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APPLICANT'S SUPPLEMENTAL RESPONSE TO DATA REQUEST 16 AND 26: ADDITIONAL INFORMATION REGARDING TRANSMISSION SYSTEM ENGINEERING

In this section of Applicant's Supplemental Response to CEC Staff Data Requests 16 and 26, Applicant describes the changes to the Transmission System Engineering section that will result from the changes to the Project Description relating to the removal of Unit 3. Per staff's request, Applicant uses a strike-out/underline format to identify changes to the Transmission System Engineering section of the Application for Certification that will result from the changes to the Project Description.

The Transmission System Engineering sub-sections that have been modified are listed in the table of contents below. If there has been no change to a Transmission System Engineering sub-section relating to Applicant's Supplemental Response to Data Request 16 and 26, the section is labeled "no changes" in the table of contents below.

BrightSource

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SECTION 3 TRANSMISSION SYSTEM ENGINEERING

3.1 INTRODUCTION (See Section 2.1.1 for updated project description)

This Application for Certification (AFC) for the Rio Mesa Solar Electric Generating Facility (Rio Mesa SEGF or Project) has been prepared in accordance with the California Energy Commission's (CEC) Power Plant Site Certification Regulations (CEC-140-2008-001-REV1, current as of July 2008). In addition, this AFC includes elements necessary for the United States (U.S.) Bureau of Land Management (BLM) to permit the Project through the National Environmental Policy Act (NEPA). The "Applicant" for purposes of this AFC comprises Rio Mesa Solar I, LLC, and Rio Mesa Solar II, LLC~~, and Rio Mesa Solar III, LLC~~, owners of the ~~three~~ two separate solar plants and certain shared facilities being proposed. These ~~three~~ two Delaware limited liability companies will hold equal one-~~third~~ half shares in the ownership of shared facilities and will separately own their respective plants. They are wholly owned by Rio Mesa Solar Holdings, LLC (a Delaware limited liability company) which is in turn wholly owned by BrightSource Energy, Inc. (BrightSource) a Delaware corporation and the ultimate parent company. The Applicant will use BrightSource's solar thermal technology for the Rio Mesa SEGF.

The proposed project site is situated on the Palo Verde Mesa in Riverside County, California, 13 miles southwest of the City of Blythe, and is located partially on private land and partially on public land administered by BLM. The project will include three solar concentrating thermal power plants and a shared common area to include shared systems. The first plant, a 250 megawatt (MW) (nominal) facility known as Rio Mesa ~~I~~1, will be constructed at the southeast portion ~~end~~ of the project and owned by Rio Mesa Solar I, LLC. The second plant, another 250 MW (nominal) facility known as Rio Mesa II, will be located at~~in~~ the northwest~~central~~ portion of the project site and owned by Rio Mesa Solar II, LLC. ~~Rio Mesa III, a third 250 MW (nominal) facility, will be constructed in the northern portion of the project site and owned by Rio Mesa Solar III, LLC.~~ These ~~three~~ two plants will be connected via a common overhead 220 kilovolt (kV) generator tie-line (gen-tie line) to the Southern California Edison (SCE) Colorado River Substation (CRS) approximately 9.7 miles to the north.

Each plant will utilize a solar power boiler (referred to as a solar receiver steam generator or SRSG), located on top of a dedicated concrete tower, and solar field based on proprietary heliostat mirror technology developed by BrightSource. The reflecting area of an individual heliostat (which includes two mirrors) is about 19 square meters (205 square feet [sq. ft.]). The heliostat (mirror) fields will focus solar energy onto the SRSG which converts the solar energy to superheated steam. In each plant, a Rankine cycle non-reheat steam turbine receiving this superheated will be directly connected to a rotating generator that generates and pushes the electricity onto the transmission system steam. Each plant will generate electricity using solar energy as its primary fuel source. However, auxiliary/start-up boilers will be used to operate in parallel with the solar field during partial load conditions and occasionally in the afternoon when power is needed after the solar energy has diminished to a level that no longer will support solar generation of electricity. The~~se~~ auxiliary/start-up boilers will also assist with daily start-up of the power generation equipment and night time preservation.

This section addresses the scope of the direct connection facilities between the Rio Mesa SEGF and the existing electrical transmission grid, and the anticipated impacts that operation of the facility will have on the flow of electrical power in the project region. This analysis contains the following discussions:

- Proposed electrical interconnection between the Project and the electrical grid
- Impacts of the Project on the existing transmission grid
- Potential nuisances (electrical/magnetic field (EMF) effects, aviation safety, and fire hazards)
- Safety of the interconnection
- Applicable laws, ordinances, regulations, and standards (LORS)

3.2 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (no changes)

3.2.1 Design and Construction LORS (no changes)

3.2.2 Electrical and Magnetic Fields LORS (no changes)

3.2.3 Hazardous Shock LORS (no changes)

3.2.4 Communication Interference LORS (no changes)

3.2.5 Aviation Safety LORS (no changes)

3.2.6 Fire Hazard LORS (no changes)

3.3 TRANSMISSION LINE DESCRIPTION, DESIGN AND OPERATION

3.3.1 Transmission Interconnection System Impact Studies (no changes)

3.3.2 Existing Transmission Facilities

The proposed project site is located on the Palo Verde Mesa in Riverside County, California, 13 miles southwest of Blythe, California on ~~both~~ lands owned by the Metropolitan Water District of Southern California (MWD)~~ and federal land managed by the BLM~~.

The proposed plant site is located within approximately 8 miles of four existing electrical transmission lines. As shown in Section 2, Figure 2-2 (rev), Project Features Map, the Buck-Julian Hinds 220 kV transmission line, Imperial Irrigation District (IID) 161 kV transmission line and Western Area Power Administration (WAPA) 161 kV transmission line run parallel with each other in a southwesterly direction until the lines are crossed by SCE's Devers - Palo Verde (DPV)-1 500 kV line, which is located approximately ~~1.7~~4 miles north of the project site's northern boundary. At this point the Buck–Julian Hinds 220 kV line turns northwest to parallel SCE 500 kV line on the north side of the 500 kV corridor. The WAPA and IID lines continue in a southerly direction to a point approximately a ~~half~~ 2.7 miles north of the of the project northern boundary where the IID line turns southwest and no longer parallels the WAPA line. The WAPA 161kV line continues southerly and traverses through the eastern portion of the site. In addition, the TransCanada Gas Transmission Company (TCGT) Northern Baja Gas Pipeline runs parallel and east of the WAPA transmission line which also traverses the east side of the project site.

3.3.3 Proposed Transmission Interconnection Facilities

SCE recently received approval to construct the Colorado River Substation (CRS) which will be located just south of the SCE 500 kV route. Rio Mesa I~~, II~~ and II~~I~~ will be interconnected to the SCE grid through the new CRS which will be interconnected to SCE's Devers-Palo Verde (DPV1) 500-kV line passing ~~approximately 2 to5 miles~~ north of the CRS site on an east-west ROW. SCE has developed a service plan for the CRS to interconnect additional projects and allow for future growth. SCE's service plan will include the following: the new CRS and other system upgrades to interconnect and deliver electrical power from Rio Mesa SEGF and other interconnecting customers in the region, as well as to support future growth. The CRS construction is projected to be completed in 2013 or 2014, well before the Rio Mesa SEGF is expected to come online. The design of the CRS and associated upgrades will be performed by SCE.

Power from each plant will be interconnected to the CAISO grid via a common 220 kV gen-tie line to the CRS. The Project will include a common area switchyard (Rio Mesa Switchyard) on site where ~~all three~~both project generator underground tie lines will terminate. These shared facilities will be jointly owned by ~~all three~~both project companies in an equal percentage. The Rio Mesa SEGF single line diagram is included in Section 2 as Figure 2.7 (rev). This diagram shows the high voltage electrical interconnection between the ~~three~~ two generators and the Rio Mesa switchyard, and from the switchyard to the CRS.

3.3.3.1 Generator Step-up Substation and Tie-Line Characteristics

Each ~~of the three plants~~plant will include a 220 kV Generator Step-up Substation (GSUS) which consists of one 220 kV motor operated disconnect switch adjacent to the 220 kV terminals of the Generator Step-up Unit (GSU) transformer. The Rio Mesa Switchyard and all associated equipment will be designed for the maximum short-circuit and load-flow design conditions of the installation. Surge arresters will be used at the underground cable terminators, and at the high voltage terminal of the GSU transformers, to minimize lightening and switching surges. Each of the generators will be connected to the low voltage side of the GSU transformer via a generator breaker. A tap between the generator breaker and low voltage terminals of the GSU transformer will serve the plant auxiliary loads via a 21 kV to 13.8 kV/6.9 kV Unit Auxiliary Transformer (UAT). Each plant UAT will be adequately sized to provide power to all auxiliary loads within each facility. Startup and standby power will be supplied through the GSU and unit auxiliary transformers. Auxiliary controls for the 220 kV motor operated disconnect switch of the GSUS will be located in the common area administration/control building located separate from the power plants.

The proposed tie lines from the ~~three~~ two GSUS's to the Rio Mesa Switchyard will be engineered for operation at 220 kV, nominal. The lines will be designed for underground installation using cross linked polyethylene (XLPE) insulation. The lines will be installed underground the entire route from each plant's substation to the Rio Mesa Switchyard. The lines will exit each plant substation and will follow the outside of the power block and continue along the access roads to the Rio Mesa Switchyard. Each line will be designed to carry the maximum output of each plant.

3.3.3.2 Rio Mesa Switchyard

The design of the Rio Mesa Switchyard will be performed by the EPC contractor based on the plant generation and interconnection requirements. Figure 3.3-1 shows an illustration of the proposed configuration for the Rio Mesa Switchyard (all figures are included at the end of this section). The switchyard will be configured in a ring bus arrangement with ~~five~~ three 220 kV breakers and three~~five~~ line positions. The three~~five~~ line positions include the two~~three~~ 220 kV lines coming from the two~~three~~ Project GSUSs to the switchyard and the single~~two~~ outgoing line~~s (double circuit overhead line)~~ going from the switchyard to the CRS. A control enclosure will be provided to house the relay panels, communication equipment, batteries, chargers and low voltage AC station service equipment. The switchyard will be fenced and surfaced with crushed stone.

3.3.3.3 Gen-Tie Line Characteristics

The proposed overhead ~~double~~ single circuit gen-tie line from the Rio Mesa Switchyard to SCE's CRS will be engineered for operation at 220 kV, nominal. The ~~double~~ single circuit line will be supported by single-pole structures at appropriate intervals with final heights as determined during final design. The lines will be insulated from the poles using glass, porcelain or polymer insulators, engineered for safe and reliable operation. Figure 3.3-2 illustrates the conceptual design of a typical ~~double~~single-circuit structure. These pole designs were engineered to provide conceptual design limits for purposes of the EMF studies. Final design will be based on actual field conditions and site requirements.

3.3.3.4 Colorado River Substation

The design of the CRS will be performed by SCE and analyzed conceptually from input provided based on the requirements of Rio Mesa SEGF and other generation projects in the queue, as well as future load growth requirements. The Phase 1 Interconnection Study Report analyzed the project with the installation of two dedicated 220 kV double breaker positions to terminate the Project's two 220 kV lines. However, SCE ~~is also considering~~has elected to provide a single breaker interconnection to the CRS from the Rio Mesa SEGF, which will have no appreciable effect on operations or reliability.

3.4 TRANSMISSION SYSTEM SAFETY AND NUISANCES

This section discusses safety and nuisance issues associated with the proposed electrical interconnection of the Rio Mesa SEGF with the CAISO electrical grid.

3.4.1 Electrical Clearances (no changes)

3.4.2 Electrical Effects (no changes)

3.4.2.1 EMF Effects (no changes)

3.4.2.2 Corona Effects (no changes)

3.4.2.3 EMF and Corona Effects Assumptions

It is important that any discussion of EMF and corona effects include the assumptions used to calculate these values and to remember that EMF and corona effects in the vicinity of the power lines vary with regard to line design, line loading, distance from the line, and other factors. Both the electric field and corona effects depend on line voltage, which remains nearly constant for a transmission line during normal operation. A worst-case voltage of 241.5 kV was used in the calculations for the 220 kV lines. The magnetic field is proportional to line loading (amperes), which varies as power plant generation is changed by the system operators to meet increases or decreases in electrical demand. Line loading values assumed for the EMF and corona effects studies are presented in Table 3.4-1.

Table 3.4-1
Estimated Line Capacities for EMF and Corona Studies

Line	Voltage/Circuits	Capacity
Rio Mesa	220 kV ~~double~~single-circuit (241.5 kV)	~~375~~ 500 MW per circuit (~~897~~ 1,383 Amps)

The following additional data was used for the analysis.

- Only the Rio Mesa 220 kV ~~double~~ single circuit line was considered for the EMF and audible noise analysis.
- A single 1590 kcmil ACSR 45/7 "Lapwing" conductor was used for the 220 kV lines in the analysis.
- The shield wires are Optical Ground Wire (OPGW) and were assumed to have a core of 48 optical fiber count (resulting in an outer diameter of 0.72 inches). These wires provide lightning protection as well as provide a communication link between interconnected points.
- The conductor spacing was assumed to be as labeled on the structure drawing (L0-2 Rev. A) provided for reference. Should a different configuration be used, the results may vary significantly.
- The phasing of the circuits (top-to-bottom) are ~~BCA~~ A, B on the left and ~~A~~C~~B~~ on the right side of the structure.
- The ROW width is 100 feet with the structures located in the center of ROW resulting in 50 feet to the edge of right-of-way from the center of the structures.

- The minimum conductor height was 30 feet for the lowest conductor.
- A sag value of 34.540.7 feet was assumed for the 220 kV lines.
- The elevation of the corridor is less than 1,000 feet.

The data and assumptions used for the EMF and corona effects studies are discussed in the following paragraphs and illustrated in Figures 3.4-1 through 3.4-5 (rev). The cross section of the pole used to calculate the EMF and corona effects is illustrated in Figure 3.3-2. The study calculations are based on the preliminary conceptual design of the interconnection facilities.

3.4.2.4 EMF and Corona Effects Calculations

EMFs were calculated using the Bonneville Power Administration's (BPA) Corona and Field Effects Program (CAFEP) software to model the tangent double single circuit transmission line configurations. Measurements for electric and magnetic fields at one meter above the ground surface are in accordance with the Institute of Electrical and Electronic Engineers (IEEE) standards. CAFEP calculates the electric fields expressed as kV/m and the magnetic fields expressed in mG. The various inputs for the calculations include voltage, current load (amps), current angle (i.e., phasing), conductor type and spacing, number of subconductors, subconductor bundle symmetry, spatial coordinates of the conductors and shield wires, various labeling parameters, and other specifics. The field level is calculated directly under and perpendicular to the line, at mid-span where the overhead line sags closest to the ground (calculation point). The mid-span location provides the maximum value for the field. Also using the CAFEP mathematical model, audible noise is calculated at 5-foot microphone height above flat terrain with information concerning rain, and fog rates for daytime and nighttime hours as input. Audible noise is expressed in a-weighted decibels (dBA). The values for RI are reported for fair weather conditions as rainy weather disturbs the signal more than the corona effects. RI is reported at either edge of the ROW and measured at a height of six (6.0) feet (1.83 m) above ground. The values for TVI are reported for wet conductor conditions, as TVI is negligible during fair weather. Values are calculated at a height of 32.8 feet (10 m) above the ground per IEEE Standard 430-1986 and FCC measurement guidelines. Both RI and TVI use the average conductor height to approximate the average values along the entire line. Figures 3.3-2 to 3.3-6 were produced by importing CAFEP data into Microsoft Excel.

3.4.2.5 Results of EMF and Corona Effects Calculations

Electric Field and Corona Effects

Line voltage, arrangement of the phases, and elevation of the cables determine the electric field. The results of the electric field for the 220 kV lines are shown in **Error! Reference source not found.Error! Reference source not found.**Table 3.42-2. The maximum electric field for the Project is 2.212 467 kV/m at 18 feet from the center line as shown in Figure 3.4-1 (rev).

Table 3.4-2
Calculated Electric Field Levels from the Rio Mesa Gen-Tie Line

Electric Field Strength (kV/m)

Distance From Centerline (feet)	Rio Mesa
90-100	0.0280.229
72-80	0.0750.358
54-60	0.3840.617
-50 (Edge of ROW)	0.859
36-40	1.2361.259
18-20	2.2122.412
Centerline	1.1071.480
1820	2.2121.728
3640	1.2361.363
50 (Edge of ROW)	1.039
5460	0.3840.774
7280	0.0750.437
90100	0.0280.263

The corona-produced RI may affect AM radio reception but not FM radio reception. Calculations were performed at a reference frequency of 1 MHz (near the middle of the AM band). While RI is greater in rainy weather, the AM signals are more distorted by the atmospheric conditions than any corona sources. Therefore, results are presented in fair weather conditions (consistent with typical industry practice). The RI produced by the 220 kV line during fair weather conditions is shown in Table 3.4-3 and Figure 3.4-2 (rev).

Table 3.4-3
Calculated Radio Interference Levels Produced During Fair Weather Conditions from the Rio Mesa Gen-Tie Line

Radio Interference (L50 Rain Fair dBuV/m)	
Distance From Centerline (feet)	Rio Mesa
90-100	31.528.1
72-80	33.830.7
54-60	36.634.3
-50 (Edge of ROW)	36.4
36-40	40.738.6
18-20	43.441.8
Centerline	42.241.1
1820	43.437.3
3640	40.734.3
50 (Edge of ROW)	32.6
5460	36.630.8
7280	33.827.5
90100	31.525.2

The corona-produced TVI is calculated using the average conductor height with the results reported at a height of ten meters (32.8 feet) above the ground and at the edge of the ROW per FCC guidelines. During fair weather conditions TVI effects are generally negligible so effects during rainy weather are calculated and reported. Television interference is not expected to be a concern due to digital television signals being less susceptible to interference than analog signals. The TVI produced by the 220 kV line during rainy weather conditions is shown in Table 3.4-4 and in Figure 3.4-3 (rev).

The calculated RI and TVI Interference levels from the 230 kV gen-tie line are expected to cause less than significant effects on existing radio and television broadcast signals in their respective primary coverage areas.

Table 3.4-4
Calculated Television Interference Levels Produced During Rainy Weather Conditions from the Rio Mesa Gen-Tie Line

Television Interference (Rain dBuV/m)	
Distance From Centerline (feet)	Rio Mesa
~~90~~-100	~~10.5~~8.5
~~72~~-80	~~12.9~~10.7
~~54~~-60	~~16.0~~13.7
-50 (Edge of ROW)	15.6
~~36~~-40	~~20.7~~18.1
~~18~~-20	~~28.6~~25.2
Centerline	~~23.9~~22.8
~~18~~20	~~28.6~~17.6
~~36~~40	~~20.7~~13.4
50 (Edge of ROW)	11.5
~~54~~60	~~16.0~~10.0
~~72~~80	~~12.9~~7.9
~~90~~100	~~10.5~~6.3

In fair weather, the audible noise will not be observable by a person standing at ground level. During rain, the noise level will be higher but will be masked by the sound of the falling raindrops as well as ambient noise. The audible noise produced for the 220 kV lines during rainy weather as measured 5 feet above ground is shown in Table 3.4-5 and in Figure 3.4-4 (rev).

Table 3.4-5
Calculated Audible Noise Levels Produced During Rainy Weather Conditions from the Rio Mesa Gen-Tie Line

Audible Noise (L50 Rain dBA)	
Distance From Centerline (feet)	Rio Mesa
90-100	41.136.0
72-80	41.936.9
54-60	42.838.0
-50 (Edge of ROW)	38.5
36-40	43.639.1
18-20	44.339.9
Centerline	44.539.9
1820	44.339.2
3640	43.638.2
50 (Edge of ROW)	37..7
5460	42.837.1
7280	41.936.2
90100	41.135.4

Magnetic Field Line current and arrangement of the phases determine the magnetic field. The magnetic fields of the 220 kV lines are shown in Figure 3.4-5 (rev). Table 3.4-6 summarizes calculated values for the magnetic field at various distances from the center line. The maximum magnetic field for Rio Mesa is 12095.1 mG at the three feet from the center line as shown in Figure 3.4-5 (rev).

Table 3.4-6
Calculated Magnetic Field Levels from the Rio Mesa Gen-Tie Line

Calculated Magnetic Field Level (mG)	
Distance From Centerline (feet)	Rio Mesa
90-100	9.620.6
72-80	16.130.5
54-60	29.049.2
-50 (Edge of ROW)	65.3
36-40	55.589.0
18-20	98.1161.4
Centerline	120.1193.6
1820	98.1145.9
3640	55.586.8
50 (Edge of ROW)	66.1
5460	29.050.9

~~72~~80	~~16.1~~32.0
~~90~~100	~~9.6~~21.6

3.4.2.6 Transmission Line EMF Reduction (no changes)

3.4.2.7 EMF and Corona Effects Conclusions (no changes)

3.4.3 Induced Current and Voltages (no changes)

3.4.4 Aviation Safety

Federal Aviation Administration (FAA) Regulations, Title 14 of the Code of Federal Regulations (CFR), Part 77 establishes standards for determining obstructions in navigable airspace in the vicinity of airports that are available for public use and are listed in the Airport Directory of the current Airman's Information Manual. These regulations set forth requirements for notification of proposed obstruction that extend above the earth's surface. FAA notification is required for any potential obstruction structure erected over 200 feet in height above ground level. Also, notification is required if the obstruction is greater than specified heights and falls within any restricted airspace in the approach to airports. For airports with runways longer than 3,200 feet, the restricted space extends 20,000 feet (3.3 nautical miles) from the runway with no obstruction greater than a 100:1 ratio of the distance from the runway. For airports with runways measuring 3,200 feet or less, the restricted space extends 10,000 feet (1.7 nautical miles) with a 50:1 ratio of the distance from the runway. For heliports, the restricted space extends 5,000 feet (0.8 nautical miles) with a 25:1 ratio.

The project is located ~~approximately~~ over ~~4.7~~10 miles from Blythe Municipal Airport, which has two runways 5,800 and 6,543 feet in length. The proposed gen-tie line structures will be located approximately 25,000 feet from the end of the nearest runway. According to the FAA horizontal distance equation for a runway greater than 3,200 feet, a 100 to 1 imaginary slope extending from the nearest point of a runway nearest to the site of the proposed structure is restricted to 20,000 feet. Accordingly, a distance of approximately 25,000 feet will allow a structure of up to ~~125~~ 285 feet. A typical 220 kV transmission structure for this project will range from 85 to 120 feet in height.

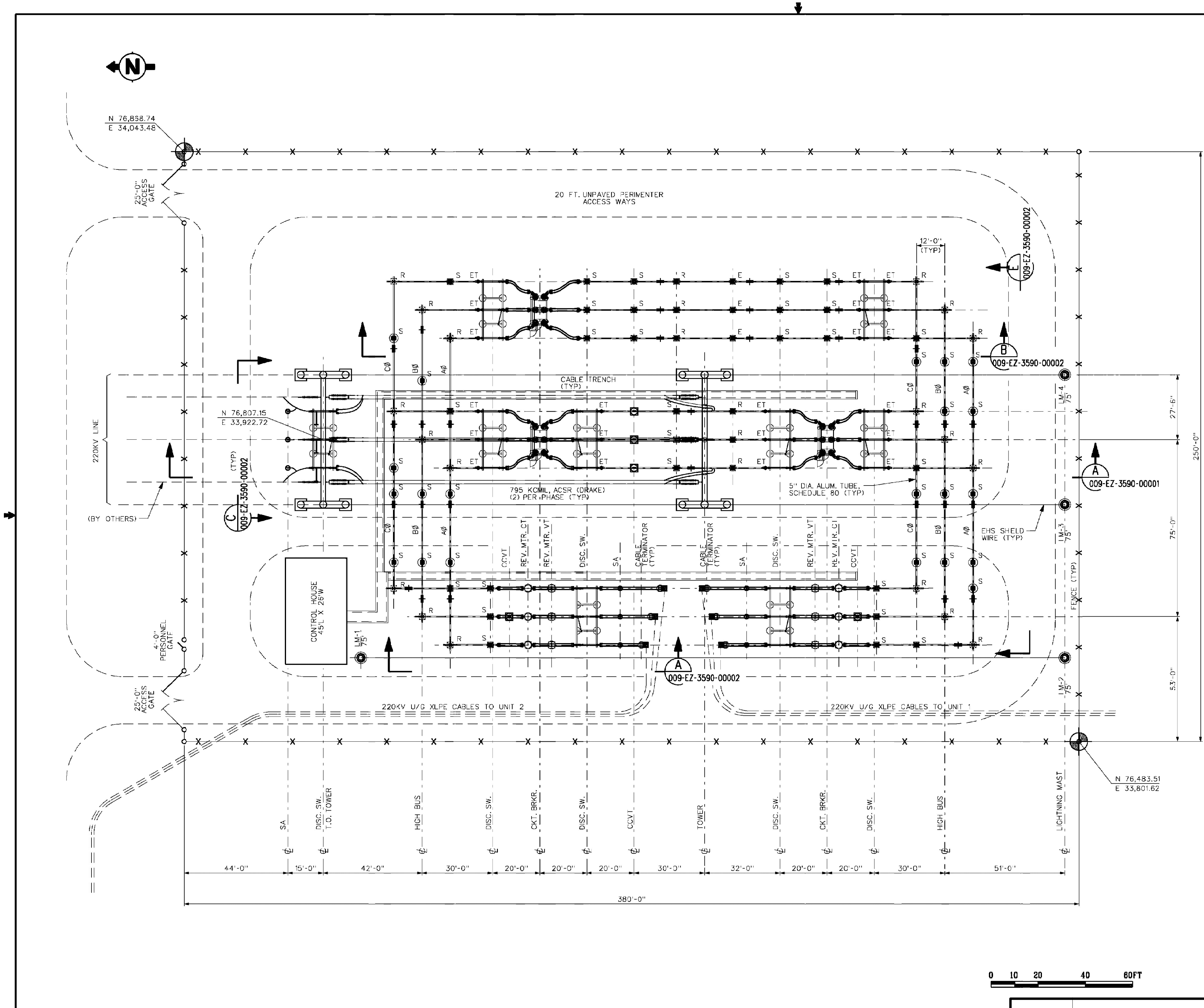
As specified by FAA Regulations, Title 14 of the CFR, Part 77, there are no airports (public or private) within 20,000 feet and no heliports within 5,000 feet of the proposed project site. For additional information on FAA Regulations see Section 5.6, Land Use.

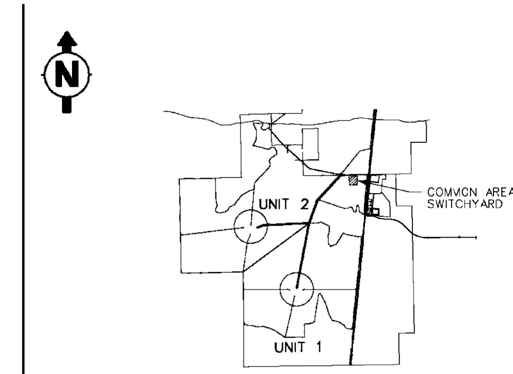
3.4.5 Fire Hazards (no changes)

3.5 INVOLVED AGENCIES AND AGENCY CONTACTS (no changes)

3.6 PERMITS REQUIRED AND PERMIT SCHEDULE (no changes)

3.7 REFERENCES (no changes)





KEY MAP

NOTES:

1. THE MINIMUM DESIGN CLEARANCE FOR GROUND TO LIVE PARTS SHALL BE 5'-11".
2. STRAIN CONDUCTORS WITHIN THE SWITCHYARD SHALL BE 795 KCMIL, ACSR (DRAKE).
3. OVERHEAD SHIELD WIRE SHALL BE 3/8" DIAMETER EHS.
4. INSTALL 795 KCMIL, 26/7 STRAND ACSR (DRAKE), DAMPING CABLE LOOSELY IN ALL HORIZONTAL 5" DIAMETER BUS RUNS OVER 21'-3" LONG.
5. DRILL 1/4" DIAMETER WEEP HOLE IN BOTTOM OF ALL HORIZONTAL TUBULAR BUS SPANS AT MAXIMUM POINT OF DEFLECTION. REMOVE ALL BURRS.
6. ACCESS AND MAINTENANCE WAYS ARE DEPICTED ON THE DRAWING TO HELP VISUALIZE MEANS OF ACCESS FOR SERVICING THE SWITCHYARD EQUIPMENT. THE ENTIRE SWITCHYARD WILL BE COVERED WITH CRUSHED STONE. THE ACCESS FOR MAINTENANCE WILL BE OVER THE SWITCHYARD CRUSHED STONE. NO PAVED ROADS WILL BE PROVIDED.

REFERENCE:

25755-000-C2-0000-00001	SITE PLAN
25755-009-EZ-3590-00001	COMMON AREA SWITCHYARD SECTIONS AND DETAILS
25755-009-EZ-3590-00002	COMMON AREA SWITCHYARD SECTIONS AND DETAILS (later)
25755-009-P1-0010-00001	COMMON AREA PLOT PLAN

LEGEND:

E	EXPANSION BUS SUPPORT
ET	EXPANSION TERMINAL
R	RIGID BUS SUPPORT
S	SLIP BUS SUPPORT
■	BUS COUPLING
■	LOW BUS SUPPORT
●	HIGH BUS SUPPORT

NO.	DATE	REVISIONS	BY	CHK	EGS	PE
	19 JUL 12	INCORP. OWNER COMMENTS	JCY	BLW	DPJ	TWA
	17 JUL 12	ISSUED FOR OWNER APPROVAL AND SUPERSEDES 25670-009-EZ-3510-00001	BLW	JCY	DPJ	TWA

SCALE: 1"-20' DRAWN: JCY/BLW DATE: 5/21/12

CBO/AHJ APPROVAL

BECHTEL POWER CORP.
FREDERICK, MARYLAND
Dedicated to Zero Accident Safety and Quality Excellence

RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

COMMON AREA SWITCHYARD
GENERAL ARRANGEMENT

JOB NO. | DRAWING NO. | REV.

COMMON AREA SWITCHYARD GENERAL ARRANGEMENT
RIO MESA SOLAR ELECTRIC GENERATING FACILITY

SOURCES: Bechtel Power Corp. , 2012.

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CREATED BY: DT	DATE: 7/20/2012	FIG. NO: 3.3-1 (REV)
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THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT, TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

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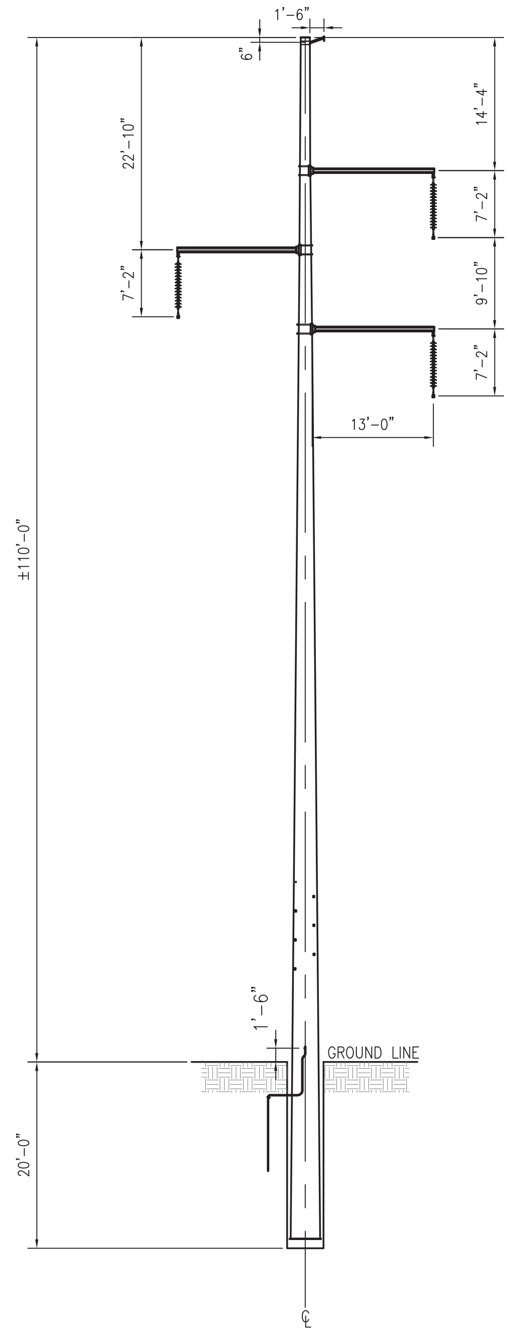

REFERENCE DRAWINGS	

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DRN	RH	06/19/12
CKD	KBB	06/19/12
SCALE:	NTS	

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

BRIGHTSOURCE ENERGY

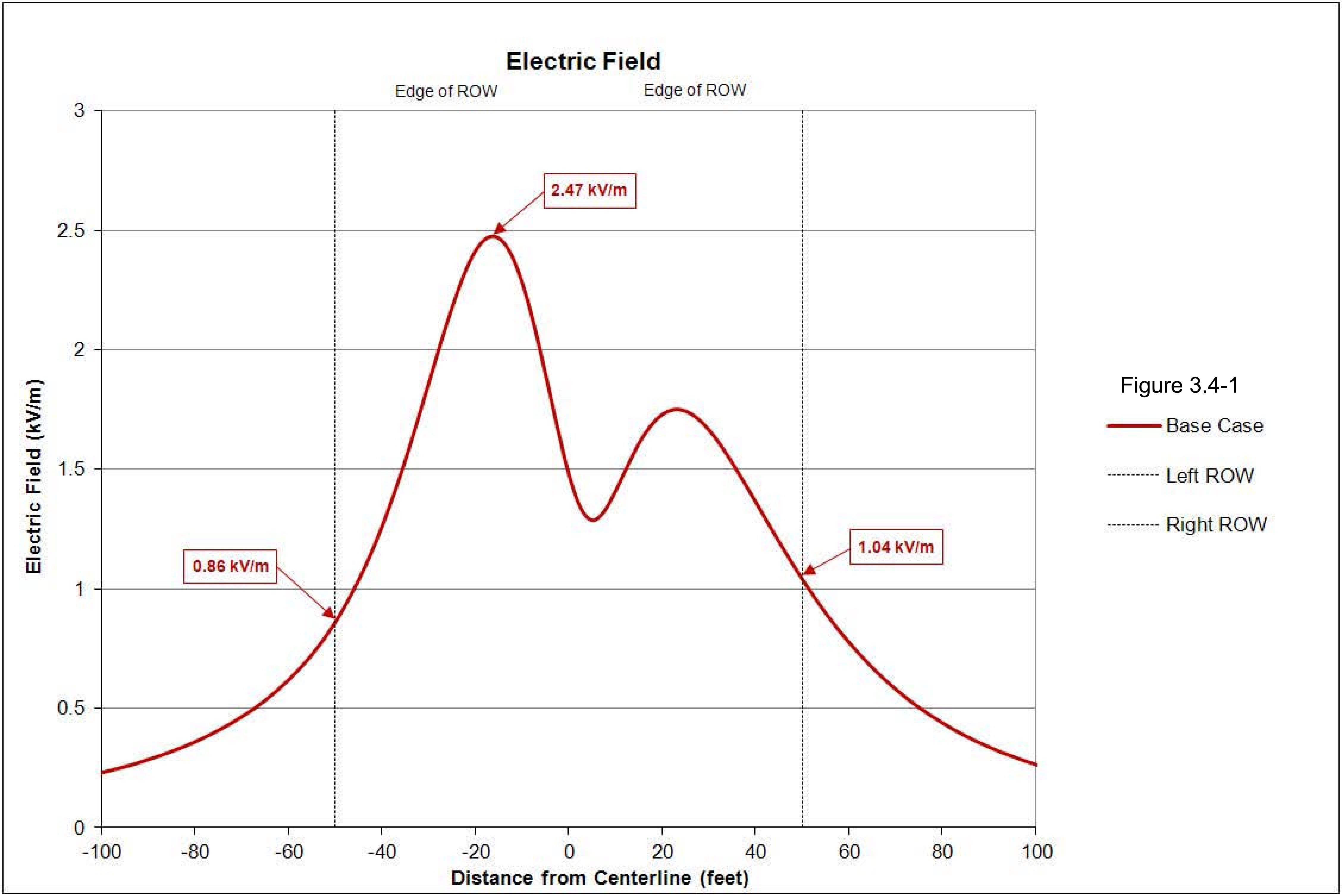
RIO MESA SOLAR
220 kV TRANSMISSION LINE

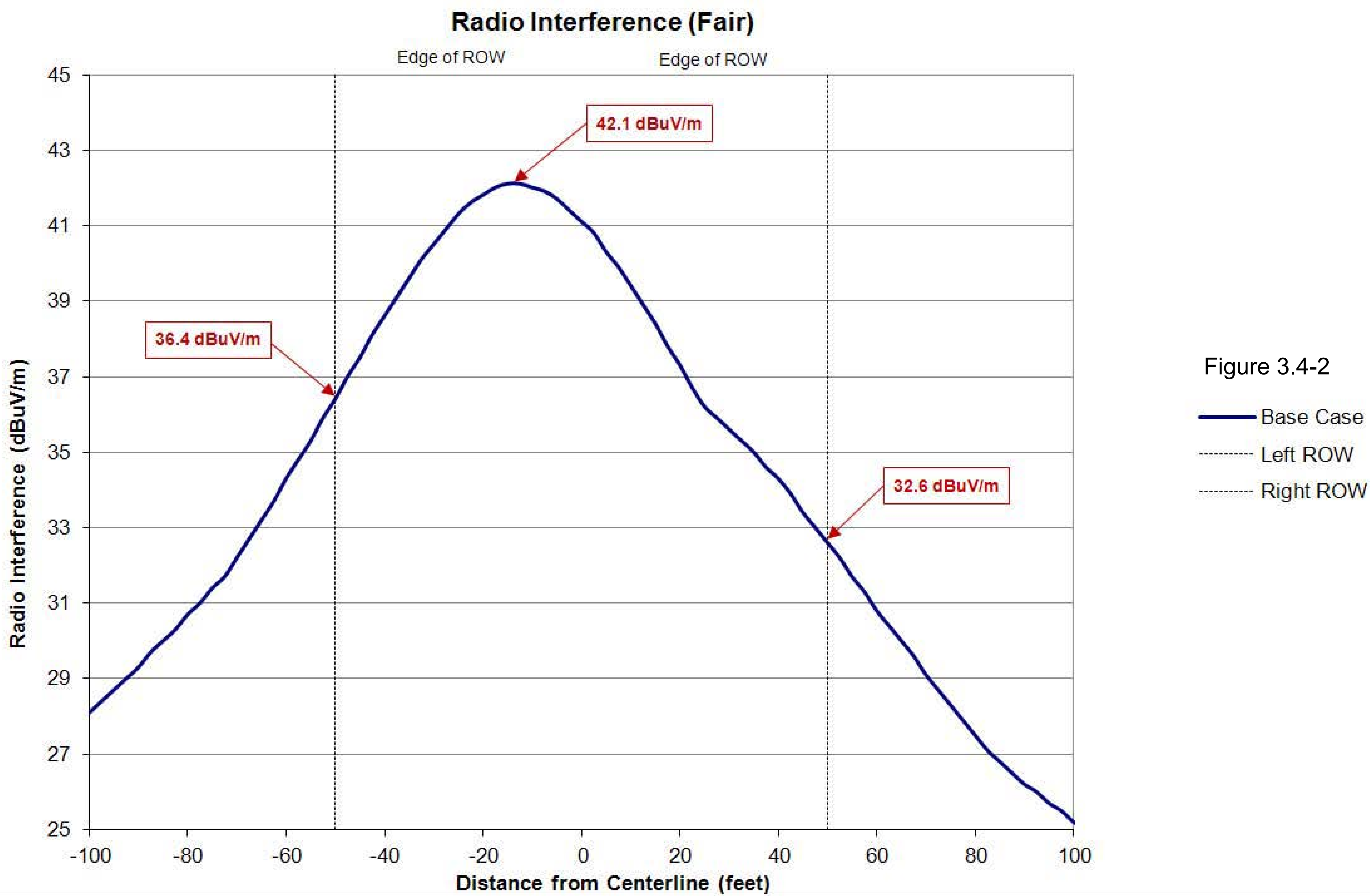
TANGENT SINGLE CIRCUIT
DIRECT EMBED CONCRETE POLE

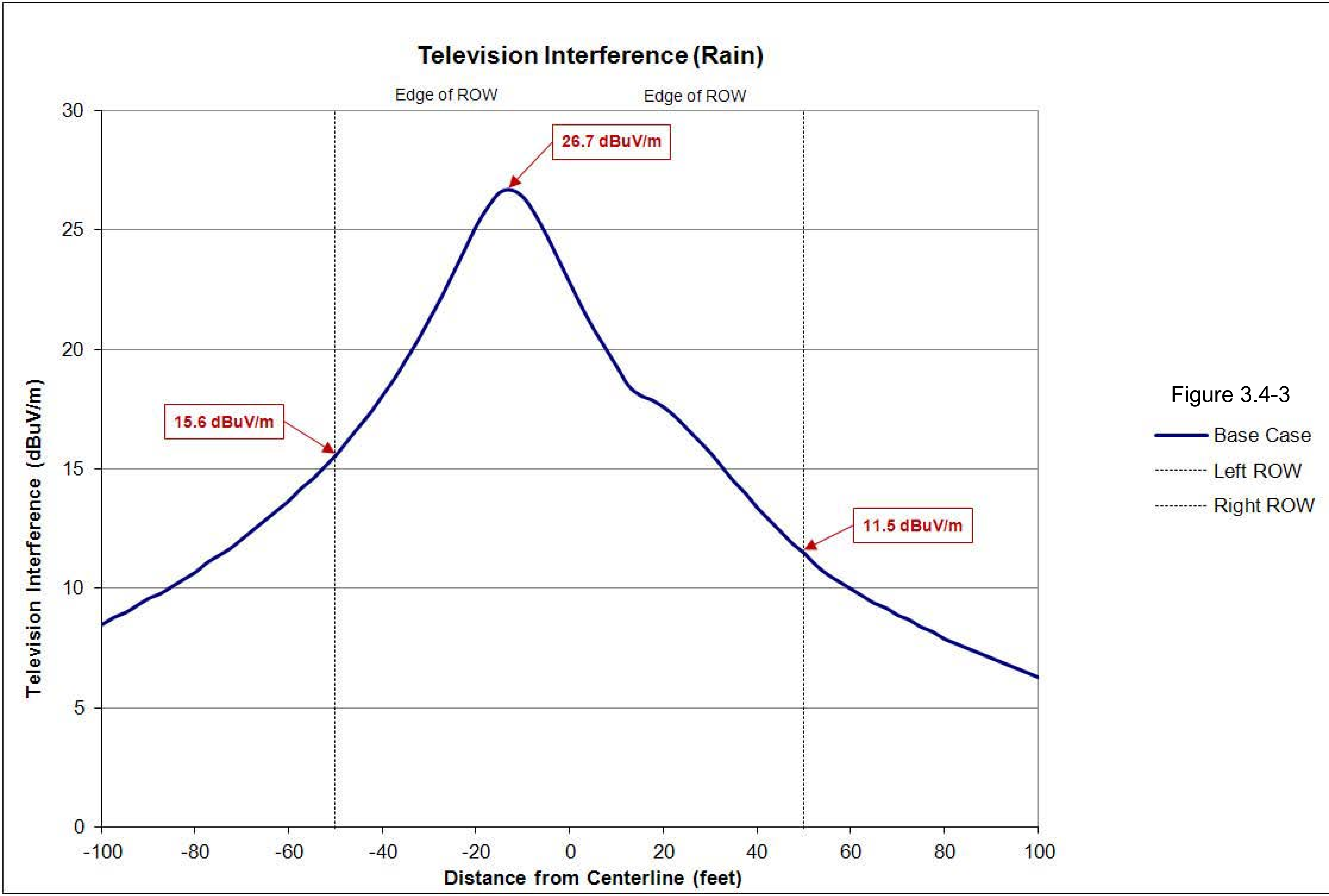
JOB NUMBER	REV
123272	A

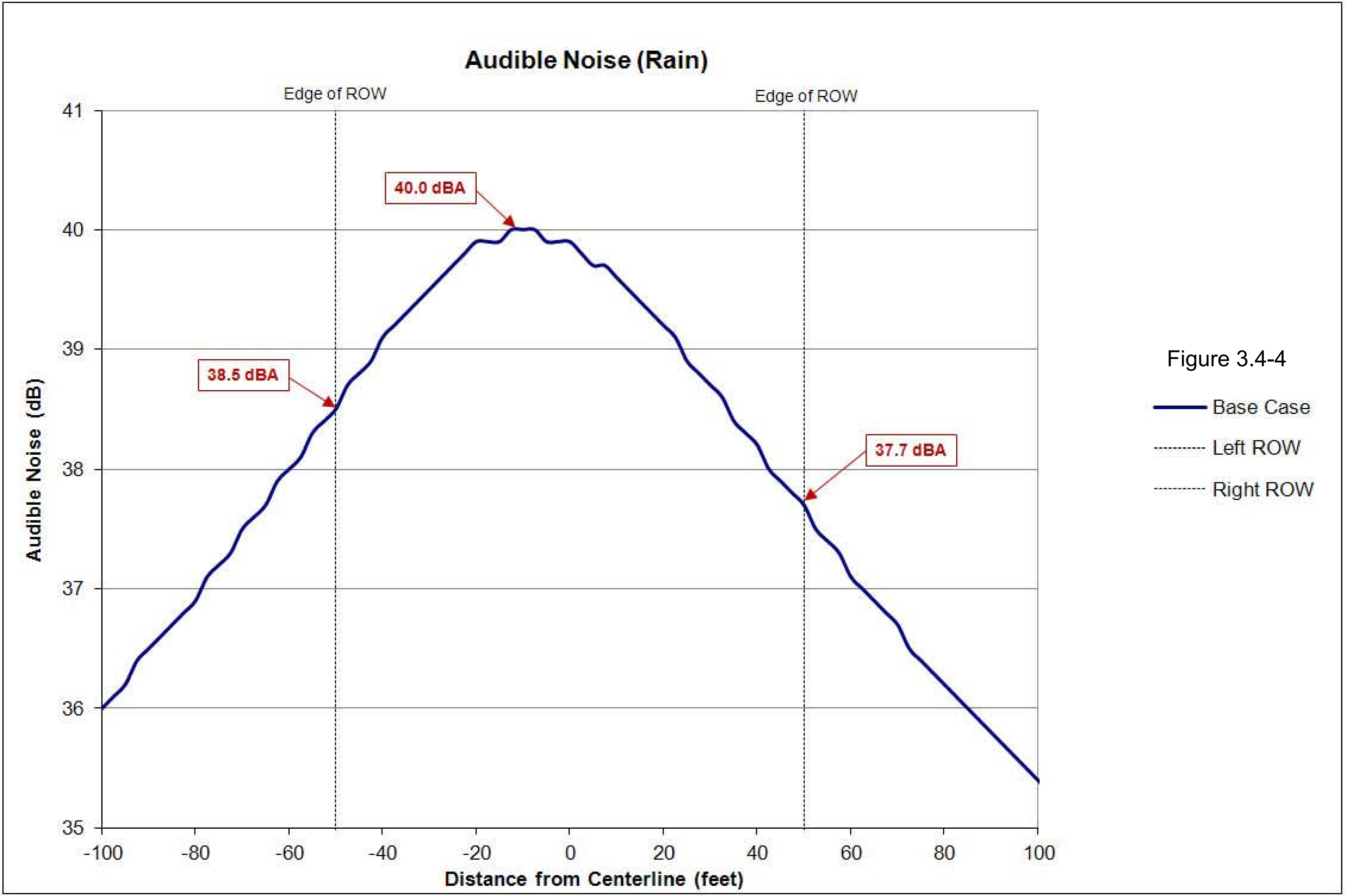
DRAWING NUMBER
3.3-2
(REV)

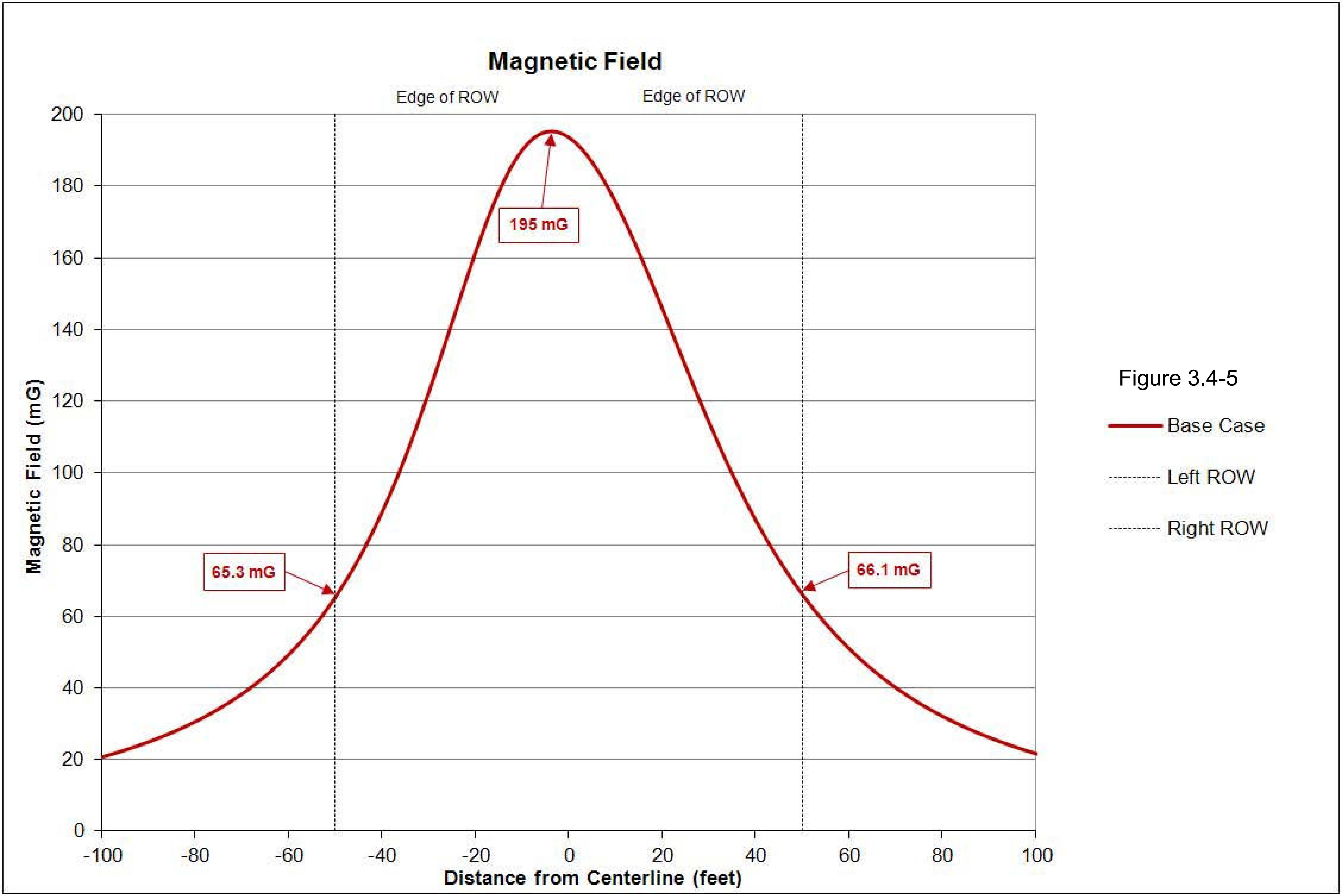
19rmS1_1.dwg


Electric Field
Edge of ROW
Edge of ROW
2.47 kV/m
0.86 kV/m
1.04 kV/m
Electric Field (kV/m)
3
2.5
2
1.5
1
0.5
0
-100
-80
-60
-40
-20
0
20
40
60
80
100
Distance from Centerline (feet)
Figure 3.4-1
Base Case
Left ROW
Right ROW


Radio Interference (Fair)
Edge of ROW
Edge of ROW
42.1 dBuV/m
36.4 dBuV/m
32.6 dBuV/m
Radio Interference (dBuV/m)
45
43
41
39
37
35
33
31
29
27
25
-100
-80
-60
-40
-20
0
20
40
60
80
100
Distance from Centerline (feet)
Base Case
Left ROW
Right ROW
Figure 3.4-2


Television Interference (Rain)
Edge of ROW
Edge of ROW
26.7 dBuV/m
15.6 dBuV/m
11.5 dBuV/m
30
25
20
15
10
5
0
Television Interference (dBuV/m)
-100
-80
-60
-40
-20
0
20
40
60
80
100
Distance from Centerline (feet)
Base Case
Left ROW
Right ROW
Figure 3.4-3


Audible Noise (Rain)
Edge of ROW
Edge of ROW
40.0 dBA
38.5 dBA
37.7 dBA
Audible Noise (dB)
41
40
39
38
37
36
35
-100
-80
-60
-40
-20
0
20
40
60
80
100
Distance from Centerline (feet)
Figure 3.4-4
Base Case
Left ROW
Right ROW


Magnetic Field
Edge of ROW
Edge of ROW
195 mG
65.3 mG
66.1 mG
Magnetic Field (mG)
200
180
160
140
120
100
80
60
40
20
0
-100
-80
-60
-40
-20
0
20
40
60
80
100
Distance from Centerline (feet)
Figure 3.4-5
Base Case
Left ROW
Right ROW