APPENDIX 'L'

Working Around Manitoba Hydro's Underground primary and secondary cable, underground ductlines, underground subsurface chambers, and underground street light cables

Work may interfere with Manitoba Hydro's underground primary and secondary cable, underground ductlines, underground subsurface chambers, and underground street light cables.

Caution shall be taken near conductors, ductlines, and subsurface chambers. When performing work near primary conductors, subtransmission conductors, ductlines, or subsurface chambers, please call the appropriate district office (refer to the District Coverage Map) for safety watch at **204 480 5900**. Limits of approach should be maintained as seen below in column three (others not under direct supervision of qualified Manitoba Hydro employees):

LIMITS OF APPROACH TO LIVE UNINSULATED HIGH VOLTAGE CONDUCTORS AND APPARATUS

"Limits of Approach" is defined as the shortest distance that is permissible between live high voltage conductors or apparatus and any part of a worker's body, material or tools being handled, or equipment operated.

High Voltage in kV	COLUMN 1 Absolute Limits of Approach for Qualified Manitoba Hydro Employees		COLUMN 2 *Others Under Direct Supervision of Qualified Manitoba Hydro Employees		COLUMN 3 *Others Not Under Direct Supervision of Qualified Manitoba Hydro Employees	
Phase-to Phase AC Voltage	**cm**	**ft**	**cm**	**ft**	**cm**	**ft**
Over 750 volts to 25	30	1.0	60	2.0	300	10.0
Over 25 to 50	60	2.0	120	4.0	300	10.0
Over 50 to 75	75	2.5	150	5.0	300	10.0
Over 75 to 150	105	3.5	240	8.0	450	15.0
Over 150 to 300	150	5.0	300	10.0	450	15.0
Over 300 to 450	210	7.0	450	15.0	600	20.0
Over 450 to 600	300	10.0	600	20.0	600	20.0
DC Voltage (+ or - to ground)						
Ground Electrode	30	1.0	60	2.0	300	10.0
150 and below	150	5.0	300	10.0	450	15.0
Over 150 to 300	210	7.0	450	15.0	600	20.0
Over 300 to 500	270	9.0	600	20.0	600	20.0

***Others refers to non-qualified Manitoba Hydro and Non-Manitoba Hydro personnel.**

If crossing over street light cables, a work order request is to be sent in to Ryan Aubry at raubry@hydro.mb.ca for temporary overhead cable installation for the duration of construction.

A minimum horizontal separation of 1.0m and a minimum vertical separation of 300mm must be maintained between any proposed underground infrastructure and Manitoba Hydro's infrastructure. CSA C22.3 7-15 (attached) shows the minimum burial depths required for Manitoba Hydro cables after work is completed. Any excavation within 1.0m of Manitoba Hydro plant should be done according to Manitoba Hydro and Work Place Safety and Health standards and practices.

For excavation near poles, the minimum amount of undisturbed earth to be left around all poles shall be 1.0m. The maximum slope angle of undisturbed earth shall be 26° or 2:1 until the desired depth is reached. The minimum separation for excavations deeper than 0.5m without regional engineering involvement shall be 1.5m. Excavations to be backfilled and tamped to maintain slope. Please discuss with the District office about whether poles can be stabilized while excavation takes place. The pole should be tied to a piece of large equipment. That equipment must not be moved until fill is back in place so the pole could

stand on its own. Excavation up to 1' deep around the pole without stabilization is acceptable. Excavations around poles and anchors must be conducted in accordance to standard CD 30-55 (attached).

Where scope of work includes Manitoba Hydro subsurface chambers, provide Manitoba Hydro with all final grades at our infrastructure. Consultants/contractors are responsible to supply Manitoba Hydro with a list of all the subsurface chambers in the scope of work they are contemplating. If any of the grades have to be lowered, it should be determined by the consultant if they can design the grades to accommodate subsurface chambers that are not able to be lowered. Designing and installing a new subsurface chamber roof takes up to six months. It would have to be determined at this time if the frame and cover could be lowered without replacing the roof. If subsurface chambers are to be raised, it would be in your best interest to design the grade to go up in 2" increments, as our steel riser rings come in 2" and not 3". If riser rings are used, new covers will have to be installed too, please provide enough time for Manitoba Hydro to order the appropriate materials.

Ductline must remain at least 600mm deep after the construction is complete. Discuss with the District office for safety watch, soft dig to expose it, and no vibratory packing of the material over the line.

All construction operations within the vicinity of any electrical distribution are to take place in a manner so as to not damage or cause detriment to the integrity of the electrical distribution. Prior to the commencement of the above project, please visit http://clickbeforeyoudigmb.com/ for locates of underground electrical distribution infrastructure and to obtain the necessary work clearance request forms. Construction operations are not to commence unless these conditions are adhered to.

Any damaged underground cable shall be replaced at contractor's cost.

This assessment is relative to the electrical distribution (66kV and below), other internal departments such as the gas department, communications, etc should be contacted directly for their assessment. Manitoba Hydro makes no representations or warranties in regard to the information contained within.

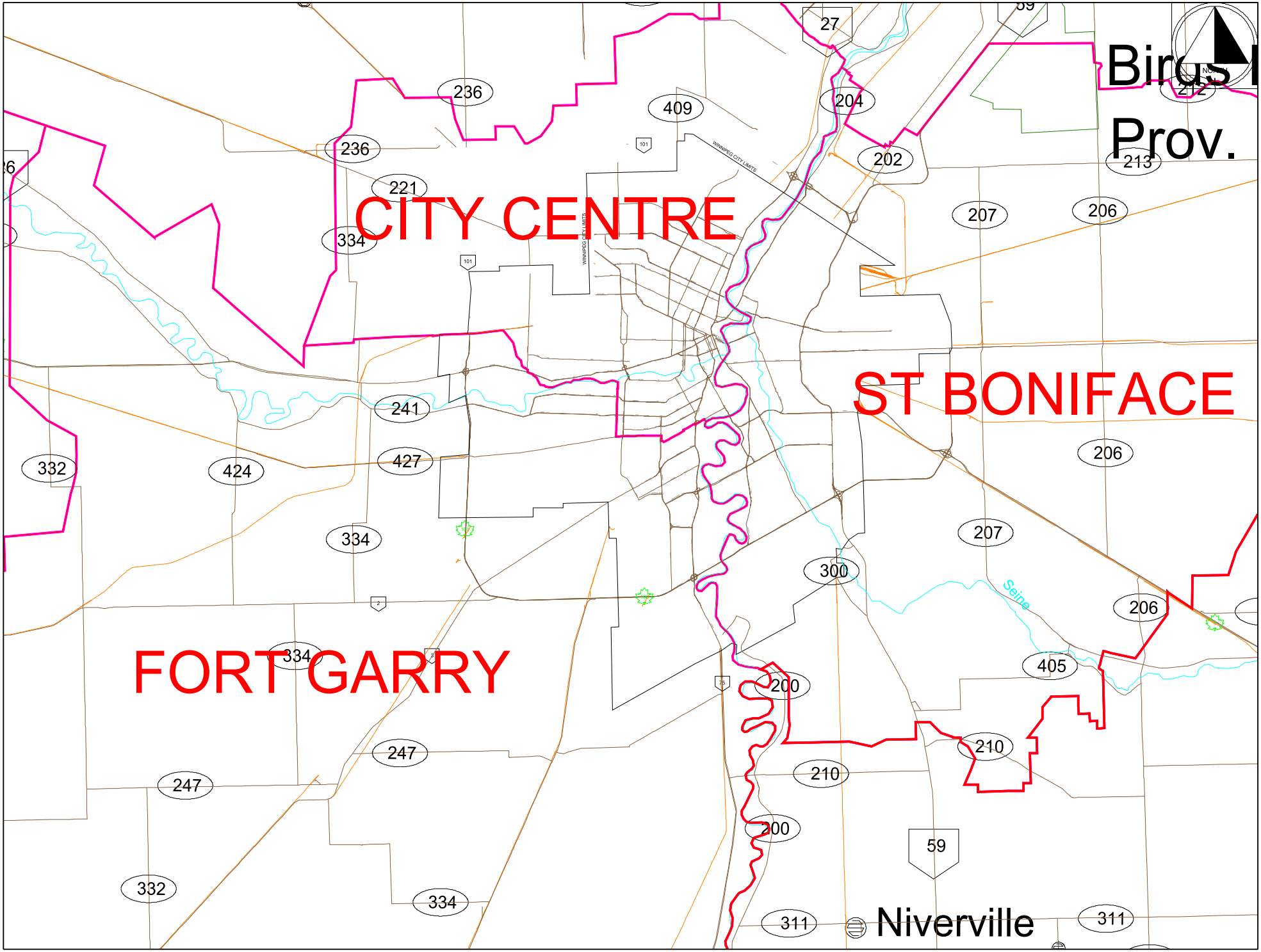

CITY CENTRE
ST BONIFACE
FORT GARRY
Niverville
Prov.
Seine
WINNIPEG CITY LIMITS
236
409
204
202
213
221
207
206
334
241
427
424
332
300
405
200
210
247
59
311

Table 1
Minimum depth of burial of cables and duct and chamber systems

(See Clauses 5.1.2, 5.1.3 and 5.2.)

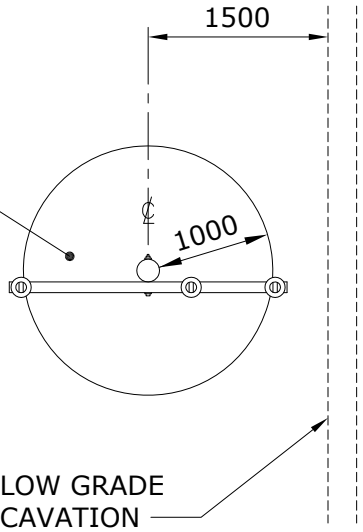
Type of system	Depth of burial, mm			
	Surface of the earth	Bottom of ditches	Under parkways or lawns	Under roadways
Communication cables	600*	750*	450*	600*
Communication drops	450*	600*	450*	450*
Supply cables >750 V	750*‡	1000*‡	750*‡	1000*‡
Supply cables ≤750 V	600*‡	750*‡	600*‡	1000*‡
Duct and subsurface chamber system	450†	600†	450†	600†

* *See Clause 5.1.4 for reduced depth of burial at cable crossings and Clause 5.1.5 where these values are not practical.*

† *See Clause 5.2.2 where these depths cannot be achieved.*

‡ *This depth of burial may be reduced where the underground supply cable transitions to an above-ground structure (e.g., a pole) within a distance as short as possible from the structure without exceeding 1.5 m.*

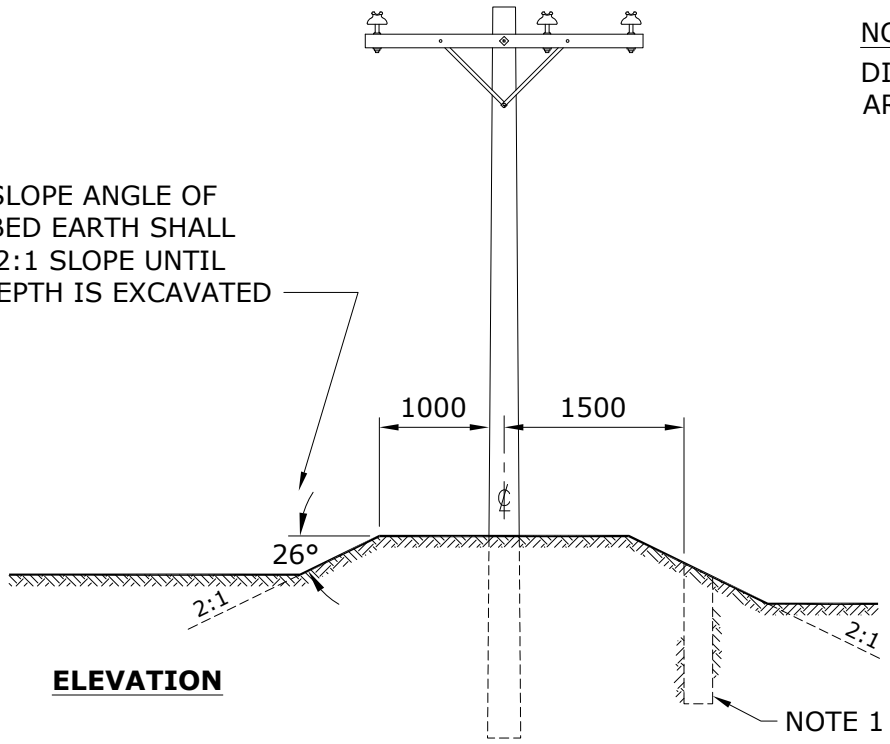
FOR CHANGES IN GRADE, THE MINIMUM AMOUNT OF UNDISTURBED EARTH TO BE LEFT ALL AROUND POLES SHALL BE 1000mm



PLAN

NOTE:
DIMENSIONS SHOWN ARE MILLIMETRES.

MAXIMUM SLOPE ANGLE OF UNDISTURBED EARTH SHALL BE 26° OR 2:1 SLOPE UNTIL DESIRED DEPTH IS EXCAVATED



ELEVATION

NOTE:

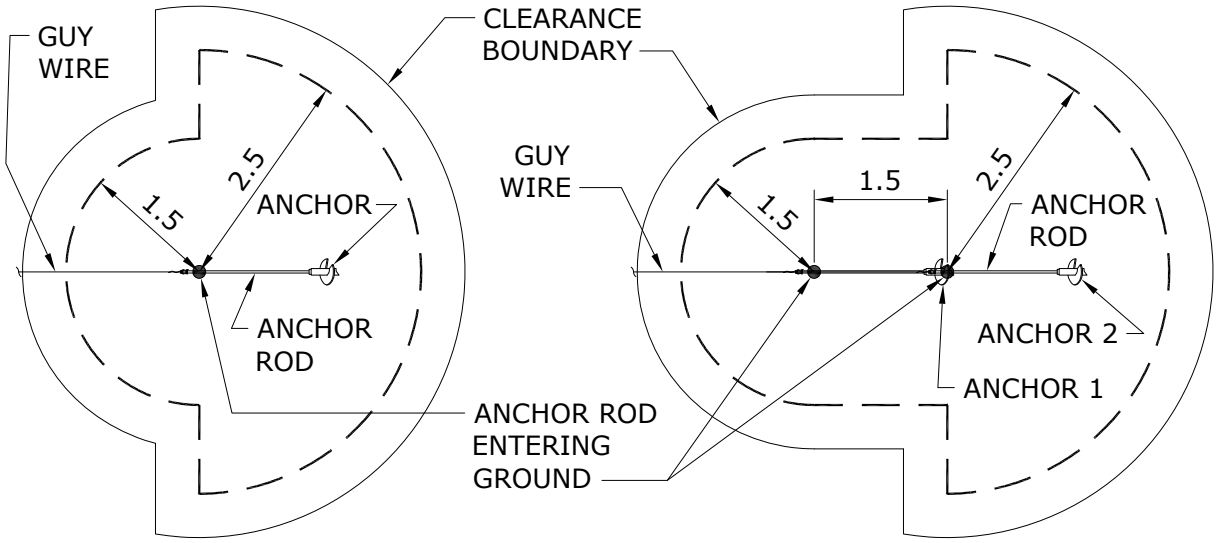
1. THE MINIMUM SEPARATION (TO ANY SIDE OF A POLE) FOR EXCAVATIONS DEEPER THAN 500mm WITHOUT DISTRIBUTION ENGINEERING INVOLVEMENT SHALL BE 1500mm, EXCAVATIONS TO BE BACKFILLED & TAMPED TO MAINTAIN SLOPE. A CIVIL ENGINEER SHOULD BE CONSULTED FOR ANY LARGER (TEMPORARY OR PERMANENT) EXCAVATIONS.

SUPERCEDES ORIGINAL SEALED BY E. WIEBE ON 94-07-11

APPROVED	REVISIONS			MANITOBA HYDRO DISTRIBUTION STANDARDS
ORIGINAL DRAWING SEALED BY D.R. ORR 19-05-17	23-01	4	ADDED SHEET 2 - EXCAVATION LIMITS AROUND ANCHORS	**ALLOWABLE EXCAVATIONS AROUND EXISTING POLES AND ANCHORS**
	19-04	3	REVISED NOTE 1, RESEALED	
	06-02	2	REVISED SLOPE & ADDED MORE EXPLANATION TO NOTES	

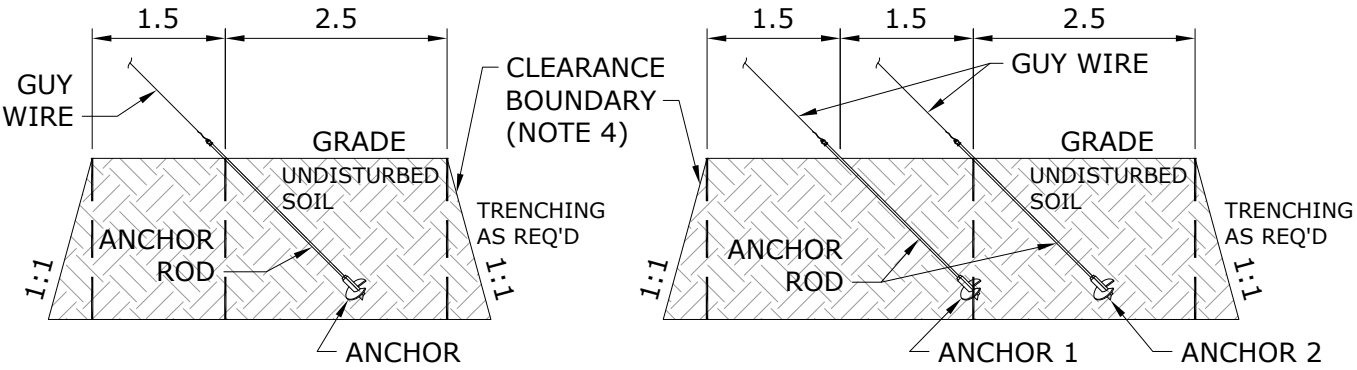
DRAWN	CHECKED	DATE		SHT	REV
C.A.	G.D./C.W.	19-04	**CD 30-55**	0001 OF 2	04

1-04430-DA-24200-0013



SINGLE ANCHOR - TOP VIEW

MULTIPLE ANCHOR - TOP VIEW



SINGLE ANCHOR - PLAN VIEW

MULTIPLE ANCHOR - PLAN VIEW

NOTES:

1. EXCAVATION ZONE LIMITS ARE ONLY APPLICABLE FOR NORMAL OR BETTER SOIL CONDITIONS. FOR POOR OR SWAMP SOIL CONDITIONS, CONTACT DISTRIBUTION ENGINEERING BEFORE BEGINNING ANY WORK.
2. IF THERE ARE MULTIPLE ANCHORS IN-LINE, ADD ANOTHER 1.5m FOR EACH ADDITIONAL ANCHOR TO THE 1.5m MINIMUM DIMENSION.
3. THIS DRAWING SHOWS A PISA ANCHOR, IT IS APPLICABLE FOR ALL ANCHOR TYPES.
4. EXCAVATION TO BE DONE AT MAXIMUM ANGLE OF 45° SLOPE AWAY FROM THE CLEARANCE BOUNDARY. THE HORIZONTAL AND VERTICAL CUTS SHALL NOT BE STEEPER THAN 1:1 RATIO TO PREVENT CAVE-IN.
5. IF AT ANY TIME IN THE COURSE OF EXCAVATION THE POLE OR ITS SUPPORTING EQUIPMENT APPEARS TO BECOME UNSTABLE TO ANY DEGREE, WORK SHALL BE HALTED IMMEDIATELY AND DISTRIBUTION ENGINEERING SHALL BE CONTACTED BEFORE PROCEEDING WITH ANY ADDITIONAL EXCAVATION.
6. IF THE SPECIFIED CLEARANCES CANNOT BE MET, CONTACT DISTRIBUTION ENGINEERING BEFORE BEGINNING ANY WORK.
7. DIMENSIONS SHOWN ARE IN METERS.

APPROVED	REVISIONS	MANITOBA HYDRO DISTRIBUTION STANDARDS
ORIGINAL DRAWING SEALED BY C. WEERAKOON 23-01-30		**ALLOWABLE EXCAVATIONS AROUND EXISTING POLES AND ANCHORS**

DRAWN	CHECKED	DATE		SHT	REV
C.A.	G.D.	23-01	**CD 30-55**	0002 OF 2	00

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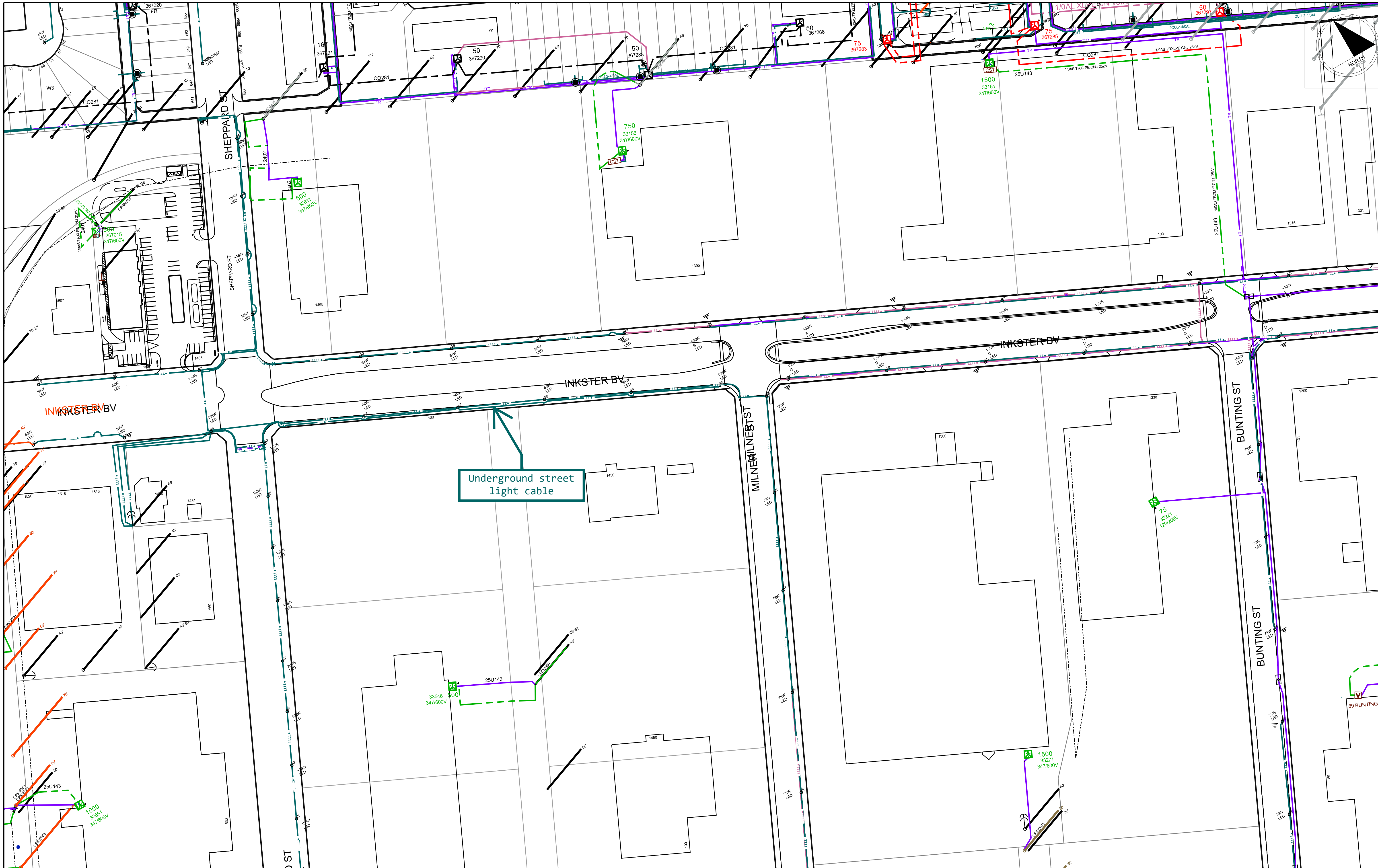
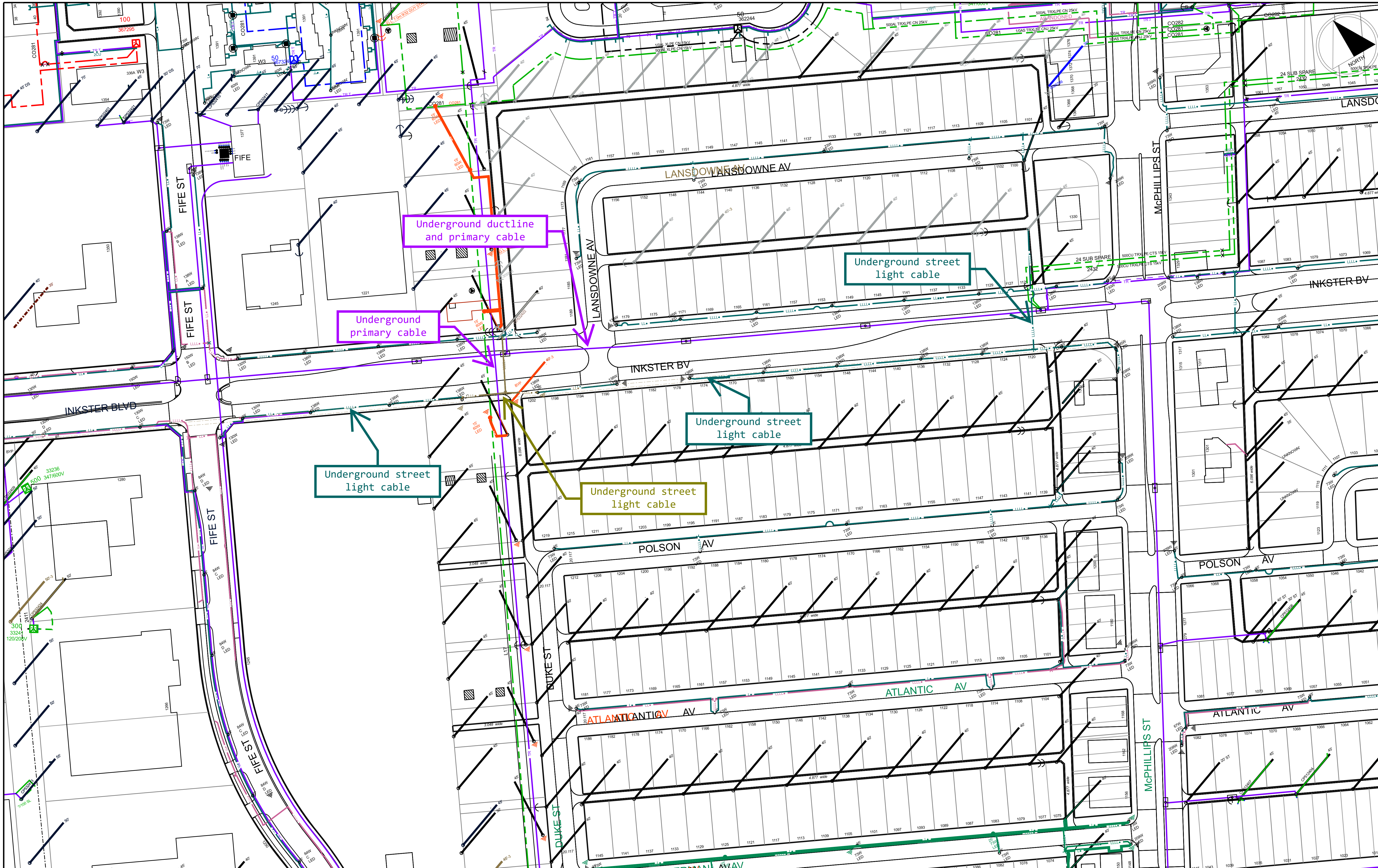

Underground street light cable
INKSTER BV
SHEPPARD ST
MILNER ST
BUNTING ST
NORTH
89 BUNTING ST
CO281
25U143
1/0AS TRXLPE CNJ 25kV
750
33156
347/600V
500
33611
1500
33161
75
33221
120/208V
33271
1000
33551
33546
50
367290
367288
367286
75
367283
367285



Underground ductline and primary cable
Underground primary cable
Underground street light cable
Underground street light cable
Underground street light cable
Underground street light cable
Underground street light cable
LANSDOWNE AV
LANSDOWNE AV
INKSTER BV
INKSTER BLVD
FIFE ST
FIFE
DUKE ST
POLSON AV
ATLANTIC AV
McPHILLIPS ST
NORTH
24 SUB SPARE 2432
500CU TRXLPE CTS 15kV
500AL TRXLPE CN 25kV
1/0AS TRXLPE CNJ 25kV
1/0AL XLPE CN 15kV
500AL XLPE CN 15kV
ABANDONED
CO281
CO282

MATHESON AV
CARRUTHERS AV
DAHLIA AV
CARRUTHERS AV
LANSDOWNE AV
LANSDOWNE AV
LANSDOWNE AV
SINCLAIR ST
ARLINGTON ST
PARR ST
McKENZIE ST
INKSTER BV
LUXTON PL
LUXTON AV
POLSON AV
ATLANTIC AV
NORTH
Underground street light cable

MATHESON AV

CARRUTHERS AV

LANSDOWNE AV

MATHESON AV

CARRUTHERS AV

INKSTER BV

POLSON AV

ATLANTIC AV

POLSON AV

ATLANTIC AV

POWER ST

ANDREWS ST

POWERS ST

McGREGOR ST

McKENZIE ST

ANDREWS ST

POWERS ST

Underground street light cable

Underground street light cable

EX. 375 CS

NORTH

Underground street light cable

Underground street light cable

Underground street light cable

Underground street light cable

MATHESON AV

CARRUTHERS AV

CARRUTHERS AV

LANSDOWNE AV

LANSDOWNE AV

INKSTER BV

INKSTER BV

INKSTER BV

LUXTON AV W

LUXTON AV

POLSON AV

POLSON AV

ATLANTIC AV

ATLANTIC AV

POWERS ST

SALTER ST

AIKINS ST

AIKINS ST

MAIN ST

MAIN

CHARLES ST

NORTH

UNIT 2

300

31846
347/600V