MOTT MACDONALD

High Bridge Wind

Electric and Magnetic Field Study
HBW-E-STDY-02 RA

May 10, 2019

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Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	05/10/19	E. Aguirre	T. Clark	K. Sokolowski	Issue for Review

Document reference: HBW-E-STDY-02 RA

Information class: Standard

Contents

Executive Summary

The High Bridge Wind Farm is a proposed 100.8 MW utility-scale wind energy facility located in Chenango County, New York. The project, which is being developed by Calpine Corporation, 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 02 and the overhead transmission line conducted using PLS-CADD. The following cable configurations were studied:

- Case 1 – 1 cable in trench
  - Single 1250 kcmil cable
- Case 2 – 2 cables in parallel
  - (2) 1250 kcmil in parallel trenches with 15 ft. separation
- Case 3 – 3 cables in parallel
  - (3) 1250 kcmil in parallel trenches with 15 ft. separation
- Case 4 – 4 cables in trench
  - (4) 1250 kcmil in parallel trenches with 15 ft. separation
- Case 5 – 115 kV Overhead Transmission Span

These underground cable configurations are seen as the worst-case, as they have the largest cables carrying capabilities. Since current drives electric and magnetic fields, these locations will have the highest levels of EMF. The overhead transmission line was calculated at the lowest sag point between the lowest structure locations. This in turn gives the highest EMF calculation at the one meter above grade test point.

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 02 and PLS CADD for calculating the electric and magnetic fields for the High Bridge Wind 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.
- 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 cables 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 42” 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 115 kV transmission span was studied based on the lowest sag point seen in the project. The configuration was based on the substation dead-end structure drawings for the project.

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 42” trench, the soil cover further reduces the electric field levels to negligible values.

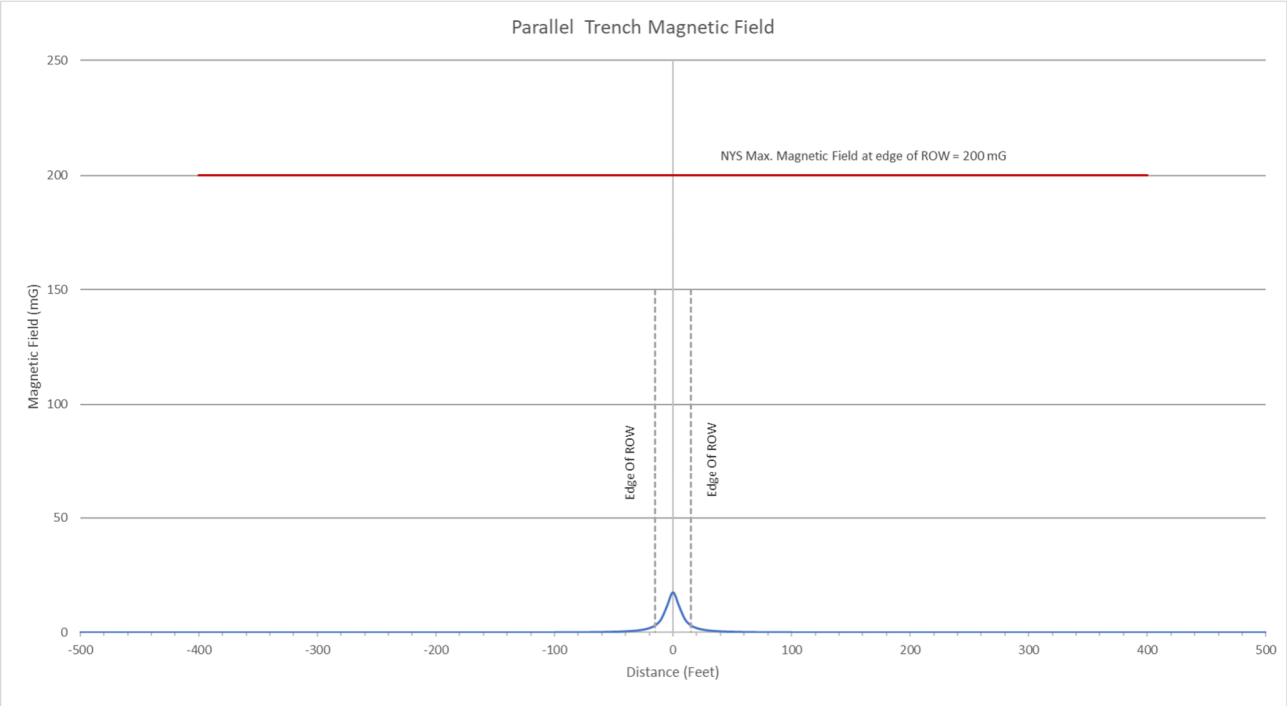
2.1 Case 1 - (1) 1250kcmil UG cable in a 42” trench

See cable trench detail "G" on HBW-E-520-02 and corresponding locations shown on the Collection System Map on HBW-E-500-01 seen in Appendix A.

Table 1: Case 1 (1) 1250kcmil Results

Case	Description	Station Number	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) 1250kcmil	G-1 through G-13	17.598mG	3.1842mG @ ±15ft.	<200 mG

Figure 1: Case 1 – Magnetic Field Calculation



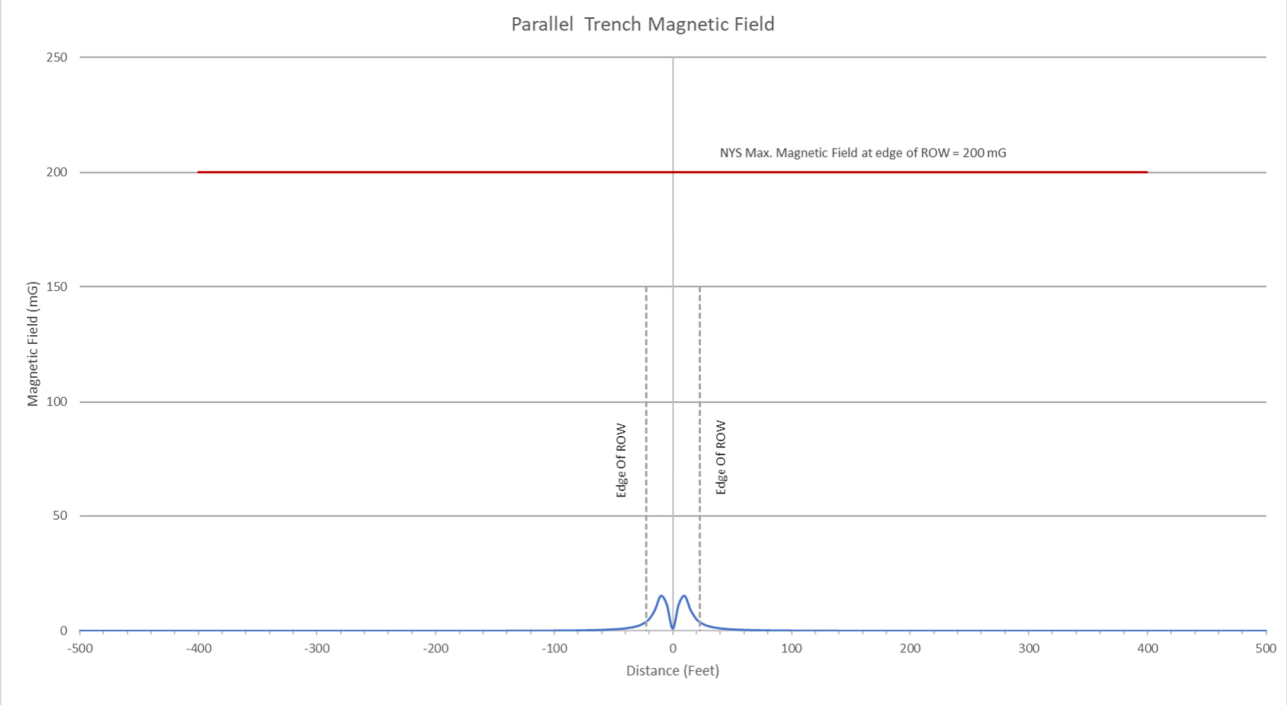
2.2 Case 2 - (2) 1250kcmil UG cable in a 42” trench

See cable trench detail "H" on HBW-E-520-02 and corresponding locations shown on the Collection System Map on HBW-E-500-01 seen in Appendix A

Table 2: (2) 1250kcmil Results

Case	Description	Station Number	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) 1250kcmil	H-1	1.017mG	3.995mG @ ±22.5ft.	<200 mG

Figure 2: Case 2 - Magnetic Field Calculation



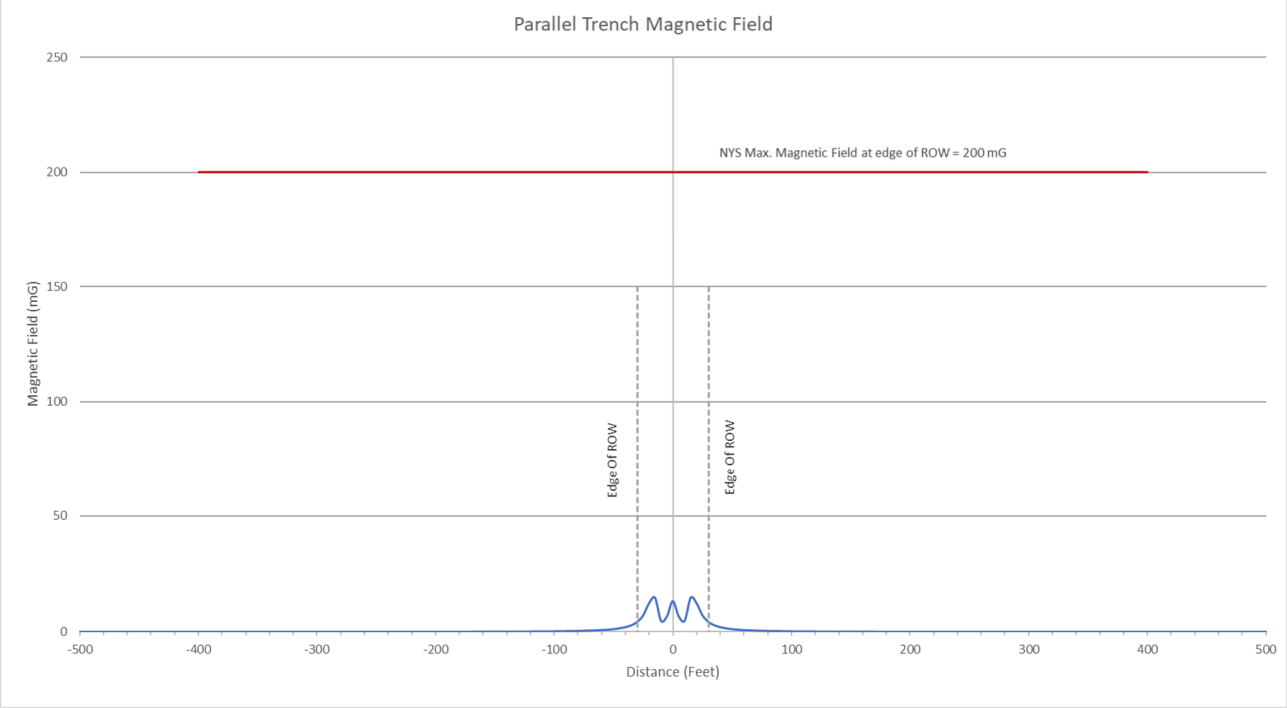
2.3 Case 3 - (3) 1250kcmil UG cable in a 42” trench

See cable trench detail "I" on HBW-E-520-02 and corresponding locations shown on the Collection System Map on HBW-E-500-01 seen in Appendix A

Table 3: (3) 1250kcmil Results

Case	Description	Station Number	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) 1250kcmil	I-1	13.257mG	4.3319mG @ ±30ft.	<200 mG

Figure 3: Case 3 - Magnetic Field Calculation



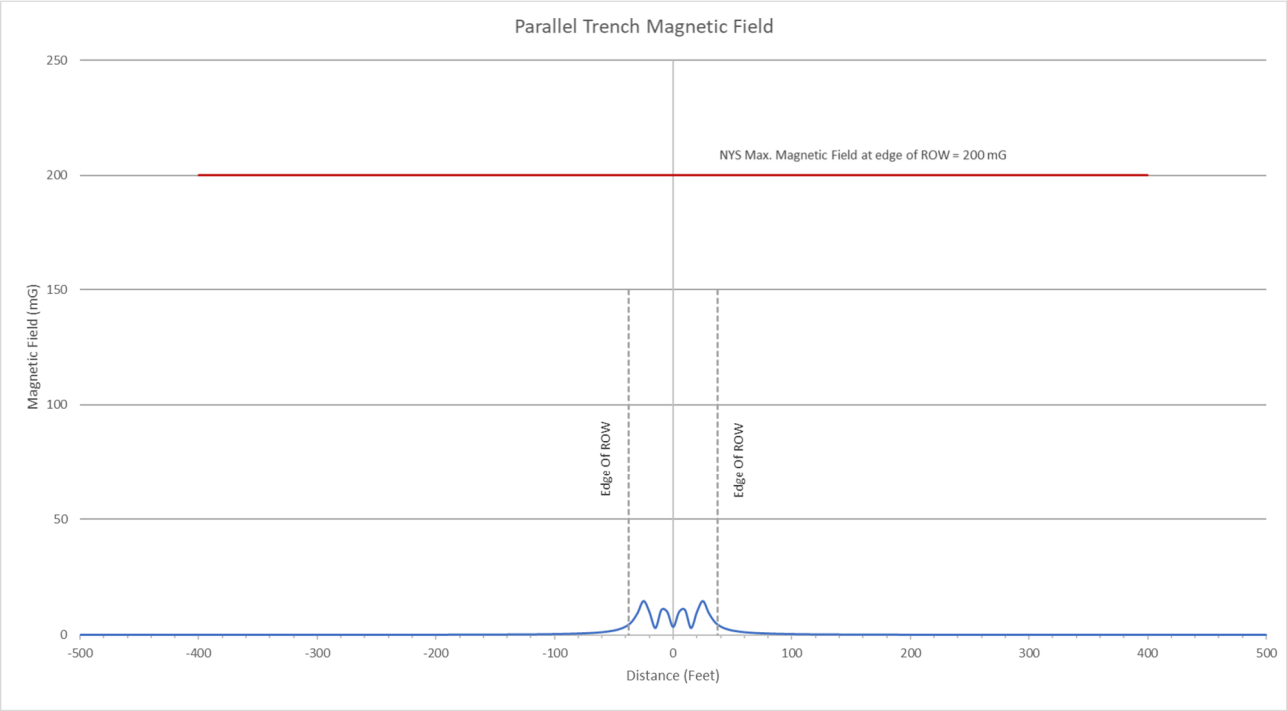
2.4 Case 4 - (4) 1250kcmil UG cable in a 42” trench

See cable trench detail "J" on HBW-E-520-03 and corresponding locations shown on the Collection System Map on HBW-E-500-01 seen in Appendix A

Table 4: (4) 1250kcmil Results

Case	Description	Station Number	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) 1250 kcmil	J-1	3.527mG	4.532mG @ ±37.5ft.	<200 mG

Figure 4: Case 4 - 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.

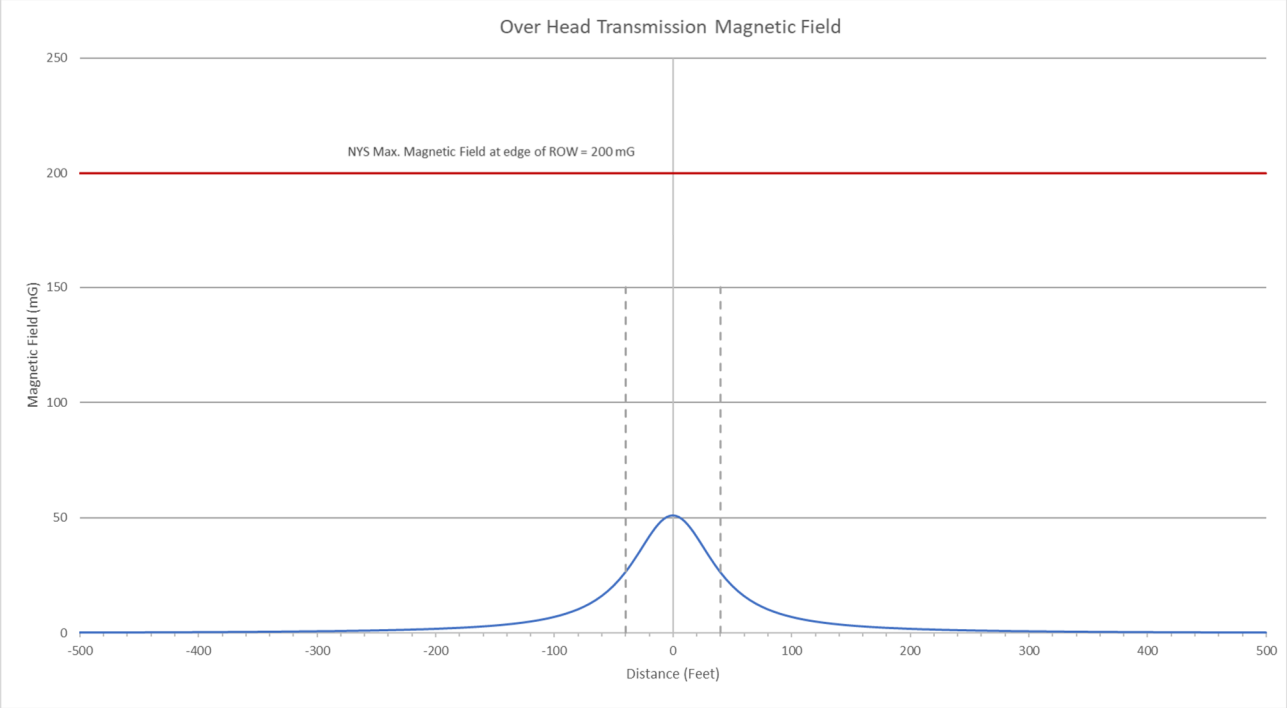
Refer to Appendix A for the typical overhead structure framing and Appendix B for aerial maps showing clearances to residences to within notable proximity of the overhead cables routes.

3.1 Case 5 - 115 kV Transmission Line Magnetic Field Levels

Table 5: 115 kV Transmission Line Magnetic Field Results

Case	Description	Station Number	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	115kV T-Line	T-1	51.088mG	28.266mG @ ±37.5ft.	<200 mG

Figure 5: Case 5 – Magnetic Field Calculation

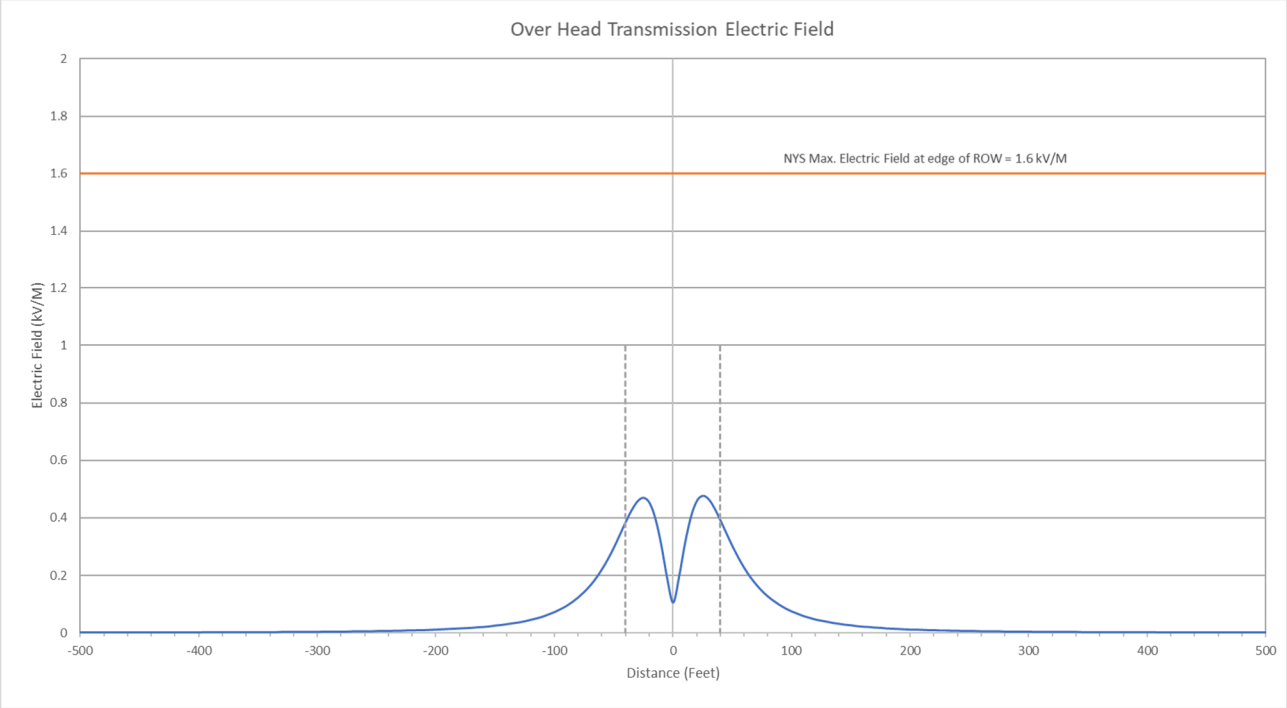


3.2 Case 5 - 115 kV Transmission Line Electric Field Levels

Table 6: 115 kV Transmission Line Electric Field Results

Case	Description	Station Number	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	115kV T-Line	T-1	0.105kV/m	0.4055kV/m @ ±37.5ft.	<1.6 kV/m

Figure 6: Case 5 – 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 7: EMF Calculation Results

Case No.	Description	Station Number	Magnetic Field Strength Calculated at Centerline	Magnetic Field Strength Calculated at Edge of Right-of-Way	Electric Field Strength Calculated at Centerline	Electric Field Strength Calculated at Edge of Right-of-Way	New York Magnetic Field Standard at Edge of Right-of-Way	New York Electric Field Standard at Edge of Right-of-Way
1	(1) 1250kcmil	G-1 to G-15	17.598mG	3.1842mG @ ±15ft.	N/A	N/A	<200 mG	<1.6 kV/m
2	(2) 1250kcmil	H-1	1.017mG	3.995mG @ ±22.5ft.	N/A	N/A	<200 mG	<1.6 kV/m
3	(3) 1250kcmil	I-1	13.257mG	4.3319mG @ ±30ft.	N/A	N/A	<200 mG	<1.6 kV/m
4	(4) 1250 kcmil	J-1	3.527mG	4.532mG @ ±37.5ft.	N/A	N/A	<200 mG	<1.6 kV/m
5	115kV T-Line	T-1	51.088mG	28.266mG @ ±37.5ft.	0.105kV/m	0.4055kV/m @ ±37.5ft.	<200 mG	<1.6 kV/m

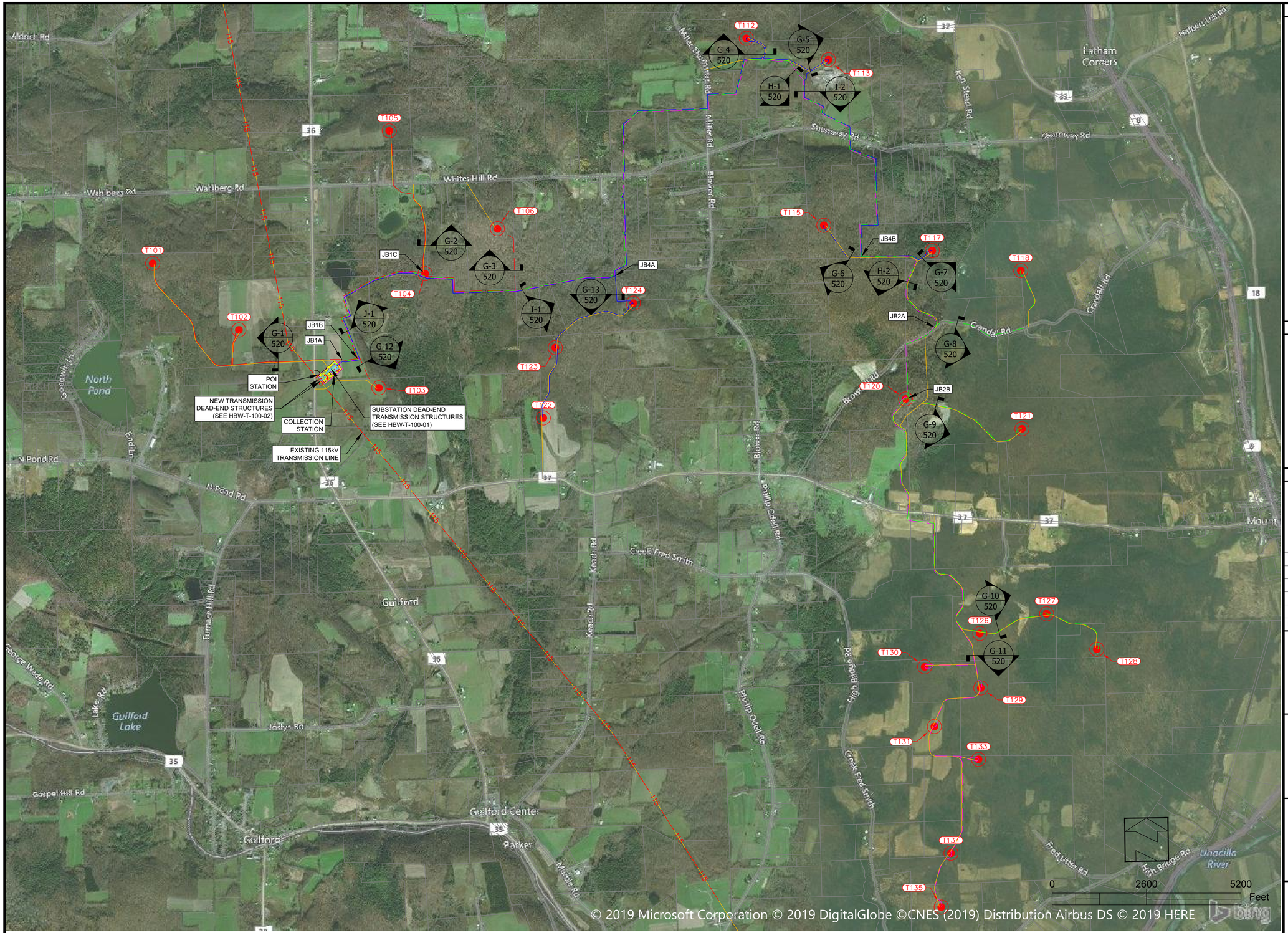
5 References

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

Appendices

A. Project Drawings

A1. HBW-E-500-01 Underground Collection System Map



LEGEND

- ACCESS ROAD
- CIRCUIT 1
- CIRCUIT 2
- CIRCUIT 3
- CIRCUIT 4
- 115 — EXISTING TRANSMISSION LINE
- WIND TURBINE GENERATOR (WTG)

NOTES

1. ALL INFORMATION SHOWN IN THIS SYSTEM MAP IS CONCEPTUAL IN NATURE.
2. LAYOUT IS BASED ON THEORETICAL BALANCED TURBINES WHICH HAVE AN OUTPUT OF 4.03MW EACH.

Rev	Date	Drawn	Description	Ch'k'd	App'd
D	7/17/2019	JS	Issued for Review	BK	SA
C	7/1/2019	JS	Issued for Review	SA	SA
B	5/9/2019	BK	Issued for Review	SA	SA
A	4/9/2019	BK	Issued for Review	SA	SA

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Client

Title

HIGH BRIDGE WIND FARM UNDERGROUND COLLECTION SYSTEM MAP

PRELIMINARY
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REPLACE WITH ENGINEERS STAMP AT CONSTRUCTION AND/OR FABRICATION

Designed	BK	Eng check	SA
Drawn	BK	Approved	SA
Dwg check	SA	Project Mngr	HM
Scale at ANSI D		Date	Rev
N.T.S.		04/09/2019	D

Drawing Number
HBW-E-500-01

CONCEPTUAL - NOT FOR CONSTRUCTION

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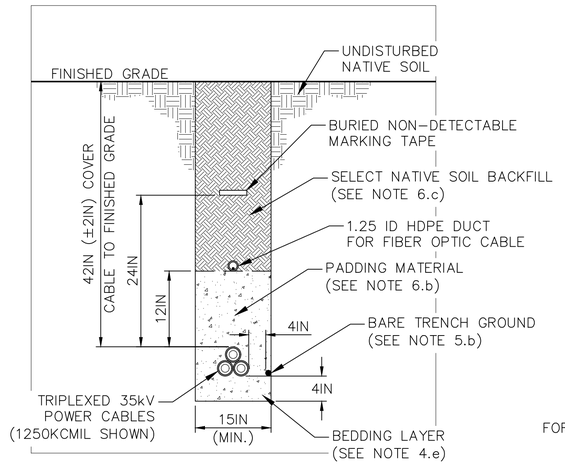
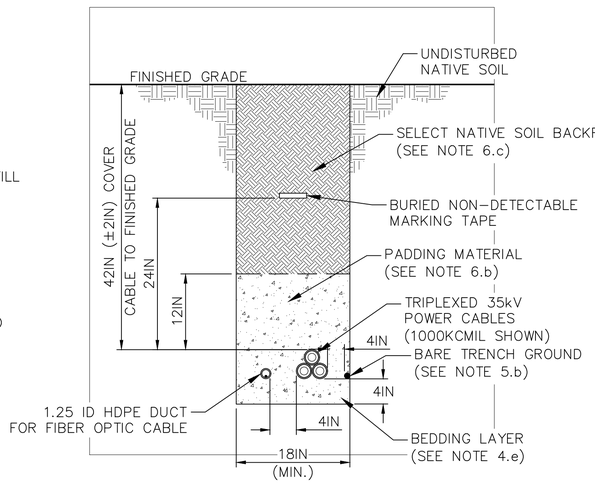
A2. HBW-E-520-01 Underground Collection Cable Trench Details



A PRIMARY POWER & COMMUNICATIONS CABLE DITCH
Not to Scale



B ALTERNATE POWER & COMMUNICATIONS CABLE DITCH
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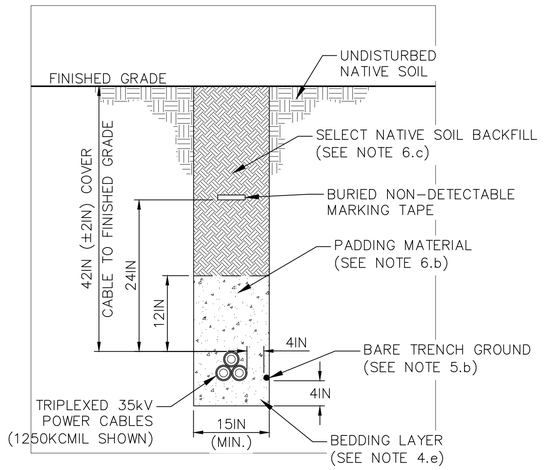

C 3-PHASE POWER ONLY CABLE DITCH
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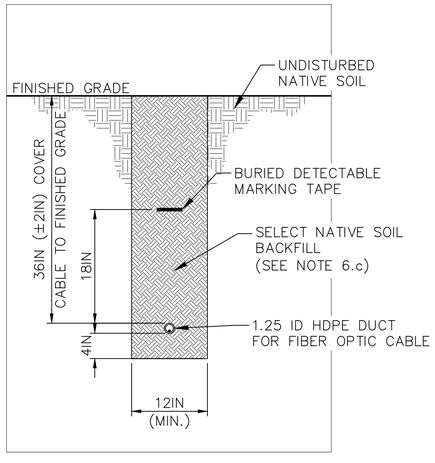

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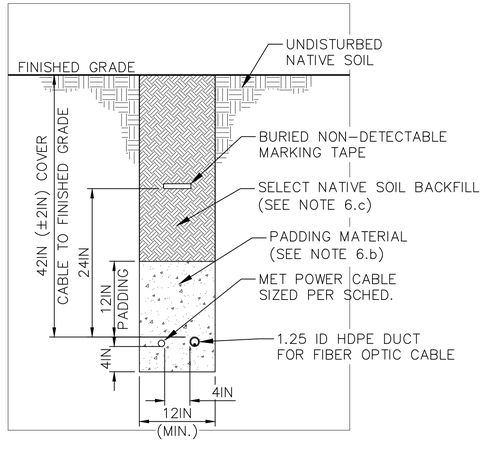

E MET TOWER & COMMUNICATION DITCH
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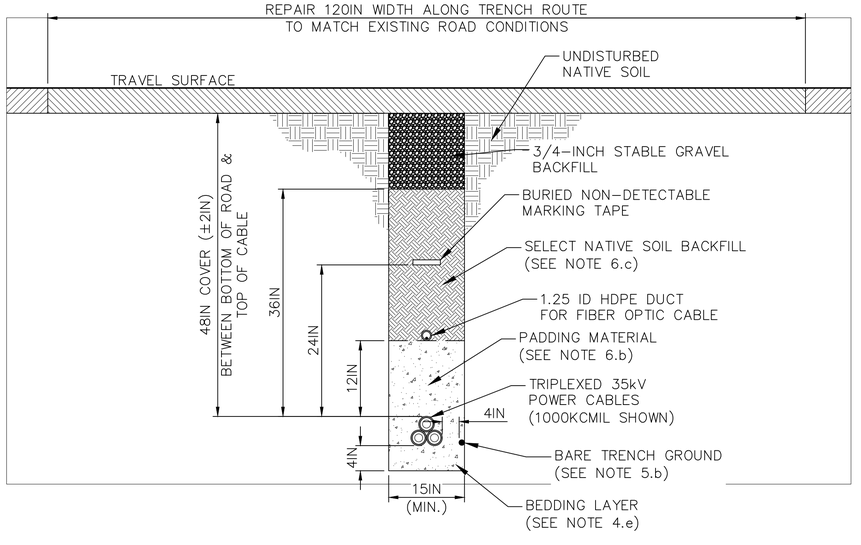

F TYPICAL GRAVEL ROAD CROSSING DETAIL
Not to Scale

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.

Rev	Date	Drawn	Description	Ch'k'd	App'd
A	4/9/2019	BK	Issued for Review	SA	SA

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Client

Title
HIGH BRIDGE WIND FARM UNDERGROUND COLLECTION CABLE TRENCH DETAILS

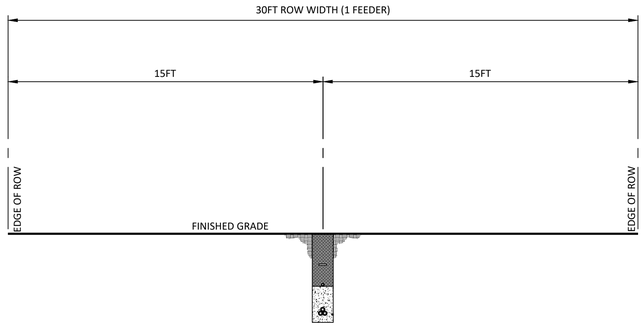
PRELIMINARY NOT FOR CONSTRUCTION
REPLACE WITH ENGINEERS STAMP AT CONSTRUCTION AND/OR FABRICATION

Designed	BK	Eng check	SA		
Drawn	BK	Approved	SA		
Dwg check	SA	Project Mngr	HM		
Scale at ANSI D N.T.S.		Date 04/09/2019		Rev A	

Drawing Number
HBW-E-520-01

CONCEPTUAL - NOT FOR CONSTRUCTION

A3. HBW-E-520-02 Underground Collection Cable Trench Details



G TYPICAL SINGLE TRENCH
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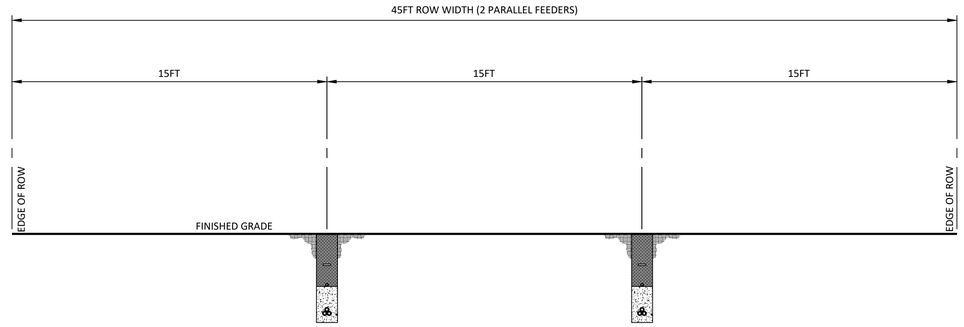

H TYPICAL 2 PARALLEL TRENCH SEPARATION
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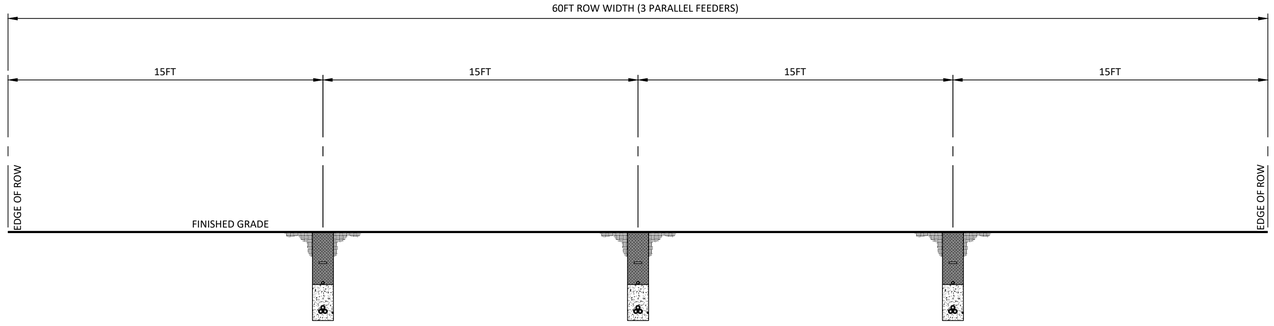

I TYPICAL 3 PARALLEL TRENCH SEPARATION
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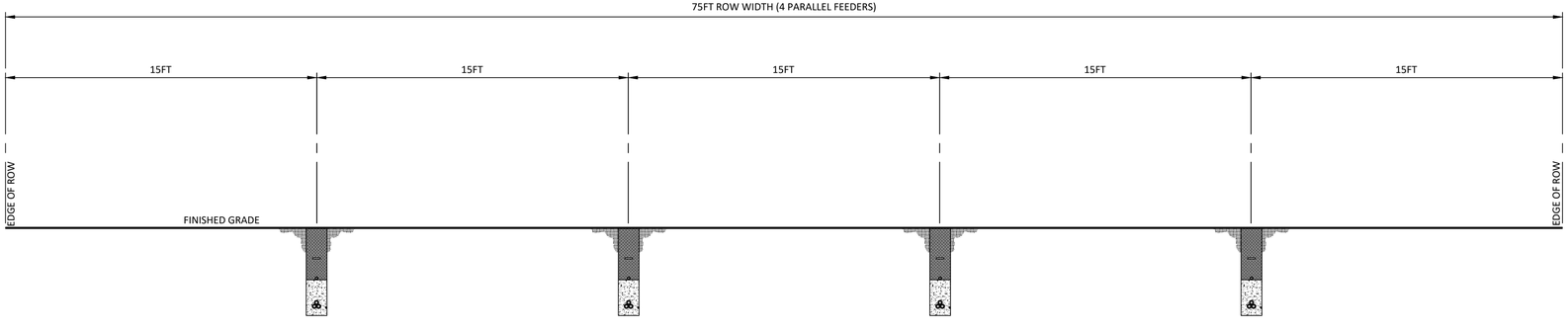

J TYPICAL 4 PARALLEL TRENCH SEPARATION
Not to Scale

NOTES

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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.

Rev	Date	Drawn	Description	Ch'k'd	App'd
B	5/9/2019	BK	Issued for Review	SA	SA
A	4/9/2019	BK	Issued for Review	SA	SA

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Client

Title
HIGH BRIDGE WIND FARM UNDERGROUND COLLECTION CABLE TRENCH DETAILS

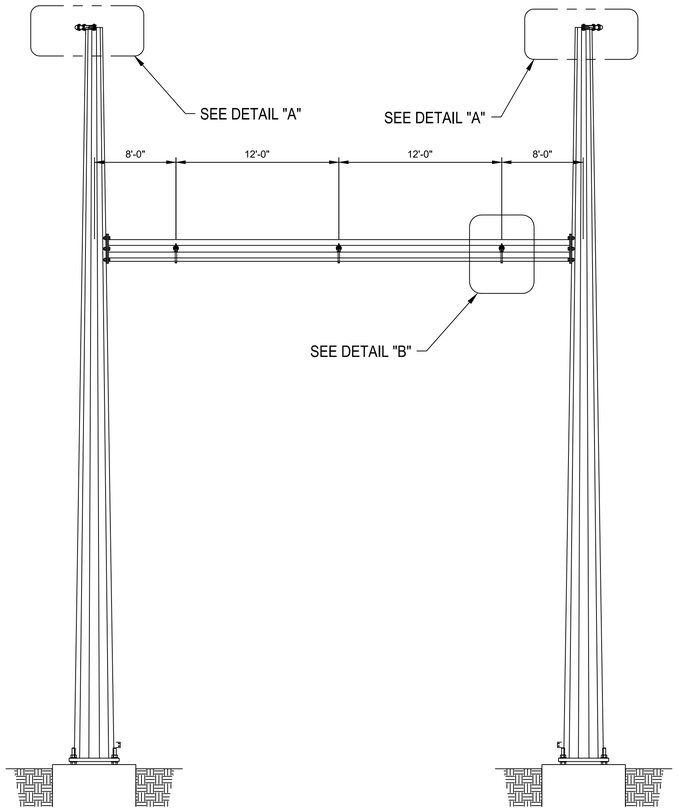
PRELIMINARY
NOT FOR CONSTRUCTION
REPLACE WITH ENGINEERS STAMP AT CONSTRUCTION AND/OR FABRICATION

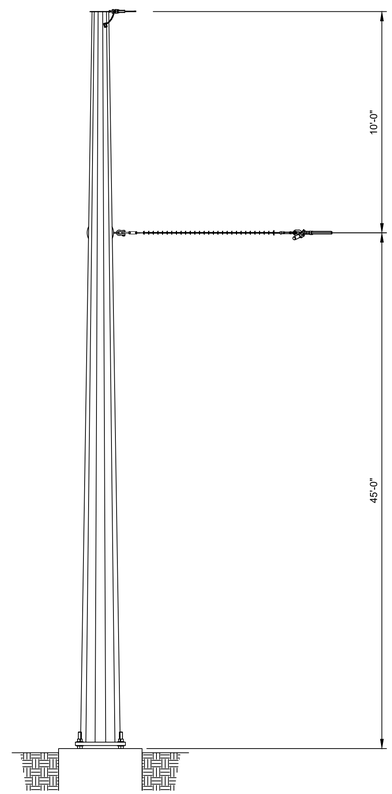
Designed	BK	Eng check	SA
Drawn	BK	Approved	SA
Dwg check	SA	Project Mngr	HM
Scale at ANSI D: N.T.S.		Date: 04/09/2019	Rev: B

Drawing Number: HBW-E-520-02

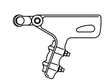
CONCEPTUAL - NOT FOR CONSTRUCTION

A4. HBW-T-100-01 115kV Transmission Line Substation Bay Dead-End

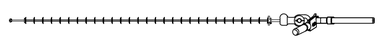




DETAIL "A"
OHSW DEAD-END ASSEMBLY



DETAIL "B"
DEAD-END ASSEMBLY



NOTES

1. ALL INFORMATION SHOWN IS CONCEPTUAL ONLY.

Rev	Date	Drawn	Description	Ch'k'd	App'd
B	5/13/2019	BK	Issued for Review	KS	SA
A	4/9/2019	BK	Issued for Review	SA	SA

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Client

Title
HIGH BRIDGE WIND FARM
115kV TRANSMISSION
SUBSTATION BAY DEAD-END

PRELIMINARY
NOT FOR CONSTRUCTION
REPLACE WITH ENGINEERS STAMP AT CONSTRUCTION AND/OR FABRICATION

Designed	BK	Eng check	SA
Drawn	BK	Approved	SA
Dwg check	SA	Project Mngr	HM
Scale at ANSI D: N.T.S.		Date: 04/09/2019	Rev: B

Drawing Number
HBW-T-100-01

CONCEPTUAL - NOT FOR CONSTRUCTION

B. Residential Clearances

B1. Underground Collection and Overhead Residential Clearances

A UNDERGROUND RESIDENTIAL CLEARANCE 1

B UNDERGROUND RESIDENTIAL CLEARANCE 2

C UNDERGROUND RESIDENTIAL CLEARANCE 3

D UNDERGROUND RESIDENTIAL CLEARANCE 4

LEGEND

- ACCESS ROAD
- CIRCUIT 1
- CIRCUIT 2
- CIRCUIT 3
- CIRCUIT 4
- STREAM
- WETLAND BOUNDARY
- 115 EXISTING TRANSMISSION LINE
- WIND TURBINE GENERATOR (WTG)

E UNDERGROUND RESIDENTIAL CLEARANCE 5

F UNDERGROUND RESIDENTIAL CLEARANCE 6

G UNDERGROUND RESIDENTIAL CLEARANCE 7

H UNDERGROUND RESIDENTIAL CLEARANCE 8

LEGEND

- ACCESS ROAD
- CIRCUIT 1
- CIRCUIT 2
- CIRCUIT 3
- CIRCUIT 4
- STREAM
- WETLAND BOUNDARY
- 115 — EXISTING TRANSMISSION LINE
- WIND TURBINE GENERATOR (WTG)

I UNDERGROUND RESIDENTIAL CLEARANCE 9

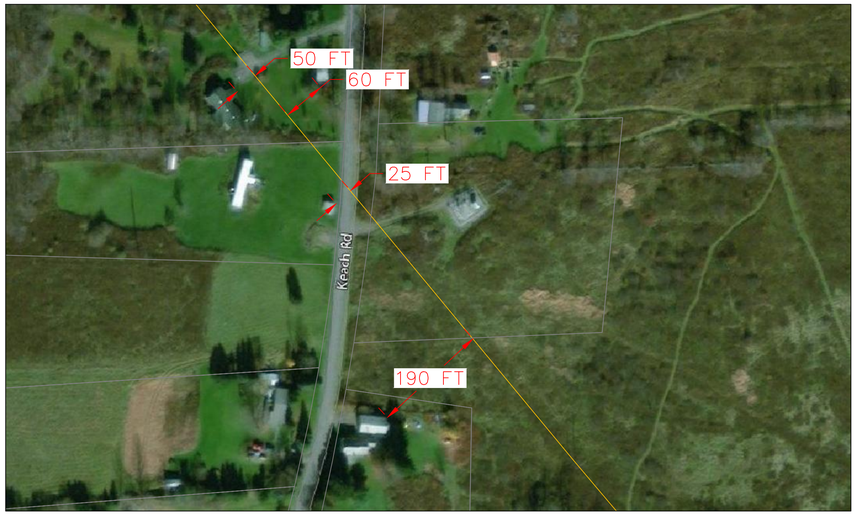
J UNDERGROUND RESIDENTIAL CLEARANCE 10

K OVERHEAD RESIDENTIAL CLEARANCE 1

L OVERHEAD RESIDENTIAL CLEARANCE 2

LEGEND

- ACCESS ROAD
- CIRCUIT 1
- CIRCUIT 2
- CIRCUIT 3
- CIRCUIT 4
- STREAM
- WETLAND BOUNDARY
- 115 EXISTING TRANSMISSION LINE
- WIND TURBINE GENERATOR (WTG)



M UNDERGROUND RESIDENTIAL CLEARANCE 3

N UNDERGROUND RESIDENTIAL CLEARANCE 4

LEGEND

- ACCESS ROAD
- CIRCUIT 1
- CIRCUIT 2
- CIRCUIT 3
- CIRCUIT 4
- STREAM
- WETLAND BOUNDARY
- 115 EXISTING TRANSMISSION LINE
- WIND TURBINE GENERATOR (WTG)

C. Software Output Files

C1. (1)1250kcmil, Al, 42in (Pages 1 – 2)

Case 1- (1) 1250kcmil 42in trench
Magnetic Flux Density [mG]

Study : High Bridge Wind

X (ft)	B(mG)
-500.0	0.0035
-495.0	0.0036
-490.0	0.0036
-485.0	0.0037
-480.0	0.0038
-475.0	0.0039
-470.0	0.0040
-465.0	0.0040
-460.0	0.0041
-455.0	0.0042
-450.0	0.0043
-445.0	0.0044
-440.0	0.0045
-435.0	0.0046
-430.0	0.0047
-425.0	0.0048
-420.0	0.0050
-415.0	0.0051
-410.0	0.0052
-405.0	0.0053
-400.0	0.0055
-395.0	0.0056
-390.0	0.0057
-385.0	0.0059
-380.0	0.0061
-375.0	0.0062
-370.0	0.0064
-365.0	0.0066
-360.0	0.0067
-355.0	0.0069
-350.0	0.0071
-345.0	0.0073
-340.0	0.0076
-335.0	0.0078
-330.0	0.0080
-325.0	0.0083
-320.0	0.0085
-315.0	0.0088
-310.0	0.0091
-305.0	0.0094
-300.0	0.0097
-295.0	0.0100

X (ft)	B(mG)
-290.0	0.0104
-285.0	0.0108
-280.0	0.0112
-275.0	0.0116
-270.0	0.0120
-265.0	0.0124
-260.0	0.0129
-255.0	0.0134
-250.0	0.0140
-245.0	0.0146
-240.0	0.0152
-235.0	0.0158
-230.0	0.0165
-225.0	0.0173
-220.0	0.0181
-215.0	0.0189
-210.0	0.0198
-205.0	0.0208
-200.0	0.0218
-195.0	0.0230
-190.0	0.0242
-185.0	0.0255
-180.0	0.0270
-175.0	0.0285
-170.0	0.0302
-165.0	0.0321
-160.0	0.0341
-155.0	0.0363
-150.0	0.0388
-145.0	0.0415
-140.0	0.0445
-135.0	0.0479
-130.0	0.0516
-125.0	0.0558
-120.0	0.0605
-115.0	0.0659
-110.0	0.0720
-105.0	0.0790
-100.0	0.0870
-95.0	0.0964
-90.0	0.1073
-85.0	0.1202

X (ft)	B(mG)
-80.0	0.1356
-75.0	0.1541
-70.0	0.1767
-65.0	0.2046
-60.0	0.2397
-55.0	0.2845
-50.0	0.3431
-45.0	0.4216
-40.0	0.5302
-35.0	0.6862
-30.0	0.9210
-25.0	1.2965
-20.0	1.9451
-15.0	3.1842
-10.0	5.8429
-5.0	11.7088
0.0	17.5979
5.0	11.7088
10.0	5.8429
15.0	3.1842
20.0	1.9451
25.0	1.2965
30.0	0.9210
35.0	0.6862
40.0	0.5302
45.0	0.4216
50.0	0.3431
55.0	0.2845
60.0	0.2397
65.0	0.2046
70.0	0.1767
75.0	0.1541
80.0	0.1356
85.0	0.1202
90.0	0.1073
95.0	0.0964
100.0	0.0870
105.0	0.0790
110.0	0.0720
115.0	0.0659
120.0	0.0605
125.0	0.0558

Case 1- (1) 1250kcmil 42in trench

Magnetic Flux Density [mG]

Study : High Bridge Wind

X (ft)	B(mG)
130.0	0.0516
135.0	0.0479
140.0	0.0445
145.0	0.0415
150.0	0.0388
155.0	0.0363
160.0	0.0341
165.0	0.0321
170.0	0.0302
175.0	0.0285
180.0	0.0270
185.0	0.0255
190.0	0.0242
195.0	0.0230
200.0	0.0218
205.0	0.0208
210.0	0.0198
215.0	0.0189
220.0	0.0181
225.0	0.0173
230.0	0.0165
235.0	0.0158
240.0	0.0152
245.0	0.0146
250.0	0.0140
255.0	0.0134
260.0	0.0129
265.0	0.0124
270.0	0.0120
275.0	0.0116
280.0	0.0112
285.0	0.0108
290.0	0.0104
295.0	0.0100
300.0	0.0097
305.0	0.0094
310.0	0.0091
315.0	0.0088
320.0	0.0085
325.0	0.0083
330.0	0.0080
335.0	0.0078

X (ft)	B(mG)
340.0	0.0076
345.0	0.0073
350.0	0.0071
355.0	0.0069
360.0	0.0067
365.0	0.0066
370.0	0.0064
375.0	0.0062
380.0	0.0061
385.0	0.0059
390.0	0.0057
395.0	0.0056
400.0	0.0055
405.0	0.0053
410.0	0.0052
415.0	0.0051
420.0	0.0050
425.0	0.0048
430.0	0.0047
435.0	0.0046
440.0	0.0045
445.0	0.0044
450.0	0.0043
455.0	0.0042
460.0	0.0041
465.0	0.0040
470.0	0.0040
475.0	0.0039
480.0	0.0038
485.0	0.0037
490.0	0.0036
495.0	0.0036
500.0	0.0035

C2. (2) 1250kcmil, Al, 42in (Pages 1 – 2)

Case 2- (2) 1250kcmil 42in trench
Magnetic Flux Density [mG]

Study : High Bridge Wind

X (ft)	B(mG)
-500.0	0.0069
-495.0	0.0071
-490.0	0.0072
-485.0	0.0074
-480.0	0.0075
-475.0	0.0077
-470.0	0.0078
-465.0	0.0080
-460.0	0.0082
-455.0	0.0084
-450.0	0.0085
-445.0	0.0087
-440.0	0.0089
-435.0	0.0091
-430.0	0.0094
-425.0	0.0096
-420.0	0.0098
-415.0	0.0100
-410.0	0.0103
-405.0	0.0105
-400.0	0.0108
-395.0	0.0111
-390.0	0.0114
-385.0	0.0117
-380.0	0.0120
-375.0	0.0123
-370.0	0.0126
-365.0	0.0130
-360.0	0.0133
-355.0	0.0137
-350.0	0.0141
-345.0	0.0145
-340.0	0.0150
-335.0	0.0154
-330.0	0.0159
-325.0	0.0164
-320.0	0.0169
-315.0	0.0174
-310.0	0.0180
-305.0	0.0186
-300.0	0.0192
-295.0	0.0199

X (ft)	B(mG)
-290.0	0.0206
-285.0	0.0213
-280.0	0.0221
-275.0	0.0229
-270.0	0.0237
-265.0	0.0247
-260.0	0.0256
-255.0	0.0266
-250.0	0.0277
-245.0	0.0289
-240.0	0.0301
-235.0	0.0314
-230.0	0.0327
-225.0	0.0342
-220.0	0.0358
-215.0	0.0375
-210.0	0.0393
-205.0	0.0412
-200.0	0.0433
-195.0	0.0456
-190.0	0.0480
-185.0	0.0507
-180.0	0.0535
-175.0	0.0567
-170.0	0.0601
-165.0	0.0638
-160.0	0.0678
-155.0	0.0723
-150.0	0.0772
-145.0	0.0827
-140.0	0.0887
-135.0	0.0955
-130.0	0.1030
-125.0	0.1115
-120.0	0.1210
-115.0	0.1319
-110.0	0.1442
-105.0	0.1584
-100.0	0.1749
-95.0	0.1940
-90.0	0.2165
-85.0	0.2431

X (ft)	B(mG)
-80.0	0.2750
-75.0	0.3136
-70.0	0.3611
-65.0	0.4203
-60.0	0.4954
-55.0	0.5929
-50.0	0.7226
-45.0	0.9005
-40.0	1.1540
-35.0	1.5331
-30.0	2.1362
-25.0	3.1756
-20.0	5.1521
-15.0	9.2017
-10.0	15.3364
-5.0	11.5849
0.0	1.0170
5.0	11.5848
10.0	15.3364
15.0	9.2017
20.0	5.1521
25.0	3.1756
30.0	2.1362
35.0	1.5331
40.0	1.1540
45.0	0.9005
50.0	0.7226
55.0	0.5929
60.0	0.4954
65.0	0.4203
70.0	0.3611
75.0	0.3136
80.0	0.2750
85.0	0.2431
90.0	0.2165
95.0	0.1940
100.0	0.1749
105.0	0.1584
110.0	0.1442
115.0	0.1319
120.0	0.1210
125.0	0.1115

Case 2- (2) 1250kcmil 42in trench

Magnetic Flux Density [mG]

Study : High Bridge Wind

X (ft)	B(mG)
130.0	0.1030
135.0	0.0955
140.0	0.0887
145.0	0.0827
150.0	0.0772
155.0	0.0723
160.0	0.0678
165.0	0.0638
170.0	0.0601
175.0	0.0567
180.0	0.0535
185.0	0.0507
190.0	0.0480
195.0	0.0456
200.0	0.0433
205.0	0.0412
210.0	0.0393
215.0	0.0375
220.0	0.0358
225.0	0.0342
230.0	0.0327
235.0	0.0314
240.0	0.0301
245.0	0.0289
250.0	0.0277
255.0	0.0266
260.0	0.0256
265.0	0.0247
270.0	0.0237
275.0	0.0229
280.0	0.0221
285.0	0.0213
290.0	0.0206
295.0	0.0199
300.0	0.0192
305.0	0.0186
310.0	0.0180
315.0	0.0174
320.0	0.0169
325.0	0.0164
330.0	0.0159
335.0	0.0154

X (ft)	B(mG)
340.0	0.0150
345.0	0.0145
350.0	0.0141
355.0	0.0137
360.0	0.0133
365.0	0.0130
370.0	0.0126
375.0	0.0123
380.0	0.0120
385.0	0.0117
390.0	0.0114
395.0	0.0111
400.0	0.0108
405.0	0.0105
410.0	0.0103
415.0	0.0100
420.0	0.0098
425.0	0.0096
430.0	0.0094
435.0	0.0091
440.0	0.0089
445.0	0.0087
450.0	0.0085
455.0	0.0084
460.0	0.0082
465.0	0.0080
470.0	0.0078
475.0	0.0077
480.0	0.0075
485.0	0.0074
490.0	0.0072
495.0	0.0071
500.0	0.0069

C3. (3) 1250kcmil, Al, 42in (Pages 1 – 2)

Case 3- (3) 1250kcmil 42in trench
Magnetic Flux Density [mG]

Study : High Bridge Wind

X (ft)	B(mG)
-500.0	0.0103
-495.0	0.0105
-490.0	0.0107
-485.0	0.0109
-480.0	0.0112
-475.0	0.0114
-470.0	0.0117
-465.0	0.0119
-460.0	0.0122
-455.0	0.0124
-450.0	0.0127
-445.0	0.0130
-440.0	0.0133
-435.0	0.0136
-430.0	0.0139
-425.0	0.0143
-420.0	0.0146
-415.0	0.0150
-410.0	0.0153
-405.0	0.0157
-400.0	0.0161
-395.0	0.0165
-390.0	0.0169
-385.0	0.0174
-380.0	0.0178
-375.0	0.0183
-370.0	0.0188
-365.0	0.0194
-360.0	0.0199
-355.0	0.0205
-350.0	0.0211
-345.0	0.0217
-340.0	0.0223
-335.0	0.0230
-330.0	0.0237
-325.0	0.0244
-320.0	0.0252
-315.0	0.0260
-310.0	0.0269
-305.0	0.0277
-300.0	0.0287
-295.0	0.0297

X (ft)	B(mG)
-290.0	0.0307
-285.0	0.0318
-280.0	0.0330
-275.0	0.0342
-270.0	0.0355
-265.0	0.0368
-260.0	0.0382
-255.0	0.0398
-250.0	0.0414
-245.0	0.0431
-240.0	0.0449
-235.0	0.0469
-230.0	0.0490
-225.0	0.0512
-220.0	0.0535
-215.0	0.0561
-210.0	0.0588
-205.0	0.0617
-200.0	0.0649
-195.0	0.0683
-190.0	0.0720
-185.0	0.0760
-180.0	0.0803
-175.0	0.0850
-170.0	0.0902
-165.0	0.0958
-160.0	0.1020
-155.0	0.1088
-150.0	0.1163
-145.0	0.1246
-140.0	0.1338
-135.0	0.1442
-130.0	0.1557
-125.0	0.1688
-120.0	0.1835
-115.0	0.2003
-110.0	0.2196
-105.0	0.2418
-100.0	0.2675
-95.0	0.2977
-90.0	0.3334
-85.0	0.3760

X (ft)	B(mG)
-80.0	0.4275
-75.0	0.4906
-70.0	0.5691
-65.0	0.6687
-60.0	0.7977
-55.0	0.9694
-50.0	1.2054
-45.0	1.5434
-40.0	2.0537
-35.0	2.8783
-30.0	4.3319
-25.0	7.1439
-20.0	12.3937
-15.0	14.7088
-10.0	4.8361
-5.0	6.6400
0.0	13.2567
5.0	6.6400
10.0	4.8361
15.0	14.7088
20.0	12.3937
25.0	7.1439
30.0	4.3319
35.0	2.8783
40.0	2.0537
45.0	1.5434
50.0	1.2054
55.0	0.9694
60.0	0.7977
65.0	0.6687
70.0	0.5691
75.0	0.4906
80.0	0.4275
85.0	0.3760
90.0	0.3334
95.0	0.2977
100.0	0.2675
105.0	0.2418
110.0	0.2196
115.0	0.2003
120.0	0.1835
125.0	0.1688

Case 3- (3) 1250kcmil 42in trench

Magnetic Flux Density [mG]

Study : High Bridge Wind

X (ft)	B(mG)
130.0	0.1557
135.0	0.1442
140.0	0.1338
145.0	0.1246
150.0	0.1163
155.0	0.1088
160.0	0.1020
165.0	0.0958
170.0	0.0902
175.0	0.0850
180.0	0.0803
185.0	0.0760
190.0	0.0720
195.0	0.0683
200.0	0.0649
205.0	0.0617
210.0	0.0588
215.0	0.0561
220.0	0.0535
225.0	0.0512
230.0	0.0490
235.0	0.0469
240.0	0.0449
245.0	0.0431
250.0	0.0414
255.0	0.0398
260.0	0.0382
265.0	0.0368
270.0	0.0355
275.0	0.0342
280.0	0.0330
285.0	0.0318
290.0	0.0307
295.0	0.0297
300.0	0.0287
305.0	0.0277
310.0	0.0269
315.0	0.0260
320.0	0.0252
325.0	0.0244
330.0	0.0237
335.0	0.0230

X (ft)	B(mG)
340.0	0.0223
345.0	0.0217
350.0	0.0211
355.0	0.0205
360.0	0.0199
365.0	0.0194
370.0	0.0188
375.0	0.0183
380.0	0.0178
385.0	0.0174
390.0	0.0169
395.0	0.0165
400.0	0.0161
405.0	0.0157
410.0	0.0153
415.0	0.0150
420.0	0.0146
425.0	0.0143
430.0	0.0139
435.0	0.0136
440.0	0.0133
445.0	0.0130
450.0	0.0127
455.0	0.0124
460.0	0.0122
465.0	0.0119
470.0	0.0117
475.0	0.0114
480.0	0.0112
485.0	0.0109
490.0	0.0107
495.0	0.0105
500.0	0.0103

C4. (4) 1250kcmil, Al, 42in (Pages 1 – 2)

Case 4- (4) 1250 kcmil 42in trench
Magnetic Flux Density [mG]

Study : High Bridge Wind

X (ft)	B(mG)
-500.0	0.0137
-495.0	0.0140
-490.0	0.0143
-485.0	0.0146
-480.0	0.0149
-475.0	0.0152
-470.0	0.0155
-465.0	0.0159
-460.0	0.0162
-455.0	0.0166
-450.0	0.0170
-445.0	0.0174
-440.0	0.0178
-435.0	0.0182
-430.0	0.0186
-425.0	0.0190
-420.0	0.0195
-415.0	0.0200
-410.0	0.0205
-405.0	0.0210
-400.0	0.0215
-395.0	0.0220
-390.0	0.0226
-385.0	0.0232
-380.0	0.0238
-375.0	0.0245
-370.0	0.0251
-365.0	0.0258
-360.0	0.0266
-355.0	0.0273
-350.0	0.0281
-345.0	0.0289
-340.0	0.0298
-335.0	0.0307
-330.0	0.0317
-325.0	0.0326
-320.0	0.0337
-315.0	0.0348
-310.0	0.0359
-305.0	0.0371
-300.0	0.0384
-295.0	0.0397

X (ft)	B(mG)
-290.0	0.0411
-285.0	0.0425
-280.0	0.0441
-275.0	0.0457
-270.0	0.0475
-265.0	0.0493
-260.0	0.0512
-255.0	0.0533
-250.0	0.0555
-245.0	0.0578
-240.0	0.0602
-235.0	0.0629
-230.0	0.0657
-225.0	0.0687
-220.0	0.0719
-215.0	0.0753
-210.0	0.0790
-205.0	0.0830
-200.0	0.0873
-195.0	0.0919
-190.0	0.0969
-185.0	0.1024
-180.0	0.1083
-175.0	0.1147
-170.0	0.1217
-165.0	0.1295
-160.0	0.1379
-155.0	0.1473
-150.0	0.1576
-145.0	0.1691
-140.0	0.1819
-135.0	0.1962
-130.0	0.2124
-125.0	0.2306
-120.0	0.2513
-115.0	0.2751
-110.0	0.3024
-105.0	0.3341
-100.0	0.3711
-95.0	0.4149
-90.0	0.4672
-85.0	0.5304

X (ft)	B(mG)
-80.0	0.6078
-75.0	0.7043
-70.0	0.8268
-65.0	0.9862
-60.0	1.1996
-55.0	1.4957
-50.0	1.9256
-45.0	2.5877
-40.0	3.6885
-35.0	5.6965
-30.0	9.5918
-25.0	14.8334
-20.0	9.9621
-15.0	3.0161
-10.0	10.8709
-5.0	10.1100
0.0	3.5272
5.0	10.1100
10.0	10.8709
15.0	3.0161
20.0	9.9621
25.0	14.8334
30.0	9.5918
35.0	5.6965
40.0	3.6885
45.0	2.5877
50.0	1.9256
55.0	1.4957
60.0	1.1996
65.0	0.9862
70.0	0.8268
75.0	0.7043
80.0	0.6078
85.0	0.5304
90.0	0.4672
95.0	0.4149
100.0	0.3711
105.0	0.3341
110.0	0.3024
115.0	0.2751
120.0	0.2513
125.0	0.2306

Case 4- (4) 1250 kcmil 42in trench

Magnetic Flux Density [mG]

Study : High Bridge Wind

X (ft)	B(mG)
130.0	0.2124
135.0	0.1962
140.0	0.1819
145.0	0.1691
150.0	0.1576
155.0	0.1473
160.0	0.1379
165.0	0.1295
170.0	0.1217
175.0	0.1147
180.0	0.1083
185.0	0.1024
190.0	0.0969
195.0	0.0919
200.0	0.0873
205.0	0.0830
210.0	0.0790
215.0	0.0753
220.0	0.0719
225.0	0.0687
230.0	0.0657
235.0	0.0629
240.0	0.0602
245.0	0.0578
250.0	0.0555
255.0	0.0533
260.0	0.0512
265.0	0.0493
270.0	0.0475
275.0	0.0457
280.0	0.0441
285.0	0.0425
290.0	0.0411
295.0	0.0397
300.0	0.0384
305.0	0.0371
310.0	0.0359
315.0	0.0348
320.0	0.0337
325.0	0.0326
330.0	0.0317
335.0	0.0307

X (ft)	B(mG)
340.0	0.0298
345.0	0.0289
350.0	0.0281
355.0	0.0273
360.0	0.0266
365.0	0.0258
370.0	0.0251
375.0	0.0245
380.0	0.0238
385.0	0.0232
390.0	0.0226
395.0	0.0220
400.0	0.0215
405.0	0.0210
410.0	0.0205
415.0	0.0200
420.0	0.0195
425.0	0.0190
430.0	0.0186
435.0	0.0182
440.0	0.0178
445.0	0.0174
450.0	0.0170
455.0	0.0166
460.0	0.0162
465.0	0.0159
470.0	0.0155
475.0	0.0152
480.0	0.0149
485.0	0.0146
490.0	0.0143
495.0	0.0140
500.0	0.0137

C5. TLINE EMF Report, PLS-CADD (Pages 1 - 27)

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	50	-500	1118383	890213.2	1726.64	0.28	0.15678	29.2	0.321	0.001	0.00002	1.5	88.9	0.001
2	50	-495	1118380	890217.1	1726.64	0.286	0.15991	29.2	0.328	0.001	0.00002	1.7	88.9	0.001
3	50	-490	1118377	890221	1726.64	0.292	0.16313	29.2	0.334	0.001	0.00003	1.9	88.9	0.001
4	50	-485	1118374	890224.9	1726.64	0.298	0.16645	29.2	0.341	0.001	0.00003	2.2	88.9	0.001
5	50	-480	1118371	890228.7	1726.64	0.304	0.16987	29.2	0.348	0.001	0.00004	2.4	88.9	0.001
6	50	-475	1118367	890232.6	1726.64	0.311	0.1734	29.2	0.356	0.001	0.00004	2.6	88.9	0.001
7	50	-470	1118364	890236.5	1726.64	0.317	0.17704	29.2	0.363	0.001	0.00005	2.8	88.9	0.001
8	50	-465	1118361	890240.4	1726.64	0.324	0.18079	29.2	0.371	0.001	0.00005	3.1	88.8	0.001
9	50	-460	1118358	890244.2	1726.64	0.331	0.18467	29.1	0.379	0.001	0.00006	3.3	88.8	0.001
10	50	-455	1118355	890248.1	1726.64	0.338	0.18867	29.1	0.388	0.001	0.00006	3.5	88.8	0.001
11	50	-450	1118352	890252	1726.64	0.346	0.1928	29.1	0.396	0.001	0.00007	3.7	88.8	0.001
12	50	-445	1118348	890255.9	1726.64	0.354	0.19707	29.1	0.405	0.001	0.00008	4	88.8	0.001
13	50	-440	1118345	890259.8	1726.64	0.362	0.20148	29.1	0.414	0.001	0.00008	4.2	88.8	0.001
14	50	-435	1118342	890263.6	1726.64	0.37	0.20604	29.1	0.424	0.001	0.00009	4.4	88.8	0.001
15	50	-430	1118339	890267.5	1726.64	0.379	0.21076	29.1	0.434	0.001	0.0001	4.7	88.7	0.001
16	50	-425	1118336	890271.4	1726.64	0.388	0.21564	29.1	0.444	0.001	0.00011	4.9	88.7	0.001
17	50	-420	1118333	890275.3	1726.64	0.397	0.22069	29.1	0.454	0.001	0.00011	5.1	88.7	0.001
18	50	-415	1118329	890279.1	1726.64	0.407	0.22592	29.1	0.465	0.001	0.00012	5.3	88.7	0.001
19	50	-410	1118326	890283	1726.64	0.417	0.23134	29	0.477	0.001	0.00013	5.6	88.7	0.001
20	50	-405	1118323	890286.9	1726.64	0.427	0.23695	29	0.488	0.001	0.00014	5.8	88.7	0.001
21	50	-400	1118320	890290.8	1726.64	0.438	0.24277	29	0.5	0.001	0.00015	6	88.6	0.001
22	50	-395	1118317	890294.6	1726.64	0.449	0.24881	29	0.513	0.002	0.00017	6.3	88.6	0.002
23	50	-390	1118314	890298.5	1726.64	0.46	0.25507	29	0.526	0.002	0.00018	6.5	88.6	0.002
24	50	-385	1118311	890302.4	1726.64	0.472	0.26158	29	0.54	0.002	0.00019	6.7	88.6	0.002
25	50	-380	1118307	890306.3	1726.64	0.485	0.26833	29	0.554	0.002	0.00021	6.9	88.6	0.002
26	50	-375	1118304	890310.1	1726.64	0.498	0.27535	29	0.569	0.002	0.00022	7.2	88.6	0.002
27	50	-370	1118301	890314	1726.64	0.511	0.28265	28.9	0.584	0.002	0.00024	7.4	88.5	0.002
28	50	-365	1118298	890317.9	1726.64	0.525	0.29024	28.9	0.6	0.002	0.00025	7.6	88.5	0.002
29	50	-360	1118295	890321.8	1726.64	0.54	0.29814	28.9	0.617	0.002	0.00027	7.9	88.5	0.002
30	50	-355	1118292	890325.6	1726.64	0.555	0.30636	28.9	0.634	0.002	0.00029	8.1	88.5	0.002
31	50	-350	1118288	890329.5	1726.64	0.571	0.31493	28.9	0.652	0.002	0.00031	8.3	88.4	0.002
32	50	-345	1118285	890333.4	1726.64	0.588	0.32386	28.9	0.671	0.002	0.00033	8.5	88.4	0.002
33	50	-340	1118282	890337.3	1726.64	0.605	0.33318	28.8	0.691	0.002	0.00036	8.8	88.4	0.002
34	50	-335	1118279	890341.1	1726.64	0.623	0.3429	28.8	0.711	0.002	0.00038	9	88.4	0.002
35	50	-330	1118276	890345	1726.64	0.642	0.35305	28.8	0.733	0.003	0.00041	9.2	88.4	0.003
36	50	-325	1118273	890348.9	1726.64	0.662	0.36366	28.8	0.755	0.003	0.00044	9.4	88.3	0.003

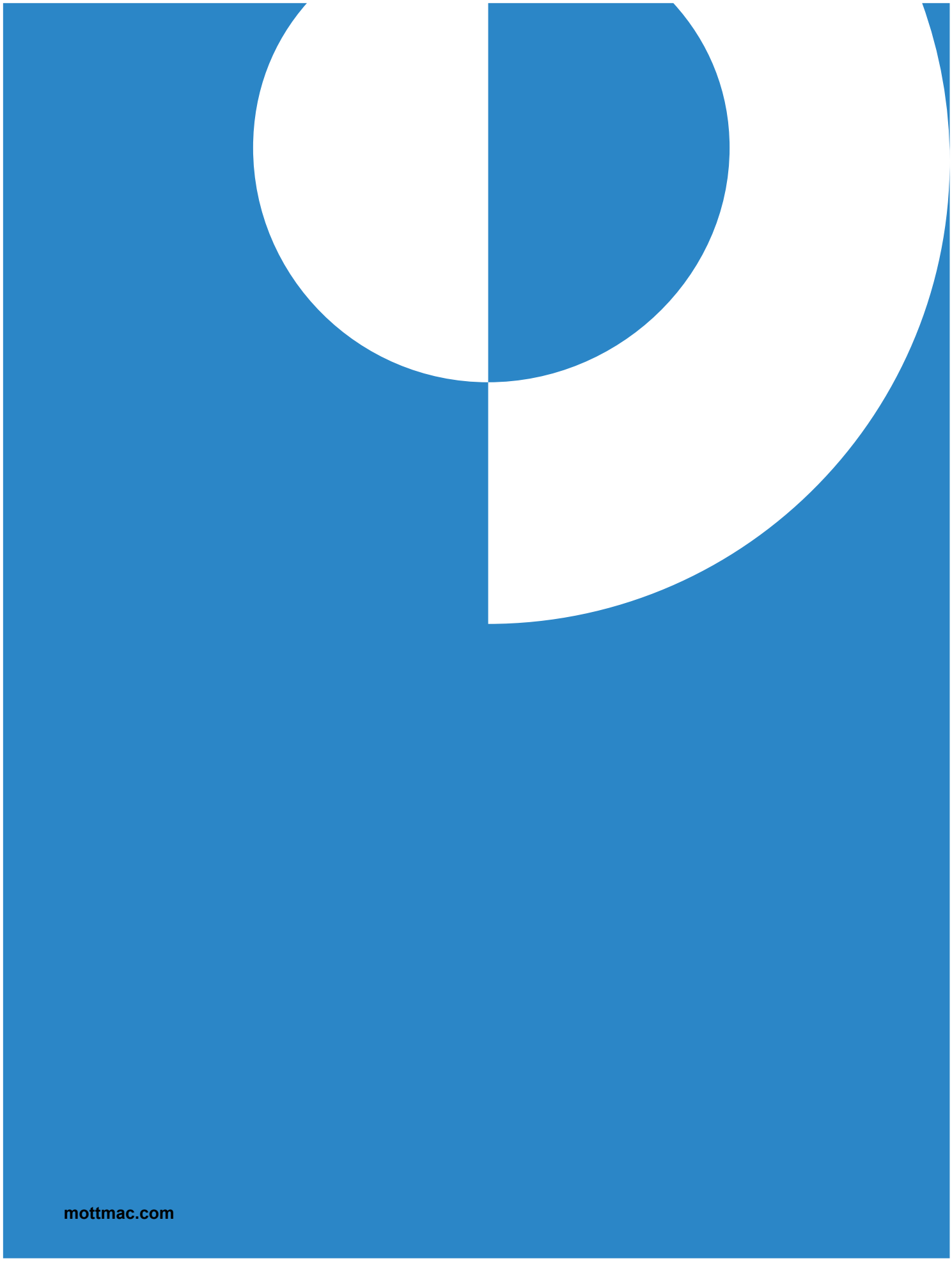
37	50	-320	1118269	890352.8	1726.64	0.682	0.37475	28.8	0.778	0.003	0.00047	9.6	88.3	0.003
38	50	-315	1118266	890356.6	1726.64	0.704	0.38635	28.8	0.803	0.003	0.0005	9.9	88.3	0.003
39	50	-310	1118263	890360.5	1726.64	0.727	0.39849	28.7	0.829	0.003	0.00054	10.1	88.2	0.003
40	50	-305	1118260	890364.4	1726.64	0.751	0.41122	28.7	0.856	0.003	0.00058	10.3	88.2	0.003
41	50	-300	1118257	890368.3	1726.64	0.776	0.42456	28.7	0.884	0.003	0.00062	10.5	88.2	0.003
42	50	-295	1118254	890372.1	1726.64	0.802	0.43856	28.7	0.914	0.003	0.00066	10.7	88.2	0.004
43	50	-290	1118251	890376	1726.64	0.829	0.45326	28.7	0.945	0.004	0.00071	10.9	88.1	0.004
44	50	-285	1118247	890379.9	1726.64	0.858	0.4687	28.6	0.978	0.004	0.00076	11.2	88.1	0.004
45	50	-280	1118244	890383.8	1726.64	0.889	0.48495	28.6	1.013	0.004	0.00081	11.4	88.1	0.004
46	50	-275	1118241	890387.6	1726.64	0.921	0.50205	28.6	1.049	0.004	0.00087	11.6	88	0.004
47	50	-270	1118238	890391.5	1726.64	0.955	0.52006	28.6	1.088	0.004	0.00094	11.8	88	0.005
48	50	-265	1118235	890395.4	1726.64	0.991	0.53905	28.5	1.128	0.005	0.00101	12	87.9	0.005
49	50	-260	1118232	890399.3	1726.64	1.029	0.5591	28.5	1.171	0.005	0.00108	12.2	87.9	0.005
50	50	-255	1118228	890403.1	1726.64	1.07	0.58027	28.5	1.217	0.005	0.00116	12.4	87.9	0.005
51	50	-250	1118225	890407	1726.64	1.112	0.60267	28.4	1.265	0.006	0.00125	12.6	87.8	0.006
52	50	-245	1118222	890410.9	1726.64	1.157	0.62637	28.4	1.316	0.006	0.00135	12.8	87.8	0.006
53	50	-240	1118219	890414.8	1726.64	1.205	0.65149	28.4	1.37	0.006	0.00145	13	87.7	0.006
54	50	-235	1118216	890418.6	1726.64	1.256	0.67814	28.4	1.428	0.007	0.00156	13.2	87.7	0.007
55	50	-230	1118213	890422.5	1726.64	1.311	0.70644	28.3	1.489	0.007	0.00169	13.4	87.6	0.007
56	50	-225	1118209	890426.4	1726.64	1.369	0.73653	28.3	1.554	0.008	0.00182	13.6	87.6	0.008
57	50	-220	1118206	890430.3	1726.64	1.43	0.76858	28.3	1.624	0.008	0.00197	13.8	87.5	0.008
58	50	-215	1118203	890434.1	1726.64	1.496	0.80273	28.2	1.698	0.009	0.00213	14	87.5	0.009
59	50	-210	1118200	890438	1726.64	1.567	0.83919	28.2	1.777	0.009	0.00231	14.1	87.4	0.009
60	50	-205	1118197	890441.9	1726.64	1.642	0.87817	28.1	1.863	0.01	0.00251	14.3	87.4	0.01
61	50	-200	1118194	890445.8	1726.64	1.724	0.91989	28.1	1.954	0.011	0.00272	14.5	87.3	0.011
62	50	-195	1118190	890449.7	1726.64	1.811	0.96462	28	2.052	0.011	0.00296	14.6	87.2	0.012
63	50	-190	1118187	890453.5	1726.64	1.905	1.01265	28	2.157	0.012	0.00322	14.8	87.2	0.013
64	50	-185	1118184	890457.4	1726.64	2.006	1.0643	27.9	2.271	0.013	0.00351	15	87.1	0.014
65	50	-180	1118181	890461.3	1726.64	2.116	1.11996	27.9	2.394	0.014	0.00383	15.1	87	0.015
66	50	-175	1118178	890465.2	1726.64	2.234	1.18003	27.8	2.527	0.015	0.00419	15.3	87	0.016
67	50	-170	1118175	890469	1726.64	2.363	1.24498	27.8	2.671	0.017	0.00459	15.4	86.9	0.017
68	50	-165	1118172	890472.9	1726.64	2.503	1.31536	27.7	2.828	0.018	0.00504	15.5	86.8	0.019
69	50	-160	1118168	890476.8	1726.64	2.655	1.39176	27.7	2.998	0.02	0.00553	15.7	86.7	0.02
70	50	-155	1118165	890480.7	1726.64	2.822	1.47489	27.6	3.184	0.022	0.00609	15.8	86.6	0.022
71	50	-150	1118162	890484.5	1726.64	3.004	1.56554	27.5	3.388	0.024	0.00672	15.9	86.5	0.025
72	50	-145	1118159	890488.4	1726.64	3.205	1.66462	27.4	3.611	0.026	0.00743	16	86.4	0.027
73	50	-140	1118156	890492.3	1726.64	3.425	1.77319	27.4	3.857	0.028	0.00823	16.1	86.3	0.03
74	50	-135	1118153	890496.2	1726.64	3.668	1.89245	27.3	4.128	0.031	0.00914	16.2	86.2	0.033
75	50	-130	1118149	890500	1726.64	3.938	2.02383	27.2	4.427	0.035	0.01018	16.3	86.1	0.036

76	50	-125	1118146	890503.9	1726.64	4.237	2.16897	27.1	4.76	0.039	0.01136	16.4	86	0.04
77	50	-120	1118143	890507.8	1726.64	4.57	2.32978	27	5.129	0.043	0.01272	16.4	85.8	0.045
78	50	-115	1118140	890511.7	1726.64	4.942	2.50852	26.9	5.542	0.048	0.01428	16.5	85.7	0.05
79	50	-110	1118137	890515.5	1726.64	5.36	2.70786	26.8	6.005	0.054	0.01608	16.5	85.6	0.056
80	50	-105	1118134	890519.4	1726.64	5.831	2.93091	26.7	6.526	0.061	0.01816	16.6	85.4	0.064
81	50	-100	1118130	890523.3	1726.64	6.362	3.18142	26.6	7.113	0.069	0.02059	16.6	85.3	0.072
82	50	-95	1118127	890527.2	1726.64	6.966	3.46381	26.4	7.78	0.078	0.02342	16.6	85.1	0.082
83	50	-90	1118124	890531	1726.64	7.653	3.78337	26.3	8.537	0.089	0.02674	16.7	85	0.093
84	50	-85	1118121	890534.9	1726.64	8.44	4.14645	26.2	9.403	0.102	0.03065	16.7	84.8	0.107
85	50	-80	1118118	890538.8	1726.64	9.342	4.56066	26	10.396	0.118	0.03526	16.7	84.7	0.123
86	50	-75	1118115	890542.7	1726.64	10.383	5.03514	25.9	11.539	0.136	0.04073	16.7	84.6	0.142
87	50	-70	1118111	890546.5	1726.64	11.586	5.58087	25.7	12.86	0.157	0.04724	16.7	84.5	0.164
88	50	-65	1118108	890550.4	1726.64	12.981	6.21096	25.6	14.39	0.182	0.055	16.8	84.4	0.19
89	50	-60	1118105	890554.3	1726.64	14.6	6.94103	25.4	16.166	0.211	0.06426	16.9	84.4	0.221
90	50	-55	1118102	890558.2	1726.64	16.479	7.78936	25.3	18.227	0.245	0.07528	17.1	84.5	0.256
91	50	-50	1118099	890562	1726.64	18.653	8.77697	25.2	20.615	0.283	0.08833	17.4	84.7	0.296
92	50	-45	1118096	890565.9	1726.64	21.154	9.92705	25.1	23.367	0.324	0.1036	17.8	85.1	0.34
93	50	-40	1118093	890569.8	1726.64	23.994	11.26348	25.1	26.506	0.365	0.1211	18.4	85.7	0.385
94	50	-35	1118089	890573.7	1726.64	27.157	12.80764	25.2	30.026	0.402	0.14041	19.2	86.7	0.426
95	50	-30	1118086	890577.5	1726.64	30.572	14.57232	25.5	33.867	0.429	0.16037	20.5	88.2	0.457
96	50	-25	1118083	890581.4	1726.64	34.093	16.55162	25.9	37.899	0.434	0.17853	22.4	90.2	0.469
97	50	-20	1118080	890585.3	1726.64	37.486	18.70626	26.5	41.894	0.41	0.19077	25	93.2	0.452
98	50	-15	1118077	890589.2	1726.64	40.442	20.9458	27.4	45.544	0.348	0.19118	28.8	97.4	0.397
99	50	-10	1118074	890593	1726.64	42.632	23.11469	28.5	48.495	0.252	0.17322	34.5	104.5	0.305
100	50	-5	1118070	890596.9	1726.64	43.788	24.99474	29.7	50.42	0.141	0.13293	43.4	119.2	0.189
101	50	0	1118067	890600.8	1726.64	43.776	26.33822	31	51.088	0.098	0.07746	38.3	182.8	0.105
102	50	5	1118064	890604.7	1726.64	42.623	26.9328	32.3	50.42	0.186	0.06832	20.1	241.6	0.195
103	50	10	1118061	890608.5	1726.64	40.5	26.67484	33.4	48.495	0.28	0.13796	26.2	255.8	0.311
104	50	15	1118058	890612.4	1726.64	37.662	25.61004	34.2	45.544	0.344	0.21093	31.5	262.7	0.403
105	50	20	1118055	890616.3	1726.64	34.398	23.91516	34.8	41.894	0.375	0.26382	35.1	266.9	0.458
106	50	25	1118051	890620.2	1726.64	30.978	21.83284	35.2	37.899	0.377	0.29104	37.7	269.8	0.476
107	50	30	1118048	890624	1726.64	27.62	19.59906	35.4	33.867	0.358	0.29506	39.5	271.8	0.464
108	50	35	1118045	890627.9	1726.64	24.473	17.39617	35.4	30.026	0.327	0.28218	40.7	273.2	0.432
109	50	40	1118042	890631.8	1726.64	21.616	15.33955	35.4	26.506	0.292	0.25928	41.6	274.2	0.39
110	50	45	1118039	890635.7	1726.64	19.082	13.48682	35.3	23.367	0.256	0.23194	42.2	274.9	0.345
111	50	50	1118036	890639.6	1726.64	16.865	11.85523	35.1	20.615	0.222	0.20395	42.6	275.3	0.301
112	50	55	1118033	890643.4	1726.64	14.942	10.43796	34.9	18.227	0.191	0.17748	42.9	275.5	0.261
113	50	60	1118029	890647.3	1726.64	13.281	9.21616	34.8	16.166	0.165	0.15361	43	275.6	0.225
114	50	65	1118026	890651.2	1726.64	11.848	8.16644	34.6	14.39	0.142	0.13268	43.1	275.6	0.194

115	50	70	1118023	890655.1	1726.64	10.611	7.26505	34.4	12.86	0.122	0.11463	43.2	275.5	0.168
116	50	75	1118020	890658.9	1726.64	9.541	6.49003	34.2	11.539	0.106	0.09921	43.2	275.4	0.145
117	50	80	1118017	890662.8	1726.64	8.613	5.82196	34.1	10.396	0.092	0.08611	43.2	275.3	0.126
118	50	85	1118014	890666.7	1726.64	7.805	5.2442	33.9	9.403	0.08	0.075	43.2	275.1	0.11
119	50	90	1118010	890670.6	1726.64	7.099	4.74265	33.7	8.537	0.07	0.06557	43.2	275	0.096
120	50	95	1118007	890674.4	1726.64	6.479	4.30553	33.6	7.78	0.061	0.05757	43.2	274.8	0.084
121	50	100	1118004	890678.3	1726.64	5.934	3.92299	33.5	7.113	0.054	0.05074	43.2	274.7	0.074
122	50	105	1118001	890682.2	1726.64	5.452	3.58684	33.3	6.526	0.048	0.04491	43.2	274.5	0.066
123	50	110	1117998	890686.1	1726.64	5.024	3.29027	33.2	6.005	0.042	0.03991	43.3	274.4	0.058
124	50	115	1117995	890689.9	1726.64	4.642	3.02759	33.1	5.542	0.038	0.03561	43.3	274.2	0.052
125	50	120	1117991	890693.8	1726.64	4.302	2.79404	33	5.129	0.034	0.03188	43.3	274.1	0.046
126	50	125	1117988	890697.7	1726.64	3.996	2.58562	32.9	4.76	0.03	0.02866	43.4	274	0.042
127	50	130	1117985	890701.6	1726.64	3.721	2.39899	32.8	4.427	0.027	0.02584	43.5	273.9	0.038
128	50	135	1117982	890705.4	1726.64	3.473	2.23129	32.7	4.128	0.025	0.02338	43.5	273.7	0.034
129	50	140	1117979	890709.3	1726.64	3.248	2.08013	32.6	3.857	0.022	0.02123	43.6	273.6	0.031
130	50	145	1117976	890713.2	1726.64	3.044	1.94346	32.6	3.611	0.02	0.01932	43.7	273.5	0.028
131	50	150	1117972	890717.1	1726.64	2.858	1.81954	32.5	3.388	0.018	0.01764	43.8	273.4	0.026
132	50	155	1117969	890720.9	1726.64	2.688	1.70685	32.4	3.184	0.017	0.01615	43.9	273.3	0.023
133	50	160	1117966	890724.8	1726.64	2.533	1.60411	32.3	2.998	0.015	0.01483	44	273.2	0.021
134	50	165	1117963	890728.7	1726.64	2.39	1.5102	32.3	2.828	0.014	0.01365	44.1	273.2	0.02
135	50	170	1117960	890732.6	1726.64	2.26	1.42417	32.2	2.671	0.013	0.01259	44.2	273.1	0.018
136	50	175	1117957	890736.4	1726.64	2.139	1.34516	32.2	2.527	0.012	0.01164	44.3	273	0.017
137	50	180	1117954	890740.3	1726.64	2.028	1.27245	32.1	2.394	0.011	0.01078	44.4	272.9	0.015
138	50	185	1117950	890744.2	1726.64	1.925	1.2054	32.1	2.271	0.01	0.01001	44.6	272.8	0.014
139	50	190	1117947	890748.1	1726.64	1.829	1.14343	32	2.157	0.009	0.00931	44.7	272.8	0.013
140	50	195	1117944	890751.9	1726.64	1.741	1.08606	32	2.052	0.009	0.00867	44.8	272.7	0.012
141	50	200	1117941	890755.8	1726.64	1.658	1.03285	31.9	1.954	0.008	0.0081	45	272.6	0.011
142	50	205	1117938	890759.7	1726.64	1.582	0.98341	31.9	1.863	0.008	0.00757	45.1	92.6	0.011
143	50	210	1117935	890763.6	1726.64	1.51	0.9374	31.8	1.777	0.007	0.00709	45.3	92.5	0.01
144	50	215	1117931	890767.4	1726.64	1.443	0.89451	31.8	1.698	0.007	0.00665	45.4	92.5	0.009
145	50	220	1117928	890771.3	1726.64	1.381	0.85447	31.8	1.624	0.006	0.00625	45.6	92.4	0.009
146	50	225	1117925	890775.2	1726.64	1.322	0.81703	31.7	1.554	0.006	0.00588	45.7	92.4	0.008
147	50	230	1117922	890779.1	1726.64	1.267	0.78197	31.7	1.489	0.005	0.00554	45.9	92.3	0.008
148	50	235	1117919	890782.9	1726.64	1.216	0.74911	31.6	1.428	0.005	0.00523	46.1	92.3	0.007
149	50	240	1117916	890786.8	1726.64	1.167	0.71825	31.6	1.37	0.005	0.00494	46.2	92.2	0.007
150	50	245	1117912	890790.7	1726.64	1.121	0.68925	31.6	1.316	0.004	0.00467	46.4	92.2	0.006
151	50	250	1117909	890794.6	1726.64	1.078	0.66196	31.6	1.265	0.004	0.00442	46.6	92.1	0.006
152	50	255	1117906	890798.4	1726.64	1.037	0.63624	31.5	1.217	0.004	0.00419	46.7	92.1	0.006
153	50	260	1117903	890802.3	1726.64	0.999	0.61198	31.5	1.171	0.004	0.00398	46.9	92.1	0.005

154	50	265	1117900	890806.2	1726.64	0.963	0.58908	31.5	1.128	0.004	0.00378	47.1	92	0.005
155	50	270	1117897	890810.1	1726.64	0.928	0.56743	31.4	1.088	0.003	0.0036	47.3	92	0.005
156	50	275	1117894	890813.9	1726.64	0.895	0.54694	31.4	1.049	0.003	0.00342	47.4	91.9	0.005
157	50	280	1117890	890817.8	1726.64	0.865	0.52753	31.4	1.013	0.003	0.00326	47.6	91.9	0.004
158	50	285	1117887	890821.7	1726.64	0.835	0.50914	31.4	0.978	0.003	0.00311	47.8	91.9	0.004
159	50	290	1117884	890825.6	1726.64	0.807	0.49168	31.3	0.945	0.003	0.00297	48	91.8	0.004
160	50	295	1117881	890829.5	1726.64	0.781	0.4751	31.3	0.914	0.003	0.00284	48.2	91.8	0.004
161	50	300	1117878	890833.3	1726.64	0.755	0.45935	31.3	0.884	0.002	0.00271	48.3	91.8	0.004
162	50	305	1117875	890837.2	1726.64	0.731	0.44435	31.3	0.856	0.002	0.00259	48.5	91.8	0.003
163	50	310	1117871	890841.1	1726.64	0.708	0.43008	31.3	0.829	0.002	0.00248	48.7	91.7	0.003
164	50	315	1117868	890845	1726.64	0.687	0.41648	31.2	0.803	0.002	0.00238	48.9	91.7	0.003
165	50	320	1117865	890848.8	1726.64	0.666	0.40351	31.2	0.778	0.002	0.00228	49.1	91.7	0.003
166	50	325	1117862	890852.7	1726.64	0.646	0.39114	31.2	0.755	0.002	0.00219	49.3	91.6	0.003
167	50	330	1117859	890856.6	1726.64	0.627	0.37932	31.2	0.733	0.002	0.0021	49.4	91.6	0.003
168	50	335	1117856	890860.5	1726.64	0.608	0.36803	31.2	0.711	0.002	0.00202	49.6	91.6	0.003
169	50	340	1117852	890864.3	1726.64	0.591	0.35724	31.2	0.691	0.002	0.00194	49.8	91.6	0.003
170	50	345	1117849	890868.2	1726.64	0.574	0.34691	31.1	0.671	0.002	0.00187	50	91.5	0.002
171	50	350	1117846	890872.1	1726.64	0.558	0.33702	31.1	0.652	0.002	0.0018	50.2	91.5	0.002
172	50	355	1117843	890876	1726.64	0.543	0.32754	31.1	0.634	0.001	0.00173	50.4	91.5	0.002
173	50	360	1117840	890879.8	1726.64	0.528	0.31846	31.1	0.617	0.001	0.00167	50.6	91.5	0.002
174	50	365	1117837	890883.7	1726.64	0.514	0.30975	31.1	0.6	0.001	0.00161	50.7	91.5	0.002
175	50	370	1117833	890887.6	1726.64	0.5	0.30139	31.1	0.584	0.001	0.00155	50.9	91.4	0.002
176	50	375	1117830	890891.5	1726.64	0.487	0.29336	31	0.569	0.001	0.0015	51.1	91.4	0.002
177	50	380	1117827	890895.3	1726.64	0.475	0.28565	31	0.554	0.001	0.00145	51.3	91.4	0.002
178	50	385	1117824	890899.2	1726.64	0.463	0.27824	31	0.54	0.001	0.0014	51.5	91.4	0.002
179	50	390	1117821	890903.1	1726.64	0.451	0.27111	31	0.526	0.001	0.00135	51.7	91.4	0.002
180	50	395	1117818	890907	1726.64	0.44	0.26425	31	0.513	0.001	0.00131	51.9	91.3	0.002
181	50	400	1117815	890910.8	1726.64	0.429	0.25765	31	0.5	0.001	0.00127	52.1	91.3	0.002
182	50	405	1117811	890914.7	1726.64	0.419	0.25129	31	0.488	0.001	0.00123	52.2	91.3	0.002
183	50	410	1117808	890918.6	1726.64	0.409	0.24516	31	0.477	0.001	0.00119	52.4	91.3	0.001
184	50	415	1117805	890922.5	1726.64	0.399	0.23925	30.9	0.465	0.001	0.00115	52.6	91.3	0.001
185	50	420	1117802	890926.3	1726.64	0.39	0.23356	30.9	0.454	0.001	0.00112	52.8	91.3	0.001
186	50	425	1117799	890930.2	1726.64	0.381	0.22806	30.9	0.444	0.001	0.00108	53	91.2	0.001
187	50	430	1117796	890934.1	1726.64	0.372	0.22276	30.9	0.434	0.001	0.00105	53.2	91.2	0.001
188	50	435	1117792	890938	1726.64	0.364	0.21764	30.9	0.424	0.001	0.00102	53.4	91.2	0.001
189	50	440	1117789	890941.8	1726.64	0.355	0.21269	30.9	0.414	0.001	0.00099	53.5	91.2	0.001
190	50	445	1117786	890945.7	1726.64	0.348	0.20791	30.9	0.405	0.001	0.00096	53.7	91.2	0.001
191	50	450	1117783	890949.6	1726.64	0.34	0.20329	30.9	0.396	0.001	0.00093	53.9	91.2	0.001
192	50	455	1117780	890953.5	1726.64	0.333	0.19881	30.9	0.388	0.001	0.00091	54.1	91.2	0.001

193	50	460	1117777	890957.3	1726.64	0.326	0.19449	30.9	0.379	0.001	0.00088	54.3	91.1	0.001
194	50	465	1117773	890961.2	1726.64	0.319	0.1903	30.8	0.371	0.001	0.00086	54.5	91.1	0.001
195	50	470	1117770	890965.1	1726.64	0.312	0.18625	30.8	0.363	0.001	0.00084	54.6	91.1	0.001
196	50	475	1117767	890969	1726.64	0.305	0.18233	30.8	0.356	0.001	0.00081	54.8	91.1	0.001
197	50	480	1117764	890972.8	1726.64	0.299	0.17853	30.8	0.348	0.001	0.00079	55	91.1	0.001
198	50	485	1117761	890976.7	1726.64	0.293	0.17484	30.8	0.341	0.001	0.00077	55.2	91.1	0.001
199	50	490	1117758	890980.6	1726.64	0.287	0.17127	30.8	0.334	0.001	0.00075	55.4	91.1	0.001
200	50	495	1117755	890984.5	1726.64	0.282	0.16781	30.8	0.328	0.001	0.00073	55.6	91.1	0.001
201	50	500	1117751	890988.3	1726.64	0.276	0.16445	30.8	0.321	0	0.00071	55.7	91	0.001



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