MOTT MACDONALD

Mohawk Solar

Electric and Magnetic Field Study
MHS-E-700-02 RE

May 31, 2019

Mott MacDonald
1435 W. Morehead Street
Suite 140
Charlotte NC 28208
United States of America

T +1 (704) 218 8100
F +1 (704) 218 8101
mottmac.com

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Executive Summary

The Mohawk Solar Farm is a proposed 90.5 MW utility-scale solar energy facility located in Montgomery County, New York. The project, which is being developed by Avangrid Renewables, is proposed to interconnect into a 115 kV transmission line to deliver power to the New York State transmission system. Mott MacDonald (MM) is responsible for supporting the Article 10 permitting application.

This report presents the Electric and Magnetic Field (EMF) calculations for the underground cables conducted using CYMCAP 7.3 Rev 01 and the overhead transmission line conducted using PLS-CADD. The following cable configurations were studied:

- Case 1 – 1 cable in trench (as seen in the Cable Ampacity Report)
  - Single 1250 kcmil cable
- Case 2 – 2 cables in parallel (as seen in the Cable Ampacity Report)
  - Two 1250 kcmil cables in parallel trenches with 15 ft. separation
- Case 3 – 3 cables in parallel (as seen in the Cable Ampacity Report)
  - Three 1250 kcmil cables in parallel trenches with 15 ft. separation
- Case 4 – 4 cables in parallel (as seen in the Cable Ampacity Report)
  - Four 1250 kcmil cables in parallel trenches with 15 ft. separation
- Case 5 – 4 cables in parallel at the substation
  - Four 1250 kcmil cables in parallel trenches with 10 ft. separation
- Case 6 – 115 kV Overhead Transmission Span

The following sections detail the method used in the studies and present the results of the analysis.

1 Design Criteria

The following data points were used as inputs to CYMCAP 7.3 Rev 01 and PLS CADD for calculating the electric and magnetic fields for the Mohawk Solar Project:

- The electric field standards in the state of New York is set forth by the Public Service Commission (PCS). In Opinion No. 78-13 an interim standard of 1.6 kilovolts per meter (kV/m) for transmission lines, measured at the edge of the right-of-way, one meter above ground level, with the line at rated voltage [1].
- The magnetic field standard in the state of New York is set forth by the Public Service Commission (PCS). In cases 26529 and 26559, the interim standard was set to 200 milligauss (mG), measured at the edge of the right-of-way, one meter above ground level [1].
- The right-of-way for the underground cables is assumed to be 15 feet beyond the outer most cable or at a minimum 50 feet (25 feet from centerline).
- The right-of-way for the overhead cables is assumed to be 37.5 feet from centerline (75ft total) of the support structure which is largely within the substation fences.
- Based on Exhibit 35 of Article 10 Regulation, for the State of New York Board on Electric Generation Siting and the Environment the electric field calculation must use 5 foot measurement intervals showing the entire right-of-way and out to 500 feet on both sides.
- All calculations were run at the cable's full ampacity for worst case conditions.
- All underground cables were studied as fully bonded (bonded ends) for the sheath configuration.
- All underground cables were set in a 48" trench as detailed in the project trench drawings as seen in Appendix A.
- Each calculation was set to calculate a value at 3.28 feet above the ground as this is equivalent to the 1-meter requirement set forth by the New York standard mentioned above.
- The overhead cables were studied based on the lowest sag tangent point seen in the project. The configuration was based on the station horizontal configuration structure.
- The Magnetic Field calculations use the maximum design currents for the project listed below. There are no expected variations in amperage for the following conditions: Summer Normal, Summer Emergency, Winter Normal, Winter Emergency, Max average annual load initially, and Max average annual load at 10 years out.
  - 34.5kV Underground
    - Cable X: 600amps
  - 34.5kV Overhead
    - Cable Y: 900amps
  - 115kV Overhead
    - 795 ACSR 26/7 Strand "DRAKE": 1,200 amps

2 Underground Cable Results

Electric Field levels for the underground cables were not calculated due to the nature of the installation. The concentric neutral wires create a grounded cage around the cable core that reduces the electric fields around the outside of the cables. With the cables buried in a 48" trench, the soil cover further reduces the electric field levels to negligible values.

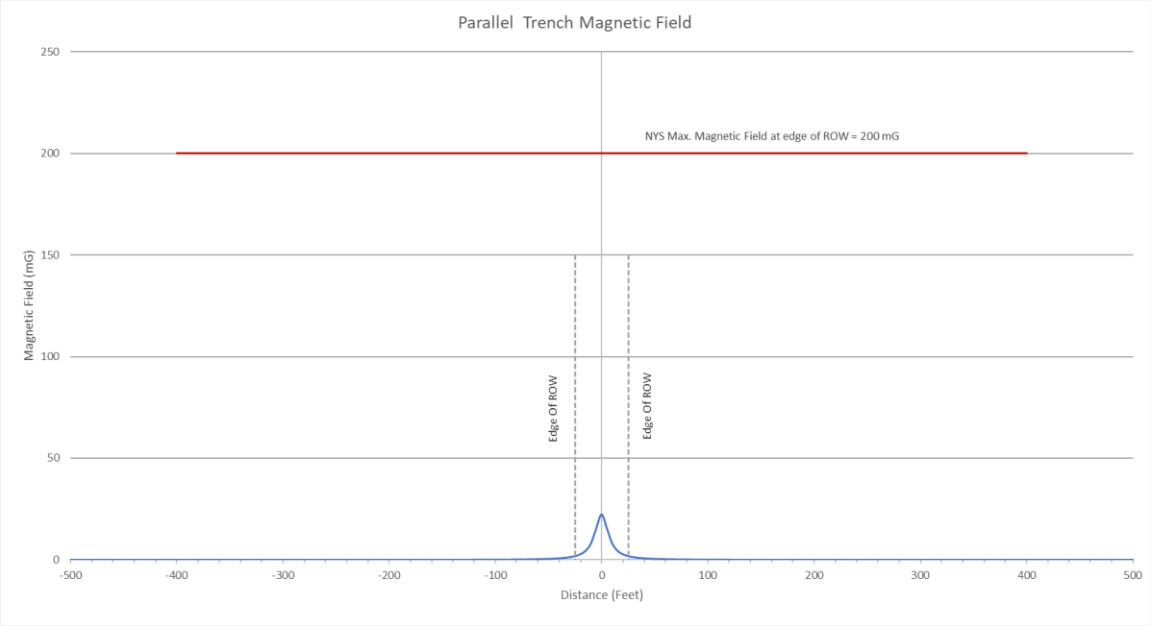
2.1 Case 1 – Single 1250KCMIL UG Cable

Case 1 consists of a single 1250KCMIL 34.5kV cable. See trench detail "1" on A.3 for trench configuration.

Table 1: Case 1 Single 1250KCMIL Results

Case	Description	Field Strength Calculated at Centerline	Field Strength Calculated at Edge of Right-of-Way	New York Magnetic Field Standard at Edge of Right-of-Way
Case 1	1 X 1250KCMIL	22.4435 mG	1.8662 mG @ ±25 ft.	<200 mG

Figure 1: Case 1 – Magnetic Field Calculation



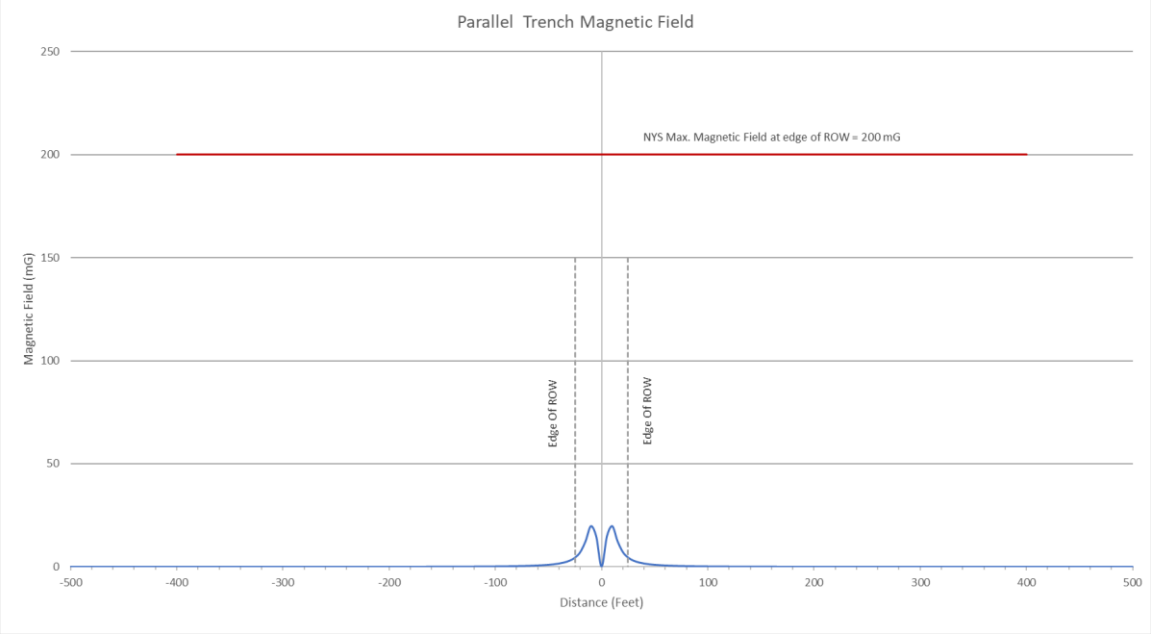
2.2 Case 2 – 2 x 1250KCMIL Parallel UG Cables

Case 2 consists of two 1250KCMIL 34.5kV cables. See trench detail “2” on A.3 for trench configuration.

Table 2: Parallel Case 2 Results

Case	Description	Field Strength Calculated at Centerline	Field Strength Calculated at Edge of Right-of-Way	New York Magnetic Field Standard at Edge of Right-of-Way
Case 2	2 X 1250KCMIL	0.1994 mG	4.5384 mG @ ±25 ft.	<200 mG

Figure 2: Case 2 – Magnetic Field Calculation



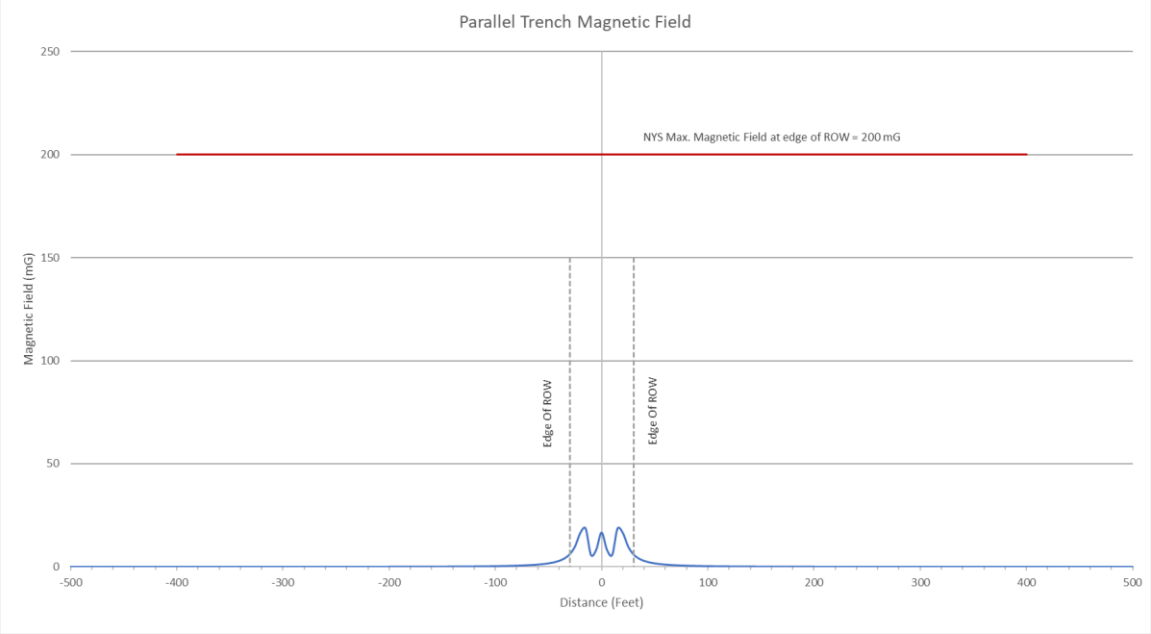
2.3 Case 3 – 3 x 1250KCMIL Parallel UG Cables

Case 3 consists of three 1250KCMIL 34.5kV cables. See trench detail "3" on A.3 in Appendix A for the trench configuration.

Table 3: Parallel Case 3 Results

Case	Description	Field Strength Calculated at Centerline	Field Strength Calculated at Edge of Right-of-Way	New York Magnetic Field Standard at Edge of Right-of-Way
Case 3	3 X 1250KXMIL	16.6484 mG	6.1441 mG @ ±30 ft.	<200 mG

Figure 3: Case 3 – Magnetic Field Calculation



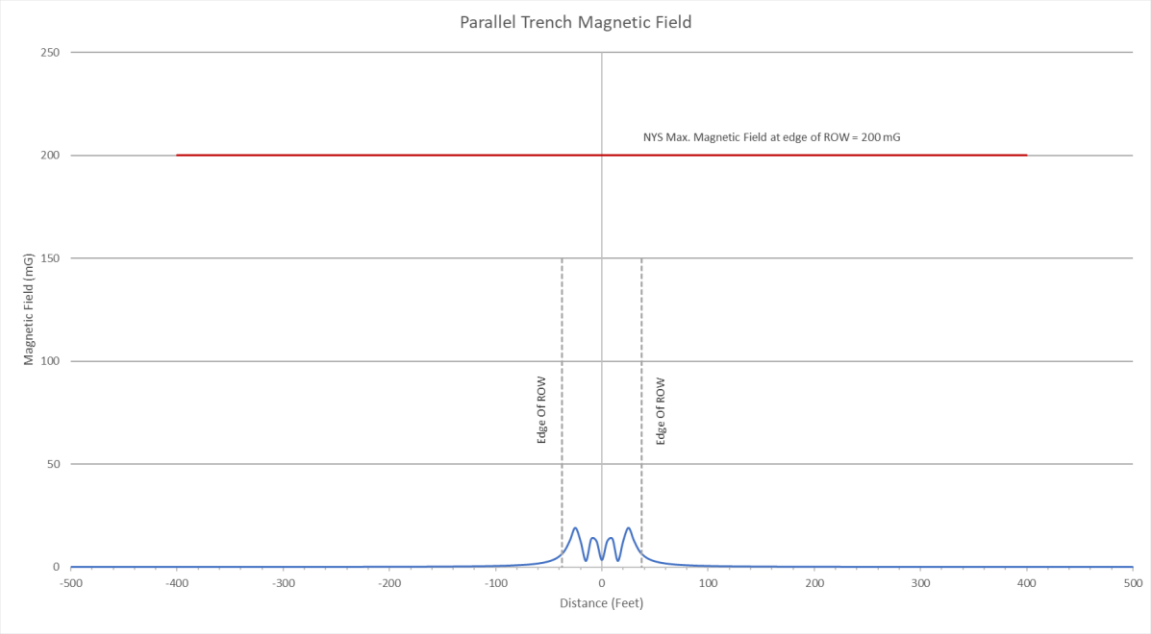
2.4 Case 4 – 4 x 1250KCMIL Parallel UG Cables

Case 4 consists of four 1250KCMIL 34.5kV cables. See trench detail "4" on A.3 in Appendix A for the trench configuration.

Table 4: Parallel Case 4 Results

Case	Description	Field Strength Calculated at Centerline	Field Strength Calculated at Edge of Right-of-Way	New York Magnetic Field Standard at Edge of Right-of-Way
Case 4	4 X 1250KXMIL	3.4341 mG	6.4183 mG @ ±37.5 ft.	<200 mG

Figure 4: Case 4 – Magnetic Field Calculation



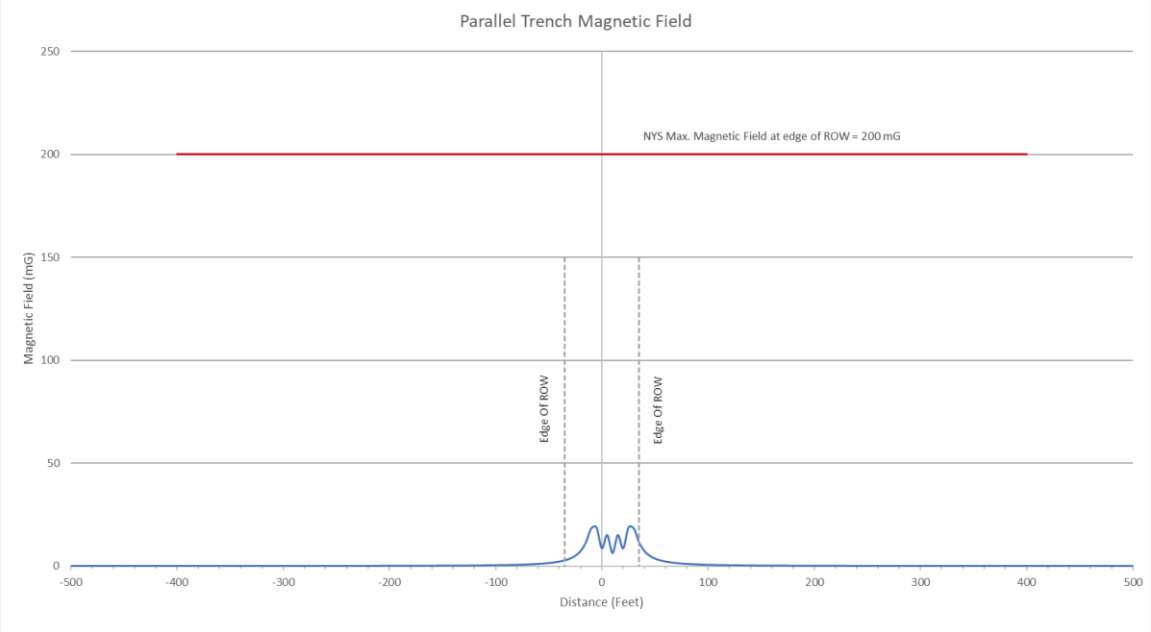
2.5 Case 5 – 4 x 1250KCMIL Parallel UG Cables with 10ft. spacing at the substation

Case 5 consists of four 1250KCMIL 34.5kV cables. See trench detail "5" on A.3 in Appendix A for the trench configuration.

Table 5: Parallel Case 5 Results

Case	Description	Field Strength Calculated at Centerline	Field Strength Calculated at Edge of Right-of-Way	New York Magnetic Field Standard at Edge of Right-of-Way
Case 5	4 X 1250KCMIL Cables at Sub	8.6475 mG	11.6297 mG @ ±37.5 ft.	<200 mG

Figure 5: Case 5 – Magnetic Field Calculation



3 Overhead Cable Results

The Electric and Magnetic Field levels for the 115kV overhead cables were calculated at a height of 1-meter above grade as described in the Design Criteria above.

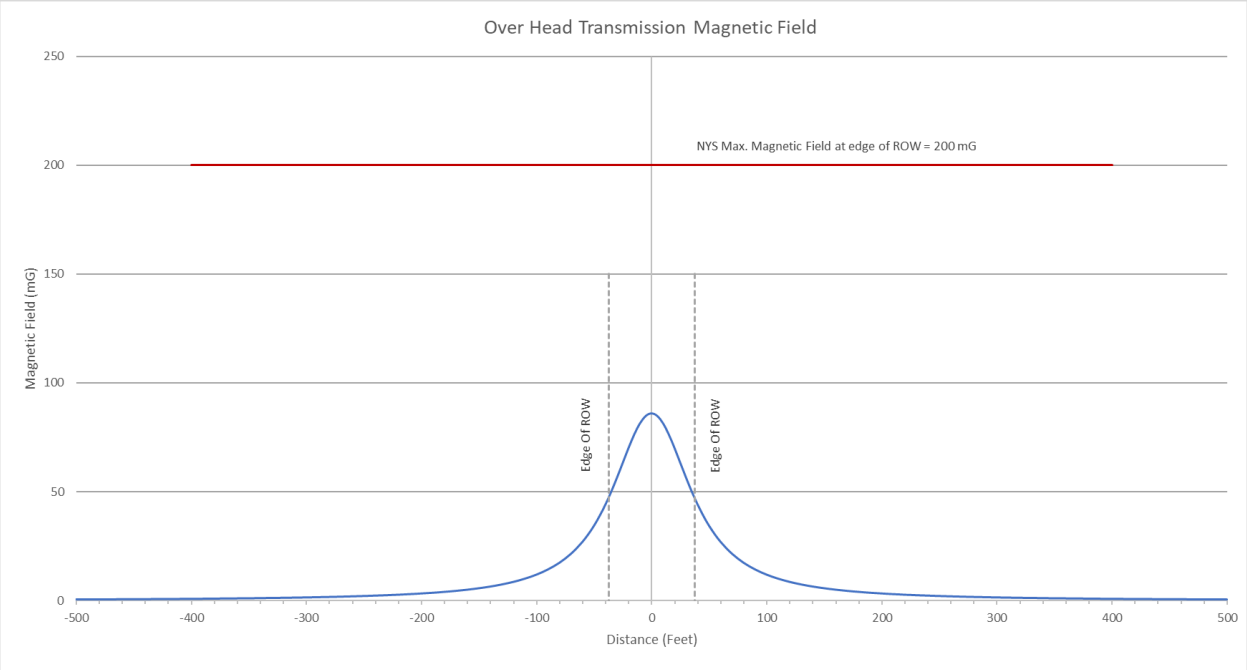
Refer to Appendix B for the typical overhead structure framing, and aerial maps showing clearances to residences to within notable proximity of the overhead cable routes.

3.1 Case 6 - Overhead Transmission Line Magnetic Field Levels

Table 6: Case 6 - Overhead Transmission Line Magnetic Field Results

Case	Description	Field Strength Calculated at Centerline	Field Strength Calculated at Edge of Right-of-Way	New York Magnetic Field Standard at Edge of Right-of-Way
Case 6	Overhead Transmission Line	85.997 mG	47.129 mG @ ±37.5 ft.	<200 mG

Figure 6: Case 6 – Magnetic Field Calculation

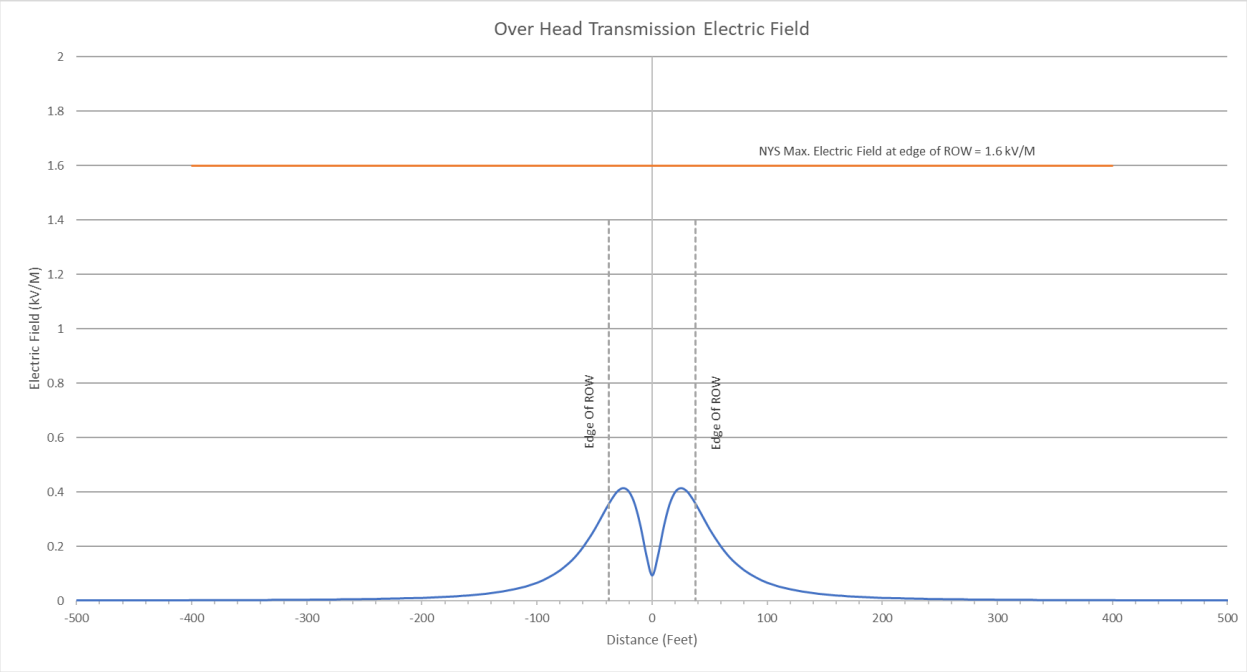


3.2 Case 6 - Overhead Transmission Line Electric Field Levels

Table 7: Case 6 - Overhead Transmission Line Electric Field Results

Description	Field Strength Calculated at Centerline	Field Strength Calculated at Edge of Right-of-Way	New York Magnetic Field Standard at Edge of Right-of-Way
Overhead Transmission Line	0.093 kV/m	0.358 kV/m @ 37.5 ft.	<1.6 kV/m

Figure 7: Case 6 – Electric Field Calculation



4 Conclusion

The EMF Study concludes that all electric and magnetic field levels for the underground and overhead cables are within the Interim Standard values of 1.6 kV/m for Electric Fields and 200 mG for Magnetic Fields set forth by the state of New York Public Service Commission.

Table 8: EMF Calculation Results

Case	Station	Description	Magnetic Field Strength Calculated at Edge of Right-of-Way	New York Magnetic Field Standard at Edge of Right-of-Way	Electric Field Strength Calculated at Edge of Right-of-Way	New York Electric Field Standard at Edge of Right-of-Way
Case 1	1-A to 1-AO	4 X 1250KCMIL	1.8662 mG @ ±25 ft.	<200 mG	N/A	N/A
Case 2	2-A & 2-D	3 X 1250KCMIL	4.5384 mG @ ±25 ft.	<200 mG	N/A	N/A
Case 3	3-A & 3-B	2 X 1250KCMIL	6.1441 mG @ ±30.0 ft.	<200 mG	N/A	N/A
Case 4	4-A & 4-B	1 X 1250KCMIL	6.4183 mG @ ±37.5 ft.	<200 mG	N/A	N/A
Case 5	5A	4 X 1250KCMIL At the substation	11.630 mG @ ±37.5 ft	<200 mG	N/A	N/A
Case 6		Overhead Transmission Line	47.129 mG @ ±37.5 ft.	<200 mG	0.358 kV/m @ ±37.5 ft.	<1.6 kV/m

The Magnetic Field calculations used the maximum design currents for the project as listed below. There are no expected variations in amperage for the following conditions: Summer Normal, Summer Emergency, Winter Normal, Winter Emergency, Max average annual load initially, and Max average annual load at 10 years out.

- 34.5kV Underground
  - Cable X: 600amps
- 34.5kV Overhead
  - Cable Y: 900amps
- 115kV Overhead
  - 795 ACSR 26/7 Strand “DRAKE”: 1,200 amps

5 References

No.	Type	Description
1.	Proceeding Notes	Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities, Dated September 11, 1990

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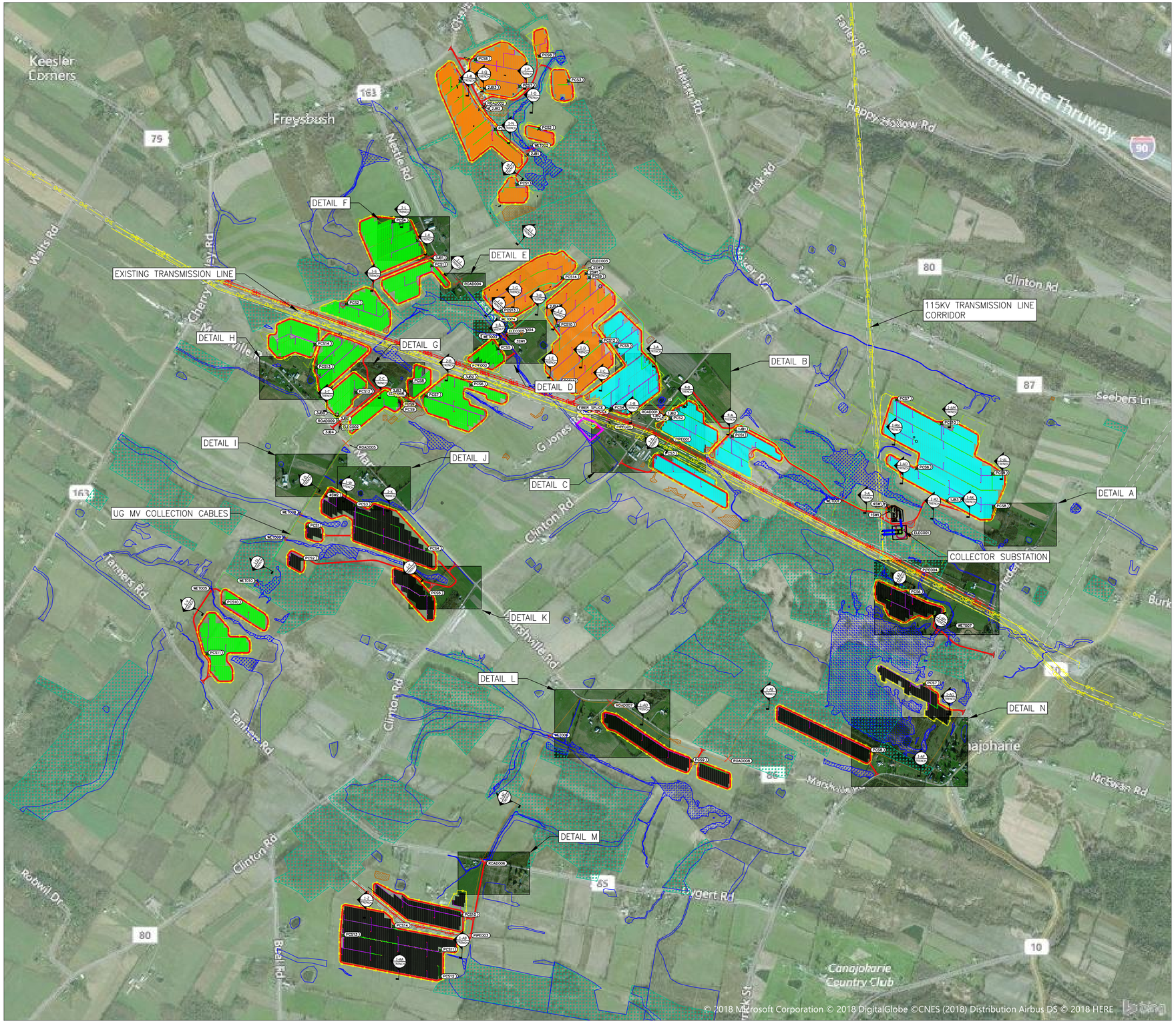
A. Underground Drawings

A.1 Mohawk EMF System Map



LEGEND

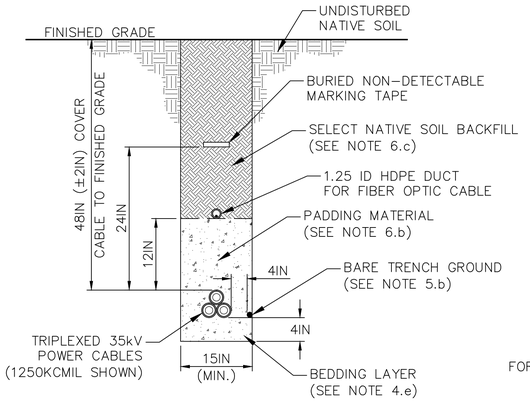
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 1
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 2
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 3
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 4
- UNDERGROUND CROSSING
- PAD MOUNTED SWITCHES
- CIRCUIT 1 PANELS
- PANEL INVERTER
- CIRCUIT 2 PANELS
- TRACKER MOTOR
- CIRCUIT 3 PANELS
- 1MW GENERATOR STEP-UP TRANSFORMER
- CIRCUIT 4 PANELS
- 2MW GENERATOR STEP-UP TRANSFORMER
- ARCHEOLOGICAL SITES
- 1MW GENERATOR STEP-UP TRANSFORMER
- DELINEATED WETLAND
- LOW VOLTAGE CABLE 600VAC
- CIVIL BASE ROADS
- FENCE LINE
- FORESTED AREA
- DC HOME RUN CABLES
- UGC UGC OVEERHEAD CABLES
- GAS GAS GAS LINE

NOTES:
ARROWS POINT TO THE APPROXIMATE EDGE OF RIGHT OF WAY.

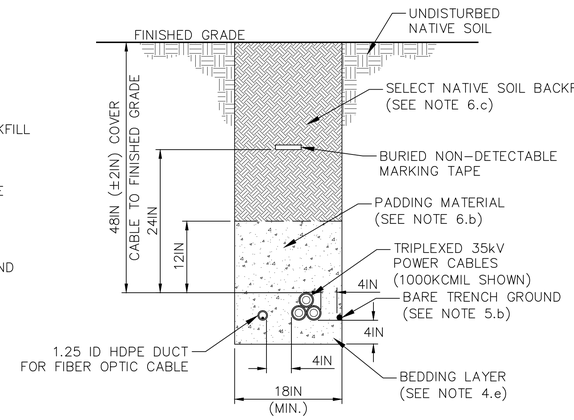
N

NY STATE PLANE
EAST ZONE
NY83-EF - US FEET

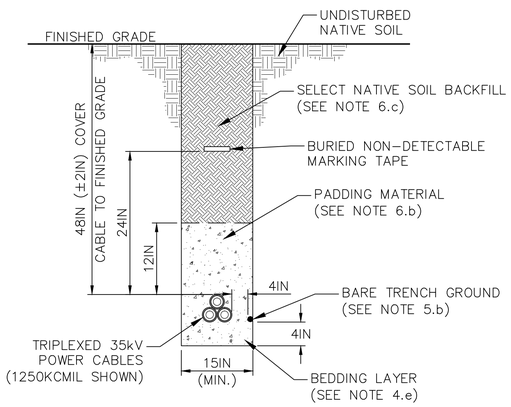
A.2 Mohawk Solar 34.5kV Collection System Cable Trench Details MHK-E-520-01



A PRIMARY POWER & COMMUNICATIONS CABLE DITCH
Not to Scale



B ALTERNATE POWER & COMMUNICATIONS CABLE DITCH
Not to Scale



C 3-PHASE POWER ONLY CABLE DITCH
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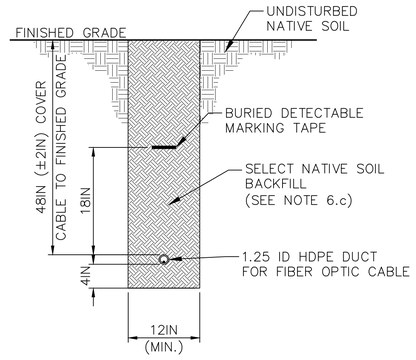

D FIBER ONLY DITCH
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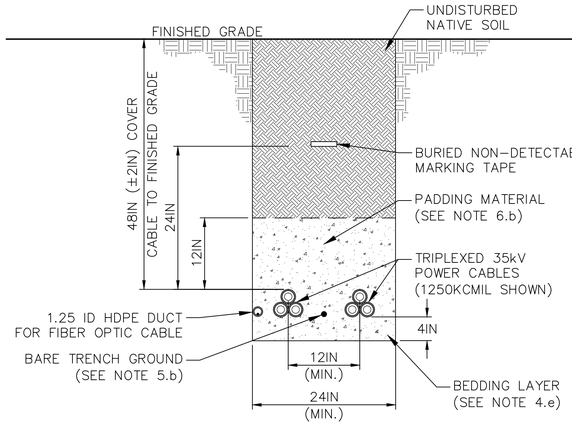

E SECTION - TRENCH TYPE 5
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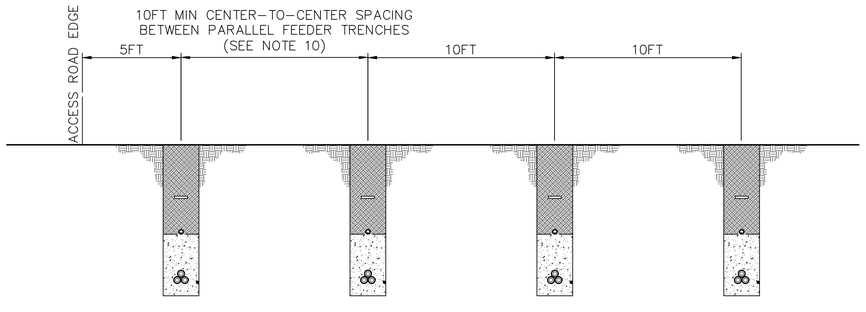
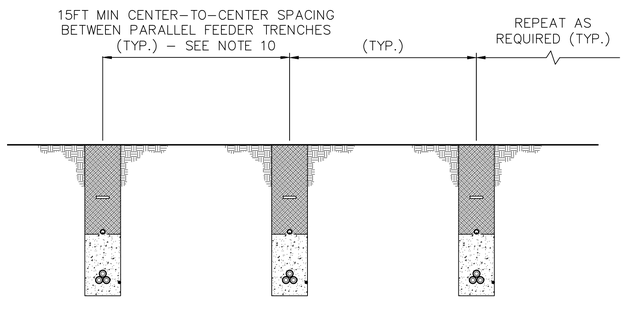


F PARALLEL HOME RUN TRENCHES SEE DETAILS A, B AND C FOR DETAILS ON EACH INDIVIDUAL TRENCH
Not to Scale



G TYPICAL PARALLEL TRENCHES SEE DETAILS A, B AND C FOR DETAILS ON EACH INDIVIDUAL TRENCH
Not to Scale

NOTES

1. ALL EXISTING UTILITIES MUST BE LOCATED BEFORE ANY EXCAVATION/TRENCHING IS STARTED. REGARDLESS OF OTHER UTILITY CONTACTS, CONTRACTOR MUST NOTIFY LOCAL LOCATING CLEARING HOUSE (I.E. ONECALL) OR OTHER STATE BODY.
2. ALL GRADE SURFACES THAT ARE DISTURBED SHALL BE RESTORED TO ESSENTIALLY ORIGINAL CONDITION AND TO THE SATISFACTION OF THE OWNER.
3. THE CABLE ROUTE TO BE FOLLOWED BY CONTRACTOR SHALL BE AS STAKED BY THE CONTRACTOR. ALL TRENCHES SHALL FOLLOW AS STRAIGHT A LINE AS PRACTICAL. ANY DEVIATION FROM THE ROUTING PROVIDED SHALL BE DISCUSSED WITH AND APPROVED BY THE OWNER PRIOR TO CONSTRUCTION. ROCK MAY BE REMOVED BY ANY MEANS CONTRACTOR PREFERS, EXCEPT BLASTING. BLASTING WILL NOT BE PERMITTED UNLESS SPECIFICALLY AUTHORIZED BY OWNER.
4. IF THE GROUND WATER LEVEL IS ABOVE THE BOTTOM OF THE TRENCH THE CONTRACTOR AND OWNER SHALL DISCUSS AND AGREE UPON AN ALTERNATIVE CABLE INSTALLATION METHOD. IF THE GROUND WATER LEVEL IS BELOW THE BOTTOM OF THE TRENCH THE FOLLOWING REQUIREMENTS SHALL BE SATISFIED:
   - 4.a. EVERY TRENCH MUST BE A MINIMUM OF 12–INCHES WIDE (WITH PROPER SLOPE FOR WEAK SOILS), AND MUST PROVIDE SUFFICIENT SPACE TO ALLOW COMPACTION AS SPECIFIED WITH THE EQUIPMENT BEING UTILIZED. THE CONTRACTOR SHALL ENSURE THAT SUFFICIENT AMOUNT OF FINE SOIL IS ADDED ABOVE CABLE FOR BACKFILLS.
   - 4.b. THE TOP SOIL MUST BE PUSHED TO ONE SIDE OF THE TRENCH ROUTE AND KEPT SEPARATE FROM BASE MATERIAL. THE STORED TOP SOIL IS TO BE SPREAD UNIFORMLY OVER THE AREA DISTURBED BY TRENCHING FOLLOWING BACKFILL AND COMPACTION.
   - 4.c. CONTRACTOR SHALL PROTECT ALL TRENCHES AND OTHER EXCAVATIONS FROM SURFACE WATER RUNOFF. ANY WATER THAT HAS ACCUMULATED IN THE EXCAVATION SHALL BE REMOVED AND ANY SOFT TRENCH BOTTOM REMOVED AND REPLACED PRIOR TO THE INSTALLATION OF THE CABLES. THIS INCLUDES REMOVAL AND REPLACEMENT OF SAND BACKFILL THAT HAS BECOME CONTAMINATED WITH SILT, ROCKS, MUD, CLAY, ETC. THE REMOVAL OF WATER AND CORRECTION OF SOFT GROUND CONDITIONS DUE TO SURFACE WATER WILL BE THE RESPONSIBILITY OF CONTRACTOR.
   - 4.d. CONTRACTOR MUST PROTECT THE PUBLIC AND LIVESTOCK FROM ALL TRENCHES AND EXCAVATIONS BY UTILIZING SUITABLE BARRICADES OR OTHER WARNING DEVICES.
   - 4.e. ALL TRENCHES SHALL BE EXCAVATED TO DEPTH AS NECESSARY TO MAINTAIN THE SPECIFIED COVER OVER THE INSTALLED CABLE. IF THE BOTTOM OF THE TRENCH CONTAINS ROCKS, WOOD, VEGETATION MATERIAL OR OTHER HARD, ROUGH, OR SHARP MATERIALS THAT COULD DAMAGE THE CABLE, THE TRENCH SHALL BE OVER–EXCAVATED AND BACKFILLED WITH A 4–INCH LAYER OF COMPACTED FINE CLEAN SOIL (NOTHING LARGER THAN WHAT WOULD PASS THROUGH A 3/8–INCH SCREEN) OR SAND PRIOR TO THE CABLE BEING LAID IN PLACE.
5. ALL DIRECT BURIED POWER CABLES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING:
   - 5.a. 34.5kV CABLES SHALL BE PLACED IN A TRIANGULAR CONFIGURATION, WITH NO INTENTIONAL SEPARATION, SECURED TOGETHER AS NEEDED WITH CABLE TIES TO ENSURE THEY REMAIN IN THIS CONFIGURATION DURING AND AFTER INSTALLATION & BACK–FILL. PROPER TIE–WRAP TOOLS SHALL BE USED TO PREVENT OVER–TIGHTENING OF THE CABLE TIE.
   - 5.b. A 4/0 BARE COPPER WIRE SHALL RUN IN THE TRENCH WITH THE POWER CABLES. THERE SHALL BE A MINIMUM OF 4 INCHES OF SEPARATION BETWEEN THIS WIRE AND THE POWER CONDUCTORS PER WIND TURBINE GENERATOR MANUFACTURER'S REQUIREMENT OF THERE BEING INTENTIONAL SEPARATION.
   - 5.c. WHEN INSTALLED ABOVE THE POWER CABLES, THE INNERDUCT FOR FIBER OPTIC COMMUNICATION CABLE SHALL BE LAID ON TOP OF THE PADDING MATERIAL. WHEN INSTALLED AT THE SAME DEPTH AS THE POWER CABLE, THE INNERDUCT AND THE POWER CABLE SHALL BE SEPARATED BY A MINIMUM OF 4 INCHES.
   - 5.d. WHERE TWO OR MORE PARALLEL COMMUNICATION CABLES ARE REQUIRED IN TRENCH, LAY EACH INNERDUCT NEXT TO EACH OTHER WHILE STILL MAINTAINING CLEARANCES SHOWN.
6. BACKFILL AND COMPACTION REQUIREMENTS ARE AS FOLLOWS:
   - 6.a. ALL EXCAVATED AREAS, INCLUDING TRENCHES AND BELL HOLES MUST BE THOROUGHLY COMPACTED TO NO LESS THAN 85% STANDARD PROCTOR OR 105 PCF, UNLESS OTHERWISE NOTED IN THE PROJECT GEO–TECHNICAL REPORT. COMPACTION SHALL BE BY PROVEN METHODOLOGY. SPECIAL CARE MUST BE TAKEN IN THE AREAS WHERE THE THERMAL TESTING OF SOILS IN THAT AREA INDICATES A POTENTIALLY HIGH RESISTIVITY. COMPACTION BY FLOODING WILL NOT BE PERMITTED.
   - 6.b. THE FIRST 12–INCHES OF BACKFILL ABOVE THE CABLE (THIS IS THE CABLE PADDING) MUST BE FREE OF ROCKS, TOP SOIL, ROOTS, AND OTHER ORGANIC MATTER (NOTHING LARGER THAN WHAT WOULD PASS THROUGH A 3/8–INCH SCREEN). IF HEAVY STIFF CLAY IS ENCOUNTERED, THE NATIVE MATERIAL MUST BE EITHER MIXED WITH SANDY SOIL FROM OTHER STRATA IN THE SAME TRENCH, MIXED WITH FINE GRADE SAND THAT IS IMPORTED, OR REPLACED WITH IMPORTED MATERIAL.
   - 6.c. SELECT NATIVE SOIL CAN BE USED FOR THE REMAINDER OF THE TRENCH BACKFILL EXCEPT THAT LARGE CLUMPS AND ROCKS LARGER THAN 4–INCHES MUST BE EXCLUDED AND SUFFICIENT FINES PROVIDED TO ELIMINATE VOIDS.
   - 6.d. AT THE BEGINNING OF THE TRENCH BACKFILLING OPERATION, THE CONTRACTOR AND THE OWNER SHALL DETERMINE THE SUITABILITY OF THE NATIVE SOIL FOR USE AS BACKFILL, AND ANY ADDITIONAL MEASURES THAT MAY BE REQUIRED TO ENSURE ADEQUATE COMPACTION.
   - 6.e. THE CONTRACTOR SHALL FILL THE TRENCH TO PRE–CONSTRUCTION GRADE WITH THE STOCKPILED TOP SOIL AND WITH ADDITIONAL BACKFILL ADDED TO ALLOW FOR SETTLING. CONTRACTOR MAY SLIGHTLY OVERFILL TRENCH IN ORDER TO ALLOW FOR SETTLING.
7. CONTRACTOR SHALL PROVIDE AND INSTALL A PLASTIC WARNING TAPE IN ALL TRENCHES DURING BACKFILLING. THIS TAPE SHALL BE INSTALLED APPROXIMATELY 24–INCHES ABOVE THE CABLES. THE TAPE SHALL BE 6" WIDE, RED WITH BLACK LETTERS, MARKED "CAUTION – BURIED ELECTRIC LINES BELOW".
8. EXCAVATED SOIL AND ROCK THAT IS NOT REUSED IN BACKFILLING THE TRENCHES IS TO BE DISTRIBUTED ACROSS THE SITE PER THE DIRECTION OF THE OWNER.
9. ALL EXCAVATION, TRENCHING AND ELECTRICAL SYSTEM CONSTRUCTION WILL BE DONE IN ACCORDANCE WITH THE FORMAL STORM WATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE PROJECT.
10. A MINIMUM OF 10 FEET OF SEPARATION IS REQUIRED BETWEEN PARALLEL HOME RUN CIRCUITS AS NOTED ON SYSTEM MAP. A MINIMUM OF 15 FEET OF SEPARATION IS REQUIRED BETWEEN ALL OTHER PARALLEL CIRCUITS. A MAXIMUM OF FOUR PARALLEL CIRCUITS IS ANTICIPATED.

CONCEPTUAL - NOT FOR CONSTRUCTION

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/19/18	JSS	SRA	SRA
B	ISSUED FOR REVIEW	02/22/19	JSS	SRA	SRA

AVANGRID RENEWABLES

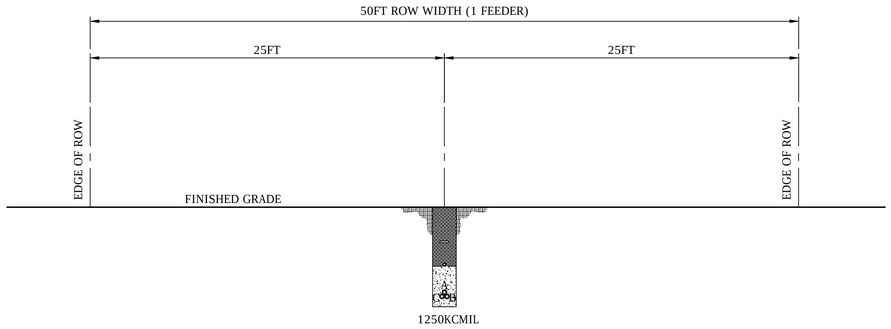
MOTT MACDONALD
1515 S. CAPITAL OF TEXAS HWY, SUITE 210
AUSTIN, TX 78746
PHONE 512.342.9516
FAX 512.342.9708

ENGINEERING RECORD	DATE
DRAWN: J. STRUBLE	02/15/19
DESIGNED: J. STRUBLE	02/15/19
CHECKED: S. AKERS	02/22/19
APPROVED: S. AKERS	02/22/19

MOHAWK SOLAR
34.5KV COLLECTOR SYSTEM
AC CABLE TRENCH DETAILS

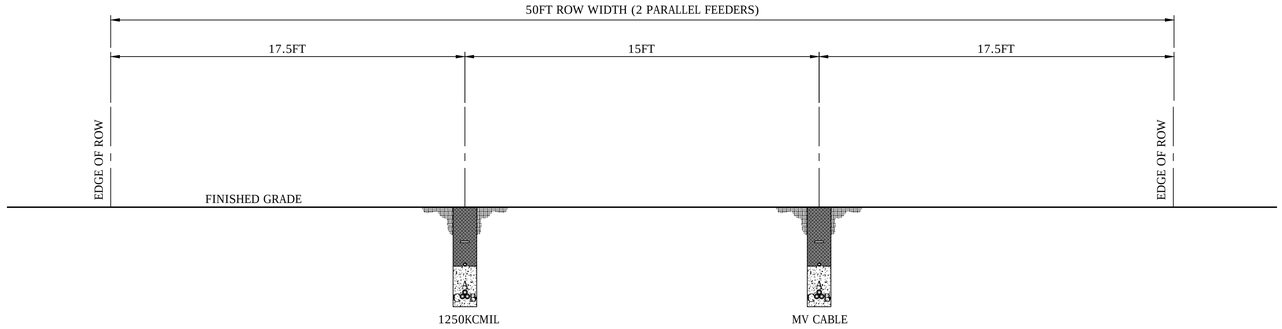
CADFILE: MHS–E–520–01.DWG | SCALE:NTS | DWG.NO. MHS-E-520-01 | SHEET 1 OF 1 | REV B

A.3 Mohawk EMF Underground Trench Details



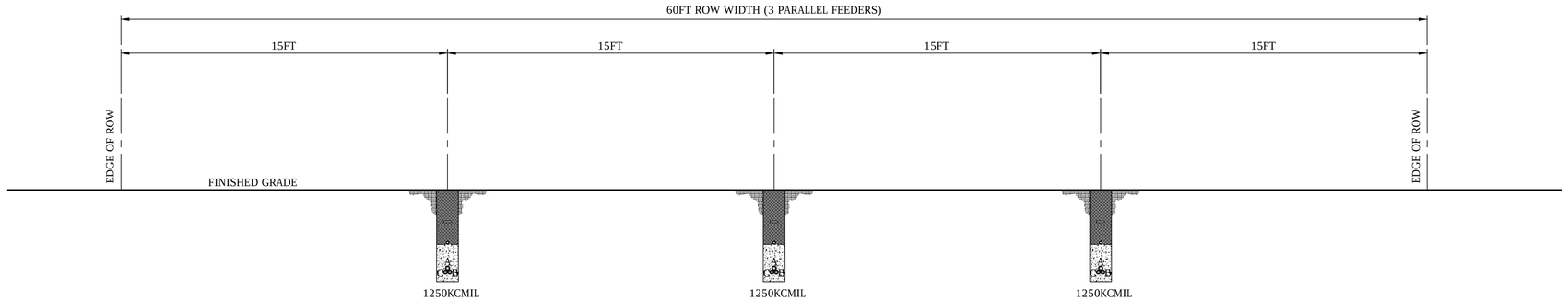
1 TYPICAL SINGLE TRENCH

NOT TO SCALE



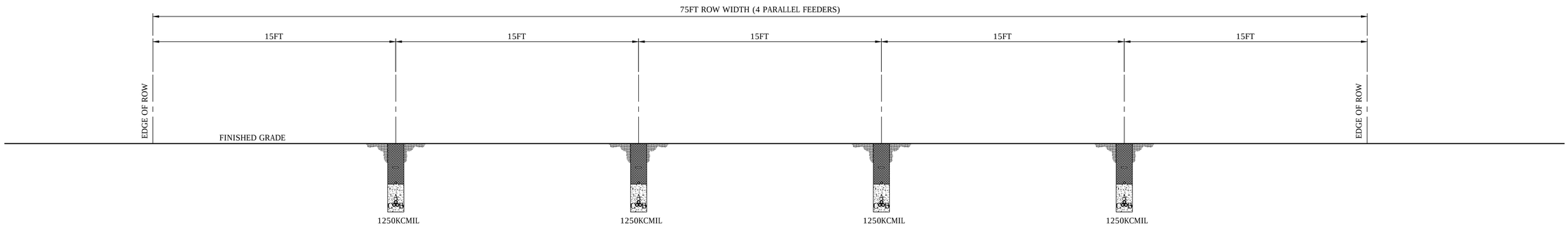
2 TYPICAL 2 PARALLEL TRENCH SEPARATION

NOT TO SCALE



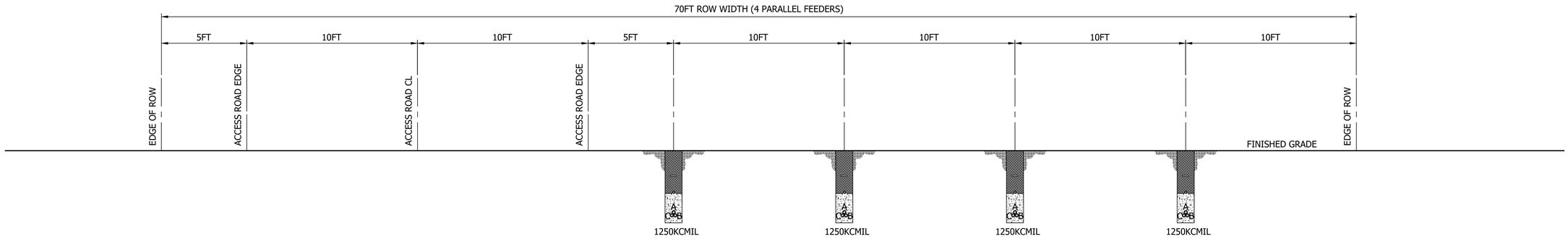
3 TYPICAL 3 PARALLEL TRENCH SEPARATION

1/3" = 1'



4 TYPICAL 4 PARALLEL TRENCH SEPARATION

1/3" = 1'



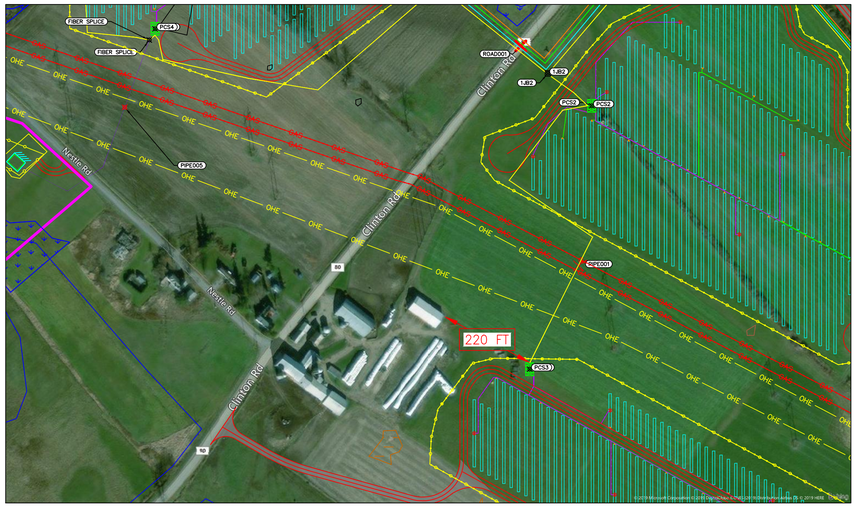
5 TYPICAL ACCESS ROAD & 4 PARALLEL TRENCH SEPARATION

1/3" = 1'

A.4 Mohawk EMF Underground Residential Clearances

A UNDERGROUND RESIDENTIAL CLEARANCE 1

B UNDERGROUND RESIDENTIAL CLEARANCE 2



C UNDERGROUND RESIDENTIAL CLEARANCE 3

D UNDERGROUND RESIDENTIAL CLEARANCE 4

LEGEND

- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 1
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 2
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 3
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 4
- UNDERGROUND CROSSING
- PAD MOUNTED SWITCHES
- CIRCUIT 1 PANELS
- PANEL INVERTER
- CIRCUIT 2 PANELS
- TRACKER MOTOR
- CIRCUIT 3 PANELS
- 1MW GENERATOR STEP-UP TRANSFORMER
- CIRCUIT 4 PANELS
- 2MW GENERATOR STEP-UP TRANSFORMER
- ARCHEOLOGICAL SITES
- 1MW GENERATOR STEP-UP TRANSFORMER
- DELINEATED WETLAND
- LOW VOLTAGE CABLE 600VAC
- CIVIL BASE ROADS
- FENCE LINE
- FORESTED AREA
- DC HOME RUN CABLES
- UGC UGC OVEERHEAD CABLES
- GAS GAS GAS LINE

NOTES:
ARROWS POINT TO THE APPROXIMATE EDGE OF RIGHT OF WAY.

N

NY STATE PLANE
EAST ZONE
NY83-EF - US FEET

E UNDERGROUND RESIDENTIAL CLEARANCE 5

F UNDERGROUND RESIDENTIAL CLEARANCE 6

G UNDERGROUND RESIDENTIAL CLEARANCE 7

H UNDERGROUND RESIDENTIAL CLEARANCE 8

LEGEND

- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 1
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 2
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 3
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 4
- UNDERGROUND CROSSING
- PAD MOUNTED SWITCHES
- CIRCUIT 1 PANELS
- PANEL INVERTER
- CIRCUIT 2 PANELS
- TRACKER MOTOR
- CIRCUIT 3 PANELS
- 1MW GENERATOR STEP–UP TRANSFORMER
- CIRCUIT 4 PANELS
- 2MW GENERATOR STEP–UP TRANSFORMER
- ARCHEOLOGICAL SITES
- 1MW GENERATOR STEP–UP TRANSFORMER
- DELINEATED WETLAND
- LOW VOLTAGE CABLE 600VAC
- CIVIL BASE ROADS
- FENCE LINE
- FORESTED AREA
- DC HOME RUN CABLES
- UGC UGC OVEERHEAD CABLES
- GAS GAS GAS LINE

NOTES:
ARROWS POINT TO THE APPROXIMATE EDGE OF RIGHT OF WAY.

N

NY STATE PLANE
EAST ZONE
NY83–EF – US FEET

I UNDERGROUND RESIDENTIAL CLEARANCE 9

J UNDERGROUND RESIDENTIAL CLEARANCE 10

K UNDERGROUND RESIDENTIAL CLEARANCE 11

L UNDERGROUND RESIDENTIAL CLEARANCE 12

LEGEND

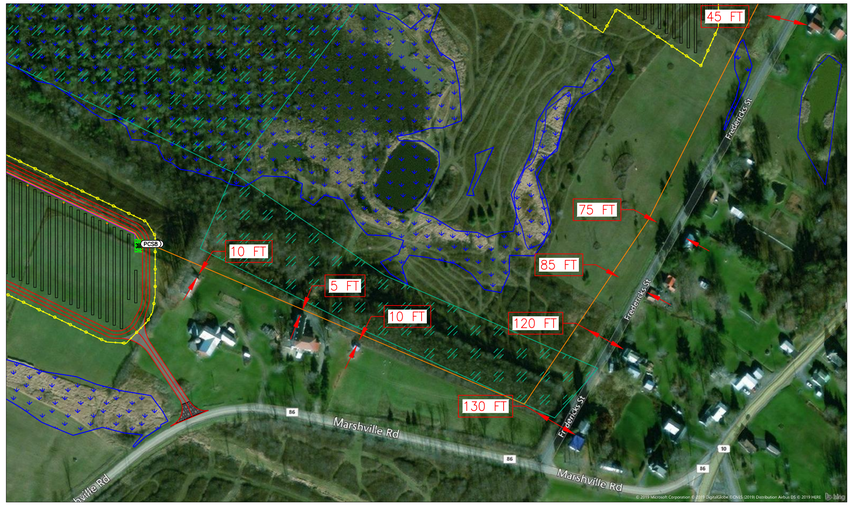
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 1
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 2
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 3
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 4
- UNDERGROUND CROSSING
- PAD MOUNTED SWITCHES
- CIRCUIT 1 PANELS
- PANEL INVERTER
- CIRCUIT 2 PANELS
- TRACKER MOTOR
- CIRCUIT 3 PANELS
- 1MW GENERATOR STEP–UP TRANSFORMER
- CIRCUIT 4 PANELS
- 2MW GENERATOR STEP–UP TRANSFORMER
- ARCHEOLOGICAL SITES
- 1MW GENERATOR STEP–UP TRANSFORMER
- DELINEATED WETLAND
- LOW VOLTAGE CABLE 600VAC
- CIVIL BASE ROADS
- FENCE LINE
- FORESTED AREA
- DC HOME RUN CABLES
- UGC UGC OVEERHEAD CABLES
- GAS GAS GAS LINE

NOTES:
ARROWS POINT TO THE APPROXIMATE EDGE OF RIGHT OF WAY.

N

NY STATE PLANE
EAST ZONE
NY83–EF – US FEET

M OVERHEAD RESIDENTIAL CLEARANCE 1



N OVERHEAD RESIDENTIAL CLEARANCE 2

LEGEND

- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 1
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 2
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 3
- 34.5kV UNDERGROUND COLLECTOR SYSTEM CIRCUIT 4
- UNDERGROUND CROSSING
- PAD MOUNTED SWITCHES
- CIRCUIT 1 PANELS
- PANEL INVERTER
- CIRCUIT 2 PANELS
- TRACKER MOTOR
- CIRCUIT 3 PANELS
- 1MW GENERATOR STEP-UP TRANSFORMER
- CIRCUIT 4 PANELS
- 2MW GENERATOR STEP-UP TRANSFORMER
- ARCHEOLOGICAL SITES
- 1MW GENERATOR STEP-UP TRANSFORMER
- DELINEATED WETLAND
- LOW VOLTAGE CABLE 600VAC
- CIVIL BASE ROADS
- FENCE LINE
- FORESTED AREA
- DC HOME RUN CABLES
- UGC UGC OVEERHEAD CABLES
- GAS GAS GAS LINE

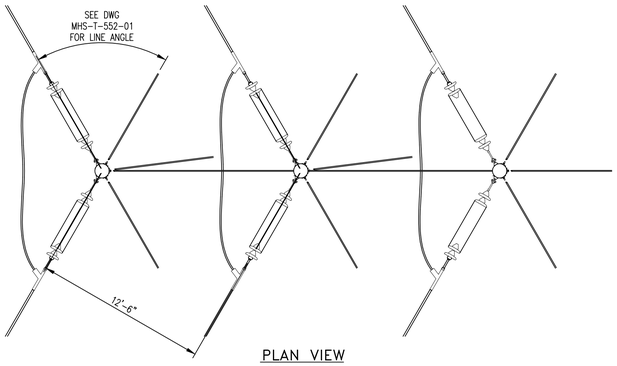
NOTES:
ARROWS POINT TO THE APPROXIMATE EDGE OF RIGHT OF WAY.

N

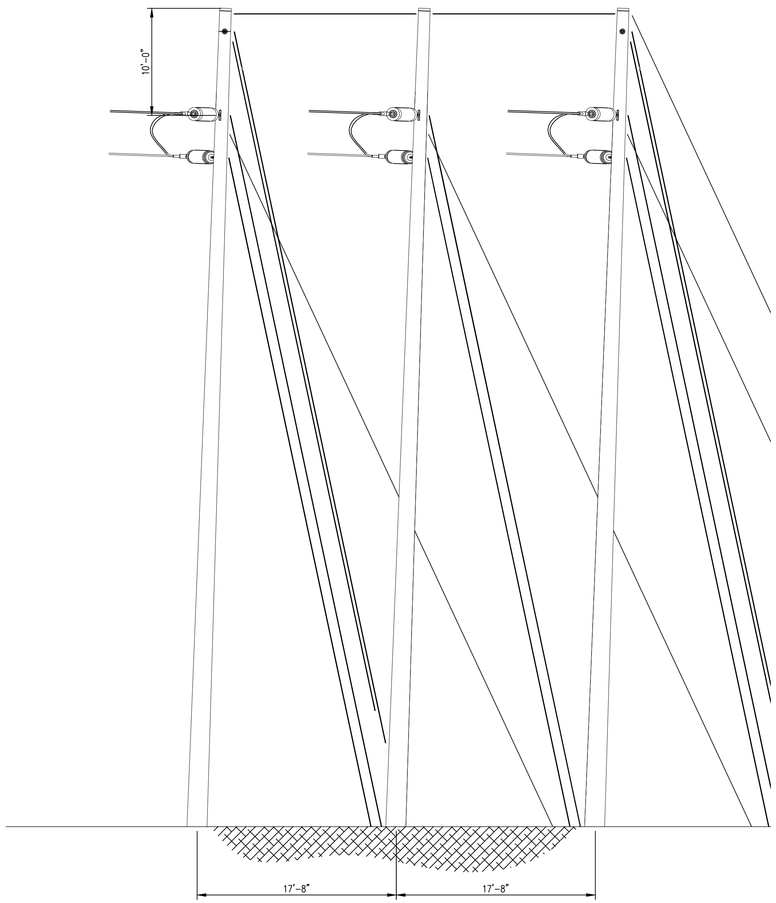
NY STATE PLANE
EAST ZONE
NY83-EF - US FEET

Overhead Drawings

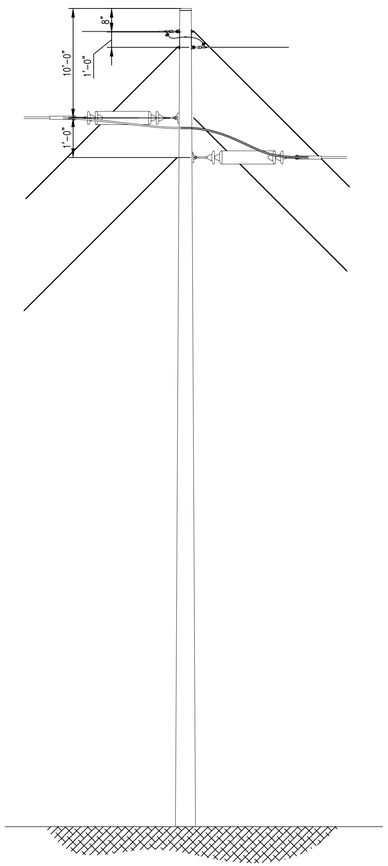
A.5 Mohawk Solar Project 115kV Transmission Deadend Concept Framing MHS-T-555-01



PLAN VIEW
SCALE: N.T.S.



FRONT ELEVATION
SCALE: N.T.S.



SIDE ELEVATION
SCALE: N.T.S.

NOTES:

1) ACTUAL STRUCTURE DETAILS WERE NOT PROVIDED. ALL INFORMATION SHOWN IS CONCEPTUAL IN NATURE.
2) A STRUCTURE STRENGTH CHECK/ANALYSIS WILL BE REQUIRED AT THE DETAILED ENGINEERING STAGE.

CONCEPTUAL - NOT FOR CONSTRUCTION

NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	10/10/18	JRR	DH	KS
B	ISSUED FOR REVIEW	12/18/18	TL	BK	KS
C	ISSUED FOR REVIEW	2/22/19	KS	MB	SA

AVANGRID RENEWABLES

MOTT MACDONALD

ENGINEERING RECORD	DATE
DRAWN: J. ROSS	09/13/18
DESIGNED: L. CAHILL	09/13/18
CHECKED: D. HYNES	12/18/18
APPROVED: K. SOKOLOWSKI	12/18/18
CADFILE: MHS-T-555-01.DWG	

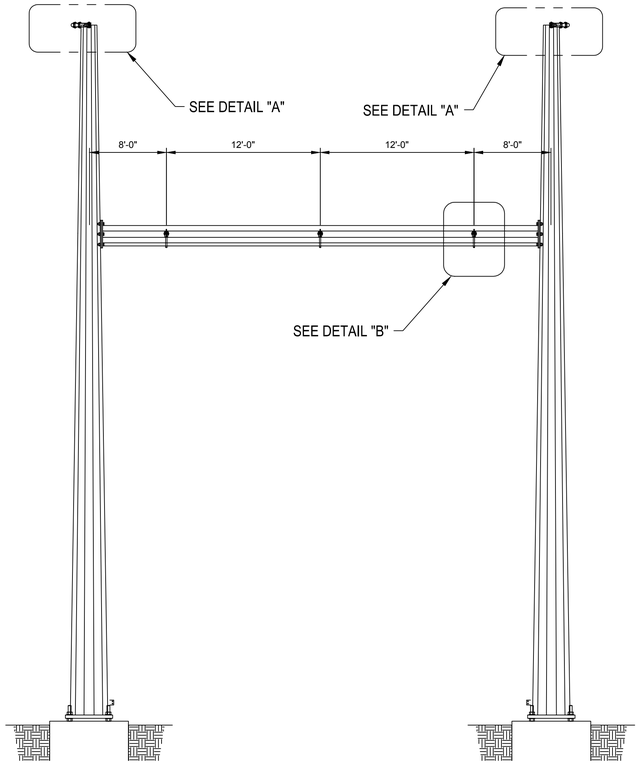
MOHAWK SOLAR PROJECT
115kV TRANSMISSION
DEADEND CONCEPT FRAMING

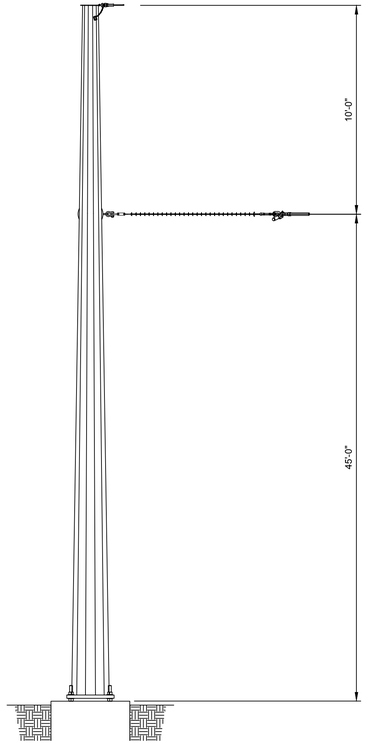
SCALE: NTS | DWG NO. MHS-T-555-01 | SHEET 1 OF 1 | REV C

A.6 Mohawk Solar Project 115kV Transmission Deadend Concept Framing MHS-T-555-02

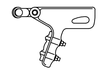
NOTES:

1) ACTUAL STRUCTURE DETAILS WERE NOT PROVIDED. ALL INFORMATION SHOWN IS CONCEPTUAL IN NATURE.
2) A STRUCTURE STRENGTH CHECK/ANALYSIS WILL BE REQUIRED AT THE DETAILED ENGINEERING STAGE.

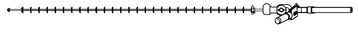




DETAIL "A"
OHSW DEAD-END ASSEMBLY



DETAIL "B"
DEAD-END ASSEMBLY



CONCEPTUAL - NOT FOR CONSTRUCTION

NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR
A	ISSUED FOR REVIEW	12/18/18	JRR	DH	KS
B	ISSUED FOR REVIEW	2/22/19	KS	MB	SA

AVANGRID RENEWABLES

MOTT MACDONALD

ENGINEERING RECORD	DATE
DRAWN: J. ROSS	12/17/18
DESIGNED: K. SOKOLOWSKI	12/17/18
CHECKED: D. HYNES	12/18/18
APPROVED: K. SOKOLOWSKI	12/18/18

MOHAWK SOLAR PROJECT
115kV TRANSMISSION
DEADEND CONCEPT FRAMING

CADFILE: MHS-T-555-02.DWG	SCALE:NTS	DWG.NO. MHS-T-555-02	SHEET 1 OF 1	REV B

B. Software Output Files

B.1 Case 1 – 1 x 1250KCMIL UG Cable

Case 1 - 1x1250kcmil UG cable in a 48" trench
Magnetic Flux Density [mG]

Study : Mohawk

X (ft)	B(mG)
-500.0	0.0051
-495.0	0.0052
-490.0	0.0053
-485.0	0.0054
-480.0	0.0055
-475.0	0.0056
-470.0	0.0058
-465.0	0.0059
-460.0	0.0060
-455.0	0.0061
-450.0	0.0063
-445.0	0.0064
-440.0	0.0066
-435.0	0.0067
-430.0	0.0069
-425.0	0.0070
-420.0	0.0072
-415.0	0.0074
-410.0	0.0076
-405.0	0.0078
-400.0	0.0079
-395.0	0.0082
-390.0	0.0084
-385.0	0.0086
-380.0	0.0088
-375.0	0.0090
-370.0	0.0093
-365.0	0.0095
-360.0	0.0098
-355.0	0.0101
-350.0	0.0104
-345.0	0.0107
-340.0	0.0110
-335.0	0.0113
-330.0	0.0117
-325.0	0.0120
-320.0	0.0124
-315.0	0.0128
-310.0	0.0132
-305.0	0.0137
-300.0	0.0141
-295.0	0.0146

X (ft)	B(mG)
-290.0	0.0151
-285.0	0.0157
-280.0	0.0162
-275.0	0.0168
-270.0	0.0174
-265.0	0.0181
-260.0	0.0188
-255.0	0.0195
-250.0	0.0203
-245.0	0.0212
-240.0	0.0221
-235.0	0.0230
-230.0	0.0240
-225.0	0.0251
-220.0	0.0263
-215.0	0.0275
-210.0	0.0288
-205.0	0.0302
-200.0	0.0318
-195.0	0.0334
-190.0	0.0352
-185.0	0.0371
-180.0	0.0392
-175.0	0.0415
-170.0	0.0439
-165.0	0.0466
-160.0	0.0496
-155.0	0.0528
-150.0	0.0564
-145.0	0.0603
-140.0	0.0647
-135.0	0.0696
-130.0	0.0750
-125.0	0.0811
-120.0	0.0880
-115.0	0.0958
-110.0	0.1046
-105.0	0.1148
-100.0	0.1265
-95.0	0.1401
-90.0	0.1560
-85.0	0.1747

X (ft)	B(mG)
-80.0	0.1970
-75.0	0.2239
-70.0	0.2567
-65.0	0.2971
-60.0	0.3479
-55.0	0.4128
-50.0	0.4976
-45.0	0.6111
-40.0	0.7679
-35.0	0.9926
-30.0	1.3298
-25.0	1.8662
-20.0	2.7856
-15.0	4.5163
-10.0	8.1193
-5.0	15.5743
0.0	22.4435
5.0	15.5744
10.0	8.1193
15.0	4.5163
20.0	2.7856
25.0	1.8662
30.0	1.3298
35.0	0.9926
40.0	0.7679
45.0	0.6111
50.0	0.4976
55.0	0.4128
60.0	0.3479
65.0	0.2971
70.0	0.2567
75.0	0.2239
80.0	0.1970
85.0	0.1747
90.0	0.1560
95.0	0.1401
100.0	0.1265
105.0	0.1148
110.0	0.1046
115.0	0.0958
120.0	0.0880
125.0	0.0811

Case 1 - 1x1250kcmil UG cable in a 48" trench
Magnetic Flux Density [mG]

Study : Mohawk

X (ft)	B(mG)
130.0	0.0750
135.0	0.0696
140.0	0.0647
145.0	0.0603
150.0	0.0564
155.0	0.0528
160.0	0.0496
165.0	0.0466
170.0	0.0439
175.0	0.0415
180.0	0.0392
185.0	0.0371
190.0	0.0352
195.0	0.0334
200.0	0.0318
205.0	0.0302
210.0	0.0288
215.0	0.0275
220.0	0.0263
225.0	0.0251
230.0	0.0240
235.0	0.0230
240.0	0.0221
245.0	0.0212
250.0	0.0203
255.0	0.0195
260.0	0.0188
265.0	0.0181
270.0	0.0174
275.0	0.0168
280.0	0.0162
285.0	0.0157
290.0	0.0151
295.0	0.0146
300.0	0.0141
305.0	0.0137
310.0	0.0132
315.0	0.0128
320.0	0.0124
325.0	0.0120
330.0	0.0117
335.0	0.0113

X (ft)	B(mG)
340.0	0.0110
345.0	0.0107
350.0	0.0104
355.0	0.0101
360.0	0.0098
365.0	0.0095
370.0	0.0093
375.0	0.0090
380.0	0.0088
385.0	0.0086
390.0	0.0084
395.0	0.0082
400.0	0.0079
405.0	0.0078
410.0	0.0076
415.0	0.0074
420.0	0.0072
425.0	0.0070
430.0	0.0069
435.0	0.0067
440.0	0.0066
445.0	0.0064
450.0	0.0063
455.0	0.0061
460.0	0.0060
465.0	0.0059
470.0	0.0058
475.0	0.0056
480.0	0.0055
485.0	0.0054
490.0	0.0053
495.0	0.0052
500.0	0.0051

B.2 Case 2 – 2 x 1250KCMIL UG Cable

Case 2 - 2x1250kcmil UG cables in a 48" trench
Magnetic Flux Density [mG]

Study : Mohawk

X (ft)	B(mG)
-500.0	0.0101
-495.0	0.0103
-490.0	0.0105
-485.0	0.0107
-480.0	0.0109
-475.0	0.0111
-470.0	0.0114
-465.0	0.0116
-460.0	0.0119
-455.0	0.0121
-450.0	0.0124
-445.0	0.0127
-440.0	0.0130
-435.0	0.0133
-430.0	0.0136
-425.0	0.0139
-420.0	0.0143
-415.0	0.0146
-410.0	0.0150
-405.0	0.0153
-400.0	0.0157
-395.0	0.0161
-390.0	0.0165
-385.0	0.0170
-380.0	0.0174
-375.0	0.0179
-370.0	0.0184
-365.0	0.0189
-360.0	0.0194
-355.0	0.0200
-350.0	0.0205
-345.0	0.0211
-340.0	0.0218
-335.0	0.0224
-330.0	0.0231
-325.0	0.0238
-320.0	0.0246
-315.0	0.0254
-310.0	0.0262
-305.0	0.0271
-300.0	0.0280
-295.0	0.0289

X (ft)	B(mG)
-290.0	0.0299
-285.0	0.0310
-280.0	0.0321
-275.0	0.0333
-270.0	0.0345
-265.0	0.0359
-260.0	0.0372
-255.0	0.0387
-250.0	0.0403
-245.0	0.0420
-240.0	0.0437
-235.0	0.0456
-230.0	0.0476
-225.0	0.0498
-220.0	0.0521
-215.0	0.0545
-210.0	0.0571
-205.0	0.0600
-200.0	0.0630
-195.0	0.0663
-190.0	0.0698
-185.0	0.0737
-180.0	0.0779
-175.0	0.0824
-170.0	0.0873
-165.0	0.0927
-160.0	0.0986
-155.0	0.1051
-150.0	0.1123
-145.0	0.1202
-140.0	0.1290
-135.0	0.1388
-130.0	0.1497
-125.0	0.1620
-120.0	0.1759
-115.0	0.1917
-110.0	0.2096
-105.0	0.2303
-100.0	0.2541
-95.0	0.2819
-90.0	0.3145
-85.0	0.3532

X (ft)	B(mG)
-80.0	0.3995
-75.0	0.4555
-70.0	0.5243
-65.0	0.6101
-60.0	0.7190
-55.0	0.8600
-50.0	1.0474
-45.0	1.3041
-40.0	1.6691
-35.0	2.2129
-30.0	3.0726
-25.0	4.5384
-20.0	7.2660
-15.0	12.5938
-10.0	19.8672
-5.0	14.8568
0.0	0.1994
5.0	14.8568
10.0	19.8672
15.0	12.5938
20.0	7.2660
25.0	4.5384
30.0	3.0726
35.0	2.2129
40.0	1.6691
45.0	1.3041
50.0	1.0474
55.0	0.8600
60.0	0.7190
65.0	0.6101
70.0	0.5243
75.0	0.4555
80.0	0.3995
85.0	0.3532
90.0	0.3145
95.0	0.2819
100.0	0.2541
105.0	0.2303
110.0	0.2096
115.0	0.1917
120.0	0.1759
125.0	0.1620

Case 2 - 2x1250kcmil UG cables in a 48" trench
Magnetic Flux Density [mG]

Study : Mohawk

X (ft)	B(mG)
130.0	0.1497
135.0	0.1388
140.0	0.1290
145.0	0.1202
150.0	0.1123
155.0	0.1051
160.0	0.0986
165.0	0.0927
170.0	0.0873
175.0	0.0824
180.0	0.0779
185.0	0.0737
190.0	0.0698
195.0	0.0663
200.0	0.0630
205.0	0.0600
210.0	0.0571
215.0	0.0545
220.0	0.0521
225.0	0.0498
230.0	0.0476
235.0	0.0456
240.0	0.0437
245.0	0.0420
250.0	0.0403
255.0	0.0387
260.0	0.0372
265.0	0.0359
270.0	0.0345
275.0	0.0333
280.0	0.0321
285.0	0.0310
290.0	0.0299
295.0	0.0289
300.0	0.0280
305.0	0.0271
310.0	0.0262
315.0	0.0254
320.0	0.0246
325.0	0.0238
330.0	0.0231
335.0	0.0224

X (ft)	B(mG)
340.0	0.0218
345.0	0.0211
350.0	0.0205
355.0	0.0200
360.0	0.0194
365.0	0.0189
370.0	0.0184
375.0	0.0179
380.0	0.0174
385.0	0.0170
390.0	0.0165
395.0	0.0161
400.0	0.0157
405.0	0.0153
410.0	0.0150
415.0	0.0146
420.0	0.0143
425.0	0.0139
430.0	0.0136
435.0	0.0133
440.0	0.0130
445.0	0.0127
450.0	0.0124
455.0	0.0121
460.0	0.0119
465.0	0.0116
470.0	0.0114
475.0	0.0111
480.0	0.0109
485.0	0.0107
490.0	0.0105
495.0	0.0103
500.0	0.0101

B.3 Case 3 – 3 x 1250KCMIL UG Cable

Case 3 - 3x1250kcmil cables in a 48" trench
Magnetic Flux Density [mG]

Study : Mohawk

X (ft)	B(mG)
-500.0	0.0149
-495.0	0.0152
-490.0	0.0155
-485.0	0.0159
-480.0	0.0162
-475.0	0.0165
-470.0	0.0169
-465.0	0.0173
-460.0	0.0176
-455.0	0.0180
-450.0	0.0184
-445.0	0.0189
-440.0	0.0193
-435.0	0.0197
-430.0	0.0202
-425.0	0.0207
-420.0	0.0212
-415.0	0.0217
-410.0	0.0222
-405.0	0.0228
-400.0	0.0234
-395.0	0.0239
-390.0	0.0246
-385.0	0.0252
-380.0	0.0259
-375.0	0.0266
-370.0	0.0273
-365.0	0.0281
-360.0	0.0288
-355.0	0.0297
-350.0	0.0305
-345.0	0.0314
-340.0	0.0324
-335.0	0.0333
-330.0	0.0344
-325.0	0.0354
-320.0	0.0365
-315.0	0.0377
-310.0	0.0389
-305.0	0.0402
-300.0	0.0416
-295.0	0.0430

X (ft)	B(mG)
-290.0	0.0445
-285.0	0.0461
-280.0	0.0478
-275.0	0.0495
-270.0	0.0514
-265.0	0.0534
-260.0	0.0555
-255.0	0.0577
-250.0	0.0600
-245.0	0.0625
-240.0	0.0652
-235.0	0.0680
-230.0	0.0710
-225.0	0.0742
-220.0	0.0776
-215.0	0.0813
-210.0	0.0853
-205.0	0.0895
-200.0	0.0941
-195.0	0.0990
-190.0	0.1044
-185.0	0.1102
-180.0	0.1164
-175.0	0.1233
-170.0	0.1307
-165.0	0.1389
-160.0	0.1479
-155.0	0.1577
-150.0	0.1686
-145.0	0.1806
-140.0	0.1940
-135.0	0.2090
-130.0	0.2257
-125.0	0.2446
-120.0	0.2660
-115.0	0.2903
-110.0	0.3182
-105.0	0.3503
-100.0	0.3876
-95.0	0.4313
-90.0	0.4830
-85.0	0.5446

X (ft)	B(mG)
-80.0	0.6191
-75.0	0.7104
-70.0	0.8238
-65.0	0.9676
-60.0	1.1537
-55.0	1.4009
-50.0	1.7402
-45.0	2.2248
-40.0	2.9528
-35.0	4.1195
-30.0	6.1441
-25.0	9.9326
-20.0	16.4822
-15.0	18.6079
-10.0	5.8226
-5.0	8.3616
0.0	16.6484
5.0	8.3617
10.0	5.8226
15.0	18.6079
20.0	16.4822
25.0	9.9326
30.0	6.1441
35.0	4.1195
40.0	2.9528
45.0	2.2248
50.0	1.7402
55.0	1.4009
60.0	1.1537
65.0	0.9676
70.0	0.8238
75.0	0.7104
80.0	0.6191
85.0	0.5446
90.0	0.4830
95.0	0.4313
100.0	0.3876
105.0	0.3503
110.0	0.3182
115.0	0.2903
120.0	0.2660
125.0	0.2446

Case 3 - 3x1250kcmil UG cables in a 48" trench
Magnetic Flux Density [mG]

Study : Mohawk

X (ft)	B(mG)
130.0	0.2257
135.0	0.2090
140.0	0.1940
145.0	0.1806
150.0	0.1686
155.0	0.1577
160.0	0.1479
165.0	0.1389
170.0	0.1307
175.0	0.1233
180.0	0.1164
185.0	0.1102
190.0	0.1044
195.0	0.0990
200.0	0.0941
205.0	0.0895
210.0	0.0853
215.0	0.0813
220.0	0.0776
225.0	0.0742
230.0	0.0710
235.0	0.0680
240.0	0.0652
245.0	0.0625
250.0	0.0600
255.0	0.0577
260.0	0.0555
265.0	0.0534
270.0	0.0514
275.0	0.0495
280.0	0.0478
285.0	0.0461
290.0	0.0445
295.0	0.0430
300.0	0.0416
305.0	0.0402
310.0	0.0389
315.0	0.0377
320.0	0.0365
325.0	0.0354
330.0	0.0344
335.0	0.0333

X (ft)	B(mG)
340.0	0.0324
345.0	0.0314
350.0	0.0305
355.0	0.0297
360.0	0.0288
365.0	0.0281
370.0	0.0273
375.0	0.0266
380.0	0.0259
385.0	0.0252
390.0	0.0246
395.0	0.0239
400.0	0.0234
405.0	0.0228
410.0	0.0222
415.0	0.0217
420.0	0.0212
425.0	0.0207
430.0	0.0202
435.0	0.0197
440.0	0.0193
445.0	0.0189
450.0	0.0184
455.0	0.0180
460.0	0.0176
465.0	0.0173
470.0	0.0169
475.0	0.0165
480.0	0.0162
485.0	0.0159
490.0	0.0155
495.0	0.0152
500.0	0.0149

B.4 Case 4 – 4 x 1250KCMIL UG Cable

Case 4 - 4x1250kcmil in a 48" trench
Magnetic Flux Density [mG]

Study : Mohawk

X (ft)	B(mG)
-500.0	0.0199
-495.0	0.0203
-490.0	0.0207
-485.0	0.0211
-480.0	0.0216
-475.0	0.0220
-470.0	0.0225
-465.0	0.0230
-460.0	0.0235
-455.0	0.0240
-450.0	0.0246
-445.0	0.0251
-440.0	0.0257
-435.0	0.0263
-430.0	0.0269
-425.0	0.0275
-420.0	0.0282
-415.0	0.0289
-410.0	0.0296
-405.0	0.0303
-400.0	0.0311
-395.0	0.0319
-390.0	0.0327
-385.0	0.0336
-380.0	0.0345
-375.0	0.0354
-370.0	0.0364
-365.0	0.0374
-360.0	0.0385
-355.0	0.0396
-350.0	0.0407
-345.0	0.0419
-340.0	0.0431
-335.0	0.0445
-330.0	0.0458
-325.0	0.0473
-320.0	0.0488
-315.0	0.0503
-310.0	0.0520
-305.0	0.0537
-300.0	0.0555
-295.0	0.0574

X (ft)	B(mG)
-290.0	0.0595
-285.0	0.0616
-280.0	0.0638
-275.0	0.0662
-270.0	0.0687
-265.0	0.0713
-260.0	0.0741
-255.0	0.0771
-250.0	0.0803
-245.0	0.0836
-240.0	0.0872
-235.0	0.0910
-230.0	0.0951
-225.0	0.0994
-220.0	0.1040
-215.0	0.1090
-210.0	0.1144
-205.0	0.1201
-200.0	0.1263
-195.0	0.1330
-190.0	0.1403
-185.0	0.1481
-180.0	0.1567
-175.0	0.1660
-170.0	0.1762
-165.0	0.1873
-160.0	0.1996
-155.0	0.2131
-150.0	0.2281
-145.0	0.2447
-140.0	0.2632
-135.0	0.2840
-130.0	0.3073
-125.0	0.3336
-120.0	0.3636
-115.0	0.3979
-110.0	0.4374
-105.0	0.4832
-100.0	0.5368
-95.0	0.6000
-90.0	0.6755
-85.0	0.7667

X (ft)	B(mG)
-80.0	0.8784
-75.0	1.0175
-70.0	1.1941
-65.0	1.4235
-60.0	1.7302
-55.0	2.1545
-50.0	2.7684
-45.0	3.7078
-40.0	5.2518
-35.0	8.0036
-30.0	13.0715
-25.0	19.0824
-20.0	12.4601
-15.0	2.9624
-10.0	13.6501
-5.0	12.5576
0.0	3.4341
5.0	12.5575
10.0	13.6501
15.0	2.9625
20.0	12.4601
25.0	19.0824
30.0	13.0715
35.0	8.0036
40.0	5.2518
45.0	3.7078
50.0	2.7684
55.0	2.1545
60.0	1.7302
65.0	1.4235
70.0	1.1941
75.0	1.0175
80.0	0.8784
85.0	0.7667
90.0	0.6755
95.0	0.6000
100.0	0.5368
105.0	0.4832
110.0	0.4374
115.0	0.3979
120.0	0.3636
125.0	0.3337

Case 4 - 4x1250kcmil in a 48" trench
Magnetic Flux Density [mG]

Study : Mohawk

X (ft)	B(mG)
130.0	0.3073
135.0	0.2840
140.0	0.2632
145.0	0.2447
150.0	0.2281
155.0	0.2131
160.0	0.1996
165.0	0.1873
170.0	0.1762
175.0	0.1660
180.0	0.1567
185.0	0.1481
190.0	0.1403
195.0	0.1330
200.0	0.1263
205.0	0.1201
210.0	0.1144
215.0	0.1090
220.0	0.1040
225.0	0.0994
230.0	0.0951
235.0	0.0910
240.0	0.0872
245.0	0.0836
250.0	0.0803
255.0	0.0771
260.0	0.0741
265.0	0.0713
270.0	0.0687
275.0	0.0662
280.0	0.0638
285.0	0.0616
290.0	0.0595
295.0	0.0574
300.0	0.0555
305.0	0.0537
310.0	0.0520
315.0	0.0503
320.0	0.0488
325.0	0.0473
330.0	0.0458
335.0	0.0445

X (ft)	B(mG)
340.0	0.0431
345.0	0.0419
350.0	0.0407
355.0	0.0396
360.0	0.0385
365.0	0.0374
370.0	0.0364
375.0	0.0354
380.0	0.0345
385.0	0.0336
390.0	0.0327
395.0	0.0319
400.0	0.0311
405.0	0.0303
410.0	0.0296
415.0	0.0289
420.0	0.0282
425.0	0.0275
430.0	0.0269
435.0	0.0263
440.0	0.0257
445.0	0.0251
450.0	0.0246
455.0	0.0240
460.0	0.0235
465.0	0.0230
470.0	0.0225
475.0	0.0220
480.0	0.0216
485.0	0.0211
490.0	0.0207
495.0	0.0203
500.0	0.0199

B.5 Case 5 - 5 x 1250KCMIL UG Cables with 10ft. spacing at the Substation

Case 5 - 4x1250kcmil in a 48" trench with 10' Spacing at Sub
Magnetic Flux Density [mG]

Study : Mohawk

X (ft)	B(mG)
-500.0	0.0186
-495.0	0.0190
-490.0	0.0194
-485.0	0.0197
-480.0	0.0202
-475.0	0.0206
-470.0	0.0210
-465.0	0.0214
-460.0	0.0219
-455.0	0.0224
-450.0	0.0229
-445.0	0.0234
-440.0	0.0239
-435.0	0.0244
-430.0	0.0250
-425.0	0.0256
-420.0	0.0262
-415.0	0.0268
-410.0	0.0274
-405.0	0.0281
-400.0	0.0288
-395.0	0.0295
-390.0	0.0303
-385.0	0.0310
-380.0	0.0318
-375.0	0.0327
-370.0	0.0335
-365.0	0.0344
-360.0	0.0354
-355.0	0.0364
-350.0	0.0374
-345.0	0.0384
-340.0	0.0395
-335.0	0.0407
-330.0	0.0419
-325.0	0.0432
-320.0	0.0445
-315.0	0.0459
-310.0	0.0473
-305.0	0.0489
-300.0	0.0504
-295.0	0.0521

X (ft)	B(mG)
-290.0	0.0539
-285.0	0.0557
-280.0	0.0577
-275.0	0.0597
-270.0	0.0619
-265.0	0.0642
-260.0	0.0666
-255.0	0.0691
-250.0	0.0718
-245.0	0.0747
-240.0	0.0777
-235.0	0.0809
-230.0	0.0844
-225.0	0.0880
-220.0	0.0919
-215.0	0.0960
-210.0	0.1005
-205.0	0.1053
-200.0	0.1104
-195.0	0.1159
-190.0	0.1218
-185.0	0.1281
-180.0	0.1350
-175.0	0.1425
-170.0	0.1506
-165.0	0.1594
-160.0	0.1690
-155.0	0.1796
-150.0	0.1911
-145.0	0.2038
-140.0	0.2178
-135.0	0.2333
-130.0	0.2506
-125.0	0.2698
-120.0	0.2913
-115.0	0.3156
-110.0	0.3430
-105.0	0.3743
-100.0	0.4100
-95.0	0.4511
-90.0	0.4988
-85.0	0.5546

X (ft)	B(mG)
-80.0	0.6204
-75.0	0.6988
-70.0	0.7934
-65.0	0.9088
-60.0	1.0519
-55.0	1.2326
-50.0	1.4652
-45.0	1.7726
-40.0	2.1911
-35.0	2.7829
-30.0	3.6609
-25.0	5.0445
-20.0	7.3901
-15.0	11.6297
-10.0	18.4544
-5.0	18.8035
0.0	8.6475
5.0	15.1604
10.0	6.3498
15.0	15.1604
20.0	8.6475
25.0	18.8035
30.0	18.4544
35.0	11.6297
40.0	7.3901
45.0	5.0445
50.0	3.6609
55.0	2.7829
60.0	2.1911
65.0	1.7726
70.0	1.4652
75.0	1.2326
80.0	1.0519
85.0	0.9088
90.0	0.7934
95.0	0.6988
100.0	0.6204
105.0	0.5546
110.0	0.4988
115.0	0.4511
120.0	0.4100
125.0	0.3743

Case 5 - 4x1250kcmil in a 48" trench with 10' Spacing at Sub
Magnetic Flux Density [mG]

Study : Mohawk

X (ft)	B(mG)
130.0	0.3430
135.0	0.3156
140.0	0.2913
145.0	0.2698
150.0	0.2506
155.0	0.2333
160.0	0.2178
165.0	0.2038
170.0	0.1911
175.0	0.1796
180.0	0.1690
185.0	0.1594
190.0	0.1506
195.0	0.1425
200.0	0.1350
205.0	0.1281
210.0	0.1218
215.0	0.1159
220.0	0.1104
225.0	0.1053
230.0	0.1005
235.0	0.0960
240.0	0.0919
245.0	0.0880
250.0	0.0844
255.0	0.0809
260.0	0.0777
265.0	0.0747
270.0	0.0718
275.0	0.0691
280.0	0.0666
285.0	0.0642
290.0	0.0619
295.0	0.0597
300.0	0.0577
305.0	0.0557
310.0	0.0539
315.0	0.0521
320.0	0.0504
325.0	0.0489
330.0	0.0473
335.0	0.0459

X (ft)	B(mG)
340.0	0.0445
345.0	0.0432
350.0	0.0419
355.0	0.0407
360.0	0.0395
365.0	0.0384
370.0	0.0374
375.0	0.0364
380.0	0.0354
385.0	0.0344
390.0	0.0335
395.0	0.0327
400.0	0.0318
405.0	0.0310
410.0	0.0303
415.0	0.0295
420.0	0.0288
425.0	0.0281
430.0	0.0274
435.0	0.0268
440.0	0.0262
445.0	0.0256
450.0	0.0250
455.0	0.0244
460.0	0.0239
465.0	0.0234
470.0	0.0229
475.0	0.0224
480.0	0.0219
485.0	0.0214
490.0	0.0210
495.0	0.0206
500.0	0.0202

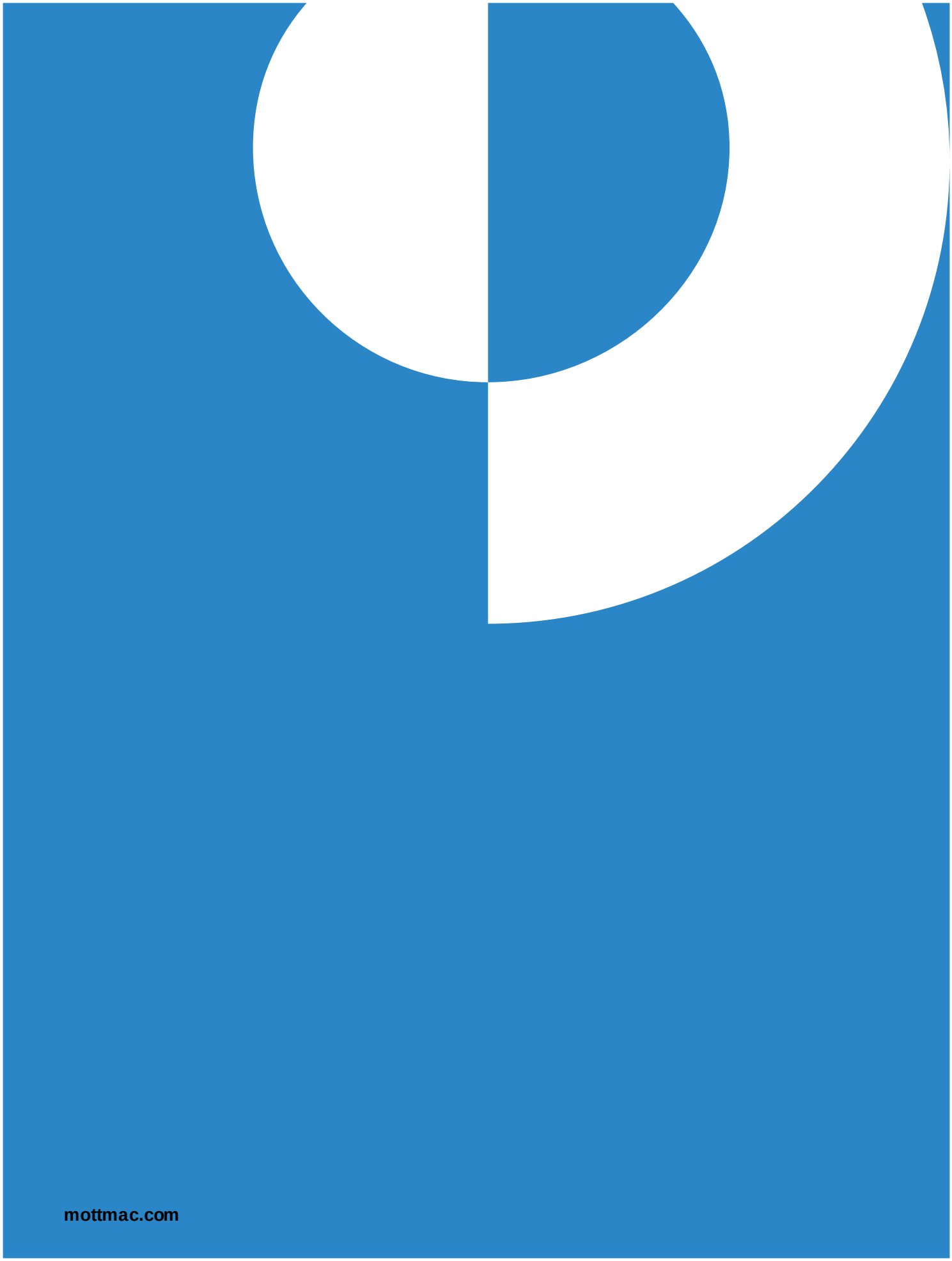
B.6 Overhead Transmission Line EMF, PLS-CADD

Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	1700.81	-500	461745.7	1477536	730	0.473	0.26585	29.3	0.543	0.001	0.0001	6.8	89	0.001
2	1700.81	-495	461750.7	1477537	730	0.482	0.27116	29.3	0.553	0.001	0.0001	6.5	89	0.001
3	1700.81	-490	461755.7	1477537	730	0.492	0.27663	29.3	0.565	0.001	0.0001	6.3	89	0.001
4	1700.81	-485	461760.6	1477538	730	0.503	0.28227	29.3	0.576	0.001	0.0001	6	89	0.001
5	1700.81	-480	461765.6	1477538	730	0.513	0.28808	29.3	0.588	0.001	0.00009	5.8	89	0.001
6	1700.81	-475	461770.6	1477539	730	0.524	0.29408	29.3	0.601	0.001	0.00009	5.5	88.9	0.001
7	1700.81	-470	461775.5	1477539	730	0.535	0.30026	29.3	0.614	0.001	0.00009	5.2	88.9	0.001
8	1700.81	-465	461780.5	1477540	730	0.547	0.30664	29.3	0.627	0.001	0.00009	5	88.9	0.001
9	1700.81	-460	461785.5	1477541	730	0.558	0.31323	29.3	0.64	0.001	0.00009	4.7	88.9	0.001
10	1700.81	-455	461790.4	1477541	730	0.571	0.32003	29.3	0.654	0.001	0.00008	4.5	88.9	0.001
11	1700.81	-450	461795.4	1477542	730	0.583	0.32705	29.3	0.669	0.001	0.00008	4.2	88.9	0.001
12	1700.81	-445	461800.4	1477542	730	0.597	0.3343	29.3	0.684	0.001	0.00008	3.9	88.9	0.001
13	1700.81	-440	461805.4	1477543	730	0.61	0.3418	29.3	0.699	0.001	0.00007	3.7	88.8	0.001
14	1700.81	-435	461810.3	1477543	730	0.624	0.34955	29.2	0.715	0.001	0.00007	3.4	88.8	0.001
15	1700.81	-430	461815.3	1477544	730	0.639	0.35757	29.2	0.732	0.001	0.00007	3.1	88.8	0.001
16	1700.81	-425	461820.3	1477545	730	0.654	0.36587	29.2	0.749	0.001	0.00006	2.8	88.8	0.001
17	1700.81	-420	461825.2	1477545	730	0.669	0.37446	29.2	0.767	0.001	0.00006	2.6	88.8	0.001
18	1700.81	-415	461830.2	1477546	730	0.686	0.38335	29.2	0.786	0.001	0.00006	2.3	88.8	0.001
19	1700.81	-410	461835.2	1477546	730	0.702	0.39257	29.2	0.805	0.001	0.00005	2	88.8	0.001
20	1700.81	-405	461840.1	1477547	730	0.72	0.40212	29.2	0.824	0.001	0.00004	1.7	88.7	0.001
21	1700.81	-400	461845.1	1477547	730	0.738	0.41202	29.2	0.845	0.002	0.00004	1.5	88.7	0.002
22	1700.81	-395	461850.1	1477548	730	0.757	0.42229	29.2	0.866	0.002	0.00003	1.2	88.7	0.002
23	1700.81	-390	461855	1477548	730	0.776	0.43295	29.2	0.889	0.002	0.00003	0.9	88.7	0.002
24	1700.81	-385	461860	1477549	730	0.796	0.44401	29.1	0.912	0.002	0.00002	0.6	88.7	0.002
25	1700.81	-380	461865	1477550	730	0.817	0.4555	29.1	0.935	0.002	0.00001	0.4	88.6	0.002
26	1700.81	-375	461869.9	1477550	730	0.839	0.46745	29.1	0.96	0.002	0.00001	0.2	88.6	0.002
27	1700.81	-370	461874.9	1477551	730	0.862	0.47986	29.1	0.986	0.002	0.00001	0.3	88.6	0.002
28	1700.81	-365	461879.9	1477551	730	0.885	0.49278	29.1	1.013	0.002	0.00002	0.6	88.6	0.002
29	1700.81	-360	461884.8	1477552	730	0.91	0.50622	29.1	1.041	0.002	0.00003	0.8	88.6	0.002
30	1700.81	-355	461889.8	1477552	730	0.935	0.52022	29.1	1.07	0.002	0.00004	1.1	88.5	0.002
31	1700.81	-350	461894.8	1477553	730	0.962	0.53481	29.1	1.101	0.002	0.00005	1.4	88.5	0.002
32	1700.81	-345	461899.7	1477553	730	0.99	0.55002	29.1	1.133	0.002	0.00007	1.7	88.5	0.002
33	1700.81	-340	461904.7	1477554	730	1.019	0.56588	29	1.166	0.002	0.00008	2	88.5	0.002
34	1700.81	-335	461909.7	1477555	730	1.05	0.58243	29	1.2	0.002	0.0001	2.3	88.4	0.002
35	1700.81	-330	461914.7	1477555	730	1.081	0.59972	29	1.237	0.003	0.00012	2.6	88.4	0.003
36	1700.81	-325	461919.6	1477556	730	1.115	0.61778	29	1.274	0.003	0.00013	2.9	88.4	0.003
37	1700.81	-320	461924.6	1477556	730	1.149	0.63667	29	1.314	0.003	0.00016	3.2	88.4	0.003
38	1700.81	-315	461929.6	1477557	730	1.186	0.65644	29	1.355	0.003	0.00018	3.5	88.3	0.003
39	1700.81	-310	461934.5	1477557	730	1.224	0.67714	28.9	1.399	0.003	0.0002	3.8	88.3	0.003
40	1700.81	-305	461939.5	1477558	730	1.264	0.69882	28.9	1.444	0.003	0.00023	4.1	88.3	0.003
41	1700.81	-300	461944.5	1477559	730	1.306	0.72156	28.9	1.492	0.003	0.00026	4.3	88.3	0.003
42	1700.81	-295	461949.4	1477559	730	1.35	0.74542	28.9	1.543	0.004	0.00029	4.6	88.2	0.004
43	1700.81	-290	461954.4	1477560	730	1.397	0.77047	28.9	1.595	0.004	0.00032	4.9	88.2	0.004
44	1700.81	-285	461959.4	1477560	730	1.446	0.79681	28.9	1.651	0.004	0.00035	5.2	88.2	0.004
45	1700.81	-280	461964.3	1477561	730	1.497	0.82451	28.8	1.709	0.004	0.00039	5.5	88.1	0.004
46	1700.81	-275	461969.3	1477561	730	1.551	0.85366	28.8	1.771	0.004	0.00044	5.8	88.1	0.004
47	1700.81	-270	461974.3	1477562	730	1.609	0.88439	28.8	1.836	0.004	0.00048	6.1	88.1	0.005
48	1700.81	-265	461979.2	1477562	730	1.669	0.91679	28.8	1.904	0.005	0.00053	6.4	88	0.005
49	1700.81	-260	461984.2	1477563	730	1.733	0.95099	28.8	1.977	0.005	0.00059	6.7	88	0.005
50	1700.81	-255	461989.2	1477564	730	1.801	0.98712	28.7	2.053	0.005	0.00065	7	87.9	0.005

51	1700.81	-250	461994.1	1477564	730	1.872	1.02534	28.7	2.135	0.006	0.00071	7.3	87.9	0.006
52	1700.81	-245	461999.1	1477565	730	1.948	1.06581	28.7	2.221	0.006	0.00079	7.6	87.9	0.006
53	1700.81	-240	462004.1	1477565	730	2.029	1.1087	28.7	2.312	0.006	0.00086	7.9	87.8	0.006
54	1700.81	-235	462009.1	1477566	730	2.114	1.1542	28.6	2.409	0.007	0.00095	8.2	87.8	0.007
55	1700.81	-230	462014	1477566	730	2.205	1.20254	28.6	2.512	0.007	0.00105	8.5	87.7	0.007
56	1700.81	-225	462019	1477567	730	2.302	1.25395	28.6	2.622	0.007	0.00115	8.8	87.7	0.008
57	1700.81	-220	462024	1477568	730	2.406	1.3087	28.5	2.739	0.008	0.00126	9.1	87.6	0.008
58	1700.81	-215	462028.9	1477568	730	2.517	1.36708	28.5	2.864	0.008	0.00139	9.4	87.6	0.009
59	1700.81	-210	462033.9	1477569	730	2.635	1.4294	28.5	2.998	0.009	0.00153	9.6	87.5	0.009
60	1700.81	-205	462038.9	1477569	730	2.762	1.49604	28.4	3.141	0.01	0.00168	9.9	87.4	0.01
61	1700.81	-200	462043.8	1477570	730	2.898	1.56739	28.4	3.295	0.01	0.00185	10.2	87.4	0.01
62	1700.81	-195	462048.8	1477570	730	3.044	1.6439	28.4	3.46	0.011	0.00204	10.5	87.3	0.011
63	1700.81	-190	462053.8	1477571	730	3.202	1.72608	28.3	3.637	0.012	0.00225	10.8	87.2	0.012
64	1700.81	-185	462058.7	1477571	730	3.371	1.81449	28.3	3.829	0.013	0.00249	11	87.2	0.013
65	1700.81	-180	462063.7	1477572	730	3.555	1.90977	28.2	4.035	0.014	0.00275	11.3	87.1	0.014
66	1700.81	-175	462068.7	1477573	730	3.753	2.01263	28.2	4.259	0.015	0.00304	11.6	87	0.015
67	1700.81	-170	462073.6	1477573	730	3.969	2.12389	28.2	4.501	0.016	0.00337	11.8	87	0.016
68	1700.81	-165	462078.6	1477574	730	4.203	2.24447	28.1	4.765	0.017	0.00374	12.1	86.9	0.018
69	1700.81	-160	462083.6	1477574	730	4.458	2.37542	28.1	5.051	0.019	0.00415	12.4	86.8	0.019
70	1700.81	-155	462088.5	1477575	730	4.737	2.51793	28	5.364	0.021	0.00461	12.6	86.7	0.021
71	1700.81	-150	462093.5	1477575	730	5.041	2.67339	27.9	5.706	0.023	0.00514	12.8	86.6	0.023
72	1700.81	-145	462098.5	1477576	730	5.376	2.84337	27.9	6.081	0.025	0.00573	13.1	86.5	0.025
73	1700.81	-140	462103.5	1477577	730	5.744	3.02968	27.8	6.494	0.027	0.00641	13.3	86.4	0.028
74	1700.81	-135	462108.4	1477577	730	6.15	3.23442	27.7	6.948	0.03	0.00718	13.5	86.3	0.031
75	1700.81	-130	462113.4	1477578	730	6.599	3.46004	27.7	7.451	0.033	0.00807	13.8	86.2	0.034
76	1700.81	-125	462118.4	1477578	730	7.097	3.70938	27.6	8.008	0.037	0.00908	14	86.1	0.038
77	1700.81	-120	462123.3	1477579	730	7.652	3.98575	27.5	8.628	0.041	0.01024	14.2	85.9	0.042
78	1700.81	-115	462128.3	1477579	730	8.272	4.29305	27.4	9.32	0.045	0.01158	14.4	85.8	0.047
79	1700.81	-110	462133.3	1477580	730	8.967	4.63588	27.3	10.095	0.051	0.01314	14.5	85.7	0.052
80	1700.81	-105	462138.2	1477580	730	9.75	5.01965	27.2	10.966	0.057	0.01494	14.7	85.5	0.059
81	1700.81	-100	462143.2	1477581	730	10.633	5.4508	27.1	11.949	0.064	0.01705	14.9	85.4	0.066
82	1700.81	-95	462148.2	1477582	730	11.634	5.93698	27	13.061	0.073	0.01951	15	85.2	0.075
83	1700.81	-90	462153.1	1477582	730	12.774	6.48734	26.9	14.327	0.083	0.0224	15.2	85.1	0.086
84	1700.81	-85	462158.1	1477583	730	14.076	7.11281	26.8	15.771	0.094	0.02581	15.3	85	0.098
85	1700.81	-80	462163.1	1477583	730	15.57	7.82649	26.7	17.426	0.108	0.02983	15.5	84.8	0.112
86	1700.81	-75	462168	1477584	730	17.29	8.6441	26.6	19.33	0.124	0.03459	15.6	84.7	0.129
87	1700.81	-70	462173	1477584	730	19.276	9.58446	26.4	21.528	0.143	0.04023	15.7	84.6	0.148
88	1700.81	-65	462178	1477585	730	21.577	10.66998	26.3	24.071	0.165	0.04693	15.9	84.6	0.171
89	1700.81	-60	462182.9	1477586	730	24.246	11.92717	26.2	27.02	0.19	0.05486	16.1	84.6	0.198
90	1700.81	-55	462187.9	1477586	730	27.341	13.38688	26.1	30.443	0.22	0.0642	16.3	84.6	0.229
91	1700.81	-50	462192.9	1477587	730	30.924	15.08414	26	34.407	0.253	0.07512	16.6	84.8	0.263
92	1700.81	-45	462197.9	1477587	730	35.046	17.0569	26	38.977	0.288	0.08767	16.9	85.2	0.301
93	1700.81	-40	462202.8	1477588	730	39.738	19.34309	26	44.196	0.324	0.10171	17.4	85.8	0.34
94	1700.81	-35	462207.8	1477588	730	44.982	21.97432	26	50.062	0.358	0.11667	18.1	86.7	0.376
95	1700.81	-30	462212.8	1477589	730	50.679	24.9648	26.2	56.494	0.382	0.13133	19	88.1	0.404
96	1700.81	-25	462217.7	1477589	730	56.609	28.29334	26.6	63.286	0.39	0.1434	20.2	90.1	0.415
97	1700.81	-20	462222.7	1477590	730	62.403	31.87834	27.1	70.074	0.372	0.14925	21.8	93	0.401
98	1700.81	-15	462227.7	1477591	730	67.555	35.54989	27.8	76.338	0.323	0.14406	24	97.3	0.354
99	1700.81	-10	462232.6	1477591	730	71.494	39.03169	28.6	81.455	0.243	0.12301	26.9	104.7	0.272
100	1700.81	-5	462237.6	1477592	730	73.719	41.95457	29.6	84.821	0.143	0.08492	30.7	121.4	0.166
101	1700.81	0	462242.6	1477592	730	73.936	43.92122	30.7	85.997	0.081	0.04836	30.8	180	0.093

102	1700.81	5	462247.5	1477593	730	72.139	44.617	31.7	84.821	0.145	0.08221	29.6	238.6	0.166
103	1700.81	10	462252.5	1477593	730	68.599	43.92122	32.6	81.455	0.228	0.14907	33.2	255.3	0.272
104	1700.81	15	462257.5	1477594	730	63.775	41.95457	33.3	76.338	0.286	0.2083	36	262.7	0.354
105	1700.81	20	462262.4	1477594	730	58.197	39.03169	33.8	70.074	0.315	0.24814	38.2	267	0.401
106	1700.81	25	462267.4	1477595	730	52.357	35.54989	34.2	63.286	0.319	0.26609	39.8	269.9	0.415
107	1700.81	30	462272.4	1477596	730	46.641	31.87834	34.4	56.494	0.305	0.26532	41	271.9	0.404
108	1700.81	35	462277.3	1477596	730	41.301	28.29334	34.4	50.062	0.28	0.25144	41.9	273.3	0.376
109	1700.81	40	462282.3	1477597	730	36.47	24.9648	34.4	44.196	0.25	0.23009	42.6	274.2	0.34
110	1700.81	45	462287.3	1477597	730	32.192	21.97432	34.3	38.977	0.22	0.20569	43.1	274.8	0.301
111	1700.81	50	462292.3	1477598	730	28.455	19.34309	34.2	34.407	0.191	0.18114	43.4	275.2	0.263
112	1700.81	55	462297.2	1477598	730	25.215	17.0569	34.1	30.443	0.165	0.15811	43.7	275.4	0.229
113	1700.81	60	462302.2	1477599	730	22.418	15.08414	33.9	27.02	0.143	0.13738	43.9	275.4	0.198
114	1700.81	65	462307.2	1477600	730	20.005	13.38688	33.8	24.071	0.123	0.11917	44.1	275.4	0.171
115	1700.81	70	462312.1	1477600	730	17.922	11.92717	33.6	21.528	0.106	0.10344	44.3	275.4	0.148
116	1700.81	75	462317.1	1477601	730	16.119	10.66998	33.5	19.33	0.092	0.08995	44.4	275.3	0.129
117	1700.81	80	462322.1	1477601	730	14.554	9.58446	33.4	17.426	0.08	0.07844	44.5	275.2	0.112
118	1700.81	85	462327	1477602	730	13.191	8.6441	33.2	15.771	0.069	0.06863	44.7	275	0.098
119	1700.81	90	462332	1477602	730	12	7.82649	33.1	14.327	0.061	0.06028	44.8	274.9	0.086
120	1700.81	95	462337	1477603	730	10.955	7.11281	33	13.061	0.053	0.05315	45	274.8	0.075
121	1700.81	100	462341.9	1477603	730	10.034	6.48734	32.9	11.949	0.047	0.04705	45.1	94.6	0.066
122	1700.81	105	462346.9	1477604	730	9.22	5.93698	32.8	10.966	0.041	0.04181	45.3	94.5	0.059
123	1700.81	110	462351.9	1477605	730	8.497	5.4508	32.7	10.095	0.037	0.0373	45.5	94.3	0.052
124	1700.81	115	462356.8	1477605	730	7.853	5.01965	32.6	9.32	0.033	0.03341	45.6	94.2	0.047
125	1700.81	120	462361.8	1477606	730	7.277	4.63588	32.5	8.628	0.029	0.03003	45.8	94.1	0.042
126	1700.81	125	462366.8	1477606	730	6.76	4.29305	32.4	8.008	0.026	0.02708	46	93.9	0.038
127	1700.81	130	462371.7	1477607	730	6.295	3.98575	32.3	7.451	0.023	0.02451	46.2	93.8	0.034
128	1700.81	135	462376.7	1477607	730	5.875	3.70938	32.3	6.948	0.021	0.02225	46.5	93.7	0.031
129	1700.81	140	462381.7	1477608	730	5.495	3.46004	32.2	6.494	0.019	0.02026	46.7	93.6	0.028
130	1700.81	145	462386.6	1477609	730	5.15	3.23442	32.1	6.081	0.017	0.0185	46.9	93.5	0.025
131	1700.81	150	462391.6	1477609	730	4.836	3.02968	32.1	5.706	0.016	0.01695	47.2	93.4	0.023
132	1700.81	155	462396.6	1477610	730	4.549	2.84337	32	5.364	0.014	0.01556	47.4	93.3	0.021
133	1700.81	160	462401.6	1477610	730	4.286	2.67339	32	5.051	0.013	0.01433	47.6	93.2	0.019
134	1700.81	165	462406.5	1477611	730	4.045	2.51793	31.9	4.765	0.012	0.01322	47.9	93.1	0.018
135	1700.81	170	462411.5	1477611	730	3.824	2.37542	31.9	4.501	0.011	0.01223	48.2	93	0.016
136	1700.81	175	462416.5	1477612	730	3.62	2.24447	31.8	4.259	0.01	0.01133	48.4	93	0.015
137	1700.81	180	462421.4	1477612	730	3.431	2.12389	31.8	4.035	0.009	0.01053	48.7	92.9	0.014
138	1700.81	185	462426.4	1477613	730	3.257	2.01263	31.7	3.829	0.009	0.0098	49	92.8	0.013
139	1700.81	190	462431.4	1477614	730	3.096	1.90977	31.7	3.637	0.008	0.00914	49.2	92.8	0.012
140	1700.81	195	462436.3	1477614	730	2.946	1.81449	31.6	3.46	0.007	0.00853	49.5	92.7	0.011
141	1700.81	200	462441.3	1477615	730	2.806	1.72608	31.6	3.295	0.007	0.00799	49.8	92.6	0.01
142	1700.81	205	462446.3	1477615	730	2.676	1.6439	31.6	3.141	0.006	0.00748	50.1	92.6	0.01
143	1700.81	210	462451.2	1477616	730	2.555	1.56739	31.5	2.998	0.006	0.00703	50.4	92.5	0.009
144	1700.81	215	462456.2	1477616	730	2.442	1.49604	31.5	2.864	0.005	0.00661	50.6	92.4	0.009
145	1700.81	220	462461.2	1477617	730	2.336	1.4294	31.5	2.739	0.005	0.00622	50.9	92.4	0.008
146	1700.81	225	462466.1	1477618	730	2.237	1.36708	31.4	2.622	0.005	0.00587	51.2	92.3	0.008
147	1700.81	230	462471.1	1477618	730	2.144	1.3087	31.4	2.512	0.004	0.00554	51.5	92.3	0.007
148	1700.81	235	462476.1	1477619	730	2.057	1.25395	31.4	2.409	0.004	0.00524	51.8	92.2	0.007
149	1700.81	240	462481	1477619	730	1.974	1.20254	31.3	2.312	0.004	0.00496	52.1	92.2	0.006
150	1700.81	245	462486	1477620	730	1.897	1.1542	31.3	2.221	0.004	0.0047	52.4	92.1	0.006
151	1700.81	250	462491	1477620	730	1.824	1.1087	31.3	2.135	0.003	0.00446	52.7	92.1	0.006
152	1700.81	255	462496	1477621	730	1.755	1.06581	31.3	2.053	0.003	0.00423	53	92.1	0.005

153	1700.81	260	462500.9	1477621	730	1.69	1.02534	31.2	1.977	0.003	0.00402	53.3	92	0.005
154	1700.81	265	462505.9	1477622	730	1.629	0.98712	31.2	1.904	0.003	0.00383	53.6	92	0.005
155	1700.81	270	462510.9	1477623	730	1.57	0.95099	31.2	1.836	0.003	0.00365	53.9	91.9	0.005
156	1700.81	275	462515.8	1477623	730	1.515	0.91679	31.2	1.771	0.003	0.00348	54.2	91.9	0.004
157	1700.81	280	462520.8	1477624	730	1.463	0.88439	31.2	1.709	0.002	0.00332	54.5	91.9	0.004
158	1700.81	285	462525.8	1477624	730	1.413	0.85366	31.1	1.651	0.002	0.00317	54.8	91.8	0.004
159	1700.81	290	462530.7	1477625	730	1.366	0.82451	31.1	1.595	0.002	0.00303	55.1	91.8	0.004
160	1700.81	295	462535.7	1477625	730	1.321	0.79681	31.1	1.543	0.002	0.0029	55.4	91.8	0.004
161	1700.81	300	462540.7	1477626	730	1.278	0.77047	31.1	1.492	0.002	0.00278	55.7	91.7	0.003
162	1700.81	305	462545.6	1477627	730	1.237	0.74542	31.1	1.444	0.002	0.00266	56	91.7	0.003
163	1700.81	310	462550.6	1477627	730	1.198	0.72156	31.1	1.399	0.002	0.00255	56.2	91.7	0.003
164	1700.81	315	462555.6	1477628	730	1.161	0.69882	31	1.355	0.002	0.00245	56.5	91.7	0.003
165	1700.81	320	462560.5	1477628	730	1.126	0.67714	31	1.314	0.002	0.00235	56.8	91.6	0.003
166	1700.81	325	462565.5	1477629	730	1.092	0.65644	31	1.274	0.001	0.00226	57.1	91.6	0.003
167	1700.81	330	462570.5	1477629	730	1.06	0.63667	31	1.237	0.001	0.00218	57.4	91.6	0.003
168	1700.81	335	462575.4	1477630	730	1.029	0.61778	31	1.2	0.001	0.00209	57.7	91.6	0.002
169	1700.81	340	462580.4	1477630	730	1	0.59972	31	1.166	0.001	0.00202	58	91.5	0.002
170	1700.81	345	462585.4	1477631	730	0.971	0.58243	30.9	1.133	0.001	0.00194	58.3	91.5	0.002
171	1700.81	350	462590.4	1477632	730	0.944	0.56588	30.9	1.101	0.001	0.00187	58.6	91.5	0.002
172	1700.81	355	462595.3	1477632	730	0.918	0.55002	30.9	1.07	0.001	0.00181	58.9	91.5	0.002
173	1700.81	360	462600.3	1477633	730	0.893	0.53481	30.9	1.041	0.001	0.00174	59.2	91.4	0.002
174	1700.81	365	462605.3	1477633	730	0.869	0.52022	30.9	1.013	0.001	0.00168	59.5	91.4	0.002
175	1700.81	370	462610.2	1477634	730	0.846	0.50622	30.9	0.986	0.001	0.00163	59.8	91.4	0.002
176	1700.81	375	462615.2	1477634	730	0.824	0.49278	30.9	0.96	0.001	0.00157	60	91.4	0.002
177	1700.81	380	462620.2	1477635	730	0.803	0.47986	30.9	0.935	0.001	0.00152	60.3	91.4	0.002
178	1700.81	385	462625.1	1477635	730	0.783	0.46745	30.9	0.912	0.001	0.00147	60.6	91.3	0.002
179	1700.81	390	462630.1	1477636	730	0.763	0.4555	30.8	0.889	0.001	0.00142	60.9	91.3	0.002
180	1700.81	395	462635.1	1477637	730	0.744	0.44401	30.8	0.866	0.001	0.00138	61.2	91.3	0.002
181	1700.81	400	462640	1477637	730	0.726	0.43295	30.8	0.845	0.001	0.00134	61.5	91.3	0.002
182	1700.81	405	462645	1477638	730	0.708	0.42229	30.8	0.824	0.001	0.0013	61.7	91.3	0.001
183	1700.81	410	462650	1477638	730	0.691	0.41202	30.8	0.805	0.001	0.00126	62	91.2	0.001
184	1700.81	415	462654.9	1477639	730	0.675	0.40212	30.8	0.786	0.001	0.00122	62.3	91.2	0.001
185	1700.81	420	462659.9	1477639	730	0.659	0.39257	30.8	0.767	0.001	0.00118	62.6	91.2	0.001
186	1700.81	425	462664.9	1477640	730	0.644	0.38335	30.8	0.749	0.001	0.00115	62.8	91.2	0.001
187	1700.81	430	462669.8	1477641	730	0.629	0.37446	30.8	0.732	0.001	0.00111	63.1	91.2	0.001
188	1700.81	435	462674.8	1477641	730	0.615	0.36587	30.8	0.715	0.001	0.00108	63.4	91.2	0.001
189	1700.81	440	462679.8	1477642	730	0.601	0.35757	30.7	0.699	0.001	0.00105	63.7	91.2	0.001
190	1700.81	445	462684.8	1477642	730	0.588	0.34955	30.7	0.684	0.001	0.00102	63.9	91.1	0.001
191	1700.81	450	462689.7	1477643	730	0.575	0.3418	30.7	0.669	0	0.001	64.2	91.1	0.001
192	1700.81	455	462694.7	1477643	730	0.563	0.3343	30.7	0.654	0	0.00097	64.5	91.1	0.001
193	1700.81	460	462699.7	1477644	730	0.551	0.32705	30.7	0.64	0	0.00094	64.7	91.1	0.001
194	1700.81	465	462704.6	1477644	730	0.539	0.32003	30.7	0.627	0	0.00092	65	91.1	0.001
195	1700.81	470	462709.6	1477645	730	0.528	0.31323	30.7	0.614	0	0.00089	65.2	91.1	0.001
196	1700.81	475	462714.6	1477646	730	0.517	0.30664	30.7	0.601	0	0.00087	65.5	91.1	0.001
197	1700.81	480	462719.5	1477646	730	0.506	0.30026	30.7	0.588	0	0.00085	65.8	91	0.001
198	1700.81	485	462724.5	1477647	730	0.496	0.29408	30.7	0.576	0	0.00083	66	91	0.001
199	1700.81	490	462729.5	1477647	730	0.486	0.28808	30.7	0.565	0	0.00081	66.3	91	0.001
200	1700.81	495	462734.4	1477648	730	0.476	0.28227	30.7	0.553	0	0.00079	66.5	91	0.001
201	1700.81	500	462739.4	1477648	730	0.467	0.27663	30.7	0.543	0	0.00077	66.8	91	0.001



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