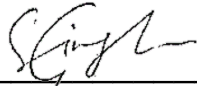




UNDERGROUND CONDUCTOR STANDARDS

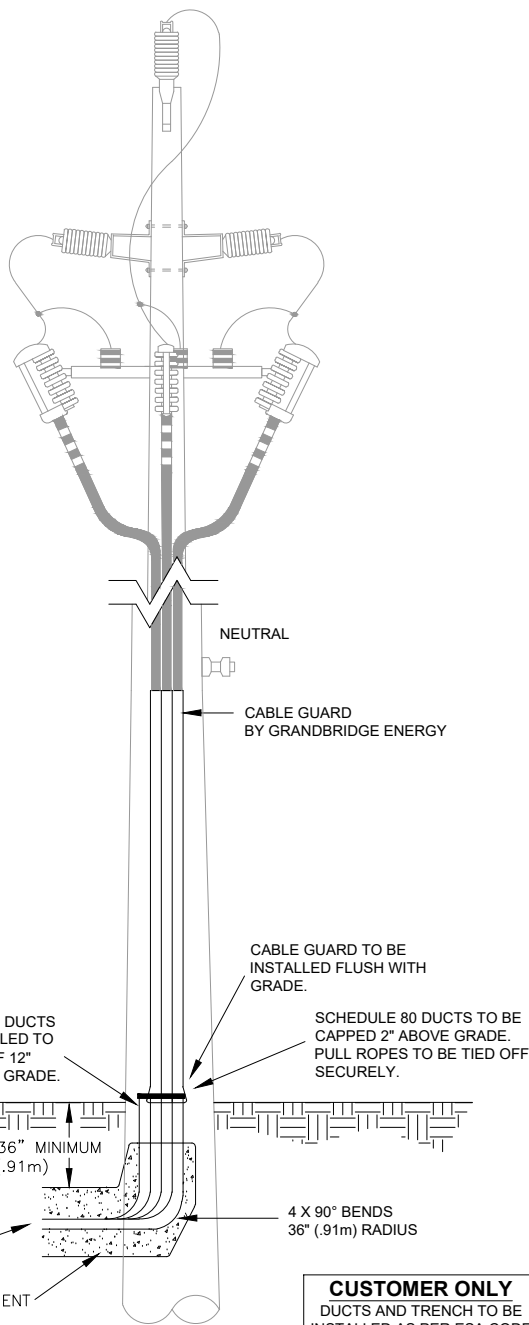
Issued by: Engineering Department
GrandBridge Energy Inc.

Effective: **September 7, 2023**

Approved by Gurdeep Bansal, P.Eng. 

Approval is given in accordance with Ontario Regulation 22/04. There are no undue hazards. It is suitable for the intended application and will be adequately inspected.

3-PHASE PRIMARY VOLTAGE



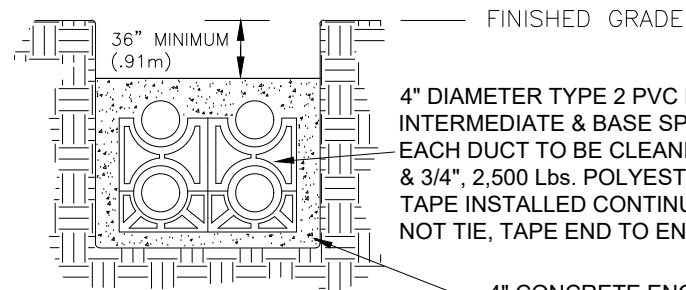
PRIMARY VOLTAGE UNDERGROUND RISER ON GRANDBRIDGE ENERGY INC. POLE

NOTES:

(1) WHEN 3-PHASE PRIMARY RISERS ARE TO BE INSTALLED, THE ELECTRICAL CONTRACTOR IS TO CONTACT GRANDBRIDGE ENERGY INC. TO DETERMINE THE POSITION OF DUCTS AT THE BASE OF THE RISER POLE PRIOR TO DUCT INSTALLATION. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR TYING DOWN THE DUCT BANK TO PREVENT FLOATING OF THE DUCTS. ELECTRICAL CONTRACTOR IS ALSO RESPONSIBLE FOR VIBRATING AND/OR FORMING OF THE CONCRETE WHEN DIRECTED TO DO SO BY GRANDBRIDGE ENERGY INC. REFER TO THE LATEST MATERIAL & CONSTRUCTION SPECIFICATIONS MANUAL.

(2) ELECTRICAL CONTRACTOR MUST ARRANGE TO HAVE DUCT BANK INSPECTED BY GRANDBRIDGE ENERGY INC.

(3) CONTRACTOR IS TO INSTALL GROUNDING AS PER OFS401.



TYPICAL 4X4" PVC DUCT CONFIGURATION

4" CONCRETE ENCASEMENT:
- 10MM PEASTONE
- 20MPA STRENGTH
- 80MM SLUMP

BELLEND'S ARE TO BE USED FOR EACH TERMINATION IN PULLING PITS OR CONCRETE ENCLOSURES. THE BELL ENDS MUST BE FLUSH WITH THE INSIDE OF THE TERMINATION POINT.

WARNING TAPE INFORMATION

TRENCH WIDTH	# OF WARNING TAPES	TAPE PLACEMENT
UP TO 305mm (12")	1	CENTRED ON THE TRENCH.
GREATER THAN 305mm (12") UP TO AND INCLUDING 762mm (30")	2 (OR MORE)	PLACED NO MORE THAN 76mm (3") FROM THE SIDE OF THE TRENCH AND NOT MORE THAN 305mm (12") APART.
GREATER THAN 762mm (30")	3 (OR MORE)	PLACED NO MORE THAN 76mm (3") FROM THE SIDE OF THE TRENCH AND NOT MORE THAN 305mm (12") APART.

NOTE: THE TRENCH WIDTH EXCLUDES THE ADDED WIDTH FOR JOINT USE GAS LINE INSTALLATION (IE. HYDRO PART OF TRENCH ONLY).

5	Sep 7, 2023	UPDATED LOGO	JKM	
4	Jul 5, 2017	REMOVED CONCRETE BARRIER, ADDED SCH80	SJ	
3	Apr 4, 2016	ADDED CONCRETE BARRIER TO DUCTS	SJ	
2	Jun 25, 2012	REVISED WARNING TAPE INFO	TM	
1	Mar 23, 2010	Note 3 - grounding details	BG	CHEK'D
REV.	DATE		BY	



TITLE: 3Ø PRIMARY HIGH-VOLTAGE UNDERGROUND RISERS ON ENEGY+ INC. POLES

DATE: AUG. 31, 2005. SCALE: N.T.S. W.O.No.: DRAWN BY: JON JAROSZ

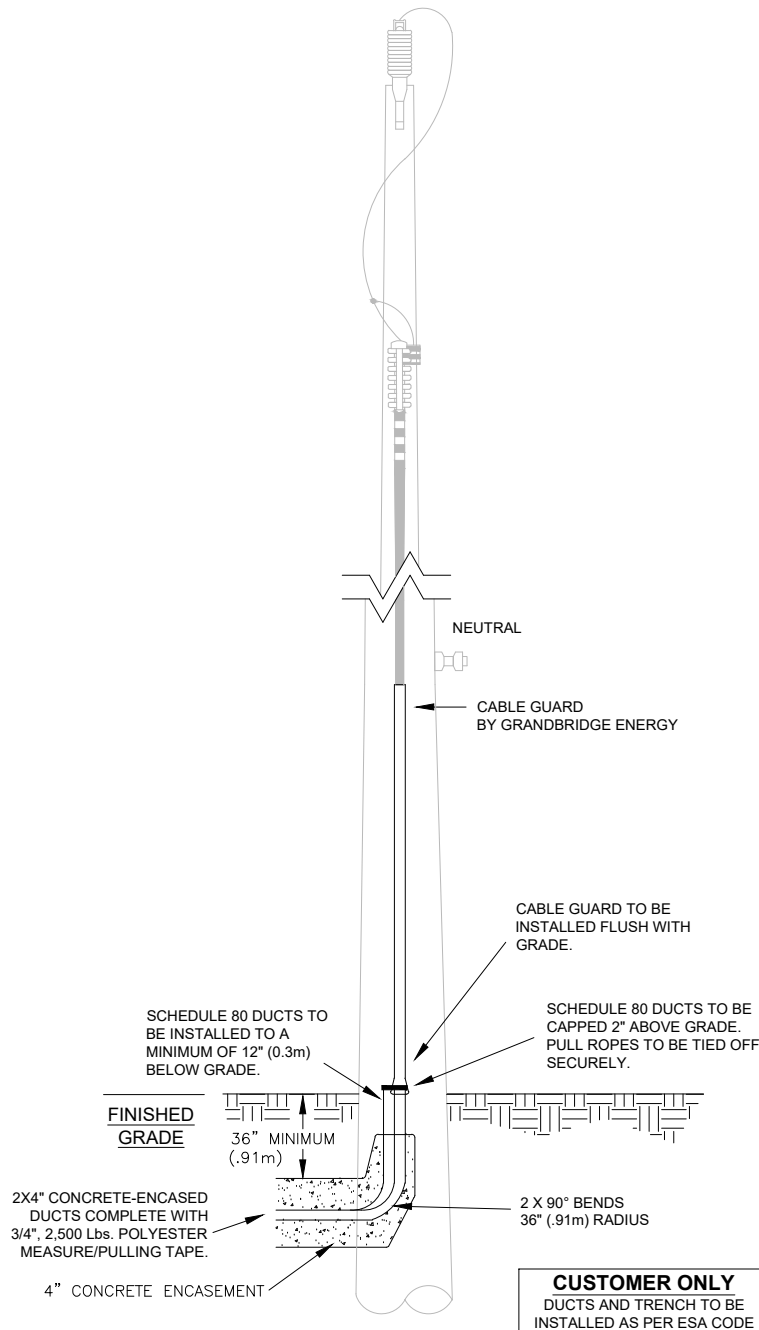
CASE VANDERLOO
DESIGNED BY

APPROVED BY P.ENG.

DRAWING No.
UCS-1

2				
1	Sep 7, 2023	UPDATED LOGO		JKM
0	JUL 5, 2017	CREATED DWG FOR C.E. DUCTS		SJ
REV	DATE		BY	CHECK'D
TITLE: 3-PHASE PRIMARY HIGH-VOLTAGE UNDERGROUND RISERS ON GRANDBRIDGE ENERGY INC. POLES WITH CONCRETE ENCASED				
DATE: DUCTS JUL 5, 2017		SCALE: N.T.S.	W.O.No.:	DRAWN BY: JON JAROSZ
CASE VANDERLOO				DRAWING No.
DESIGNED BY		APPROVED BY P.ENG.		UCS-1-CON

1-PHASE PRIMARY VOLTAGE



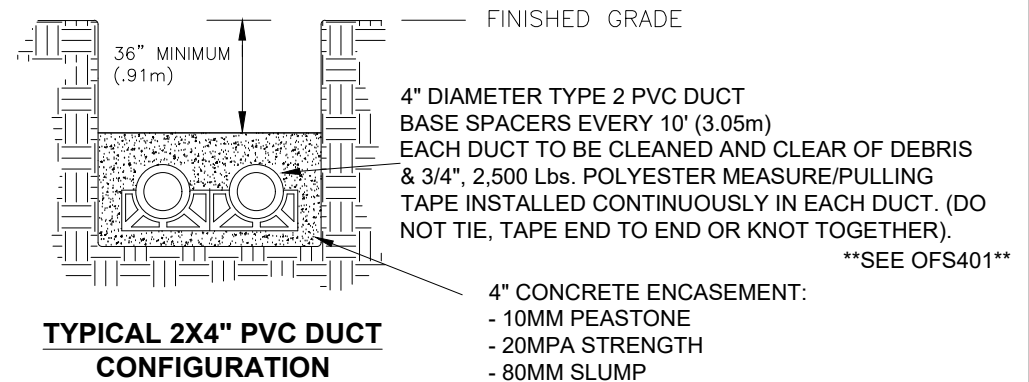
PRIMARY VOLTAGE UNDERGROUND RISER ON GRANDBRIDGE ENERGY INC. POLE

NOTES:

(1) WHEN 1-PHASE PRIMARY RISERS ARE TO BE INSTALLED, THE ELECTRICAL CONTRACTOR IS TO CONTACT GRANDBRIDGE ENERGY INC. TO DETERMINE THE POSITION OF DUCTS AT THE BASE OF THE RISER POLE PRIOR TO DUCT INSTALLATION. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR TYING DOWN THE DUCT BANK TO PREVENT FLOATING OF THE DUCTS. ELECTRICAL CONTRACTOR IS ALSO RESPONSIBLE FOR VIBRATING AND/OR FORMING OF THE CONCRETE WHEN DIRECTED TO DO SO BY GRANDBRIDGE ENERGY INC. REFER TO THE LATEST MATERIAL & CONSTRUCTION SPECIFICATIONS MANUAL.

(2) ELECTRICAL CONTRACTOR MUST ARRANGE TO HAVE DUCT BANK INSPECTED BY GRANDBRIDGE ENERGY INC.

(3) CONTRACTOR IS TO INSTALL GROUNDING AS PER OFS401.



BELL ENDS ARE TO BE USED FOR EACH TERMINATION IN PULLING PITS OR CONCRETE ENCLOSURES. THE BELL ENDS MUST BE FLUSH WITH THE INSIDE OF THE TERMINATION POINT.

WARNING TAPE INFORMATION

TRENCH WIDTH	# OF WARNING TAPES	TAPE PLACEMENT
UP TO 305mm (12")	1	CENTRED ON THE TRENCH.
GREATER THAN 305mm (12") UP TO AND INCLUDING 762mm (30")	2 (OR MORE)	PLACED NO MORE THAN 76mm (3") FROM THE SIDE OF THE TRENCH AND NOT MORE THAN 305mm (12") APART.
GREATER THAN 762mm (30")	3 (OR MORE)	PLACED NO MORE THAN 76mm (3") FROM THE SIDE OF THE TRENCH AND NOT MORE THAN 305mm (12") APART.

NOTE: THE TRENCH WIDTH EXCLUDES THE ADDED WIDTH FOR JOINT USE GAS LINE INSTALLATION (I.E. HYDRO PART OF TRENCH ONLY).

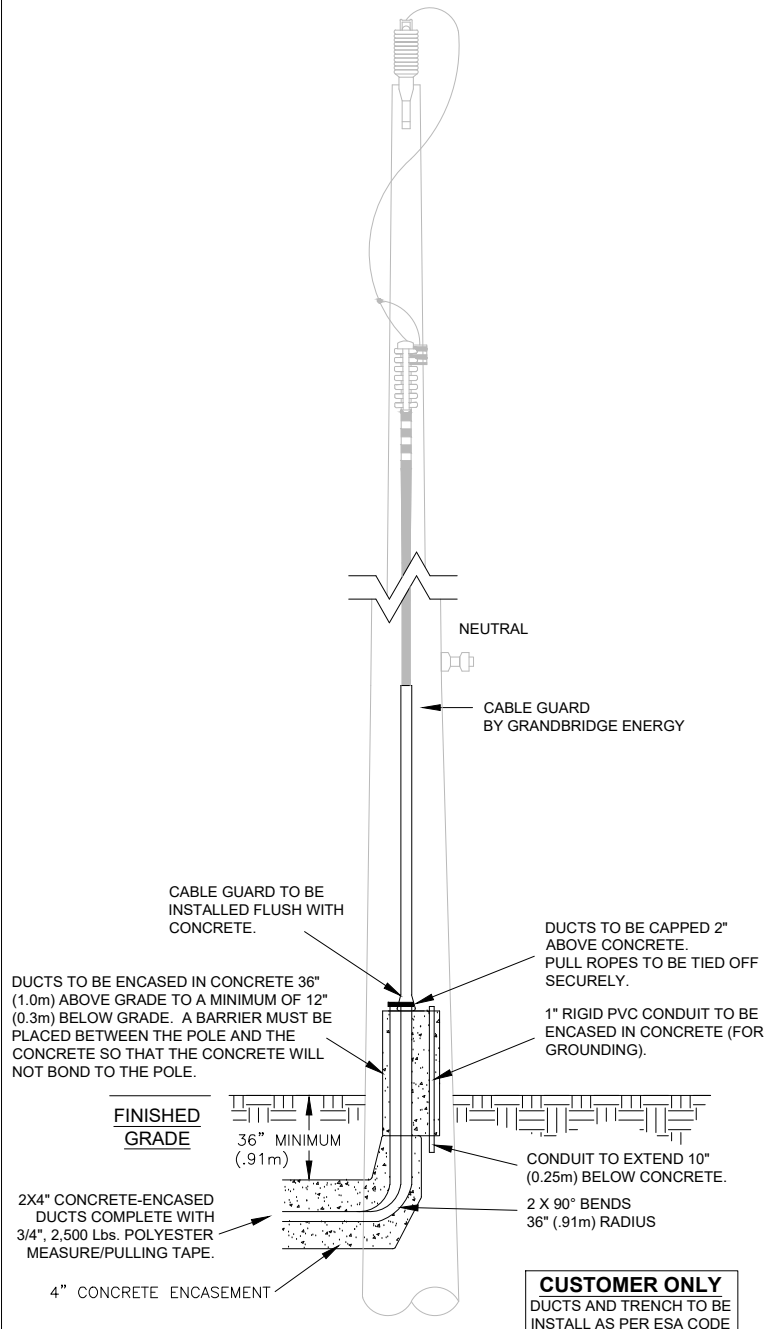
5	Sep 7, 2023	UPDATED LOGO	JKM	
4	Jul 5, 2017	REMOVED CONCRETE BARRIER, ADDED SCH80	SJ	
3	Apr 4, 2016	ADDED CONCRETE BARRIER TO DUCTS	SJ	
2	Jun 25, 2012	REVISED WARNING TAPE INFO	TM	CHEK'D.
REV.	DATE		BY	



TITLE: 1-PHASE PRIMARY HIGH-VOLTAGE UNDERGROUND RISER ON GRANDBRIDGE ENERGY INC. POLES

DATE: OCT 12, 2010	SCALE: NTS	W.O.No.:	DRAWN BY:
DESIGNED BY	APPROVED BY P.ENG.	DRAWING No.	UCS-1A

1-PHASE PRIMARY VOLTAGE



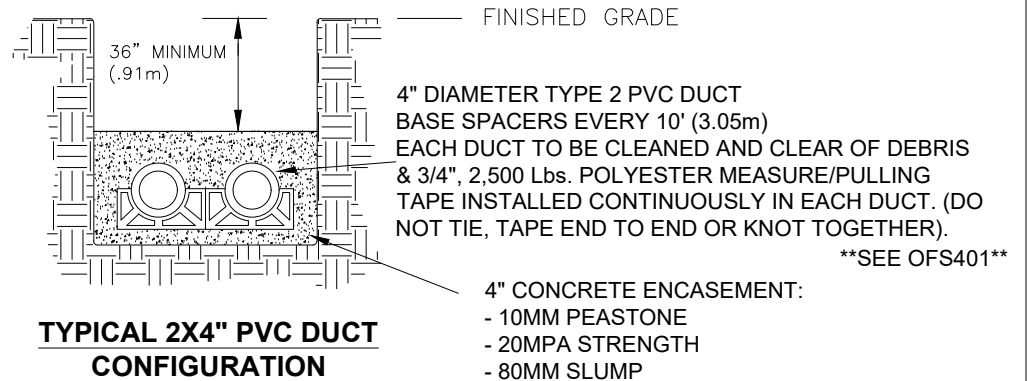
PRIMARY VOLTAGE UNDERGROUND RISER ON GRANDBRIDGE ENERGY INC. POLE

NOTES:

(1) WHEN 1-PHASE PRIMARY RISERS ARE TO BE INSTALLED, THE ELECTRICAL CONTRACTOR IS TO CONTACT GRANDBRIDGE ENERGY INC. TO DETERMINE THE POSITION OF DUCTS AT THE BASE OF THE RISER POLE PRIOR TO DUCT INSTALLATION. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR TYING DOWN THE DUCT BANK TO PREVENT FLOATING OF THE DUCTS. ELECTRICAL CONTRACTOR IS ALSO RESPONSIBLE FOR VIBRATING AND/OR FORMING OF THE CONCRETE WHEN DIRECTED TO DO SO BY GRANDBRIDGE ENERGY INC. REFER TO THE LATEST MATERIAL & CONSTRUCTION SPECIFICATIONS MANUAL.

(2) ELECTRICAL CONTRACTOR MUST ARRANGE TO HAVE DUCT BANK INSPECTED BY GRANDBRIDGE ENERGY INC.

(3) CONTRACTOR IS TO INSTALL GROUNDING AS PER OFS401.



BELL ENDS ARE TO BE USED FOR EACH TERMINATION IN PULLING PITS OR CONCRETE ENCLOSURES. THE BELL ENDS MUST BE FLUSH WITH THE INSIDE OF THE TERMINATION POINT.

WARNING TAPE INFORMATION

TRENCH WIDTH	# OF WARNING TAPES	TAPE PLACEMENT
UP TO 305mm (12")	1	CENTRED ON THE TRENCH.
GREATER THAN 305mm (12") UP TO AND INCLUDING 762mm (30")	2 (OR MORE)	PLACED NO MORE THAN 76mm (3") FROM THE SIDE OF THE TRENCH AND NOT MORE THAN 305mm (12") APART.
GREATER THAN 762mm (30")	3 (OR MORE)	PLACED NO MORE THAN 76mm (3") FROM THE SIDE OF THE TRENCH AND NOT MORE THAN 305mm (12") APART.

NOTE: THE TRENCH WIDTH EXCLUDES THE ADDED WIDTH FOR JOINT USE GAS LINE INSTALLATION (I.E. HYDRO PART OF TRENCH ONLY).

1	Sep 7, 2023	UPDATED LOGO	JKM	
0	JUL 5, 2017	CREATED DWG FOR C.E. DUCTS	SJ	
REV.	DATE		BY	CHECK'D.
				
TITLE: 1-PHASE PRIMARY HIGH-VOLTAGE UNDERGROUND RISER ON GRANDBRIDGE ENERGY INC. POLES WITH CONCRETE ENCASED				
DATE: DUCTS JUL 5, 2017		SCALE: NTS	W.O.No.:	DRAWN BY:
DESIGNED BY:		APPROVED BY P.ENG.		DRAWING No. UCS-1A-CON

3-PHASE PRIMARY VOLTAGE

NOTES:

- (1) GRANDBRIDGE ENERGY INC. WILL MAKE CONNECTIONS BETWEEN THE RISER TAILS AND THE POLEMOUNT TRANSFORMER BANK.
- (2) THE ELECTRICAL CONTRACTOR IS TO SUPPLY & INSTALL THE SECONDARY SERVICE UP THE POLE IN PVC DUCT, COMPLETE WITH WEATHERHEAD AND MINIMUM 4' OF SECONDARY TAILS. WEATHERHEAD IS TO BE AT HEIGHT SHOWN ON DRAWING. RISER TO BE SECURED TO POLE WITH NON-CORROSIVE CLAMPS (WOOD POLES) OR STAINLESS STEEL BANDING (CONCRETE POLES).
- (3) FOR CONCERNS REGARDING SAFE LIMITS OF APPROACH BETWEEN SECONDARY RISER AND POLEMOUNT TRANSFORMER BANK, THE ELECTRICAL CONTRACTOR IS TO COORDINATE THE WORK WITH GRANDBRIDGE ENERGY INC. OPERATIONS DEPARTMENT (519-621-3530). ON ENERGIZED THREE-PHASE TRANSFORMER BANK POLES, GRANDBRIDGE ENERGY WILL BRING THE LAST 10' OF PVC DUCT, WITH WEATHERHEAD AND TAILS, UP THE POLE.
- (4) FOR ALL SECONDARY SERVICES, ELECTRICAL CONTRACTOR MUST INFORM GRANDBRIDGE ENERGY INC., IN WRITING, OF THE SIZE, TYPE, AND NUMBER OF SECONDARY CONDUCTORS.

MINIMUM 4' (1.22m) OF SECONDARY TAILS. COREFLEX OR TECH CABLING NOT PERMITTED. MAXIMUM CONDUCTOR SIZE: 500MCM

PVC CONDUIT ONLY

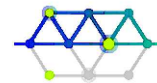
- (1) ON WOOD POLES, STRAPS MAY BE USED AND SCREWED TO THE POLE TO SECURE THE PVC
- (2) ON CONCRETE POLES, PVC MUST BE SECURED WITH STAINLESS STEEL BANDING. STRAPS OR DRILLING INTO THE POLE IS NOT PERMITTED

WEATHERHEAD MOUNTING HEIGHT MUST BE 12" (.30m) BELOW TRANSFORMERS

FINISHED GRADE

SECONDARY CABLING RISER ON GRANDBRIDGE ENERGY INC. POLE

2	Sep 7, 2023	UPDATED LOGO AND MOVED DRAWING UP	JKM	
1	Apr 6, 2016	CHANGED COMPANY NAME	SJ	
REV.	DATE		BY	CHEK'D.



GrandBridge
ENERGY

TITLE: SECONDARY VOLTAGE UNDERGROUND RISERS ON GRANDBRIDGE ENERGY INC. POLES - THREE-PHASE TRANSFORMER BANK DETAIL

DATE: AUG. 31, 2005. SCALE: NTS W.O.No.: DRAWN BY: JON JAROSZ

CASE VANDERLOO DESIGNED BY APPROVED BY P.ENG. DRAWING No. UCS-2

3-PHASE PRIMARY VOLTAGE

NOTES:

- (1) GRANDBRIDGE ENERGY INC. WILL MAKE CONNECTIONS BETWEEN THE RISER TAILS AND THE POLEMOUNT TRANSFORMER.
- (2) THE ELECTRICAL CONTRACTOR IS TO SUPPLY & INSTALL THE SECONDARY SERVICE UP THE POLE IN PVC DUCT, COMPLETE WITH WEATHERHEAD AND MINIMUM 4' OF SECONDARY TAILS. WEATHERHEAD IS TO BE AT HEIGHT SHOWN ON DRAWING. RISER TO BE SECURED TO POLE WITH NON-CORROSIVE CLAMPS (WOOD POLES) OR STAINLESS STEEL BANDING (CONCRETE POLES).
- (3) FOR CONCERNS REGARDING SAFE LIMITS OF APPROACH BETWEEN SECONDARY RISER AND POLEMOUNT TRANSFORMER, THE ELECTRICAL CONTRACTOR IS TO COORDINATE THE WORK WITH GRANDBRIDGE ENERGY INC. OPERATIONS DEPARTMENT (519-621-3530). ON ENERGIZED SINGLE-PHASE TRANSFORMER POLES, GRANDBRIDGE ENERGY WILL BRING THE LAST 10' OF PVC DUCT, WITH WEATHERHEAD AND TAILS, UP THE POLE.
- (4) FOR ALL SECONDARY SERVICES, ELECTRICAL CONTRACTOR MUST INFORM GRANDBRIDGE ENERGY INC., IN WRITING, OF THE SIZE, TYPE, AND NUMBER OF SECONDARY CONDUCTORS.

SINGLE-PHASE
TRANSFORMER

MINIMUM 4' (1.22m) OF
SECONDARY TAILS. COREFLEX
OR TECH CABLING NOT PERMITTED.
MAXIMUM CONDUCTOR SIZE: 500MCM

PVC CONDUIT ONLY

- (1) ON WOOD POLES,
STRAPS MAY BE USED
AND SCREWED TO THE
POLE TO SECURE THE
PVC
- (2) ON CONCRETE POLES,
PVC MUST BE SECURED WITH
STAINLESS STEEL BANDING.
STRAPS OR DRILLING INTO
THE POLE IS NOT PERMITTED

WEATHERHEAD MOUNTING
HEIGHT MUST BE
12" (.30m)
BELOW TRANSFORMER

FINISHED
GRADE

SECONDARY CABLING RISER
ON GRANDBRIDGE ENERGY INC. POLE

2	Sep 7, 2023	UPDATED LOGO AND MOVED DRAWING UP	JKM	
1	Apr 6, 2016	CHANGED COMPANY NAME	SJ	
REV.	DATE		BY	CHECK'D.



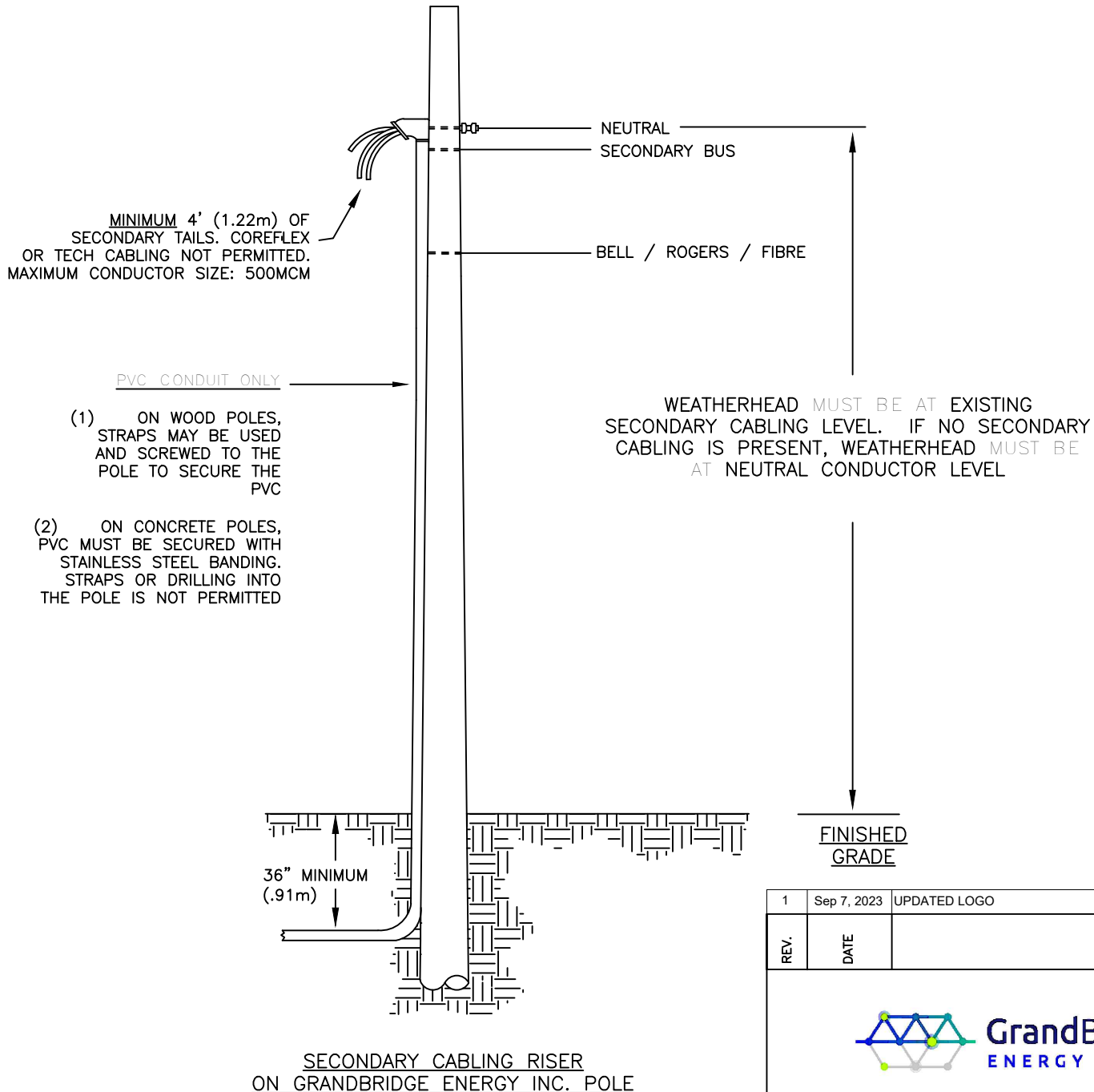
TITLE: SECONDARY VOLTAGE UNDERGROUND RISERS ON GRANDBRIDGE ENERGY INC. POLES - SINGLE-PHASE TRANSFORMER DETAIL

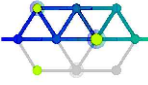
DATE: AUG. 31, 2005. SCALE: N.T.S. W.O.No.: DRAWN BY: JON JAROSZ

CASE VANDERLOO DESIGNED BY APPROVED BY P.ENG. DRAWING No. UCS-3

NOTES:

- (1) GRANDBRIDGE ENERGY INC. WILL MAKE CONNECTIONS BETWEEN THE RISER TAILS AND THE SECONDARY CABLING.
- (2) THE ELECTRICAL CONTRACTOR IS TO SUPPLY & INSTALL THE SECONDARY SERVICE UP THE POLE IN PVC DUCT, COMPLETE WITH WEATHERHEAD AND MINIMUM 4' OF SECONDARY TAILS. WEATHERHEAD IS TO BE AT HEIGHT SHOWN ON DRAWING. RISER TO BE SECURED TO POLE WITH NON-CORROSIVE CLAMPS (WOOD POLES) OR STAINLESS STEEL BANDING (CONCRETE POLES).
- (3) FOR ALL SECONDARY SERVICES, ELECTRICAL CONTRACTOR MUST INFORM CAMBRIDGE & NORTH DUMFRIES HYDRO INC., IN WRITING, OF THE SIZE, TYPE, AND NUMBER OF SECONDARY CONDUCTORS.

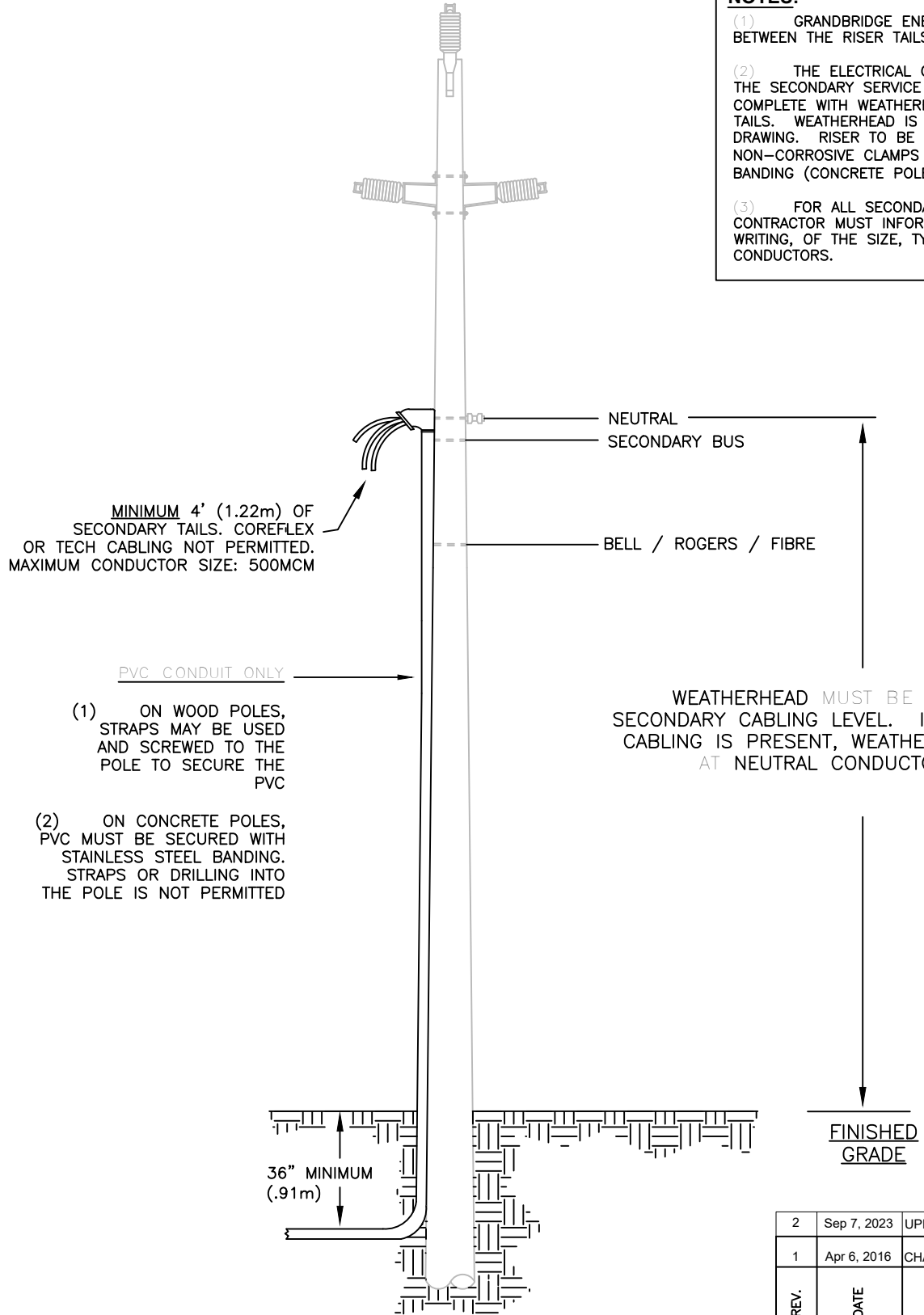


1	Sep 7, 2023	UPDATED LOGO	JKM	
REV.	DATE		BY	CHEK'D.
 GrandBridge ENERGY				
TITLE: SECONDARY VOLTAGE UNDERGROUND RISERS ON GRANDBRIDGE ENERGY INC. POLES				
DATE: AUG. 31, 2005.		SCALE: NTS		W.O.No.:
CASE VANDERLOO		DESIGNED BY		DRAWN BY: JON JAROSZ
DESIGNED BY				APPROVED BY P.ENG.
				DRAWING No. UCS-4

3-PHASE PRIMARY VOLTAGE

NOTES:

- (1) GRANDBRIDGE ENERGY INC. WILL MAKE CONNECTIONS BETWEEN THE RISER TAILS AND THE SECONDARY CABLING.
- (2) THE ELECTRICAL CONTRACTOR IS TO SUPPLY & INSTALL THE SECONDARY SERVICE UP THE POLE IN PVC DUCT, COMPLETE WITH WEATHERHEAD AND MINIMUM 4' OF SECONDARY TAILS. WEATHERHEAD IS TO BE AT HEIGHT SHOWN ON DRAWING. RISER TO BE SECURED TO POLE WITH NON-CORROSIVE CLAMPS (WOOD POLES) OR STAINLESS STEEL BANDING (CONCRETE POLES).
- (3) FOR ALL SECONDARY SERVICES, ELECTRICAL CONTRACTOR MUST INFORM GRANDBRIDGE ENERGY INC., IN WRITING, OF THE SIZE, TYPE, AND NUMBER OF SECONDARY CONDUCTORS.



SECONDARY CABLING RISER
ON GRANDBRIDGE ENERGY INC. POLE

2	Sep 7, 2023	UPDATED LOGO AND MOVED DRAWING UP	JKM	
1	Apr 6, 2016	CHANGED COMPANY NAME	SJ	
REV.	DATE		BY	CHEK'D



TITLE: SECONDARY VOLTAGE UNDERGROUND RISERS ON GRANDBRIDGE ENERGY INC. POLES			
DATE: AUG. 31, 2005.	SCALE: NTS	W.O.No.:	DRAWN BY: JON JAROSZ
CASE VANDERLOO			DRAWING No.
DESIGNED BY	APPROVED BY P.ENG.		UCS-4

3-PHASE PRIMARY VOLTAGE

NOTES:

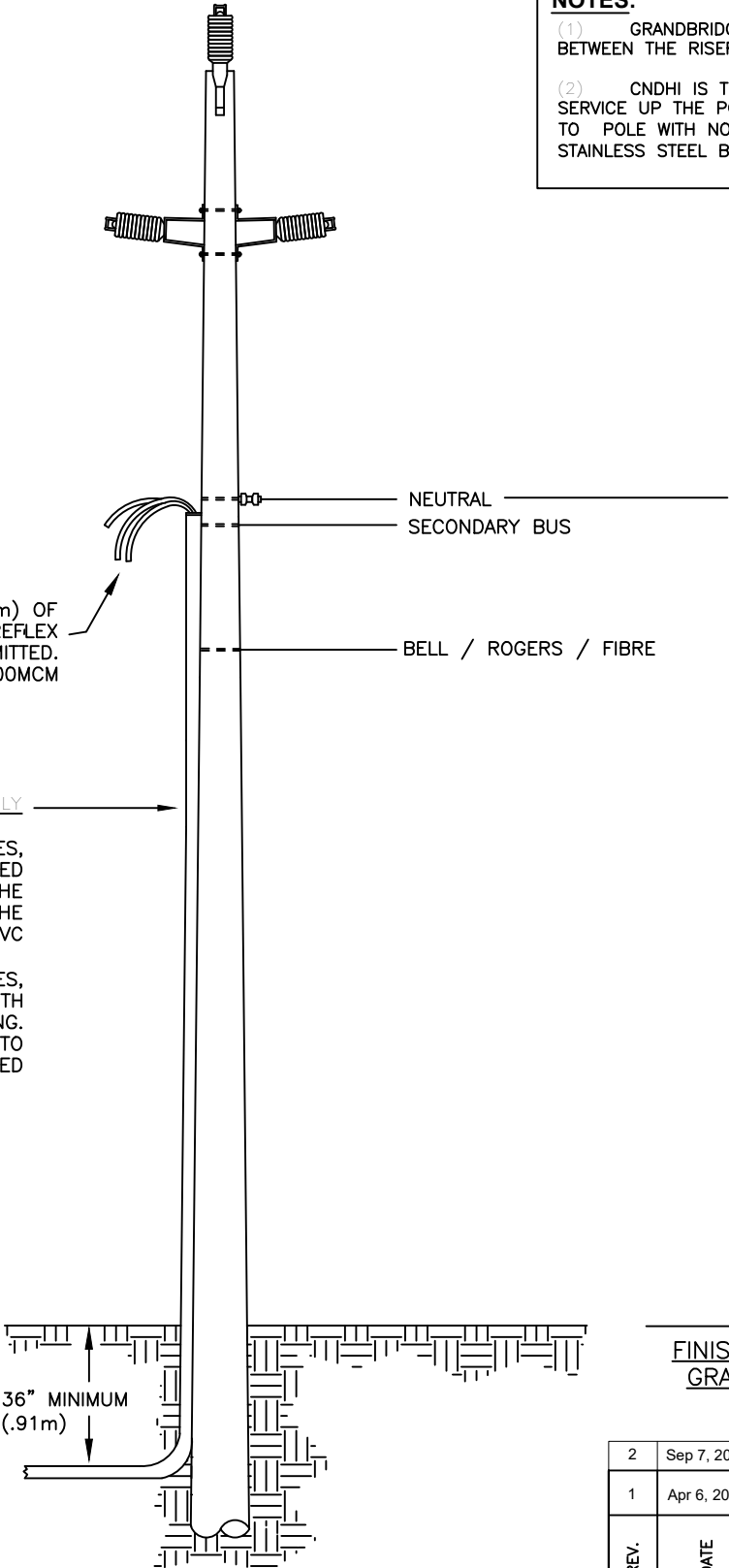
- (1) GRANDBRIDGE ENERGY INC. WILL MAKE CONNECTIONS BETWEEN THE RISER TAILS AND THE SECONDARY CABLING.
- (2) CNDHI IS TO SUPPLY & INSTALL THE SECONDARY SERVICE UP THE POLE IN PVC DUCT. RISER TO BE SECURED TO POLE WITH NON-CORROSIVE CLAMPS (WOOD POLES) OR STAINLESS STEEL BANDING (CONCRETE POLES).

MINIMUM 4' (1.22m) OF
SECONDARY TAILS. COREFLEX
OR TECH CABLING NOT PERMITTED.
MAXIMUM CONDUCTOR SIZE: 500MCM

PVC CONDUIT ONLY

(1) ON WOOD POLES,
STRAPS MAY BE USED
AND SCREWED TO THE
POLE TO SECURE THE
PVC

(2) ON CONCRETE POLES,
PVC MUST BE SECURED WITH
STAINLESS STEEL BANDING.
STRAPS OR DRILLING INTO
THE POLE IS NOT PERMITTED



SECONDARY CABLING RISER
ON GRANDBRIDGE ENERGY INC. POLE

FINISHED
GRADE

2	Sep 7, 2023	UPDATED LOGO AND MOVED DRAWING UP	JKM	
1	Apr 6, 2016	CHANGED COMPANY NAME	SJ	
REV.	DATE		BY	CHECK'D.



TITLE: SECONDARY VOLTAGE UNDERGROUND RISERS WITHOUT WEATHER
HEAD ON GRANDBRIDGE ENERGY INC. POLES

DATE: OCT. 12, 2010 SCALE: NTS W.O.No.: DRAWN BY:

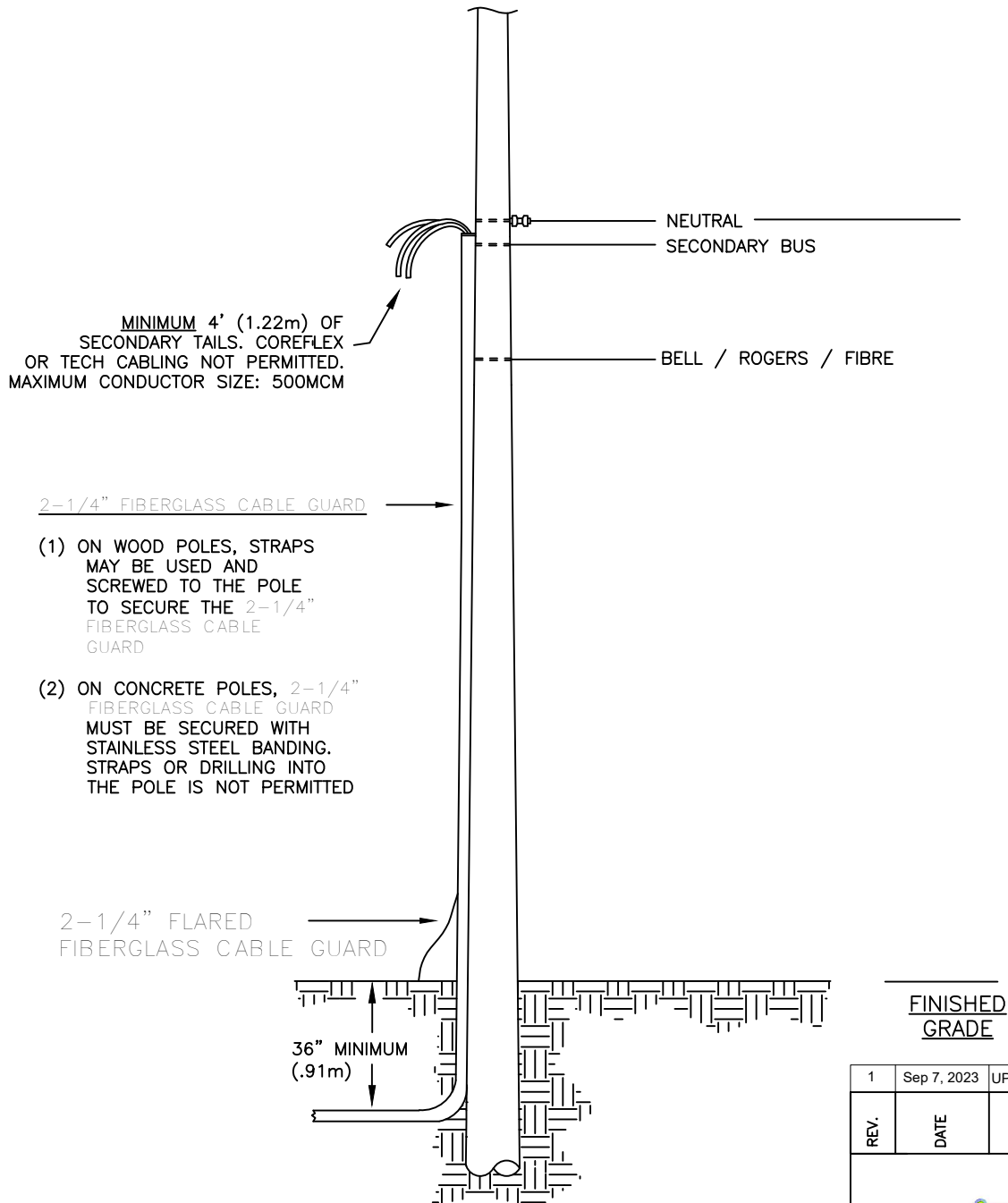
DESIGNED BY

APPROVED BY P.ENG.

DRAWING No.
UCS-4A

NOTES:

- (1) RISER TO BE SECURED TO POLE WITH NON-CORROSIVE CLAMPS (WOOD POLES) OR STAINLESS STEEL BANDING (CONCRETE POLES).



SECONDARY CABLING RISER
ON GRANDBRIDGE ENERGY INC POLE

FINISHED
GRADE

1	Sep 7, 2023	UPDATED LOGO	JKM	
REV.	DATE		BY	CHEK'D.
				
TITLE: SECONDARY VOLTAGE UNDERGROUND RISERS WITHOUT WEATHER HEAD ON GRANDBRIDGE ENERGY INC. POLES				
DATE: OCT. 12, 2010		SCALE: NTS	W.O.No.:	DRAWN BY:
DESIGNED BY		APPROVED BY P.ENG.		DRAWING No. UCS-4B