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ACOUSTIC ASSESSMENT REPORT

PENN ENERGY – ROSEPLAIN SOLAR FARM

Goodwood, Regional Municipality of Durham, Ontario

FIT Contract ID# F-001557-SPV-130-505
EBR Registry No: 011-8867

Prepared for:

Roseplain Solar Farm Partnership
620 Righters Ferry Road,
Bala Cynwyd, PA, 19004
USA

Prepared by

Petr Chocensky, PhD

Reviewed by

LICENSED PROFESSIONAL ENGINEER
I. R. BONSMA
100100550
21-Oct-13
PROVINCE OF ONTARIO

Ian Bonsma, PEng

October 21, 2013

VERSION CONTROL

Penn Energy - Roseplain Solar Farm
5240 Concession 4, RR #1, Goodwood, Town of Uxbridge, Regional Municipality of Durham, Ontario

Ver.	Date	Version Description	Prepared By
1	13-June-12	Original Acoustic Assessment Report supporting an application for a Renewable Energy Approval	P. Chocensky
2	20-Feb-13	Updated Acoustic Assessment Report supporting an application for a Renewable Energy Approval incorporating refined sound level data for transformers	P. Chocensky
3	3-Apr-13	Updated Acoustic Assessment Report supporting an application for a Renewable Energy Approval addressing updated source height and sound rating for primary transformer and comments from the MOE	P. Chocensky
4	6-Aug-13	Updated Acoustic Assessment Report supporting an application for a Renewable Energy Approval addressing updated site layout and equipment selection, and introducing noise control measures	P. Chocensky
5	21-Oct-13	Updated Acoustic Assessment Report supporting an application for a Renewable Energy Approval addressing updated site layout and addition of one sound source	P. Chocensky

EXECUTIVE SUMMARY

Roseplain Solar Farm Partnership retained HGC Engineering to undertake an Acoustic Assessment of their proposed Roseplain Solar Farm in Goodwood, in the Town of Uxbridge within the Regional Municipality of Durham, Ontario. The study is required in support of an application for a Renewable Energy Approval from the Ontario Ministry of The Environment ("MOE"), under the Renewable Energy Act ("REA"), pursuant to Ontario Regulation 359/09. The assessment considers all acoustically significant sound sources currently proposed for use at the facility. This assessment has been prepared in accordance with the Ontario Ministry of the Environment publication "Basic Comprehensive Certificates of Approval (AIR) – User Guide".

Previously, HGC Engineering issued a number of Acoustic Assessment Reports for the Roseplain site, addressing comments from the Ministry of the Environment, as well as refinements in the site design.

Sound emissions from key items of proposed equipment were based on information provided by the equipment manufacturers and established prediction methods for the transformers. The source sound levels were used as input to a predictive acoustical model to quantify the sound emissions associated with the facility.

The predictive analysis indicates that, with the benefit of the noise control measures outlined in Section 6, the sound emissions of the facility will be within the sound level limits as set out in MOE guideline NPC-232 during normal 'predictable worst case' operations at all identified residential receptors.

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Ministry of the Environment | Ministère de l'Environnement

Ontario

ACOUSTIC ASSESSMENT REPORT CHECK-LIST

Company Name: Roseplain Solar Farm Partnership

Company Address: 620 Righters Ferry Rd

Bala Cynwyd, USA 19004

Location of Facility: 5240 Concession 4, RR #1,

Goodwood, Town of Uxbridge, RM of Durham, Ontario L0C 1A0

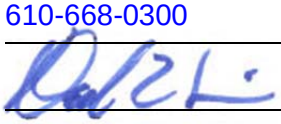
The attached Acoustic Assessment Report was prepared in accordance with the guidance in the ministry document "Information to be Submitted for Approval of Stationary Source of Sound" (NPC 233) dated October 1995 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact:

Name: David Savoia

Representing: Roseplain Solar Farm Partnership

Phone Number: 610-668-0300

Signature: 

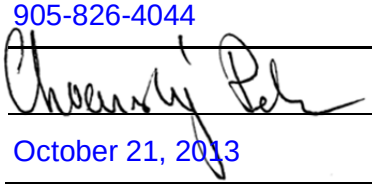
Date: October 21, 2013

Technical Contact:

Name: Petr Chocensky, PhD

Representing: HGC Engineering

Phone Number: 905-826-4044

Signature: 

Date: October 21, 2013

ACOUSTIC ASSESSMENT REPORT CHECK-LIST

	Required Information		
		Submitted	Explanation/Reference
1.0	**Introduction** (Project Background and Overview)	☒ Yes	Section 1
2.0	**Facility Description**		
	2.1 Operating hours of facility and significant Noise Sources	☒ Yes	Section 2
	2.2 Site Plan identifying all significant Noise Sources	☒ Yes	Figure 3
3.0	**Noise Source Summary**		
	3.1 ***Noise Source Summary Table***	☒ Yes	Appendix A
	3.2 Source noise emissions specifications	☒ Yes	Appendix A
	3.3 Source power/capacity ratings	☒ Yes	Appendix A
	3.4 Noise control equipment description and acoustical specifications	☒ Yes	Section 6, Figure 4
4.0	**Point of Reception Noise Impact Calculations**		
	4.1 ***Point of Reception Noise Impact Table***	☒ Yes	Appendix A
	4.2 Point(s) of Reception (POR) list and description	☒ Yes	Section 4
	4.3 Land-use Zoning Plan	☒ Yes	Appendix B
	4.4 Scaled Area Location Plan	☒ Yes	Figure 1
	4.5 Procedure used to assess noise impacts at each POR	☒ Yes	Appendix D
	4.6 List of parameters/assumptions used in calculations	☒ Yes	Appendix D
5.0	**Acoustic Assessment Summary**		
	5.1 ***Acoustic Assessment Summary Table***	☒ Yes	Appendix A
	5.2 Rationale for selecting applicable noise guideline limits	☒ Yes	Appendix E
	5.3 Predictable Worst Case Impacts Operating Scenario	☒ Yes	Figure 4
6.0	**Conclusions**		
	6.1 Statement of compliance with selected noise performance limits	☒ Yes	Sections 7 & 8
7.0	**Appendices** (provide details such as)	☒ Yes	
	Listing of Insignificant Noise Sources	☐ Yes	N/A
	Manufacturer's Noise Specifications	☒ Yes	Appendix C
	Calculations	☒ Yes	Appendices F & G
	Instrumentation	☐ Yes	N/A
	Meteorology during Sound Level Measurements	☐ Yes	N/A
	Raw Data from Measurements	☐ Yes	N/A
	Drawings (Facility / Equipment)	☒ Yes	Figure 3, Appendix C

1 INTRODUCTION

1.1 Context

The Roseplain Solar Farm will be located at 5240 Concession 4, Regional Road #1, in Goodwood, in the Town of Uxbridge in the Regional Municipality of Durham, Ontario. A scaled location map of the surrounding area is included as Figure 1. The purpose of this assessment is to evaluate the sound emissions of the facility under a predictable worst case operating scenario, which is defined as an hour when typical full operation of the stationary sources under consideration could coincide with an hour of low background sound.

This report has been prepared in accordance with the Ontario Ministry of The Environment ("MOE") guideline documents NPC-233 "Information to be Submitted for Approval of Stationary Sources of Sound", dated October 1995 [1], and "Supporting Information for the Preparation of an Acoustic Assessment Report", dated November 2003 [2].

A zoning map identifying the land uses surrounding the subject facility, obtained from the Township of Uxbridge, is included as Appendix B. The lands surrounding the Roseplain Solar Farm are zoned for agricultural and industrial use. Sixty points of reception have been considered in this assessment in order to represent the existing residential dwellings and vacant lots, which permit noise-sensitive use, within 1000 metres of the proposed equipment at the solar facility, labelled as locations R01 through R60 in Figure 2.

A house (marked as location O1 in Figure 2), located on the property/parcel of the proposed project, is owned by the proponent and has not been included in this assessment pursuant to Ontario Regulation 359/09 [3].

HGC Engineering visited the site and surrounding area on January 31, 2012. The proposed site is rural in nature, both acoustically and in general character, with agricultural land uses widely in evidence, including scattered dwellings near the major roadways. Therefore, the area is best characterized as a "Class 3" rural area, under MOE noise assessment guidelines.

1.2 Summary of Updates Addressed In This Assessment

The updates addressed in this report include:

- Updated site layout of the Roseplain Solar Farm,
- Updated number of inverters on-site; there will be a total of eight inverters at the facility installed in four inverter houses,
- Updated modeling approach; each inverter house and accompanying transformer is represented by a single source of sound, based on instructions from the MOE. Previously, sound emissions from inverter houses and transformers were modeled individually,
- Addition of one HVAC unit (NS-06).

2 FACILITY DESCRIPTION

The Roseplain Solar Farm is a proposed 6.5 MW solar electrical generation project. The facility will consist of numerous fixed array mounted solar panels, four collection houses, and one primary transformer. The sound sources associated with the facility will be the collection houses, each including two inverters and a small transformer, and one primary transformer. The inverters are power semiconductor devices which synthesize alternating current ("A/C") from the direct current produced by the solar panels. The solar panels themselves are passive, direct current devices and do not produce sound. They are thus not considered as sources in this assessment.

The inverter units will typically operate during hours when daylight is available. However, the transformers will be energized throughout the 24 hour period. Since daylight can occur during some hours of the nighttime period (19:00 – 7:00), the facility was assumed to operate fully during both daytime (7:00 – 19:00) and nighttime hours (19:00 – 7:00). The facility will operate 7 days per week.

3 SOUND SOURCE SUMMARY

A Sound Source Summary is included as Table A1 in Appendix A, which lists the sources associated with the facility, in the standard format required by the MOE. Each noise source has been assigned an identification number of the form NS-## (e.g. NS-01).

Figure 3 shows the location of each source. The non-negligible sources of sound at the facility are described below.

The site plan for the proposed development includes four inverter collection houses (NS-01 through NS-04) which will be distributed throughout the site. Each inverter collection house will include two 800 kW inverters and will be accompanied by a small 1,750 kVA transformer. The facility will also have one larger, 7.5 MVA, transformer (NS-05) and a small HVAC unit (NS-06) located on the south façade of a facility control house, in the east part of the site.

Sound emissions from inverter units were based on sound measurements of a single 800 kW inverter provided by the proponent.

For the transformers, Roseplain Solar Farm Partnership provided NEMA sound ratings and drawings with dimensions for the proposed 1,750 kVA and 7.5 MVA transformers. The total A-weighted sound power levels of the transformers were determined using the NEMA rating and the transformer dimensions, assuming the sound level ratings apply at the distance of 0.3 m from the transformer. The shape of the octave band spectrum for the transformers was based on established engineering prediction methods [4].

The inverter sound levels, NEMA sound ratings, drawings, and details of the prediction calculation for the transformers and inverter collection houses are included in Appendix C.

Sound levels of the HVAC unit were based on measured sound data on file by HGC Engineering.

The sound power levels for the sources outlined above were used to develop the sound source inventory included as Table A1 in Appendix A, and was input to a predictive computer model (see Appendix D) to quantify the sound emissions of the facility during a predictable worst case hour of operation. As outlined in Section 2, the facility can operated throughout both daytime and nighttime hours. Therefore, for the purposes of this assessment, all sources were assumed to operate 24 hours per day, seven days per week.

4 POINT OF RECEPTION SUMMARY

The sixty key receptors chosen to represent the residential dwellings and vacant lots surrounding the site are shown as locations R01 through R60 in Figure 2.

Each dwelling was assumed to be a two-storey structure, with the respective points of reception representing either an upper storey window or a location within 30 metres from the structure, whichever exhibits greater exposure to noise from the subject facility. In general, upper storey windows are the most potentially impacted point on the properties since they are most exposed to elevated sources at the subject site and benefit least from ground absorption. Where vacant lots were identified, the future location of the assumed dwelling was taken to be a location that would reasonably be expected to contain the dwelling based on the typical building pattern. The selected points of reception are described briefly in Table A3, the Acoustic Assessment Summary Table.

5 ASSESSMENT CRITERIA

The points of reception surrounding the subject facility were assessed in regards to sound level limits applicable in a “Class 3” rural acoustical environment. Accordingly, the relevant document for defining the applicable sound level limits is MOE guidelines NPC-232 [5]. The details by which the applicable sound level limits were established for the assessment of this facility are provided in Appendix E. For the purposes of this assessment, the applicable sound level criterion at all locations is 40 dBA. This limit is included in Table A3 of Appendix A.

Some types of sound have a special quality which may tend to increase their audibility and potential for disturbance or annoyance. For tonal sound, MOE guidelines [6] stipulate that a penalty of 5 dBA is to be added to the measured source level. A tonal sound is defined as one which has a “pronounced audible tonal quality such as a whine, screech, buzz or hum”. A/C transformers and inverters typically exhibit a humming character at twice the line frequency (120 Hz) and harmonics thereof, as a result of magnetostrictive forces in the windings and semiconductors. In the subsequent analysis, a tonal penalty has been applied to the sounds of all inverters and transformers.

6 NOISE CONTROL MEASURES

Ventilation air inlets and outlets of one inverter collection house (NS-01) will be equipped with acoustic hoods providing the acoustical performance listed in Table 1, below.

Table 1 – Acoustic Hood Insertion Loss Specifications, [dB]

Source ID	Source Name	Octave Band Centre Frequency, [Hz]							
		63	125	250	500	1k	2k	4k	8k
NS-01	Inverter Collection House Air Inlet and Outlet	--	--	1	9	6	9	10	--

7 IMPACT ASSESSMENT

The predictive analysis indicates that, with the benefit of noise control measures outlined in Section 6, the sound levels will be in the range of 20 to 40 dBA at all key points of reception, which are within the applicable sound level limit.

The results of the analysis are summarized in Table A3 and are shown graphically in Figure 4. Details of the prediction methods are summarized in Appendix D, and sample calculation results are included as Appendices F and G.

8 CONCLUSIONS

The acoustical analysis indicates that, with the benefit of the noise control measures in Section 6, the predicted sound levels of the Roseplain Solar Farm will be within the applicable sound level limits specified in MOE guideline NPC-232, during all hours of the day and night, under typical "predictable worst case" operating conditions at all identified off-site receptor locations.

REFERENCES

1. Ontario Ministry of Environment Publication NPC-233, *Information to be Submitted for Approval of Stationary Sources of Sound*, October, 1995.

2. Ontario Ministry of Environment Guide, *Supporting Information for the Preparation of an Acoustic Assessment Report*, November 2003.

3. Environmental Protection Act, *ONTARIO REGULATION 359/09*, October 1, 2009.

4. Crocker, Malcolm, J., Sound *Power Level Predictions for Industrial Machinery*, In Encyclopedia of Acoustics (Vol. 2, pp. 1049 - 1057), John Wiley & Sons, Inc., 1997.

5. Ontario Ministry of the Environment Publication NPC-232, *Sound Level Limits for Stationary Sources in Class 3 Areas (Rural)*, October, 1995.

6. Ontario Ministry of the Environment Publication NPC-104, *Sound Level Adjustments*, August, 1978.

7. International Organization for Standardization, *Acoustics – Attenuation of Sound during Propagation Outdoors – Part 2: General Method of Calculation*, ISO-9613-2, Switzerland, 1996.

8. Google Maps Aerial Imagery, Internet Application: *maps.google.com*

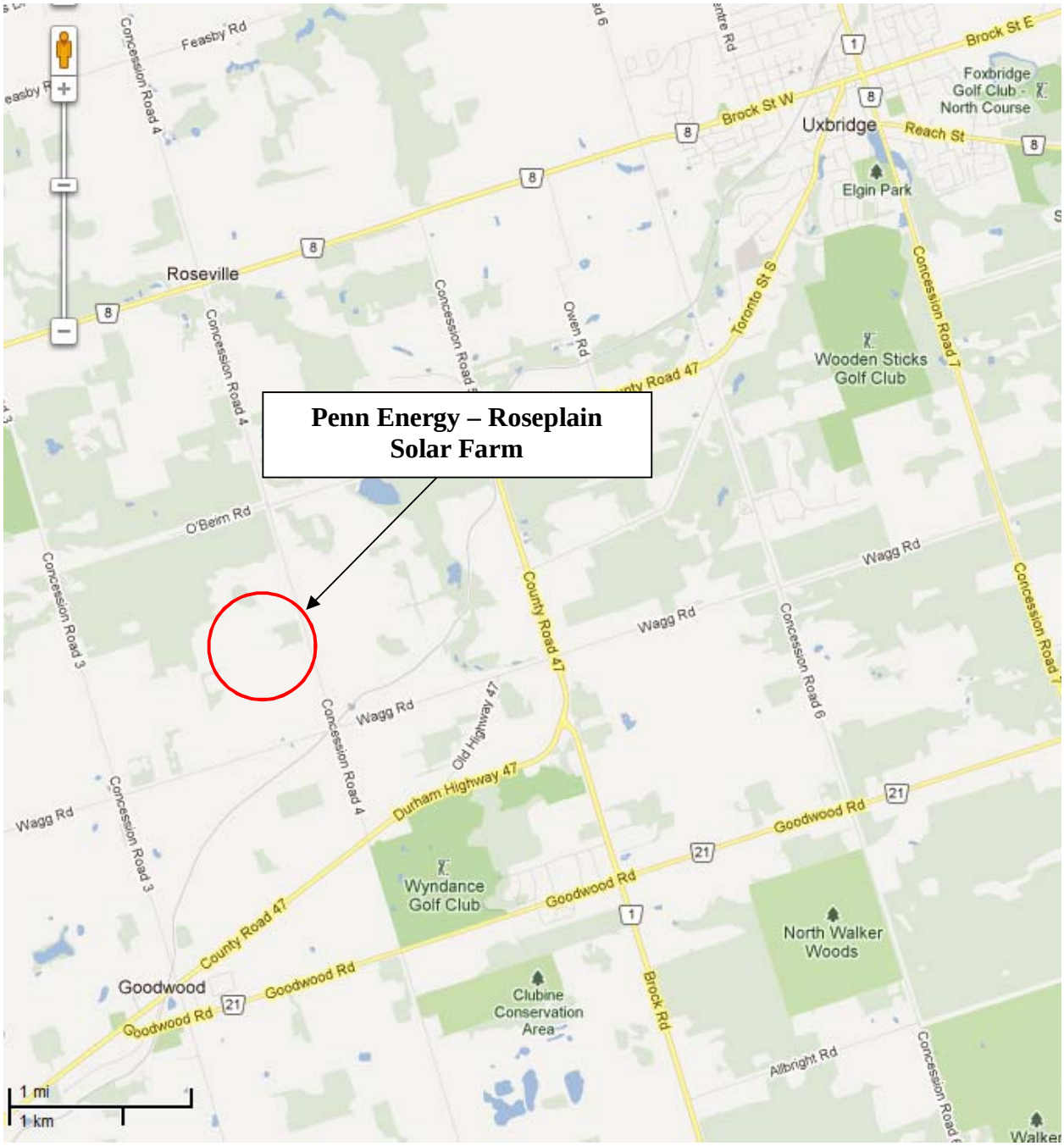


Figure 1: Location Map

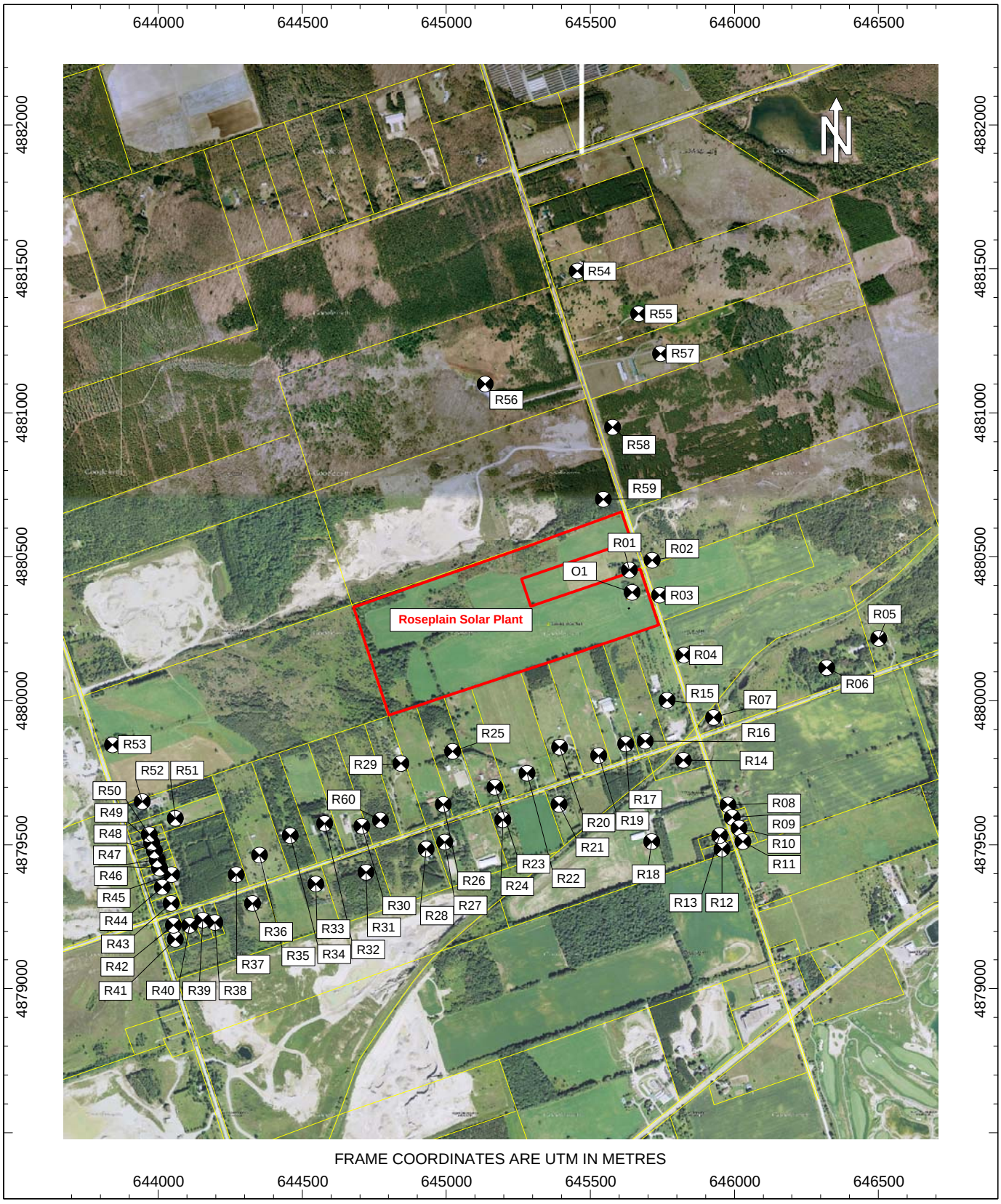


Figure 2: Locations of Points of Reception
Roseplain Solar Farm

Figure 3: Locations of Sound Sources
Roseplain Solar Farm

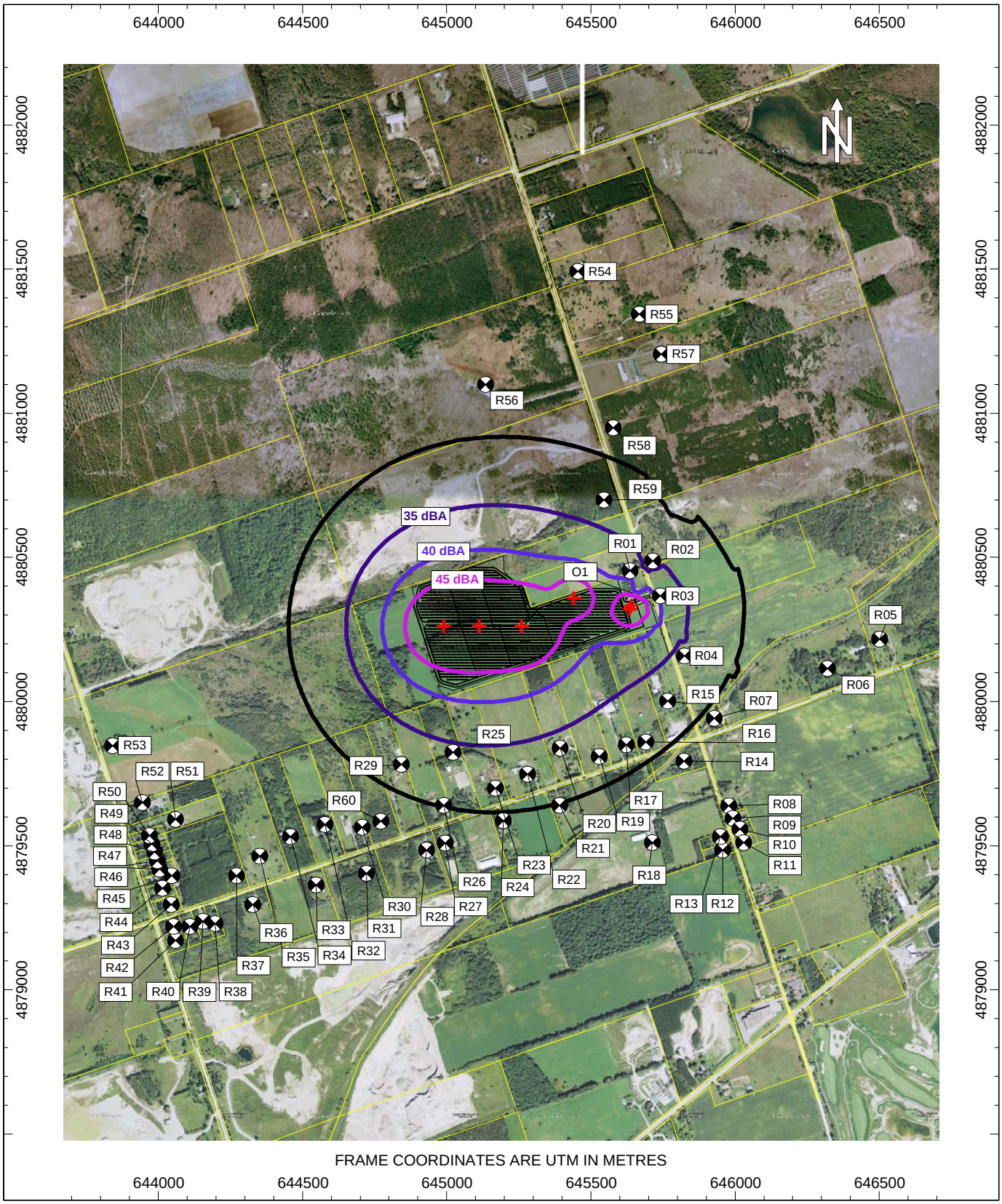


Figure 4: Sound Level Contours Leq (dBA)
Predicted at 4.5 m Above Grade
Roseplain Solar Farm

APPENDIX A

Acoustic Assessment Summary Tables

ACOUSTIC ASSESSMENT SUMMARY TABLES
VERSION CONTROL

5240 Concession 4, RR #1, Goodwood, Town of Uxbridge, Regional Municipality of Durham, Ontario

Ver.	Date	Issued as Part of AAR?	Version Description	Prepared By
1.0	13-June-12	Y	Original version of tables as part of Ver. 1 of Acoustic Assessment Report	P. Chocensky
2.0	20-Feb-13	Y	Revised version of tables as part of Ver. 2 of Acoustic Assessment Report	P. Chocensky
3.0	3-Apr-13	Y	Revised version of tables as part of Ver. 3 of Acoustic Assessment Report	P. Chocensky
4.0	6-Aug-13	Y	Revised version of tables as part of Ver. 4 of Acoustic Assessment Report	P. Chocensky
5.0	21-Oct-13	Y	Revised version of tables as part of Ver. 5 of Acoustic Assessment Report	P. Chocensky

Table A1: Noise Source Summary Table

Source ID	Source Description	UTM Coordinates		Sound Power Level [dBA re 10^-12 W]	Source Location	Sound Characteristic	Noise Control Measure
		Northing	Easting				
NS-01	Inverter House	645440	4880359	93	O	S,T	O
NS-02	Inverter House	645259	4880261	100	O	S,T	U
NS-03	Inverter House	645112	4880262	100	O	S,T	U
NS-04	Inverter House	644990	4880261	100	O	S,T	U
NS-05	Transformer 7.5 MVA	645634	4880320	90	O	S,T	U
NS-06	Control House HVAC Unit	645640	4880333	83	O	S	U

Legend

Sound Characteristics
S: Steady
Q: Quasi-steady impulsive
I: Impulsive
B: Buzzing
T: Tonal (+5 dBA penalty applied)
C: Cyclically varying
O: Occasional

Noise Control Measures
S: Silencer, Acoustic Louvre, Muffler
A: Acoustic Lining, Plenum
B: Barrier, Berm, Screening
L: Lagging (Acoustical Wrapping)
E: Acoustic Enclosure
O: Other
U: Currently Uncontrolled

Source Location
O: Outdoors
I: Indoors

Table A2: Point of Reception Noise Impact Table

Source ID	Source Name	Point of Reception									
		R01		R02		R03		R04		R05	
		Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]
NS-01	Inverter House	217	31	303	27	301	27	434	23	1071	10
NS-02	Inverter House	423	30	509	28	494	28	575	26	1244	17
NS-03	Inverter House	558	27	644	25	638	25	720	23	1391	15
NS-04	Inverter House	674	24	759	23	758	23	841	22	1512	14
NS-05	Transformer 7.5 MVA	134	36	186	28	116	37	250	30	874	18
NS-06	Control House HVAC Unit	121	21	172	18	107	34	254	26	870	13

Source ID	Source Name	Point of Reception									
		R06		R07		R08		R09		R10	
		Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]
NS-01	Inverter House	913	15	643	19	900	15	943	15	988	14
NS-02	Inverter House	1071	19	742	23	952	20	992	20	1035	19
NS-03	Inverter House	1217	17	877	21	1067	19	1104	18	1146	18
NS-04	Inverter House	1338	16	991	20	1168	18	1204	17	1245	17
NS-05	Transformer 7.5 MVA	716	20	480	24	764	19	810	19	854	18
NS-06	Control House HVAC Unit	714	16	486	19	773	15	818	14	863	14

Source ID	Source Name	Point of Reception									
		R11		R12		R13		R14		R15	
		Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]
NS-01	Inverter House	1032	14	1017	14	972	14	683	18	484	22
NS-02	Inverter House	1075	19	1045	19	1005	19	732	23	570	26
NS-03	Inverter House	1185	17	1148	18	1111	18	850	21	704	24
NS-04	Inverter House	1281	16	1241	17	1205	17	954	20	818	22
NS-05	Transformer 7.5 MVA	900	18	896	18	849	18	559	23	345	27
NS-06	Control House HVAC Unit	909	13	906	13	859	14	569	18	354	22

Source ID	Source Name	Point of Reception									
		R16		R17		R18		R19		R20	
		Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]
NS-01	Inverter House	558	20	542	21	892	15	558	20	524	21
NS-02	Inverter House	589	26	549	27	878	21	527	27	445	29
NS-03	Inverter House	704	24	656	25	962	20	615	25	509	28
NS-04	Inverter House	807	22	754	23	1043	19	704	24	585	26
NS-05	Transformer 7.5 MVA	464	24	471	24	814	19	522	23	539	23
NS-06	Control House HVAC Unit	476	20	484	19	826	14	536	18	553	18

Source ID	Source Name	Point of Reception									
		R21		R22		R23		R24		R25	
		Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]
NS-01	Inverter House	721	18	631	19	713	18	811	16	679	18
NS-02	Inverter House	635	25	513	28	569	26	678	24	497	28
NS-03	Inverter House	681	24	540	27	564	26	681	24	446	29
NS-04	Inverter House	739	23	589	26	589	26	706	24	438	30
NS-05	Transformer 7.5 MVA	722	20	672	21	776	19	855	18	787	19
NS-06	Control House HVAC Unit	736	15	685	16	789	15	869	14	800	14

Source ID	Source Name	Point of Reception									
		R26		R27		R28		R29		R30	
		Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]
NS-01	Inverter House	849	16	960	15	1013	14	831	16	1081	13
NS-02	Inverter House	677	24	797	22	844	22	634	25	889	21
NS-03	Inverter House	634	25	761	23	798	22	549	27	806	22
NS-04	Inverter House	622	25	752	23	779	23	501	28	752	23
NS-05	Transformer 7.5 MVA	937	17	1033	16	1093	16	957	17	1196	15
NS-06	Control House HVAC Unit	950	13	1046	11	1106	11	969	12	1208	10

Source ID	Source Name	Point of Reception									
		R31		R32		R33		R34		R35	
		Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]
NS-01	Inverter House	1195	12	1167	12	1337	11	1284	11	1409	10
NS-02	Inverter House	1011	19	968	20	1145	18	1083	19	1208	17
NS-03	Inverter House	942	20	871	21	1060	19	980	20	1102	18
NS-04	Inverter House	898	21	802	22	1000	19	903	21	1022	19
NS-05	Transformer 7.5 MVA	1293	14	1294	14	1447	12	1416	13	1542	12
NS-06	Control House HVAC Unit	1306	9	1306	9	1460	8	1427	8	1554	7

Source ID	Source Name	Point of Reception									
		R36		R37		R38		R39		R40	
		Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]
NS-01	Inverter House	1538	9	1515	9	1679	8	1706	8	1751	8
NS-02	Inverter House	1340	16	1313	16	1480	15	1505	14	1550	14
NS-03	Inverter House	1243	17	1207	17	1378	16	1401	15	1445	15
NS-04	Inverter House	1170	18	1125	18	1301	16	1321	16	1363	16
NS-05	Transformer 7.5 MVA	1659	11	1647	11	1803	10	1833	10	1880	9
NS-06	Control House HVAC Unit	1671	6	1658	6	1815	5	1845	5	1892	5

Source ID	Source Name	Point of Reception									
		R41		R42		R43		R44		R45	
		Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]
NS-01	Inverter House	1821	7	1795	7	1754	8	1745	8	1694	8
NS-02	Inverter House	1620	13	1593	14	1551	14	1540	14	1489	15
NS-03	Inverter House	1514	14	1485	15	1439	15	1425	15	1372	16
NS-04	Inverter House	1432	15	1401	15	1351	16	1333	16	1280	16
NS-05	Transformer 7.5 MVA	1948	9	1926	9	1891	9	1886	9	1837	10
NS-06	Control House HVAC Unit	1960	4	1938	4	1902	5	1898	5	1848	5

Source ID	Source Name	Point of Reception									
		R46		R47		R48		R49		R50	
		Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]
NS-01	Inverter House	1715	8	1707	8	1700	8	1693	8	1687	8
NS-02	Inverter House	1510	14	1501	14	1494	15	1487	15	1480	15
NS-03	Inverter House	1391	15	1380	16	1371	16	1363	16	1354	16
NS-04	Inverter House	1296	16	1284	16	1273	17	1263	17	1253	17
NS-05	Transformer 7.5 MVA	1861	9	1855	9	1850	10	1846	10	1841	10
NS-06	Control House HVAC Unit	1872	5	1866	5	1861	5	1857	5	1852	5

Source ID	Source Name	Point of Reception									
		R51		R52		R53		R54		R55	
		Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]
NS-01	Inverter House	1579	9	1655	8	1678	8	1132	13	1010	14
NS-02	Inverter House	1373	16	1449	15	1476	15	1246	17	1157	18
NS-03	Inverter House	1247	17	1318	16	1336	16	1277	16	1216	17
NS-04	Inverter House	1146	18	1211	17	1221	17	1315	16	1277	16
NS-05	Transformer 7.5 MVA	1734	10	1817	10	1853	10	1185	15	1023	16
NS-06	Control House HVAC Unit	1745	6	1827	5	1862	--	1173	--	1010	1

Source ID	Source Name	Point of Reception									
		R56		R57		R58		R59		R60	
		Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]	Dist [m]	LEQ [dBA]
NS-01	Inverter House	802	17	898	15	606	20	356	25	1022	14
NS-02	Inverter House	848	21	1061	19	759	23	523	27	833	22
NS-03	Inverter House	839	22	1136	18	831	22	616	25	757	23
NS-04	Inverter House	851	21	1208	17	905	21	706	24	710	24
NS-05	Transformer 7.5 MVA	926	17	891	18	631	21	389	26	1133	15
NS-06	Control House HVAC Unit	919	3	878	3	620	6	379	11	1145	10

Note: Reported sound levels include all adjustment factors (time weighting, tonal penalty), as applicable

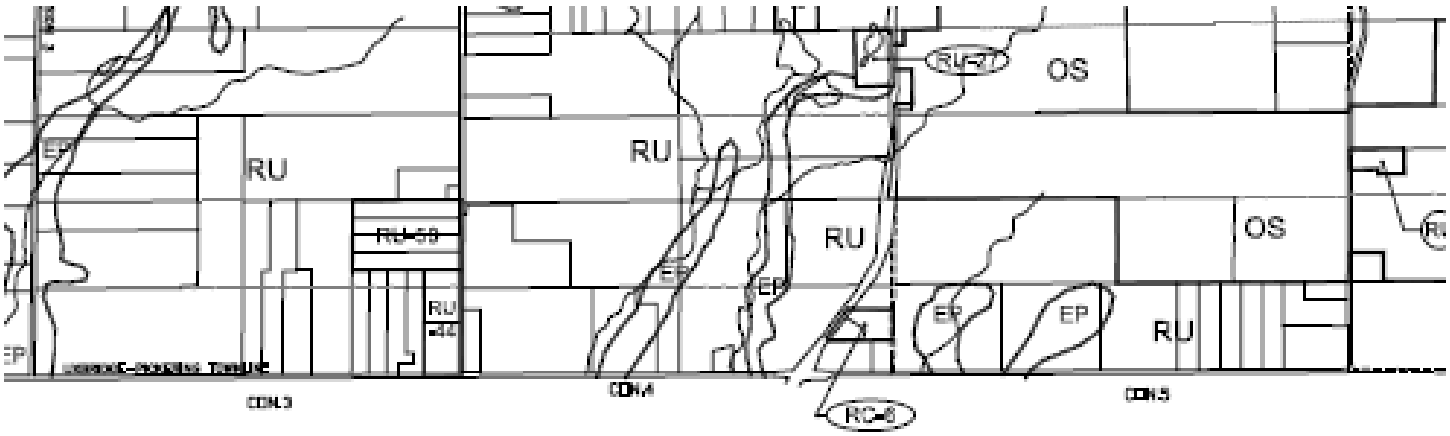
Table A3: Acoustic Assessment Summary Table

Point of Reception	Point of Reception Description	UTM Coordinates [m]		Sound Level at Point of Reception, LEQ [dBA]	Verified by Acoustic Audit	Performance Limit, LEQ [dBA]	Compliance with Performance Limit
		Easting	Northing				
R01	Residential Dwelling	645636	4880454	38	No	40	Yes
R02	Residential Dwelling	645715	4880488	34	No	40	Yes
R03	Vacant Lot	645741	4880366	40	No	40	Yes
R04	Residential Dwelling	645825	4880159	34	No	40	Yes
R05	Residential Dwelling	646502	4880217	23	No	40	Yes
R06	Residential Dwelling	646320	4880115	25	No	40	Yes
R07	Residential Dwelling	645929	4879942	29	No	40	Yes
R08	Residential Dwelling	645978	4879638	26	No	40	Yes
R09	Residential Dwelling	645992	4879595	25	No	40	Yes
R10	Residential Dwelling	646017	4879557	25	No	40	Yes
R11	Residential Dwelling	646029	4879511	24	No	40	Yes
R12	Residential Dwelling	645958	4879485	25	No	40	Yes
R13	Residential Dwelling	645949	4879532	25	No	40	Yes
R14	Vacant Lot	645822	4879794	29	No	40	Yes
R15	Residential Dwelling	645766	4880002	32	No	40	Yes
R16	Residential Dwelling	645690	4879860	31	No	40	Yes
R17	Residential Dwelling	645622	4879849	32	No	40	Yes
R18	Vacant Lot	645713	4879510	26	No	40	Yes
R19	Residential Dwelling	645529	4879809	32	No	40	Yes
R20	Residential Dwelling	645394	4879838	34	No	40	Yes
R21	Residential Dwelling	645391	4879641	30	No	40	Yes
R22	Residential Dwelling	645281	4879749	32	No	40	Yes
R23	Residential Dwelling	645169	4879700	32	No	40	Yes
R24	Residential Dwelling	645197	4879586	29	No	40	Yes
R25	Residential Dwelling	645022	4879825	34	No	40	Yes
R26	Residential Dwelling	644991	4879640	30	No	40	Yes
R27	Residential Dwelling	644994	4879510	28	No	40	Yes
R28	Residential Dwelling	644930	4879485	27	No	40	Yes
R29	Residential Dwelling	644843	4879783	32	No	40	Yes
R30	Residential Dwelling	644707	4879565	27	No	40	Yes
R31	Residential Dwelling	644722	4879405	26	No	40	Yes
R32	Residential Dwelling	644578	4879573	26	No	40	Yes
R33	Residential Dwelling	644547	4879365	24	No	40	Yes
R34	Residential Dwelling	644458	4879532	25	No	40	Yes
R35	Residential Dwelling	644352	4879463	24	No	40	Yes
R36	Residential Dwelling	644329	4879297	22	No	40	Yes
R37	Residential Dwelling	644272	4879396	23	No	40	Yes
R38	Residential Dwelling	644198	4879230	21	No	40	Yes
R39	Residential Dwelling	644155	4879238	21	No	40	Yes
R40	Residential Dwelling	644110	4879221	20	No	40	Yes
R41	Residential Dwelling	644060	4879172	20	No	40	Yes
R42	Residential Dwelling	644053	4879220	20	No	40	Yes
R43	Residential Dwelling	644045	4879296	20	No	40	Yes
R44	Residential Dwelling	644015	4879352	21	No	40	Yes
R45	Residential Dwelling	644046	4879396	21	No	40	Yes
R46	Residential Dwelling	644006	4879419	21	No	40	Yes
R47	Residential Dwelling	643997	4879448	21	No	40	Yes
R48	Residential Dwelling	643987	4879478	21	No	40	Yes
R49	Residential Dwelling	643977	4879507	21	No	40	Yes
R50	Residential Dwelling	643969	4879535	21	No	40	Yes
R51	Residential Dwelling	644060	4879592	22	No	40	Yes
R52	Residential Dwelling	643946	4879649	22	No	40	Yes
R53	Vacant Lot	643842	4879847	21	No	40	Yes
R54	Residential Dwelling	645456	4881492	23	No	40	Yes
R55	Residential Dwelling	645669	4881343	24	No	40	Yes
R56	Residential Dwelling	645135	4881101	27	No	40	Yes
R57	Residential Dwelling	645744	4881205	25	No	40	Yes
R58	Vacant Lot	645578	4880949	28	No	40	Yes
R59	Vacant Lot	645545	4880699	33	No	40	Yes
R60	Vacant Lot	644772	4879586	28	No	40	Yes

APPENDIX B

Zoning Maps


RU
EP
RU-34
WEES ROAD
ER-1
RU-3
O'BEIRN ROAD
OS
EP-35 2003-073
EP-35
2003-073
(H)OS-13
2003-073
(H)EP-33
2003-073
(H)OS-14
2003-073
EP-1
M3
(H)EP-34
2003-073
M1-20
WAGG ROAD
RC
CF
RC-4
M3
97-024
RU-18
M5-4
M3
2007-199
M1-23
M1-15
EP-31
2004-192
CF-6
EP-30
2004-192
OS-15
2007-072
2007-074
2007-141
2007-142
OS-12
2004-192
2006-216
2007-075
REGIONAL ROAD NO. 47
M1-38
2009-091
(H)M1-38
2003-064
(H)M1-35
2003-064
PROUSE ROAD
(H)M1-39
2003-064
HR-34
2002-133
RU-6
RU-2
OWEN ROAD
PARRATT
M1-32
99-130
(H)M1-25
M5-2
M1-24
2006-140
(H)M1-24
OLD STOUFFVILLE ROAD
RU-38
RU-57
97-089
M3-2
RU-8
M1-18
RU-5
(H)RU-89
2009-103
OS-13
2004-192
2007-075
SILVER
HILLBORNE
COURT
SPRING
ER-2
2003-073



GENERAL ZONE CATEGORES

EP ENVIRONMENTAL PROTECTION ZONE

OS RECREATIONAL OPEN SPACE ZONE

RU RURAL ZONE

CF COMMUNITY FACILITY ZONE

RC RECREATIONAL CLUSTER ZONE

ER ESTATE RESIDENTIAL ZONE

M1 RURAL INDUSTRIAL ZONE

M3 RURAL RESOURCE EXTRACTION ZONE

M5 AGGREGATE PROCESSING ZONE

Lands Affected By Freestanding By-law No. 90-39

Note:

This Schedule 'A3' has been prepared for consolidation purposes only. It incorporates those amendments to Schedule 'A3' as of August 2009. For accurate reference, the original of the individual by-law should be consulted.

APPENDIX C

Equipment Sound Data

Acoustic Environmental Test

SC 800CP-US central inverter

(Extract of Test report SC800CP-US-91:LE1613)

1 Overview

Project title:	SC800CP-US
Type of test / thresholds and requirements:	Sound level measurement according to DIN EN ISO 3744:2011-02 and DIN EN ISO 9614-2:2010-11 of sinusoidal, irregularly shaped, transient signals. Classification of ambient conditions in compliance with the German Noise Control Guidelines (TA Lärm). (according to Section 2)
Type of device:	e.g. solar central inverter for large-scale PV power plants
Type designation:	SC800CP-US
Test specification:	Level of emissions according to the German Noise Control Guidelines and acoustic power

2 Results

The EN 3744:04/2005 and German Noise Control Guidelines form the testing specification for the thresholds and requirements	Requirement		Results [dBA]/ without fan (distance 1m)	Results [dBA]/ with fan (distance 1m)
	Standard (Germany)	SMA		
EN 3744:2011-02 typical value; LAeq averaged [1]	-	-	-	78,74
§48 of the German Federal Emission Control ACT (BImSchG): 09-2002 German Noise Control Guidelines; L_{pa} [2]	-	-	-	77,81
EN 9614-2 sound power L_{WA} [3]	-	-	-	92,30
Sound pressure level in 10m L_{xpA} [4]	-	-	-	64,31
Sound pressure level in 50m L_{xpA} [4]	-	-	-	50,32
Overall result (if applicable)			*Standard requirments: - passed	

* Dependent on the local conditions at the mounting location (distance of 10m standard)

3 Operating States

The following states and configurations have been defined as operating conditions:

- Operation of the inverter.
- Operating conditions: UDC =820 V; 800 kW
- The device fans must be running.
- The unit under test must have reached its operating temperature.
- The unit under test must have reached an operating temperature of 25°C.

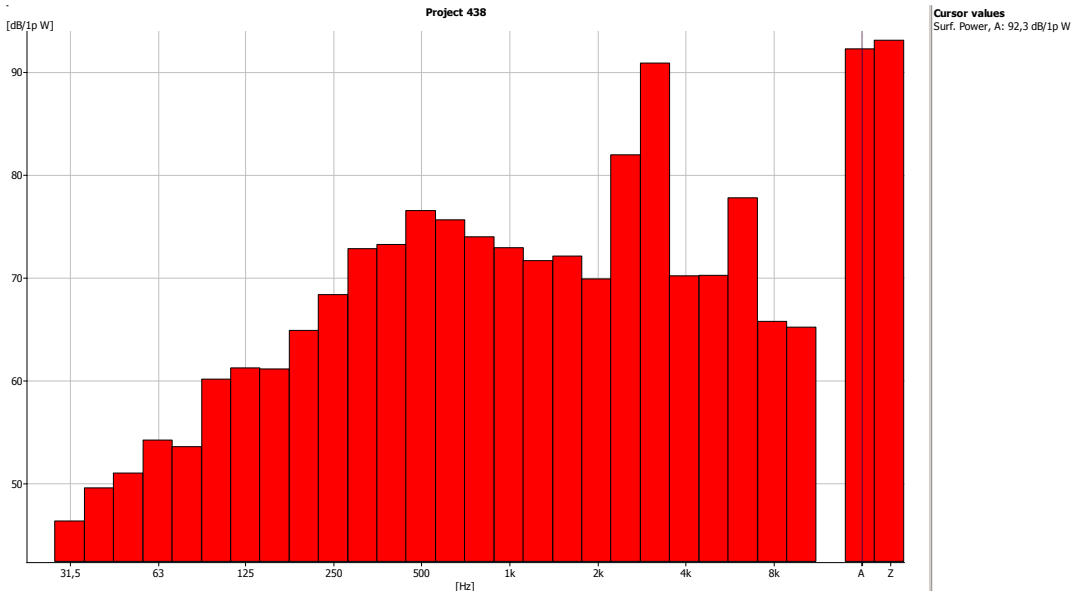
4 Calculating the Acoustic Power

L_{pA} =	average sound pressure level on the measurement surface [dB_A] *	77.81
S =	overall measurement surface [m^2]	28.09
S_0 =	1 [m^2]	

* This specified spatially/temporally averaged sound pressure level was determined using the calcu-lated acoustic power level.
$L_{PA} = L_{WA} - 10\log (S/S_0)$

Acoustic power of L_{WA}= 92,3 dBA/W results for the measurement.

Acoustic Power Levels of the Third Octave Band Frequencies According to EN ISO 9614-2



A-rated sound power = 92.3 $dB_{A/W}$

Z-rated sound power = 93.1 $dB_{A/W}$

A-rated acoustic power – based on physiologic human hearing

Z-rated acoustic power – technically linear measured value

5 Overview of the Acoustic Power

Third octave band center frequency [Hz]	Acoustic power- level LwA [dBA/pW] 880 kW	Acoustic power- level LwZ [dBA/pW] 880 kW
25 Hz	42,33	–
31.5 Hz	46,34	–
40 Hz	49,56	–
50 Hz	51	–
63 Hz	54,21	–
80 Hz	53,57	–
100 Hz	60,14	–
125 Hz	61,23	–
160 Hz	61,13	–
200 Hz	64,88	–
250 Hz	68,36	–
315 Hz	72,83	–
400 Hz	73,24	–
500 Hz	76,54	–
630 Hz	75,64	–
800 Hz	73,99	–
1 kHz	72,93	–
1.25 kHz	71,67	–
1.6 kHz	72,11	–
2 kHz	69,89	–
2.5 kHz	81,96	–
3.15 kHz	90,89	–
4 kHz	70,19	–
5 kHz	70,24	–
6.3 kHz	77,78	–
8 kHz	65,76	–
10 kHz	65,2	–
Acoustic power above the surface	A-rated	Z-rated
	92,3	93.1

6 Deriving the Emission Sound Pressure Level at a Distance

The calculated acoustic power can be used to derive an A-rated sound pressure level L_{xpA} for undirected sources at any distance x.

$$LxpA = LwA + Ko - 10 \cdot \log\left(4 \cdot \pi \cdot \frac{X^2}{So}\right)$$

K_0 = solid angle index on the floor 3 [dB]
X = distance from the source [m]
S_0 = 1 m

Device	Distance X [m]	Sound pressure level LxpA [dBA] without fan	Sound pressure level LxpA [dBA] with fan
SC800CP-US	10	–	64,30
	50	–	50.33

7 Appendix - Calculations

deriving sound pressure level at a distance

LxpA = LWA + K0 - 10log (4*PI*(x^2/S0))

LWA 92,3dB
K0 3dB
x 10m
S0 1m

LxpA 64,31dBA

Transformer 7.5 MVA												
NEMA (Nr):	67									MVA Rating: 7.5		
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	A	Surface area [m^2]: 55.4	Length [m]	Width [m]	Height [m]
Correction*	3	5	0	0	-6	-11	-16	-23		10*logS: 17.4	3.2	4.3	2.775
Lw [dB]	87	89	84	84	78	73	68	61	85				

Transformer 1.75 MVA												
NEMA (Nr):	61									MVA Rating: 1.75		
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	A	Surface area [m^2]: 32.3	Length [m]	Width [m]	Height [m]
Correction*	3	5	0	0	-6	-11	-16	-23		10*logS: 15.1	2.4	2.85	2.425
Lw [dB]	79	81	76	76	70	65	60	53	76				

*based on *Crocker, Malcolm, J., Sound Power Level Predictions for Industrial Machinery, In Encyclopedia of Acoustics (Vol. 2, pp. 1049 - 1057), John Wiley & Sons, Inc., 1997*

Inverter Collection House Lw										
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	A	
Inverter 1 (800 kW)	84	82	83	83	78	81	90	79	92	Based on test report provided by proponent
Inverter 2 (800 kW)	84	82	83	83	78	81	90	79	92	Based on test report provided by proponent
Transformer 1.75 MVA	79	81	76	76	70	65	60	53	76	Predicted as above
Total Collection House [dB]	88	86	86	86	81	84	93	82	95	

Note: The above data does not include adjustments for tonality

Substation Transformers

COOPER Power Systems

Electrical Apparatus

210-15

Unit Type Substation Transformers

GENERAL

Cooper Power Systems Unit Type Substation Transformers are designed to meet customer specifications.

Flexibility in design, combined with the highest quality manufacturing processes, equipment, and testing procedures enable Cooper Power Systems to provide a product optimized to the customer's requirements. All units meet applicable American National Standards Institute (ANSI®), Institute of Electrical and Electronics Engineers, Inc. (IEEE®)and National Electrical Manufacturers Association (NEMA) standards, as well as National Electric Code® (NEC®), Department of Energy (DOE) and Canadian Electricity Association (CEA) specifications.

Unit type substation transformers are available with enclosed sidewall-mounted bushings for connections to primary and/or secondary switchgear.

Substation transformers are made with a wide range of core steels and winding conductors to optimize efficiency versus cost. Flexible core/coil and tank construction enable your dimensional requirements to be met.

Cooper Power Systems transformers are available with our patented Envirotemp FR3 fluid, a less-flammable and bio-degradable fluid or electrical grade mineral insulating oil. Unit type substation transformers intended for indoor use are solely filled with Envirotemp FR3 fluid. Electrical codes recognize the advantages of using Envirotemp FR3 fluid both indoors and outdoors for fire sensitive applications. Envirotemp FR3 fluid-filled units meet Occupational Safety and Health Administration (OSHA) and Section 450.23, 2008 NEC requirements.

Figure 1.
Unit type substation transformer equipped with low-voltage transition flange and high-voltage full height air terminal chamber.

PRODUCT SCOPE

Type	Three-Phase or Single-Phase, 50 or 60 Hz, 65 ºC (55 ºC/65 ºC, 75 ºC Optional)
Fluid Type	Envirotemp FR3 fluid or Mineral Oil (upon special request)
Size	Three-Phase: 300 – 12,000 kVA
	Single-Phase: 500 – 6667 kVA
Primary Voltage	2400 – 46,000 V
Secondary Voltage	208Y/120 V to 24,940 V Wye
Specialty Designs	Inverter/Rectifier Bridge
	Zig Zag
	K-Factor (up to K-19)
	Hazardous Location (Class 1 Div 2)
	Internal Circuit Breaker (VFI)
	UL Listed & Labeled/ Classified
	Factory Mutual (FM) Approved
	Solar/Wind Designs
	Differential Protection
	Automation Solutions

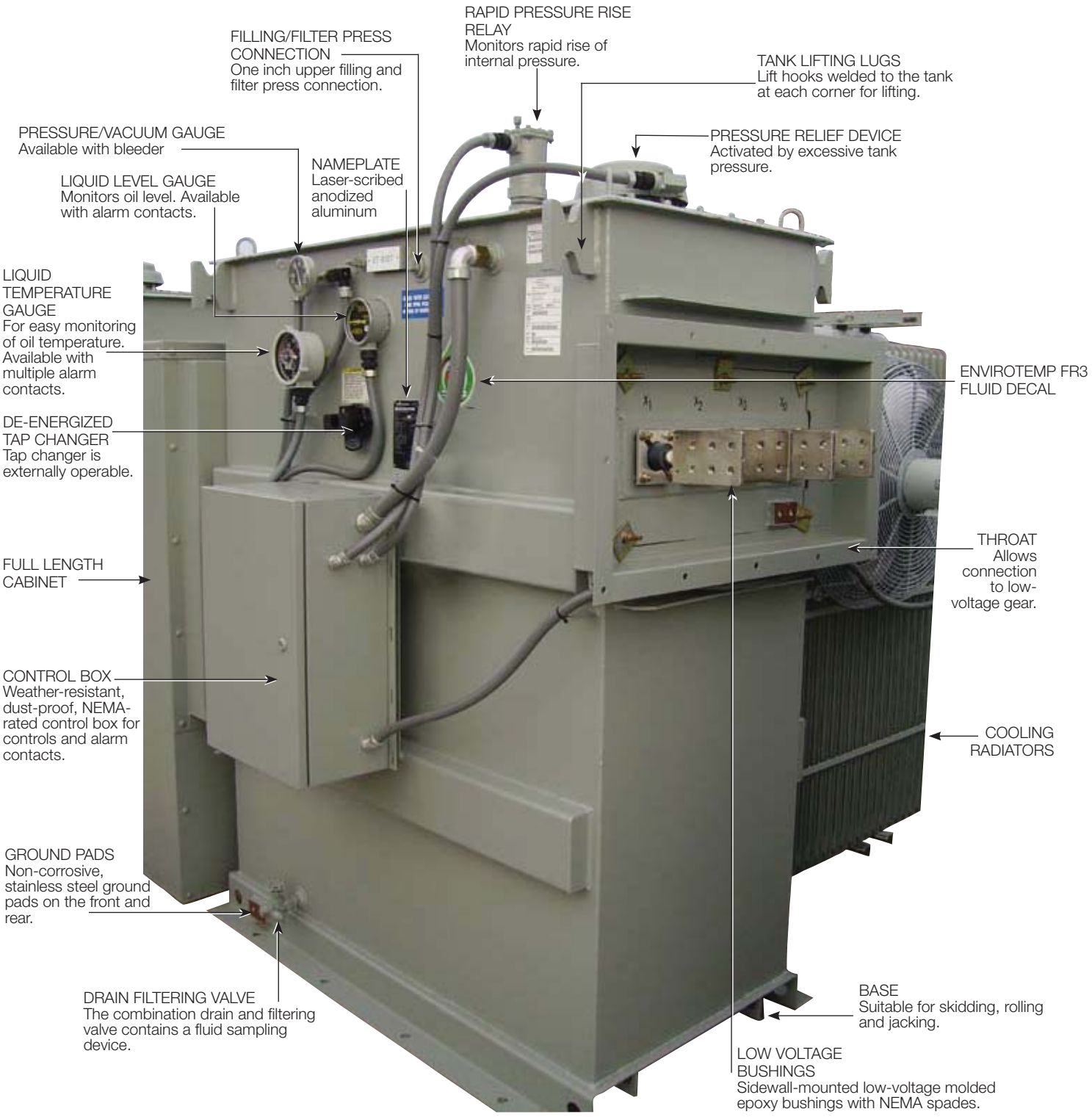


Figure 2.
Unit type substation transformer with standard features and optional accessories.

TABLE 1
Three-Phase, Single Temperature kVA Ratings

Three-Phase kVA Self-Cooled and Forced-Air Cooled with 65 ºC Temperature Rise		
65 ºC Rise KNAN		65 ºC Rise KNAN/ KNAF
500	+15%	575
750		863
1000		1150
1500		1725
2000		2300
2500	+25%	3125
3750		4688
5000		6250
7500		9375
10000		12500
12000	+33%	16000

TABLE 4
Three-Phase, Dual or Triple Temperature kVA Ratings

Three-Phase kVA Self-Cooled and Forced-Air Cooled with Triple Rated 55 ºC/65 ºC/75 ºC Temperature Rise							
55 ºC Rise KNAN		65 ºC Rise KNAN		75 ºC Rise KNAN	55 ºC Rise KNAN/ KNAF	65 ºC Rise KNAN/ KNAF	75 ºC Rise KNAN/ KNAF
500	+12%	560	+9%	610	575	644	702
750		840		916	863	966	1053
1000		1120		1221	1150	1288	1404
1500		1680		1831	1725	1932	2106
2000		2240		2442	2300	2576	2808
2500		2800		3052	3125	3500	3815
3750		4200		4578	4688	5250	5723
5000		5600		6104	6250	7000	7630
7500		8400		9156	9375	10500	11445
10000		11200		12208	12500	14000	15260
12000		13440		14650	16000	17920	19533

TABLE 2
Percentage Impedance Voltage[1]

kV BIL Class	Low Voltage	
	< 2400V	≥ 2400V
45-150	5.75[2]	6.5[3]
200	7.25	7
250	7.75	7.5

1 The standard tolerance is ± 7.5%.
2 Option for 6.75% is available.
3 Option for 5.50% is available.

TABLE 3
Audible Sound Levels

Self-Cooled, Two Winding kVA Rating	NEMA Average	
	dB, KNAN	dB, KNAF
500	56	67
501-700	57	67
701-1000	58	67
1001-1500	60	67
1501-2000	61	67
2001-2500	62	67
2501-3000	63	67
3001-4000	64	67
4001-5000	65	67
5001-6000	66	68
6001-7500	67	70
7501-10000	68	71
12500	69	71

TABLE 5
Insulation Test Levels

kV Class	Induced Test 180 or 400 Hz-7200 Cycle	kV BIL		Applied Test 60Hz (kV)
		Distribution	Power	
1.2	TWICE RATED VOLTAGE	30	45	10
2.5		45	60	15
5		60	75	19
8.7		75	95	26
15		95	110	34
25 (Grd Y Only)		125	150	40
25		150	150	50
34.5 (Grd Y Only)		125	150	50
34.5		150	200	70
46		200	250	95

TABLE 6
Temperature Rise Ratings 0 - 3300 feet (0-1000 meters)

	Standard	Optional
Unit Rating	65 ºC	55/65 ºC, 75 ºC
Ambient Temperature Rise	40 ºC	40 ºC
Ambient Temperature 24 Hour Av.	30 ºC	30 ºC
Temperature Rise Winding[1]	65 ºC	55 ºC
Temperature Rise Hotspot	80 ºC	65 ºC

1 Average Rise by resistance. Refer to ANSI/IEEE Std C57.12.00™ standard.
NOTE: Derate kVA by 0.4% for each 100 M (330 ft.) that the altitude is above 1000 M (3300 ft.)

TABLE 7
Fluid-Filled - Aluminum Windings 55/65 °C Rise[1]

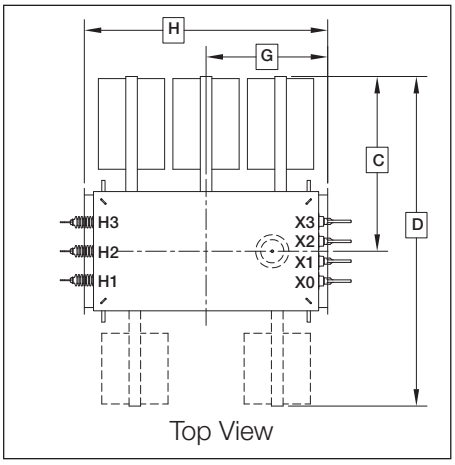
kVA	Drawing Dimensions (in.)									Gallons Of Fluid	Approx. Total Weight (lbs.) (With Fluid)
	A	B	C	D	E	F	G	H	J		
500	66	51	26	52	45	45	30	60	35	300	5600
750	75	59	26	52	55	55	34	68	35	360	7000
1000	75	67	26	52	55	55	38	76	35	420	8400
1500	75	59	59	80	55	55	34	68	35	400	9500
2000	85	67	67	90	55	55	38	76	39	520	12000
2500	85	75	68	92	55	55	42	84	41	570	14600
3750	85	75	70	120	65	65	42	84	45	790	20500
5000	99	87	72	144	65	65	48	96	49	1050	26000
7500	99	95	74	148	75	75	52	104	53	1320	35000
10,000	99	103	76	152	75	75	56	112	57	1740	43000
12,000	99	103	82	164	75	75	56	112	61	1850	49000

[1] Weights, gallons of fluid and dimensions are for reference only, and not for construction. Please contact Cooper Power Systems for exact dimensions

TABLE 8
Fluid-Filled - Copper Windings 55/65 °C Rise[1]

kVA	Drawing Dimensions (in.)									Gallons Of Fluid	Approx. Total Weight (lbs.) (With Fluid)
	A	B	C	D	E	F	G	H	J		
500	66	51	26	52	45	45	30	60	35	310	5900
750	75	59	26	52	55	55	34	68	35	370	7400
1000	75	67	26	52	55	55	38	76	35	430	8800
1500	75	59	59	80	55	55	34	68	35	420	10000
2000	85	63	67	90	55	55	36	72	39	500	12800
2500	85	67	68	92	55	55	38	76	41	590	14900
3750	85	75	70	120	65	65	42	84	45	830	21500
5000	99	87	72	144	65	65	48	96	49	1090	28000
7500	99	95	74	148	75	75	52	104	53	1360	37000
10,000	99	103	76	152	75	75	56	112	57	1780	45000
12,000	99	103	82	164	75	75	56	112	61	1880	50000

[1] Weights, gallons of fluid and dimensions are for reference only, and not for construction. Please contact Cooper Power Systems for exact dimensions



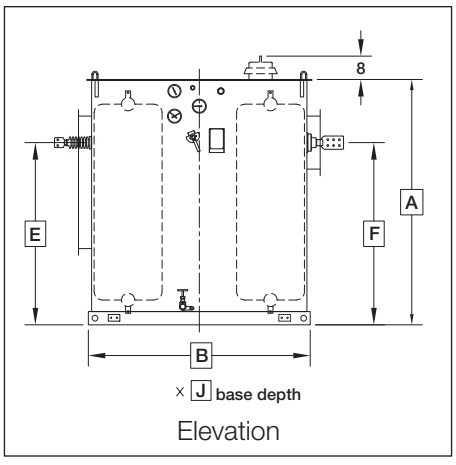


Figure 3.
High-Voltage left (Segment 2) shown. High-Voltage right (Segment 4) also available.

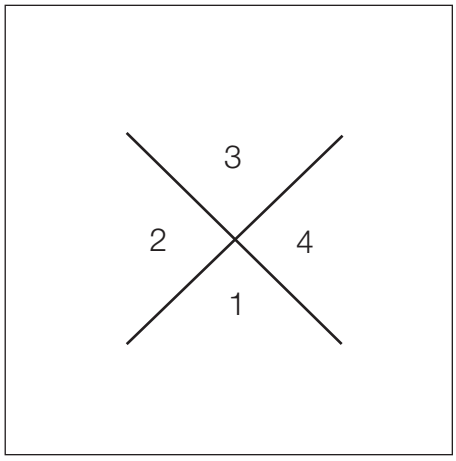


Figure 4.
ANSI segment designation.

APPENDIX D

Details of Predictive Acoustical Modelling

The predictive model used for this Assessment (*Cadna-A version 4.3.143*) is based on the methods from ISO Standard 9613-2.2 "Acoustics - Attenuation of Sound During Propagation Outdoors" [7], which accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures (or by topography and foliage where applicable). This modeling technique is acceptable to the MOE.

The site and the surrounding area were conservatively modelled as flat, although observations during the January 31, 2012 site visit by HGC Engineering noticed minor terrain features in the area surrounding the site. Ground attenuation was assumed to be spectral for all sources, with the ground factor (G) assumed to be 0.7 in all areas. The temperature and relative humidity were assumed to be 10° C and 70%, respectively.

The predictive modelling considered one order of reflection, with both on-site and off-site shielding/reflections afforded by buildings, walls, etc., with spectral absorptive characteristics applied to structures as appropriate. No credit has been assumed in the model for self-shielding of the sources on site by the arrays of solar panels themselves. In this regard the predictions are conservative (i.e. may tend to overpredict the sound levels slightly).

All mechanical sources were modeled as point sources of sound and are shown as crosses in Figures 3 and 4.

APPENDIX E

Acoustic Assessment Criteria

The MOE noise assessment guidelines draw a distinction between sound produced by traffic sources and that produced by industrial or commercial activities, which are classified as *stationary sources of sound*. In essence, the sound from the stationary sources is evaluated against (i.e. compared to) the typical background sound at any potentially impacted, sound-sensitive points of reception (e.g., residences). Background sound is considered to include road traffic sound and other typical sounds, but excludes the sound of the facility under assessment. MOE Publication NPC-232, "Sound Level Limits for Stationary Sources in Class 3 Areas (Rural)," is a guideline for developing applicable sound level limits. In general, the acceptability limits for stationary sources are site dependent, and are based on the existing ambient background sound levels in the area of the subject site.

MOE Publication NPC-232 states that the sound level limit for a stationary source that operates during daytime and nighttime hours in a Class 3 (rural) environment is the lower of the minimum one-hour L_{EQ} ambient (background) sound level or the minimum one-hour ninetieth percentile L_{90} sound level plus 10 dB (i.e. L_{90} + 10 dB) at any potentially impacted residential point of reception. In addition, NPC-232 also states exclusionary minimum limits of 45 dBA during daytime hours (07:00 – 19:00) and 40 dBA during nighttime hours (19:00 – 07:00).

Based on the rural nature of the area surrounding the subject site, background sound levels are expected to fall below the exclusionary minimum limits stipulated in NPC-232 during the quietest hours of the day and night. Given that the equipment at the subject facility will be energized during the day and night with steady sound emissions when daylight conditions allow, the most stringent nighttime criterion of 40 dBA is the applicable sound level limit at all points of reception.

APPENDIX F

Sample Calculation Results - Condensed, Overall dBA Format

In the following tables of calculation results, the column headings for the various sound attenuation mechanisms follow the terminology of ISO Standard 9613-2. Lx is the A-weighted, one-hour energy-equivalent (or logarithmic-mean impulse) source sound power level, which includes the effects of any source-abatement measures included in the model, and any time-averaging effects for intermittent sources. Lr is the A-weighted, one-hour energy-equivalent (or logarithmic-mean impulse) sound level at the point of reception. The results are presented in terms of overall A-weighted results, at the most impacted off-site point of reception.

R01	Residential Dwelling	645636	4880454	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	57.7	0	0.0	0.2	0.0	4.2	0.0	0.0	0.0	0.0	31
NS-02	Inverter House	645259	4880262	2.3	100	63.5	0	0.0	-0.8	0.0	7.6	0.0	0.0	0.0	0.0	30
NS-03	Inverter House	645112	4880262	2.3	100	65.9	0	0.0	-0.8	0.0	8.7	0.0	0.0	0.0	0.0	27
NS-04	Inverter House	644990	4880262	2.3	100	67.6	0	0.0	-0.8	0.0	9.3	0.0	0.0	0.0	0.0	24
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	53.5	0	0.0	-0.1	0.0	0.5	0.0	0.0	0.0	0.0	36
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	52.7	3	0.0	2.3	10.2	0.4	0.0	0.0	0.0	0.0	21

R02	Residential Dwelling	645715	4880488	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	60.6	0	0.0	0.1	0.0	4.9	0.0	0.0	0.0	0.0	27
NS-02	Inverter House	645259	4880262	2.3	100	65.1	0	0.0	-0.8	0.0	8.4	0.0	0.0	0.0	0.0	28
NS-03	Inverter House	645112	4880262	2.3	100	67.2	0	0.0	-0.8	0.0	9.2	0.0	0.0	0.0	0.0	25
NS-04	Inverter House	644990	4880262	2.3	100	68.6	0	0.0	-0.8	0.0	9.7	0.0	0.0	0.0	0.0	23
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	56.4	0	0.0	0.4	3.9	0.6	0.0	0.0	0.0	0.0	28
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	55.7	3	0.0	2.4	9.5	0.6	0.0	0.0	0.0	0.0	18

R03	Vacant Lot	645741	4880366	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	60.6	0	0.0	0.1	0.0	4.9	0.0	0.0	0.0	0.0	27
NS-02	Inverter House	645259	4880262	2.3	100	64.9	0	0.0	-0.8	0.0	8.2	0.0	0.0	0.0	0.0	28
NS-03	Inverter House	645112	4880262	2.3	100	67.1	0	0.0	-0.8	0.0	9.2	0.0	0.0	0.0	0.0	25
NS-04	Inverter House	644990	4880262	2.3	100	68.6	0	0.0	-0.8	0.0	9.7	0.0	0.0	0.0	0.0	23
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	52.3	0	0.0	-0.1	0.0	0.4	0.0	0.0	0.0	0.0	37
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	51.6	3	0.0	0.7	0.0	0.4	0.0	0.0	0.0	0.0	34

R04	Residential Dwelling	645825	4880159	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	63.7	0	0.0	0.2	0.0	5.6	0.0	0.0	0.0	0.0	23
NS-02	Inverter House	645259	4880262	2.3	100	66.2	0	0.0	-0.8	0.0	8.8	0.0	0.0	0.0	0.0	26
NS-03	Inverter House	645112	4880262	2.3	100	68.2	0	0.0	-0.8	0.0	9.5	0.0	0.0	0.0	0.0	23
NS-04	Inverter House	644990	4880262	2.3	100	69.5	0	0.0	-0.8	0.0	10.0	0.0	0.0	0.0	0.0	22
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	59.0	0	0.0	-0.1	0.0	0.8	0.0	0.0	0.0	0.0	30
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	59.1	3	0.0	0.8	0.0	0.8	0.0	0.0	0.0	0.0	26

R05	Residential Dwelling	646502	4880217	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	71.6	0	0.0	1.3	2.8	7.4	0.0	0.0	0.0	0.0	10
NS-02	Inverter House	645259	4880262	2.3	100	72.9	0	0.0	-0.7	0.0	11.3	0.0	0.0	0.0	0.0	17
NS-03	Inverter House	645112	4880262	2.3	100	73.9	0	0.0	-0.6	0.0	11.7	0.0	0.0	0.0	0.0	15
NS-04	Inverter House	644990	4880262	2.3	100	74.6	0	0.0	-0.6	0.0	12.0	0.0	0.0	0.0	0.0	14
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	69.8	0	0.0	-0.4	0.0	2.3	0.0	0.0	0.0	0.0	18
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	69.8	3	0.0	0.8	0.0	2.1	0.0	0.0	0.0	0.0	13

R06	Residential Dwelling	646320	4880115	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	70.2	0	0.0	0.4	0.0	7.0	0.0	0.0	0.0	0.0	15
NS-02	Inverter House	645259	4880262	2.3	100	71.6	0	0.0	-0.7	0.0	10.8	0.0	0.0	0.0	0.0	19
NS-03	Inverter House	645112	4880262	2.3	100	72.7	0	0.0	-0.7	0.0	11.2	0.0	0.0	0.0	0.0	17
NS-04	Inverter House	644990	4880262	2.3	100	73.5	0	0.0	-0.6	0.0	11.5	0.0	0.0	0.0	0.0	16
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	68.1	0	0.0	-0.4	0.0	1.9	0.0	0.0	0.0	0.0	20
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	68.1	3	0.0	0.8	0.0	1.8	0.0	0.0	0.0	0.0	16

R07	Residential Dwelling	645929	4879942	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	67.2	0	0.0	0.3	0.0	6.4	0.0	0.0	0.0	0.0	19
NS-02	Inverter House	645259	4880262	2.3	100	68.4	0	0.0	-0.8	0.0	9.6	0.0	0.0	0.0	0.0	23
NS-03	Inverter House	645112	4880262	2.3	100	69.9	0	0.0	-0.7	0.0	10.2	0.0	0.0	0.0	0.0	21
NS-04	Inverter House	644990	4880262	2.3	100	70.9	0	0.0	-0.7	0.0	10.6	0.0	0.0	0.0	0.0	20
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	64.6	0	0.0	-0.4	0.0	1.4	0.0	0.0	0.0	0.0	24
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	64.7	3	0.0	0.7	0.0	1.3	0.0	0.0	0.0	0.0	19

R08	Residential Dwelling	645978	4879638	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	70.1	0	0.0	0.4	0.0	7.0	0.0	0.0	0.0	0.0	15
NS-02	Inverter House	645259	4880262	2.3	100	70.6	0	0.0	-0.7	0.0	10.4	0.0	0.0	0.0	0.0	20
NS-03	Inverter House	645112	4880262	2.3	100	71.6	0	0.0	-0.7	0.0	10.8	0.0	0.0	0.0	0.0	19
NS-04	Inverter House	644990	4880262	2.3	100	72.4	0	0.0	-0.7	0.0	11.1	0.0	0.0	0.0	0.0	18
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	68.7	0	0.0	-0.4	0.0	2.1	0.0	0.0	0.0	0.0	19
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	68.8	3	0.0	0.8	0.0	1.9	0.0	0.0	0.0	0.0	15

R09	Residential Dwelling	645992	4879595	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	70.5	0	0.0	0.4	0.0	7.1	0.0	0.0	0.0	0.0	15
NS-02	Inverter House	645259	4880262	2.3	100	70.9	0	0.0	-0.7	0.0	10.6	0.0	0.0	0.0	0.0	20
NS-03	Inverter House	645112	4880262	2.3	100	71.9	0	0.0	-0.7	0.0	10.9	0.0	0.0	0.0	0.0	18
NS-04	Inverter House	644990	4880262	2.3	100	72.6	0	0.0	-0.7	0.0	11.2	0.0	0.0	0.0	0.0	17
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	69.2	0	0.0	-0.4	0.0	2.2	0.0	0.0	0.0	0.0	19
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	69.3	3	0.0	0.8	0.0	2.0	0.0	0.0	0.0	0.0	14

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl

R10	Residential Dwelling	646017	4879557	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	70.9	0	0.0	0.4	0.0	7.2	0.0	0.0	0.0	0.0	14
NS-02	Inverter House	645259	4880262	2.3	100	71.3	0	0.0	-0.7	0.0	10.7	0.0	0.0	0.0	0.0	19
NS-03	Inverter House	645112	4880262	2.3	100	72.2	0	0.0	-0.7	0.0	11.0	0.0	0.0	0.0	0.0	18
NS-04	Inverter House	644990	4880262	2.3	100	72.9	0	0.0	-0.7	0.0	11.3	0.0	0.0	0.0	0.0	17
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	69.6	0	0.0	-0.4	0.0	2.2	0.0	0.0	0.0	0.0	18
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	69.7	3	0.0	0.8	0.0	2.1	0.0	0.0	0.0	0.0	14

R11	Residential Dwelling	646029	4879512	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	71.3	0	0.0	0.5	0.0	7.3	0.0	0.0	0.0	0.0	14
NS-02	Inverter House	645259	4880262	2.3	100	71.6	0	0.0	-0.7	0.0	10.8	0.0	0.0	0.0	0.0	19
NS-03	Inverter House	645112	4880262	2.3	100	72.5	0	0.0	-0.7	0.0	11.1	0.0	0.0	0.0	0.0	17
NS-04	Inverter House	644990	4880262	2.3	100	73.2	0	0.0	-0.6	0.0	11.4	0.0	0.0	0.0	0.0	16
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	70.1	0	0.0	-0.4	0.0	2.3	0.0	0.0	0.0	0.0	18
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	70.2	3	0.0	0.8	0.0	2.2	0.0	0.0	0.0	0.0	13

R12	Residential Dwelling	645958	4879485	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	71.1	0	0.0	0.5	0.0	7.3	0.0	0.0	0.0	0.0	14
NS-02	Inverter House	645259	4880262	2.3	100	71.4	0	0.0	-0.7	0.0	10.7	0.0	0.0	0.0	0.0	19
NS-03	Inverter House	645112	4880262	2.3	100	72.2	0	0.0	-0.7	0.0	11.0	0.0	0.0	0.0	0.0	18
NS-04	Inverter House	644990	4880262	2.3	100	72.9	0	0.0	-0.7	0.0	11.3	0.0	0.0	0.0	0.0	17
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	70.1	0	0.0	-0.4	0.0	2.3	0.0	0.0	0.0	0.0	18
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	70.1	3	0.0	0.8	0.0	2.2	0.0	0.0	0.0	0.0	13

R13	Residential Dwelling	645949	4879532	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	70.8	0	0.0	0.4	0.0	7.2	0.0	0.0	0.0	0.0	14
NS-02	Inverter House	645259	4880262	2.3	100	71.0	0	0.0	-0.7	0.0	10.6	0.0	0.0	0.0	0.0	19
NS-03	Inverter House	645112	4880262	2.3	100	71.9	0	0.0	-0.7	0.0	10.9	0.0	0.0	0.0	0.0	18
NS-04	Inverter House	644990	4880262	2.3	100	72.6	0	0.0	-0.7	0.0	11.2	0.0	0.0	0.0	0.0	17
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	69.6	0	0.0	-0.4	0.0	2.2	0.0	0.0	0.0	0.0	18
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	69.7	3	0.0	0.8	0.0	2.1	0.0	0.0	0.0	0.0	14

R14	Vacant Lot	645822	4879794	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	67.7	0	0.0	0.3	0.0	6.5	0.0	0.0	0.0	0.0	18
NS-02	Inverter House	645259	4880262	2.3	100	68.3	0	0.0	-0.8	0.0	9.6	0.0	0.0	0.0	0.0	23
NS-03	Inverter House	645112	4880262	2.3	100	69.6	0	0.0	-0.8	0.0	10.1	0.0	0.0	0.0	0.0	21
NS-04	Inverter House	644990	4880262	2.3	100	70.6	0	0.0	-0.7	0.0	10.4	0.0	0.0	0.0	0.0	20
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	66.0	0	0.0	-0.4	0.0	1.6	0.0	0.0	0.0	0.0	23
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	66.1	3	0.0	0.7	0.0	1.5	0.0	0.0	0.0	0.0	18

R15	Residential Dwelling	645766	4880002	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	64.7	0	0.0	0.2	0.0	5.9	0.0	0.0	0.0	0.0	22
NS-02	Inverter House	645259	4880262	2.3	100	66.1	0	0.0	-0.8	0.0	8.8	0.0	0.0	0.0	0.0	26
NS-03	Inverter House	645112	4880262	2.3	100	68.0	0	0.0	-0.8	0.0	9.5	0.0	0.0	0.0	0.0	24
NS-04	Inverter House	644990	4880262	2.3	100	69.3	0	0.0	-0.8	0.0	9.9	0.0	0.0	0.0	0.0	22
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	61.8	0	0.0	-0.3	0.0	1.1	0.0	0.0	0.0	0.0	27
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	62.0	3	0.0	0.8	0.0	1.0	0.0	0.0	0.0	0.0	22

R16	Residential Dwelling	645690	4879860	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	65.9	0	0.0	0.2	0.0	6.1	0.0	0.0	0.0	0.0	20
NS-02	Inverter House	645259	4880262	2.3	100	66.4	0	0.0	-0.8	0.0	8.9	0.0	0.0	0.0	0.0	26
NS-03	Inverter House	645112	4880262	2.3	100	68.0	0	0.0	-0.8	0.0	9.5	0.0	0.0	0.0	0.0	24
NS-04	Inverter House	644990	4880262	2.3	100	69.1	0	0.0	-0.8	0.0	9.9	0.0	0.0	0.0	0.0	22
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	64.3	0	0.0	-0.4	0.0	1.4	0.0	0.0	0.0	0.0	24
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	64.5	3	0.0	0.7	0.0	1.3	0.0	0.0	0.0	0.0	20

R17	Residential Dwelling	645622	4879850	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	65.7	0	0.0	0.2	0.0	6.1	0.0	0.0	0.0	0.0	21
NS-02	Inverter House	645259	4880262	2.3	100	65.8	0	0.0	-0.8	0.0	8.6	0.0	0.0	0.0	0.0	27
NS-03	Inverter House	645112	4880262	2.3	100	67.3	0	0.0	-0.8	0.0	9.2	0.0	0.0	0.0	0.0	25
NS-04	Inverter House	644990	4880262	2.3	100	68.6	0	0.0	-0.8	0.0	9.7	0.0	0.0	0.0	0.0	23
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	64.5	0	0.0	-0.4	0.0	1.4	0.0	0.0	0.0	0.0	24
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	64.7	3	0.0	0.7	0.0	1.3	0.0	0.0	0.0	0.0	19

R18	Vacant Lot	645713	4879510	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	70.0	0	0.0	0.4	0.0	7.0	0.0	0.0	0.0	0.0	15
NS-02	Inverter House	645259	4880262	2.3	100	69.9	0	0.0	-0.7	0.0	10.2	0.0	0.0	0.0	0.0	21
NS-03	Inverter House	645112	4880262	2.3	100	70.7	0	0.0	-0.7	0.0	10.5	0.0	0.0	0.0	0.0	20
NS-04	Inverter House	644990	4880262	2.3	100	71.4	0	0.0	-0.7	0.0	10.7	0.0	0.0	0.0	0.0	19
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	69.2	0	0.0	-0.4	0.0	2.2	0.0	0.0	0.0	0.0	19
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	69.3	3	0.0	0.8	0.0	2.0	0.0	0.0	0.0	0.0	14

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl

R19	Residential Dwelling	645529	4879809	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	65.9	0	0.0	0.2	0.0	6.1	0.0	0.0	0.0	0.0	20
NS-02	Inverter House	645259	4880262	2.3	100	65.4	0	0.0	-0.8	0.0	8.5	0.0	0.0	0.0	0.0	27
NS-03	Inverter House	645112	4880262	2.3	100	66.8	0	0.0	-0.8	0.0	9.0	0.0	0.0	0.0	0.0	25
NS-04	Inverter House	644990	4880262	2.3	100	67.9	0	0.0	-0.8	0.0	9.5	0.0	0.0	0.0	0.0	24
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	65.4	0	0.0	-0.4	0.0	1.5	0.0	0.0	0.0	0.0	23
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	65.6	3	0.0	0.7	0.0	1.4	0.0	0.0	0.0	0.0	18

R20	Residential Dwelling	645394	4879838	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	65.4	0	0.0	0.2	0.0	6.0	0.0	0.0	0.0	0.0	21
NS-02	Inverter House	645259	4880262	2.3	100	64.0	0	0.0	-0.8	0.0	7.9	0.0	0.0	0.0	0.0	29
NS-03	Inverter House	645112	4880262	2.3	100	65.1	0	0.0	-0.8	0.0	8.4	0.0	0.0	0.0	0.0	28
NS-04	Inverter House	644990	4880262	2.3	100	66.3	0	0.0	-0.8	0.0	8.9	0.0	0.0	0.0	0.0	26
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	65.6	0	0.0	-0.4	0.0	1.5	0.0	0.0	0.0	0.0	23
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	65.9	3	0.0	0.7	0.0	1.5	0.0	0.0	0.0	0.0	18

R21	Residential Dwelling	645391	4879641	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	68.2	0	0.0	0.3	0.0	6.6	0.0	0.0	0.0	0.0	18
NS-02	Inverter House	645259	4880262	2.3	100	67.1	0	0.0	-0.8	0.0	9.1	0.0	0.0	0.0	0.0	25
NS-03	Inverter House	645112	4880262	2.3	100	67.7	0	0.0	-0.8	0.0	9.4	0.0	0.0	0.0	0.0	24
NS-04	Inverter House	644990	4880262	2.3	100	68.4	0	0.0	-0.8	0.0	9.6	0.0	0.0	0.0	0.0	23
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	68.2	0	0.0	-0.4	0.0	2.0	0.0	0.0	0.0	0.0	20
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	68.3	3	0.0	0.8	0.0	1.8	0.0	0.0	0.0	0.0	15

R22	Residential Dwelling	645281	4879749	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	67.0	0	0.0	0.3	0.0	6.4	0.0	0.0	0.0	0.0	19
NS-02	Inverter House	645259	4880262	2.3	100	65.2	0	0.0	-0.8	0.0	8.4	0.0	0.0	0.0	0.0	28
NS-03	Inverter House	645112	4880262	2.3	100	65.7	0	0.0	-0.8	0.0	8.6	0.0	0.0	0.0	0.0	27
NS-04	Inverter House	644990	4880262	2.3	100	66.4	0	0.0	-0.8	0.0	8.9	0.0	0.0	0.0	0.0	26
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	67.5	0	0.0	-0.4	0.0	1.9	0.0	0.0	0.0	0.0	21
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	67.7	3	0.0	0.8	0.0	1.7	0.0	0.0	0.0	0.0	16

R23	Residential Dwelling	645169	4879700	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	68.1	0	0.0	0.3	0.0	6.6	0.0	0.0	0.0	0.0	18
NS-02	Inverter House	645259	4880262	2.3	100	66.1	0	0.0	-0.8	0.0	8.8	0.0	0.0	0.0	0.0	26
NS-03	Inverter House	645112	4880262	2.3	100	66.0	0	0.0	-0.8	0.0	8.7	0.0	0.0	0.0	0.0	26
NS-04	Inverter House	644990	4880262	2.3	100	66.4	0	0.0	-0.8	0.0	8.9	0.0	0.0	0.0	0.0	26
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	68.8	0	0.0	-0.4	0.0	2.1	0.0	0.0	0.0	0.0	19
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	68.9	3	0.0	0.8	0.0	1.9	0.0	0.0	0.0	0.0	15

R24	Residential Dwelling	645197	4879586	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	69.2	0	0.0	0.4	0.0	6.8	0.0	0.0	0.0	0.0	16
NS-02	Inverter House	645259	4880262	2.3	100	67.6	0	0.0	-0.8	0.0	9.3	0.0	0.0	0.0	0.0	24
NS-03	Inverter House	645112	4880262	2.3	100	67.7	0	0.0	-0.8	0.0	9.4	0.0	0.0	0.0	0.0	24
NS-04	Inverter House	644990	4880262	2.3	100	68.0	0	0.0	-0.8	0.0	9.5	0.0	0.0	0.0	0.0	24
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	69.6	0	0.0	-0.4	0.0	2.2	0.0	0.0	0.0	0.0	18
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	69.8	3	0.0	0.8	0.0	2.1	0.0	0.0	0.0	0.0	14

R25	Residential Dwelling	645023	4879825	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	67.6	0	0.0	0.3	0.0	6.5	0.0	0.0	0.0	0.0	18
NS-02	Inverter House	645259	4880262	2.3	100	64.9	0	0.0	-0.8	0.0	8.3	0.0	0.0	0.0	0.0	28
NS-03	Inverter House	645112	4880262	2.3	100	64.0	0	0.0	-0.8	0.0	7.9	0.0	0.0	0.0	0.0	29
NS-04	Inverter House	644990	4880262	2.3	100	63.8	0	0.0	-0.8	0.0	7.8	0.0	0.0	0.0	0.0	30
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	68.9	0	0.0	-0.4	0.0	2.1	0.0	0.0	0.0	0.0	19
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	69.1	3	0.0	0.8	0.0	2.0	0.0	0.0	0.0	0.0	14

R26	Residential Dwelling	644991	4879640	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	69.6	0	0.0	0.4	0.0	6.9	0.0	0.0	0.0	0.0	16
NS-02	Inverter House	645259	4880262	2.3	100	67.6	0	0.0	-0.8	0.0	9.3	0.0	0.0	0.0	0.0	24
NS-03	Inverter House	645112	4880262	2.3	100	67.0	0	0.0	-0.8	0.0	9.1	0.0	0.0	0.0	0.0	25
NS-04	Inverter House	644990	4880262	2.3	100	66.9	0	0.0	-0.8	0.0	9.1	0.0	0.0	0.0	0.0	25
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	70.4	0	0.0	-0.4	0.0	2.4	0.0	0.0	0.0	0.0	17
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	70.6	3	0.0	0.9	0.0	2.3	0.0	0.0	0.0	0.0	13

R27	Residential Dwelling	644994	4879510	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	70.6	0	0.0	0.4	0.0	7.1	0.0	0.0	0.0	0.0	15
NS-02	Inverter House	645259	4880262	2.3	100	69.0	0	0.0	-0.8	0.0	9.9	0.0	0.0	0.0	0.0	22
NS-03	Inverter House	645112	4880262	2.3	100	68.6	0	0.0	-0.8	0.0	9.7	0.0	0.0	0.0	0.0	23
NS-04	Inverter House	644990	4880262	2.3	100	68.5	0	0.0	-0.8	0.0	9.7	0.0	0.0	0.0	0.0	23
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	71.3	0	0.0	-0.4	0.0	2.6	0.0	0.0	0.0	0.0	16
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	71.4	3	0.0	0.9	0.0	2.4	0.0	0.0	0.0	0.0	11

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl

R28	Residential Dwelling	644930	4879485	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	71.1	0	0.0	0.5	0.0	7.3	0.0	0.0	0.0	0.0	14
NS-02	Inverter House	645259	4880262	2.3	100	69.5	0	0.0	-0.8	0.0	10.0	0.0	0.0	0.0	0.0	22
NS-03	Inverter House	645112	4880262	2.3	100	69.0	0	0.0	-0.8	0.0	9.9	0.0	0.0	0.0	0.0	22
NS-04	Inverter House	644990	4880262	2.3	100	68.8	0	0.0	-0.8	0.0	9.8	0.0	0.0	0.0	0.0	23
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	71.8	0	0.0	-0.4	0.0	2.7	0.0	0.0	0.0	0.0	16
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	71.9	3	0.0	0.9	0.0	2.5	0.0	0.0	0.0	0.0	11

R29	Residential Dwelling	644843	4879783	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	69.4	0	0.0	0.4	0.0	6.9	0.0	0.0	0.0	0.0	16
NS-02	Inverter House	645259	4880262	2.3	100	67.1	0	0.0	-0.8	0.0	9.1	0.0	0.0	0.0	0.0	25
NS-03	Inverter House	645112	4880262	2.3	100	65.8	0	0.0	-0.8	0.0	8.6	0.0	0.0	0.0	0.0	27
NS-04	Inverter House	644990	4880262	2.3	100	65.0	0	0.0	-0.8	0.0	8.3	0.0	0.0	0.0	0.0	28
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	70.6	0	0.0	-0.4	0.0	2.5	0.0	0.0	0.0	0.0	17
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	70.7	3	0.0	0.9	0.0	2.3	0.0	0.0	0.0	0.0	12

R30	Residential Dwelling	644707	4879565	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	71.7	0	0.0	0.5	0.0	7.4	0.0	0.0	0.0	0.0	13
NS-02	Inverter House	645259	4880262	2.3	100	70.0	0	0.0	-0.7	0.0	10.2	0.0	0.0	0.0	0.0	21
NS-03	Inverter House	645112	4880262	2.3	100	69.1	0	0.0	-0.8	0.0	9.9	0.0	0.0	0.0	0.0	22
NS-04	Inverter House	644990	4880262	2.3	100	68.5	0	0.0	-0.8	0.0	9.7	0.0	0.0	0.0	0.0	23
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	72.6	0	0.0	-0.3	0.0	2.9	0.0	0.0	0.0	0.0	15
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	72.6	3	0.0	1.0	0.0	2.7	0.0	0.0	0.0	0.0	10

R31	Residential Dwelling	644722	4879405	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	72.6	0	0.0	0.5	0.0	7.6	0.0	0.0	0.0	0.0	12
NS-02	Inverter House	645259	4880262	2.3	100	71.1	0	0.0	-0.7	0.0	10.6	0.0	0.0	0.0	0.0	19
NS-03	Inverter House	645112	4880262	2.3	100	70.5	0	0.0	-0.7	0.0	10.4	0.0	0.0	0.0	0.0	20
NS-04	Inverter House	644990	4880262	2.3	100	70.1	0	0.0	-0.7	0.0	10.2	0.0	0.0	0.0	0.0	21
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	73.2	0	0.0	-0.3	0.0	3.1	0.0	0.0	0.0	0.0	14
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	73.3	3	0.0	1.0	0.0	2.9	0.0	0.0	0.0	0.0	9

R32	Residential Dwelling	644578	4879574	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	72.3	0	0.0	0.5	0.0	7.6	0.0	0.0	0.0	0.0	12
NS-02	Inverter House	645259	4880262	2.3	100	70.7	0	0.0	-0.7	0.0	10.5	0.0	0.0	0.0	0.0	20
NS-03	Inverter House	645112	4880262	2.3	100	69.8	0	0.0	-0.7	0.0	10.2	0.0	0.0	0.0	0.0	21
NS-04	Inverter House	644990	4880262	2.3	100	69.1	0	0.0	-0.8	0.0	9.9	0.0	0.0	0.0	0.0	22
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	73.2	0	0.0	-0.3	0.0	3.1	0.0	0.0	0.0	0.0	14
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	73.3	3	0.0	1.0	0.0	2.9	0.0	0.0	0.0	0.0	9

R33	Residential Dwelling	644547	4879365	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	73.5	0	0.0	0.6	0.0	7.9	0.0	0.0	0.0	0.0	11
NS-02	Inverter House	645259	4880262	2.3	100	72.2	0	0.0	-0.7	0.0	11.0	0.0	0.0	0.0	0.0	18
NS-03	Inverter House	645112	4880262	2.3	100	71.5	0	0.0	-0.7	0.0	10.8	0.0	0.0	0.0	0.0	19
NS-04	Inverter House	644990	4880262	2.3	100	71.0	0	0.0	-0.7	0.0	10.6	0.0	0.0	0.0	0.0	19
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	74.2	0	0.0	-0.3	0.0	3.4	0.0	0.0	0.0	0.0	12
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	74.3	3	0.0	1.1	0.0	3.2	0.0	0.0	0.0	0.0	8

R34	Residential Dwelling	644458	4879532	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	73.2	0	0.0	0.5	0.0	7.8	0.0	0.0	0.0	0.0	11
NS-02	Inverter House	645259	4880262	2.3	100	71.7	0	0.0	-0.7	0.0	10.8	0.0	0.0	0.0	0.0	19
NS-03	Inverter House	645112	4880262	2.3	100	70.8	0	0.0	-0.7	0.0	10.5	0.0	0.0	0.0	0.0	20
NS-04	Inverter House	644990	4880262	2.3	100	70.1	0	0.0	-0.7	0.0	10.3	0.0	0.0	0.0	0.0	21
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	74.0	0	0.0	-0.3	0.0	3.4	0.0	0.0	0.0	0.0	13
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	74.1	3	0.0	1.0	0.0	3.1	0.0	0.0	0.0	0.0	8

R35	Residential Dwelling	644352	4879464	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	74.0	0	0.0	0.6	0.0	8.0	0.0	0.0	0.0	0.0	10
NS-02	Inverter House	645259	4880262	2.3	100	72.6	0	0.0	-0.7	0.0	11.2	0.0	0.0	0.0	0.0	17
NS-03	Inverter House	645112	4880262	2.3	100	71.8	0	0.0	-0.7	0.0	10.9	0.0	0.0	0.0	0.0	18
NS-04	Inverter House	644990	4880262	2.3	100	71.2	0	0.0	-0.7	0.0	10.7	0.0	0.0	0.0	0.0	19
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	74.8	0	0.0	-0.3	0.0	3.6	0.0	0.0	0.0	0.0	12
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	74.8	3	0.0	1.1	0.0	3.3	0.0	0.0	0.0	0.0	7

R36	Residential Dwelling	644329	4879297	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	74.7	0	0.0	0.6	0.0	8.2	0.0	0.0	0.0	0.0	9
NS-02	Inverter House	645259	4880262	2.3	100	73.5	0	0.0	-0.6	0.0	11.6	0.0	0.0	0.0	0.0	16
NS-03	Inverter House	645112	4880262	2.3	100	72.9	0	0.0	-0.7	0.0	11.3	0.0	0.0	0.0	0.0	17
NS-04	Inverter House	644990	4880262	2.3	100	72.4	0	0.0	-0.7	0.0	11.1	0.0	0.0	0.0	0.0	18
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	75.4	0	0.0	-0.2	0.0	3.8	0.0	0.0	0.0	0.0	11
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	75.5	3	0.0	1.1	0.0	3.5	0.0	0.0	0.0	0.0	6

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl

R37	Residential Dwelling	644272	4879396	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	74.6	0	0.0	0.6	0.0	8.2	0.0	0.0	0.0	0.0	9
NS-02	Inverter House	645259	4880262	2.3	100	73.4	0	0.0	-0.6	0.0	11.5	0.0	0.0	0.0	0.0	16
NS-03	Inverter House	645112	4880262	2.3	100	72.6	0	0.0	-0.7	0.0	11.2	0.0	0.0	0.0	0.0	17
NS-04	Inverter House	644990	4880262	2.3	100	72.0	0	0.0	-0.7	0.0	11.0	0.0	0.0	0.0	0.0	18
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	75.3	0	0.0	-0.2	0.0	3.8	0.0	0.0	0.0	0.0	11
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	75.4	3	0.0	1.1	0.0	3.5	0.0	0.0	0.0	0.0	6

R38	Residential Dwelling	644198	4879231	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	75.5	0	0.0	0.7	0.0	8.4	0.0	0.0	0.0	0.0	8
NS-02	Inverter House	645259	4880262	2.3	100	74.4	0	0.0	-0.6	0.0	11.9	0.0	0.0	0.0	0.0	15
NS-03	Inverter House	645112	4880262	2.3	100	73.8	0	0.0	-0.6	0.0	11.7	0.0	0.0	0.0	0.0	16
NS-04	Inverter House	644990	4880262	2.3	100	73.3	0	0.0	-0.6	0.0	11.5	0.0	0.0	0.0	0.0	16
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.1	0	0.0	-0.2	0.0	4.1	0.0	0.0	0.0	0.0	10
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.2	3	0.0	1.2	0.0	3.8	0.0	0.0	0.0	0.0	5

R39	Residential Dwelling	644155	4879238	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	75.6	0	0.0	0.7	0.0	8.5	0.0	0.0	0.0	0.0	8
NS-02	Inverter House	645259	4880262	2.3	100	74.6	0	0.0	-0.6	0.0	12.0	0.0	0.0	0.0	0.0	14
NS-03	Inverter House	645112	4880262	2.3	100	73.9	0	0.0	-0.6	0.0	11.7	0.0	0.0	0.0	0.0	15
NS-04	Inverter House	644990	4880262	2.3	100	73.4	0	0.0	-0.6	0.0	11.5	0.0	0.0	0.0	0.0	16
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.3	0	0.0	-0.2	0.0	4.1	0.0	0.0	0.0	0.0	10
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.3	3	0.0	1.2	0.0	3.8	0.0	0.0	0.0	0.0	5

R40	Residential Dwelling	644110	4879221	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	75.9	0	0.0	0.7	0.0	8.6	0.0	0.0	0.0	0.0	8
NS-02	Inverter House	645259	4880262	2.3	100	74.8	0	0.0	-0.6	0.0	12.1	0.0	0.0	0.0	0.0	14
NS-03	Inverter House	645112	4880262	2.3	100	74.2	0	0.0	-0.6	0.0	11.8	0.0	0.0	0.0	0.0	15
NS-04	Inverter House	644990	4880262	2.3	100	73.7	0	0.0	-0.6	0.0	11.6	0.0	0.0	0.0	0.0	16
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.5	0	0.0	-0.2	0.0	4.2	0.0	0.0	0.0	0.0	9
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.5	3	0.0	1.2	0.0	3.9	0.0	0.0	0.0	0.0	5

R41	Residential Dwelling	644060	4879173	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	76.2	0	0.0	0.7	0.0	8.7	0.0	0.0	0.0	0.0	7
NS-02	Inverter House	645259	4880262	2.3	100	75.2	0	0.0	-0.6	0.0	12.2	0.0	0.0	0.0	0.0	13
NS-03	Inverter House	645112	4880262	2.3	100	74.6	0	0.0	-0.6	0.0	12.0	0.0	0.0	0.0	0.0	14
NS-04	Inverter House	644990	4880262	2.3	100	74.1	0	0.0	-0.6	0.0	11.8	0.0	0.0	0.0	0.0	15
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.8	0	0.0	-0.2	0.0	4.3	0.0	0.0	0.0	0.0	9
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.9	3	0.0	1.2	0.0	4.0	0.0	0.0	0.0	0.0	4

R42	Residential Dwelling	644053	4879221	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	76.1	0	0.0	0.7	0.0	8.6	0.0	0.0	0.0	0.0	7
NS-02	Inverter House	645259	4880262	2.3	100	75.0	0	0.0	-0.6	0.0	12.2	0.0	0.0	0.0	0.0	14
NS-03	Inverter House	645112	4880262	2.3	100	74.4	0	0.0	-0.6	0.0	11.9	0.0	0.0	0.0	0.0	15
NS-04	Inverter House	644990	4880262	2.3	100	73.9	0	0.0	-0.6	0.0	11.7	0.0	0.0	0.0	0.0	15
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.7	0	0.0	-0.2	0.0	4.3	0.0	0.0	0.0	0.0	9
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.8	3	0.0	1.2	0.0	4.0	0.0	0.0	0.0	0.0	4

R43	Residential Dwelling	644045	4879297	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	75.9	0	0.0	0.7	0.0	8.6	0.0	0.0	0.0	0.0	8
NS-02	Inverter House	645259	4880262	2.3	100	74.8	0	0.0	-0.6	0.0	12.1	0.0	0.0	0.0	0.0	14
NS-03	Inverter House	645112	4880262	2.3	100	74.2	0	0.0	-0.6	0.0	11.8	0.0	0.0	0.0	0.0	15
NS-04	Inverter House	644990	4880262	2.3	100	73.6	0	0.0	-0.6	0.0	11.6	0.0	0.0	0.0	0.0	16
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.5	0	0.0	-0.2	0.0	4.2	0.0	0.0	0.0	0.0	9
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.6	3	0.0	1.2	0.0	3.9	0.0	0.0	0.0	0.0	5

R44	Residential Dwelling	644015	4879353	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	75.8	0	0.0	0.7	0.0	8.5	0.0	0.0	0.0	0.0	8
NS-02	Inverter House	645259	4880262	2.3	100	74.8	0	0.0	-0.6	0.0	12.1	0.0	0.0	0.0	0.0	14
NS-03	Inverter House	645112	4880262	2.3	100	74.1	0	0.0	-0.6	0.0	11.8	0.0	0.0	0.0	0.0	15
NS-04	Inverter House	644990	4880262	2.3	100	73.5	0	0.0	-0.6	0.0	11.5	0.0	0.0	0.0	0.0	16
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.5	0	0.0	-0.2	0.0	4.2	0.0	0.0	0.0	0.0	9
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.6	3	0.0	1.2	0.0	3.9	0.0	0.0	0.0	0.0	5

R45	Residential Dwelling	644046	4879397	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	75.6	0	0.0	0.7	0.0	8.5	0.0	0.0	0.0	0.0	8
NS-02	Inverter House	645259	4880262	2.3	100	74.5	0	0.0	-0.6	0.0	11.9	0.0	0.0	0.0	0.0	15
NS-03	Inverter House	645112	4880262	2.3	100	73.8	0	0.0	-0.6	0.0	11.6	0.0	0.0	0.0	0.0	16
NS-04	Inverter House	644990	4880262	2.3	100	73.2	0	0.0	-0.6	0.0	11.4	0.0	0.0	0.0	0.0	16
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.3	0	0.0	-0.2	0.0	4.1	0.0	0.0	0.0	0.0	10
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.3	3	0.0	1.2	0.0	3.8	0.0	0.0	0.0	0.0	5

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl

R46	Residential Dwelling	644006	4879419	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	75.7	0	0.0	0.7	0.0	8.5	0.0	0.0	0.0	0.0	8
NS-02	Inverter House	645259	4880262	2.3	100	74.6	0	0.0	-0.6	0.0	12.0	0.0	0.0	0.0	0.0	14
NS-03	Inverter House	645112	4880262	2.3	100	73.9	0	0.0	-0.6	0.0	11.7	0.0	0.0	0.0	0.0	15
NS-04	Inverter House	644990	4880262	2.3	100	73.3	0	0.0	-0.6	0.0	11.4	0.0	0.0	0.0	0.0	16
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.4	0	0.0	-0.2	0.0	4.2	0.0	0.0	0.0	0.0	9
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.5	3	0.0	1.2	0.0	3.9	0.0	0.0	0.0	0.0	5

R47	Residential Dwelling	643997	4879448	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	75.6	0	0.0	0.7	0.0	8.5	0.0	0.0	0.0	0.0	8
NS-02	Inverter House	645259	4880262	2.3	100	74.5	0	0.0	-0.6	0.0	12.0	0.0	0.0	0.0	0.0	14
NS-03	Inverter House	645112	4880262	2.3	100	73.8	0	0.0	-0.6	0.0	11.7	0.0	0.0	0.0	0.0	16
NS-04	Inverter House	644990	4880262	2.3	100	73.2	0	0.0	-0.7	0.0	11.4	0.0	0.0	0.0	0.0	16
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.4	0	0.0	-0.2	0.0	4.1	0.0	0.0	0.0	0.0	9
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.4	3	0.0	1.2	0.0	3.8	0.0	0.0	0.0	0.0	5

R48	Residential Dwelling	643987	4879478	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	75.6	0	0.0	0.7	0.0	8.5	0.0	0.0	0.0	0.0	8
NS-02	Inverter House	645259	4880262	2.3	100	74.5	0	0.0	-0.6	0.0	11.9	0.0	0.0	0.0	0.0	15
NS-03	Inverter House	645112	4880262	2.3	100	73.7	0	0.0	-0.6	0.0	11.6	0.0	0.0	0.0	0.0	16
NS-04	Inverter House	644990	4880262	2.3	100	73.1	0	0.0	-0.7	0.0	11.4	0.0	0.0	0.0	0.0	17
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.3	0	0.0	-0.2	0.0	4.1	0.0	0.0	0.0	0.0	10
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.4	3	0.0	1.2	0.0	3.8	0.0	0.0	0.0	0.0	5

R49	Residential Dwelling	643977	4879507	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	75.6	0	0.0	0.7	0.0	8.5	0.0	0.0	0.0	0.0	8
NS-02	Inverter House	645259	4880262	2.3	100	74.5	0	0.0	-0.6	0.0	11.9	0.0	0.0	0.0	0.0	15
NS-03	Inverter House	645112	4880262	2.3	100	73.7	0	0.0	-0.6	0.0	11.6	0.0	0.0	0.0	0.0	16
NS-04	Inverter House	644990	4880262	2.3	100	73.0	0	0.0	-0.7	0.0	11.4	0.0	0.0	0.0	0.0	17
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.3	0	0.0	-0.2	0.0	4.1	0.0	0.0	0.0	0.0	10
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.4	3	0.0	1.2	0.0	3.8	0.0	0.0	0.0	0.0	5

R50	Residential Dwelling	643969	4879536	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	75.5	0	0.0	0.7	0.0	8.5	0.0	0.0	0.0	0.0	8
NS-02	Inverter House	645259	4880262	2.3	100	74.4	0	0.0	-0.6	0.0	11.9	0.0	0.0	0.0	0.0	15
NS-03	Inverter House	645112	4880262	2.3	100	73.6	0	0.0	-0.6	0.0	11.6	0.0	0.0	0.0	0.0	16
NS-04	Inverter House	644990	4880262	2.3	100	73.0	0	0.0	-0.7	0.0	11.3	0.0	0.0	0.0	0.0	17
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.3	0	0.0	-0.2	0.0	4.1	0.0	0.0	0.0	0.0	10
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.4	3	0.0	1.2	0.0	3.8	0.0	0.0	0.0	0.0	5

R51	Residential Dwelling	644060	4879593	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	75.0	0	0.0	0.6	0.0	8.3	0.0	0.0	0.0	0.0	9
NS-02	Inverter House	645259	4880262	2.3	100	73.8	0	0.0	-0.6	0.0	11.6	0.0	0.0	0.0	0.0	16
NS-03	Inverter House	645112	4880262	2.3	100	72.9	0	0.0	-0.7	0.0	11.3	0.0	0.0	0.0	0.0	17
NS-04	Inverter House	644990	4880262	2.3	100	72.2	0	0.0	-0.7	0.0	11.0	0.0	0.0	0.0	0.0	18
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	75.8	0	0.0	-0.2	0.0	3.9	0.0	0.0	0.0	0.0	10
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	75.8	3	0.0	1.2	0.0	3.7	0.0	0.0	0.0	0.0	6

R52	Residential Dwelling	643946	4879649	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	75.4	0	0.0	0.7	0.0	8.4	0.0	0.0	0.0	0.0	8
NS-02	Inverter House	645259	4880262	2.3	100	74.2	0	0.0	-0.6	0.0	11.8	0.0	0.0	0.0	0.0	15
NS-03	Inverter House	645112	4880262	2.3	100	73.4	0	0.0	-0.6	0.0	11.5	0.0	0.0	0.0	0.0	16
NS-04	Inverter House	644990	4880262	2.3	100	72.7	0	0.0	-0.7	0.0	11.2	0.0	0.0	0.0	0.0	17
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.2	0	0.0	-0.2	0.0	4.1	0.0	0.0	0.0	0.0	10
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.2	3	0.0	1.2	0.0	3.8	0.0	0.0	0.0	0.0	5

R53	Vacant Lot	643842	4879848	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	75.5	0	0.0	0.7	0.0	8.4	0.0	0.0	0.0	0.0	8
NS-02	Inverter House	645259	4880262	2.3	100	74.4	0	0.0	-0.6	0.0	11.9	0.0	0.0	0.0	0.0	15
NS-03	Inverter House	645112	4880262	2.3	100	73.5	0	0.0	-0.6	0.0	11.5	0.0	0.0	0.0	0.0	16
NS-04	Inverter House	644990	4880262	2.3	100	72.7	0	0.0	-0.7	0.0	11.2	0.0	0.0	0.0	0.0	17
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	76.4	0	0.0	-0.2	0.0	4.1	0.0	0.0	0.0	0.0	10
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	76.4	3	0.0	2.5	4.9	3.9	0.0	0.0	0.0	0.0	--

R54	Residential Dwelling	645456	4881492	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	72.1	0	0.0	0.5	0.0	7.5	0.0	0.0	0.0	0.0	13
NS-02	Inverter House	645259	4880262	2.3	100	72.9	0	0.0	-0.7	0.0	11.3	0.0	0.0	0.0	0.0	17
NS-03	Inverter House	645112	4880262	2.3	100	73.1	0	0.0	-0.7	0.0	11.4	0.0	0.0	0.0	0.0	16
NS-04	Inverter House	644990	4880262	2.3	100	73.4	0	0.0	-0.6	0.0	11.5	0.0	0.0	0.0	0.0	16
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	72.5	0	0.0	-0.3	0.0	2.9	0.0	0.0	0.0	0.0	15
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	72.4	3	0.0	2.6	9.0	2.7	0.0	0.0	0.0	0.0	--

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl

R55	Residential Dwelling	645669	4881343	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	71.1	0	0.0	0.5	0.0	7.2	0.0	0.0	0.0	0.0	14
NS-02	Inverter House	645259	4880262	2.3	100	72.3	0	0.0	-0.7	0.0	11.1	0.0	0.0	0.0	0.0	18
NS-03	Inverter House	645112	4880262	2.3	100	72.7	0	0.0	-0.7	0.0	11.2	0.0	0.0	0.0	0.0	17
NS-04	Inverter House	644990	4880262	2.3	100	73.1	0	0.0	-0.7	0.0	11.4	0.0	0.0	0.0	0.0	16
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	71.2	0	0.0	-0.4	0.0	2.6	0.0	0.0	0.0	0.0	16
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	71.1	3	0.0	2.6	9.3	2.4	0.0	0.0	0.0	0.0	1

R56	Residential Dwelling	645135	4881101	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	69.1	0	0.0	0.4	0.0	6.8	0.0	0.0	0.0	0.0	17
NS-02	Inverter House	645259	4880262	2.3	100	69.6	0	0.0	-0.8	0.0	10.1	0.0	0.0	0.0	0.0	21
NS-03	Inverter House	645112	4880262	2.3	100	69.5	0	0.0	-0.8	0.0	10.0	0.0	0.0	0.0	0.0	22
NS-04	Inverter House	644990	4880262	2.3	100	69.6	0	0.0	-0.8	0.0	10.1	0.0	0.0	0.0	0.0	21
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	70.3	0	0.0	-0.4	0.0	2.4	0.0	0.0	0.0	0.0	17
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	70.3	3	0.0	2.4	8.2	2.2	0.0	0.0	0.0	0.0	3

R57	Residential Dwelling	645744	4881205	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	70.1	0	0.0	0.4	0.0	7.0	0.0	0.0	0.0	0.0	15
NS-02	Inverter House	645259	4880262	2.3	100	71.5	0	0.0	-0.7	0.0	10.8	0.0	0.0	0.0	0.0	19
NS-03	Inverter House	645112	4880262	2.3	100	72.1	0	0.0	-0.7	0.0	11.0	0.0	0.0	0.0	0.0	18
NS-04	Inverter House	644990	4880262	2.3	100	72.6	0	0.0	-0.7	0.0	11.2	0.0	0.0	0.0	0.0	17
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	70.0	0	0.0	-0.4	0.0	2.3	0.0	0.0	0.0	0.0	18
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	69.9	3	0.0	2.4	8.6	2.2	0.0	0.0	0.0	0.0	3

R58	Vacant Lot	645578	4880950	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	66.7	0	0.0	0.3	0.0	6.3	0.0	0.0	0.0	0.0	20
NS-02	Inverter House	645259	4880262	2.3	100	68.6	0	0.0	-0.8	0.0	9.7	0.0	0.0	0.0	0.0	23
NS-03	Inverter House	645112	4880262	2.3	100	69.4	0	0.0	-0.8	0.0	10.0	0.0	0.0	0.0	0.0	22
NS-04	Inverter House	644990	4880262	2.3	100	70.1	0	0.0	-0.7	0.0	10.3	0.0	0.0	0.0	0.0	21
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	67.0	0	0.0	-0.4	0.0	1.8	0.0	0.0	0.0	0.0	21
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	66.8	3	0.0	2.4	9.2	1.6	0.0	0.0	0.0	0.0	6

R59	Vacant Lot	645545	4880700	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	62.0	0	0.0	0.1	0.0	5.3	0.0	0.0	0.0	0.0	25
NS-02	Inverter House	645259	4880262	2.3	100	65.4	0	0.0	-0.8	0.0	8.5	0.0	0.0	0.0	0.0	27
NS-03	Inverter House	645112	4880262	2.3	100	66.8	0	0.0	-0.8	0.0	9.0	0.0	0.0	0.0	0.0	25
NS-04	Inverter House	644990	4880262	2.3	100	68.0	0	0.0	-0.8	0.0	9.5	0.0	0.0	0.0	0.0	24
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	62.8	0	0.0	-0.3	0.0	1.2	0.0	0.0	0.0	0.0	26
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	62.6	3	0.0	2.3	9.6	1.1	0.0	0.0	0.0	0.0	11

R60	Vacant Lot	644772	4879586	4.5												
Src ID	Src Name	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr
NS-01	Inverter House	645440	4880360	2.3	93	71.2	0	0.0	0.5	0.0	7.3	0.0	0.0	0.0	0.0	14
NS-02	Inverter House	645259	4880262	2.3	100	69.4	0	0.0	-0.8	0.0	10.0	0.0	0.0	0.0	0.0	22
NS-03	Inverter House	645112	4880262	2.3	100	68.6	0	0.0	-0.8	0.0	9.7	0.0	0.0	0.0	0.0	23
NS-04	Inverter House	644990	4880262	2.3	100	68.0	0	0.0	-0.8	0.0	9.5	0.0	0.0	0.0	0.0	24
NS-05	Transformer 7.5 MVA	645634	4880321	2.5	90	72.1	0	0.0	-0.4	0.0	2.8	0.0	0.0	0.0	0.0	15
NS-06	Control House HVAC Unit	645640	4880333	2.0	83	72.2	3	0.0	0.9	0.0	2.6	0.0	0.0	0.0	0.0	10

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl

APPENDIX G

Sample Calculation Results - Octave Band Format

In the following tables of calculation results, the column headings for the various sound attenuation mechanisms follow the terminology of ISO Standard 9613-2. Lx is the A-weighted, one-hour energy-equivalent (or logarithmic-mean impulse) source sound power level, which includes the effects of any source-abatement measures included in the model, and any time-averaging effects for intermittent sources. Lr is the A-weighted, one-hour energy-equivalent (or logarithmic-mean impulse) sound level at the point of reception. The results are presented in terms of full octave band sound levels, at the most impacted off-site point of reception.

R03	Vacant Lot		645741	4880366	4.5													
Src ID	Src Name	Band	X	Y	Z	Lx	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahous	Cmet	Refl	Lr	Band
NS-01	Inverter House	32	645440	4880360	2.3	60	60.6	0	0.0	-3.9	0.0	0.0	0.0	0.0	0.0	0.0	3	32
NS-01	Inverter House	63	645440	4880360	2.3	67	60.6	0	0.0	-3.9	0.0	0.0	0.0	0.0	0.0	0.0	10	63
NS-01	Inverter House	125	645440	4880360	2.3	75	60.6	0	0.0	2.5	0.0	0.1	0.0	0.0	0.0	0.0	12	125
NS-01	Inverter House	250	645440	4880360	2.3	83	60.6	0	0.0	3.3	0.0	0.3	0.0	0.0	0.0	0.0	19	250
NS-01	Inverter House	500	645440	4880360	2.3	82	60.6	0	0.0	-0.2	0.0	0.6	0.0	0.0	0.0	0.0	21	500
NS-01	Inverter House	1000	645440	4880360	2.3	81	60.6	0	0.0	-1.2	0.0	1.1	0.0	0.0	0.0	0.0	20	1000
NS-01	Inverter House	2000	645440	4880360	2.3	82	60.6	0	0.0	-1.2	0.0	2.9	0.0	0.0	0.0	0.0	20	2000
NS-01	Inverter House	4000	645440	4880360	2.3	89	60.6	0	0.0	-1.2	0.0	9.9	0.0	0.0	0.0	0.0	20	4000
NS-01	Inverter House	8000	645440	4880360	2.3	86	60.6	0	0.0	-1.2	0.0	35.2	0.0	0.0	0.0	0.0	--	8000
NS-02	Inverter House	32	645259	4880262	2.3	60	64.9	0	0.0	-4.7	0.0	0.0	0.0	0.0	0.0	0.0	--	32
NS-02	Inverter House	63	645259	4880262	2.3	67	64.9	0	0.0	-4.7	0.0	0.1	0.0	0.0	0.0	0.0	6	63
NS-02	Inverter House	125	645259	4880262	2.3	75	64.9	0	0.0	3.0	0.0	0.2	0.0	0.0	0.0	0.0	7	125
NS-02	Inverter House	250	645259	4880262	2.3	83	64.9	0	0.0	3.1	0.0	0.5	0.0	0.0	0.0	0.0	15	250
NS-02	Inverter House	500	645259	4880262	2.3	89	64.9	0	0.0	-0.8	0.0	1.0	0.0	0.0	0.0	0.0	23	500
NS-02	Inverter House	1000	645259	4880262	2.3	86	64.9	0	0.0	-1.4	0.0	1.8	0.0	0.0	0.0	0.0	21	1000
NS-02	Inverter House	2000	645259	4880262	2.3	91	64.9	0	0.0	-1.4	0.0	4.8	0.0	0.0	0.0	0.0	22	2000
NS-02	Inverter House	4000	645259	4880262	2.3	99	64.9	0	0.0	-1.4	0.0	16.2	0.0	0.0	0.0	0.0	19	4000
NS-02	Inverter House	8000	645259	4880262	2.3	86	64.9	0	0.0	-1.4	0.0	57.7	0.0	0.0	0.0	0.0	--	8000
NS-03	Inverter House	32	645112	4880262	2.3	60	67.1	0	0.0	-5.0	0.0	0.0	0.0	0.0	0.0	0.0	--	32
NS-03	Inverter House	63	645112	4880262	2.3	67	67.1	0	0.0	-5.0	0.0	0.1	0.0	0.0	0.0	0.0	4	63
NS-03	Inverter House	125	645112	4880262	2.3	75	67.1	0	0.0	3.5	0.0	0.3	0.0	0.0	0.0	0.0	4	125
NS-03	Inverter House	250	645112	4880262	2.3	83	67.1	0	0.0	3.0	0.0	0.7	0.0	0.0	0.0	0.0	12	250
NS-03	Inverter House	500	645112	4880262	2.3	89	67.1	0	0.0	-0.9	0.0	1.2	0.0	0.0	0.0	0.0	21	500
NS-03	Inverter House	1000	645112	4880262	2.3	86	67.1	0	0.0	-1.5	0.0	2.3	0.0	0.0	0.0	0.0	18	1000
NS-03	Inverter House	2000	645112	4880262	2.3	91	67.1	0	0.0	-1.5	0.0	6.2	0.0	0.0	0.0	0.0	19	2000
NS-03	Inverter House	4000	645112	4880262	2.3	99	67.1	0	0.0	-1.5	0.0	20.9	0.0	0.0	0.0	0.0	13	4000
NS-03	Inverter House	8000	645112	4880262	2.3	86	67.1	0	0.0	-1.5	0.0	74.5	0.0	0.0	0.0	0.0	--	8000
NS-04	Inverter House	32	644990	4880262	2.3	60	68.6	0	0.0	-5.2	0.0	0.0	0.0	0.0	0.0	0.0	--	32
NS-04	Inverter House	63	644990	4880262	2.3	67	68.6	0	0.0	-5.2	0.0	0.1	0.0	0.0	0.0	0.0	3	63
NS-04	Inverter House	125	644990	4880262	2.3	75	68.6	0	0.0	3.9	0.0	0.3	0.0	0.0	0.0	0.0	2	125
NS-04	Inverter House	250	644990	4880262	2.3	83	68.6	0	0.0	2.9	0.0	0.8	0.0	0.0	0.0	0.0	11	250
NS-04	Inverter House	500	644990	4880262	2.3	89	68.6	0	0.0	-0.9	0.0	1.5	0.0	0.0	0.0	0.0	19	500
NS-04	Inverter House	1000	644990	4880262	2.3	86	68.6	0	0.0	-1.5	0.0	2.8	0.0	0.0	0.0	0.0	16	1000
NS-04	Inverter House	2000	644990	4880262	2.3	91	68.6	0	0.0	-1.6	0.0	7.3	0.0	0.0	0.0	0.0	16	2000
NS-04	Inverter House	4000	644990	4880262	2.3	99	68.6	0	0.0	-1.6	0.0	24.8	0.0	0.0	0.0	0.0	7	4000
NS-04	Inverter House	8000	644990	4880262	2.3	86	68.6	0	0.0	-1.6	0.0	88.6	0.0	0.0	0.0	0.0	--	8000
NS-05	Transformer 7.5 MVA	32	645634	4880321	2.5	--	52.3	0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	--	32
NS-05	Transformer 7.5 MVA	63	645634	4880321	2.5	66	52.3	0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	17	63
NS-05	Transformer 7.5 MVA	125	645634	4880321	2.5	78	52.3	0	0.0	1.9	0.0	0.1	0.0	0.0	0.0	0.0	24	125
NS-05	Transformer 7.5 MVA	250	645634	4880321	2.5	81	52.3	0	0.0	3.1	0.0	0.1	0.0	0.0	0.0	0.0	25	250
NS-05	Transformer 7.5 MVA	500	645634	4880321	2.5	86	52.3	0	0.0	-0.4	0.0	0.2	0.0	0.0	0.0	0.0	34	500
NS-05	Transformer 7.5 MVA	1000	645634	4880321	2.5	83	52.3	0	0.0	-0.9	0.0	0.4	0.0	0.0	0.0	0.0	32	1000
NS-05	Transformer 7.5 MVA	2000	645634	4880321	2.5	80	52.3	0	0.0	-0.9	0.0	1.1	0.0	0.0	0.0	0.0	27	2000
NS-05	Transformer 7.5 MVA	4000	645634	4880321	2.5	74	52.3	0	0.0	-0.9	0.0	3.8	0.0	0.0	0.0	0.0	19	4000
NS-05	Transformer 7.5 MVA	8000	645634	4880321	2.5	65	52.3	0	0.0	-0.9	0.0	13.6	0.0	0.0	0.0	0.0	0	8000
NS-06	Control House HVAC Unit	32	645640	4880333	2.0	40	51.6	3	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	--	32
NS-06	Control House HVAC Unit	63	645640	4880333	2.0	53	51.6	3	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	8	63
NS-06	Control House HVAC Unit	125	645640	4880333	2.0	69	51.6	3	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	19	125
NS-06	Control House HVAC Unit	250	645640	4880333	2.0	78	51.6	3	0.0	3.7	0.0	0.1	0.0	0.0	0.0	0.0	26	250
NS-06	Control House HVAC Unit	500	645640	4880333	2.0	78	51.6	3	0.0	0.5	0.0	0.2	0.0	0.0	0.0	0.0	29	500
NS-06	Control House HVAC Unit	1000	645640	4880333	2.0	77	51.6	3	0.0	-0.8	0.0	0.4	0.0	0.0	0.0	0.0	28	1000
NS-06	Control House HVAC Unit	2000	645640	4880333	2.0	73	51.6	3	0.0	-0.9	0.0	1.0	0.0	0.0	0.0	0.0	24	2000
NS-06	Control House HVAC Unit	4000	645640	4880333	2.0	69	51.6	3	0.0	-0.9	0.0	3.5	0.0	0.0	0.0	0.0	18	4000
NS-06	Control House HVAC Unit	8000	645640	4880333	2.0	59	51.6	3	0.0	-0.9	0.0	12.5	0.0	0.0	0.0	0.0	--	8000

Where: Lr = Lx - Adiv + K0 + Dc - Agnd - Abar - Aatm - Afol - Ahous + Cmet + Refl