HALTON HILLS HYDRO
UNDERGROUND DISTRIBUTION SPECIFICATIONS

The following Underground Distribution Specifications (UD-Specs) were developed by Halton Hills Hydro Inc. to be used only in this utilities service area. The following standards have been approved by a Professional Engineering accredited by the PEO in accordance with Ontario Regulation 22/04 and the appropriate *Certificates* of Approval have been issued in the specifications latest revision. For proof of *Certificate*, please contact Halton Hills Hydro Inc., Engineering Department.

Halton Hills Hydro has and will continue to determine the application for each specification. Halton Hills Hydro will not be held responsible/ liable for any misuse of these specifications by others (inside or outside the limits of this utilities service area).

These specifications are not recommended for use outside of Halton Hills Hydro's distribution service area as other standards/ codes may apply in other areas. As such, Standards/ Codes/ other applicable documentation should be obtained from the utility responsible for power distribution in the area you are working, if not within the limits of this utilities service area.

Please note that these standards are subject to change without notification and as such it is recommended that the user confirm latest revision if in doubt.

Any questions should be direct to Halton Hills Hydro Inc., Engineering Department at 519-853-3700.

- UD-01 - Typical Concrete Encased Duct Bank Section (8 ducts) – Roadcrossing/ Boulevard
- UD-02 - Concrete Encase Duct Bank Arrangements
- UD-03 - Hydro, Bell & TV Joint Use Trench Section 1.200 m Depth, Direct Buried Ducts, Boulevard
- UD-04 - Hydro, Bell & TV Joint Use Trench Section 1.425 m Depth, Direct Buried Ducts, Boulevard
- UD-05 - Hydro, Bell & TV Joint Use Trench Section 1.675 m Depth, Direct Buried Ducts, Boulevard
- UD-06 - Secondary Service Trench Section
- UD-07 - Street Lighting Trench Section
- UD-08 - Street Lighting Duct Termination Detail
- UD-09 - Secondary Service Installation Detail for Single Phase up to 400A and three Phase up to 200A
- UD-09-REC – Secondary Service Installation Detail (Recessed) for 1 Phase (& 3 Phase up to 200 AMP)
- UD-09B - Secondary Service on Stub Pole Installation Detail for 1 Phase (& 3 Phase up to 200A)
- UD-09C – CMS Secondary Service on Stub Pole Installation Detail for 1 Phase
- UD-09D - Secondary Service Installation Detail for 1 Phase (up to 400A)

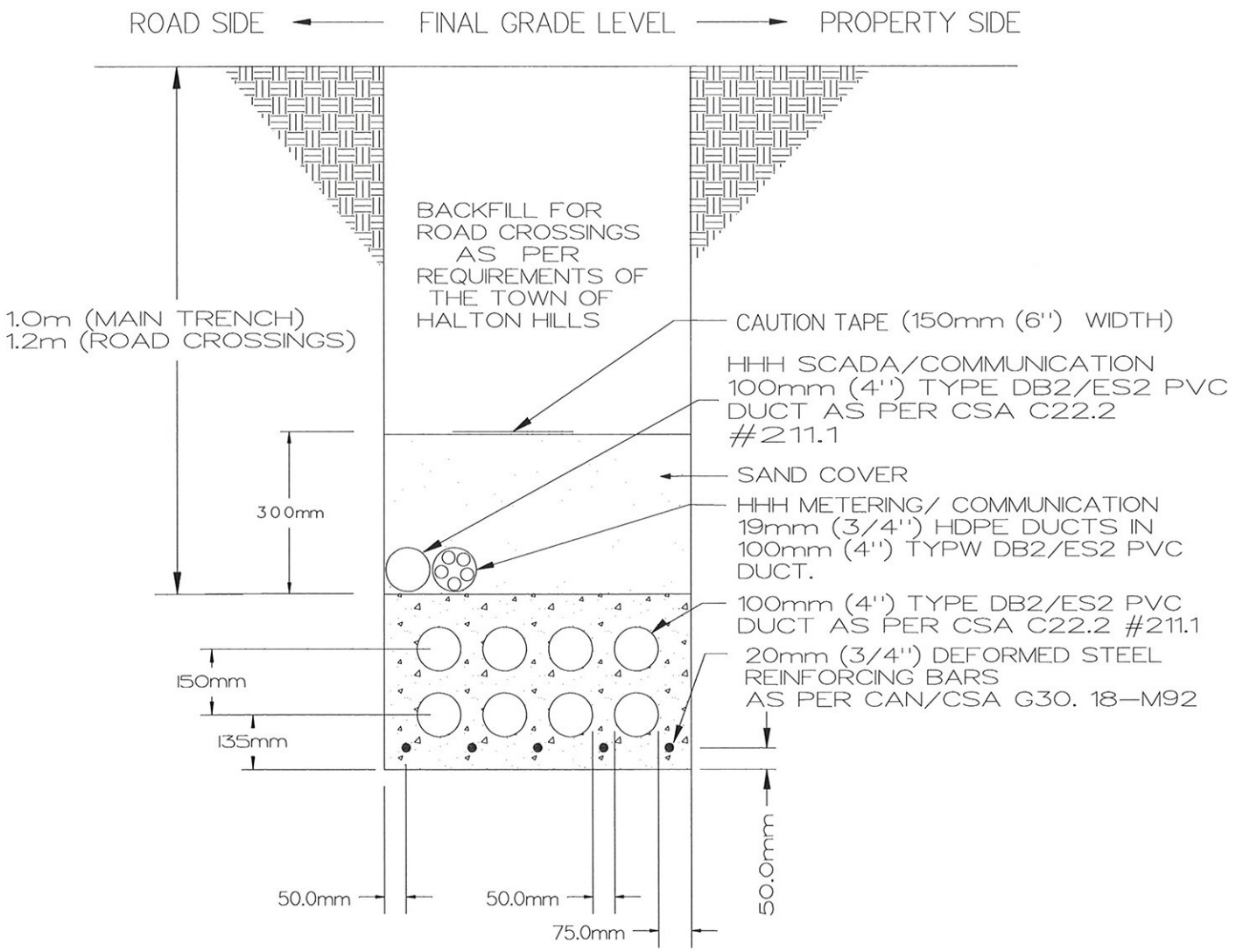
- UD-09E- Ganged Meter Base (3 Position Max. + Entry Door), Secondary Service on Wood Structure – Installation Detail
- UD-10 - Secondary Service Cable Splice Detail
- UD-11 - Installation of Precast Foundation for Pad Mounted Transformer & Switchgear Including Grounding Detail
- UD-12 - Proposed Typical Lot Servicing Agreement (Future)
- UD-13 - Single Phase Low Profile Pad Mounted Transformer
- UD-14 - Secondary Underground Cable Termination
- UD-15 - Primary Underground Termination Pole
- UD-16 - Typical 1 Phase Low Profile Pad Mounted Transformer Installation
- UD-17 - Typical 3 Phase Pad Mounted Transformer Installation (Radial & Loop Feed)
- UD-18B Typical Canada Power Pad Mounted Switchgear with Resettable Fault Interrupter Installation Detail
- UD-18C Canada Power Pad Mounted Switchgear, 2 – 600A 3ϕ Loop Feed with Resettable Fault Interrupters on 6 – 200A Single Phase Taps
- UD-18D Canada Power Pad Mounted Switchgear, 2 – 600A 3ϕ Loop Feed with Resettable Fault Interrupters on 1 – 200A 3ϕ Tap and 3 – 200A Switchable Single Phase Taps
- UD-19 - Faulted Circuit Indicator Installation Details
- UD-20 – Typical Switching Kiosk Installation
- UD-23 – Proposed Joint-Use Secondary Service Lateral (Step) Trench Section
- UD-24 Proposed Joint Use Primary & Secondary Hydro, Bell, T.V., & Gas Concrete Encased Step Trench Section (1.
- UD-25 Proposed Joint Use Primary & Secondary Hydro, Bell, T.V., & Gas Step Trench Section (1.525m Depth) – Boulevard
- UD-26 Proposed Concrete Encased Duct Bank Section Step Trench (For 8 Ducts) – Roadcrossing
- UD-27 Concrete Foundation Standard (For Halton Hills Hydro 898 Series Canada Power Switchgear.
- UD-29 Concrete Foundation Standard Lid (for Retrofitting PMH-9 Foundations with Lid for 898 Series Canada Power Switchgears.
- UD-30 Directional Bore Street Crossing Secondary Services – Typical.
- UD-31 Directional Bore Street Crossing Primary Services - Typical

- End of List

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
2. ALL DIMENSIONS ARE THE MINIMUM DISTANCES REQUIRED.
3. CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.
4. THE REINFORCING BARS ALONG THE BOTTOM SIDES AND BOTTOM OF THE DUCT BANK SHALL BE CONCEALED WITH A MINIMUM OF 50mm OF CONCRETE COVER.
5. BACKFILL IN LAYERS NOT EXCEEDING 300mm. COMPACTION TO BE TO 95% PROCTOR DENSITY MINIMUM (AS PER CSA C22.3 No. 7–94 clause – 3.5.3.2).
6. THIS SPECIFICATION MEETS OR EXCEEDS CSA C22.3 NO.7–94 STANDARD.
7. ALL DUCTS TO BE PVC TYPE DB2/ES2 AS PER CSA–C22.2 #211.1 STANDARD. VACANT DUCTS TO BE CAPPED PRIOR TO BACKFILLING.
8. 5 – 19mm (3/4") PVC DUCTS TO BE INSTALLED INSIDE 100mm (4") PVC DUCT, BY CONTRACTOR.
9. ALL PVC DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.
10. CABLE PULLING ROPES MUST BE INSTALLED IN ALL DUCTS AT TIME OF DUCT INSTALLATION. ANY CONCRETE OR OTHER BACKFILL SHALL NOT COVER ENDS OF DUCTS.

Halton Hills HYDRO



TYPICAL CONCRETE ENCASED DUCT BANK SECTION (FOR 8 DUCTS) – ROADCROSSINGS/ BOULEVARDS

DESIGNED BY:	H.H.H. FILE: U:\ Engineering Operations\ 2. Specs\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 05–05–16 C. HALE
DRAWN BY: F. LEMUT		
APPROVED BY: M. MAROSCHAK & G. EBERSBERGER		
SIGNATURE:	H.H.H. DWG. NO: UD–01–R2	ORIGINAL DATE: 00–04–18
SCALE: N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.

2 THE TOP ELEVATION OF THE CONCRETE ENCASEMENT SHALL BE A DEPTH OF 1.0m. IN ROCK OR HIGH WATER TABLE AREAS, THE TOP OF THE DUCT BANK MAY BE PLACED AT SUBGRADE ELEVATION OR AS OTHERWISE DIRECTED BY THE ENGINEER.

3 THE REINFORCING BARS ALONG THE BOTTOM SIDES AND BOTTOM OF THE DUCT BANK SHALL BE CONCEALED WITH A MINIMUM OF 50mm OF CONCRETE COVER.

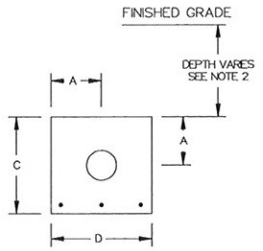
4 ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SHOWN.

5 THIS SPECIFICATION MEETS OR EXCEEDS CSA 22.3 NO.7-94 STANDARD.

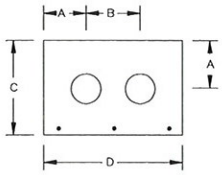
6 ALL DUCTS TO BE PVC TYPE DB2/ES2 AS PER CSA-C22.2 #211.1 STANDARD.

7 ALL PVC DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.

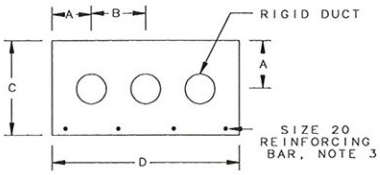
Halton Hills HYDRO



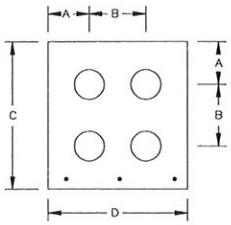
ONE - DUCT BANK



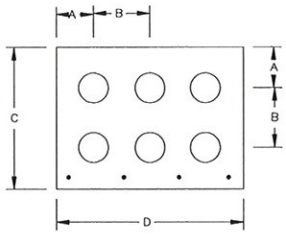
TWO - DUCT BANK



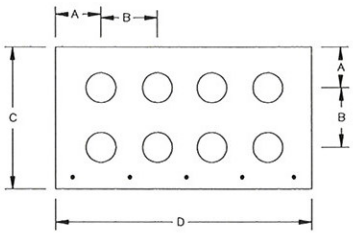
THREE - DUCT BANK



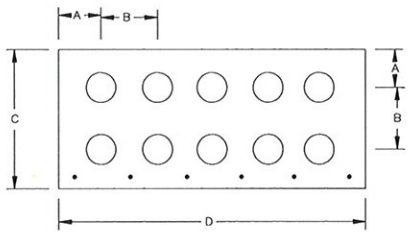
FOUR - DUCT BANK



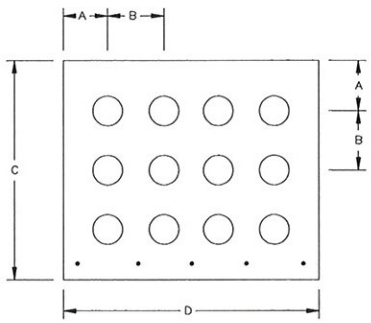
SIX - DUCT BANK



EIGHT - DUCT BANK

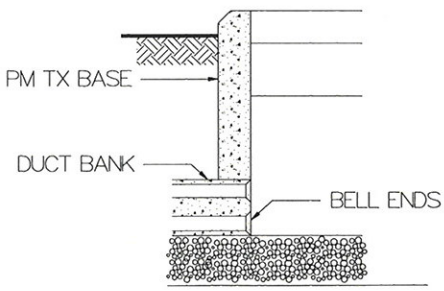


TEN - DUCT BANK



TWELVE - DUCT BANK

NO. OF DUCT IN BANK	TYPICAL DIMENSIONS IN mm. 100 MM DIA. DUCTS			
	A	B	C	D
1	135	–	270	270
2	135	150	270	420
3	135	150	270	570
4	135	150	420	420
6	135	150	420	570
8	135	150	420	720
10	135	150	420	870
12	135	150	570	720



TYPICAL SECTION

CONCRETE ENCASED DUCT STRUCTURE ARRANGEMENTS

DESIGNED BY:		H.H.H. FILE: U:\Engineering Operations\ 2. Specs\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE: 05-05-16 C. HALE
DRAWN BY:	F. LEMUT		
APPROVED BY:	M. MAROSCHAK & G. EBERSBERGER		
SIGNATURE:		H.H.H. DWG. NO: UD-02-R2	ORIGINAL DATE: 00-04-18
SCALE:	N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.

2 ALL DIMENSIONS ARE THE MINIMUM DISTANCES REQUIRED

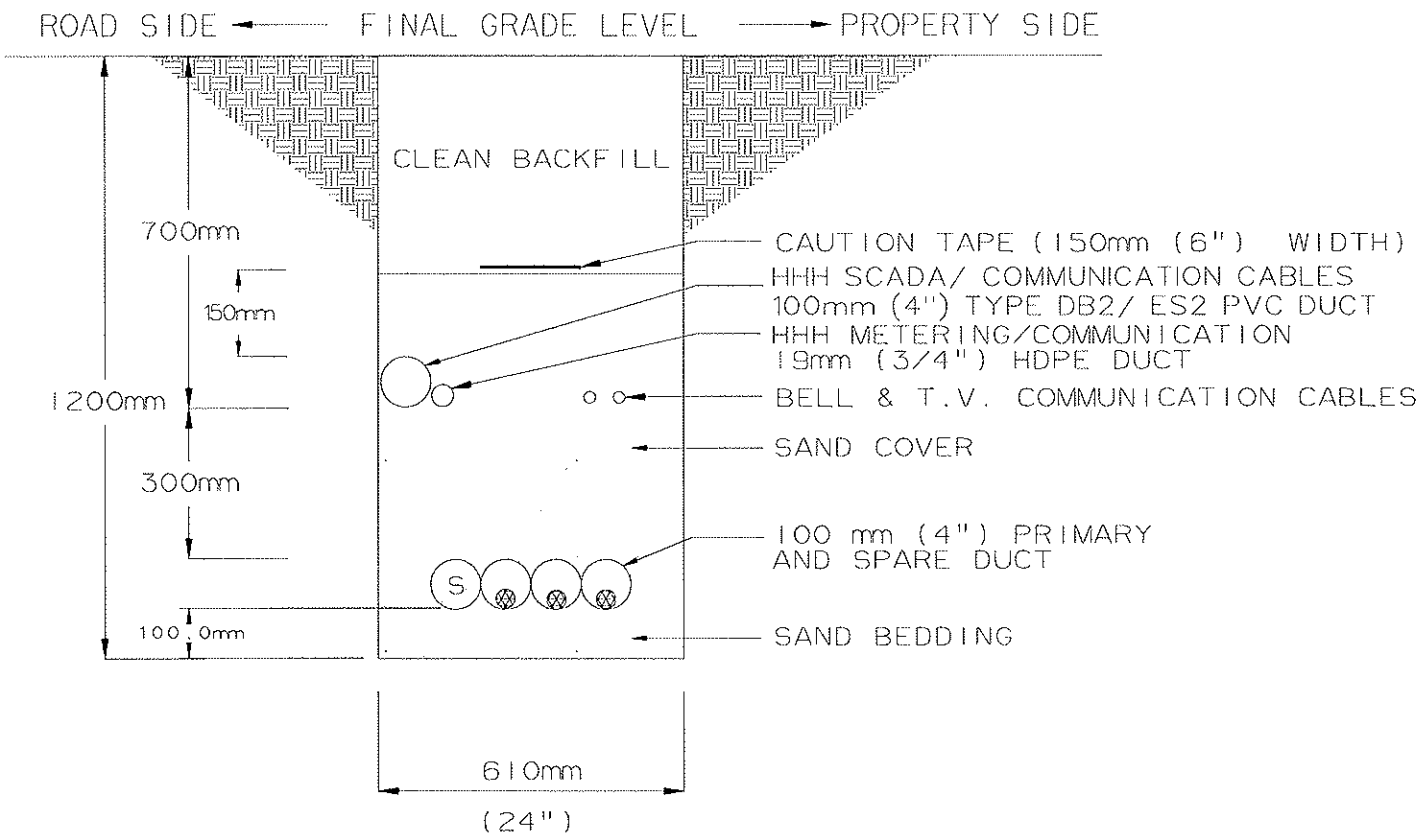
3 CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.

4 BACKFILL IN LAYERS NOT EXCEEDING 300 mm. THOROUGHLY COMPACT EACH LAYER.

5 THIS SPECIFICATION MEETS OR EXCEEDS CSA C22.3 NO.7-94 STANDARD.

6 ALL PVC DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.

Halton Hills HYDRO



TYPICAL PRIMARY HYDRO, BELL & T.V. JOINT USE TRENCH SECTION (1.2 m DEPTH), DIRECT BURIED DUCTS – BOULEVARD

DESIGNED BY:	H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE: 05-05-16 C. HALE
DRAWN BY: F. LEMUT		
APPROVED BY: M. MAROSCHAK & G. EBERSBERGER		
SIGNATURE:	H.H.H. DWG. NO: UD-03-R2	ORIGINAL DATE: 00-04-18
SCALE: N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.

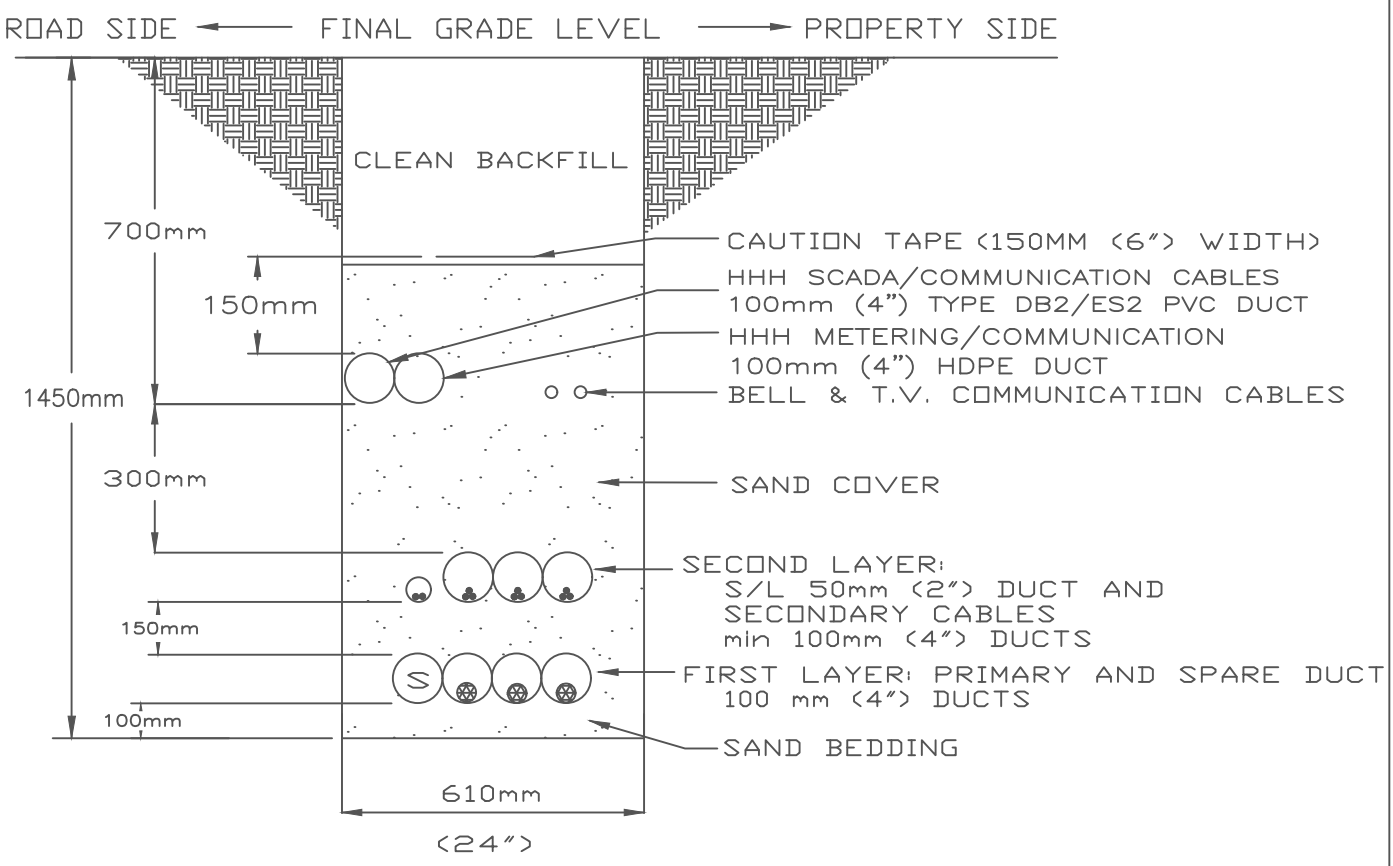
2 ALL DIMENSIONS ARE THE MINIMUM DISTANCES REQUIRED.

3 CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.

4 BACKFILL IN LAYERS NOT EXCEEDING 300 mm. THOROUGHLY COMPACT EACH LAYER.

5 THIS SPECIFICATION MEETS OR EXCEEDS CSA C22.3 NO.7–15 STANDARD.

6 ALL PVC DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.



TYPICAL PRIMARY & SECONDARY HYDRO, BELL & T.V. JOINT USE TRENCH SECTION (1.450 m DEPTH), DIRECT BURIED DUCTS – BOULEVARD

DESIGNED BY:	H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 17–02–08 J. ORLENI
DRAWN BY: F. LEMUT		
APPROVED BY: C. HALE C.E.T LEL, ENG SUPERVISOR		
SIGNATURE:	H.H.H. DWG. NO: UD–04–R3	ORIGINAL DATE: 00–04–18
SCALE: N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.

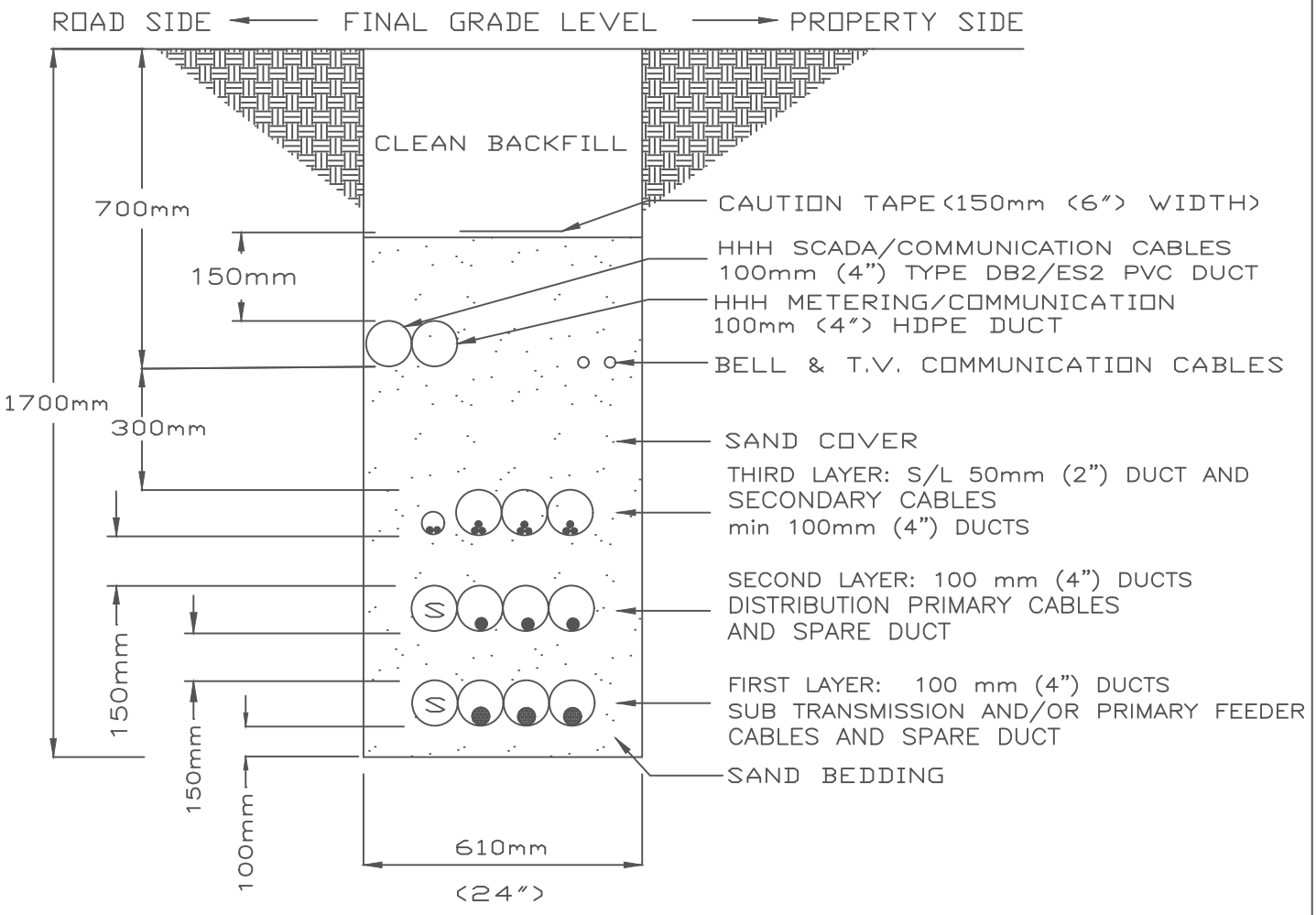
2 ALL DIMENSIONS ARE THE MINIMUM DISTANCES REQUIRED.

3 CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.

4 BACKFILL IN LAYERS NOT EXCEEDING 300 mm. THOROUGHLY COMPACT EACH LAYER.

5 THIS SPECIFICATION MEETS OR EXCEEDS CSA C22.3 NO.7–15 STANDARD.

6 ALL HYDRO PVC DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.

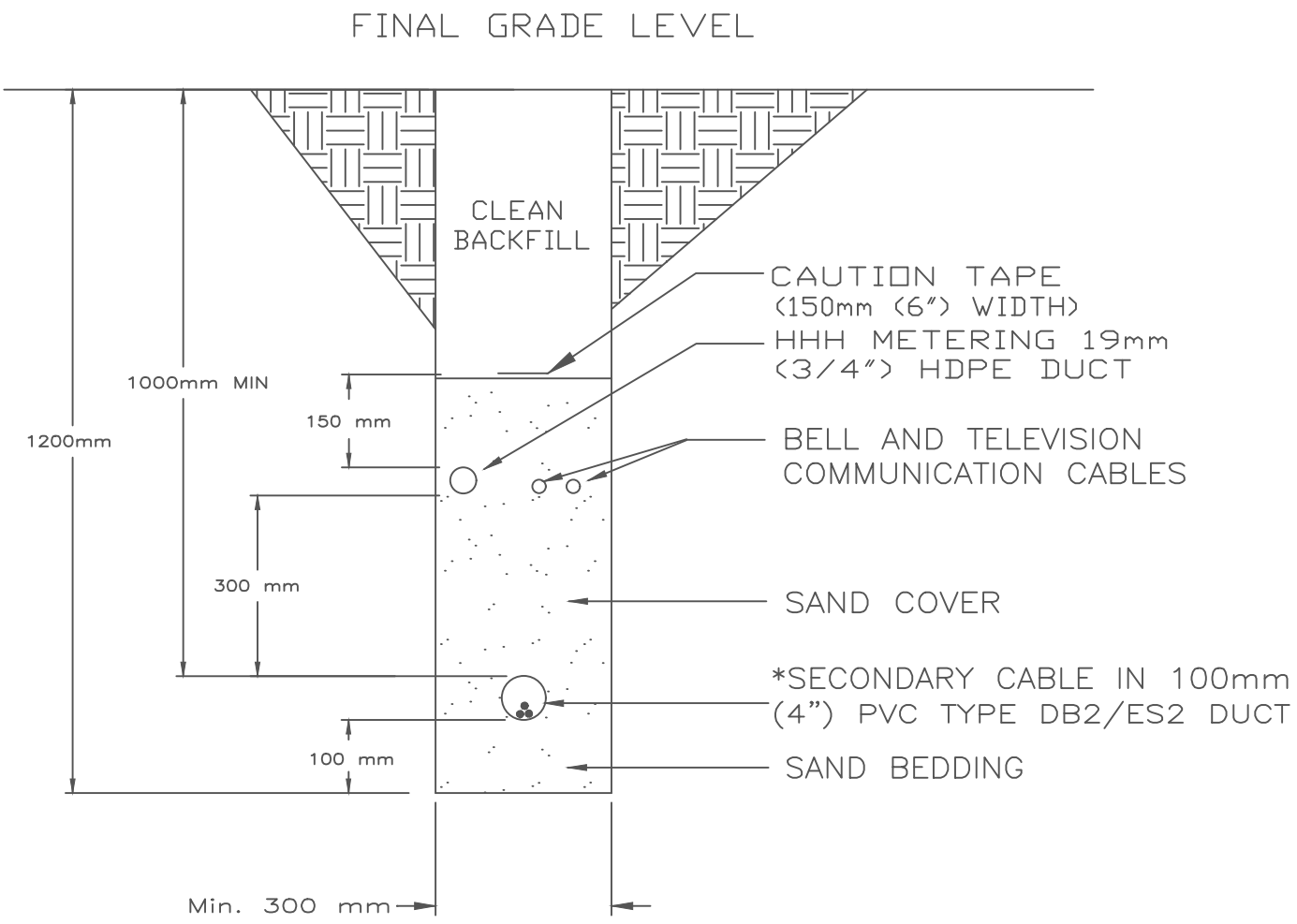


TYPICAL HYDRO, BELL & T.V. JOINT USE TRENCH SECTION (1.700 m DEPTH), DIRECT BURIED DUCTS – BOULEVARD

DESIGNED BY:	H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE: 17-02-08 J. ORLENI
DRAWN BY: F. LEMUT		
APPROVED BY: C. HALE C.E.T LEL, ENG SUPERVISOR		
SIGNATURE:	H.H.H. DWG. NO: UD-05-R3	ORIGINAL DATE: 00-04-18
SCALE: N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
2 ALL DIMENSIONS ARE THE MINIMUM REQUIRED DISTANCES.
3 CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.
4 BACKFILL IN LAYERS NOT EXCEEDING 300 mm. THOROUGHLY COMPACT EACH LAYER.
5 THIS SPECIFICATION MEETS OR EXCEEDS CSA-C22.3 NO.7-15 STANDARD.
6 HHH METERING/COMMUNICATION 100mm (4") HDPE POLY DUCT SHALL BE INSTALLED AND TERMINATED AT EACH METER BASE AND TIE WRAPPED TO THE INCOMING RIGID METER BASE DUCT. THE OTHER END SHALL BE TERMINATED AND BURIED AT THE COMMUNICATION LEVEL IN CLOSE PROXIMITY TO THE RELEVANT TRANSFORMER. THE DUCT SHALL BE SEALED WITH APPROPRIATE TAPERED POLY PLUG OR END CAP ON BOTH ENDS. PULLING ROPE 4.75 mm (3/16") SHALL BE INSTALLED IN THIS DUCT. SEE HHH DUCT INSTALLATION SPECIFICATION FOR MORE DETAILS.
7 ALL PVC DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.



*NOTE: SERVICES RATED 400A OR GREATER WILL REQUIRE ADDITIONAL DUCTS

SECONDARY SERVICE TRENCH SECTION

DESIGNED BY:	H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE: 17-02-08 J. ORLENI
DRAWN BY: F. LEMUT		
APPROVED BY: C. HALE C.E.T LEL, ENG SUPERVISOR		
SIGNATURE:	H.H.H. DWG. NO: UD-06-R3	ORIGINAL DATE: 00-04-18
SCALE: N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.

2 ALL DIMENSIIONS ARE THE MINIMUM REQUIRED DISTANCES.

3 CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.

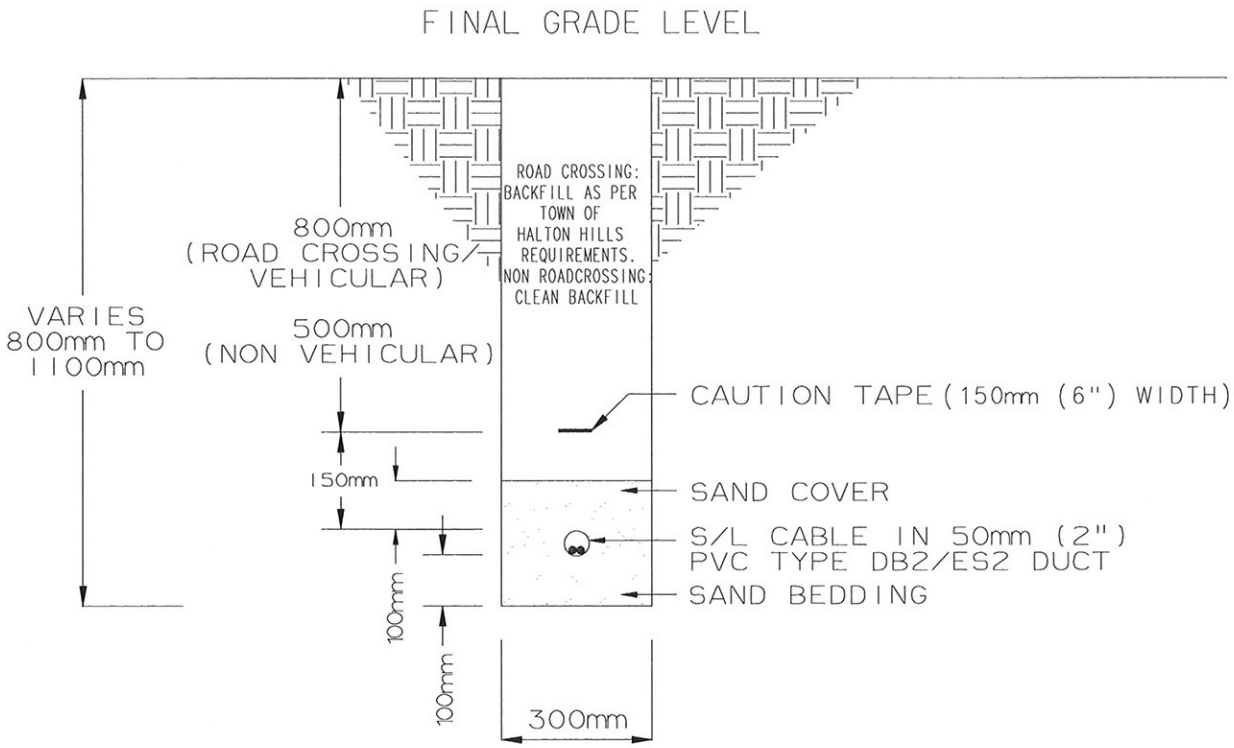
4 BACKFILL IN LAYERS NOT EXCEEDING 300 mm. THOROUGHLY COMPACT EACH LAYER.

5 THIS SPECIFICATION MEETS OR EXCEEDS CSA C22.3 NO.7-94 STANDARD.

6 FOR MORE DETAILS SEE HALTON HILLS HYDRO STANDARD DWG. UD-08.

7 ALL PVC DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.

Halton Hills HYDRO



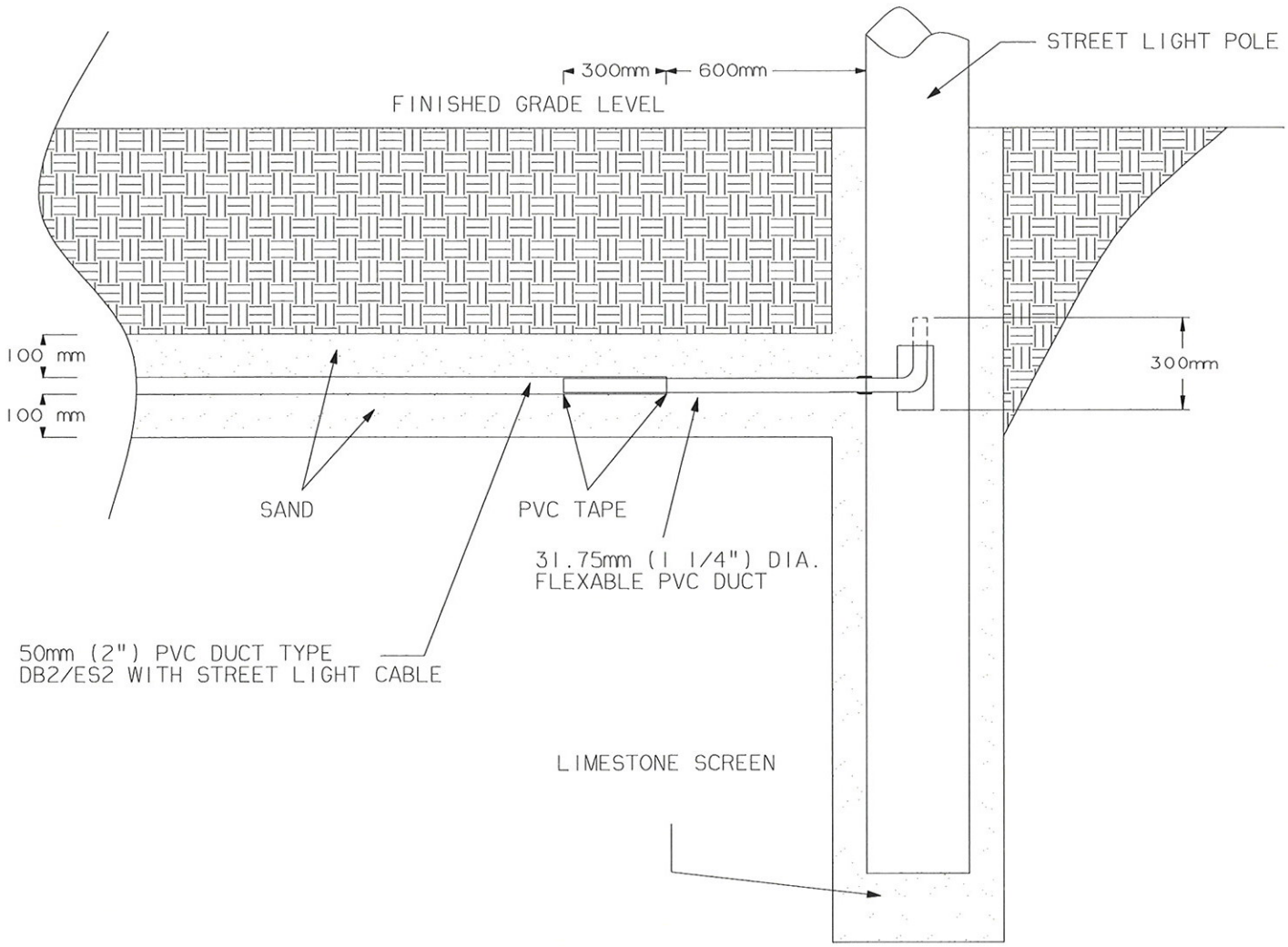
STREET LIGHTING TRENCH SECTION

DESIGNED BY:		H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE: 05-04-06 C. HALE
DRAWN BY:	F. LEMUT		
APPROVED BY:	M. MAROSCHAK & G. EBERSBERGER		
SIGNATURE:		H.H.H. DWG. NO: UD-07-R1	ORIGINAL DATE: 00-04-18
SCALE:	N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
2 ALL DIMENSIONS ARE THE MINIMUM DISTANCES REQUIRED.
3 CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.
4 BACKFILL IN LAYERS NOT EXCEEDING 300 mm. THOROUGHLY COMPACT EACH LAYER.
5 THIS SPECIFICATION MEETS OR EXCEEDS CSA C22.3 No. 7-94 STANDARD.
6 FOR FURTHER DETAILS SEE HALTON HILLS HYDRO STANDARD DWG. UD-07.
7 ALL PVC DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.

Halton Hills HYDRO

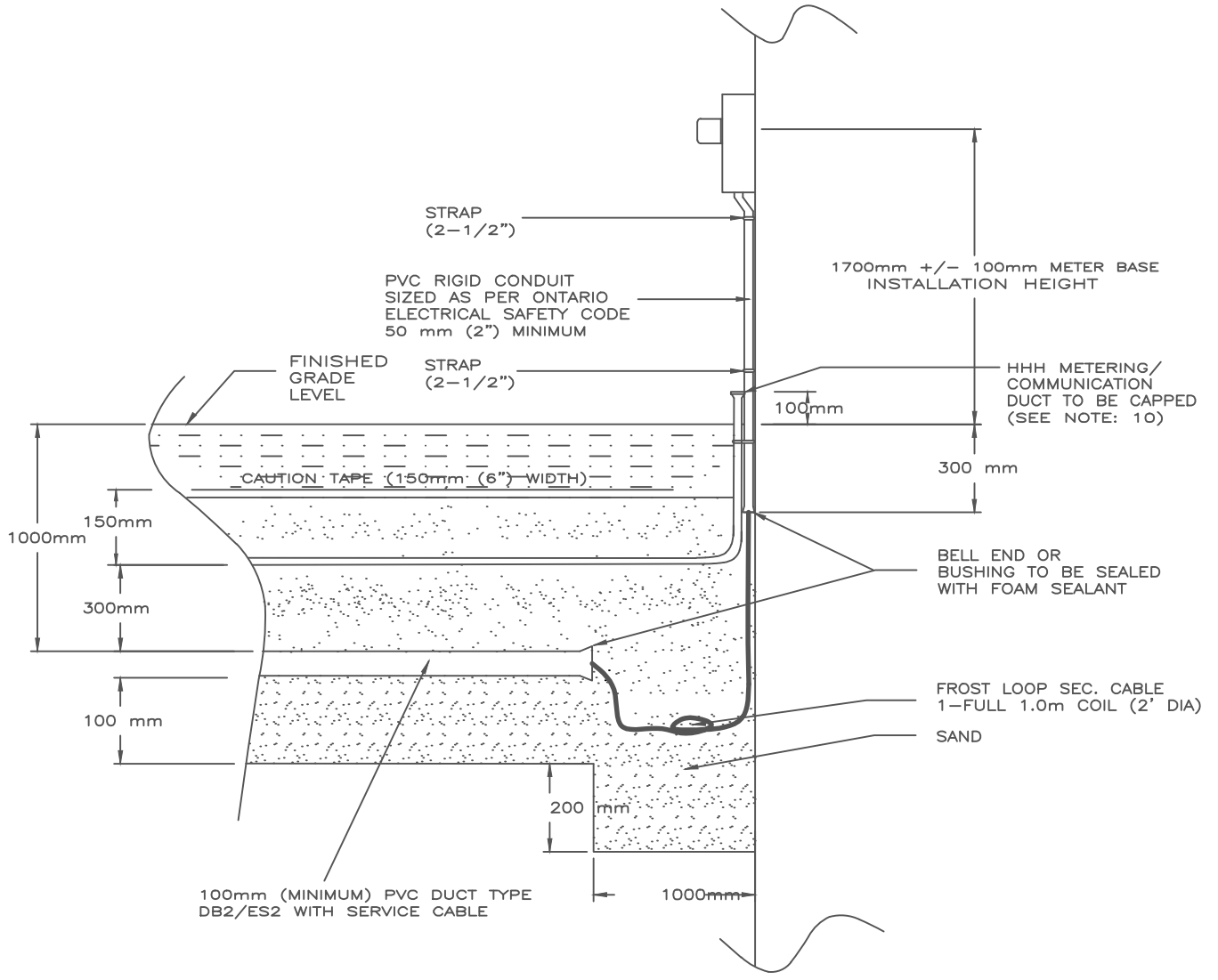


STREETLIGHTING DUCT TERMINATION DETAIL

DESIGNED BY:		H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE: 05-05-20 C. HALE
DRAWN BY:	F. LEMUT		
APPROVED BY:	M. MAROSCHAK & G. EBERSBERGER		
SIGNATURE:		H.H.H. DWG. NO: UD-08-R2	ORIGINAL DATE: 00-04-18
SCALE:	N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
2 FOR MORE INFORMATION SEE HALTON HILLS HYDRO SECONDARY SERVICE TRENCH PROFILE, UD–06.
3 CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.
4 ALL MATERIALS SHALL MEET THE SAFETY REQUIREMENTS OF THE ONTARIO ELECTRICAL SAFETY CODE. 2002, OR LATEST AND O. REG. 22/04, LATEST ADMENDMENT.
5 ALL DUCTS TO BE SEALED AGAINST DIRT INGRESS.
6 CAUTION TAPE TO BE INSTALLED FULL LENGTH OF THE TRENCH.
7 SAND COVER WILL BE REQUIRED FOR ALL DIRECT BURIED CABLE.
8 ALL DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.
9 THIS SPECIFICATION MEETS OR EXCEEDS CSA–C22.3 NO.7–15 STANDARD.
10 HHH METERING/COMMUNICATION 100mm (4") HDPE POLY DUCT SHALL BE INSTALLED AND TERMINATED AT EACH METER BASE AND TIE WRAPPED TO THE INCOMING RIGID METER BASE DUCT. THE OTHER END SHALL BE TERMINATED AND BURIED AT THE COMMUNICATION LEVEL IN CLOSE PROXIMITY TO THE RELEVANT TRANSFORMER. THE DUCT SHALL BE SEALED WITH APPROPRIATE TAPERED POLY PLUG OR END CAP ON BOTH ENDS. PULLING ROPE 4.75mm (3/16") SHALL BE INSTALLED IN THIS DUCT. SEE HHH STD. DWG. UD–06 FOR REFERENCE AND HHH DUCT INSTALLATION SPECIFICATION FOR MORE DETAILS.

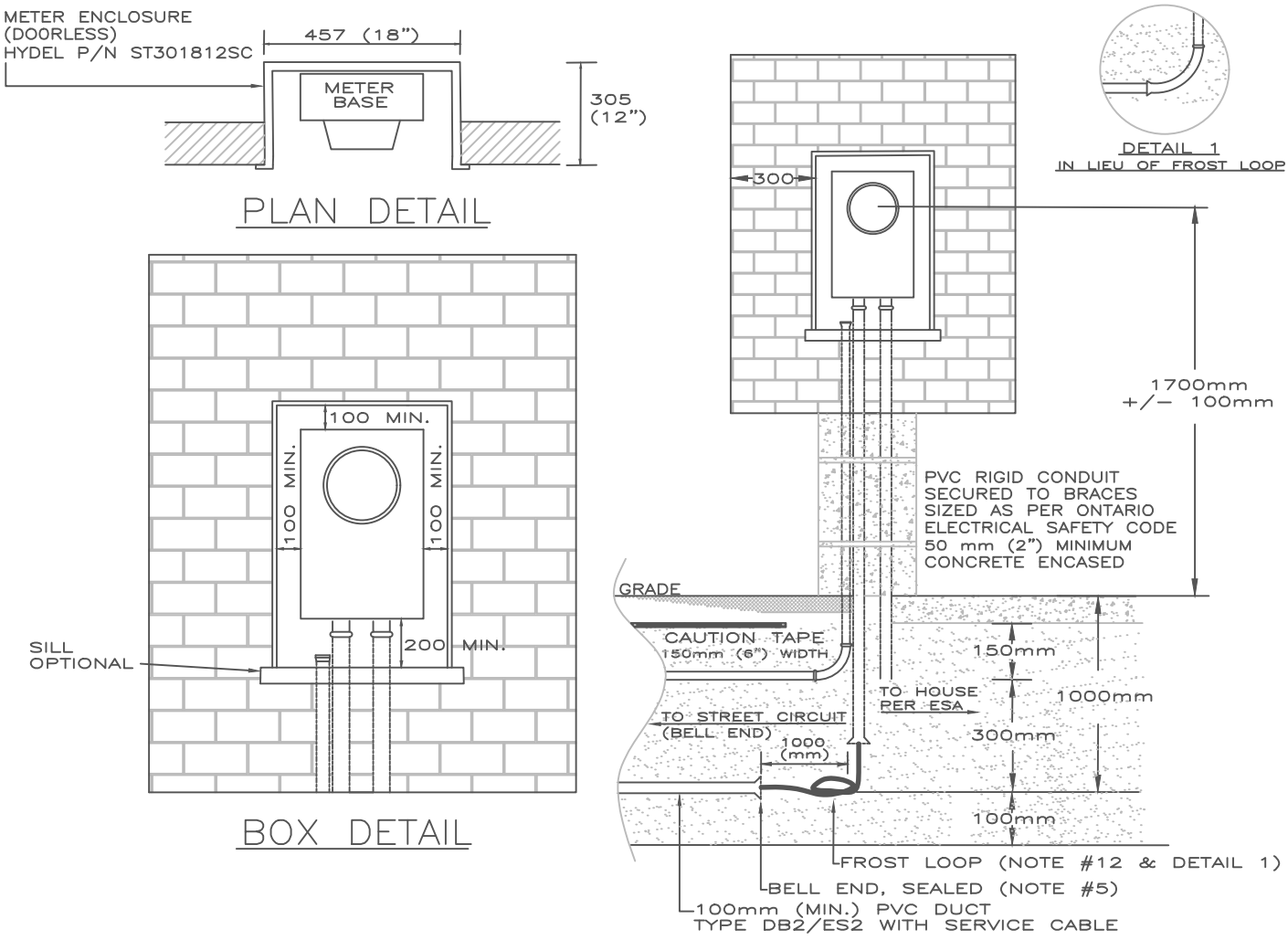


SECONDARY SERVICE INSTALLATION DETAIL FOR 1 PHASE (& 3 PHASE UP TO 200 AMP).

DESIGNED BY: L. BAKER	H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 17–02–08 J. ORLENI
DRAWN BY: F. LEMUT		
APPROVED BY: C. HALE C.E.T LEL, ENG SUPERVISOR		
SIGNATURE:	H.H.H. DWG. NO: UD–09–R3	ORIGINAL DATE: 01–01–17
SCALE: N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
2 FOR MORE INFORMATION SEE HALTON HILLS HYDRO SECONDARY SERVICE TRENCH PROFILE, UD–06.
3 CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.
4 ALL MATERIALS SHALL MEET THE SAFETY REQUIREMENTS OF THE ONTARIO ELECTRICAL SAFETY CODE. 2002, OR LATEST AND O. REG. 22/04, LATEST AMENDMENT.
5 ALL DUCTS TO BE SEALED AGAINST DIRT INGRESS WITH ELECTRICALLY INSULATED FOAM.
6 CAUTION TAPE TO BE INSTALLED FULL LENGTH OF THE TRENCH.
7 SAND COVER WILL BE REQUIRED FOR ALL DIRECT BURIED DUCTS PER UD–06. DUCTS SHALL BE CONCRETE ENCASED UNDER VEHICLE TRAVELED SURFACES PER UD–02.
8 ALL DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.
9 THIS SPECIFICATION MEETS OR EXCEEDS CSA–C22.3 NO.7–15 STANDARD.
10 HHH METERING/COMMUNICATION 100mm (4") HDPE POLY DUCT SHALL BE INSTALLED AND TERMINATED AT EACH METER BASE AND TIE WRAPPED TO THE INCOMING RIGID METER BASE DUCT. THE OTHER END SHALL BE TERMINATED AND BURIED AT THE COMMUNICATION LEVEL IN CLOSE PROXIMITY TO THE RELEVANT TRANSFORMER. THE DUCT SHALL BE SEALED WITH APPROPRIATE TAPERED POLY PLUG OR END CAP ON BOTH ENDS. PULLING ROPE 4.75mm (3/16") SHALL BE INSTALLED IN THIS DUCT. SEE HHH STD. DWG. UD–06 FOR REFERENCE AND HHH DUCT INSTALLATION SPECIFICATION FOR MORE DETAILS.
11 METER CABINET SHALL BE ELECTRICAL BONDED/ GROUNDED PER ESA CODE. METER CABINET SHALL BE DOORLESS AND SHALL HAVE A WOOD BACKPANEL FOR MOUNTING METER BASE. CABINET OPENING SHALL REMAIN UNOBSTRUCTED.
12 FROST LOOP SHALL BE INSTALLED BELOW METER BASE AND SHALL NOT BE CONCRETE ENCASED. IF A FROST LOOP IS NOT POSSIBLE, A CSA 36" RADIUS BENDED CONDUIT PER DETAIL 1 MAY BE USED WITH HHH'S APPROVAL.

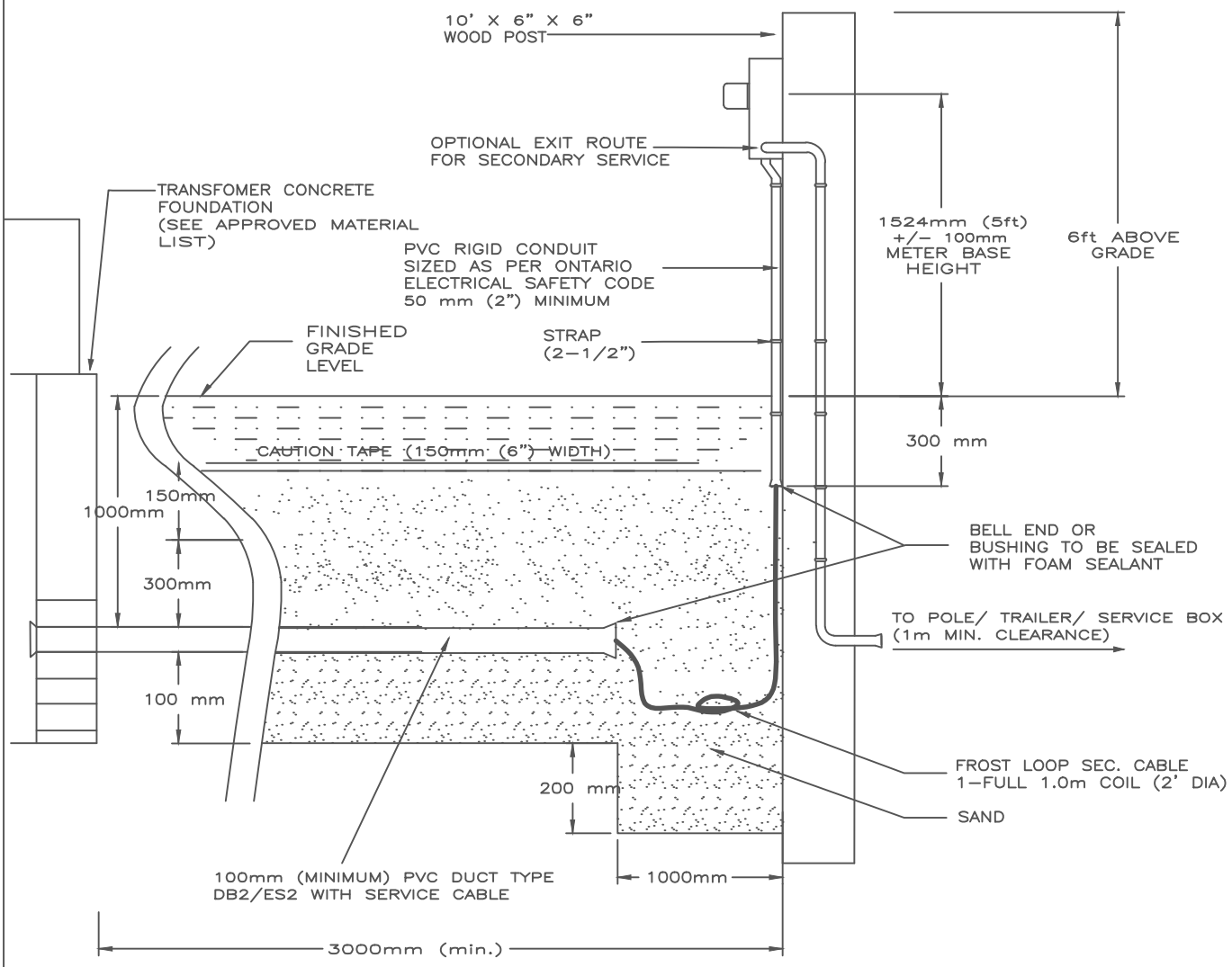


SECONDARY SERVICE INSTALLATION DETAIL (RECESSED)
FOR 1 PHASE (& 3 PHASE UP TO 200 AMP)

DESIGNED BY: C. HALE	H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 17–02–08 J. ORLENI
DRAWN BY: C. HALE		
APPROVED BY: C. HALE C.E.T LEL, ENG SUPERVISOR		
SIGNATURE:	H.H.H. DWG. NO: UD–09–REC–R2	ORIGINAL DATE: 07–05–01
SCALE: N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
2 FOR MORE INFORMATION SEE HALTON HILLS HYDRO SECONDARY SERVICE TRENCH PROFILE, UD–06.
3 CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.
4 ALL MATERIALS SHALL MEET THE SAFETY REQUIREMENTS OF THE ONTARIO ELECTRICAL SAFETY CODE. 2002, OR LATEST AND O. REG. 22/04, LATEST ADMENDMENT.
5 ALL DUCTS TO BE SEALED AGAINST DIRT INGRESS.
6 CAUTION TAPE TO BE INSTALLED FULL LENGTH OF THE TRENCH.
7 SAND COVER WILL BE REQUIRED FOR ALL DIRECT BURIED CABLE.
8 ALL DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.
9 THIS SPECIFICATION MEETS OR EXCEEDS CSA–C22.3 NO.7–15 STANDARD.
10 SEE HALTON HILLS HYDRO'S APPROVED MATERIALS LIST FOR APPROVED METER BASES, CABLE, CONDUIT, STRAPS, TRANSFORMERS, AND CONCRETE FOUNDATIONS.
11 WHERE APPLICABLE, ESA CODE SHALL BE FOLLOWED AND INSPECTION REQUIRED PRIOR TO ENERGIZING THE SERVICE.
12 METER SHALL BE ORIENTED OPPOSITE THE DIRECTION OF TRAFFIC.

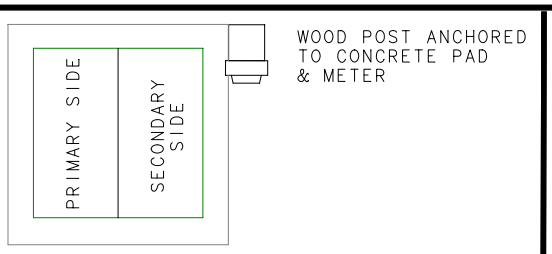


SECONDARY SERVICE ON STUB POLE INSTALLATION DETAIL FOR 1 PHASE (& 3 PHASE UP TO 200 AMP).

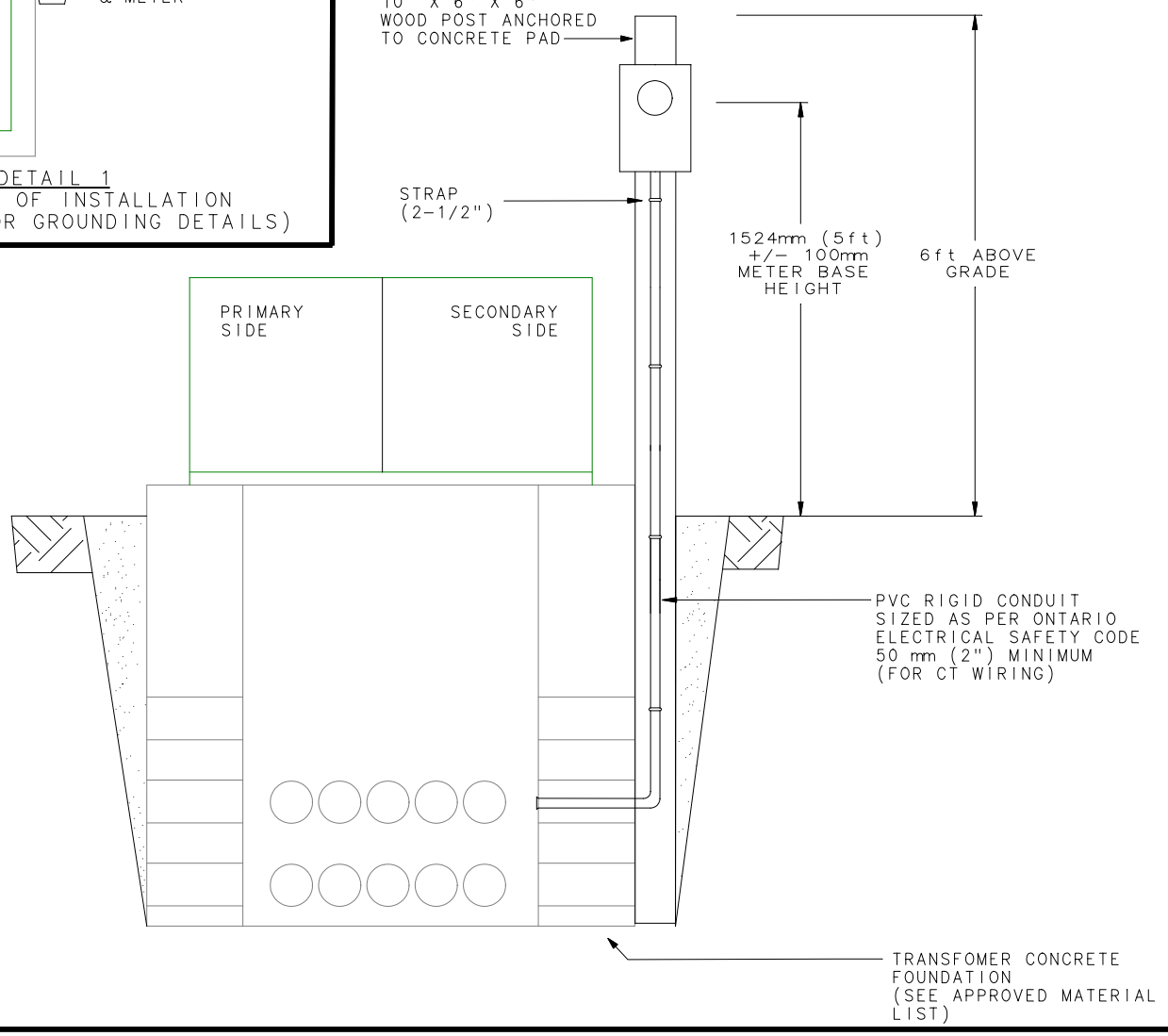
DESIGNED BY: C. HALE	H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 17–02–08 J. ORLENI
DRAWN BY: C. HALE		
APPROVED BY: C. HALE C.E.T LEL, ENG SUPERVISOR		
SIGNATURE:	H.H.H. DWG. NO: UD–09B–R1	ORIGINAL DATE: 07–07–12
SCALE: N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
2 FOR MORE INFORMATION SEE HALTON HILLS HYDRO SECONDARY SERVICE TRENCH PROFILE, UD-06.
3 CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.
4 ALL MATERIALS SHALL MEET THE SAFETY REQUIREMENTS OF THE ONTARIO ELECTRICAL SAFETY CODE. 2002, OR LATEST AND O. REG. 22/04, LATEST ADMENDMENT.
5 ALL DUCTS TO BE SEALED AGAINST DIRT INGRESS.
6 STUB POLE SHALL BE INSTALLED ON SECONDARY SIDE OF TRANSFORMER (DETAIL 1) AND BE ANCHORED TO THE CONCRETE FOUNDATION.
7 SAND COVER WILL BE REQUIRED FOR AROUND STUB POST AND DUCT.
8 ALL DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.
9 THIS SPECIFICATION MEETS OR EXCEEDS CSA-C22.3 NO.7-94 STANDARD.
10 SEE HALTON HILLS HYDRO'S APPROVED MATERIALS LIST FOR APPROVED METER BASES, CABLE, CONDUIT, STRAPS, TRANSFORMERS, AND CONCRETE FOUNDATIONS.
11 WHERE APPLICABLE, ESA CODE SHALL BE FOLLOWED AND INSPECTION REQUIRED PRIOR TO ENERGIZING THE SERVICE.
12 METER SHALL BE ORIENTED OPPOSITE THE DIRECTION OF TRAFFIC.

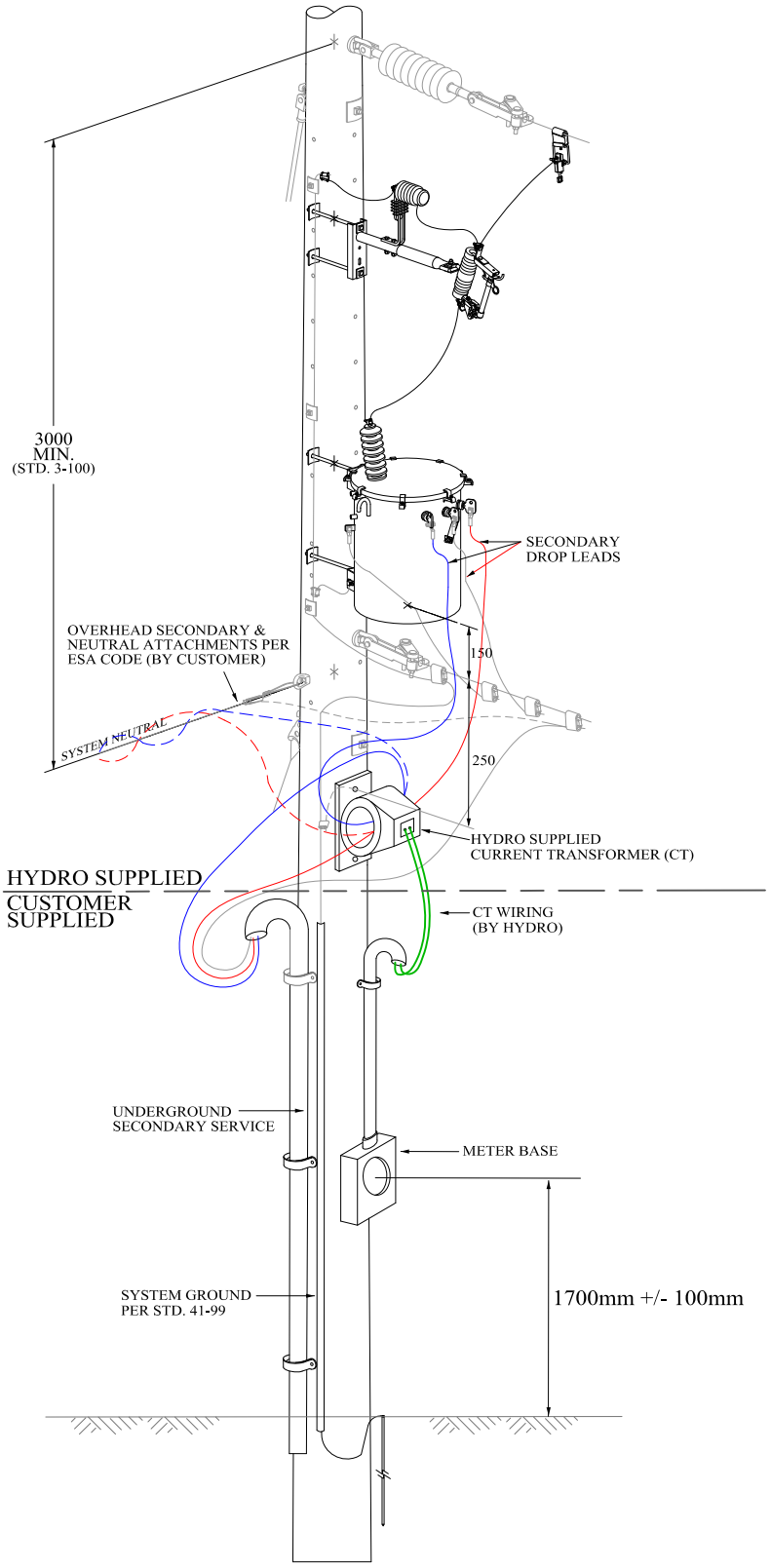


DETAIL 1
PLAN VIEW OF INSTALLATION
(SEE UD-11 FOR GROUNDING DETAILS)



CMS SECONDARY SERVICE ON STUB POLE INSTALLATION DETAIL (FOR 1 PHASE)

DESIGNED BY: C. HALE	H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE:
DRAWN BY: C. HALE		
APPROVED BY: M. MAROSCHAK & K. DURSKI		
SIGNATURE:	H.H.H. DWG. NO: UD-09C-R0	ORIGINAL DATE: 07-07-12
SCALE: N.T.S.		



NOTES:

1. OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.

2. ALL MATERIALS SHALL MEET THE SAFETY REQUIREMENTS OF THE ONTARIO ELECTRICAL SAFETY CODE. 2002, OR LATEST AND O. REG. 22/04, LATEST ADMENDMENT.

3. HYDRO WILL SUPPLY CURRENT TRANSFORMER (CT), CT WIRING HARNESS, AND WIRE CT'S INTO METER BASE.

4. CUSTOMER SHALL PROVIDE CSA APPROVED METER BASE, SERVICE MAST, AND WEATHERHEAD. SEE HALTON HILLS HYDRO APPROVED MATERIALS LIST FOR APPROVED MATERIALS.

5. OVERHEAD AND UNDERGROUND SERVICES SECONDARY, OR A COMBINATION OF BOTH, ARE PERMITTED.

6. DISTRIBUTION TRANSFORMER INSTALLATION BY HYDRO SHALL BE DONE IN ACCORDANCE WITH SECTIONS 19 AND 41 OF HYDRO'S APPROVED STANDARDS.

7. CUSTOMERS WORK MUST MEET WITH ESA CODE AND BE INSPECTED BY ESA. PRIOR TO CONNECTION BY HYDRO, CUSTOMER WILL NEED TO SUPPLY HYDRO WITH A COPY OF ESA's CONNECTION AUTHORIZATION.

8. CUSTOMERS POLE SHALL BE SIZED PER ESA CODE AND MUST BE OF LENGTH TO ALLOW THE INSTALLATION SHOWN AT LEFT.

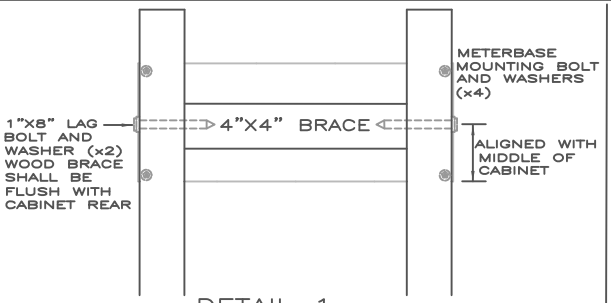
9. CT's SHALL BE INSTALLED SUCH THAT CT RATIO CAN BE SEEN FROM THE GROUND.

CMS SECONDARY SERVICE INSTALLATION DETAIL FOR 1 PHASE (UP TO 400 AMP).

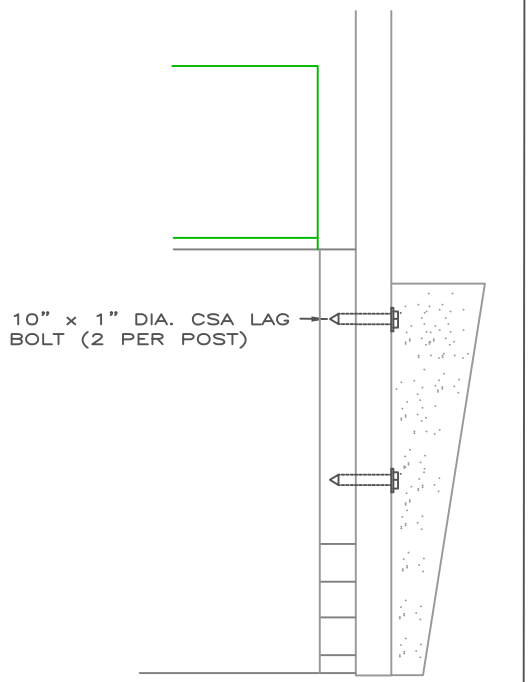
DESIGNED BY: C. HALE	H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE:
DRAWN BY: C. HALE		
APPROVED BY: M. MAROSCHAK & K. DURSKI		
SIGNATURE:	H.H.H. DWG. NO: UD-09D-R0	ORIGINAL DATE: 07-07-19
SCALE: N.T.S.		

NOTES:

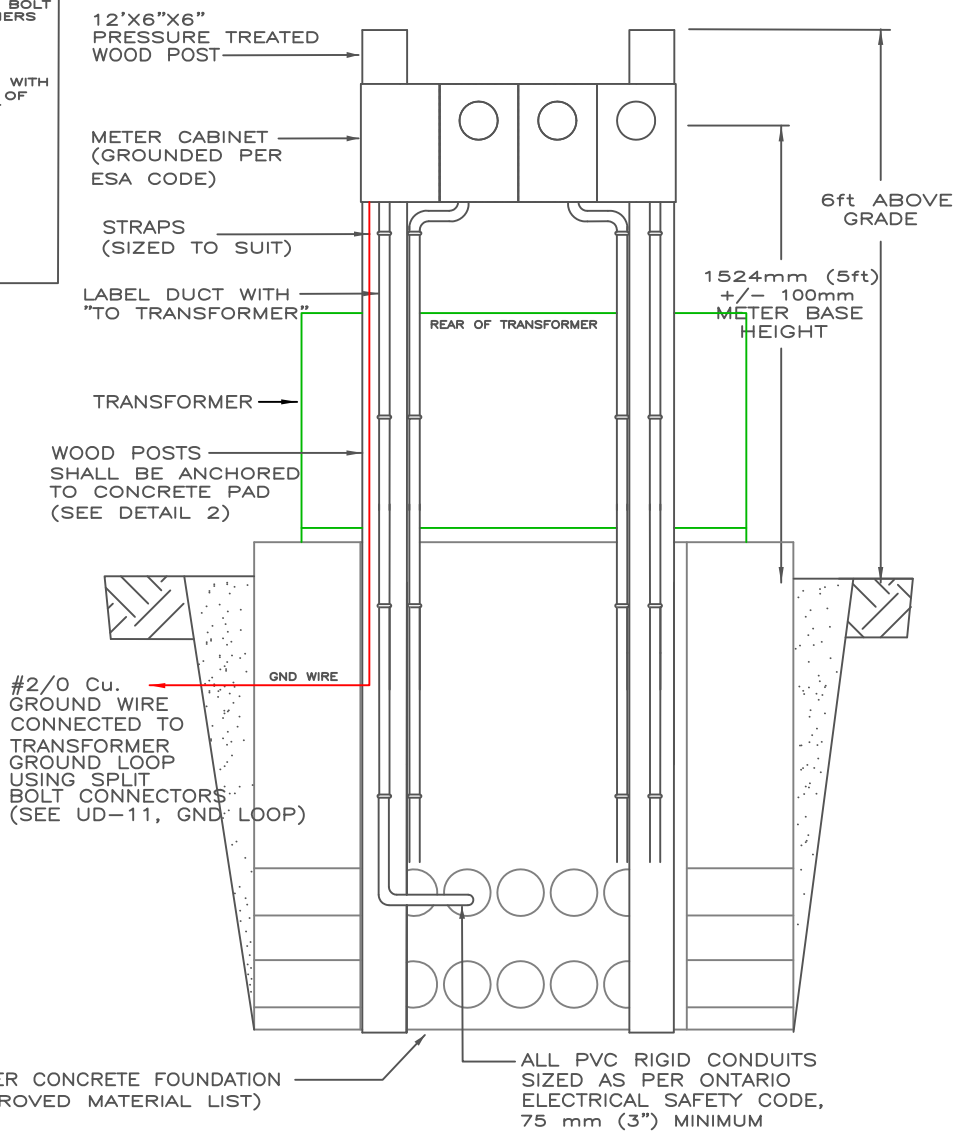
1. OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
2. THIS STANDARD IS ONLY TO BE USED WHEN APPROVED BY HHH AND IS ONLY INTENDED FOR RURAL CUSTOMER SERVICES WHERE A CMS IS NOT APPLICABLE. THIS STANDARD SHALL NOT BE USED FOR SUBDIVISIONS, CONDOMINIUMS, TOWNHOUSE, OR APPARTMENT COMPLEXES.
3. SEE HALTON HILLS HYDRO SECONDARY SERVICE TRENCH PROFILE, UD–06.
4. CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.
5. ALL MATERIALS SHALL MEET THE SAFETY REQUIREMENTS OF THE ONTARIO ELECTRICAL SAFETY CODE. 2002, OR LATEST AND O. REG. 22/04, LATEST ADMENDMENT.
6. ALL DUCTS TO BE SEALED AGAINST DIRT INGRESS.
7. THE METERING STRUCTURE SHALL BE INSTALLED AT THE REAR FACING OF THE TRANSFORMER.
8. REFER TO UD–11 (LATEST REVISION) FOR BACKFILL AROUND STUB POST AND DUCTS.
9. ALL DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.
10. THIS SPECIFICATION MEETS OR EXCEEDS CSA–C22.3 NO.7–06 STANDARD.
11. SEE HALTON HILLS HYDRO'S APPROVED MATERIALS LIST FOR APPROVED METER BASES, CABLE, CONDUIT, STRAPS, TRANSFORMERS, AND CONCRETE FOUNDATIONS.
12. WHERE APPLICABLE, ESA CODE SHALL BE FOLLOWED AND INSPECTION REQUIRED PRIOR TO ENERGIZING THE SERVICE (INCLUDING THE METER BASE STRUCTURE).



DETAIL 1
REAR OF METER BASE INSTALLATION



DETAIL 2
ANCHORING TO CONCRETE PAD



GANGED METER BASE (3 POSITION MAX. + ENTRY DOOR)
SECONDARY SERVICE ON WOOD STRUCTURE – INSTALLATION DETAIL

DESIGNED BY: N. ROKNIC & C. HALE	H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 2008–11–05 C. HALE
DRAWN BY: C. HALE		
APPROVED BY: K. DURSKI		
SIGNATURE:	H.H.H. DWG. NO: UD–09E–R1	ORIGINAL DATE: 2008–10–20
SCALE: N.T.S.		

NOTES:

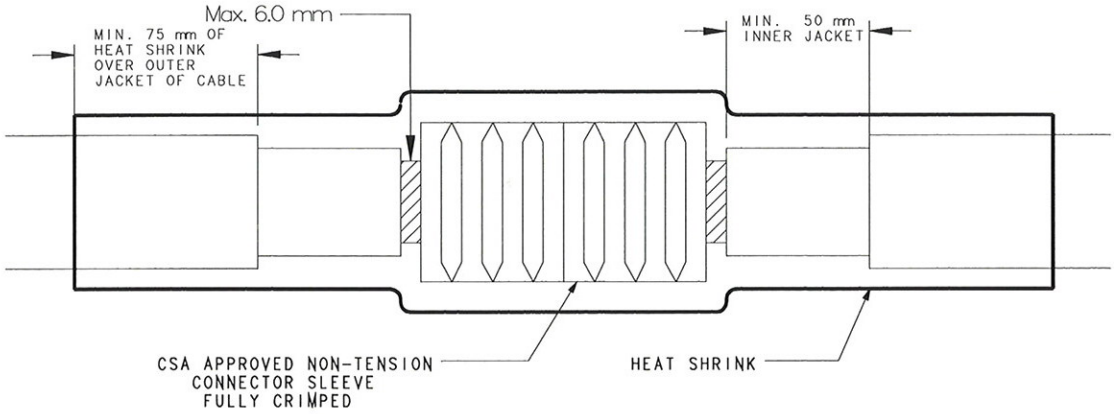
1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.

2 FOR MORE INFORMATION SEE HALTON HILLS HYDRO SECONDARY TRENCH PROFILES UD-06, UD-09 AND UD-14.

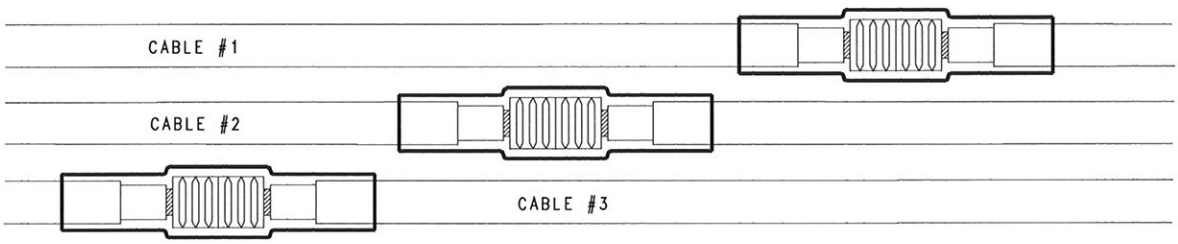
3 CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.

4 BACKFILL IN LAYERS NOT EXCEEDING 300 mm. THOROUGHLY COMPACT EACH LAYER.

5 THIS SPECIFICATION MEETS OR EXCEEDS CSA C22.3 NO.7-94 STANDARD.



CRIMP DETAIL



SPLICE STAGGERING DETAIL

NOTES:

A) IF THE CORE CONDUCTOR HAS BEEN EXPOSED TO MOISTURE, SUFFICIENT LENGTH OF CABLE MUST BE CUT OFF TO ENSURE THAT NO MOISTURE IS PRESENT BETWEEN INSULATION AND CORE. ANY PORTION OF THE CABLE THAT IS DAMAGED OR SUBJECTED TO PULLING GRIPS SHALL BE REMOVED.

B) CABLES SHALL BE TRAINED INTO POSITION FACING EACH OTHER AND CUT OFF SQUARELY AND BUTTED TOGETHER.

C) CONDUCTORS SHALL BE CLEANED WITH GRIT PAPER OR WIRE BRUSHED BEFORE CONNECTOR INSTALLED.

D) APPROPRIATELY SIZED COMPRESSION CONNECTORS AS LISTED IN HHH'S APPROVED MATERIALS LIST SHALL BE USED FOR UNDERGROUND SECONDARY CABLE SPLICING. USE DIES RECOMMENDED BY MANUFACTURER IN CRIMPING TOOL.

E) CONDUCTORS SHALL BE INSERTED INTO COMPRESSION CONNECTOR AND DRESSED WITH APPROPRIATE DIE. EXCESS OF OXIDE INHIBITOR SHALL BE REMOVED AND SHARP EDGES FILED OFF.

F) INSULATION SURFACES AND THE CONNECTOR SHALL BE FIRST CLEANED WITH CLEAN CLOTH DAMPENED WITH ISOPROPYL ALCOHOL AND THEN WIPED DRY WITH A CLEAN CLOTH.

G) SPLICE SPECIFICATION APPLIES TO DIRECT BURRIED CABLES AND CABLES IN DUCTS.

H) WHERE CABLES TO BE SPLICED LAY SIDE-BY-SIDE, SPLICE POINTS SHALL BE STAGGERED AS INDICATED ABOVE TO REDUCE CONGESTION AND THERMAL INTERFERENCE..

SECONDARY SERVICE CABLE SPLICE DETAIL

DESIGNED BY:	L. BAKER	H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE: 05-05-16 C. HALE
DRAWN BY:	F. LEMUT		
APPROVED BY:	M. MAROSCHAK & G. EBERSBERGER		
SIGNATURE:		H.H.H. DWG. NO: UD-10-R2	ORIGINAL DATE: 00-04-18
SCALE:	N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.

2 COIL 3.0m OF EACH GROUND CONDUCTOR TAIL INSIDE FOUNDATION FOR CONNECTION TO TRANSFORMER/ SWITCHGEAR.

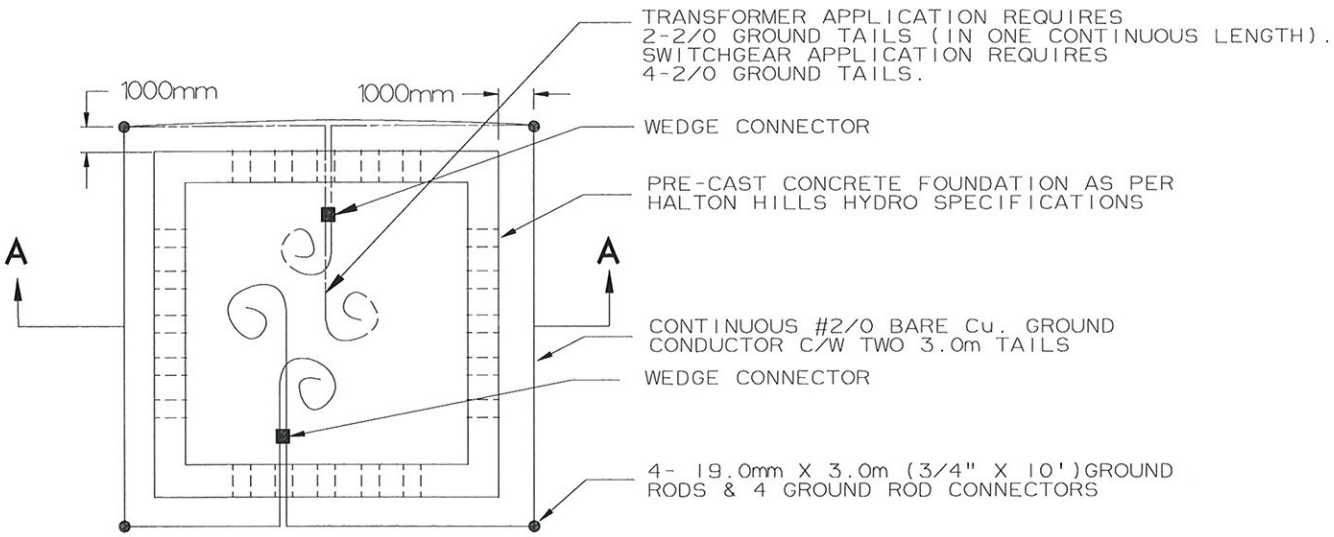
3 CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS

4 BACKFILL IN LAYERS NOT EXCEEDING 300 mm. THOROUGHLY COMPACT EACH LAYER.

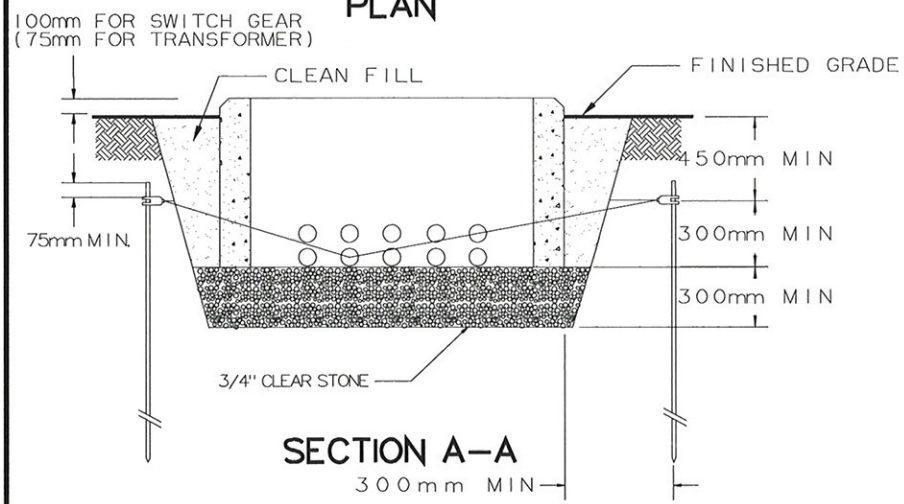
5 THIS SPECIFICATION MEETS OR EXCEEDS CSA C22.3 No.7-94 STANDARD.

6.REFER TO HHH "MATERIAL SPECIFICATIONS" FOR CONCRETE FOUNDATION CATALOG NUMBER.

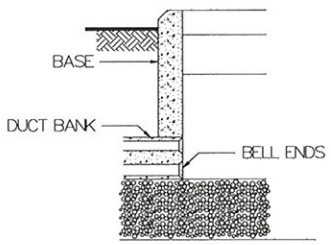
Halton Hills HYDRO



PLAN



SECTION A–A



TYPICAL SECTION

INSTALLATION OF PRE–CAST FOUNDATION FOR PADMOUNT TRANSFORMER & SWITCHGEAR INCLUDING GROUNDING DETAIL

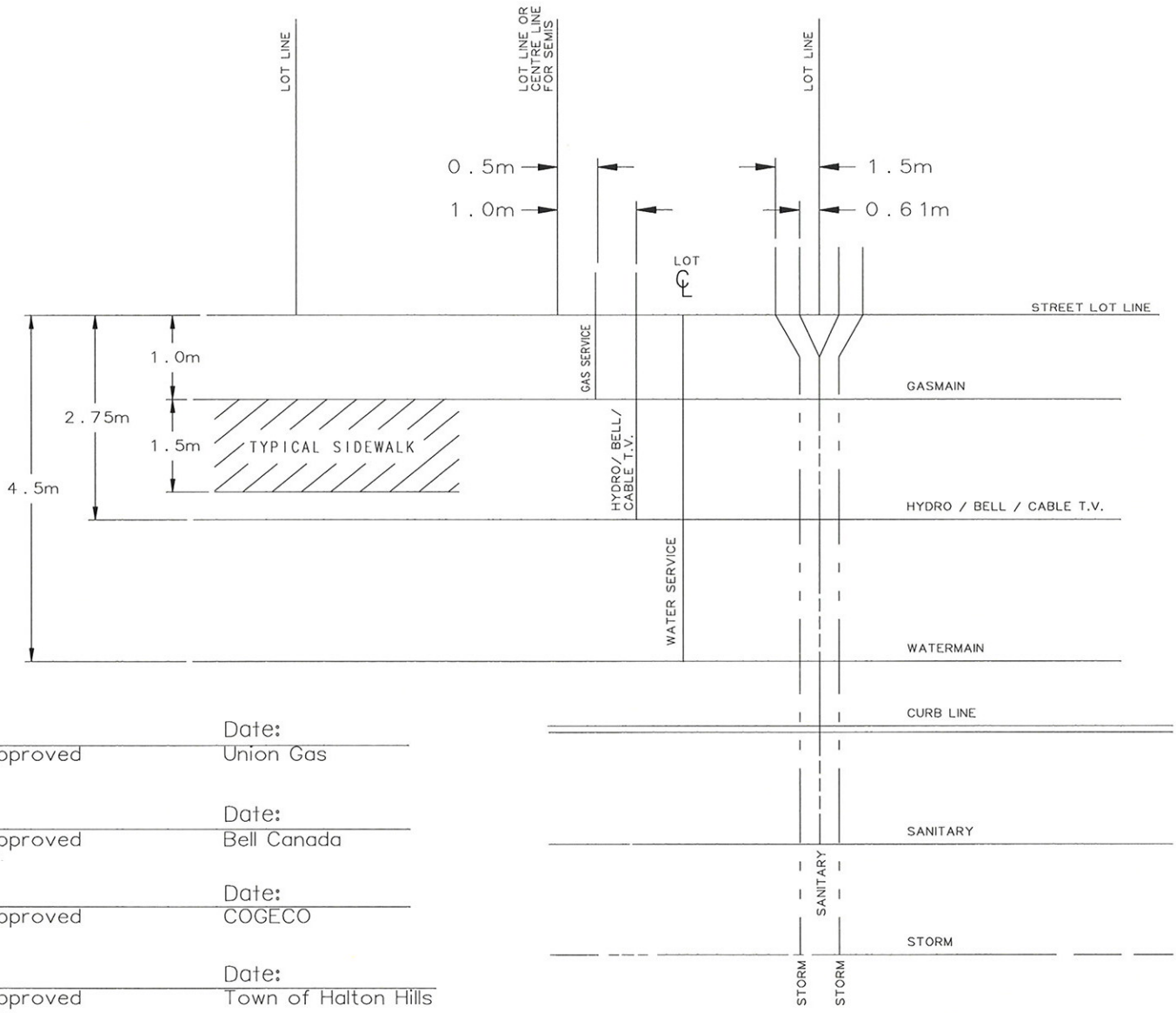
DESIGNED BY:	H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 05–04–07 C. HALE
DRAWN BY: F. LEMUT		
APPROVED BY: M. MAROSCHAK & G. EBERSBERGER		
SIGNATURE:	H.H.H. DWG. NO: UD–11–R1	ORIGINAL DATE: 00–04–18
SCALE: N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.

2 FOR MORE INFORMATION SEE HALTON HILLS HYDRO SECONDARY TRENCH PROFILE

3 CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO FILLING TO SCHEDULE INSPECTIONS



Approved	Date: Union Gas
Approved	Date: Bell Canada
Approved	Date: COGECO
Approved	Date: Town of Halton Hills

PROPOSED LOT SERVICING ARRANGEMENT (TOWN OF HALTON HILLS)

DESIGNED BY: L. BAKER		H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE: 05-04-07 C.HALE
DRAWN BY: F. LEMUT			
APPROVED BY:			
SIGNATURE:		H.H.H. DWG. NO: UD-12-R1	ORIGINAL DATE: 01-03-22
SCALE: N.T.S.			

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
2 APPLICABLE STANDARDS AS PER HHH SINGLE PHASE LOW PROFILE PAD-MOUNTED TRANSFORMER GUIDE: CAN/CSA-C277.3-M91, CAN/CSA-C2-M91 AND CEA-DTWG-02 (99)
3 ALL SECONDARY CABLES SHALL BE TAGGED WITH LOT NUMBER AND CIVIC ADDRESS. SEE HALTON HILLS HYDRO SPECIFICATION 37-400 (CABLE INDENTIFICATION).
4 TRANSFORMER IDENTIFICATION DATA ON OUTSIDE OF TRANSFORMER SHELL SHALL CONFORM TO CEA-DWTG-02 (99) STANDARD.
5 ALL DUAL VOLTAGE TRANSFORMERS SHALL MEET THE REQUIREMENTS OF CEA-DTWG-02 (99) CLAUSE "5.3 FUSING" AND SHALL HAVE A "CURRENT LIMITING BACK-UP FUSE" UNDER OIL WHOSE "VOLTAGE RATING IS SUITABLE FOR THE HIGHER VOLTAGE AND A CURRENT RATING ADEQUATE FOR THE LOWER VOLTAGE."
6 ALL DUAL VOLTAGE TRANSFORMERS SHALL MEET THE REQUIREMENTS OF CEA-DTWG-02 (99) CLAUSE "5.3.3 FUSE IDENTIFICATION" AND "5.3.4 BAYONET FUSE LABEL". WHEN CHANGING THE OPERATING VOLTAGE, THE BAYONET FUSE MUST BE CHANGED. SEE TRANSFORMER NAMEPLATE FOR FUSE.

Halton Hills HYDRO

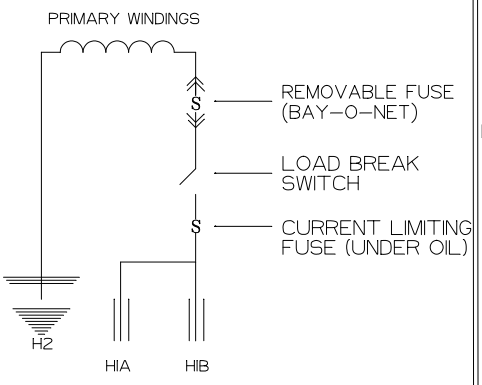


FIGURE 2.
SINGLE LINE DIAGRAM

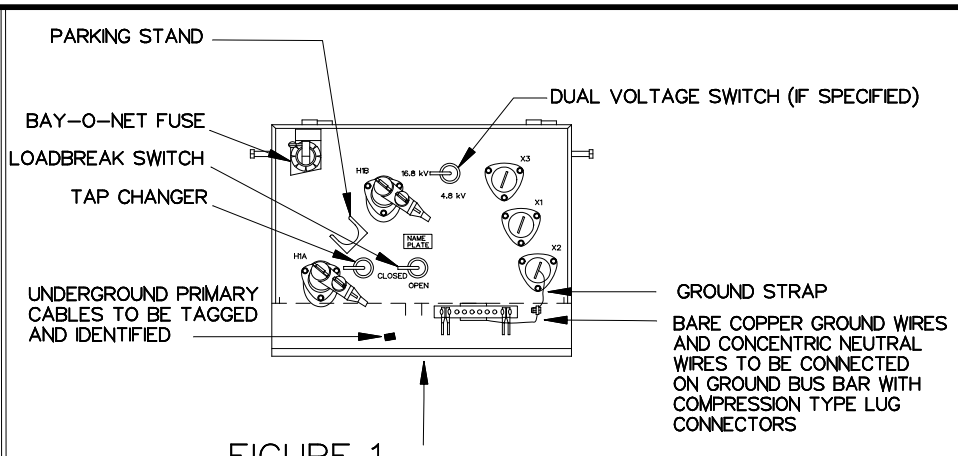


FIGURE 1.
TYPICAL 1 PHASE LOW PROFILE TRANSFORMER

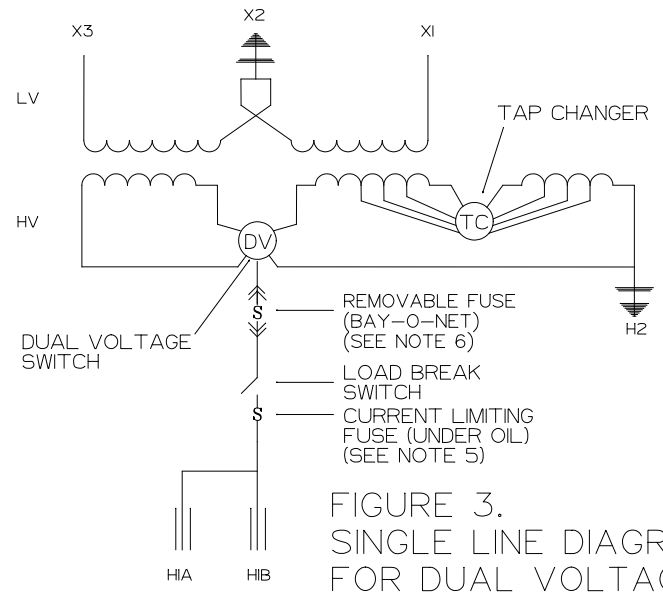


FIGURE 3.
SINGLE LINE DIAGRAM FOR DUAL VOLTAGE TRANSFORMER

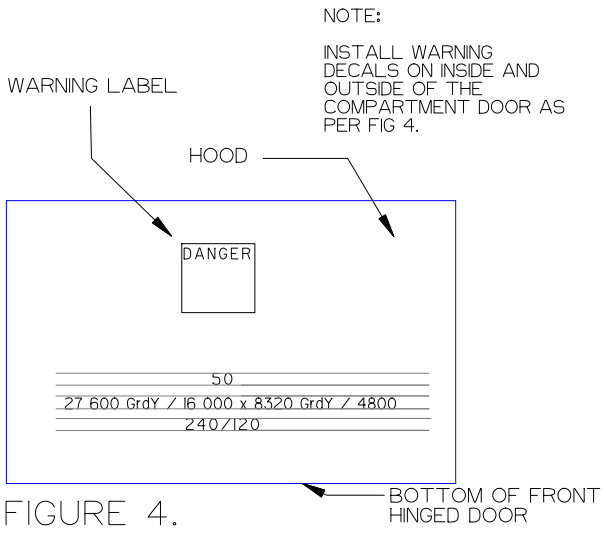


FIGURE 4.
TYPICAL DESIGNATION

SINGLE PHASE LOW PROFILE PAD-MOUNTED DISTRIBUTION TRANSFORMER

DESIGNED BY:		H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE: 07-08-09 C.HALE
DRAWN BY:	F. LEMUT		
APPROVED BY:	M. MAROSCHAK & G. EBERSBERGER		
SIGNATURE:		H.H.H. DWG. NO: UD-13-R3	ORIGINAL DATE: 00-08-31
SCALE:	N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.

2 CUSTOMER TO COIL SUFFICIENT LENGTH OF U/G SECONDARY CABLE AT BASE OF POLE. CABLE TO BE SUPPORTED OFF THE GROUND AND THE CABLE ENDS MUST BE SEALED WITH TAPE.

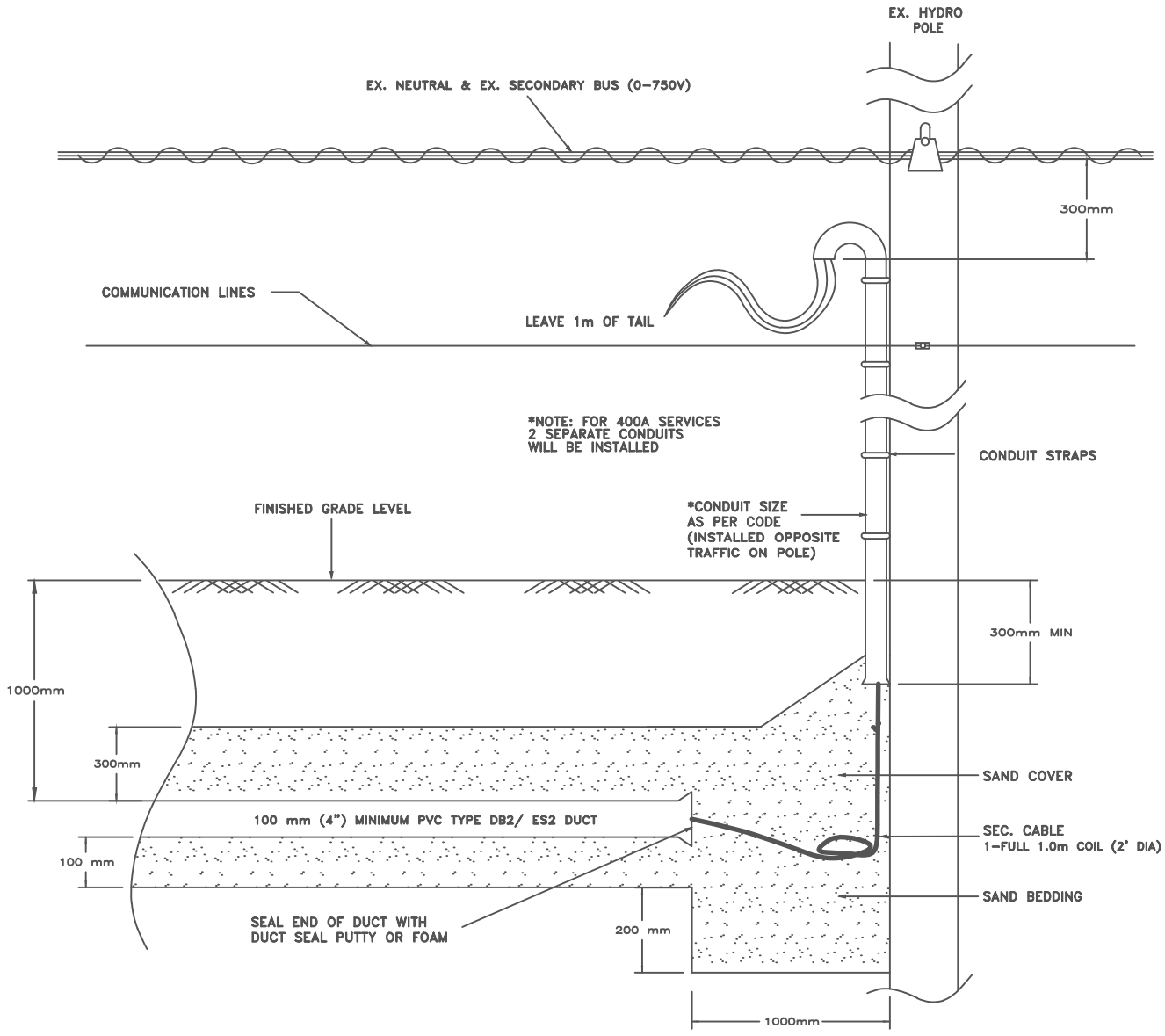
3 CUSTOMER TO SUPPLY CONDUIT, STRAPS AND WEATHERHEAD AND LEAVE THEM ON SITE. HYDRO TO INSTALL CABLE AND CONDUIT ON POLE AND MAKE CONNECTIONS.

4.THIS SPECIFICATION MEETS OR EXCEEDS CSA – C22.3 No. 7–15 STANDARD.

5.ALL PVC DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.

6.SECONDARY DIP & CABLE GUARD SHALL BE INSTALLED ON SIDE OF POLE OPPOSITE TRAFFIC.

Halton Hills HYDRO



SECONDARY UNDERGROUND TERMINATION POLE

DESIGNED BY:	H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH Underground Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 17–02–08 J. ORLENI
DRAWN BY: F. LEMUT		
APPROVED BY: C. HALE C.E.T LEL, ENG SUPERVISOR		
SIGNATURE:	H.H.H. DWG. NO: UD–14–R3	ORIGINAL DATE: 00–08–31
SCALE: N.T.S.		

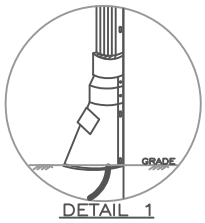
NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
2 CONTRACTOR TO COIL SUFFICIENT LENGTH OF U/G PRIMARY CABLE. CABLE TO BE SUSPENDED FROM TERMINAL POLE AT MINIMUM 3.0 m HEIGHT. COMPLETE ACTIVITY TO BE COORDINATED WITH HALTON HILLS HYDRO.
3 THIS DETAIL APPLIES TO SINGLE PHASE AND THREE PHASE INSTALLATIONS.
4 THIS SPECIFICATION MEETS OR EXCEEDS CSA – C22.3 No. 7–94 STANDARD.
5 ALL PVC DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.
6 RIGID PVC U–GUARD SHALL BE THE PRIMARY SELECTION FOR CABLE PROTECTION. 2" AND 3" VENTED BOOTS ARE PERMITTED ABOVE GRADE AS NEEDED (DETAIL 1). U–GUARD SHALL BE AFFIXED TO POLE USING CSA APPROVED BOLTS. IF PVC U–GUARD IS NOT AVAILABLE METAL CABLE GUARD MAY BE ACCEPTABLE AND IS TO BE GROUNDED AS PER PER HHH DISTRIBUTION STANDARD 41–99 "GROUNDING FOR OVERHEAD INSTALLATIONS – 0V TO 44kV". CONTACT HHH PRIOR TO PURCHASING METAL U–GUARD FOR APPROVAL. SEE HALTON HILLS HYDRO'S APPROVED MATERIALS LIST FOR U–GUARD SELECTION.
7 PRIMARY DIP AND CABLE GUARD SHALL BE INSTALLED ON OPPOSITE SIDE OF POLE OPPOSITE TRAFFIC.

PVC U-Guard Table

Part No.	Primary Cable Type	Description	No. of Riser/ DIP U-Guards
TBD	#1/0 Cu., 28kV TRXLPEI - (PVC OR LLDPE Jacket)	U-Guard, 2"x8', Flanged, Heavy Duty	1 (1 phase)
		U-Guard, 4"x8', Flanged, Heavy Duty	1 (3 phase)
TBD	#2/0 Al., 28kV TRXLPEI - (PVC OR LLDPE Jacket)	U-Guard, 2"x8', Flanged, Heavy Duty	1 (1 phase)
		U-Guard, 4"x8', Flanged, Heavy Duty	1 (3 phase)
TBD	#500 MCM Cu. or Al., 28kV TRXLPEI - PVC Jacket	U-Guard, 4"x8', Flanged, Heavy Duty	3 (1-per phase)
TBD	#1000 MCM Cu. or Al., 28kV TRXLPEI - PVC Jacket	U-Guard, 4"x8', Flanged, Heavy Duty	3 (1-per phase)

*Quantity of U-Guards to be selected per application.
**Please refer to Halton Hills Hydro Standard 41-99 or 41-100 (as applicable) for ground w ire installation.



DETAIL 1
VENTILATION BOOT

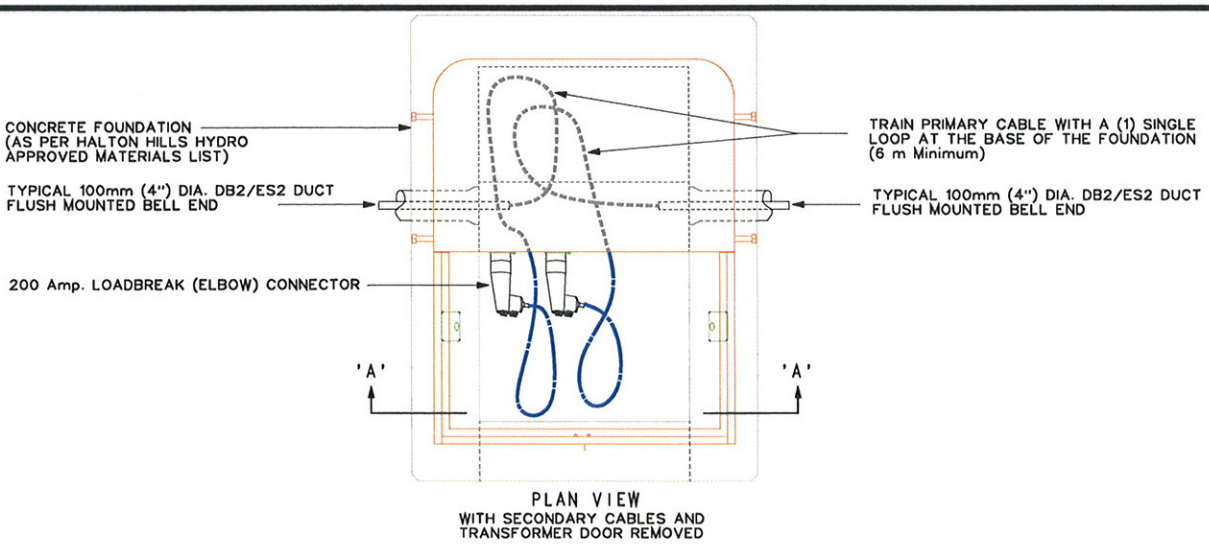
PRIMARY UNDERGROUND TERMINATION POLE

DESIGNED BY:	H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 08–05–06 C.HALE
DRAWN BY: F. LEMUT		
APPROVED BY: M. MAROSCHAK & G. EBERSBERGER		
SIGNATURE:	H.H.H. DWG. NO: UD–15–R4	ORIGINAL DATE: 00–08–31
SCALE: N.T.S.		

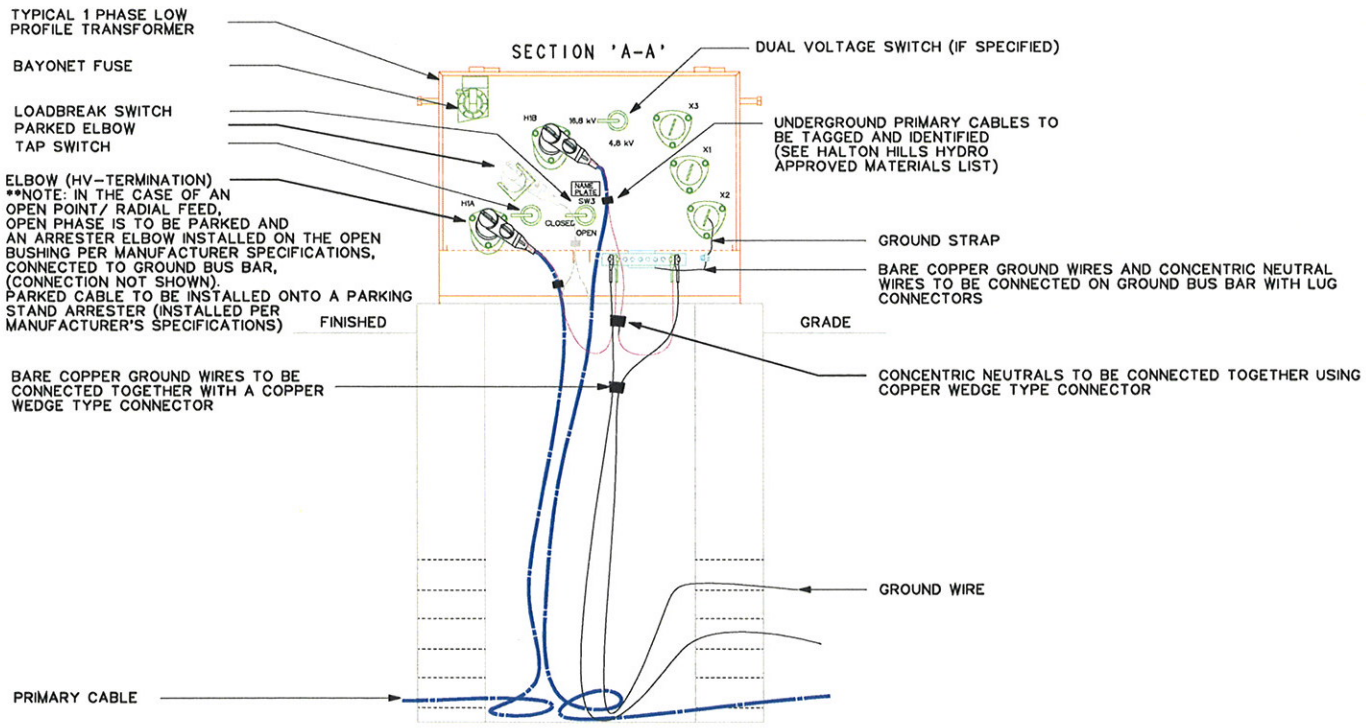
NOTES:

1 BOLT TRANSFORMER TO THE CONCRETE BASE
2 SEE UD–19 FOR FAULT INDICATOR INSTALLATION DETAIL
3 ALL CABLES TO BE TAGGED AND IDENTIFIED
4 TRANSFORMER DOOR OPENS TOWARDS SIDEWALK
5 INSTALL FOUR GROUND RODS (19.0mm X 3.0m (3/4" X 10') – GALVANIZED STEEL) COMPLETE WITH #2/0 BARE COPPER GROUND LOOP AROUND TRANSFORMER FOUNDATION AND APPROVED GROUND ROD CONNECTORS. GROUND WIRE TAILS TO BE PROVIDED. FOR DETAILED INFORMATION SEE HALTON HILLS HYDRO DWG UD–11.
6 HHH SINGLE PHASE LOW PROFILE PAD–MOUNTED TRANSFORMER SPECIFICATION AS PER CAN/CSA–C277.3–M91, CAN/CSA–C2–M91 AND CEA–DWTG–02 (99) STANDARDS.
7 ALL SECONDARY CABLES SHALL BE TAGGED WITH LOT NUMBER AND CIVIC ADDRESS AS PER HALTON HILLS HYDRO SPECIFICATION 37–400 (CABLE IDENTIFICATION).

Halton Hills HYDRO



PLAN VIEW
WITH SECONDARY CABLES AND TRANSFORMER DOOR REMOVED



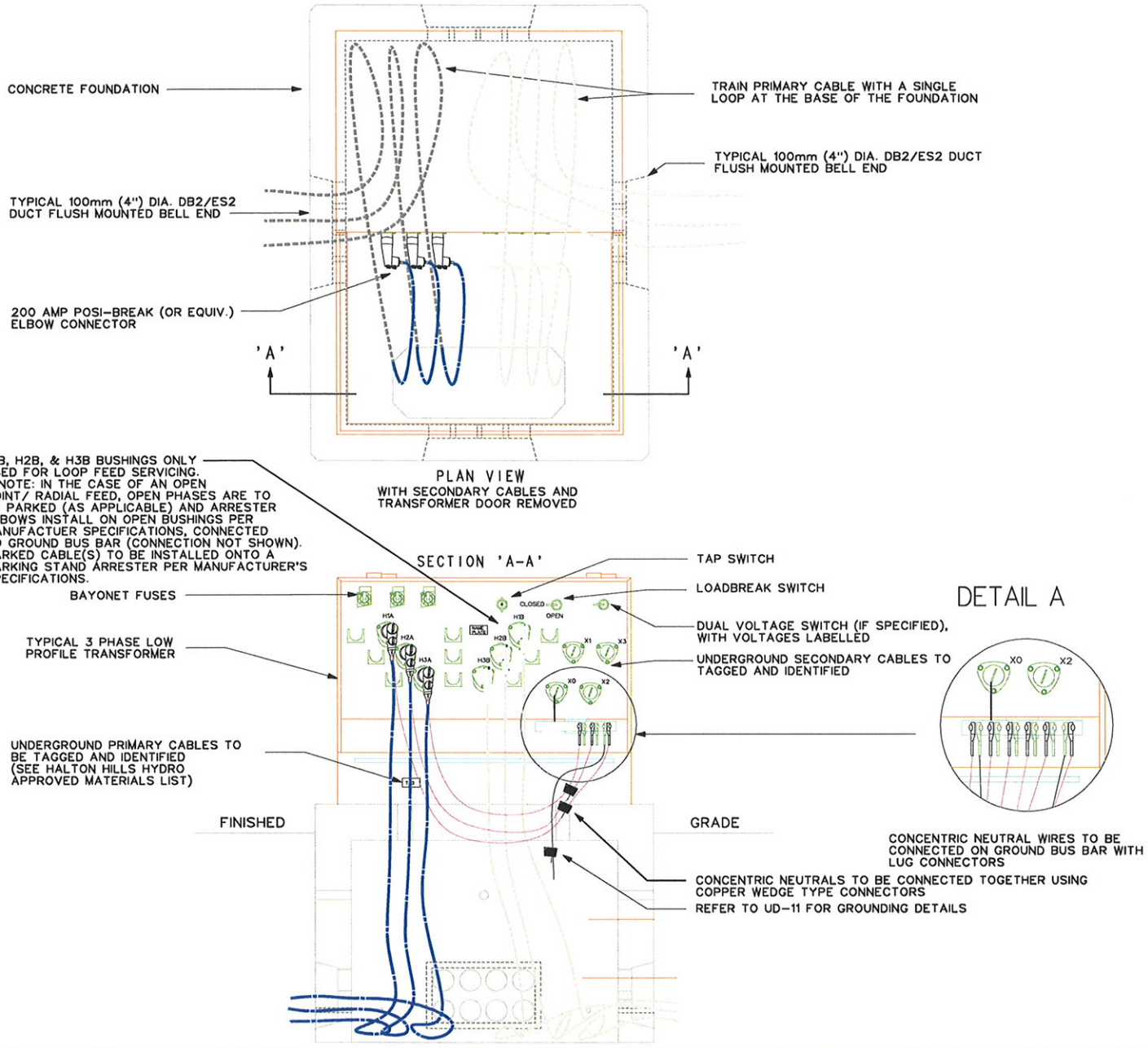
TYPICAL 1 PHASE LOW PROFILE PAD MOUNTED TRANSFORMER INSTALLATION (UP TO 167 kVA)

DESIGNED BY:	F. LEMUT	H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 06–02–22 C. HALE
DRAWN BY:	F. LEMUT		
APPROVED BY:	M. MAROSCHAK & G. EBERSBERGER		
SIGNATURE:		H.H.H. DWG. NO: UD–16–R2	ORIGINAL DATE: 02–02–18
SCALE:	N.T.S.		

NOTES:

1 BOLT TRANSFORMER TO THE CONCRETE BASE
2 SEE UD-19 FOR FAULT INDICATOR INSTALLATION DETAIL
3 ALL CABLES TO BE TAGGED AND IDENTIFIED
4 TRANSFORMER DOORS OPEN TOWARDS SIDEWALK IF PLACED IN BLOUEVARD.
TRANSFORMER DOORS OPEN ALLOWING LINES STAFF TO FACE ONCOMING TRAFFIC IF PLACED ELSEWHERE.
5 HHH THREE PHASE PAD MOUNTED DISTRIBUTION TRANSFORMER SPECIFICATION
AS PER CAN/CSA-C227.4-M91, CAN/CSA-C2-M91 & CEA-DWTG-03 (12/93) STANDARDS.
6 INSTALL FOUR GROUND RODS (19.0mm X 3.0m (3/4" X 10') GALVANIZED STEEL) COMPLETE WITH #2/0 BARE COPPER GROUND LOOPS AROUND TRANSFORMER FOUNDATION AND APPROVED GROUND ROD CONNECTORS (2 GROUND WIRE TAILS TO BE PROVIDED) AS PER UD-11.
FOR DETAILED INFORMATION SEE HALTON HILLS HYDRO APPROVED MATERIALS LIST
7 ALL SECONDARY SERVICES SHALL BE TAGGED WITH CIVIC ADDRESS AS PER HALTON HILLS HYDRO SPECIFICATION 37-400 (CABLE IDENTIFICATION).

Halton Hills HYDRO



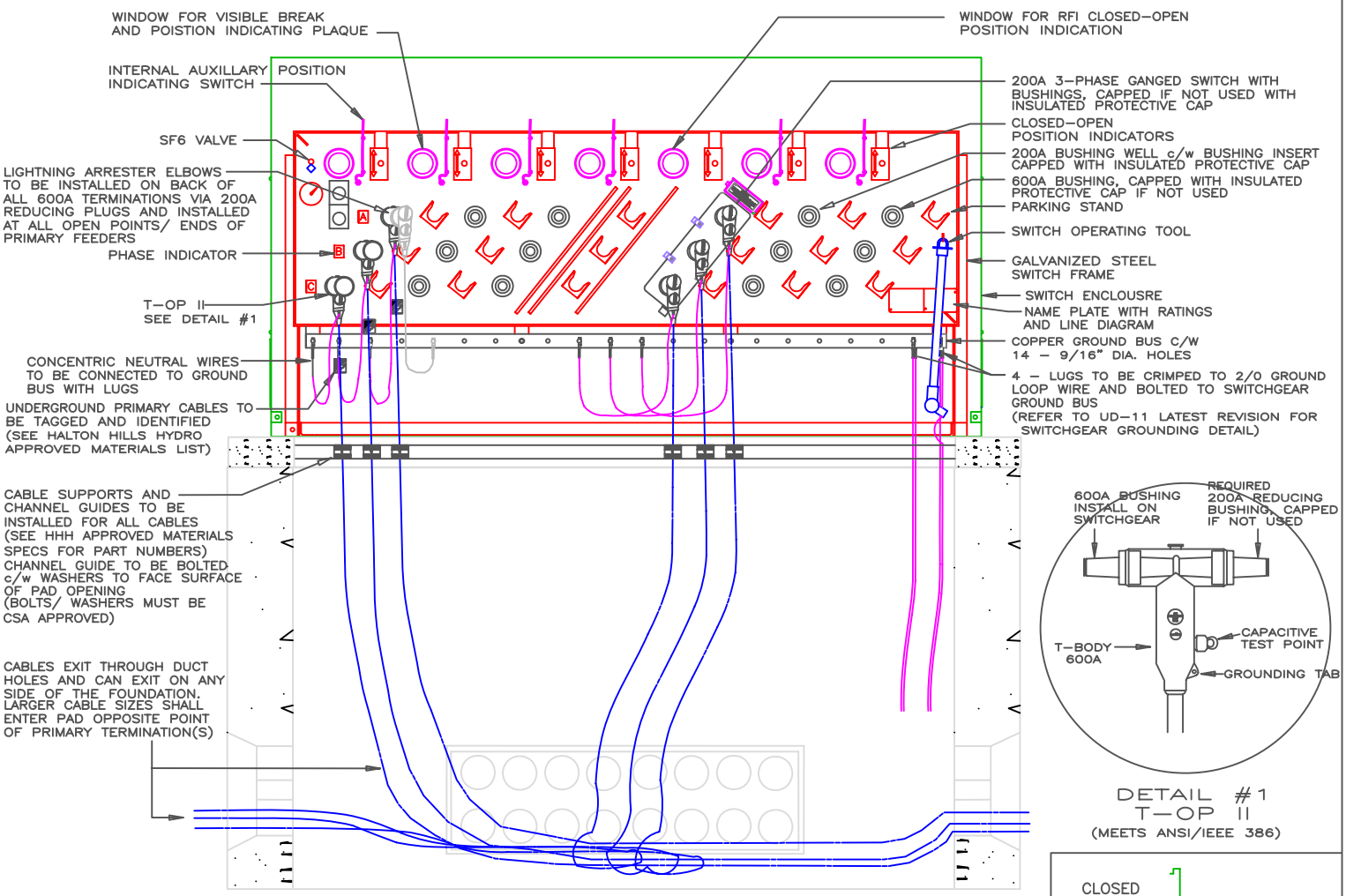
TYPICAL 3 PHASE PAD MOUNTED TRANSFORMER INSTALLATION (RADIAL & LOOP FEED)

DESIGNED BY:	F. LEMUT	H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE: 06-02-22 C.HALE
DRAWN BY:	F. LEMUT		
APPROVED BY:	M.MAROSCHAK & K.DURSKI		
SIGNATURE:		H.H.H. DWG. NO: UD-17-R3	ORIGINAL DATE: 02-02-26
SCALE:	N.T.S.		

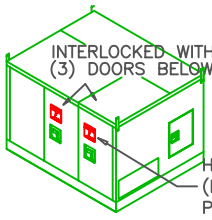
NOTES:

1. SEE UD–19 FOR FAULT INDICATOR INSTALLATION DETAIL
2. ALL CABLES TO BE TAGGED AND IDENTIFIED
3. SWITCHGEAR SHALL BE INSTALLED IN SUCH A WAY THAT DOORS OPEN AWAY FROM ROAD ALLOWING LINES CREW THE ABILITY TO SEE ONCOMING TRAFFIC.
4. REFER TO HALTON HILLS HYDRO DWG UD–27 FOR SWITCHGEAR CONCRETE FOUNDATION.
5. .CANADA POWER SWITCHGEARS ARE TO MEET OR EXCEED THE FOLLOWING STANDARDS: SWITCH: ANSI C37.71 & C37.73, BUSHINGS: ANSI/IEEE 386, COMMERCIAL GRADE SF6 GAS: ASTM D–2472, RFI: ANSI C37.60, PADMOUNT ENCLOSURE: ANSI C37.72 & C57.12.28.
6. SWITCHGEAR TO BE PAINTED GREEN (9 GY 1.5/2.6) WITH STAINLESS STEEL HARDWARE. SWITCHGEAR AND ENCLOSURE TO BE BOLTED TO CONCRETE PAD
7. SEE HALTON HILLS HYDRO PURCHASING SPECIFICATIONS FOR SWITCHGEAR MODEL NUMBERS, T–OP II, AND 200A BUSHING.
8. T–OP II SHALL BE SUPPLIED WITH 200A REDUCING BUSHING ON BACK OF 600A TERMINATION AND CAPPED USING INSULATED PROTECTIVE CAP. LIGHTNING ARRESTER EBLOWS SHALL BE INSTALLED ON 200A REDUCING BUSHING AT OPEN POINTS/ ENDS OF RUNS.
9. SWITCHGEAR ENCLOSURE TO BE GROUNDED TO SWITCH USING TWO HOLES IN THE FRONT BOTTOM CORNERS OF THE ENCLOSURE.
10. WARNING LABELS PER CEA DTWG–03 (12/93) SHALL BE INSTALLED ON EXTERIOR AND INTERIOR COMPARTMENT DOORS OF ENCLOSURE (SEE BELOW).

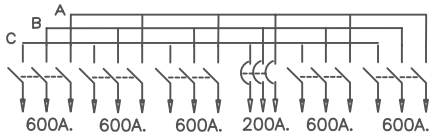
Halton Hills HYDRO



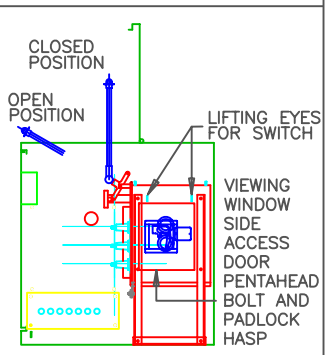
DETAIL #1
T–OP II
(MEETS ANSI/IEEE 386)



SWITCHGEAR OUTER ENCLOSURE



LINE DIAGRAM – SWITCH INTERCONNECTIONS



SIDE VIEW OF SWITCH

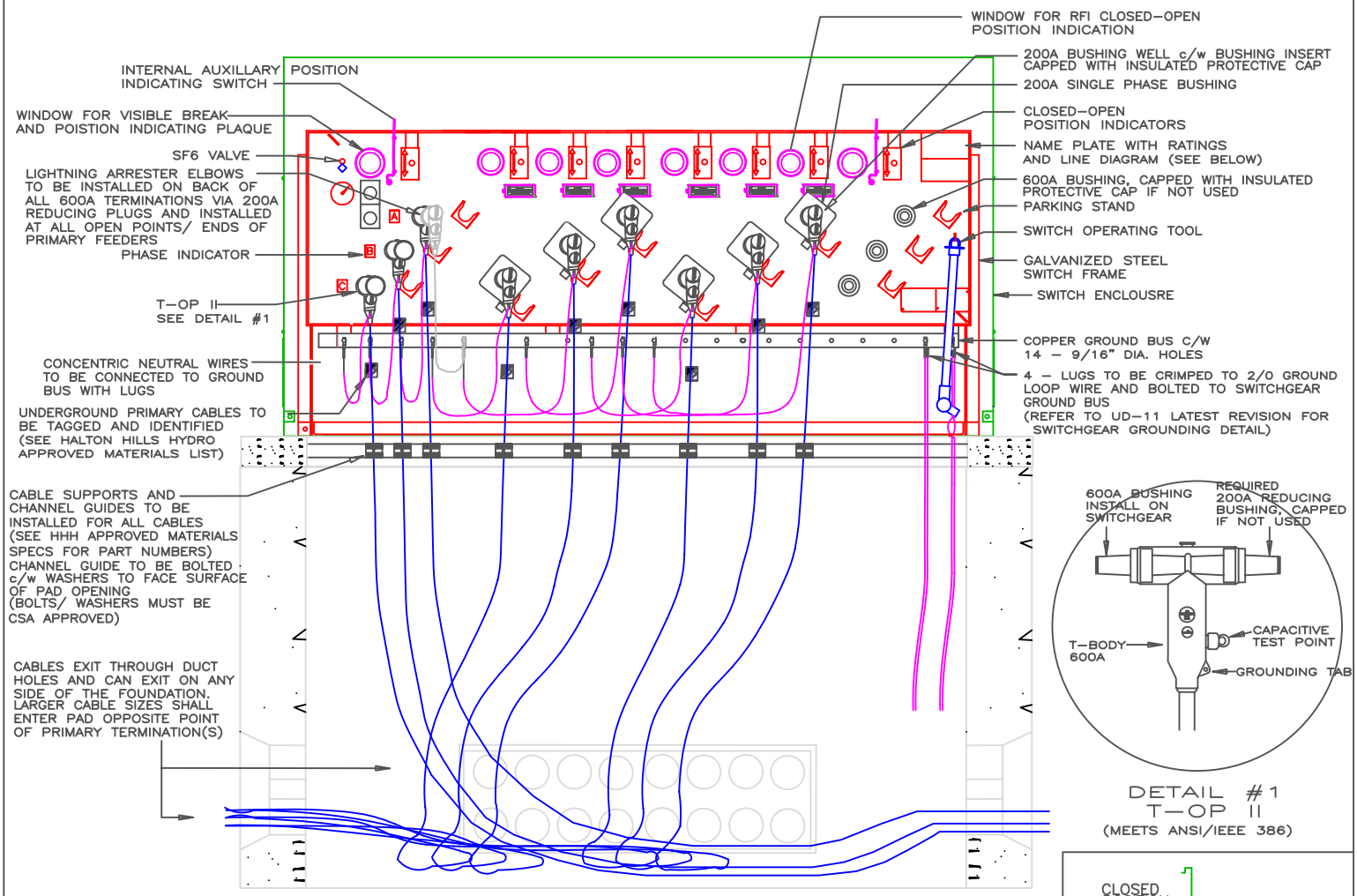
TYPICAL CANADA POWER PADMOUNTED SWITCHGEAR WITH RESETTABLE FAULT INTERRUPTER INSTALLATION DETAIL

DESIGNED BY:	C. HALE	H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 06–07–24 C. HALE
DRAWN BY:	C. HALE		
APPROVED BY:	M. MAROSCHAK & K. DURSKI		
SIGNATURE:		H.H.H. DWG. NO: UD–18B–R3	ORIGINAL DATE: 05–04–08
SCALE:	N.T.S.		

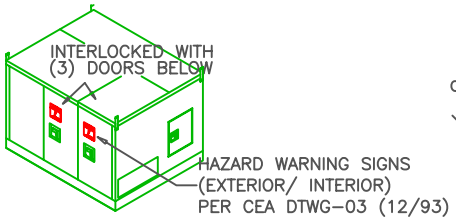
NOTES:

1. SEE UD–19 FOR FAULT INDICATOR INSTALLATION DETAIL
2. ALL CABLES TO BE TAGGED AND IDENTIFIED
3. SWITCHGEAR SHALL BE INSTALLED IN SUCH A WAY THAT DOORS OPEN AWAY FROM ROAD ALLOWING LINES CREW THE ABILITY TO SEE ONCOMING TRAFFIC.
4. REFER TO HALTON HILLS HYDRO DWG UD–27 FOR SWITCHGEAR CONCRETE FOUNDATION.
5. .CANADA POWER SWITCHGEARS ARE TO MEET OR EXCEED THE FOLLOWING STANDARDS: SWITCH: ANSI C37.71 & C37.73, BUSHINGS: ANSI/IEEE 386, COMMERCIAL GRADE SF6 GAS: ASTM D–2472, RFI: ANSI C37.60, PADMOUNT ENCLOSURE: ANSI C37.72 & C57.12.28.
6. SWITCHGEAR TO BE PAINTED GREEN (9 GY 1.5/2.6) WITH STAINLESS STEEL HARDWARE. SWITCHGEAR AND ENCLOSURE TO BE BOLTED TO CONCRETE PAD
7. SEE HALTON HILLS HYDRO PURCHASING SPECIFICATIONS FOR SWITCHGEAR MODEL NUMBERS, T–OP II, AND 200A BUSHING.
8. T–OP II SHALL BE SUPPLIED WITH 200A REDUCING BUSHING ON BACK OF 600A TERMINATION AND CAPPED USING INSULATED PROTECTIVE CAP. LIGHTNING ARRESTER EBLOWS SHALL BE INSTALLED ON 200A REDUCING BUSHING AT OPEN POINTS/ ENDS OF RUNS.
9. SWITCHGEAR ENCLOSURE TO BE GROUNDED TO SWITCH USING TWO HOLES IN THE FRONT BOTTOM CORNERS OF THE ENCLOSURE.
10. WARNING LABELS PER CEA DTWG–03 (12/93) SHALL BE INSTALLED ON EXTERIOR AND INTERIOR COMPARTMENT DOORS OF ENCLOSURE (SEE BELOW).

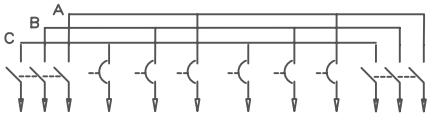
Halton Hills HYDRO



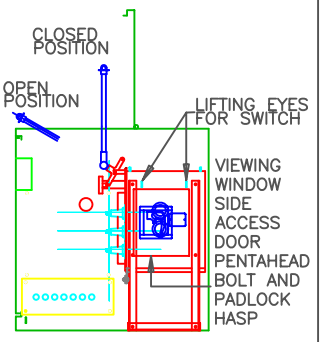
DETAIL #1
T–OP II
(MEETS ANSI/IEEE 386)



SWITCHGEAR OUTER ENCLOSURE



TYPICAL LINE DIAGRAM OF SWITCH INTERCONNECTIONS



SIDE VIEW OF SWITCH

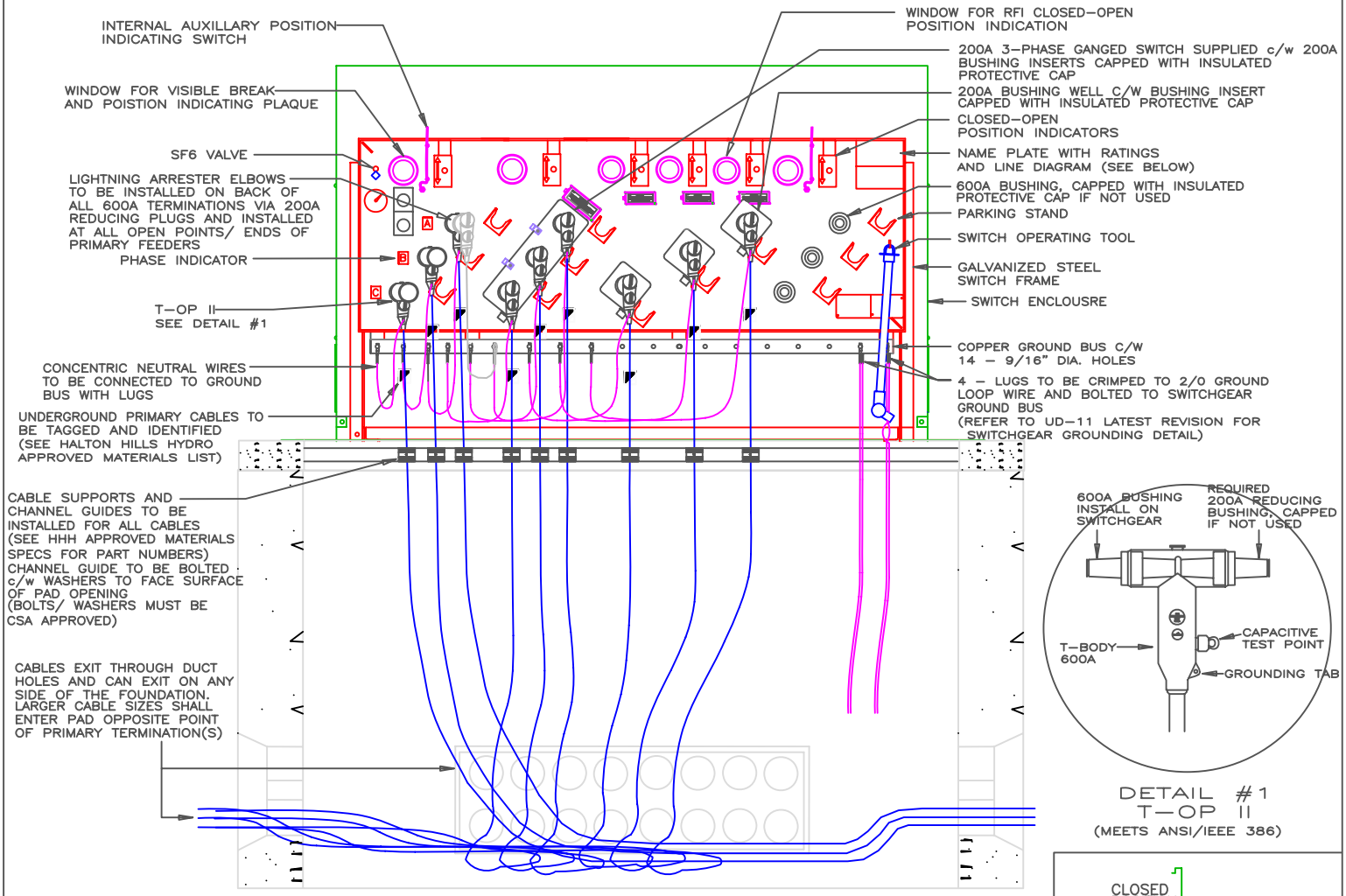
CANADA POWER PADMOUNTED SWITCHGEAR
2–600A 3–PHASE LOOP FEED WITH RESETTABLE FAULT INTERRUPTERS ON 6–200A SINGLE PHASE TAPS

DESIGNED BY:	C. HALE	H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 06–07–24 C. HALE
DRAWN BY:	C. HALE		
APPROVED BY:	M. MAROSCHAK & K. DURSKI		
SIGNATURE:		H.H.H. DWG. NO: UD–18C–R3	ORIGINAL DATE: 05–04–08
SCALE:	N.T.S.		

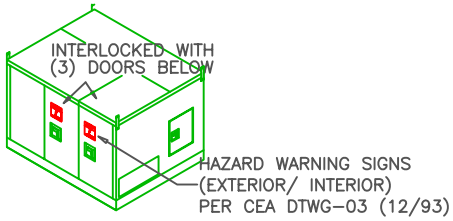
NOTES:

1. SEE UD-19 FOR FAULT INDICATOR INSTALLATION DETAIL
2. ALL CABLES TO BE TAGGED AND IDENTIFIED
3. SWITCHGEAR SHALL BE INSTALLED IN SUCH A WAY THAT DOORS OPEN AWAY FROM ROAD ALLOWING LINES CREW THE ABILITY TO SEE ONCOMING TRAFFIC.
4. REFER TO HALTON HILLS HYDRO DWG UD-27 FOR SWITCHGEAR CONCRETE FOUNDATION.
5. .CANADA POWER SWITCHGEARS ARE TO MEET OR EXCEED THE FOLLOWING STANDARDS: SWITCH: ANSI C37.71 & C37.73, BUSHINGS: ANSI/IEEE 386, COMMERCIAL GRADE SF6 GAS: ASTM D-2472, RFI: ANSI C37.60, PADMOUNT ENCLOSURE: ANSI C37.72 & C57.12.28.
6. SWITCHGEAR TO BE PAINTED GREEN (9 GY 1.5/2.6) WITH STAINLESS STEEL HARDWARE. SWITCHGEAR AND ENCLOSURE TO BE BOLTED TO CONCRETE PAD
7. SEE HALTON HILLS HYDRO PURCHASING SPECIFICATIONS FOR SWITCHGEAR MODEL NUMBERS, T-OP II, AND 200A BUSHING.
8. T-OP II SHALL BE SUPPLIED WITH 200A REDUCING BUSHING ON BACK OF 600A TERMINATION AND CAPPED USING INSULATED PROTECTIVE CAP. LIGHTNING ARRESTER EBLOWS SHALL BE INSTALLED ON 200A REDUCING BUSHING AT OPEN POINTS/ ENDS OF RUNS.
9. SWITCHGEAR ENCLOSURE TO BE GROUNDED TO SWITCH USING TWO HOLES IN THE FRONT BOTTOM CORNERS OF THE ENCLOSURE.
10. WARNING LABELS PER CEA DTWG-03 (12/93) SHALL BE INSTALLED ON EXTERIOR AND INTERIOR COMPARTMENT DOORS OF ENCLOSURE (SEE BELOW).

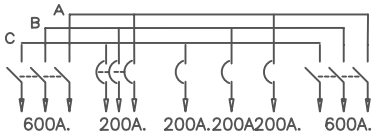
Halton Hills HYDRO



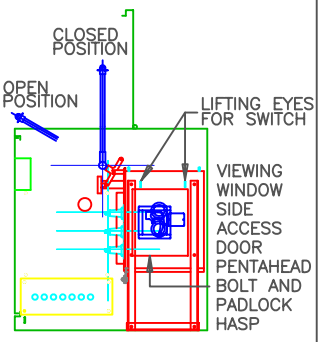
DETAIL #1
T-OP II
(MEETS ANSI/IEEE 386)



SWITCHGEAR OUTER ENCLOSURE



TYPICAL LINE DIAGRAM OF SWITCH INTERCONNECTIONS



SIDE VIEW OF SWITCH

CANADA POWER PADMOUNTED SWITCHGEAR
2-600A 3-PHASE LOOP FEED WITH RESETTABLE FAULT INTERRUPTERS ON 1-200A 3-PHASE TAP AND 3-200A SWITCHABLE SINGLE PHASE TAPS

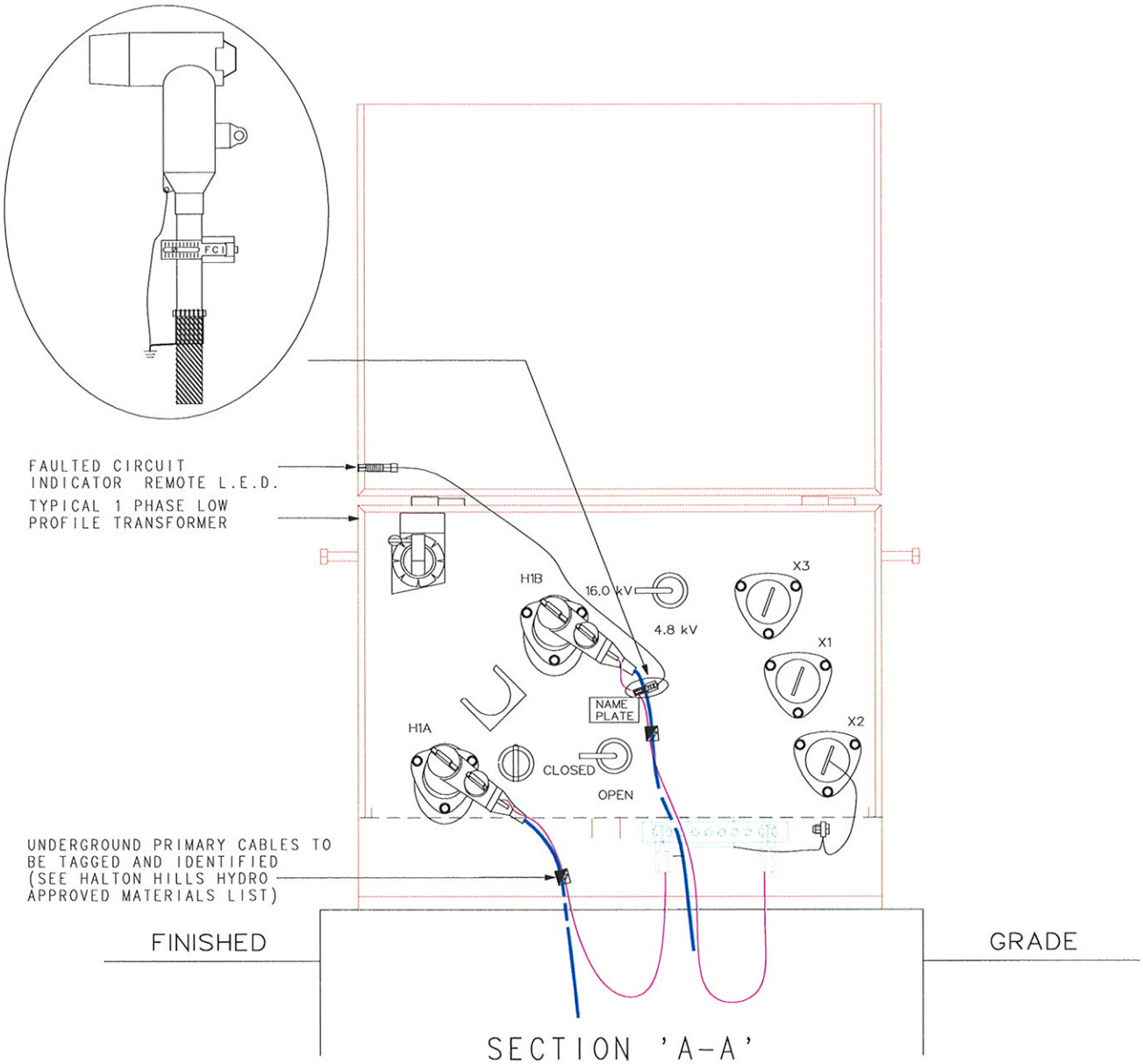
DESIGNED BY:	C. HALE	H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE: 06-07-24 C. HALE
DRAWN BY:	C. HALE		
APPROVED BY:	M. MAROSCHAK & K. DURSKI		
SIGNATURE:		H.H.H. DWG. NO: UD-18D-R3	ORIGINAL DATE: 05-04-15
SCALE:	N.T.S.		

NOTES:

1 ALL DIMENSIONS ARE THE MINIMUM DISTANCES REQUIRED.
2 FAULT INDICATOR TO BE MOUNTED ON THE CABLE CONNECTED TO THE H1B BUSHING. IF H1B BUSING IN AN OPEN POINT, MOUNT FAULT INDICATOR ON H1A BUSHING.
3 FAULT INDICATOR CLAMPS AROUND PRIMARY ELBOW AND ABOVE CONCENTRIC NEUTAL WIRES. HARDWIRE TO REMOTE L.E.D. IN SIDE OF DOOR FACING TRAFFIC. FIBER OPTIC WIRE CONNECTING FCI TO L.E.D. SHALL BE TRAINED SUCH THAT IT WILL NOT COME IN CONTACT WITH X1 OR X3 SECONDARY TERMINALS.
4 THE CONCENTRIC NEUTRAL WIRES SHALL BE LOOPED BACK FROM THE FAULTED CIRCUIT INDICATOR TO CANCEL OUT ANY STRAY OR CONCENTRIC NEUTRAL CURRENTS.

Halton Hills HYDRO

DETAIL:



FAULTED CIRCUIT INDICATOR INSTALLATION DETAIL FOR 1 PHASE LOW PROFILE PADMOUNT TRANSFORMER

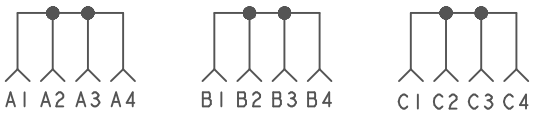
DESIGNED BY:	F. LEMUT	H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE: 05-05-16 C.HALE
DRAWN BY:	F. LEMUT		
APPROVED BY:	M. MAROSCHAK & G. EBERSBERGER		
SIGNATURE:		H.H.H. DWG. NO: UD-19-R2	ORIGINAL DATE: 02-03-04
SCALE:	N.T.S.		

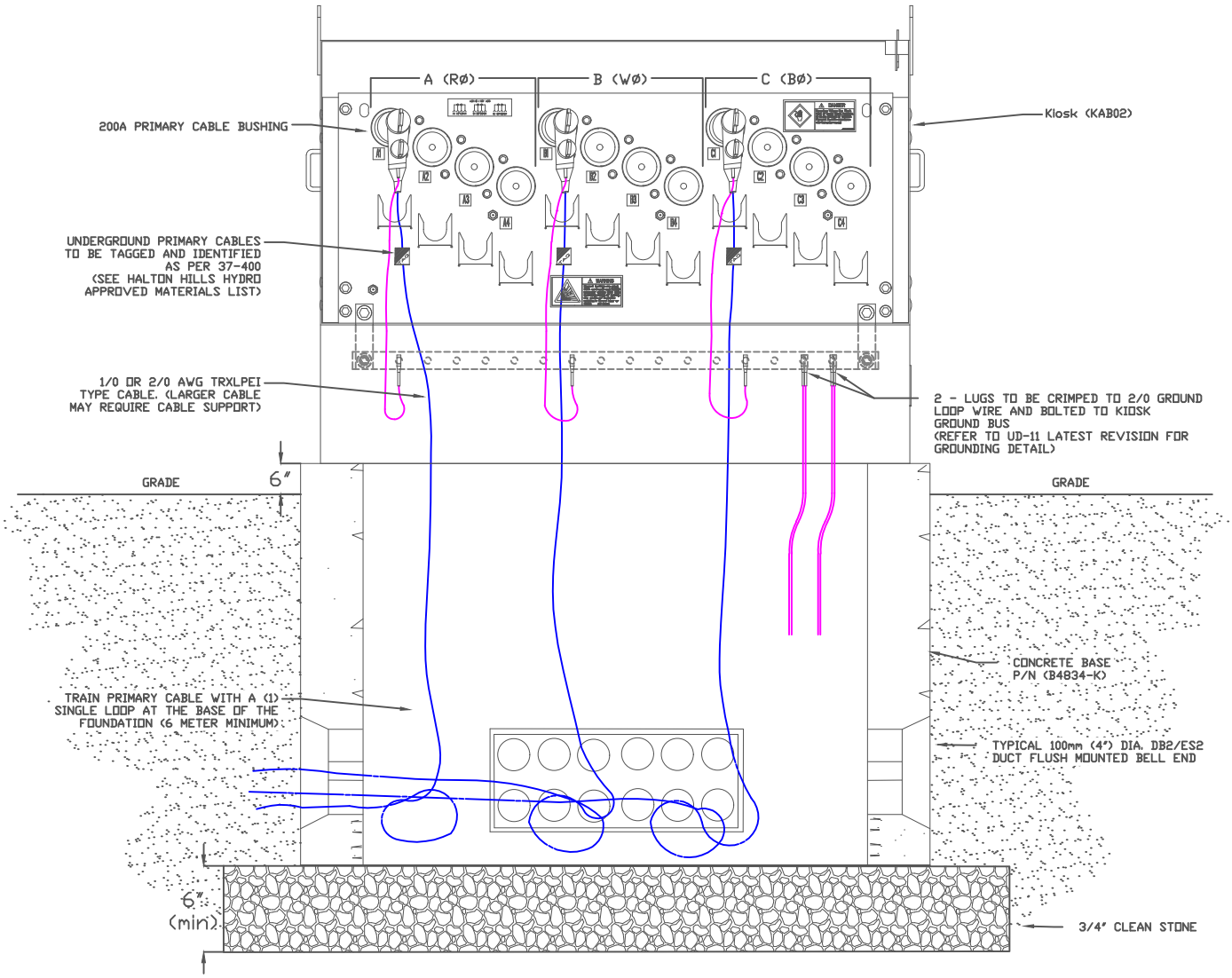
NOTES:

1. BOLT SWITCHING KISOK TO THE CONCRETE BASE
2. GROUNDING AS PER UD-11, 2 GROUNDING TAILS
3. ALL CABLES TO BE TAGGED AND IDENTIFIED AS PER HALTON HILLS HYDRO SPECIFICATION 37-400 (CABLE IDENTIFICATION)
4. TRAIN PRIMARY CABLE WITH A SINGLE LOOP AT THE BASE OF THE FOUNDATION
5. KIOSK HOOD TO OPEN TOWARDS SIDEWALK IF PLACED IN BOULEVARD KIOSK HOOD TO OPEN ALLOWING LINES STAFF TO FACE ONCOMING TRAFFIC IF PLACED ELSEWHERE
6. KIOSK SHALL BE PAINTED EQUIPMENT GREEN (9 GY 1.5/2.6)
7. THE OPENING HOOD SHALL HAVE HAZARD / WARNING LABELS INSTALLED PER CSA C227.3-06, FIGURE B.3 (EXTERIOR) AND FIGURE 13 (INTERIOR)
8. ENCLOSURE SHALL BE DESIGNED TO MEET ANSI/IEEE C37.74 AND ANSI C57.12.29
9. KIOSK BUSHING WELLS SHALL ACCOMMODATE 15kV & 28kV THREADED BUSHING INSERTS
10. HOOD SHALL BE CLOSED TO KIOSK CASE WITH A THREADED PENTA-BOLT. ASSEMBLY SHALL PROVIDE FOR INSTALLATION OF LOCK & HASP (PAD LOCK) FOR TAMPER PROOFING CLOSED HOOD.
11. KIOSK SHALL BE RATED 28kV, 125KVBIL, 600A.

Halton Hills HYDRO

TYPICAL LINE DIAGRAM OF KIOSK INTERCONNECTIONS



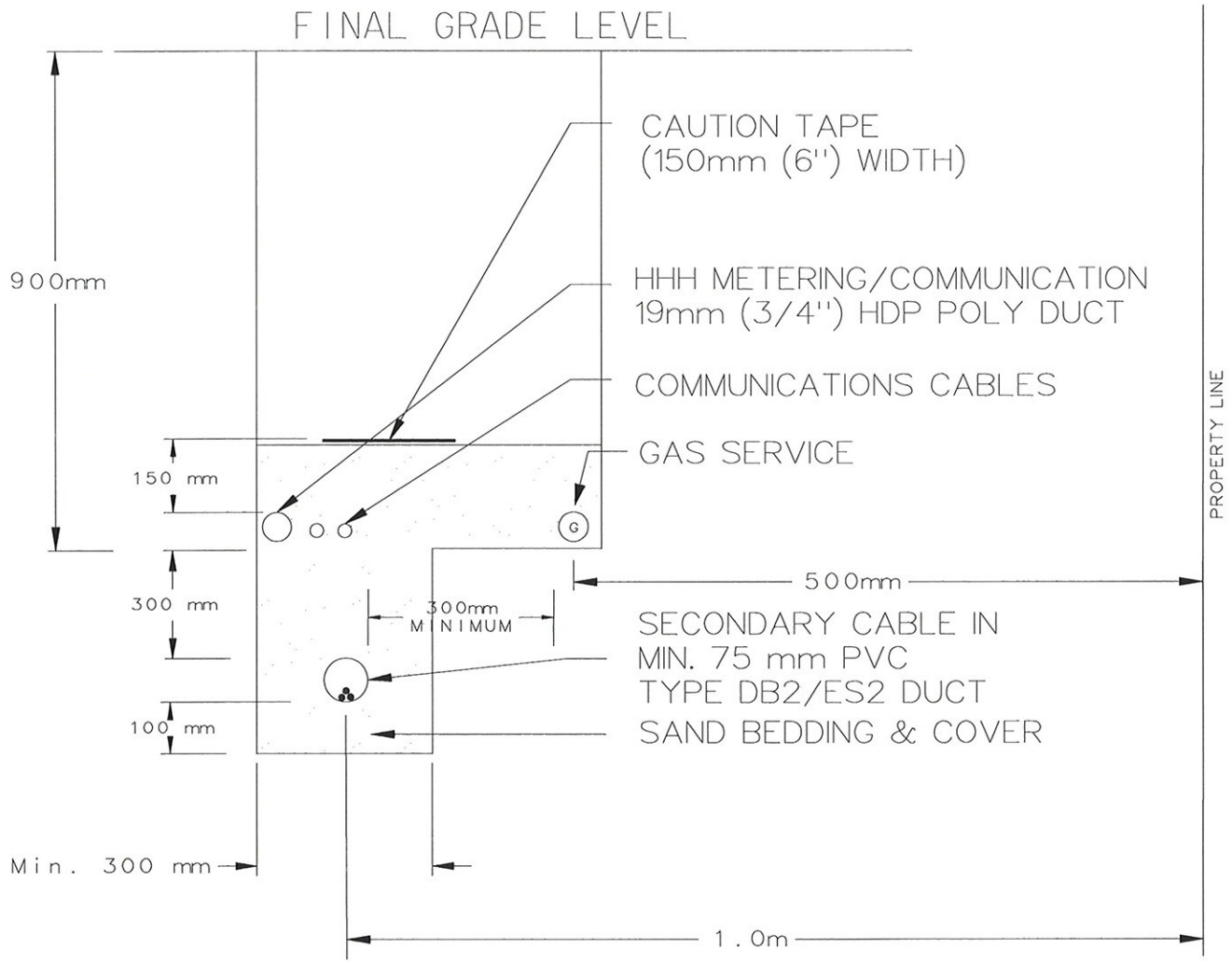


TYPICAL SWITCHING KIOSK INSTALLATION

DESIGNED BY:	J. ORLENI	H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE:
DRAWN BY:	J. ORLENI		
APPROVED BY:	CHRISTOPHER HALE C.E.T , LEL.		
SIGNATURE:		H.H.H. DWG. NO: UD-20-R0	ORIGINAL DATE: 18-03-28
SCALE:	N.T.S.		

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
2 ALL DIMENSIONS ARE THE MINIMUM REQUIRED DISTANCES
3 CONTACT HALTON HILLS HYDRO AND UNION GAS A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.
4. ELECTRICAL CONTRACTOR TO EXCAVATE TRENCH AND INSTALL HYDRO AND COMMUNICATIONS PLANT. GAS CONTRACTOR TO INSTALL THE GAS SERVICE. GAS CONTRACTOR TO COORDINATE BACKFILL OF TRENCH WITH ELECTRICAL CONTRACTOR.
5. ALL HYDRO PVC DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.
6. HHH METERING/ COMMUNICATION 19mm (3/4"). POLY DUCT SHALL BE INSTALLED AND TERMINATED AT EACH METER BASE FLUSH WITH GRADE LEVEL. THE OTHER END SHALL BE TERMINATED AND BURIED AT COMMUNICATION LEVEL ON STREET PROPERTY OF EACH INDIVIDUAL LOT.
THE DUCT SHALL BE SEALED WITH APPROPRIATE TAPERED POLY PLUG OR END CAP ON BOTH ENDS.
PULLING ROPE 4.75mm (3/16") SHALL BE INSTALLED IN THIS DUCT.



Approved	Date: Union Gas	Approved	Date: COGECO
Approved	Date: Bell Canada	Approved	Date: Town of Halton Hills

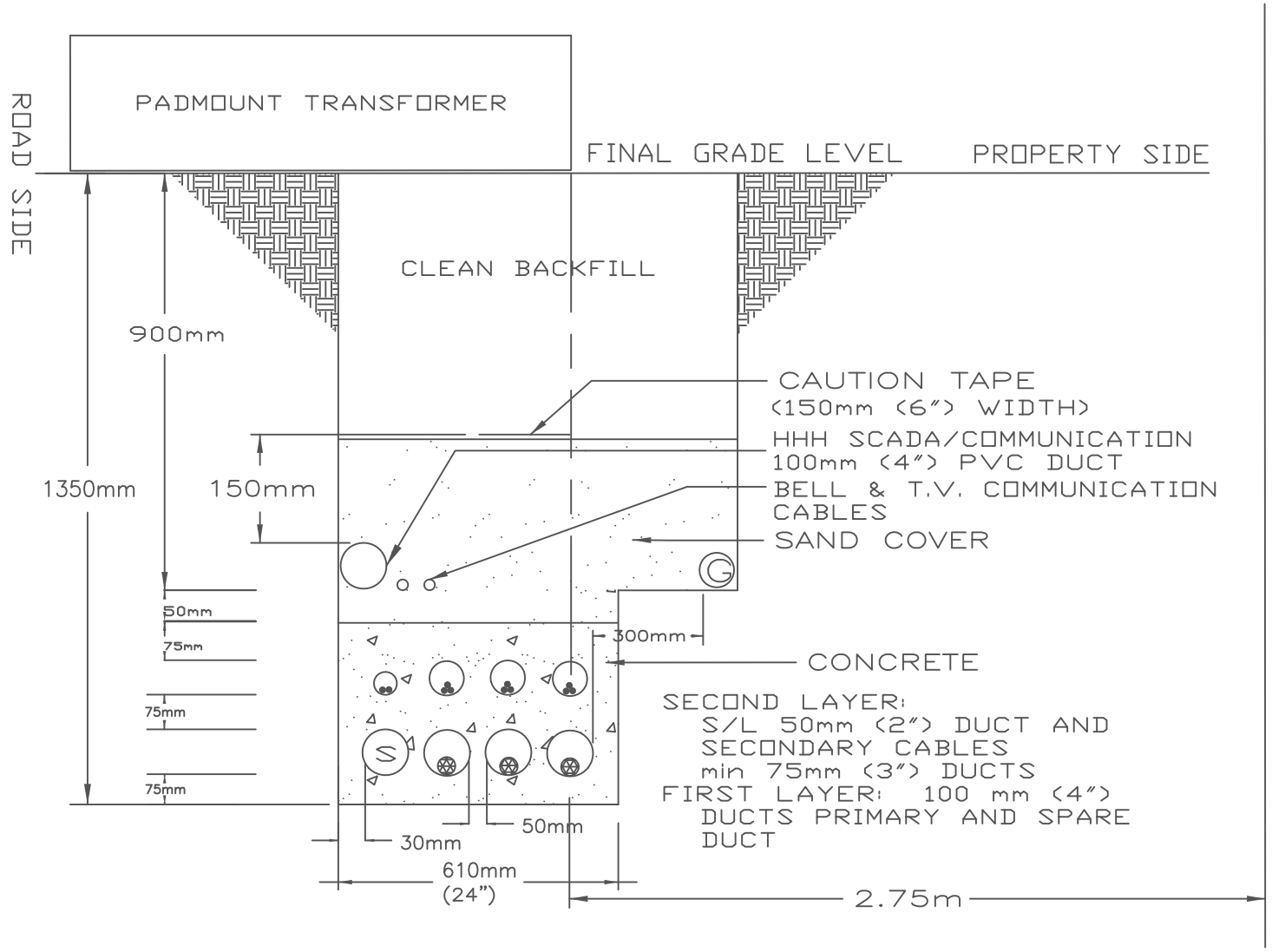
JOINT–USE SECONDARY SERVICE LATERAL TRENCH SECTION

DESIGNED BY:	L. BAKER	H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 05–05–20 C. HALE
DRAWN BY:	L. BAKER		
APPROVED BY:			
SIGNATURE:		H.H.H. DWG. NO: UD–23–R2	ORIGINAL DATE: 02–05–06
SCALE:	N.T.S.		

NOTES:

1. OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
2. ALL DIMENSIONS ARE THE MINIMUM DISTANCES REQUIRED.
3. CONTACT HALTON HILLS HYDRO 48 HRS. PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.
4. BACKFILL IN LAYERS NOT EXCEEDING 300 mm. THOROUGHLY COMPACT EACH LAYER 95% STANDARD PROCTOR.
5. THIS SPECIFICATION MEETS OR EXCEEDS CSA C22.3 NO.7–94 STANDARD.
6. ALL PVC DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.
7. 900mm FOR GAS IS TO ACCOMMODATE WATER LATERALS.
8. INSTALL CABLE PULLING ROPES IN ALL DUCTS AT TIME OF DUCT INSTALLATION.
9. AT HALTON HILLS HYDRO'S DISCRETION, PRIMARY AND SECONDARY DUCTS ARE TO BE CONCRETE ENCASED. THIS APPLIES ESPECIALLY FOR TOWNHOUSE COMPLEXES.
10. GAS AND OTHER UTILITY STRUCTURES SHALL DEVIATE AROUND TRANSFORMER GROUND GRID.

Halton Hills HYDRO



Approved	Union Gas	Date:	
Approved	COGECO	Date:	
Approved	Bell Canada	Date:	
Approved	Town of Halton Hills	Date:	

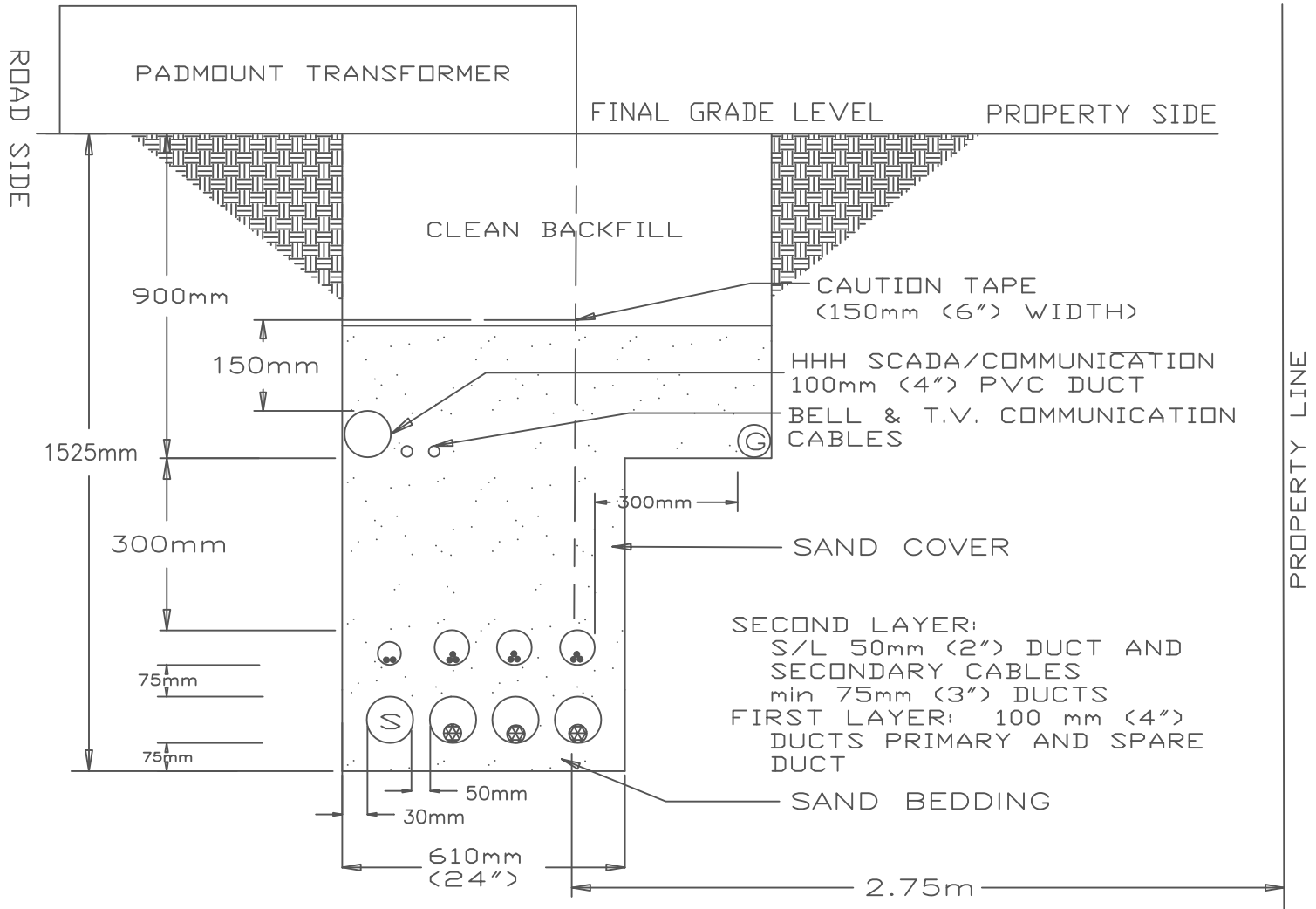
PROP. JOINT USE PRI. & SEC. HYDRO, BELL, T.V. ,& GAS CONCRETE ENCASED STEP TRENCH SECTION (1.35 m DEPTH)

DESIGNED BY: M. MAROSCHAK & M. GONZALES		H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 06–12–06 C. HALE
DRAWN BY: F. LEMUT			
APPROVED BY:			
SIGNATURE:		H.H.H. DWG. NO: UD–24–R3	ORIGINAL DATE: 03–03–24
SCALE: N.T.S.			

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
2 ALL DIMENSIONS ARE THE MINIMUM DISTANCES REQUIRED.
3 CONTACT HALTON HILLS HYDRO 48 HRS. PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.
4 BACKFILL IN LAYERS NOT EXCEEDING 300 mm. THOROUGHLY COMPACT EACH LAYER 95% STANDARD PROCTOR.
5 THIS SPECIFICATION MEETS OR EXCEEDS CSA C22.3 NO.7–94 STANDARD.
6 ALL PVC DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.
7. INSTALL CABLE PULLING ROPE IN ALL DUCTS AT TIME OF DUCT INSTALLATION.
8. AT HALTON HILLS HYDRO'S DISCRETION, PRIMARY AND SECONDARY DUCTS ARE TO BE CONCRETE ENCASED. THIS APPLIES ESPECIALLY FOR TOWNHOUSE COMPLEXES.
9. GAS AND OTHER UTILITY DUCT STRUCTURES SHALL DEVIATE AROUND TRANSFORMER GROUND GRID.

Halton Hills HYDRO



Approved Union Gas Date:

Approved COGECO Date:

Approved Bell Canada Date:

Approved Town of Halton Hills Date:

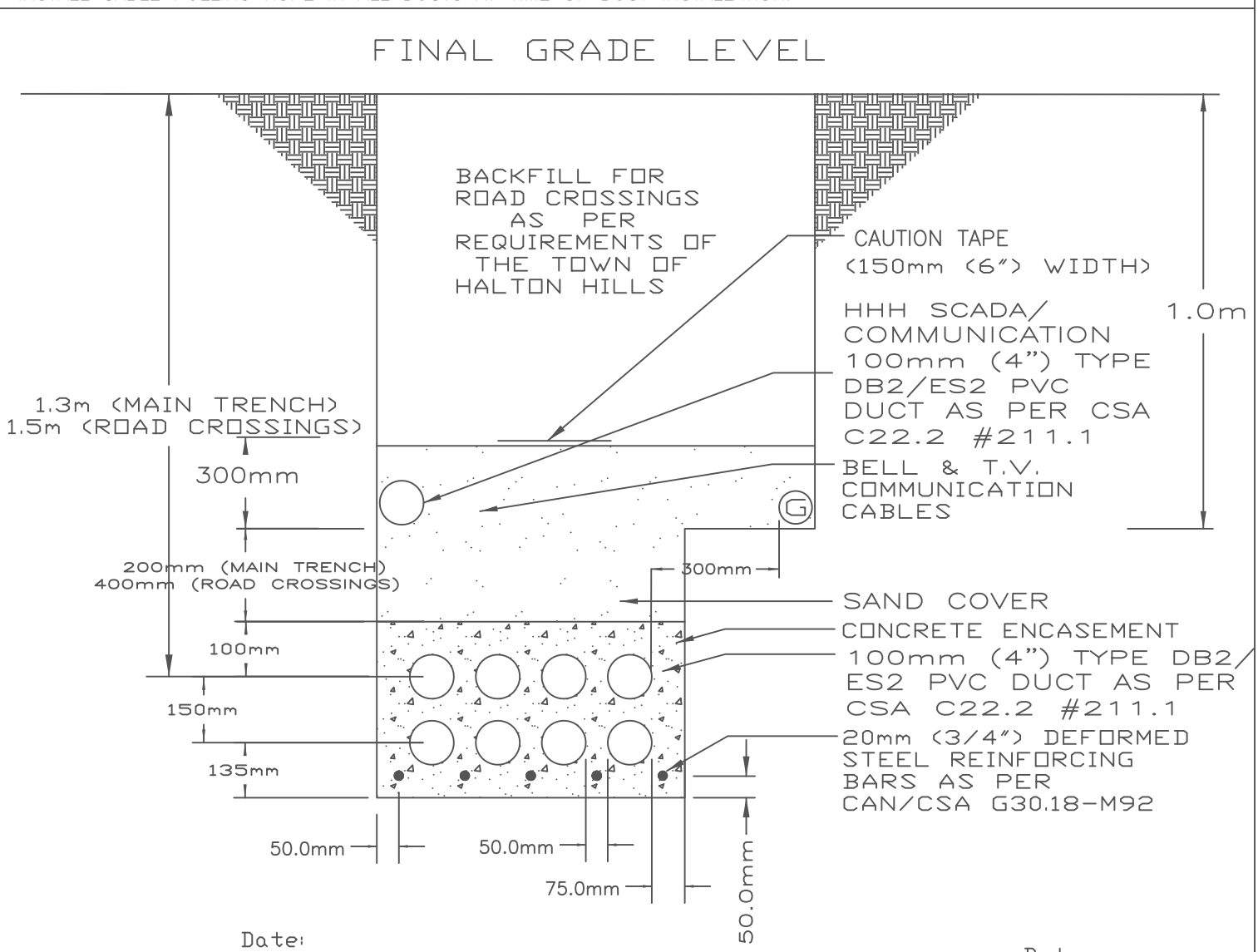
PROP. JOINT USE PRI. & SEC. HYDRO, BELL, T.V. ,& GAS STEP TRENCH SECTION (1.525 m DEPTH) – BOULEVARD

DESIGNED BY: M. MAROSCHAK & M. GONZALES		H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 06–12–06 C. HALE
DRAWN BY: F. LEMUT			
APPROVED BY:			
SIGNATURE:		H.H.H. DWG. NO: UD–25–R3	ORIGINAL DATE: 03–03–24
SCALE: N.T.S.			

NOTES:

1 OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION.
2 ALL DIMENSIONS ARE THE MINIMUM DISTANCES REQUIRED.
3 CONTACT HALTON HILLS HYDRO 48 HRS. PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS.
4 THE REINFORCING BARS ALONG THE BOTTOM SIDES AND BOTTOM OF THE DUCT BANK SHALL BE CONCEALED WITH A MINIMUM OF 50mm OF CONCRETE COVER.
5 BACKFILL IN LAYERS NOT EXCEEDING 300mm. COMPACTION TO BE TO 95 STANDARD PROCTOR DENSITY MINIMUM (AS PER CSA C22.3 – No. 7–94 – clause 3.5.3.2).
6 THIS SPECIFICATION MEETS OR EXCEEDS CSA C22.3 NO.7–94 STANDARD.
7 ALL DUCTS TO BE PVC TYPE DB2/ES2 AS PER CSA–C22.2 #211.1 STANDARD.
8 ALL PVC DUCTS AND JOINTS TO BE GLUED WITH APPROVED ADHESIVE.
9 INSTALL CABLE PULLING ROPE IN ALL DUCTS AT TIME OF DUCT INSTALLATION.

Halton Hills HYDRO



Approved Union Gas Date:

Approved COGECO Date:

Approved Bell Canada Date:

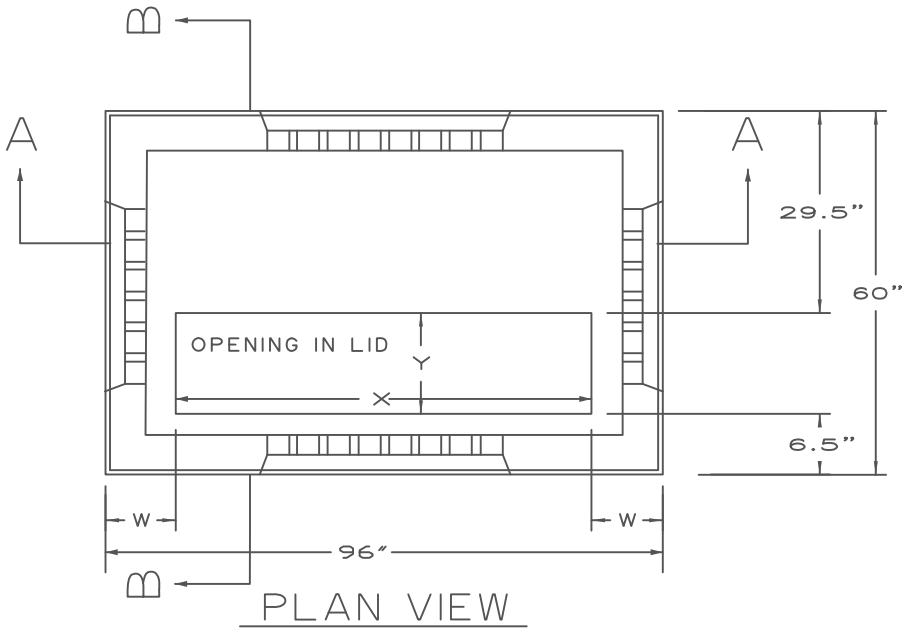
Approved Town of Halton Hills Date:

PROPOSED CONCRETE ENCASED DUCT BANK SECTION
STEP TRENCH (FOR 8 DUCTS) – ROADCROSSING

DESIGNED BY: M. MAROSCHAK & M. GONZALES	H.H.H. FILE: U:\Engineering Operations\ 6. Specs & Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22–04	LAST REVISED DATE: 06–12–06 C. HALE
DRAWN BY: F. LEMUT		
APPROVED BY:		
SIGNATURE:	H.H.H. DWG. NO: UD–26–R3	ORIGINAL DATE: 03–03–24
SCALE: N.T.S.		

NOTES:

1. ALL DIMENSIONS ARE SHOWN IN INCHES UNLESS OTHERWISE INDICATED,
2. CANADA POWER SWITCHGEAR 898 SERIES SHALL BE IDENTIFIED FOR HALTON HILLS HYDRO INC.
3. THE CONCRETE FOUNDATION DIMENSIONS SHALL BE OF SIZE AS INDICATED.
4. LID OPENING DIMENSIONS AS PER "TABLE A" SHALL BE APPLIED TO THE SPECIFIC SWITCHGEAR.
5. CONCRETE FOUNDATION MUST BE ABLE TO SUPPORT A MINIMUM OF 2,200 LBS.
6. FOUNDATION TO BE SET ON A 12" THICK BASE MADE OF TAMPED 3/4" CRUSHED STONE.
7. CONCRETE TO BE A MINIMUM 30MPa, AIR ENTRAINED.
8. LID CABLE ENTRY AND CABLE ENTRY KNOCKOUT SURFACES TO BE SMOOTH FINISHED.
9. ALL CABLES OPENINGS IN FOUNDATION SHALL BE MANUFACTURER TO ACCOMODATE 4" PVC DUCTS, COMPLETE WITH POLYLOC PLASTIC PIPE SEALS INSTALLED.
10. CONCRETE MUST BE DESIGNED, MIXED, AND PLACED IN ACCORDANCE WITH CAN/CSA-A23.1 AND CAN/CSA-A23.2.
11. FOR SWITCHGEAR GROUNDING DETAIL, REFER TO HALTON HILLS HYDRO DRAWING UD-11.
12. PLEASE REFER TO HALTON HILLS HYDRO APPROVED MATERIALS LIST FOR MAUNFACTURER PART NUMBERS.

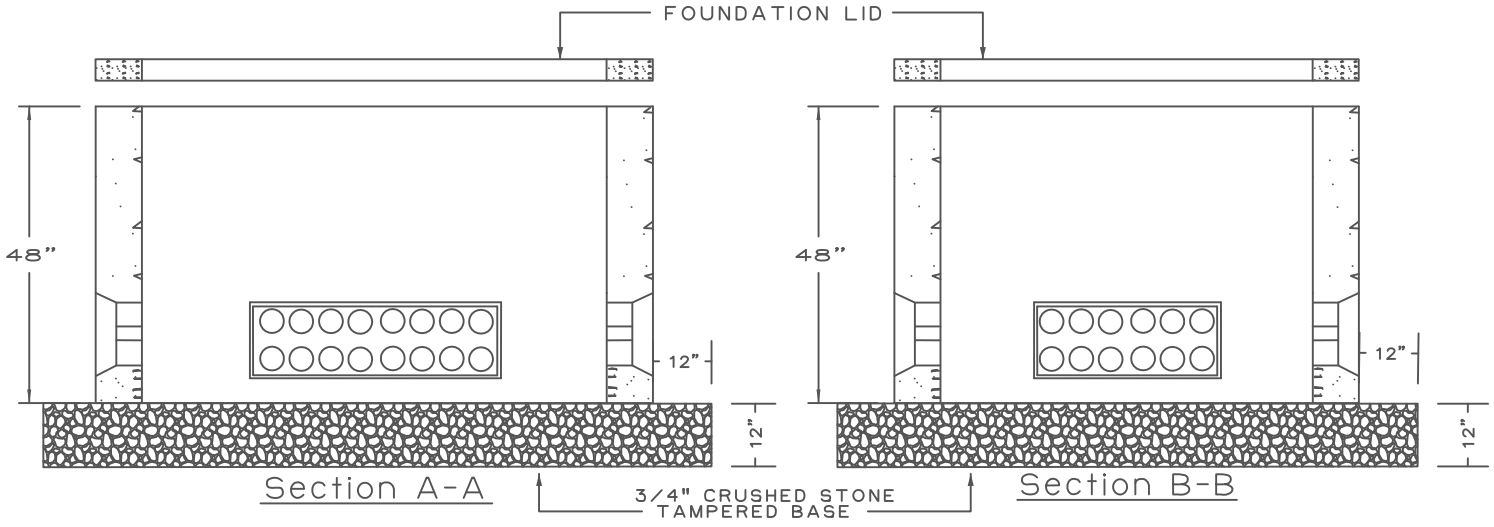


PLAN VIEW

TABLE A

FOUNDATION LID OPENING DIMENSIONS

	DIMENSIONS		
SWITCHGEAR MODEL No.	**W**	**X**	**Y**
6TTT6/ 898 (801C1801)	12.5"	71"	24"
66T6/ 898 (801C1806)	12.5"	71"	24"
6TT6/ 898 (801C1781)	12.5"	71"	24"
6TT6/ 898B (801C1810)	12.5"	71"	24"
6TT6/ 898C (801C1809)	12.5"	71"	24"
6TT6/ 898 (801C1767)	12.5"	71"	24"
6TTT6/ 898 (801C1928)	12.5"	71"	24"



Section A-A

Section B-B

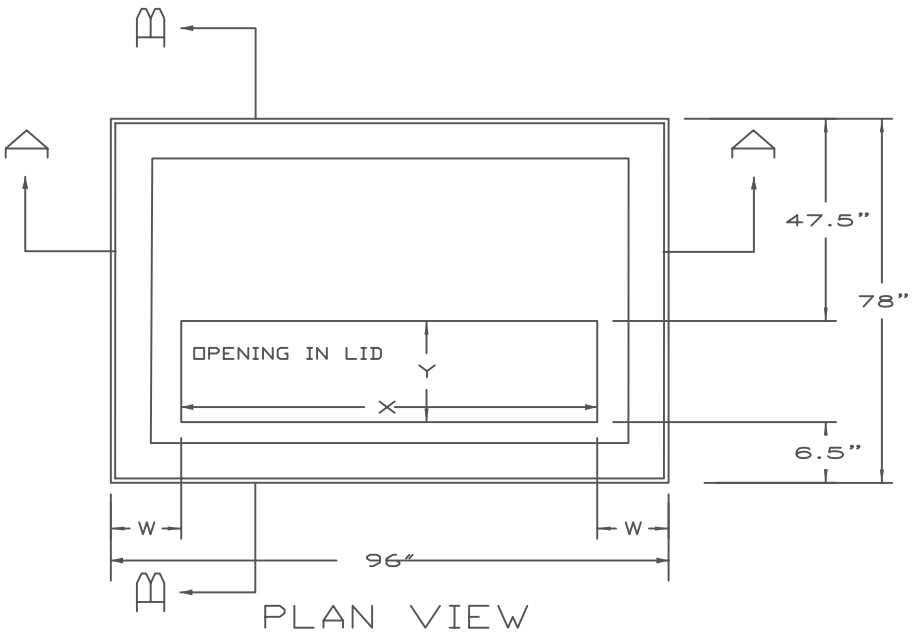
CONCRETE FOUNDATION STANDARD
(FOR HALTON HILLS HYDRO 898 SERIES CANADA POWER SWITCHGEAR)

DESIGNED BY: C. HALE		H.H.H. FILE: U:\ ENGINEERING OPERATIONS\ 6. SPECS AND DOCUMENTS\ 04. HHH UNDERGROUND SPECS\ UD SPECS REG 22-04\	LAST REVISED DATE: 2007-07-03 C. HALE
DRAWN BY: C. HALE			
APPROVED BY: M. MAROSCHAK/ K. DURSKI			
SIGNATURE:		H.H.H. DWG. NO: UD-27-R3	ORIGINAL DATE: 2005-03-02
SCALE: N.T.S.			

NOTES:

1. ALL DIMENSIONS ARE SHOWN IN INCHES UNLESS OTHERWISE INDICATED.
2. CANADA POWER SWITCHGEAR 898 SERIES SHALL BE IDENTIFIED FOR HALTON HILLS HYDRO INC.
3. THE CONCRETE LID DIMENSIONS SHALL BE OF SIZE AS INDICATED.
4. LID OPENING DIMENSIONS AS PER "TABLE A" SHALL BE APPLIED TO THE SPECIFIC SWITCHGEAR.
5. CONCRETE LID MUST BE ABLE TO SUPPORT A MINIMUM OF 2,200 LBS.
6. CONCRETE TO BE A MINIMUM 30MPa, AIR ENTRAINED.
8. LID CABLE ENTRY SURFACES TO BE SMOOTH FINISHED.
9. CONCRETE MUST BE DESIGNED, MIXED, AND PLACED IN ACCORDANCE WITH CAN/CSA-A23.1 AND CAN/CSA-A23.2.
11. FOR SWITCHGEAR GROUNDING DETAIL, REFER TO HALTON HILLS HYDRO DRAWING UD-11.
12. PLEASE REFER TO HALTON HILLS HYDRO APPROVED MATERIALS LIST FOR MAUNFACTURER PART NUMBERS.

Halton Hills HYDRO

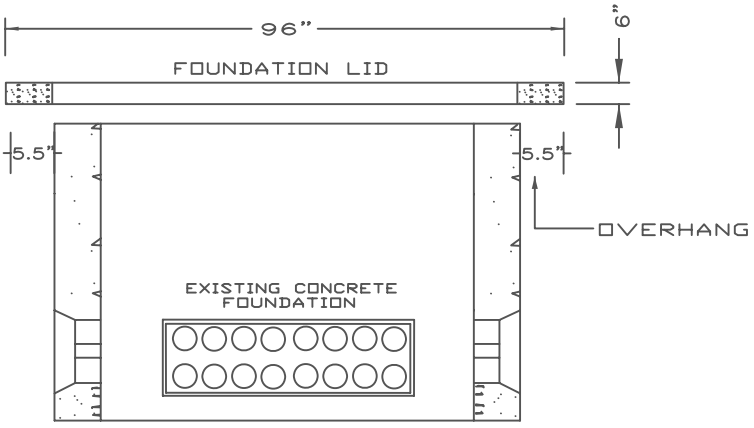


PLAN VIEW

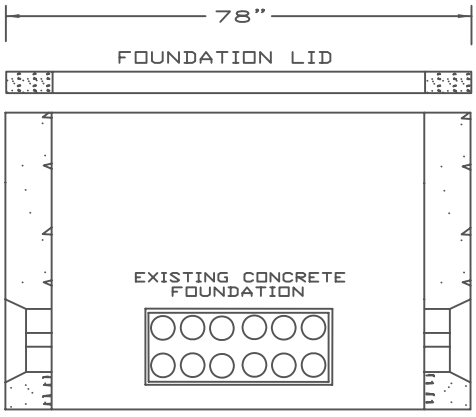
TABLE A

FOUNDATION LID OPENING DIMENSIONS

SWITCHGEAR MODEL No.	DIMENSIONS W	X	Y
6TTT6/ 898 (801C1801)	12.5"	71"	24"
66T6/ 898 (801C1806)	12.5"	71"	24"
6TT6/ 898 (801C1781)	12.5"	71"	24"
6TT6/ 898B (801C1810)	12.5"	71"	24"
6TT6/ 898C (801C1809)	12.5"	71"	24"
6TTT/ 898 (801C1767)	12.5"	71"	24"



Section A-A



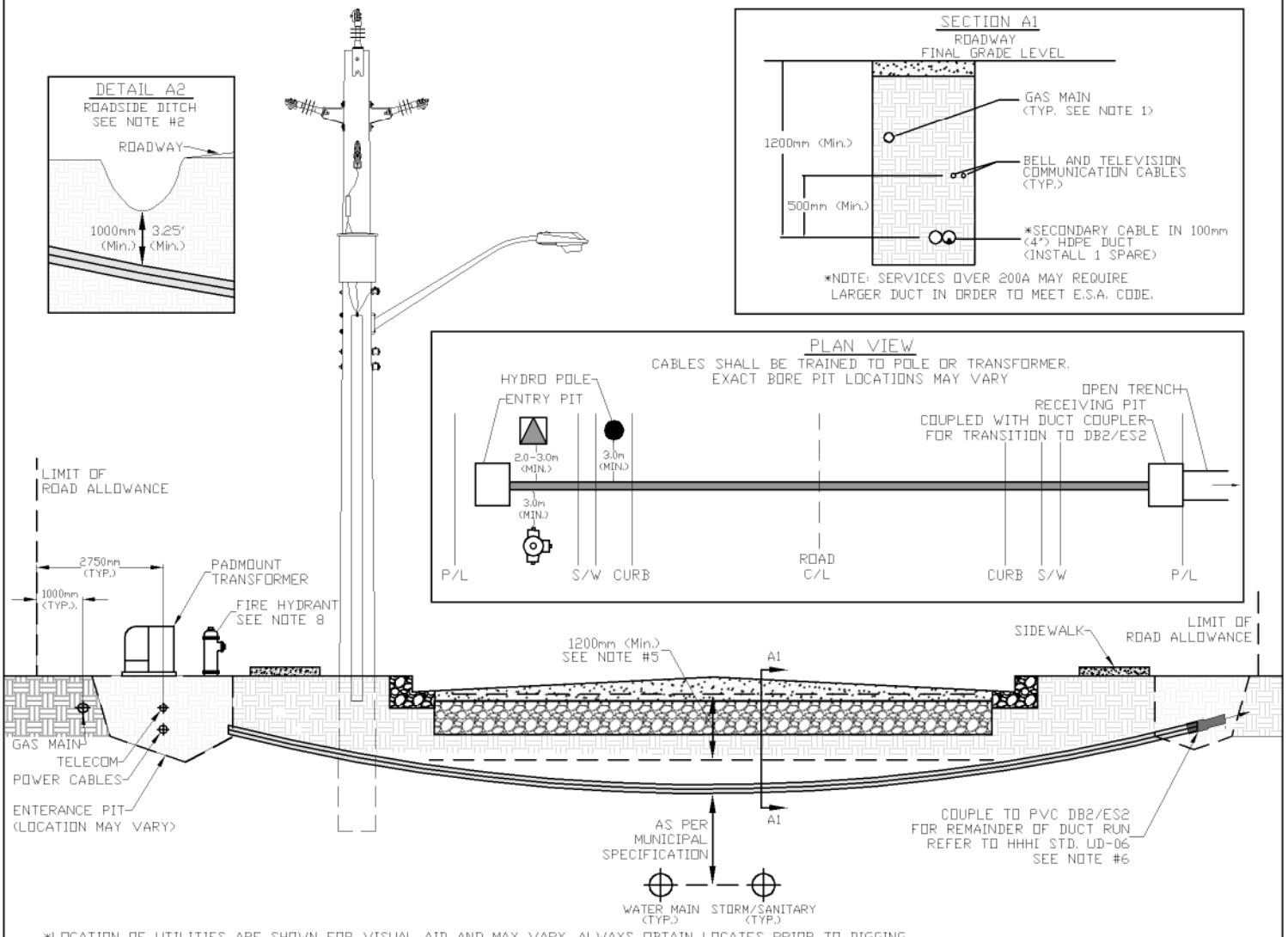
Section B-B

CONCRETE FOUNDATION LID STANDARD (FOR RETROFITTING PMH-9 FOUNDATIONS WITH LID FOR 898 SERIES CANADA POWER SWITCHGEAR)

DESIGNED BY: C. HALE	H.H.H. FILE: U:\ ENGINEERING OPERATIONS\ 6. SPECS AND DOCUMENTS\ 04. HHH UNDERGROUND SPECS\ UD SPECS REG 22-04\	LAST REVISED DATE: 2006-10-04 C. HALE
DRAWN BY: C. HALE		
APPROVED BY: M. MAROSCHAK/ K. DURSKI		
SIGNATURE:	H.H.H. DWG. NO: UD-29-R1	ORIGINAL DATE: 2006-09-26
SCALE: N.T.S.		

NOTES:

1. OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION. APPROVAL OF THE RESPECTIVE AUTHORITIES MUST BE OBTAINED FOR DIRECTIONAL BORED STREET CROSSING AND ALL MATERIAL USED THERE IN. MAINTAIN A MINIMUM 500mm HORIZONTAL AND 500mm VERTICAL DISTANCE FROM OTHER UTILITIES THROUGHOUT THE LENGTH OF BORE.
2. WHEN CROSSING IN RURAL AREA'S, MINIMUM 1000mm DEPTH MUST BE MAINTAINED FROM BOTTOM OF DITCH GRADE. SEE DETAIL A2.
3. CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS AT ENTRANCE LOCATIONS.
4. ALL ROAD CROSSINGS SHALL BE PERPENDICULAR IN NATURE WHEN CROSSING THE CURB LINE.
5. THE DRILL PATH SHALL BE ACCURATELY SURVEYED WITH ENTRY AND EXIT AREAS PLACED IN APPROPRIATE LOCATIONS AS SHOWN ON DRAWINGS AND SHALL BE DRILLED SO AS NOT TO EXCEED THE MANUFACTURERS BENDING LIMITATIONS OF THE PIPE. DRILL PATH TO BE AS STRAIGHT AS POSSIBLE AT ALL TIMES. DEPTH OF CROSSING MAY BE VARIED DEPENDING ON LOCATION OF OTHER UNDERGROUND UTILITIES AND/OR STRUCTURES. DEPTH OF DUCT AS PER ONTARIO PROVINCIAL STANDARDS SPECIFICATION OPSS #450. MAINTAIN A MINIMUM 1200 mm VERTICAL DISTANCE FROM ROADWAY FINAL GRADE THROUGHOUT LENGTH OF BORE.
6. ALL DUCTS BORED TO BE HIGH DENSITY POLYETHYLENE (HDPE) AS PER CSA-C22.2 #211.1 STANDARD. HDPE SHALL BE SDR (200 PSI) PRESSURE.
7. AT EITHER SIDE OF ROAD CROSSING WHERE THE HDPE DUCT TERMINATES, PVC DUCT TYPE DB2/ES2 SHALL BE COUPLED TO THE HDPE DUCT. SEE HHHI STD. UD-06. HDPE DUCT SHALL NOT BE USED FOR THE ENTIRE LENGTH OF THE TRENCH.
8. MAINTAIN MINIMUM DISTANCES AROUND EXISTING UTILITIES. ACCESS TO HYDRANT AS PER OPSD 217.050 AND THE REGIONAL MUNICIPALITY OF HALTON BY-LAWS AND SPECIFICATIONS.
9. FOLLOWING DRILLING OPERATIONS, THE CONTRACTOR SHALL DE-MOBILIZE EQUIPMENT AND RESTORE WORK-SITE TO PRE-CONSTRUCTION OR BETTER CONDITIONS.
10. FILL ANNULAR VOIDS USING GROUT (ONE PART OF PORTLAND CEMENT & 2 PARTS OF SAND).
11. OPEN BORE PITS SHALL HAVE SNOW FENCE ERECTED AROUND THE OUTER PERIMETER WHEN LEFT UNATTENDED.
12. THIS SPECIFICATION MEETS OR EXCEEDS CSA-C22.3 NO. 7-15 STANDARD.
13. ALL DIRECTIONAL BORING WORKS TO CONFORM TO TOWN OF HALTON HILLS REQUIREMENTS UNLESS OTHERWISE APPROVED BY THE TOWN PRIOR TO COMMENCEMENT OF WORK INCLUDING BUT NOT LIMITED TO THE FOLLOWING: ENTRY AND EXIT PITS TO REMAIN OUTSIDE OF DRIVEWAYS/ENTERANCES, BACKFILL IN THE TOWNS BOULEVARD SHALL BE CLEAN NATIVE MATERIAL (FREE OF TOP SOIL) AND COMPACTED TO MINIMUM 95% STANDARD PROCTOR DRY DENSITY, THE USE OF LEAN CONCRETE (U-FILL) IS NOT PERMITTED AS BACKFILL MATERIAL. ALL WORKS SHALL COMPLY WITH THE TOWN OF HALTON HILLS TREE BY-LAW 93-106 (AS AMENDED).



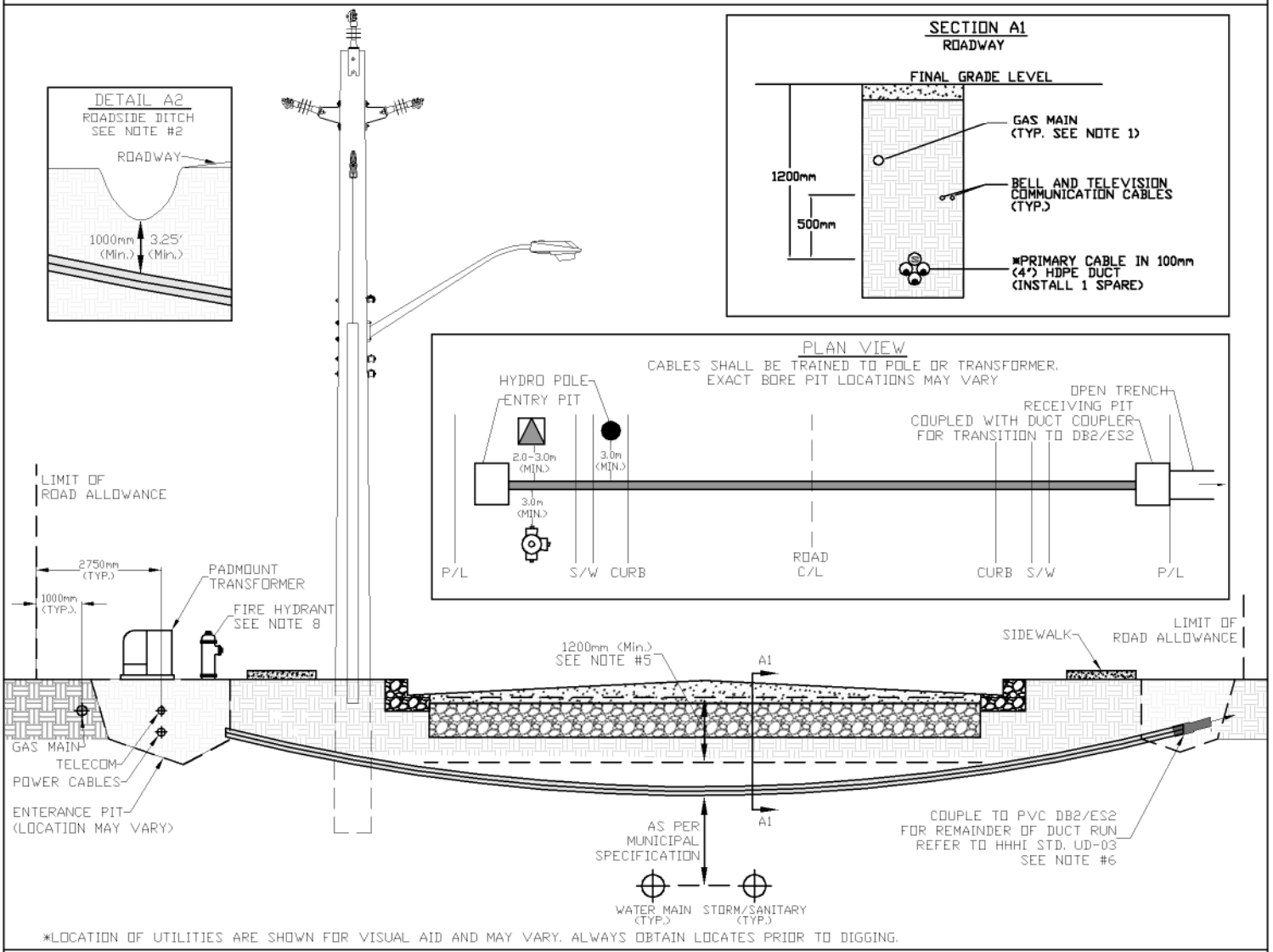
*LOCATION OF UTILITIES ARE SHOWN FOR VISUAL AID AND MAY VARY. ALWAYS OBTAIN LOCATES PRIOR TO DIGGING.

DIRECTIONAL BORED STREET CROSSING SECONDARY SERVICES - TYPICAL

DESIGNED BY:	H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE:
DRAWN BY: J. AICHWALDER		
APPROVED BY: C.HALE, C.E.T., LEL		
SIGNATURE:	H.H.H. DWG. NO: UD-30	ORIGINAL DATE: 01-03-2019
SCALE: N.T.S.		

NOTES:

1. OBTAIN ALL UTILITY LOCATES PRIOR TO CONSTRUCTION. APPROVAL OF THE RESPECTIVE AUTHORITIES MUST BE OBTAINED FOR DIRECTIONAL BORED STREET CROSSING AND ALL MATERIAL USED THERE IN. MAINTAIN A MINIMUM 500mm HORIZONTAL AND 500mm VERTICAL DISTANCE FROM OTHER UTILITIES THROUGHOUT THE LENGTH OF BORE.
2. WHEN CROSSING IN RURAL AREA'S, MINIMUM 1000mm DEPTH MUST BE MAINTAINED FROM BOTTOM OF DITCH GRADE. SEE DETAIL A2.
3. CONTACT HALTON HILLS HYDRO A MINIMUM OF 2 BUSINESS DAYS PRIOR TO BACKFILL TO SCHEDULE INSPECTIONS AT ENTRANCE LOCATIONS.
4. ALL ROAD CROSSINGS SHALL BE PERPENDICULAR IN NATURE WHEN CROSSING THE CURB LINE.
5. THE DRILL PATH SHALL BE ACCURATELY SURVEYED WITH ENTRY AND EXIT AREAS PLACED IN APPROPRIATE LOCATIONS AS SHOWN ON DRAWINGS AND SHALL BE DRILLED SO AS NOT TO EXCEED THE MANUFACTURERS BENDING LIMITATIONS OF THE PIPE. DRILL PATH TO BE AS STRAIGHT AS POSSIBLE AT ALL TIMES. DEPTH OF CROSSING MAY BE VARIED DEPENDING ON LOCATION OF OTHER UNDERGROUND UTILITIES AND/OR STRUCTURES. DEPTH OF DUCT AS PER ONTARIO PROVINCIAL STANDARDS SPECIFICATION OPSS #450. MAINTAIN A MINIMUM 1200 mm VERTICAL DISTANCE FROM ROADWAY FINAL GRADE THROUGHOUT LENGTH OF BORE.
6. ALL DUCTS BORED TO BE HIGH DENSITY POLYETHYLENE (HDPE) AS PER CSA-C22.2 #211.1 STANDARD. HDPE SHALL BE SDR (200 PSI) PRESSURE.
7. AT EITHER SIDE OF ROAD CROSSING WHERE THE HDPE DUCT TERMINATES, PVC DUCT TYPE DB2/ES2 SHALL BE COUPLED TO THE HDPE DUCT. SEE HHHI STD. UD-06. HDPE DUCT SHALL NOT BE USED FOR THE ENTIRE LENGTH OF THE TRENCH.
8. MAINTAIN MINIMUM DISTANCES AROUND EXISTING UTILITIES. ACCESS TO HYDRANT AS PER OPSD 217.050 AND THE REGIONAL MUNICIPALITY OF HALTON BY-LAWS AND SPECIFICATIONS.
9. FOLLOWING DRILLING OPERATIONS, THE CONTRACTOR SHALL DE-MOBILIZE EQUIPMENT AND RESTORE WORK-SITE TO PRE-CONSTRUCTION OR BETTER CONDITIONS.
10. FILL ANNULAR VOIDS USING GROUT (ONE PART OF PORTLAND CEMENT & 2 PARTS OF SAND).
11. OPEN BORE PITS SHALL HAVE SNOW FENCE ERECTED AROUND THE OUTER PERIMETER WHEN LEFT UNATTENDED.
12. THIS SPECIFICATION MEETS OR EXCEEDS CSA-C22.3 NO. 7-15 STANDARD.
13. ALL DIRECTIONAL BORING WORKS TO CONFORM TO TOWN OF HALTON HILLS REQUIREMENTS UNLESS OTHERWISE APPROVED BY THE TOWN PRIOR TO COMMENCEMENT OF WORK INCLUDING BUT NOT LIMITED TO THE FOLLOWING: ENTRY AND EXIT PITS TO REMAIN OUTSIDE OF DRIVEWAYS/ENTERANCES, BACKFILL IN THE TOWNS BOULEVARD SHALL BE CLEAN NATIVE MATERIAL (FREE OF TOP SOIL) AND COMPACTED TO MINIMUM 95% STANDARD PROCTOR DRY DENSITY, THE USE OF LEAN CONCRETE (U-FILL) IS NOT PERMITTED AS BACKFILL MATERIAL. ALL WORKS SHALL COMPLY WITH THE TOWN OF HALTON HILLS TREE BY-LAW 93-106 (AS AMENDED).



*LOCATION OF UTILITIES ARE SHOWN FOR VISUAL AID AND MAY VARY. ALWAYS OBTAIN LOCATES PRIOR TO DIGGING.

DIRECTIONAL BORED STREET CROSSING PRIMARY SERVICES - TYPICAL

DESIGNED BY:	R.R., J.A.	H.H.H. FILE: U:\Engineering Operations\ 6. Specs and Documents\ 4. HHH UnderGround Specs\ UD Specs Reg 22-04	LAST REVISED DATE:
DRAWN BY:	J. AICHWALDER		
APPROVED BY:	C.HALE, C.E.T., LEL		
SIGNATURE:		H.H.H. DWG. NO: UD-31	ORIGINAL DATE: 01-03-2019
SCALE:	N.T.S.		