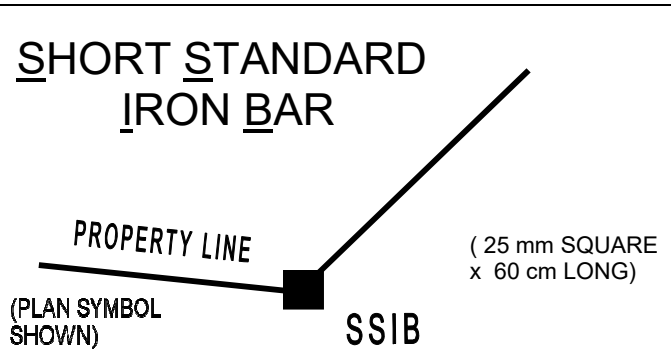
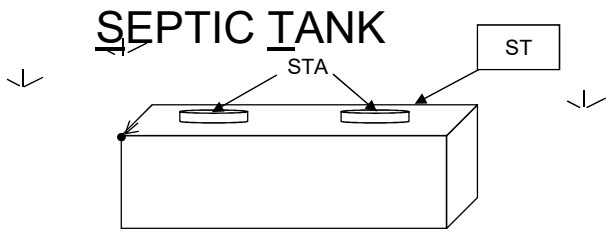
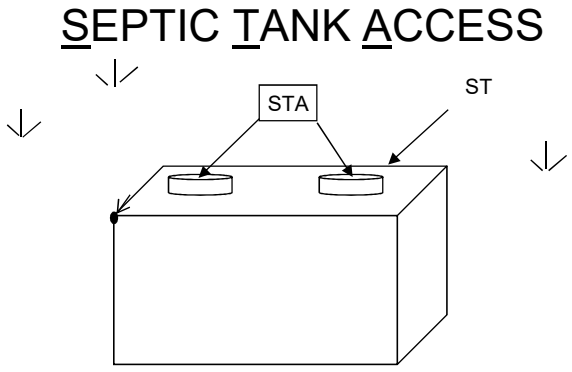
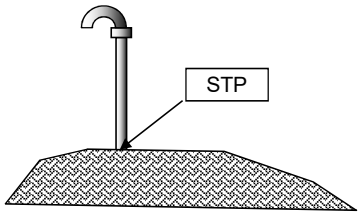
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
SFS	SP-E-BAR-SFS	**M**	**L**	C	C		STONE FENCE STRING 	LINE FEATURE. SHOOT TWO ENDS	**SFS**
SH	SP-E-UTL-SH	**P**	**P**	B	–		SPRINKLER HEAD 	COLLECT AS 2 STRINGS WITH COMPLEMENTARY **OG** AND **SFS** STRINGS	**SH**
SHB	SP-E-VEG-SHB	**P**	**P**	C	–		SHRUB 		**SHB**
SHD	SP-E-MSC-SHD	**P**	**L**	*	–	description	SHED 	COLLECT AT CENTRE	**SHD**
SIB	SP-E-MON	**P**	**P**	A	A		STANDARD IRON BAR 	COLLECT CENTRE AT GROUND LEVEL	**SIB**

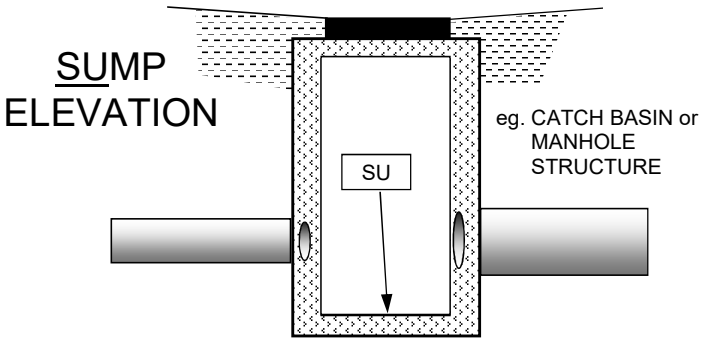
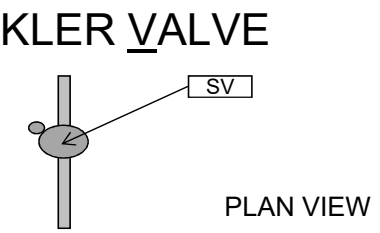
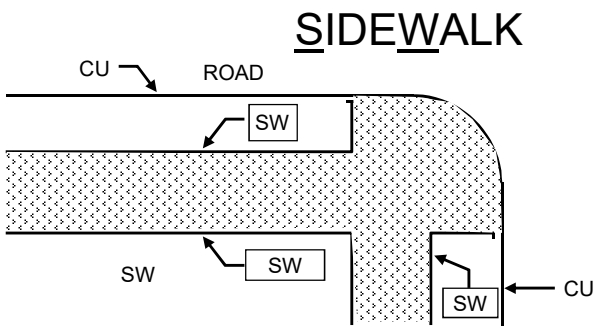
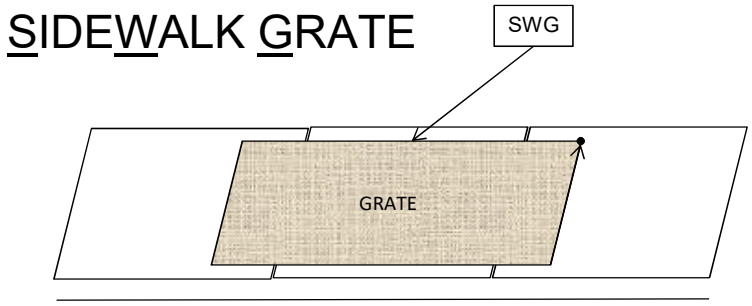
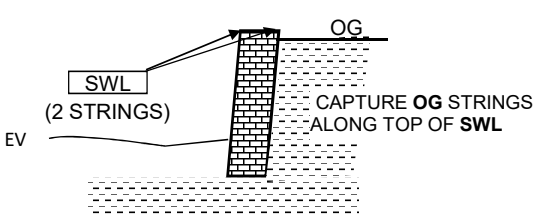
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
SIGN	SP-E-MSC-SIGN	**P**	**L**	C	_		COMMERCIAL SIGN 	* ACCURACY TO REFLECT SURROUNDING SURFACE: EITHER A or B. COLLECT SURFACE STRINGS (OG, AS, CS etc) FOR DTM IN CLOSE PROXIMITY TO OR IN THE SAME PLACE AS THE SHED OUTLINE	**SIGN**
SP	SP-E-GND-SP	**B**	**L**	C	C	description	STOCK PILE OR PIT 	DESCRIBE MATERIAL IF A PILE, OR SHOW ON FIELD NOTES EG. TOPSOIL TRAP ROCK	**SP**
SR	SP-E-RDS-SR	**B**	**L**	A	A		SIDEROAD - PAVED 		**SR**
SS	SP-E-GND-SS	**M**	**L**	C	C		SAND STRING 	COLLECT COMPLEMENTARY **OG** AND **SS** STRINGS	**SS**

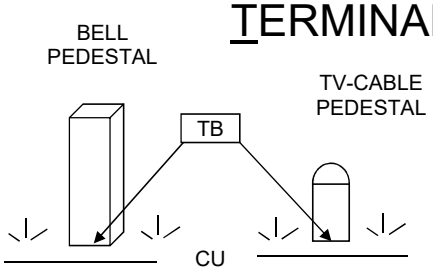
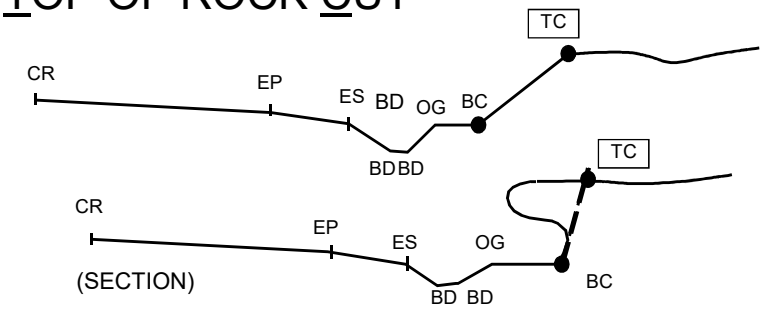
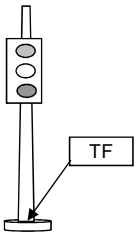
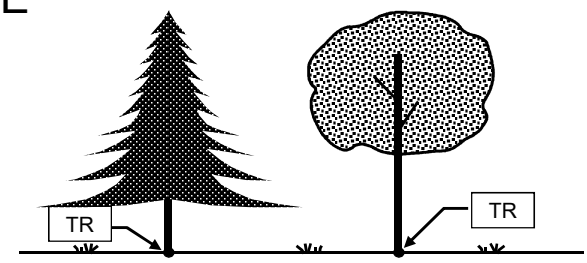
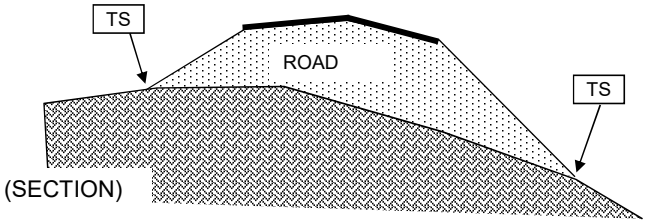
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
SSIB	SP-E-MON	**P**	**P**	A	A				**SSIB**
ST	SP-E-UTL-ST	**P**	**L**	B	_			COLLECT OUTLINE STRING AT TOP	**ST**
STA	SP-E-UTL-STA	**P**	**P**	B	_			COLLECT CENTRE POINTS	**STA**
STP	SP-E-UTL-STP	**P**	**P**	B	_			COLLECT CENTRE OF POINT AT GROUND	**STP**

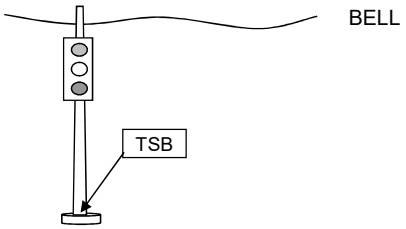
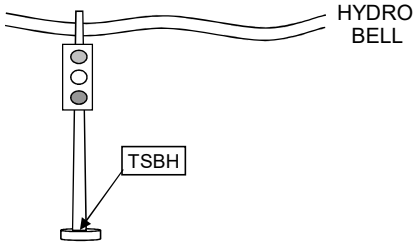
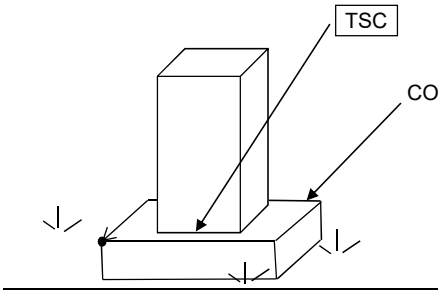
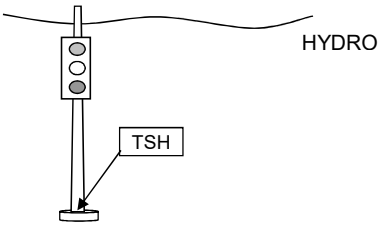
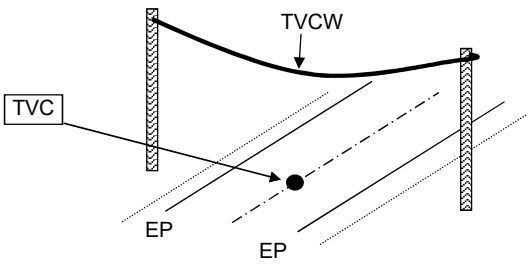
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
SU	SP-E-DRN-SU-Z	**I**	**P**	B	B			NORMALLY NOT REQUIRED, BUT SEE TERMS OF REFERENCE. NOTE ALSO THAT THERE MAY BE CONCRETE "BENCHING" BELOW PIPE INVERTS. IF SO, INDICATE IN DETAIL NOTES. OBSERVE PROPER SAFETY PRACTICES.	**SU**
SV	SP-E-UTL-SV	**P**	**P**	B	_				**SV**
SW	SP-E-MSC-SW	**B**	**L**	A	A	type		EDGES TO BE TRACED. FOR TYPE, INCLUDE DESCRIPTION OF MATERIAL	**SW**
SWG	SP-E-MSC-SWG	**B**	**L**	A	A			COLLECT OUTLINE STRING	**SWG**
SWL	SP-E-BAR-SWL	**B**	**L**	A	A	type		COLLECT TWO STRINGS ALONG TOP WITH COMPLEMENTARY **OG** STRINGS AND **EV** AS REQ'D. ATTRIBUTE CONSTRUCTION TYPE: CONCRETE, STONE ETC.	**SWL**

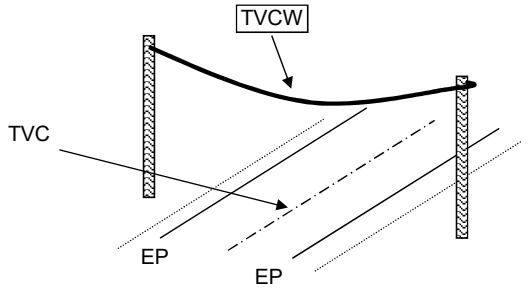
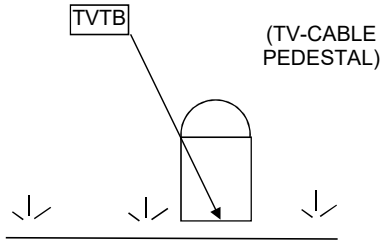
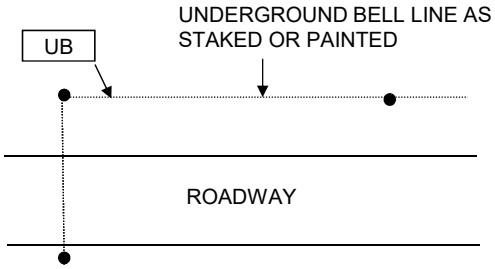
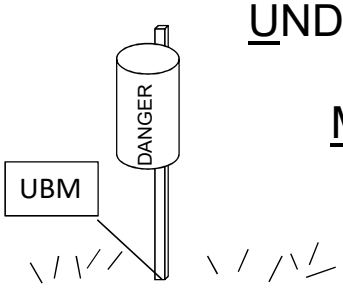
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
TB	SP-E-UTL-TB	**P**	**P**	B	_	type	TERMINAL BOX 	CODE NOW SUBDIVIDED: use this for type other than Bell, Hydro or Cable (see TSC for Traffic Signal Control)	**TB**
TC	SP-E-GND-TC	**B**	**L**	C	C		TOP OF ROCK CUT 	EXAGGERATE SEPARATION OF TOP AND BOTTOM IF NECCESARY TO AVOID CROSSING BREAKLINES, BUT NOTE LENGTH AND WIDTH OF ANY OVERHANGS. GENERALLY, DTM SOFTWARE WILL NOT HANDLE OVERHANGS.	**TC**
TF	SP-E-UTL-TF	**P**	**P**	B	_		TRAFFIC SIGNAL POLE 	COLLECT CENTRE POINT	**TF**
TR	SP-E-VEG-TR	**P**	**P**	C	_	size & type	TREE 	COLLECT CENTRE POINT AND GIVE TRUNK SIZE (m) AND TYPE (CONIFEROUS OR DECIDUOUS) EG. 0.5 CON ALSO GIVE DIAMETER OF THE CROWN, IF SPECIFIED IN TERMS OF REFERENCE	**TR**
TS	SP-E-GND-TS	**M**	**L**	C	C		TOE OF SIDESLOPE 	APPLIES TO FILLED CONDITIONS ONLY DITCH NOT PRESENT	**TS**

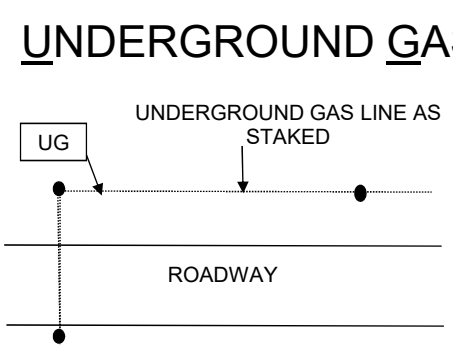
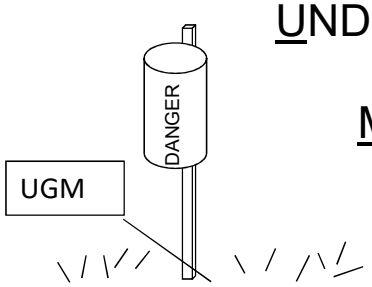
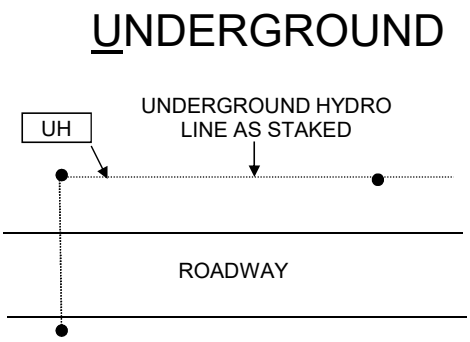
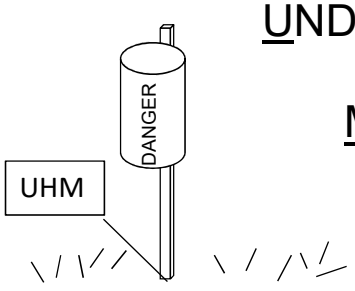
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
TSB	SP-E-UTL-TSB	**P**	**P**	B	_		TRAFFIC SIGNAL BELL 	COLLECT CENTRE POINT	**TSB**
TSBH	SP-E-UTL-TSBH	**P**	**P**	B	_		TRAFFIC SIGNAL BELL & HYDRO 	COLLECT CENTRE POINT	**TSBH**
TSC	SP-E-UTL-TSC	**P**	**P**	B	_		TRAFFIC SIGNAL CONTROL 	COLLECT CENTRE POINT, COBCRETE OUTLINE AND SURROUNDING GROUND STRINGS (CS, AS, OG etc) AS REQUIRED	**TSC**
TSH	SP-E-UTL-TSH	**P**	**P**	B	_		TRAFFIC SIGNAL HYDRO 	COLLECT CENTRE POINT	**TSH**
TVCG	SP-E-UTL-TVCG-Z	**I**	**P**	B	B		TV CROSSING GROUND ELEV 		**TVCG**

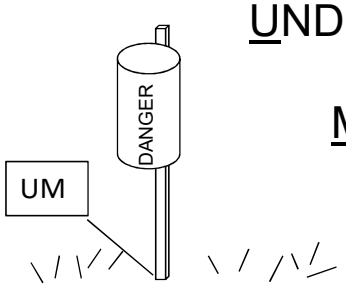
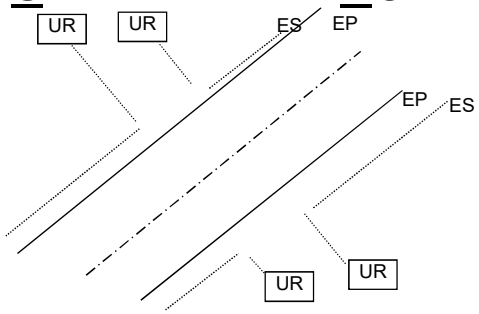
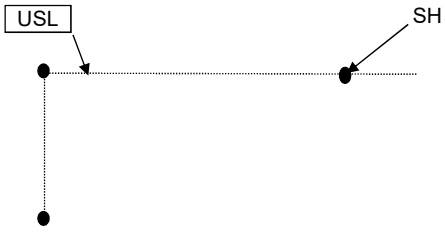
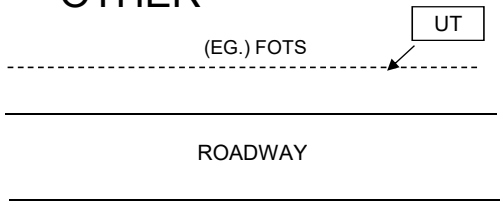
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
TVCW	SP-E-UTL-TVCW-Z	**I**	**P**	B	B		TV CROSSING WIRE ELEV 		**TVCW**
TVTB	SP-E-UTL-TVTB	**P**	**P**	B	_		TV CABLE TERMINAL BOX 	COLLECT CENTRE POINT	**TVTB**
UB	SP-E-UTL-UB	**P**	**L**	C	_		UNDERGROUND BELL 		**UB**
UBM	SP-E-UTL-UBM	**P**	**P**	B	_		UNDERGROUND BELL MARKER 		**UBM**

Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
UG	SP-E-UTL-UG	**P**	**L**	C	_				**UG**
UGM	SP-E-UTL-UGM	**P**	**P**	B	_				**UGM**
UH	SP-E-UTL-UH	**P**	**L**	C	_				**UH**
UHM	SP-E-UTL-UHM	**P**	**P**	B	_				**UHM**

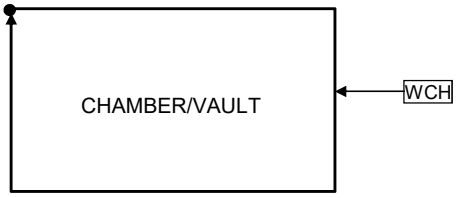
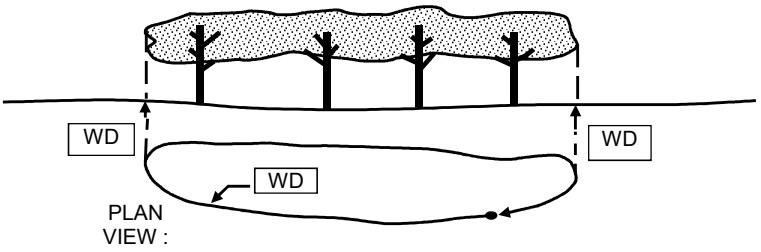
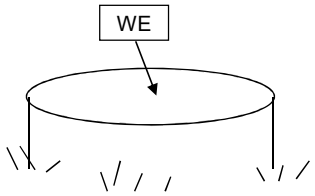
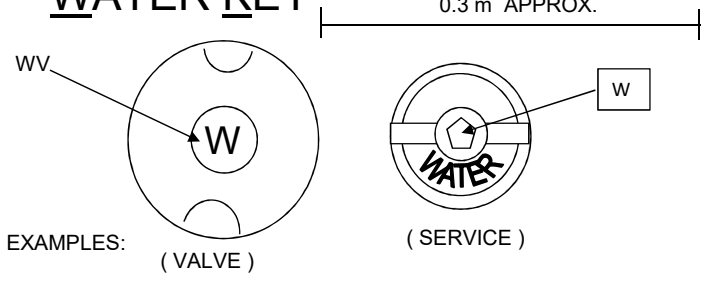
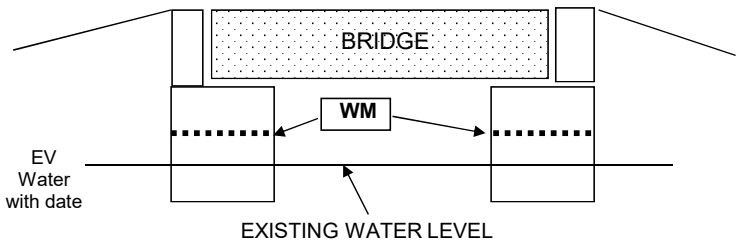
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
UM	SP-E-UTL-UM	**P**	**P**	B	_	type	UNDERGROUND UTILITY MARKER 	SINGLE POINT FEATURE TYPE EG. GPUM....GAS HUCM....ELEC BUCM....TEL	**UM**
UR	SP-E-RDS-UR	**B**	**L**	B	B		UNPAVED SIDEROAD 		**UR**
USL	SP-E-UTL-USL	**P**	**L**	C	_		UNDERGROUND SPRINKLER LINE 		**USL**
UT	SP-E-UTL-UT	**P**	**L**	C	_	type	UNDERGROUND UTILITY - OTHER 		**UT**

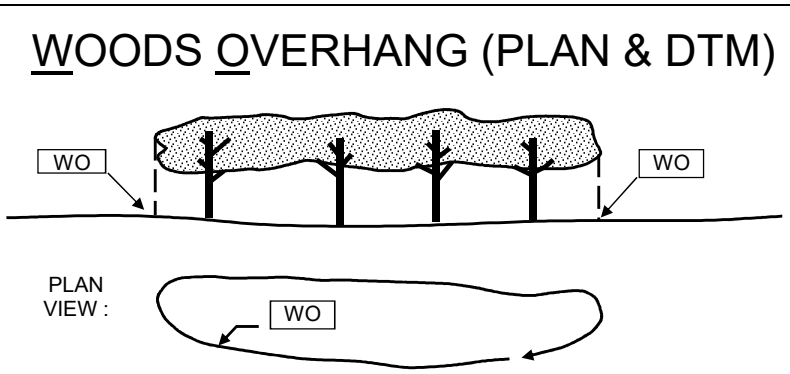
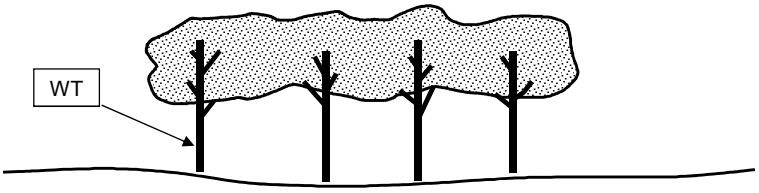
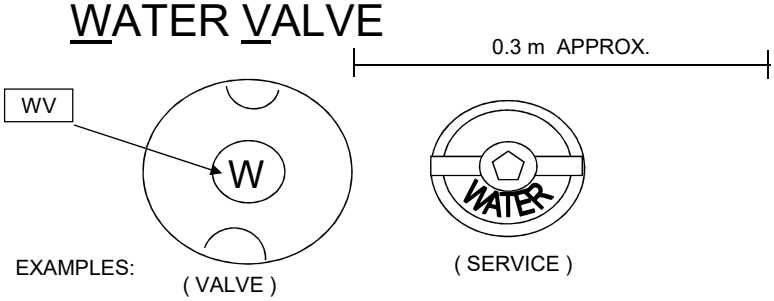
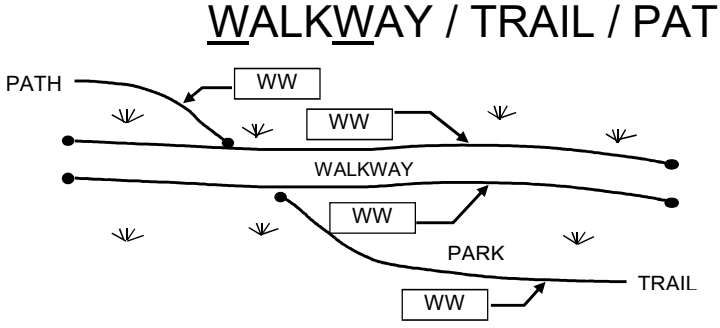
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
UTV	SP-E-UTL-UTV	**P**	**L**	C	_		UNDERGROUND TV CABLE UNDERGROUND CABLE TV LINE AS STAKED UTV ROADWAY		**UTV**
UW	SP-E-UTL-UW	**P**	**L**	C	_		UNDERGROUND WATERMAIN UNDERGROUND WATERMAIN AS STAKED UW ROADWAY		**UW**
VE	SP-E-UTL-VE	**P**	**P**	B	_		VENT VE VE G A S	COLLECT CENTRE	**VE**
VEGE	SP-E-VEG-VEGE	**P**	**L**	C	_		VEGETATION EDGE VEGE PLAN		**VEGE**

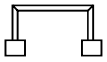
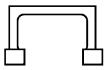
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
WCH	SP-E-UTL-WCH	**P**	**L**	B	_		WATER CHAMBER 	OUTLINE STRING	**WCH**
WD	SP-E-VEG-WD	**P**	**L**	D	_		WOODS DETAIL (PLAN ONLY) 	NOTE: USE WHEN ELEVATIONS ARE NOT VALID GROUND ELEVATIONS OR TO AVOID CROSSING STRINGS	**WD**
WE	SP-E-UTL-WE	**P**	**P**	B	_	diameter	WATER WELL 	COLLECT CENTRE	**WE**
WK	SP-E-UTL-WK	**P**	**P**	B	_		WATER KEY 	COLLECT CENTRE	**WK**
WM	SP-E-DRN-WM	**P**	**L**	C	C		HIGH WATER MARK 	REPRESENTS HIGHEST LIMIT OF WATER MARK VISIBLE IN FIELD	**WM**

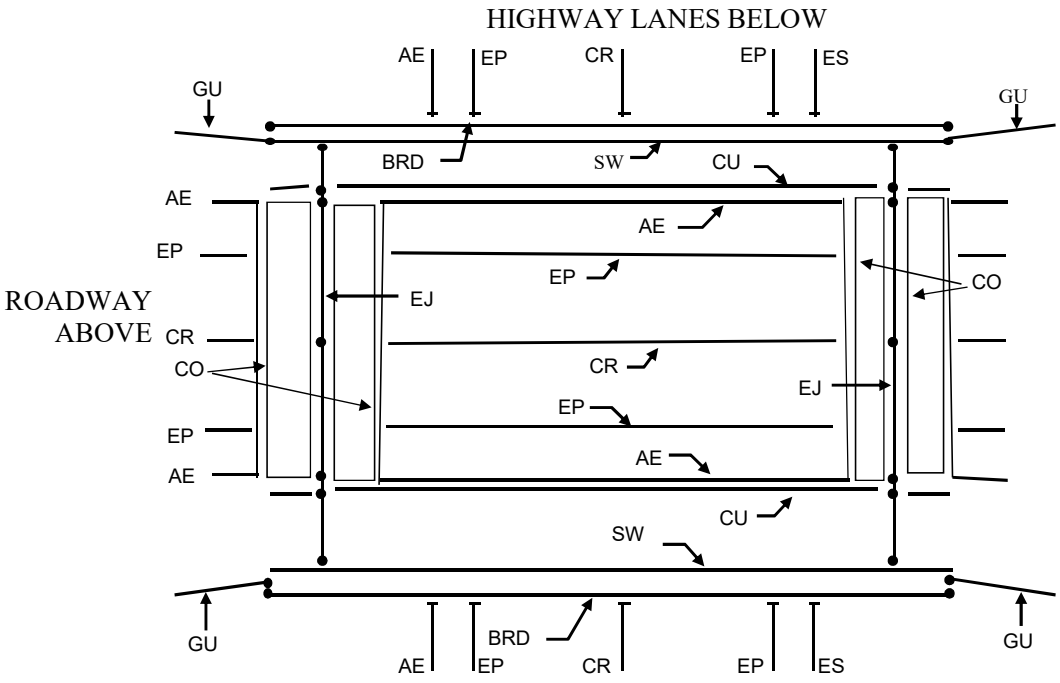
Appendix A: Topographic Feature Code Sketches

Code	Layer	Use	Type	H Acc	V Acc	Attr	Sketch	Collection Guidance	Code
WO	SP-E-VEG-WO	**B**	**L**	D	C			NOTE: USE WHEN ELEVATIONS ARE VALID GROUND ELEVATIONS. AVOID CROSSING STRINGS.	**WO**
WT	SP-E-VEG-WT	**I**	**L**	D	–			LINE FEATURE FOR INFORMATION ONLY	**WT**
WV	SP-E-UTL-WV	**P**	**P**	B	–			FEATURE WOULD INCLUDE: WATERVALVE/ WATER BOX/ WATER KEY SERVICE BOX/ SERVICE POST	**WV**
WW	SP-E-MSC-WW	**B**	**L**	C	C	type		FOR TYPE, INCLUDE MATERIAL,EG., CONC., ASPHALT	**WW**

Appendix B: Culvert Types and Notes

	A	B	C
1	**Abbreviation**	**Culvert Types**	**Notes**
2	CP	Concrete Pipe	
3	CSP	Corrugated Steel Pipe	
4	CSPA	Corrugated Steel Pipe Arch	
5	PP	Plastic Pipe	
6	SPCSP	Structural Plate CSP	Made of corrugated steel plates riveted together
7	SPCSPA	Structural Plate CSP Arch	Made of corrugated steel plates riveted together in arch shape
8	SPCSA	Structural Plate CS Arch	Plate arch formed with concrete floor
9	TSP	Timber Stave Pipe	Constructed from Wood strips running lengthwise
10	CTC	Creosoted Timber Culvert	Made of railway-tie type timbers in a box shape
11	CTCD	CTC (Double opening)	
12	CTCT	CTC (Triple opening)	
13	NRFB	Non-Rigid Frame Box (Concrete with concrete floor)	
14	NRFO	Non-Rigid Frame Open (Concrete with wall Footings only)	
15	RFB	Rigid Frame Box (Concrete with additional corner reinforcing and concrete floor)	
16	RFO	Rigid Frame Open (Concrete with additional corner reinforcing and wall Footings only)	
17	**Notes:**	1. This list may not be exhaustive. Special elliptical or parabolic shaped culverts may be encountered. Sketch in fieldnotes where clarifications are needed.	
18		2. SPAN or WIDTH should be measured horizontally perpendicular to wall, NOT on skewed ends.	
19		3. RISE or HEIGHT should be measured from the concrete floor or top of footings.	
20		4. End treatments should be noted, eg. "Steel apron", "0.3 m wide headwall" or surveyed with "CO" where large.	

BRIDGE DETAIL (Example Plan view)



Appendix D: Topographic Drawing Elements and Symbols

Layer	CAD Element Type	Symbol Layer (Graphics Portion)	Symbol Layer (Text Portion including attributes)	Feature Description
Data Collection Generated - Sorted by Layer				
SP-E-BAR-BB	Line			Barrier Concrete (Bottom)_BLAA
SP-E-BAR-BT	Line			Barrier Concrete (Top)_IPAA
SP-E-BAR-FB	Line			Fitch Barrier_PLC_
SP-E-BAR-FL	Line			Fence Line (Ground)_BLCC
SP-E-BAR-FN	Line			Fence Not for Ground Model_PLCC
SP-E-BAR-GAT	Line			Gate_PLCC
SP-E-BAR-GP-Z	Block/Cell = GP	SP-E-BAR-GP-Z	SP-E-BAR-T	Guide Rail (Top of Post)_IPAA
SP-E-BAR-GU	Line			Guide Rail (Ground)_BLAA
SP-E-BAR-GW-Z	Block/Cell = GW	SP-E-BAR-GW-Z	SP-E-BAR-T	Guide Rail (Top of Wire)_IPAA
SP-E-BAR-NB	Line			Noise Barrier (Ground)_BLAA
SP-E-BAR-SFB	Line			Stone Fence Bottom_BLCC
SP-E-BAR-SFS	Line			Stone Fence String_MLCC
SP-E-BAR-SWL	Line			Seawall (Top)_BLAA
SP-E-DRN-BD	Line			Bottom Of Ditch_BLCC
SP-E-DRN-CB	Block/Cell = CB	SP-E-DRN-CB	SP-E-DRN-T (See Note 1)	Catch Basin_BPAA
SP-E-DRN-CBS	Block/Cell = CBS	SP-E-DRN-CBS	SP-E-DRN-T (See Note 1)	Catch Basin: Side Inlet_BPAA
SP-E-DRN-CVP	Block/Cell = CVP	SP-E-DRN-CVP	SP-E-DRN-T	Culvert (One End)_PPAA
SP-E-DRN-CVT	Line			Culvert Centreline (Top)_PLAA
SP-E-DRN-CV-Z	Block/Cell = CVZ	SP-E-DRN-CV-Z	SP-E-DRN-T	Culvert Elevation_IPAA
SP-E-DRN-DB-Z	Block/Cell = DB	SP-E-DRN-DB-Z	SP-E-DRN-T	Ditch Inlet (Bottom Elevation) _IPAA
SP-E-DRN-DC	Line			Ditch Centerline_BLCC
SP-E-DRN-DI	Block/Cell = DI	SP-E-DRN-DI	SP-E-DRN-T	Ditch Inlet_PPAA
SP-E-DRN-DT-Z	Block/Cell = DT	SP-E-DRN-DT-Z	SP-E-DRN-T	Ditch Inlet (Top Elevation) _IPAA
SP-E-DRN-EW	Line			Edge of Water_BLCC
SP-E-DRN-EWL	Line			Edge of Wetland_BLCC
SP-E-DRN-FR-Z	Block/Cell = FR	SP-E-DRN-FR-Z	SP-E-DRN-T	Frustrum Elevation_IPAA
SP-E-DRN-HDW	Line			Headwall_BLBB
SP-E-DRN-RR	Line			Rip-Rap_BLCC
SP-E-DRN-SAN	Line			Sanitary Sewer Pipes_PLBB
SP-E-DRN-SEW	Line			Storm Sewer Pipes_PLBB
SP-E-DRN-SEWC	Line			Sewer Pipes Combined_PLBB
SP-E-DRN-SU-Z	Block/Cell = SU	SP-E-DRN-SU-Z	SP-E-DRN-T	Sump Elevation_IPBB
SP-E-DRN-WM	Line			Water Mark_PLCC
SP-E-GND-AO	Line			Asphalt Outline_BLAA
SP-E-GND-AS	Line			Asphalt String_MLAA
SP-E-GND-BA	Line			Bank of River or Stream_MLCC
SP-E-GND-BC	Line			Bottom of Rock Cut_BLCC
SP-E-GND-CO	Line			Concrete Outline _BLAA
SP-E-GND-CS	Line			Concrete String _MLAA
SP-E-GND-DS	Line			Door Sill _IPAA
SP-E-GND-EC	Line			Entrance Centerline_MLAA
SP-E-GND-EDS	Line			Edge of Sand_BLCC
SP-E-GND-GO	Line			Gravel Outline_BLBB
SP-E-GND-GS	Line			Gravel String_MLBB
SP-E-GND-OG	Line			Original Ground Line_MLCC
SP-E-GND-RKO	Line			Rock Outline_BLBB
SP-E-GND-RKS	Line			Rock String_MLBB
SP-E-GND-SB	Line			River or Stream Bed_MLCC
SP-E-GND-SP	Line			Stock Piles - Gravel Pits_BLCC
SP-E-GND-SS	Line			Sand String_MLCC
SP-E-GND-TC	Line			Top of Rock Cut_BLCC
SP-E-GND-TS	Line			Toe of Slope_MLCC

Appendix D: Topographic Drawing Elements and Symbols

Layer	CAD Element Type	Symbol Layer (Graphics Portion)	Symbol Layer (Text Portion including attributes)	Feature Description
SP-E-MON	Block/Cell = CC	SP-E-MON	SP-E-MON-T	Cut Cross_PPAA
SP-E-MON	Block/Cell = CM	SP-E-MON	SP-E-MON-T	Concrete Monument_PPAA
SP-E-MON	Block/Cell = CP	SP-E-MON	SP-E-MON-T	Concrete Pin_PPAA
SP-E-MON	Block/Cell = HCM	SP-E-MON	SP-E-MON-T	Primary Horizontal Control Point_PPSPA
SP-E-MON	Block/Cell = HCP	SP-E-MON	SP-E-MON-T	Horizontal Project Control Point_PPSPA
SP-E-MON	Block/Cell = IB	SP-E-MON	SP-E-MON-T	Iron Bar_PPAA
SP-E-MON	Block/Cell = PK	SP-E-MON	SP-E-MON-T	Nail, Spike, Rock Rivet, etc_PPAA
SP-E-MON	Block/Cell = RBR	SP-E-MON	SP-E-MON-T	Rock Bar_PPAA
SP-E-MON	Block/Cell = RIB	SP-E-MON	SP-E-MON-T	Round Iron Bar_PPAA
SP-E-MON	Block/Cell = RPL	SP-E-MON	SP-E-MON-T	Rock Plug_PPAA
SP-E-MON	Block/Cell = RPO	SP-E-MON	SP-E-MON-T	Rock Post_PPAA
SP-E-MON	Block/Cell = SIB	SP-E-MON	SP-E-MON-T	Standard Iron Bar_PPAA
SP-E-MON	Block/Cell = SSIB	SP-E-MON	SP-E-MON-T	Short Standard Iron Bar_PPAA
SP-E-MON	Block/Cell = VCM	SP-E-MON	SP-E-MON-T	Primary Vertical Control Point_PP_SP
SP-E-MON	Block/Cell = VCP	SP-E-MON	SP-E-MON-T	Vertical Project Control Point_PP_SP
SP-E-MSC-BLO	Line			Building Outline (Bottom)_PL*_
SP-E-MSC-BN	Block/Cell = BN	SP-E-MSC-BN	SP-E-MSC-T (See Note 1)	Centre of Bull Nose_MPAA
SP-E-MSC-BO	Block/Cell = BO	SP-E-MSC-BO	SP-E-MSC-T	Borehole_PPAA
SP-E-MSC-BOL	Block/Cell = BOL	SP-E-MSC-BOL	SP-E-MSC-T	Bollard_PPCC
SP-E-MSC-BRP	Block/Cell = BRP	SP-E-MSC-BRP	SP-E-MSC-T	Bridge Pillar _PPCC
SP-E-MSC-BUS	Line			Bus Shelter_PLCC
SP-E-MSC-CE	Line			Cemetery _PLCC
SP-E-MSC-CUP	Line			Curb - Parking_PLCC
SP-E-MSC-DD	Block/Cell = DD	SP-E-MSC-DD	SP-E-MSC-T	Deck Drain_PPAA
SP-E-MSC-DK	Line			Wooden Decks or Docks_PLCC
SP-E-MSC-EJ	Line			Expansion Joint_BLAA
SP-E-MSC-EVD-Z	Block/Cell = EVD	SP-E-MSC-EVD-Z	SP-E-MSC-T (See Note 1)	Miscellaneous Elevation in DTM_BPAA
SP-E-MSC-EV-Z	Block/Cell =EV	SP-E-MSC-EV-Z	SP-E-MSC-T	Miscellaneous Elevation_IPAA
SP-E-MSC-FPP	Block/Cell = FPP	SP-E-MSC-FPP	SP-E-MSC-T	Fuel Pump_PPBB
SP-E-MSC-GAB	Line			Gabion Baskets_BLCC
SP-E-MSC-HR	Line			Bridge Hand Rails_PLAA
SP-E-MSC-LMSC	Line			Line_Misc in DTM_MLAA
SP-E-MSC-MB	Block/Cell = MB	SP-E-MSC-MB	SP-E-MSC-T	Mailbox_PPCC
SP-E-MSC-OS	Line			Overhead Sign_PLC_
SP-E-MSC-PM	Block/Cell = PM	SP-E-MSC-PM	SP-E-MSC-T	Parking Meter_PPCC
SP-E-MSC-RW	Line			Retaining Wall _BLAA
SP-E-MSC-SHD	Line			Shed Outline (Bottom)_PL*_
SP-E-MSC-SIGN	Line			Commercial Sign_PLC_
SP-E-MSC-SW	Line			Sidewalk_BLAA
SP-E-MSC-SWG	Line			Sidewalk Grate_BLAA
SP-E-MSC-WW	Line			Walkways - Trails - Paths_BLCC
SP-E-RDS-AE	Line			Asphalt Edges_BLAA
SP-E-RDS-BRD	Line			Bridge Deck_BLAA
SP-E-RDS-CR	Line			Crown of Road_MLAA
SP-E-RDS-CUB	Line			Curb - back_BLAA
SP-E-RDS-CUF	Line			Curb - front_BLAA
SP-E-RDS-DL	Line			Driving Lane - Edge_MLAA
SP-E-RDS-EG	Line			Edge Of Gutter_BLAA
SP-E-RDS-EP	Line			Edge Of Pavement_BLAA
SP-E-RDS-ES	Line			Edge Of Shoulder_BLBB
SP-E-RDS-NG	Line			Entrance - Gravel_BLBB
SP-E-RDS-NP	Line			Entrance - Paved_BLAA
SP-E-RDS-PS	Line			Painted Striping_BLAA
SP-E-RDS-RDS	Block/Cell = RDS	SP-E-RDS-RDS	SP-E-RDS-T	Road Sign_PPCC

Appendix D: Topographic Drawing Elements and Symbols

Layer	CAD Element Type	Symbol Layer (Graphics Portion)	Symbol Layer (Text Portion including attributes)	Feature Description
SP-E-RDS-RS	Line			Ripple Strip_BLBB
SP-E-RDS-SR	Line			Sideroads Paved_BLAA
SP-E-RDS-UR	Line			Gravel Sideroads_BLBB
SP-E-RWY-GFL	Block/Cell = GFL	SP-E-RWY-GFL	SP-E-RWY-T	Gate with Flashing Light_PPCC
SP-E-RWY-RBE	Line			Railway Ballast Edge_BLCC
SP-E-RWY-RBS	Line			Railway Buffer Stop_PLB_
SP-E-RWY-RBT	Line			Railway Ballast Top_MLCC
SP-E-RWY-RCL	Line			Railway Centreline_MLBB
SP-E-RWY-RCS	Block/Cell = RCS	SP-E-RWY-RCS	SP-E-RWY-T	Railway Crossing Sign_PPCC
SP-E-RWY-RGR	Line			Railway Guard Rail_PLAA
SP-E-RWY-RLS	Block/Cell = RLS	SP-E-RWY-RLS	SP-E-RWY-T	Railway Sign or signal_PPCC
SP-E-RWY-RLT	Line			Railway - Top of Rail_PLAA
SP-E-RWY-RPF	Block/Cell = RPF	SP-E-RWY-RPF	SP-E-RWY-T	Point of Frog_PPAA
SP-E-RWY-RSB	Line			Railway Switch Blade_PLAA
SP-E-RWY-RSR	Line			Railway Switch Rod_PLBB
SP-E-RWY-RSS	Block/Cell = RSS	SP-E-RWY-RSS	SP-E-RWY-T	Railway Switch Stand_PPCC
SP-E-RWY-RST	Block/Cell = RST	SP-E-RWY-RST	SP-E-RWY-T	Railway Stanchion_PPBB
SP-E-RWY-RSX	Line			Railway Signal Box_BLBB
SP-E-RWY-RWR	Line			Railway Wing Rail_PLAA
SP-E-RWY-RWS	Block/Cell = RWS	SP-E-RWY-RWS	SP-E-RWY-T	Railway Wheel Stop_PPCC
SP-E-UTL-AN	Block/Cell = AN	SP-E-UTL-AN	SP-E-UTL-T	Anchor_PPCC
SP-E-UTL-AP	Block/Cell = AP	SP-E-UTL-AP	SP-E-UTL-T	Anchor Pole_PPB_
SP-E-UTL-BCG-Z	Block/Cell = BCG	SP-E-UTL-BCG-Z	SP-E-UTL-BELL-T	Bell Crossing Ground Elev_IPBB
SP-E-UTL-BCH	Line			Bell Chamber/Vault_PLB_
SP-E-UTL-BCW-Z	Block/Cell = BCW	SP-E-UTL-BCW-Z	SP-E-UTL-BELL-T	Bell Crossing Wire Elev_IPBB
SP-E-UTL-BH	Block/Cell = BH	SP-E-UTL-BH	SP-E-UTL-COMB-T	Bell -w- Hydro Pole_PPB_
SP-E-UTL-BP	Block/Cell = BP	SP-E-UTL-BP	SP-E-UTL-BELL-T	Bell Pole_PPB_
SP-E-UTL-BTB	Block/Cell = BTB	SP-E-UTL-BTB	SP-E-UTL-BELL-T	Bell Terminal Box_PPB_
SP-E-UTL-CT	Line			Cell Tower_PLB_
SP-E-UTL-FH	Block/Cell = FH	SP-E-UTL-FH	SP-E-UTL-T	Fire Hydrant_PPB_
SP-E-UTL-FMP	Block/Cell = FMP	SP-E-UTL-FMP	SP-E-UTL-T	Fire Main Indicator Post_PPB_
SP-E-UTL-GCH	Line			Gas Chamber/Vault_PLB_
SP-E-UTL-GK	Block/Cell = GK	SP-E-UTL-GK	SP-E-UTL-GAS-T	Gas Key_PPB_
SP-E-UTL-GM	Block/Cell = GM	SP-E-UTL-GM	SP-E-UTL-GAS-T	Gas Meter_PPB_
SP-E-UTL-GV	Block/Cell = GV	SP-E-UTL-GV	SP-E-UTL-GAS-T	Gas Valve_PPB_
SP-E-UTL-HCG-Z	Block/Cell = HGC	SP-E-UTL-HCG-Z	SP-E-UTL-HYDRO-T	Hydro Crossing Ground Elev_IPBB
SP-E-UTL-HCH	Line			Hydro Chamber/Vault_PLB_
SP-E-UTL-HCW-Z	Block/Cell = HGW	SP-E-UTL-HCW-Z	SP-E-UTL-HYDRO-T	Hydro Crossing Wire Elev_IPBB
SP-E-UTL-HM	Block/Cell = HM	SP-E-UTL-HM	SP-E-UTL-HYDRO-T	Hydro Meter_PPB_
SP-E-UTL-HP	Block/Cell = HP	SP-E-UTL-HP	SP-E-UTL-HYDRO-T	Hydro Pole_PPB_
SP-E-UTL-HT	Line			Hydro Tower_PLB_
SP-E-UTL-HTB	Block/Cell = HTB	SP-E-UTL-HTB	SP-E-UTL-HYDRO-T	Hydro Terminal Box_PPB_
SP-E-UTL-HW	Block/Cell = HW	SP-E-UTL-HW	SP-E-UTL-T	Handwell_PPB_
SP-E-UTL-HYT	Line			Hydro Transformer_PLB_
SP-E-UTL-LS	Block/Cell = LS	SP-E-UTL-LS	SP-E-UTL-LIGHT-T	Light Standard_PPB_
SP-E-UTL-LSB	Block/Cell = LSB	SP-E-UTL-LSB	SP-E-UTL-COMB-T	Light Standard -w- Bell_PPB_
SP-E-UTL-LSBH	Block/Cell = LSBH	SP-E-UTL-LSBH	SP-E-UTL-COMB-T	Light Standard -w- Bell & Hydro_PPB_
SP-E-UTL-LSH	Block/Cell = LSH	SP-E-UTL-LSH	SP-E-UTL-COMB-T	Light Standard -w- Hydro_PPB_
SP-E-UTL-LSTS	Block/Cell = LSTS	SP-E-UTL-LSTS	SP-E-UTL-COMB-T	Light Standard -w - Traffic Signal_PPB_
SP-E-UTL-MHB	Block/Cell = MHB	SP-E-UTL-MHB	SP-E-UTL-BELL-T	Maintenance Hole Bell_PPAA
SP-E-UTL-MHH	Block/Cell = MHH	SP-E-UTL-MHH	SP-E-UTL-HYDRO-T	Maintenance Hole Hydro_PPAA
SP-E-UTL-MHSA	Block/Cell = MHSA	SP-E-UTL-MHSA	SP-E-UTL-SAN-T	Maintenance Hole Sanitary_PPAA
SP-E-UTL-MHSC	Block/Cell = MHSC	SP-E-UTL-MHSC	SP-E-UTL-SAN-ST-COMB-T	Maintenance Hole Combined_PPAA
SP-E-UTL-MHST	Block/Cell = MHST	SP-E-UTL-MHST	SP-E-UTL-STORM-T	Maintenance Hole Storm_PPAA

Appendix D: Topographic Drawing Elements and Symbols

Layer	CAD Element Type	Symbol Layer (Graphics Portion)	Symbol Layer (Text Portion including attributes)	Feature Description
SP-E-UTL-MHU	Block/Cell = MHU	SP-E-UTL-MHU	SP-E-UTL-T	Maintenance Hole Unknown_PPAA
SP-E-UTL-MHW	Block/Cell = MHW	SP-E-UTL-MHW	SP-E-UTL-WATER-T	Maintenance Hole Water_PPAA
SP-E-UTL-MW	Block/Cell = MW	SP-E-UTL-MW	SP-E-UTL-T	Monitoring Well_PPA_
SP-E-UTL-MWT	Line			Microwave Tower_PLB_
SP-E-UTL-PB	Block/Cell = PB	SP-E-UTL-PB	SP-E-UTL-T	Phone Booth_PLB_
SP-E-UTL-PL	Line			Pipeline_PLBB
SP-E-UTL-PO	Block/Cell = PO	SP-E-UTL-PO	SP-E-UTL-T	Pole - other_PPB_
SP-E-UTL-PW	Block/Cell = PW	SP-E-UTL-PW	SP-E-UTL-T	Pole Well_PPC_
SP-E-UTL-SH	Block/Cell = SH	SP-E-UTL-SH	SP-E-UTL-T	Sprinkler Head_PPB_
SP-E-UTL-ST	Line			Septic Tank (Outline)_PLB_
SP-E-UTL-STA	Block/Cell = STA	SP-E-UTL-STA	SP-E-UTL-T	Septic Tank Access_PPB_
SP-E-UTL-STP	Block/Cell = STP	SP-E-UTL-STP	SP-E-UTL-T	Standpipe_PPB_
SP-E-UTL-SV	Block/Cell = SV	SP-E-UTL-SV	SP-E-UTL-T	Sprinkler Valve_PPB_
SP-E-UTL-TB	Block/Cell = TB	SP-E-UTL-TB	SP-E-UTL-T	Utility Terminal Box_PPB_
SP-E-UTL-TF	Block/Cell = TF	SP-E-UTL-TF	SP-E-UTL-TRAFFIC-T	Traffic Signal Pole_PPB_
SP-E-UTL-TSB	Block/Cell = TSB	SP-E-UTL-TSB	SP-E-UTL-COMB-T	Traffic Signal -w- Bell_PPB_
SP-E-UTL-TSBH	Block/Cell = TSBH	SP-E-UTL-TSBH	SP-E-UTL-COMB-T	Traffic Signal -w- Bell & Hydro_PPB_
SP-E-UTL-TSC	Block/Cell = TSC	SP-E-UTL-TSC	SP-E-UTL-TRAFFIC-T	Traffic Signal Control_PPB_
SP-E-UTL-TSH	Block/Cell = TSH	SP-E-UTL-TSH	SP-E-UTL-COMB-T	Traffic Signal -w- Hydro_PPB_
SP-E-UTL-TVCG-Z	Block/Cell = TVCG	SP-E-UTL-TVCG-Z	SP-E-UTL-TV-T	TV Cable Crossing Ground Elev_IPBB
SP-E-UTL-TVCW-Z	Block/Cell = TVCW	SP-E-UTL-TVCW-Z	SP-E-UTL-TV-T	TV Cable Crossing Wire Elev_IPBB
SP-E-UTL-TVTB	Block/Cell = TVTB	SP-E-UTL-TVTB	SP-E-UTL-TV-T	TV Cable Terminal Box_PPB_
SP-E-UTL-UB	Line			Underground Bell_PLC_
SP-E-UTL-UBM	Block/Cell = UBM	SP-E-UTL-UBM	SP-E-UTL-BELL-T	Underground Bell Marker_PPB_
SP-E-UTL-UG	Line			Underground Gas_PLC_
SP-E-UTL-UGM	Block/Cell = UGM	SP-E-UTL-UGM	SP-E-UTL-GAS-T	Underground Gas Marker_PPB_
SP-E-UTL-UH	Line			Underground Hydro_PLC_
SP-E-UTL-UHM	Block/Cell = UHM	SP-E-UTL-UHM	SP-E-UTL-HYDRO-T	Underground Hydro Marker_PPB_
SP-E-UTL-UM	Block/Cell = UM	SP-E-UTL-UM	SP-E-UTL-T	Underground Utility Marker_PPB_
SP-E-UTL-USL	Line			Underground Sprinkler Line_PLC_
SP-E-UTL-UT	Line			Underground Utility - other_PLC_
SP-E-UTL-UTV	Line			Underground TV Cable_PLC_
SP-E-UTL-UW	Line			Underground_Watermain_PLC_
SP-E-UTL-VE	Block/Cell = VE	SP-E-UTL-VE	SP-E-UTL-T	Vent_PPB_
SP-E-UTL-WCH	Line			Water Chamber_PLB_
SP-E-UTL-WE	Block/Cell = WE	SP-E-UTL-WE	SP-E-UTL-T	Well_PPB_
SP-E-UTL-WK	Block/Cell = WK	SP-E-UTL-WK	SP-E-UTL-WATER-T	Water Key_PPB_
SP-E-UTL-WV	Block/Cell = WV	SP-E-UTL-WV	SP-E-UTL-WATER-T	Water Valve_PPB_
SP-E-VEG-FLB	Line			Flower Box_BLBB
SP-E-VEG-HE	Line			Hedge_BLCC
SP-E-VEG-LC	Line			Line of Cultivation_BLCC
SP-E-VEG-SHB	Block/Cell = SHB	SP-E-VEG-SHB	SP-E-VEG-T	Shrub_PPC_
SP-E-VEG-TR	Block/Cell = TR	SP-E-VEG-TR	SP-E-VEG-T	Trees_PPC_
SP-E-VEG-VEGE	Line			Vegetation Edge_PLC_
SP-E-VEG-WD	Line			Woods Detail_PLD_
SP-E-VEG-WO	Line			Woods Overhang (Ground)_BLDC
SP-E-VEG-WT	Line			Woods Trunkline_ILD_
SP-Q-MSC-AU	Line			Audit Line_ILAA
Graphics Generated - Sorted by Layer				
MX-G-GRID	Line			Mapping Grid
MX-G-GRID-T	Text			Grid Text
SP-E-BAR-T	Text			Barrier Features Grouping Text

Appendix D: Topographic Drawing Elements and Symbols

Layer	CAD Element Type	Symbol Layer (Graphics Portion)	Symbol Layer (Text Portion including attributes)	Feature Description
SP-E-BDY-CITY	Line			City Boundary
SP-E-BDY-LIN	Line			General Property Boundary Line
SP-E-BDY-LLC	Line			Lot Line - Concession Boundary
SP-E-BDY-LLS	Line			Lot Line - Subdivision Boundary
SP-E-BDY-T	Text			Property Boundary Text
SP-E-CTR-MAJR	Line/Text			Major Contours
SP-E-CTR-MAJR-DEPO	Line/Text			Major Depression Obscured Contours
SP-E-CTR-MAJR-DEPR	Line/Text			Major Depression Contours
SP-E-CTR-MAJR-OBSC	Line/Text			Major Obscured Contours
SP-E-CTR-MINR	Line			Minor Contours
SP-E-CTR-MINR-DEPO	Line			Minor Depression Obscured Contours
SP-E-CTR-MINR-DEPR	Line			Minor Depression Contours
SP-E-CTR-MINR-OBSC	Line			Minor Obscured Contours
SP-E-DRN-T	Text			Drainage Features Grouping Text
SP-E-GND-T	Text			Ground Feature Grouping Text
SP-E-LABELS	Text			String Labels
SP-E-MON-T	Text			Survey Monument Grouping Text
SP-E-MSC-T	Text			Miscellaneous Features Grouping Text
SP-E-PTS-INFO	Point			Points for elevation INFORMATION
SP-E-PTS-PLAN	Point			Points for Plan but not DTM
SP-E-PTS-TEXT	Text			Point label component
SP-E-PTS-UNKNOWN_CODE	Point			Default Layer for survey points with Non-Standard Point Code
SP-E-RDS-T	Text			Roadway Features Grouping Text
SP-E-RWY-T	Text			Railway Features Grouping Text
SP-E-SCANNED	Raster			Raster Imagery
SP-E-TIN	Line			TIN Surface
SP-E-TIN-BNDY	Line			TIN Boundary
SP-E-TIN-BNDYOBSC	Line			TIN Boundary- Obscured Area
SP-E-TIN-PTS	Point			TIN Points
SP-E-TIN-TRIANGLES	Line			TIN Triangles
SP-E-UTL-BELL-T	Text			Utility Bell Text
SP-E-UTL-COMB-T	Text			Utility Pole Combined Text
SP-E-UTL-GAS-T	Text			Utility Gas Text
SP-E-UTL-HYDRO-T	Text			Utility Hydro Text
SP-E-UTL-LIGHT-T	Text			Utility Light Text
SP-E-UTL-SAN-ST-COMB-T	Text			Utility Sanitary Storm Combined Text
SP-E-UTL-SAN-T	Text			Utility Sanitary Text
SP-E-UTL-STORM-T	Text			Utility Storm Text
SP-E-UTL-T	Text			Utility Features General Text
SP-E-UTL-TRAFFIC-T	Text			Utility Traffic Text
SP-E-UTL-TV-T	Text			Utility TV Text
SP-E-UTL-WATER-T	Text			Utility Water Text
SP-E-VEG-T	Text			Vegetation Features Grouping Text
SP-G-CONS	Line			General Construction Lines existing survey
SP-G-LINES	Line			General lines
SP-G-MON-T	Text			General survey monument text
SP-G-TEXT	Text			General Text - existing survey
SP-L-FABRIC-LINES	Line			Legal Survey adjoining linework
SP-L-FABRIC-TEXT	Text			Legal Survey adjoining property info
SP-L-LINES	Line			Legal Survey Lines
SP-L-PART	Line			Legal Survey Part Linework
SP-L-PART-TEXT	Text			Reference Plan Part text
SP-L-TEXT	Text			Legal Survey Text

Appendix D: Topographic Drawing Elements and Symbols

Layer	CAD Element Type	Symbol Layer (Graphics Portion)	Symbol Layer (Text Portion including attributes)	Feature Description
Note 1	Symbols CB, CBS, EVD and BH are unique as these features are used to generate the DTM. The insert point of each of these symbols (blocks/cells) is used as the DTM point location. Each of these symbols contain a zero length line that is coincident with the insert point. In the event that the symbol is exploded, the zero length line remains on the DTM layer but the lines, circles and text are moved to a non DTM layer.			