

OTTAWA CATHOLIC SCHOOL BOARD

FINDLAY CREEK ELEMENTARY SCHOOL NOISE IMPACT STUDY

SEPTEMBER 08, 2022





**FINDLAY CREEK
ELEMENTARY
SCHOOL
NOISE IMPACT STUDY
OTTAWA CATHOLIC SCHOOL BOARD**

PROJECT NO.: 221-07861-00
DATE: SEPTEMBER 08, 2022

WSP
UNIT 2
126 DON HILLOCK DRIVE
AURORA, ON, CANADA L4G 0G9

T: +1 905 750-3080
F: +1 905 727-0463
WSP.COM

VERSION HISTORY

VERSION	DATE	TITLE	COMMENTS	PREPARED BY
1.0	September 26, 2022	Noise Impact Study	Issued for Submission	WSP

SIGNATURES

PREPARED BY



Carolyn Ropp, B.Sc.
Acoustics, Noise and Vibration Specialist

REVIEWED BY



Cris delos Santos, M.Eng., P.Eng.
Senior Engineer, Acoustics, Noise & Vibration

LIMITATIONS STATEMENT

WSP Canada Inc. (WSP) prepared this report solely for the use of the intended recipient, OTTAWA CATHOLIC SCHOOL BOARD, in accordance with the professional services agreement between the parties. In the event a contract has not been executed, the parties agree that the WSP General Terms for Consultant shall govern their business relationship which was provided to you prior to the preparation of this report.

The report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings in the assessment.

The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

WSP disclaims any obligation to update this report if, after the date of this report, any conditions appear to differ significantly from those presented in this report; however, WSP reserves the right to amend or supplement this report based on additional information, documentation or evidence.

WSP makes no other representations whatsoever concerning the legal significance of its findings.

The intended recipient is solely responsible for the disclosure of any information contained in this report. If a third party makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance or decisions. WSP does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report.

WSP has provided services to the intended recipient in accordance with the professional services agreement between the parties and in a manner consistent with that degree of care, skill and diligence normally provided by members of the same profession performing the same or comparable services in respect of projects of a similar nature in similar circumstances. It is understood and agreed by WSP and the recipient of this report that WSP provides no warranty, express or implied, of any kind. Without limiting the generality of the foregoing, it is agreed and understood by WSP and the recipient of this report that WSP makes no representation or warranty whatsoever as to the sufficiency of its scope of work for the purpose sought by the recipient of this report.

In preparing this report, WSP has relied in good faith on information provided by others, as noted in the report. WSP has reasonably assumed that the information provided is correct and WSP is not responsible for the accuracy or completeness of such information.

Benchmark and elevations used in this report are primarily to establish relative elevation differences between the specific testing and/or sampling locations and should not be used for other purposes, such as grading, excavating, construction, planning, development, etc.

The original of this digital file will be kept by WSP for a period of not less than 10 years. As the digital file transmitted to the intended recipient is no longer under the control of WSP, its integrity cannot be assured. As such, WSP does not guarantee any modifications made to this digital file subsequent to its transmission to the intended recipient.

This limitations statement is considered an integral part of this report.

EXECUTIVE SUMMARY

WSP Canada Inc. was retained by Ottawa Catholic School Board (OCSB) to complete an Environmental Noise Impact Study in support of an application for Site Plan Control Application (SPA) for the proposed OCSB Findlay Creek Elementary School development to be located at 4140 Kelly Farm Drive in Ottawa, Ontario (the Site). The Site consists of a main one-storey building and separate classroom portables, a fenced playground for childcare, a separate playground for kindergarten, naturalization area, educational garden area, outdoor sporting areas, and a parking lot.

The purpose of the study is to assess the potential noise effects of the environment onto the Site and assess the potential noise impact of the proposed stationary noise sources at the Site on surrounding noise-sensitive areas. This report is based on the Site Plan, prepared Pye & Richards – Temprano & Young Architects Inc., dated June 15, 2022 (“Issue for Client Review”).

The assessment was conducted in accordance with the City of Ottawa and the Ministry of Environment, Parks and Conservation (MECP) noise guidelines.

The significant sources of noise in the vicinity of the proposed development are transportation noise sources, mainly road traffic on Kelly Farm Drive and Findlay Creek Drive, which are clarified as urban collector roads. The significant stationary sources of noise at the Site are rooftop HVAC equipment, and offsite is the rooftop HVAC equipment from the Vimy Ridge Public School located immediately to the east.

The Site is located just inside the Ottawa Macdonald Cartier International Airport Operating Influence Zone which includes Noise Exposure Forecast contours, and thus, aircraft noise assessment is required.

Based on the predicted sound levels at the proposed development due to road traffic noise sources, exterior wall, door, and window construction meeting the Ontario Building Code (OBC) minimum requirements will be adequate to meet the indoor sound level limits to comply with the City of Ottawa and the MECP noise guidelines. Stationary sources at the Site are predicted to comply with the City of Ottawa and the MECP noise guidelines following the implementation of noise control measures outlined in this report. The proposed development is demonstrated to comply with the applicable noise guidelines.



1	INTRODUCTION	1
1.1	The Site and Surrounding Area	1
1.2	The Proposed Development.....	1
2	NOISE IMPACT ASSESSMENT	2
2.1	Noise Sources.....	2
2.2	Noise Guidelines and Assessment Criteria	3
2.2.1	Road Sources Assessment Criteria	3
2.2.2	Aircraft Sources Assessment Criteria	4
2.2.3	Stationary Sources Assessment Criteria	4
2.3	Road Sources	5
2.3.1	Road Traffic Data	5
2.3.2	Analysis Method	5
2.3.3	Results	6
2.3.4	Recommendations	6
2.3.5	Warning Clauses	7
2.4	Aircraft Sources.....	7
2.4.1	Analysis Method	7
2.4.2	Results and Recommendations	Error! Bookmark not defined.
2.5	Stationary Sources.....	7
2.5.1	Onsite Noise Sources and Receptors	8
2.5.2	Offsite Noise Sources and Receptors	8
2.5.3	Analysis Method	10
2.5.4	Results	10
3	RECOMMENDATIONS AND CONCLUSIONS	13
	BIBLIOGRAPHY	14

TABLES

TABLE 2-1	ENCG & NPC-300 ROAD TRAFFIC INDOOR SOUND LEVEL CRITERIA FOR SCHOOLS.....	3
TABLE 2-2	BUILDING REQUIREMENTS FOR INDOOR SPACES.....	3
TABLE 2-3	ENCG & NPC-300 AIR TRAFFIC INDOOR SOUND LEVEL CRITERIA FOR SCHOOLS.....	4
TABLE 2-4	MECP'S EXCLUSION LIMITS IN DBA	4
TABLE 2-5	SUMMARY OF ROAD TRAFFIC DATA USED IN THE TRANSPORTATION NOISE ANALYSIS	5
TABLE 2-6	SUMMARY OF PREDICTED FACADE SOUND LEVELS DUE TO ROAD TRAFFIC.....	6
TABLE 2-7	STATIONARY SOURCE SOUND DATA FOR PROPOSED SCHOOL.....	8
TABLE 2-8	STATIONARY SOURCE SOUND DATA FOR VIMY RIDGE PUBLIC SCHOOL.....	9
TABLE 2-9	PREDICTED SOUND LEVELS FROM ONSITE STATIONARY SOURCES ..	10
TABLE 2-10	PREDICTED SOUND LEVELS FROM OFFSITE STATIONARY SOURCES.	11
TABLE 3-1	SUMMARY OF NOISE CONTROL REQUIREMENTS.....	13

APPENDICES

FIGURES

- A** DRAWINGS
- B** TRAFFIC DATA
- C** NEF/NEP CONTOUR MAP
- D** STAMSON VALIDATION FILES
- E** SUPPORTING INFORMATION
- F** CADNA OUTPUT

1 INTRODUCTION

WSP Canada Inc. (WSP) was retained by Ottawa Catholic School Board (OCSB) to complete an Environmental Noise Impact Study for the proposed Findlay Creek Elementary School development to be located at 4140 Kelly Farm Drive in Ottawa, Ontario (the Site). This report was prepared in support of the Site Plan Approval application submission.

This assessment investigates the potential for noise impacts of the environment onto the Site from the nearby transportation sources (i.e., Kelly Farm Drive or Findlay Creek Drive), nearby stationary sources (i.e. HVAC units from the Vimy Ridge Elementary School), and proposed stationary sources at the Site on surrounding noise-sensitive areas.

The purpose of the study is to assess the potential noise effects of the environment onto the Site and proposed stationary sources at the Site onto surrounding noise-sensitive areas. The findings and recommendations needed to comply with the applicable noise guidelines are included herein.

1.1 THE SITE AND SURROUNDING AREA

The Site is located west of Robert Grant Avenue and is bounded by:

- To the east, Vimy Ridge Public School;
- To the south, Dragonfly Park and Findly Creek Drive;
- To the west, Bradwell Way; and,
- To the north, Kelly Farm Drive.

The Site is proposed to be surrounded by mostly residential lots. The location of the site is shown in **Figure 1**. A zoning map showing the land use surrounding the proposed development obtained from the City of Ottawa is provided in **Figure 2** – Land Use and Zoning Designation Plan. The Site is zoned “I1E H(15)” Minor Institutional and the immediate surrounding area of the proposed development includes residential, institutional, and open space land uses.

1.2 THE PROPOSED DEVELOPMENT

This report was based on the Site Plan, prepared by Pye & Richards – Temprano & Young Architects Inc., dated June 15, 2022, and included as **Appendix A**. The Site consists of a main one-storey building at the north side, three (3) portable 6-pack classrooms south of the main building, playgrounds for childcare and kindergarten, naturalization area, educational garden area, outdoor sporting areas, and a parking lot.

2 NOISE IMPACT ASSESSMENT

2.1 NOISE SOURCES

The City's *Environmental Noise Control Guidelines* (ENCG) stipulates that a noise study shall be prepared when a new development is proposed within distances as follows:

- 100 metres from the right-of-way of an existing or proposed road; arterial, major collector, light rail transit, bus rapid transit or transit priority corridor;
- 250 metres from the right-of-way of an existing or proposed highway;
- 300 metres from the right-of-way of a proposed or existing rail corridor or secondary main railway line;
- 500 metres from the right-of-way of a freeway or 400-series provincial highway or principal main railway line; or
- The new development is proposed to be located outside the 30 Noise Exposure Forecast (NEF) noise contour of airport / aircraft noise.

2.1.1 SURFACE TRANSPORTATION NOISE SOURCES

The significant sources of noise in the vicinity of the proposed development are transportation noise sources. The road types were identified using the City's "Annex 1 – Road Classification and Rights-of-Way Protection" as provided in **Appendix B**. The road meeting the City's requirements is Kelly Farm Drive and Findlay Creek Drive which are both classified as an Urban Collector Road. Other roads are over 100 metres away from the Site and are not expected to have a significant impact. Thus, other roads are not considered further in the assessment.

Rail corridors are located well over 6 km from the Site. Due to increased setback distances and screening effect from the intervening structures, rail movements on corridors are also not expected to create a significant noise effect at the Site and therefore, has not been included in the assessment.

The light rail transit corridor, bus rapid transit and transit priority corridors are located greater than 100 m away from the Site and, therefore, were not included in the assessment.

2.1.2 STATIONARY NOISE SOURCES

There are proposed stationary sources to be located on the proposed development which is surrounded by sensitive land use. There are also existing stationary noise sources located in close proximity to the Site, which are the HVAC units located on Vimy Ridge Public School. Therefore, stationary noise has been included in the study to assess the potential noise impacts of the development from surrounding environment and impacts to the surrounding environment from the proposed development.

2.1.3 AIRCRAFT SOURCES

The proposed development is located within City of Ottawa's International Airport's (Macdonald-Cartier International Airport) Vicinity Development Zone. Therefore, aircraft noise has been considered in the assessment. **Figure 3** shows the Site location in relation to the airport's NEF/NEP contour map. The NEF/NEP contour map is included in **Appendix C**.

2.2 NOISE GUIDELINES AND ASSESSMENT CRITERIA

Noise is recognized as a pollutant in the Environmental Protection Act, as uncontrolled noise can affect human activities. Ontario provincial noise control guidelines require that noise concerns are addressed in the planning of any new development.

In land use planning, although elimination or control of the source of pollution is usually a primary objective, there are general limits as to what is practical and technically possible. The City’s ENCG follows the MECP’s Publication NPC-300, *Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning* for acceptable levels of road and air traffic noise impacting noise-sensitive institutional developments and stationary noise on surrounding noise-sensitive residential areas. These limits are discussed in Section “Part C – Land Use Planning” of NPC-300 as well as Section 2 and 4 of the ENCG.

2.2.1 ROAD SOURCES ASSESSMENT CRITERIA

Table 2-1 summarizes sound level limits for road traffic applicable for the proposed institutional development.

Table 2-1 ENCG & NPC-300 Road Traffic Indoor Sound Level Criteria for Schools

AREA	TIME PERIOD	LEQ (dBA) ^[1] -ROAD	REFERENCE
Indoor Living/Dining Areas of Schools, Daycares	Daytime (0700 – 2300h)	45	NPC-300 Table C-2 ENCG Table 2.2b

Notes: [1] Daytime: L_{EQ 16HR}; Nighttime: L_{EQ 8-HR}.

The NPC-300 and ENCG provide sound level limits in terms of energy equivalent (average) sound levels [L_{EQ}] in units of A-weighted decibels (dBA) at a specific noise-sensitive location. Outdoor areas are not considered noise-sensitive for institutional developments. Therefore, only indoor locations are identified and only during the daytime period.

The building envelope, such as walls, windows and doors where applicable, should be designed so that the indoor sound levels comply with the sound level limits summarized in **Table 2-1** above.

BUILDING COMPONENT REQUIREMENTS

To comply with the indoor sound level criteria listed in **Table 2-1**, the ENCG and NPC-300 provides guidelines based on predicted sound level at the façade/plane of window. If the predicted sound level at the plane of window exceeds, additional considerations such as the type of windows, exterior walls, and doors that can provide noise attenuation must be selected. In addition, warning clauses to inform the future occupants are also required.

Table 2-2 summarizes requirements for type of building façade construction for institutional purpose buildings.

Table 2-2 Building Requirements for Indoor Spaces

AREA	TIME PERIOD	LEQ (DBA) ^[2]	BUILDING COMPONENT REQUIREMENTS
Plane of Window ^[1]	Daytime (0700 – 2300h)	≤ 55	Building components compliant with Ontario Building Code (OBC)
		> 55 and ≤ 65	Building components compliant with OBC
		> 65	Building components designed/selected to meet Indoor Requirements

Notes: [1] Plane of Window of an institutional purpose building leading to a noise sensitive room, such as teacher’s lounge, classrooms, etc.
[2] Daytime: L_{EQ 16HR}.

2.2.2 AIRCRAFT SOURCES ASSESSMENT CRITERIA

Aircraft noise impact assessment is based on the Noise Exposure Forecast (NEF) and Noise Exposure Projection (NEP) methods approved by Transport Canada. The noise contours were used to define the Airport Operating Influence Zone (AOIZ) and Airport Vicinity Development Zone (AVDZ) which is shown on Annex 10 of the Official Plan in **Appendix C**.

No new noise sensitive developments are permitted within the AOIZ. Noise sensitive developments are permitted within the AVDZ and outside of the AOIZ subject to a noise study or under the Prescribed Measures for Aircraft Noise in Part 6 of the ENCG Guidelines. It should be noted that Prescribed Measures set out in the ENCG guidelines are for proposed low to mid-rise residential developments not between the NEF/NEP 25 and the AOIZ and not for institutional developments.

Table 2-3 summarizes sound level limits for air traffic applicable for the proposed institutional development.

Table 2-3 ENCG & NPC-300 Air Traffic Indoor Sound Level Criteria for Schools

AREA	TIME PERIOD	NEF/NEP	REFERENCE
Indoor Living/Dining Areas of Schools, Daycares	24 hours	5 ^[1]	NPC-300 Table C-4 ENCG Table 4.2a

Notes: [1] The indoor NEF/NEP values are used to determine acoustical insulation requirements based on the NEF/NEP contour maps.

Under NPC-300, the requirements for detailed noise studies are for new noise sensitive land use proposals that are located at or above the Noise Exposure Forecast/Noise Exposure Projection 25 (NEF/NEP 35) contours, if less than 25, further assessment is not required.

2.2.3 STATIONARY SOURCES ASSESSMENT CRITERIA

For stationary sources, the MECP NPC-300 and ENCG Section 3 provides criteria based on one-hour equivalent sound level. In order to comply with the noise impact from stationary sources, the predicted sound level must comply with the noise guidelines stipulated in NPC-300 and ENCG. Two locations are typically considered: an outdoor location and the plane of window.

Both guidelines provide sound level limits for noise-sensitive receptors based on the acoustical environment of the area. NPC-300 categorizes the acoustical environment into four classes: Class 1 (urban), Class 2 (semi-urban), Class 3 (rural), or Class 4 (special cases). Based on a review of the area using aerial imagery, receptors are conservatively considered as Class 2 Area. Given that the school only operates during the daytime, **Table 2-4** summarizes the daytime sound level limit for a Class 2 Area and was used as the applicable sound level limit for the development.

Table 2-4 MECP's Exclusion Limits in dBA

PERIOD	CLASS 2	
	PLANE OF WINDOW ¹	OUTDOOR POR ²
Daytime (07:00 – 19:00)	50	50

Notes:

1 Plane of window means a point in space corresponding with the location of the centre of a window of a noise sensitive space

2 PoR means point of reception; representing a point in a receptor location.

2.3 ROAD SOURCES

2.3.1 ROAD TRAFFIC DATA

Road traffic data were obtained from the ENCG **Appendix B** for Kelly Farm Drive and Findlay Creek Drive. The data obtained from the ENCG provides future traffic volume, day/night split, commercial vehicle percentages, and posted speed limits for various roadways based on roadway class and number of lanes. The ENCG data represents the future traffic volume and corresponding to a “mature state of development”, in the City’s Official Plan.

The traffic and road parameters used for sound level predictions are shown in **Table 2-5**. The surrounding topography is generally flat and assessed as such.

Table 2-5 Summary of Road Traffic Data Used in the Transportation Noise Analysis

ROAD	ROAD CLASSIFICATION	TRAFFIC VOLUMES (AADT)	DAY/NIGHT SPLIT (%)	MEDIUM TRUCKS (%)	HEAVY TRUCKS (%)	POSTED SPEED LIMIT (KPH)
Kelly Farm Drive	2-Lane Urban Collector	8,000	92/8	7%	5%	40
Findlay Creek Drive	2-Lane Urban Collector	8,000	92/8	7%	5%	40

2.3.2 ANALYSIS METHOD

The MECP updated their guidance requiring the use of up-to-date noise prediction methods and software for determining the impacts of noise from roads and railways (Publication NPC-306 “Methods to Determine Sound Levels Due to Road and Rail Traffic” December 2021). The Publication NPC-306 replaces Publication NPC-206 “Sound Levels Due to Road Traffic”, dated October 1995, which referenced the use of ORNAMENT calculation procedures. Previous noise prediction methods using STAMSON, and MECP prediction software implementation of ORNAMENT, were based on a 1995 DOS program which is a modification of the U.S. Federal Highway Administration (FHWA) FHWA-RD-77-108 algorithm to simplify calculations with inherent limitations. Based on the MECP’s draft guidance, the new methods will lead to more accurate noise predictions, effective control measures and based on current science.

Although Publication NPC-306 is in circulation for comments as draft, further clarifications from the MECP to Noise Practitioners and Stakeholders suggests that the methods and software will not change. This assessment therefore uses the updated guidance set out in NPC-306 to account for complex features of the development and provide more accurate noise predictions. This is also in line with recent trends in industry best practices, as well as the Region’s SOP which recommend the use of other enhancements and procedures to the application of ORNAMENT.

Road traffic sound levels at the proposed development were predicted using Cadna/A, a commercially available noise propagation modelling software. The following parameters were taken into consideration in the model:

- Road and rail alignments and gradients;
- Traffic volumes and design speeds;
- Commercial vehicle percentages for roads;
- Number of locomotives and railcars;
- Shielding provided by intervening buildings, barriers and/or topographical features; and
- Special details such as barrier and receptor locations, elevations, and heights.

Kelly Farm Drive and Findlay Creek Drive were modelled as road source using the U.S. FHWA Traffic Noise Model (TNM) noise emission and calculation method implemented by Cadna/A. The TNM predictions were validated at the closest north façade of the one-storey building facing Kelly Farm Drive and are equivalent to those made using the MECP prediction software STAMSON, which is an implementation of the ORNAMENT calculation methods.

The STAMSON validation files are included in **Appendix D**.

The analysis method in the NRC document, BPN56 “Controlling Sound Transmissions into Buildings”, dated September 1985, were used to estimate the acoustical requirements for the building components.

2.3.3 RESULTS

Based on the road traffic data, sound levels were predicted at the proposed school. The Site’s location with respect to these roads is shown in **Figure 4**. The predicted sound levels were used to investigate building construction requirements. The results of these predictions are summarized in **Table 2-6**.

Table 2-6 Summary of Predicted Façade Sound Levels due to Road Traffic

RECEPTOR LOCATION	DESCRIPTION	DAYTIME SOUND LEVEL LEQ (dBA)
A	1 Storey Building – East façade	55
B	1 Storey Building – South façade	43
C	1 Storey Building – South façade	41
D	1 Storey Building – South façade	38
E	1 Storey Building – West façade	50
F	1 Storey Building – West façade	55
G	1 Storey Building – North façade	60
H	1 Storey Building – North façade	61
I	1 Storey Building – North façade	60
J	Western Portable 6 Pack – North façade	46
K	Eastern Portable 6 Pack – North façade	48
L	Eastern Portable 6 Pack – South façade	44
M	Western Portable 6 Pack – South façade	41

The predicted sound levels shown above indicate that daytime façade sound levels are between 48 dBA and 63 dBA.

2.3.4 RECOMMENDATIONS

As shown in **Table 2-6**, the sound levels at the plane of window are below 65 dBA during the daytime hours. Thus, wall, door and window glazing assemblies meeting the minimum non-acoustical requirements of the Ontario Building Code (OBC) will be sufficient to meet the applicable indoor sound level limits.

2.3.5 WARNING CLAUSES

As per ENCG and NPC-300, inclusion of appropriate warning clauses for ventilation is a requirement for residential dwellings; however, though a school is not considered a dwelling, as per previous comments received from the City for other noise impact studies previously completed for proposed schools within the City, a warning clause Type C for road noise was requested and provided below. The suggested warning clause wording is as follows; it can be modified or amended by the City's planning department, as appropriate:

Type C

"The school has been fitted with a forced air heating system and ducting, etc. and was sized to accommodate central air conditioning. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with noise criteria of MECP Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property.)"

2.4 AIRCRAFT SOURCES

As stated in Section 2.1.3, the proposed development is located within the Airport Operating Influencing Zone (AOIZ), the limit of the AVDZ is shown in **Figure 3** and in Appendix C. The site, however, is located outside the NEF/NEP 25 contour line so as such, there are no building components and ventilation requirements. It should be noted that Part 6 Prescribed Measures for Aircraft Noise of the ENCG Guidelines are applicable for residential land use only.

2.5 STATIONARY SOURCES

Stationary source is defined in MECP publication NPC-300 as source of sound or combination of sources of sound that are included and normally operated within the property lines of a facility. In addition, the ENCG breaks down stationary sources into the two following subsections:

- New noise-sensitive development applications (noise receptors) in proximity to existing or approved stationary sources of noise; and
- New stationary sources of noise (noise generating) in proximity to existing or approved noise-sensitive developments.

Accordingly, the following stationary sources are identified and included in this noise impact study:

- **Stationary Sources Onsite**
 - Immediate institutional land use to the east (Vimy Ridge Public School) with rooftop HVAC units and bus drop off location are considered stationary sources; and
- **Stationary Sources Offsite**
 - As detailed mechanical design is not available at the time of this report, the noise sources associated with the proposed development were based on a similar sized school. The significant stationary sources of noise are the rooftop HVAC units and a condenser. Insignificant sources or sources with negligible sound level contribution off-site include hot water heaters, small fans, and indoor equipment. No emergency generator is planned at the Site. Bus drop-off location is to be located along Kelly Farm Drive and located outside the school's property boundary (off-site noise source). Therefore, noise associated with bus drop-off activities is not included in the assessment.

MECP's guidelines (Section B of the NPC-300) applies to the noise from the various stationary sources.

2.5.1 ONSITE NOISE SOURCES AND RECEPTORS

Surrounding noise-sensitive land uses are residential lots surrounding the site in north, east and west directions with the exception of one area to the south of the school which is open space and the area to the immediate east is an existing institutional building (Vimy Ridge Public School). Based on residential homes that have been built, receptors are 2-storeys and modelled as such. These two storey dwellings were analysed as receptors at the second-floor plane of window (i.e. 4.5 m above ground) and outdoor points of reception were assessed at standing height (i.e. 1.5 m above ground) representing the backyards.

A site layout plan showing the proposed stationary source locations and applicable receptor locations are shown in **Figure 5**.

A total of six (6) rooftop HVAC units (RTUs) and two (2) condensers are planned on the main school building as shown in **Figure 5**. All six RTUs and both condensers were conservatively assumed to operate simultaneously for 60 minutes in a predictable worst-case hour during the day. The school operates only during the daytime between 0700h to 1900h and assessed as such.

Sound power levels for the RTUs were provided by the manufacturer (AAON) for both the exposed condenser section and exhaust fan outlet. The sound power levels for the VRF Condensers were taken from Daikin and Carrier model. The sound level data used in the assessment is summarized in **Table 2-8** and manufacturer's cutsheets are provided in **Appendix E**.

The source locations and receptors placed on the proposed development are provided in **Figure 5**.

Table 2-7 Stationary Source Sound Data for Proposed School

SOURCE ID ¹	BUILDING	DESCRIPTION	OVERALL SOUND POWER LEVEL (dBA)	OPERATION
				DAY
SS_RTU1c	Proposed 1-Storey Main School Building	HVAC 11T Unit Condenser	84	60
SS_RTU1e		HVAC 11T Unit Exhaust Air	85	60
SS_RTU2c		HVAC 6T Unit Condenser	81	60
SS_RTU2e		HVAC 6T Unit Exhaust Air	82	60
SS_RTU3c		HVAC 11T Unit Condenser	84	60
SS_RTU3e		HVAC 11T Unit Exhaust Air	87	60
SS_RTU4c		HVAC 11T Unit Condenser	84	60
SS_RTU4e		HVAC 11T Unit Exhaust Air	85	60
SS_RTU5c		HVAC 11T Unit Condenser	84	60
SS_RTU5e		HVAC 11T Unit Exhaust Air	85	60
SS_RTU6c		HVAC 11T Unit Condenser	84	60
SS_RTU6e		HVAC 11T Unit Exhaust Air	92	60
SS_CU1Ac		Air Cooled VRF 10T Condenser	85	60
SS_CU1Bc		Air Cooled VRF 10T Condenser	85	60

Notes:

[1] Refer **Figure 5** for source locations; locations are referred using these IDs.

2.5.2 OFFSITE NOISE SOURCES AND RECEPTORS

As noted, there is an existing institutional building called Vimy Ridge Public School located to the immediate east of the proposed school.

Based on aerial imagery, there is a total of twelve (12) HVAC units (RTUs) as shown in **Figure 6**. All twelve RTUs were conservatively assumed to operate simultaneously for 60 minutes in a predictable worst-case hour during the day. The school operates only during the daytime between 0700h to 1900h and assessed as such.

A site layout plan showing the stationary sources and applicable receptor locations at the most impacted representative façades of the proposed school during the daytime hours are shown in **Figure 6**.

Sound power levels for the RTUs were assumed based on number of fans and obtained by the manufacturer (AAON) for both the exposed condenser section and exhaust fan outlet. The buses enter on the west side and exit the east side. It was assumed that there would be a potential of 5 buses idling at one time. It was assumed that 5 buses would enter and exit the school at one time. Bus idling and movement sound power data was taken from the U.S. Department of Transportation Federal Highway Administration Traffic Noise Model (TNM) and the sound level data used in the assessment is summarized in **Table 2-8** and manufacturer’s cutsheets are provided in **Appendix E**.

Table 2-8 Stationary Source Sound Data for Vimy Ridge Public School

SOURCE ID ¹	BUILDING	DESCRIPTION	OVERALL SOUND POWER LEVEL (dBA)	OPERATION
				DAY
SS_VR_RTU1c	Vimy Ridge Public School (2-Storey Main School Building)	HVAC 6T Unit Condenser (1 fan)	81	60
SS_VR_RTU1e		HVAC 6T Unit Exhaust Air	82	60
SS_VR_RTU2c		HVAC 30T Unit Condenser (3 fan)	93	60
SS_VR_RTU2e		HVAC 30T Unit Exhaust Air	98	60
SS_VR_RTU3c		HVAC 6T Unit Condenser (1 fan)	81	60
SS_VR_RTU3e		HVAC 6T Unit Exhaust Air	82	60
SS_VR_RTU4c		HVAC 30T Unit Condenser (3 fan)	93	60
SS_VR_RTU4e		HVAC 30T Unit Exhaust Air	98	60
SS_VR_RTU5c		HVAC 30T Unit Condenser (3 fan)	93	60
SS_VR_RTU5e		HVAC 30T Unit Exhaust Air	98	60
SS_VR_RTU6c		HVAC 11T Unit Condenser (3 fan)	84	60
SS_VR_RTU6e		HVAC 11T Unit Exhaust Air	92	60
SS_VR_RTU7c		HVAC 11T Unit Condenser (3 fan)	84	60
SS_VR_RTU7e		HVAC 11T Unit Exhaust Air	92	60
SS_VR_RTU8c		HVAC 6T Unit Condenser (1 fan)	81	60
SS_VR_RTU8e		HVAC 6T Unit Exhaust Air	82	60
SS_VR_RTU9c		HVAC 6T Unit Condenser (1 fan)	81	60
SS_VR_RTU9e		HVAC 6T Unit Exhaust Air	82	60
SS_VR_RTU10c		HVAC 11T Unit Condenser (3 fan)	84	60
SS_VR_RTU10e		HVAC 11T Unit Exhaust Air	92	60
SS_VR_RTU11c		HVAC 11T Unit Condenser (3 fan)	84	60
SS_VR_RTU11e		HVAC 11T Unit Exhaust Air	92	60
SS_VR_RTU12c		HVAC 6T Unit Condenser (1 fan)	81	60
SS_VR_RTU12e		HVAC 6T Unit Exhaust Air	82	60
SS_VR_BUSM		Bus Movement	100	5 buses per hr
SS_VR_BId1		Bus Idling	100	15
SS_VR_BId2		Bus Idling	100	15
SS_VR_BId3		Bus Idling	100	15
SS_VR_BId4		Bus Idling	100	15
SS_VR_BId5		Bus Idling	100	15

Notes:

[1] Refer **Figure 6** for source locations; locations are referred using these IDs.

2.5.3 ANALYSIS METHOD

In order to estimate the sound levels from stationary sources to the surrounding residential areas, a predictive analysis was completed using a commercially available software package CADNA/A, a computer implementation of the ISO Standard 9613-2 “Acoustics – Attenuation of Sound During Propagation Outdoors”, which takes into account the following:

- Source sound power levels;
- Distance attenuation;
- Source-receptor geometry;
- Ground and air (atmospheric) attenuation; and,
- Temperature and humidity effects on noise propagation.

Key parameters used in the model and sample calculations are located in **Appendix F**.

2.5.4 RESULTS

IMPACTS FROM THE PROPOSED DEVELOPMENT ON THE SURROUNDING ENVIRONMENT

The overall sound levels at the proposed development using assumed predictable worst-case operations for the nearby Vimy Ridge Public School are summarized in **Table 2-10**.

Table 2-9 Predicted Sound Levels from Onsite Stationary Sources

POR ID	POR DESCRIPTION	RECEPTOR HEIGHT (M)	PREDICTED SOUND LEVEL (dBA)	DAYTIME SOUND LEVEL LIMIT (dBA)	COMPLIANCE WITH LIMIT?
R01_W	2-storey Residential Home to the West (Window)	4.5	45	50	Yes
R01_O	2-storey Residential Home to the West (Outdoor)	1.5	45	50	Yes
R02_W	2-storey Residential Home to the West (Window)	4.5	44	50	Yes
R03_W	2-storey Residential Home to the West (Window)	4.5	42	50	Yes
R04_W	2-storey Residential Home to the South (Window)	4.5	40	50	Yes
R05_W	2-storey Residential Home to the South (Window)	4.5	36	50	Yes
R05_O	2-storey Residential Home to the South (Outdoor)	1.5	35	50	Yes
R06_W	2-storey Residential Home to the North (Window)	4.5	43	50	Yes
R06_O	2-storey Residential Home to the North (Outdoor)	1.5	42	50	Yes
R07_W	2-storey Residential Home to the North (Window)	4.5	44	50	Yes
R07_O	2-storey Residential Home to the North (Outdoor)	1.5	44	50	Yes

R08_W	2-storey Residential Home to the North (Window)	4.5	43	50	Yes
R08_O	2-storey Residential Home to the North (Outdoor)	1.5	44	50	Yes
R09_W	2-storey Vimy Ridge Public School (Window)	6.5	42	50	Yes
R10_W	1-storey Vimy Ridge Public School (Window)	1.5	40	50	Yes

As shown in **Table 2-10**, the predicted stationary source sound level of the proposed RTUs and condensers meet the sound level limit at all receptors. Therefore, noise control measures are not required to comply with the applicable sound level limits.

IMPACTS OF THE SURROUNDING ENVIRONMENT ON THE DEVELOPMENT

The overall sound levels at the proposed development using assumed predictable worst-case operations for the nearby Vimy Ridge Public School are summarized in **Table 2-11**.

Table 2-10 Predicted Sound Levels from Offsite Stationary Sources

POR ID	POR DESCRIPTION	RECEPTOR HEIGHT (M)	PREDICTED SOUND LEVEL (dBA)	DAYTIME SOUND LEVEL LIMIT (dBA)	COMPLIANCE WITH LIMIT?
A	1 Storey Building – East façade	1.5	39	50	Yes
B	1 Storey Building – South façade	1.5	26	50	Yes
C	1 Storey Building – South façade	1.5	22	50	Yes
D	1 Storey Building – South façade	1.5	19	50	Yes
E	1 Storey Building – West façade	1.5	17	50	Yes
F	1 Storey Building – West façade	1.5	17	50	Yes
G	1 Storey Building – North façade	1.5	20	50	Yes
H	1 Storey Building – North façade	1.5	29	50	Yes
I	1 Storey Building – North façade	1.5	35	50	Yes
J	Western Portable 6 Pack – North façade	1.5	30	50	Yes
K	Eastern Portable 6 Pack – North façade	1.5	33	50	Yes
L	Eastern Portable 6 Pack – South façade	1.5	31	50	Yes
M	Western Portable 6 Pack – South façade	1.5	29	50	Yes

As shown in **Table 2-11**, the predicted stationary source sound level of the proposed RTUs and condensers meet the sound level limit at all receptors. Therefore, noise control measures are not required to comply with the applicable sound level limits.

3 RECOMMENDATIONS AND CONCLUSIONS

3.1 CONCLUSIONS

This report has been prepared to support the Site Plan Approval application. The assessment evaluated the potential for noise impact of transportation sources on the Site (road and aircraft), and stationary sources associated with the Site on nearby residential uses and stationary sources associated with the nearby public school on the proposed development.

The predicted sound levels were assessed as per the MECP Publication NPC-300 and ENCG requirements. With appropriate on-site acoustical treatment, a suitable off-site acoustical environment can be achieved. This assessment demonstrates that the Site complies with the applicable guidelines.

3.2 RECOMMENDATIONS

Table 3-1 summarizes the recommendations for the proposed development.

Table 3-1 Summary of Noise Control Requirements

BUILDING	BUILDING COMPONENTS (WALLS) STC	BUILDING COMPONENTS (WINDOWS & DOORS) STC	WARNING CLAUSE	NOISE CONTROL MEASURES
1-Storey Main School Building	OBC ¹	OBC ¹	Type C	NA
Portables	OBC ¹	OBC ¹	Type C	NPC-216 ²

Notes:

¹ OBC – Meet or exceed the minimum non-acoustical requirement of Ontario Building Code (OBC).

² Where possible, select equipment to comply with noise criteria of MECP Publication NPC-216, Residential Air Conditioning Devices.

Warning clause Type C (as requested by the City based on previous projects).

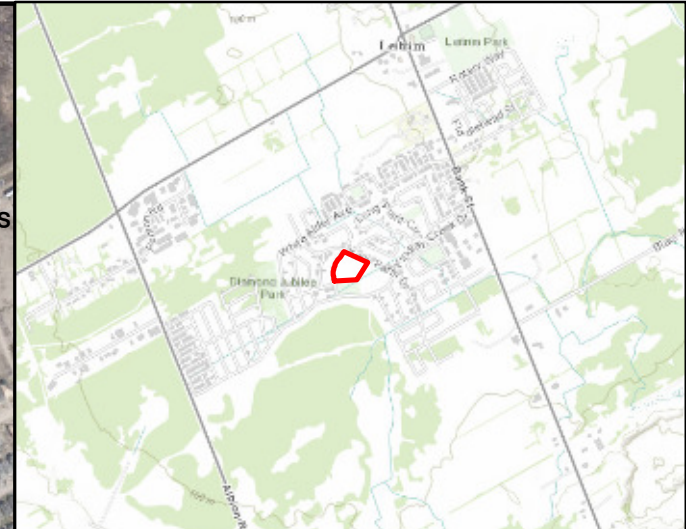
"This school has been fitted with a forced air heating system and ducting, etc. and was sized to accommodate central air conditioning. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with noise criteria of MECP Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property.)"

BIBLIOGRAPHY

- National Research Council of Canada (1995, September). Building Practice Note (BPN) No. 56: Controlling Sound Transmission into Buildings, Canada
- Ontario Ministry of the Environment and Climate Change (2013). Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning – Publication NPC-300. Ontario, Canada
- Ontario Ministry of the Environment and Climate Change (1996), STAMSON v5.04: Road, Rail and Rapid Transit Noise Prediction Model, Ontario, Canada
- Ontario Ministry of the Environment (1989). Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT), Ontario, Canada
- Ontario Ministry of the Environment and Energy (October 1995). Sound Level Due To Road Traffic Planning – Publication NPC-300. Ontario, Canada
- City of Ottawa (2016; January). Environmental Noise Control Guidelines (ENCG), Ontario, Canada

FIGURES






LEGEND:

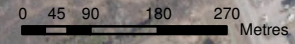
- SITE BOUNDARY
- 1000 m STUDY AREA

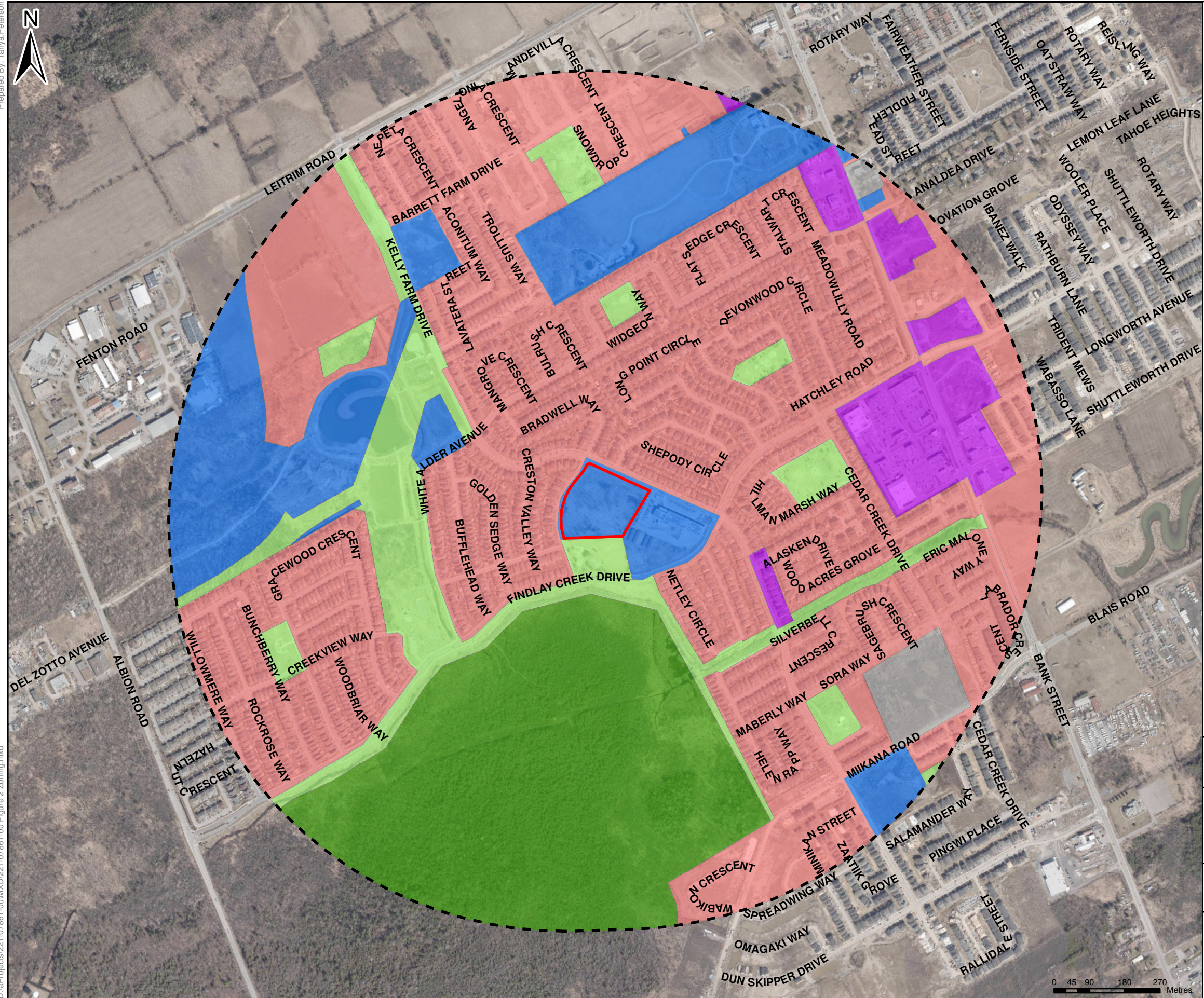
TITLE:
THE SITE AND SURROUNDING AREA

PROJECT:
NOISE IMPACT STUDY
FINDLAY ELEMENTARY SCHOOL
OTTAWA, ONTARIO

CLIENT:
OCSB

 GOLDER	PROJECT NO.:	REVIEWED BY:
	DATE:	FIGURE:
	221-07861-00	CR
	JULY 2022	1





LEGEND:

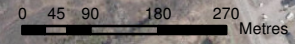
	SITE BOUNDARY
	1000 m STUDY AREA
	DEVELOPMENT RESERVE
	ENVIRONMENTAL PROTECTION
	GENERAL MIXED USE ZONE
	INSTITUTIONAL
	OPEN SPACE
	RESIDENTIAL

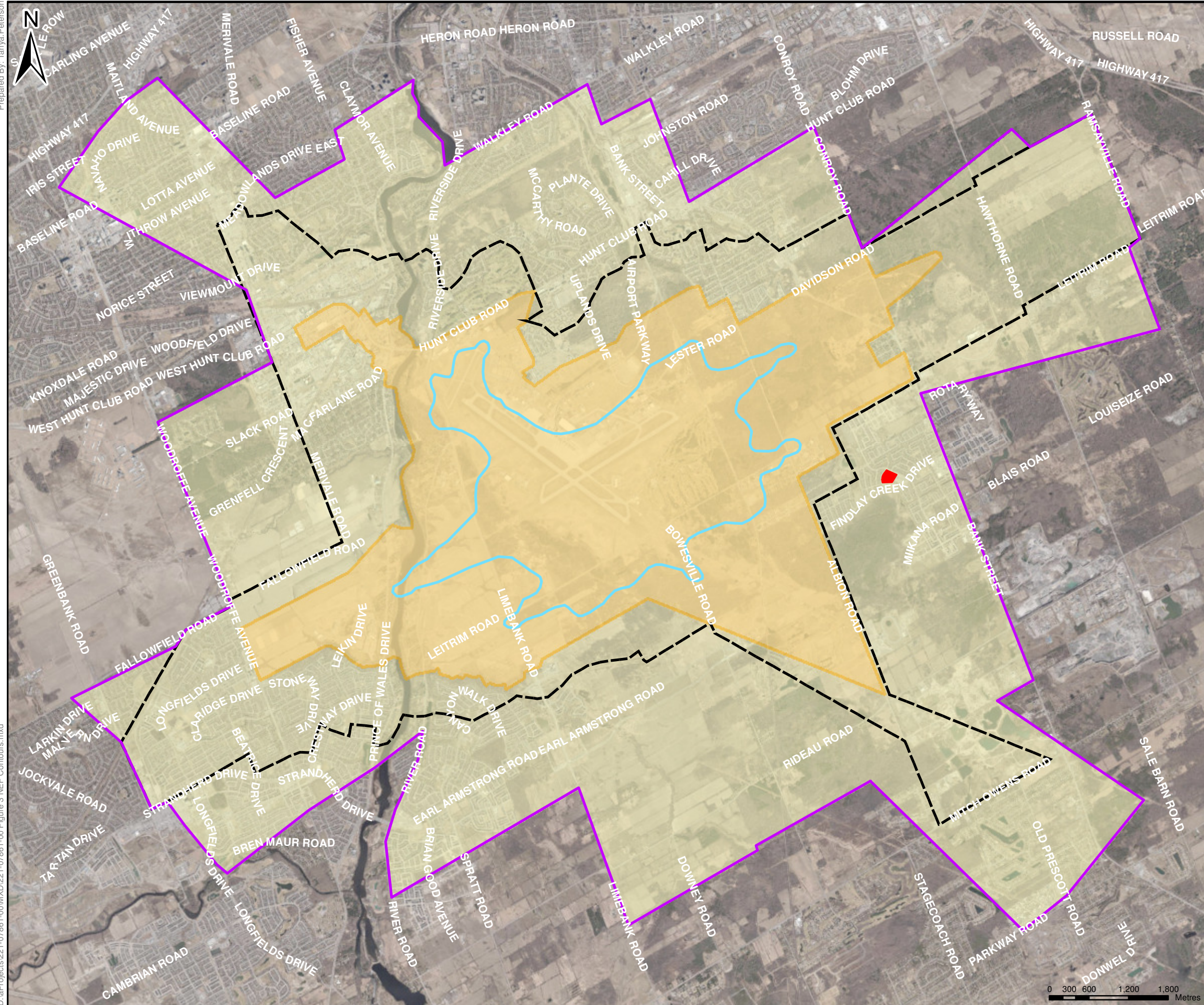
TITLE: ZONING MAP

PROJECT: NOISE IMPACT STUDY
FINDLAY ELEMENTARY SCHOOL
OTTAWA, ONTARIO

CLIENT: OCSB

	PROJECT NO.:	REVIEWED BY:
	221-07861-00	CR
	DATE:	FIGURE:
	JULY 2022	2






LEGEND:

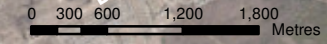
- SITE BOUNDARY
- AIRPORT VICINITY DEVELOPMENT ZONE
- 25 LINE (COMPOSITE OF 25 NEF/NEP)
- 35 LINE NOISE EXPOSURE PROTECTION (NEP 2023)
- AIRPORT ZONING REGULATIONS
- AIRPORT OPERATING INFLUENCING ZONE

TITLE: SITE LOCATION IN RELATION TO THE AIRPORTS NEF/NEP CONTOUR MAP

PROJECT: NOISE IMPACT STUDY
FINDLAY ELEMENTARY SCHOOL
OTTAWA, ONTARIO

CLIENT: OCSB

	PROJECT NO.: 221-07861-00	REVIEWED BY: CR
	DATE: JULY 2022	FIGURE: 3






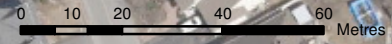
- LEGEND:
- SITE BOUNDARY
 - BUILDING
 - PORTABLES
 - PREDICTION LOCATIONS

TITLE: SITE PLAN SHOWING
PREDICTION LOCATIONS & ROAD SOURCES
(TRANSPORTATION NOISE IMPACTS)

PROJECT: NOISE IMPACT STUDY
FINDLAY ELEMENTARY SCHOOL
OTTAWA, ONTARIO

CLIENT: OCSB

 GOLDER	PROJECT NO.: 221-07861-00	REVIEWED BY: CR
	DATE: JULY 2022	FIGURE: 4






LEGEND:

- SITE BOUNDARY
- BUILDING
- PORTABLES
- RECEPTORS
- SOURCE LOCATION

TITLE: SITE PLAN SHOWING ONSITE STATIONARY SOURCES & RECEPTOR LOCATIONS (STATIONARY NOISE IMPACTS OFFSITE)

PROJECT: NOISE IMPACT STUDY
FINDLAY ELEMENTARY SCHOOL
OTTAWA, ONTARIO

CLIENT: OCSB

 GOLDER	PROJECT NO.: 221-07861-00	REVIEWED BY: RW
	DATE: JULY 2022	FIGURE: 5






LEGEND:

- SITE BOUNDARY
- BUILDING
- PORTABLES
- PREDICTION LOCATIONS
- SOURCE LOCATION
- LINE SOURCE LOCATION

TITLE: SITE PLAN SHOWING OFFSITE STATIONARY SOURCES & RECEPTOR LOCATIONS (STATIONARY NOISE IMPACTS ONSITE)

PROJECT: NOISE IMPACT STUDY
FINDLAY ELEMENTARY SCHOOL
OTTAWA, ONTARIO

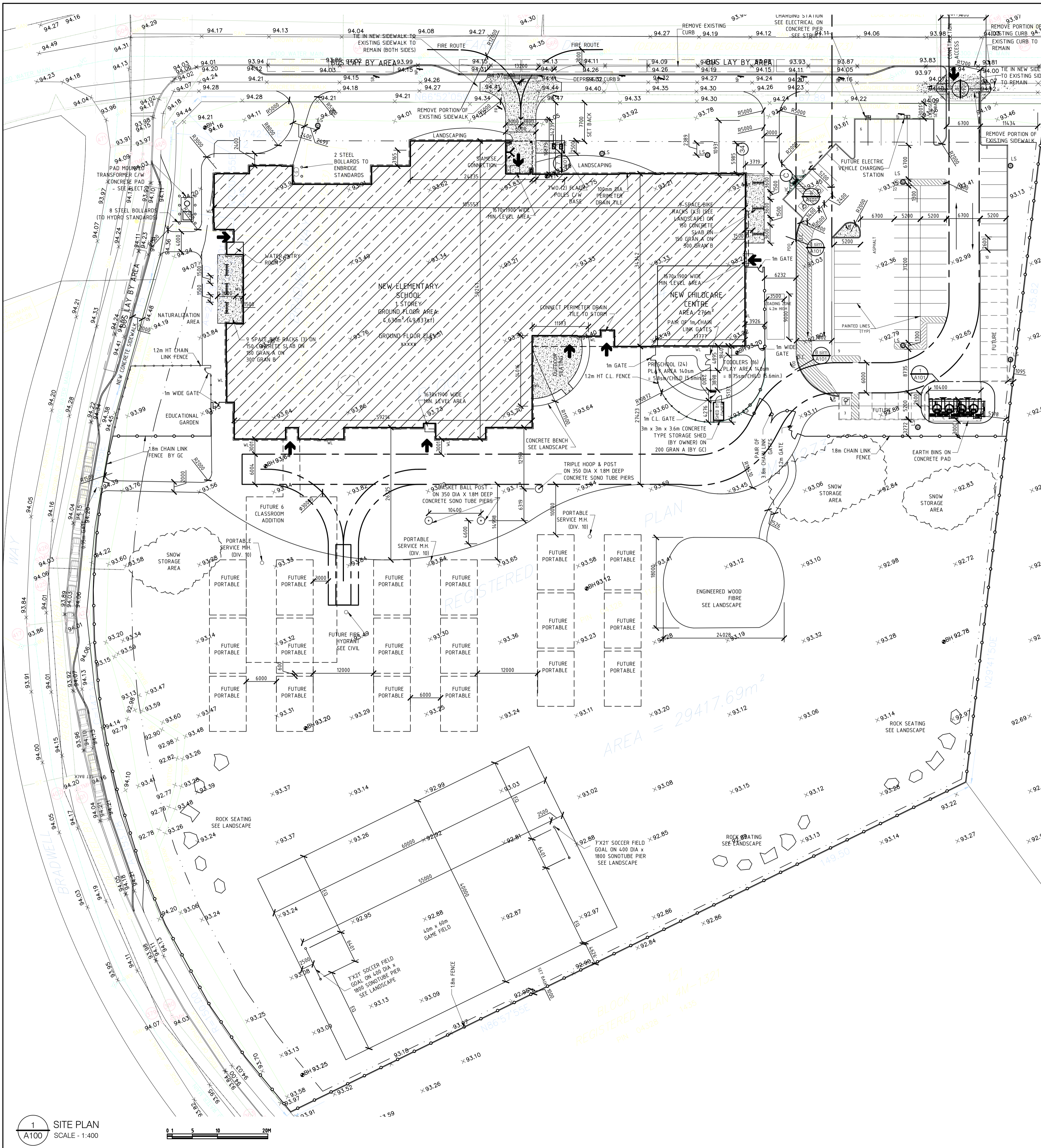
CLIENT: OCSB

 GOLDER	PROJECT NO.: 221-07861-00	REVIEWED BY: CR
	DATE: JULY 2022	FIGURE: 6

APPENDIX


A DRAWINGS





ZONING REQUIREMENTS			
Municipality	City of Ottawa		
Legal Description	XXXXXX City of Ottawa		
Survey Information	Survey Information Prepared By: XXX XXX		
Common Address	4210 Kelly Farm Dr Ottawa, Ontario		
Project Information	Lot Size: 29,410 sm Gross Building Floor Area: 4,630sm		
Zoning	1E H(15)	Institutional 1	
	Bylaw Provisions	Proposed	Compliance
Minimum Lot Width	15m	xm	Complies
Minimum Lot Area	400 sm	xsm	Complies
Minimum Front Yard Setback	7.65m	xm	Complies
Minimum Rear Yard Setback	1m	xm	Complies
Minimum Interior Side Yard Setback	1m	xm	Complies
Minimum Corner Side Yard Setback	7.65m	xm	Complies
Maximum Building Height	15.0m	7.65m	Complies
Required Parking (Schedule 1A - Area C) Rate = 1.5 per classroom (includes 16 classrooms + 6 kindergartens) Childcare 1/50sm	1.5 x 22 classrooms = 33 Spaces + 275sm Childcare/50sm = 6 Spaces 39 Total spaces required	50 Spaces Proposed	Complies
Future Parking (12 future portables)	1.5 x 12 portables = 18 additional Spaces total (18 + 39) = 57 Spaces	15 Future Spaces total (50 + 15) = 65	Complies
HC Parking Requirements	Based on 50 parking spaces provided	2 HC Spaces Required 1 @ type A 1 @ type B	Complies
Required Bicycle Parking (1/100sm Gross Floor Area)	1/100sm X4,647sm = 47 spaces required	48 spaces (6 Bike Racks @ 8 spaces)	Complies
Required Loading Zones 1 per 1000-9999 sm of gross floor area	1 Loading Zone = 3.5m(W) X 7m (L) X 4.2m (H) As per zoning Section 113 (4) & (5)	1	Complies
Minimum Width of Landscaped Area (Landscape Buffer)	Abutting A Street = 3.0m Abutting residential, institutional = 3.0m Other Cases - None	4.0m	Complies
Landscaped Provisions for Parking Lots	Landscape buffer width: 3m abutting a street, 1.5m not abutting a street Refuse collection areas must be minimum 9.0m from property line abutting a street Refuse collection areas must be minimum 3.0m from other property lines Refuse collection area must be screened with minimum 2.0m height screen	4m 2.15m	Complies
	Minimum landscaped area of parking lot = 15%	Parking Lot Area = 1782sm Landscape around Parking = 478sm Parking = >15%	

ZONING INFORMATION	
PROJECT NO.	22012
SCALE	AS NOTED
DRAWN	I.R.
CHECKED	I.R.
PLOT DATE	15/06/2022
DRAWING NO.	A100
PROJECT	OCSB FINDLAY CREEK ELEMENTARY SCHOOL
PROJECT NO.	22012
SCALE	AS NOTED
DRAWN	I.R.
CHECKED	I.R.
PLOT DATE	15/06/2022



OTTAWA CATHOLIC SCHOOL BOARD

REV	REVISION DESCRIPTION	DATE
2	ISSUED FOR CLIENT REVIEW	6/JUN/2022
1	ISSUED FOR CLIENT REVIEW	11/MAY/2022

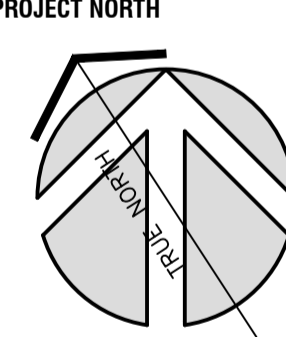
THIS DRAWING IS THE EXCLUSIVE PROPERTY OF PYE & RICHARDS - TEMPRANO & YOUNG ARCHITECTS INC. COPYRIGHT RESERVED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DIMENSIONAL ERRORS AND/OR POSSIBLE TRADE INTERFERENCE/CONFLICT FOR CLARIFICATION PRIOR TO COMMENCEMENT OF THE WORK. DO NOT SCALE DRAWINGS.

SEAL

Not for construction unless SEALED and SIGNED

PROJECT NORTH



P R
T Y

PYE & RICHARDS - TEMPRANO & YOUNG ARCHITECTS INC.

824 Meath St. Suite 200
Ottawa, ON K1Z 6E8

613.724.7700
info@prty.ca

CONTEXT MAP

APPENDIX

B TRAFFIC DATA



Appendix B: Table of Traffic and Road Parameters To Be Used For Sound Level Predictions

Table B1 Traffic And Road Parameters To Be Used For Sound Level Predictions

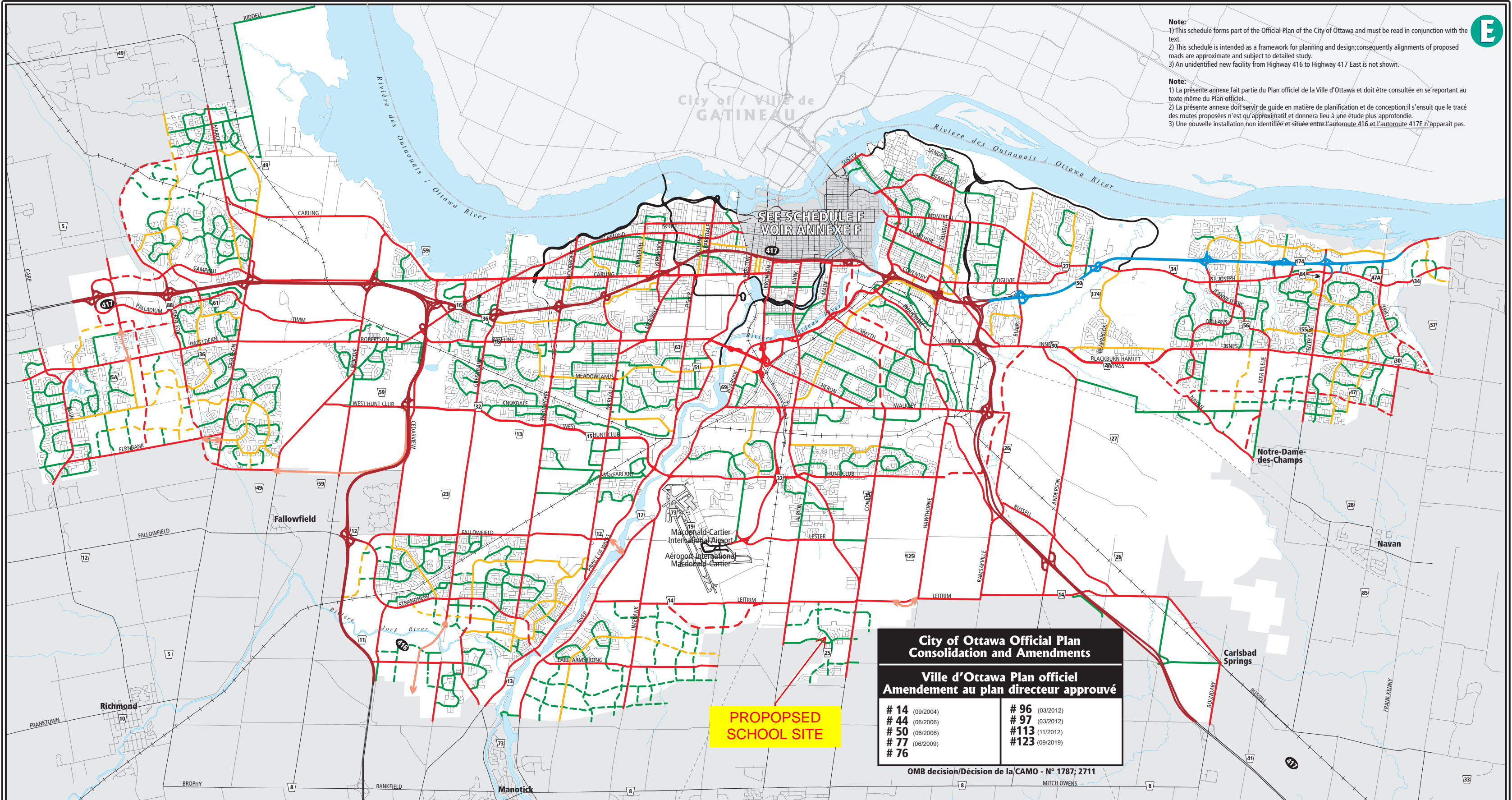
Row Width (m)	Implied Roadway Class	AADT Vehicles/Day	Posted Speed Km/Hr	Day/Night Split %	Medium Trucks %	Heavy Trucks % ¹
NA ²	Freeway, Queensway, Highway	18,333 per lane	100	92/8	7	5
37.5-44.5	6-Lane Urban Arterial-Divided (6 UAD)	50,000	50-80	92/8	7	5
34-37.5	4-Lane Urban Arterial-Divided (4-UAD)	35,000	50-80	92/8	7	5
23-34	4-Lane Urban Arterial-Undivided (4-UAU)	30,000	50-80	92/8	7	5
23-34	4-Lane Major Collector (4-UMCU)	24,000	40-60	92/8	7	5
30-35.5	2-Lane Rural Arterial (2-RAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Urban Arterial (2-UAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Major Collector (2-UMCU)	12,000	40-60	92/8	7	5
30-35.5	2-Lane Outer Rural Arterial (near the extremities of the City) (2-RAU)	10,000	50-80	92/8	7	5
20-30	2-Lane Urban Collector (2-UCU)	8,000	40-50	92/8	7	5

¹ The MOE Vehicle Classification definitions should be used to estimate automobiles, medium trucks and heavy trucks.

² The number of lanes is determined by the future mature state of the roadway.

Note:
 1) This schedule forms part of the Official Plan of the City of Ottawa and must be read in conjunction with the text.
 2) This schedule is intended as a framework for planning and design; consequently alignments of proposed roads are approximate and subject to detailed study.
 3) An unidentified new facility from Highway 416 to Highway 417 East is not shown.

Note:
 1) La présente annexe fait partie du Plan officiel de la Ville d'Ottawa et doit être consultée en se reportant au texte même du Plan officiel.
 2) La présente annexe doit servir de guide en matière de planification et de conception; il s'ensuit que le tracé des routes proposées n'est qu'approximatif et donnera lieu à une étude plus approfondie.
 3) Une nouvelle installation non identifiée et située entre l'autoroute 416 et l'autoroute 417E n'apparaît pas.



SEE SCHEDULE F
 VOIR ANNEXE F

PROPOSED
 SCHOOL SITE

City of Ottawa Official Plan Consolidation and Amendments
Ville d'Ottawa Plan officiel Amendement au plan directeur approuvé

# 14 (09/2004)	# 96 (03/2012)
# 44 (06/2006)	# 97 (03/2012)
# 50 (06/2006)	# 113 (11/2012)
# 77 (06/2009)	# 123 (09/2019)
# 76	

OMB decision/Décision de la CAMO - N° 1787; 2711

**Official Plan - Schedule E
 Urban Road Network**
 Plan officiel - Annexe E
 Routes Arterial - Urbain

Prepared by: Planning and Growth Management Department, Mapping & Graphics Unit

Préparé par : Service de l'urbanisme et de la gestion de la croissance, Unité de la cartographie et des graphiques

Provincial Highway City Freeway	Route provinciale Autoroute de ville	Arterials Existing Proposed Conceptual (Alignment Undefined)	Artère Établie Proposé Conceptuelle (Alignement à déterminée)	Major Collectors Existing Proposed	Grande collectrice Établie Proposé
Federally Owned Road Existing Proposed (Alignment defined)	Chemins de propriété fédéral Établie Proposé (Alignement déterminée)			Collectors Existing Proposed	Collectrice Établie Proposé

APPENDIX

C NEF/NEP

CONTOUR MAP

OFFICIAL PLAN - ANNEX 10

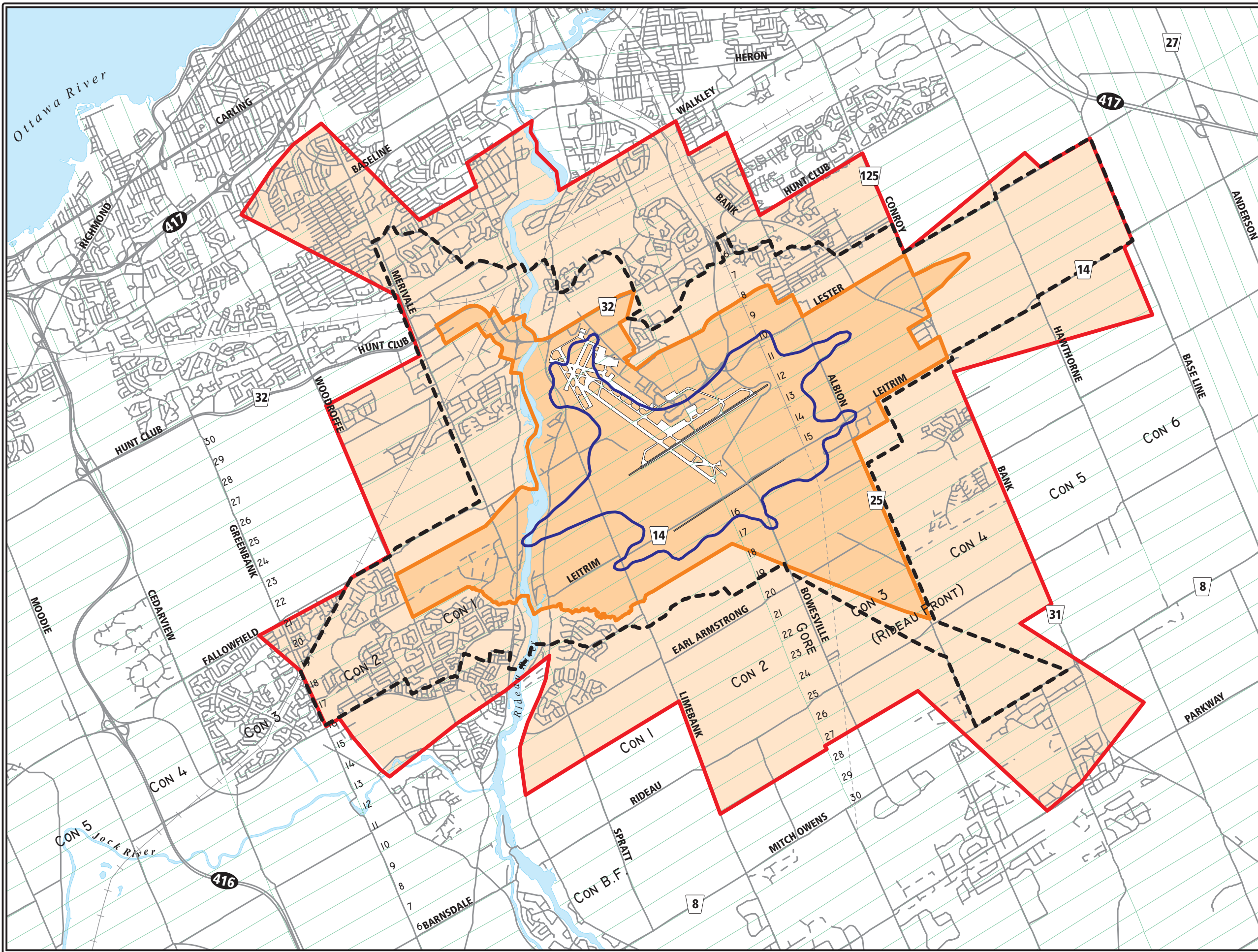
Land Use Constraints Due to Aircraft Noise






Prepared by: City of Ottawa,
Department of Planning, Transit and the Environment,
September 2011

PLAN OFFICIEL - APPENDICE 10

Contraintes limitant l'utilisation en raison du bruit des avions

Préparé par : Ville d'Ottawa,
Le Service de l'urbanisme, du transport en commun et de l'environnement,
septembre 2011



-  Airport Vicinity Development Zone
Zone d'aménagement dans le voisinage de l'aéroport
-  25 Line (Composite of 25 NEF/NEP)
Ligne 25 (ensemble des courbes NEF et NEP 25)
-  35 Line Noise Exposure Protection (NEP 2023)
Ligne 35 : prévisions à long terme de l'ambiance sonore (NEP 2023)
-  Airport Zoning Regulations
Règlements de zonage applicables à de l'Aéroport
-  Airport Operating Influence Zone
Zone d'influence d'exploitation de l'aéroport

Note:
The boundaries of the Ottawa Airport Operating Influence Zone and the Airport Vicinity Development Zone, are not subject to interpretation and their precise locations should be read from a map at a scale of 1:50,000 available from the City of Ottawa and the Ottawa International Airport Authority.

Scale / Échelle
1km 0 1 2 3 km



APPENDIX

D STAMSON VALIDATION FILES

Filename: Time Period: 24 hours
Description: Location H - Transportation

Road data, segment # 1: Kelly Farm D

Car traffic volume : 7040 veh/TimePeriod *
Medium truck volume : 560 veh/TimePeriod *
Heavy truck volume : 400 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Kelly Farm D

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 21.50 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

RF

Results segment # 1: Kelly Farm D

Source height = 1.50 m

ROAD (0.00 + 60.99 + 0.00) = 60.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.56	0.00	-1.56	0.00	0.00	0.00	0.00	60.99

Segment Leq : 60.99 dBA

Total Leq All Segments: 60.99 dBA

RF

TOTAL Leq FROM ALL SOURCES: 60.99

RF

RF

Filename: LOCH.te Time Period: Day/Night 16/8 hours
Description: Location L

Road data, segment # 1: Findlay (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Findlay (day/night)

Angle1 Angle2 : -65.00 deg 35.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 142.00 / 142.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

RF
Road data, segment # 2: Findlay2 (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Findlay2 (day/night)

```

-----
Angle1  Angle2      : 35.00 deg  50.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      2 / 0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 142.00 / 142.00 m
Receiver height  :      1.50 / 4.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00

```

FF
Road data, segment # 3: KellyFarmDr (day/night)

```

-----
Car traffic volume : 6477/563   veh/TimePeriod *
Medium truck volume : 515/45    veh/TimePeriod *
Heavy truck volume  : 368/32    veh/TimePeriod *
Posted speed limit  : 40 km/h
Road gradient       : 0 %
Road pavement      : 1 (Typical asphalt or concrete)

```

* Refers to calculated road volumes based on the following input:

```

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth      : 0.00
Number of Years of Growth        : 0.00
Medium Truck % of Total Volume    : 7.00
Heavy Truck % of Total Volume     : 5.00
Day (16 hrs) % of Total Volume    : 92.00

```

Data for Segment # 3: KellyFarmDr (day/night)

```

-----
Angle1  Angle2      : 70.00 deg  90.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      5 / 0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 144.00 / 144.00 m
Receiver height  :      1.50 / 4.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :      0.00

```

FF
Results segment # 1: Findlay (day)

Source height = 1.50 m

ROAD (0.00 + 44.71 + 0.00) = 44.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-65	35	0.66	63.96	0.00	-16.20	-3.05	0.00	0.00	0.00	44.71

Segment Leq : 44.71 dBA

RF
Results segment # 2: Findlay2 (day)

Source height = 1.50 m

ROAD (0.00 + 26.12 + 0.00) = 26.12 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

35 50 0.66 63.96 0.00 -16.20 -11.68 0.00 -9.95 0.00 26.12

Segment Leq : 26.12 dBA

RF
Results segment # 3: KellyFarmDr (day)

Source height = 1.50 m

ROAD (0.00 + 21.32 + 0.00) = 21.32 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

70 90 0.66 63.96 0.00 -16.31 -14.79 0.00 -11.54 0.00 21.32

Segment Leq : 21.32 dBA

Total Leq All Segments: 44.79 dBA

RF
Results segment # 1: Findlay (night)

Source height = 1.50 m

ROAD (0.00 + 38.05 + 0.00) = 38.05 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-65 35 0.57 56.36 0.00 -15.33 -2.98 0.00 0.00 0.00 38.05

Segment Leq : 38.05 dBA

RF
Results segment # 2: Findlay2 (night)

Source height = 1.50 m

ROAD (0.00 + 29.48 + 0.00) = 29.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
35	50	0.57	56.36	0.00	-15.33	-11.56	0.00	0.00	0.00	29.48

Segment Leq : 29.48 dBA

RR
Results segment # 3: KellyFarmDr (night)

Source height = 1.50 m

ROAD (0.00 + 26.81 + 0.00) = 26.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
70	90	0.57	56.36	0.00	-15.42	-14.13	0.00	0.00	0.00	26.81

Segment Leq : 26.81 dBA

Total Leq All Segments: 38.89 dBA

RR

TOTAL Leq FROM ALL SOURCES (DAY): 44.79
 (NIGHT): 38.89

RR
RR

APPENDIX

E SUPPORTING INFORMATION



AAON Standard Condenser Fan Radiated Sound Levels

Updated 10/26/2018

		Fans Dia RPM		Sound Power Level								Sound Pressure Level in a Hemispherical Free Field								Dist (ft) 5		
				63	125	250	500	1000	2000	4000	8000	LwA	63	125	250	500	1000	2000	4000		8000	dBA
RQ 2 & 3 Ton	Inlet	1	30	850	79	74	72	70	66	62	59	59	72	68	62	60	58	54	51	48	47	60
	Outlet				81	77	71	71	67	62	59	58	73	69	66	59	59	55	51	48	46	61
	Total				83	79	74	73	69	65	62	61	75	72	67	63	62	58	54	51	50	63
RQ 4-6 Ton & RN 6 & 7 Ton	Inlet	1	30	1085	85	79	77	75	71	68	65	64	77	73	67	66	63	59	56	53	52	65
	Outlet				86	83	76	76	72	68	65	63	78	75	71	64	65	60	56	53	52	66
	Total				89	84	80	79	75	71	68	67	80	77	73	68	67	63	59	56	55	69
RN 8 & 10 Ton	Inlet	1	30	1085	92	86	85	82	78	75	72	71	84	80	75	73	70	66	63	60	60	73
	Outlet				94	90	83	83	79	75	72	71	85	82	78	71	72	68	63	60	59	73
	Total				96	91	87	86	82	78	75	74	88	84	80	75	74	70	66	63	62	76
RN 09 & 11 Ton	Inlet	2	30	1085	88	82	80	78	74	71	68	67	80	76	70	69	66	62	59	56	55	68
	Outlet				89	86	79	79	75	71	68	66	81	78	74	67	68	63	59	56	55	69
	Total				92	87	83	82	78	74	71	70	83	80	76	71	70	66	62	59	58	72
RN 13-20 Ton	Inlet	2	30	1085	95	89	88	85	81	78	75	74	87	83	78	76	73	69	66	63	63	76
	Outlet				97	93	86	86	82	78	75	74	88	85	81	74	75	71	66	63	62	76
	Total				99	94	90	89	85	81	78	77	91	87	83	78	77	73	69	66	65	79
RN 25 & 30 Ton	Inlet	3	30	1085	97	91	89	87	83	80	77	76	89	85	79	78	75	71	68	65	64	77
	Outlet				98	95	88	88	84	80	77	75	90	87	83	76	76	72	68	65	64	78
	Total				101	96	92	91	86	83	80	79	92	89	85	80	79	75	71	68	67	81
RN 26,31 & 40 Ton	Inlet	4	30	1085	98	92	91	88	84	81	78	77	90	86	81	79	76	72	69	66	66	79
	Outlet				100	96	89	89	85	81	78	77	91	88	84	77	78	74	69	66	65	79
	Total				102	98	93	92	88	84	81	80	94	90	86	81	80	76	72	69	68	82
RN 50,60 & 70 Ton	Inlet	6	30	1085	100	94	92	90	86	83	80	79	92	88	82	81	78	74	71	68	67	80
	Outlet				101	98	91	91	87	83	80	78	93	90	86	79	79	75	71	68	67	81
	Total				104	99	95	94	89	86	83	82	95	92	88	83	82	78	74	71	70	84
RN E 55,65 & 75 Ton LN & LZ 45-60 Ton RZ 45-75	Inlet	4	30	1170	92	86	87	87	86	85	85	78	92	80	74	75	75	74	73	73	66	80
	Outlet				92	86	87	87	86	85	85	78	92	80	74	75	75	74	73	73	66	80
	Total				95	89	90	90	89	88	88	81	95	83	77	78	78	77	76	76	69	83
RN E 90-140 Ton LN & LZ 75-140 Ton RZ 90-140	Inlet	8	30	1170	95	89	90	90	89	88	88	81	95	83	77	78	78	77	76	76	69	83
	Outlet				95	89	90	90	89	88	88	81	95	83	77	78	78	77	76	76	69	83
	Total				98	92	93	93	92	91	91	84	98	86	80	81	81	80	79	79	72	86
RZ 145-180	Inlet	12	30	1170	97	91	92	92	91	90	90	83	97	85	79	80	80	79	78	78	71	85
	Outlet				97	91	92	92	91	90	90	83	97	85	79	80	80	79	78	78	71	85
	Total				100	94	95	95	94	93	93	86	100	88	82	83	83	82	81	81	74	88
RZ 200-240	Inlet	16	30	1170	98	92	93	93	92	91	91	84	98	86	80	81	81	80	79	79	72	86
	Outlet				98	92	93	93	92	91	91	84	98	86	80	81	81	80	79	79	72	86
	Total				101	95	96	96	95	94	94	87	101	89	83	84	84	83	82	82	75	89

Tested in Accordance with AMCA 300 - Updated 6-15-15



15.0" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.324 (SN: 6114768-C4GU4Q4U)

JOB INFORMATION:

Job Name: *CEPEO Kanata*
 Job Tag: *RTU-1 Daycare*
 Rep Firm:
 Date: *07-07-2022*

WHEEL SPECIFICATION:

Max RPM: *2,200*
 Diameter x Qty: *15.0 in. x 1*
 CFM: *3200*
 Tip Speed: *7,846 FPM*
 Inertia: *3 WR²*

OPERATING CONDITIONS:

Air Flow: *3,200 CFM*
 Static Pressure: *0.98 in. Wg.*
 Relief Dampers DP: *0.44 in. Wg.*
 TSP: *1.42 in. Wg.*
 Site Altitude: *0.00 Ft*
 TSP @Sea Level: *1.42 in. Wg.*

MOTOR SELECTION:

Rated HP / Bypass: *2 / No*
 Frame Size: *145T*
 Nominal RPM: *1760*
 VAC/PH/HZ: *575/3/60*
 Efficiency: *Premium / 0.865*
 Enclosure Type: *ODP*
 Max Inertial Load: *27 WR²*

FAN PERFORMANCE:

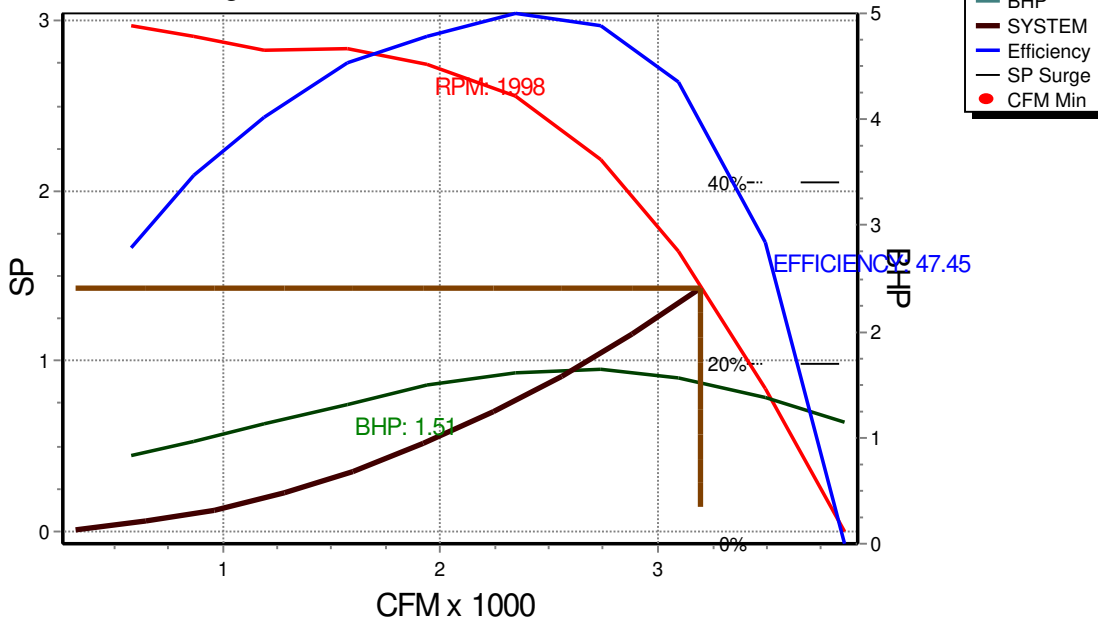
RPM: *1998*
 BHP: *1.51*
 Efficiency: *47.4%*
 In/Out Velocity: *1624/1260 FPM*
 Plenum Out Velocity: *53 FPM*

FAN SOUND POWER (Inlet/Outlet):

Octave Band:	(Re 10 ⁻¹² watts)							
	1	2	3	4	5	6	7	8
	85	86	86	86	80	76	74	70
	85	86	86	86	80	76	74	70

SOUND POWER A-Weighted: 87 / 87 dB

Exhaust Fan Model: RM150 @ 1998 RPM and 100% Width
 Design Conditions: 3200 CFM @ 1.43" SP





22.0" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.324 (SN: 6114768-C4GU4Q4U)

JOB INFORMATION:

Job Name: *CEPEO Kanata*
 Job Tag: *RTU-2 Kindergarten*
 Rep Firm: *Classrooms*
 Date: *07-07-2022*

WHEEL SPECIFICATION:

Max RPM: *2,200*
 Diameter x Qty: *22.0 in. x 1*
 CFM: *6100*
 Tip Speed: *7,914 FPM*
 Inertia: *5 WR²*

OPERATING CONDITIONS:

Air Flow: *6,100 CFM*
 Static Pressure: *0.83 in. Wg.*
 Relief Dampers DP: *0.43 in. Wg.*
 TSP: *1.26 in. Wg.*
 Site Altitude: *0.00 Ft*
 TSP @Sea Level: *1.26 in. Wg.*

MOTOR SELECTION:

Rated HP / Bypass: *5 / No*
 Frame Size: *184T*
 Nominal RPM: *1760*
 VAC/PH/HZ: *575/3/60*
 Efficiency: *Premium / 0.895*
 Enclosure Type: *ODP*
 Max Inertial Load: *52 WR²*

FAN PERFORMANCE:

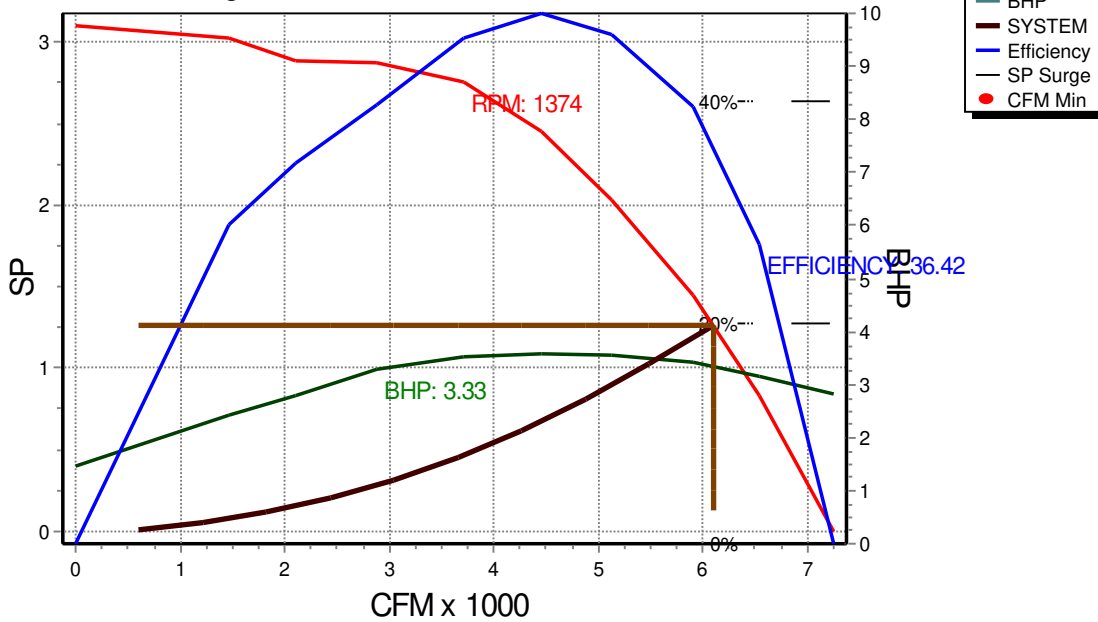
RPM: *1374*
 BHP: *3.33*
 Efficiency: *36.4%*
 In/Out Velocity: *1865/2054 FPM*
 Plenum Out Velocity: *102 FPM*

FAN SOUND POWER (Inlet/Outlet):

Octave Band:	(Re 10 ⁻¹² watts)							
	1	2	3	4	5	6	7	8
	89	88	90	85	79	78	73	65
	89	88	90	85	79	78	73	65

SOUND POWER A-Weighted: 90 / 90 dB

Exhaust Fan Model: RM220A @ 1374 RPM and 100% Width
 Design Conditions: 6100 CFM @ 1.26" SP





18.5" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.324 (SN: 6114768-C4GU4Q4U)

JOB INFORMATION:

Job Name: *CEPEO Kanata*
 Job Tag: *RTU-3 Library and*
 Rep Firm: *Multipurpose*
 Date: *07-07-2022*

WHEEL SPECIFICATION:

Max RPM: *2,200*
 Diameter x Qty: *18.5 in. x 1*
 CFM:
 Tip Speed: *4100*
 Inertia: *6,601 FPM*
3 WR²

OPERATING CONDITIONS:

Air Flow: *4,100 CFM*
 Static Pressure: *1.02 in. Wg.*
 Relief Dampers DP: *0.26 in. Wg.*
 TSP: *1.28 in. Wg.*
 Site Altitude: *0.00 Ft*
 TSP @Sea Level: *1.28 in. Wg.*

MOTOR SELECTION:

Rated HP / Bypass: *2 / No*
 Frame Size: *145T*
 Nominal RPM: *1760*
 VAC/PH/HZ: *575/3/60*
 Efficiency: *Premium / 0.865*
 Enclosure Type: *ODP*
 Max Inertial Load: *27 WR²*

FAN PERFORMANCE:

RPM: *1363*
 BHP: *1.39*
 Efficiency: *59.5%*
 In/Out Velocity: *2081/1614 FPM*
 Plenum Out Velocity: *68 FPM*

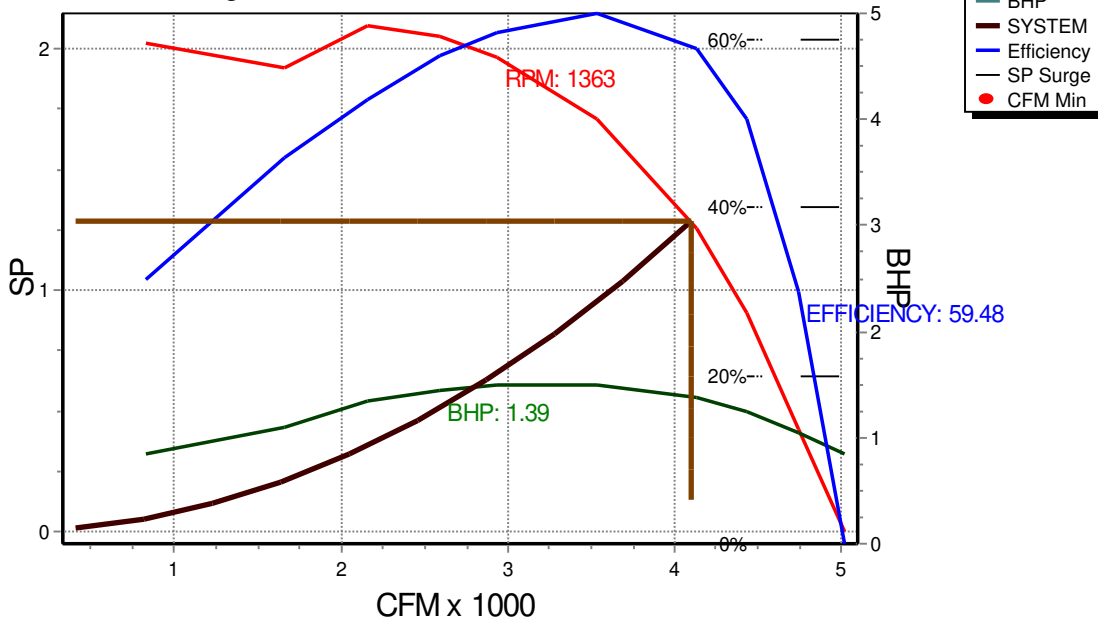
FAN SOUND POWER (Inlet/Outlet):

Octave Band: (Re 10⁻¹² watts)

	1	2	3	4	5	6	7	8
Inlet	84	84	83	81	75	72	69	64
Outlet	84	84	83	81	75	72	69	64

SOUND POWER A-Weighted: 85 / 85 dB

Exhaust Fan Model: RM185 @ 1363 RPM and 100% Width
 Design Conditions: 4100 CFM @ 1.28" SP





18.5" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.324 (SN: 6114768-C4GU4Q4U)

JOB INFORMATION:

Job Name: *CEPEO Kanata*
 Job Tag: *RTU-4 Admin*
 Rep Firm:
 Date: *07-07-2022*

WHEEL SPECIFICATION:

Max RPM: *2,200*
 Diameter x Qty: *18.5 in. x 1*
 CFM: *3650*
 Tip Speed: *5,822 FPM*
 Inertia: *3 WR²*

OPERATING CONDITIONS:

Air Flow: *3,650 CFM*
 Static Pressure: *0.74 in. Wg.*
 Relief Dampers DP: *0.23 in. Wg.*
 TSP: *0.97 in. Wg.*
 Site Altitude: *0.00 Ft*
 TSP @Sea Level: *0.97 in. Wg.*

MOTOR SELECTION:

Rated HP / Bypass: *2 / No*
 Frame Size: *145T*
 Nominal RPM: *1760*
 VAC/PH/HZ: *575/3/60*
 Efficiency: *Premium / 0.865*
 Enclosure Type: *ODP*
 Max Inertial Load: *27 WR²*

FAN PERFORMANCE:

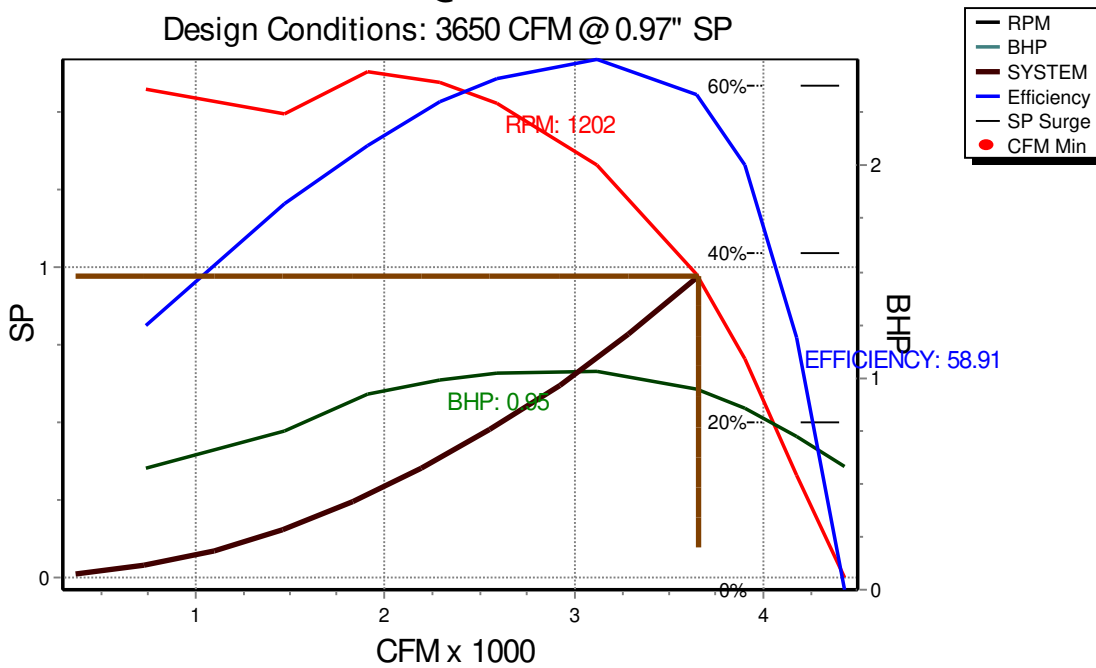
RPM: *1202*
 BHP: *0.95*
 Efficiency: *58.9%*
 In/Out Velocity: *1853/1437 FPM*
 Plenum Out Velocity: *61 FPM*

FAN SOUND POWER (Inlet/Outlet):

Octave Band:	(Re 10 ⁻¹² watts)							
	1	2	3	4	5	6	7	8
	80	81	81	76	72	69	65	60
	80	81	81	76	72	69	65	60

SOUND POWER A-Weighted: 81 / 81 dB

Exhaust Fan Model: RM185 @ 1202 RPM and 100% Width
 Design Conditions: 3650 CFM @ 0.97" SP





22.0" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.324 (SN: 6114768-C4GU4Q4U)

JOB INFORMATION:

Job Name: *CEPEO Kanata*
 Job Tag: *RTU-5 Gym*
 Rep Firm:
 Date: *07-07-2022*

WHEEL SPECIFICATION:

Max RPM: *2,200*
 Diameter x Qty: *22.0 in. x 1*
 CFM: *6200*
 Tip Speed: *7,862 FPM*
 Inertia: *5 WR²*

OPERATING CONDITIONS:

Air Flow: *6,200 CFM*
 Static Pressure: *0.67 in. Wg.*
 Relief Dampers DP: *0.44 in. Wg.*
 TSP: *1.11 in. Wg.*
 Site Altitude: *0.00 Ft*
 TSP @Sea Level: *1.11 in. Wg.*

MOTOR SELECTION:

Rated HP / Bypass: *5 / No*
 Frame Size: *184T*
 Nominal RPM: *1760*
 VAC/PH/HZ: *575/3/60*
 Efficiency: *Premium / 0.895*
 Enclosure Type: *ODP*
 Max Inertial Load: *52 WR²*

FAN PERFORMANCE:

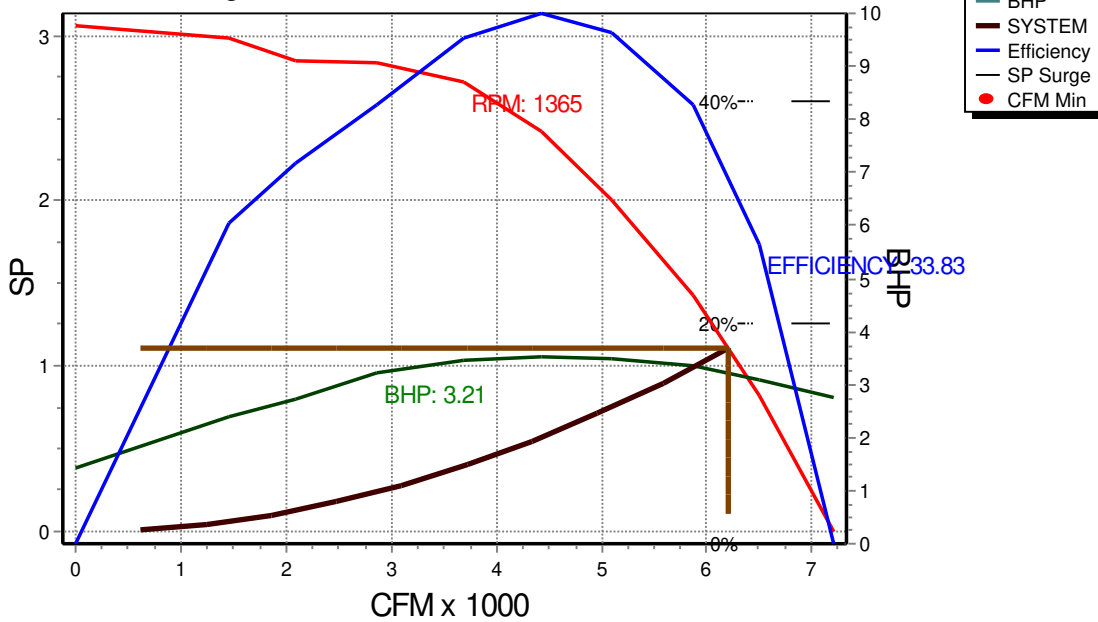
RPM: *1365*
 BHP: *3.21*
 Efficiency: *33.8%*
 In/Out Velocity: *1896/2088 FPM*
 Plenum Out Velocity: *103 FPM*

FAN SOUND POWER (Inlet/Outlet):

Octave Band:	(Re 10 ⁻¹² watts)							
	1	2	3	4	5	6	7	8
	89	88	90	85	79	78	73	65
	89	88	90	85	79	78	73	65

SOUND POWER A-Weighted: 90 / 90 dB

Exhaust Fan Model: RM220A @ 1365 RPM and 100% Width
 Design Conditions: 6200 CFM @ 1.11" SP





22.0" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.324 (SN: 6114768-C4GU4Q4U)

JOB INFORMATION:

Job Name: *CEPEO Kanata*
 Job Tag: *RTU-6 Ground East*
 Rep Firm:
 Date: *07-07-2022*

WHEEL SPECIFICATION:

Max RPM: *2,200*
 Diameter x Qty: *22.0 in. x 1*
 CFM: *6750*
 Tip Speed: *8,490 FPM*
 Inertia: *5 WR²*

OPERATING CONDITIONS:

Air Flow: *6,750 CFM*
 Static Pressure: *0.74 in. Wg.*
 Relief Dampers DP: *0.50 in. Wg.*
 TSP: *1.24 in. Wg.*
 Site Altitude: *0.00 Ft*
 TSP @Sea Level: *1.24 in. Wg.*

MOTOR SELECTION:

Rated HP / Bypass: *5 / No*
 Frame Size: *184T*
 Nominal RPM: *1760*
 VAC/PH/HZ: *575/3/60*
 Efficiency: *Premium / 0.895*
 Enclosure Type: *ODP*
 Max Inertial Load: *52 WR²*

FAN PERFORMANCE:

RPM: *1474*
 BHP: *4.02*
 Efficiency: *32.9%*
 In/Out Velocity: *2064/2273 FPM*
 Plenum Out Velocity: *112 FPM*

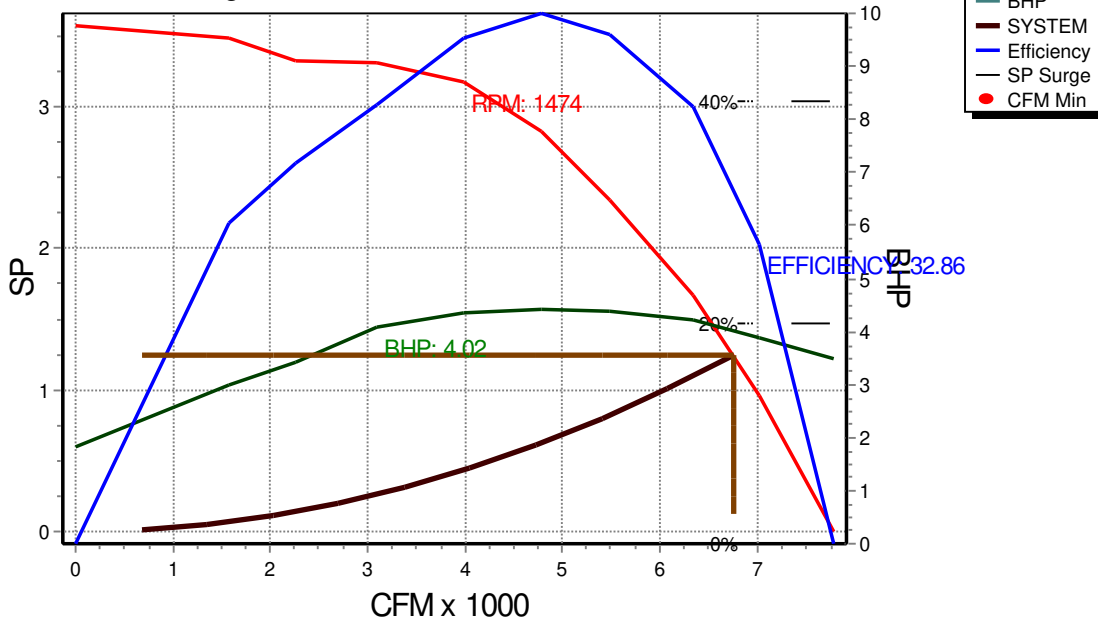
FAN SOUND POWER (Inlet/Outlet):

Octave Band: (Re 10⁻¹² watts)

	1	2	3	4	5	6	7	8
Inlet	91	89	92	88	80	80	75	67
Outlet	91	89	92	88	80	80	75	67

SOUND POWER A-Weighted: 92 / 92 dB

Exhaust Fan Model: RM220A @ 1474 RPM and 100% Width
 Design Conditions: 6750 CFM @ 1.24" SP





18.5" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.324 (SN: 6114768-C4GU4Q4U)

JOB INFORMATION:

Job Name: *CEPEO Kanata*
 Job Tag: *RTU-7 Second Floor Zone 1*
 Rep Firm:
 Date: *07-07-2022*

WHEEL SPECIFICATION:

Max RPM: *2,200*
 Diameter x Qty: *18.5 in. x 1*
 CFM: *4400*
 Tip Speed: *6,650 FPM*
 Inertia: *3 WR²*

OPERATING CONDITIONS:

Air Flow: *4,400 CFM*
 Static Pressure: *0.64 in. Wg.*
 Relief Dampers DP: *0.35 in. Wg.*
 TSP: *0.99 in. Wg.*
 Site Altitude: *0.00 Ft*
 TSP @Sea Level: *0.99 in. Wg.*

MOTOR SELECTION:

Rated HP / Bypass: *2 / No*
 Frame Size: *145T*
 Nominal RPM: *1760*
 VAC/PH/HZ: *575/3/60*
 Efficiency: *Premium / 0.865*
 Enclosure Type: *ODP*
 Max Inertial Load: *27 WR²*

FAN PERFORMANCE:

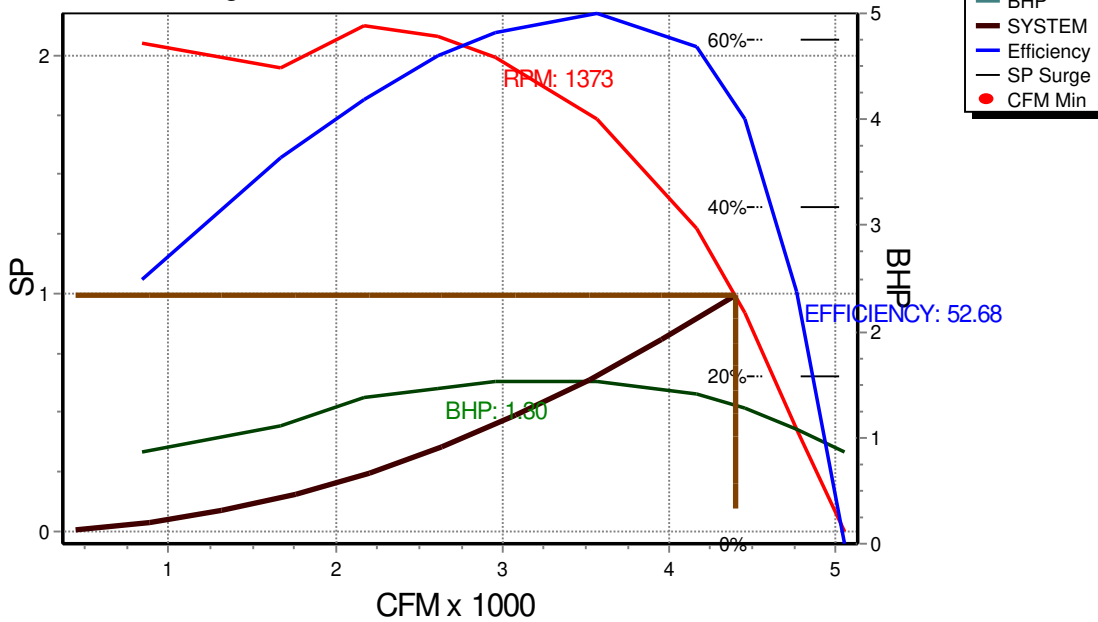
RPM: *1373*
 BHP: *1.30*
 Efficiency: *52.7%*
 In/Out Velocity: *2234/1732 FPM*
 Plenum Out Velocity: *73 FPM*

FAN SOUND POWER (Inlet/Outlet):

Octave Band:	(Re 10 ⁻¹² watts)							
	1	2	3	4	5	6	7	8
	84	84	85	81	76	73	70	65
	84	84	85	81	76	73	70	65

SOUND POWER A-Weighted: 85 / 85 dB

Exhaust Fan Model: RM185 @ 1373 RPM and 100% Width
 Design Conditions: 4400 CFM @ 0.99" SP





22.0" STAR Plenum

2425 South Yukon Ave - Tulsa, Oklahoma 74107-2728 - Ph. (918) 583-2266 Fax (918) 583-6094
AAONEcat32 Ver. 4.324 (SN: 6114768-C4GU4Q4U)

JOB INFORMATION:

Job Name: *CEPEO Kanata*
 Job Tag: *RTU-8 Second Floor Zone 2*
 Rep Firm:
 Date: *07-07-2022*

WHEEL SPECIFICATION:

Max RPM: *2,200*
 Diameter x Qty: *22.0 in. x 1*
 CFM: *6800*
 Tip Speed: *8,478 FPM*
 Inertia: *5 WR²*

OPERATING CONDITIONS:

Air Flow: *6,800 CFM*
 Static Pressure: *0.67 in. Wg.*
 Relief Dampers DP: *0.51 in. Wg.*
 TSP: *1.18 in. Wg.*
 Site Altitude: *0.00 Ft*
 TSP @Sea Level: *1.18 in. Wg.*

MOTOR SELECTION:

Rated HP / Bypass: *5 / No*
 Frame Size: *184T*
 Nominal RPM: *1760*
 VAC/PH/HZ: *575/3/60*
 Efficiency: *Premium / 0.895*
 Enclosure Type: *ODP*
 Max Inertial Load: *52 WR²*

FAN PERFORMANCE:

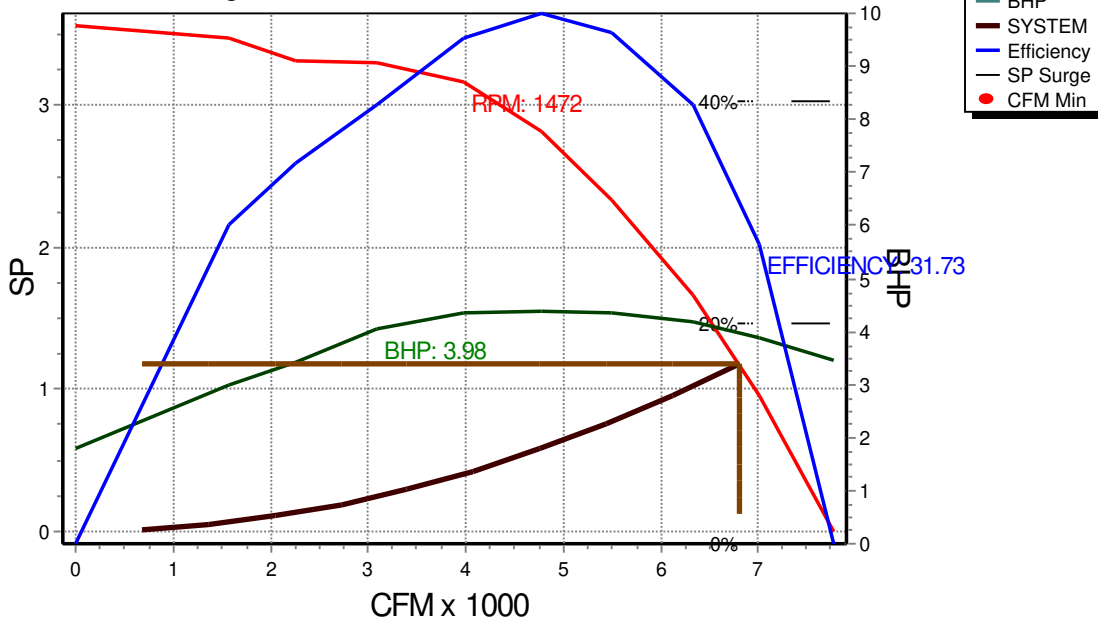
RPM: *1472*
 BHP: *3.98*
 Efficiency: *31.7%*
 In/Out Velocity: *2080/2290 FPM*
 Plenum Out Velocity: *113 FPM*

FAN SOUND POWER (Inlet/Outlet):

Octave Band:	(Re 10 ⁻¹² watts)							
	1	2	3	4	5	6	7	8
	91	89	92	88	80	80	75	67
	91	89	92	88	80	80	75	67

SOUND POWER A-Weighted: 92 / 92 dB

Exhaust Fan Model: RM220A @ 1472 RPM and 100% Width
 Design Conditions: 6800 CFM @ 1.18" SP



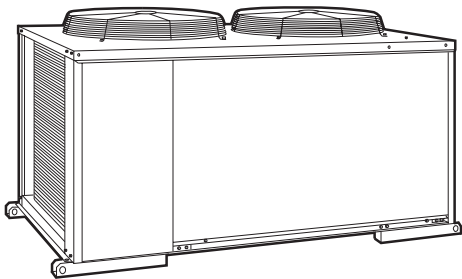
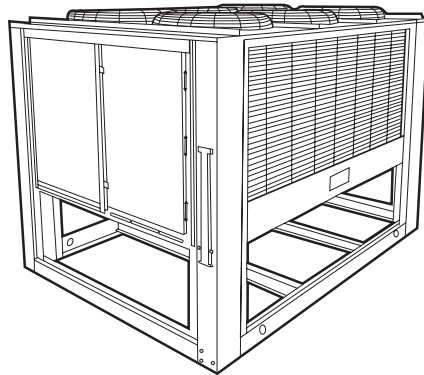


Product Data

09DE,DK Air-Cooled Condensers

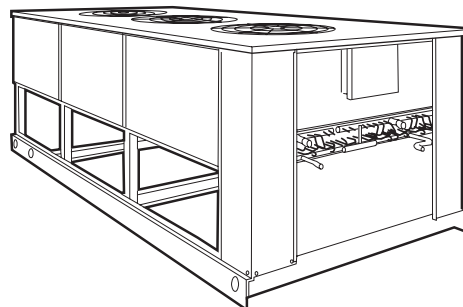
15 to 90 Nominal Tons

**09DK054-094
(074-094 Shown)**



09DE016

**09DK020-044
(034, 044 Shown)**



Air-Cooled Condenser Units for Remote System Application

- 11 popular sizes
- performance proven in every building application
- efficient direct-drive fans
- unit casings meet the ASTM B117 500-hour salt spray test requirements
- small footprints allow for installations in tight spaces

Features/Benefits

A family of ruggedly built condensers ideal for clinics, motels, schools, apartments, office buildings, and factories.

Greater system economy

Subcooling offers more cooling capacity. A specially designed liquid refrigerant circuit provides subcooling for increased capacity without additional power consumption. Subcooling liquid refrigerant also expands condenser applications by permitting condenser installation below the evaporator without subjecting the refrigerant to flashing before the expansion valve.

All units are UL (Underwriters' Laboratories) and UL, Canada approved.

Quieter, more efficient operation

Improved fan design — direct drive fans move air efficiently, yet quietly, at low power input. Bell-mouthed fan openings offer increased airflow, improved fan efficiency, and quiet operation.



Multi-circuit, multi-refrigerant capability

Choose the multi-circuit 09DE or 09DK and realize separate cooling system economy on each circuit. Save space and satisfy installation needs without the expense of smaller condensers with single circuitry. Models can be used with Refrigerants 12, 22, 500, 502 or 134a to meet individual system capacity requirements. A different refrigerant can be used with each cooling circuit.

Individual unit qualities

09DE016 condenser with 15-ton capacity uses a wraparound coil design (with integral subcooling) that may be used as single system or split into 2 systems. Unit with vertical air discharge contains a control box, 2 direct-drive fans, motors, and motor mounts. The U-shaped coil has a large face area to maximize heat transfer.

09DK020-044 condensers are available in 17.5-, 20-, 25-, 30-, 40-ton sizes. Models 09DK020, 024, and 028 have 2 direct drive fans, 2 motors and motor mounts. Models 09DK034 and 044 have 3 direct drive fans, 3 motors and motor mounts. Fan motors are 3-phase, TEAO (Totally Enclosed, Air Over). All units are equipped with a junction box and 2 condenser coils with integral subcooling circuits. Each circuit may be used as a separate condenser for a single system.

09DK054-094 condensers are available in 50-, 60-, 70-, 80-, and 90-ton sizes. Models 09DK054 and 064 have 4 direct-drive fans, 4 motors and motor mounts. Models 09DK074-094 have 6 direct-drive fans, 6 motors and motor mounts. All fan motors are 3-phase and are protected against single phasing conditions. Fans 1 and 2 use open drip-proof motors that are compatible with the Motormaster® V accessory. On 208-230/460 volt units, the remaining fan motors are totally enclosed. All 380/415 v and 575 v units have open drip-proof fan motors. All fan motors have permanently lubricated sealed bearings. Fans 3 and 4 on 09DK054 and 064 and fans 3, 4, 5, and 6 on 09DK074-094 models are controlled separately for efficient unit control.

These units are equipped with a hinged access door, which allows for easy entrance into the control box. Four condenser coils with integral subcooling circuits are available to create a variety of capacity split combinations. A tubing package is supplied with the unit for 100%, 50/50%, and 67/33% (09DK044-084 only) coil circuiting applications to facilitate field installations and maximize unit flexibility.

Coil split versatility

Model 09DE and 09DK coils can be split into 2 or more condensing circuits. Each circuit may handle a separate cooling system, using a different refrigerant if desired. Each circuit has a refrigerant subcooling circuit. Depending on condenser size, one to 6 condenser coil circuiting applications can be used as shown below. This saves space and provides installation flexibility.

CONDENSER		CIRCUIT NUMBER		
		1	2	3
		Percent Condenser Capacity		
09DE	016	100	—	—
		50	50	—
09DK	020,024	100	—	—
		50	50	—
		67	33	—
09DK	028,034	100	—	—
		50	50	—
		40	40	20
		60	40	—

CONDENSER		CIRCUIT NUMBER			
		1	2	3	4
		Percent Condenser Capacity			
09DK	044	100	—	—	—
		73	27	—	—
		67	33	—	—
		60	40	—	—
		53	47	—	—
		40	34	13	13
	054, 064, 074, 084	100	—	—	—
		50	50	—	—
		67	33	—	—
		33	33	33	—
094	100	—	—	—	
	50	50	—	—	

- Factory-supplied circuiting.
- Circuiting by field piping modifications.

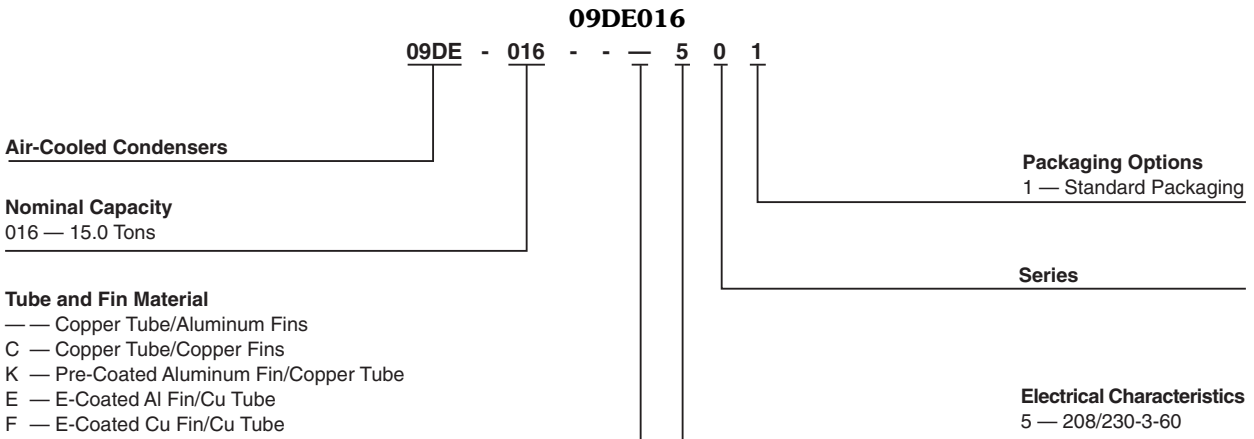
NOTE: Split percentages shown are approximate. Actual split capacities may vary slightly from those shown.

Table of contents

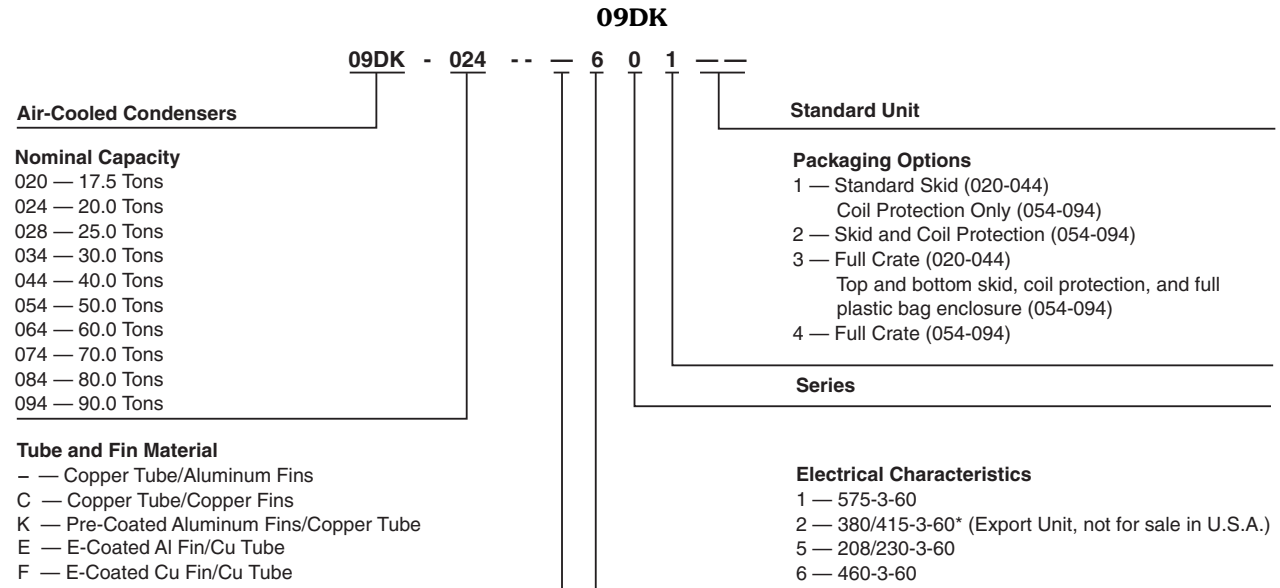


	Page
Features/Benefits	1,2
Model Number Nomenclature	3
Physical Data	4-9
Options and Accessories	10,11
Base Unit Dimensions	12-19
Selection Procedure	20
Performance Data	21
Electrical Data	22
Typical Wiring Schematic	23-25
Typical Piping	26
Application Data	27-30
Guide Specifications	31-34

Model number nomenclature



LEGEND
Al — Aluminum
Cu — Copper



LEGEND
Al — Aluminum
Cu — Copper

*380/415-3-60 for unit sizes 054-094 only. Unit sizes 020-044 are 380-3-60.

Quality Assurance



Certificate No FM 21837

Approvals:
 ISO 9001
 EN 9000:2000

Physical data



CONDENSER	09DE		09DK			
	016	020	024	028	034	044
RATING (Tons)*	18.4	21.9	25.9	33.3	48.0	56.2
NET WEIGHT (lb)†	465	762	762	944	1438	1589
FAN						
Quantity	2	2	2	2	3	3
Prop. Diam (in.)	24	30	30	30	30	30
Rpm	1075	1140	1140	1140	1140	1140
Total Airflow (cfm)	9600	10,600	13,500	15,700	21,100	23,700
Motor Hp (per fan)	1/2	3/4	3/4	1	1	1
COILS						
Arrangement	Vertical			Horizontal		
Rows...Fins/in.	3...15.6	3...17	3...17	2...19	2...17	3...17
Total Face Area (sq ft)	29.2	23.5	23.5	39.2	58.4	58.4

CONDENSER	09DK				
	054	064	074	084	094
RATING (Tons)*	65.8	78.6	95.4	103.5	116.3
NET WEIGHT (lb)†	1645	1771	2106	2310	2714
FAN					
Quantity	4	4	6	6	6
Prop. Diam (in.)	30	30	30	30	30
Rpm	1140	1140	1140	1140	1140
Total Airflow (cfm)	35,000	35,000	52,000	51,000	57,000
Motor Hp (per fan)	1	1	1	1	1
COILS					
Arrangement	Vertical/Horizontal				
Rows...Fins/in.	2...17	3...17	2...17	3...17	3...17
Total Face Area (sq ft)	80.5	80.5	116.7	116.7	128.3

*Nominal heat rejection based on optimum refrigerant charge of R-22 with 15 F subcooling at 30 F temperature difference.

†Without refrigerant. Weights include copper tubes/aluminum fins.

ESTIMATED RADIATED SOUND POWER LEVEL, dB

UNIT	OCTAVE BAND CENTER FREQUENCY, Hz								
	63	125	250	500	1000	2000	4000	8000	dBa
09DE016	NA	89	86	84	82	76	71	64	86.3
09DK020	92	89	89	88	87	82	78	71	90.1
09DK024	94	91	91	90	88	83	81	74	92.5
09DK028	91	91	90	88	86	82	79	74	90.8
09DK034	92	92	90	88	87	83	80	75	91.5
09DK044	93	93	91	89	88	83	81	76	92.3
09DK054	101	90	94	92	90	88	85	78	95.5
09DK064	101	90	94	92	90	88	85	78	95.5
09DK074	102	96	98	97	93	91	87	80	98.8
09DK084	102	96	98	97	93	91	87	80	98.8
09DK094	102	96	98	97	93	91	87	80	98.8

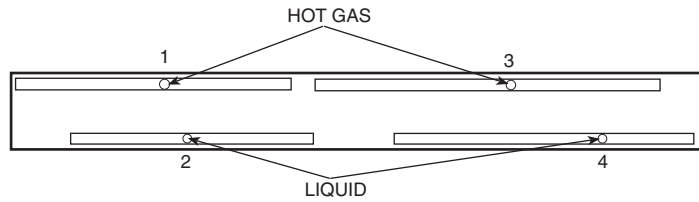
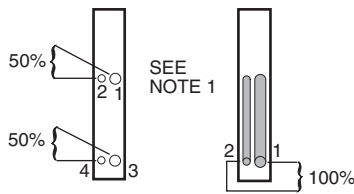
NOTE: Estimated sound power levels, dB re 1 Picowatt.

ESTIMATED RADIATED SOUND POWER LEVEL, dB — 09DK054-094 CONDENSERS WITH ACCESSORY SOUND POWER REDUCTION KIT

UNIT	OCTAVE BAND CENTER FREQUENCY, Hz								
	63	125	250	500	1000	2000	4000	8000	dBa
09DK054	96	89	90	89	87	84	80	73	91.7
09DK064	96	89	90	89	87	94	80	73	91.7
09DK074	101	96	94	94	90	87	82	73	95.6
09DK084	101	96	94	94	90	87	82	73	95.6
09DK094	101	96	94	94	90	87	82	73	95.6

NOTE: Estimated sound power levels, dB re 1 Picowatt.

09DE AND 09DK020-034 COIL CONNECTIONS



09DE 50% AND 100% SPLIT

CONDENSER 09DE	COIL CONNECTION		
	Type	No.	Size (in.)
016 50% SPLIT	Hot Gas	1, 3	7/8 ODF
	Liquid	2, 4	5/8 ODF
016 100% SPLIT	Hot Gas	1	1 1/8 ODF
	Liquid	2	5/8 ODF

09DK 50/50% COIL SPLIT

CONDENSER 09DK	COIL CONNECTION		
	Type	No.	Size (in.)
020,024, 028,034	Hot Gas	1, 3	1 1/8 ID
	Liquid	2, 4	5/8 ID

09DK 67/33% COIL SPLIT

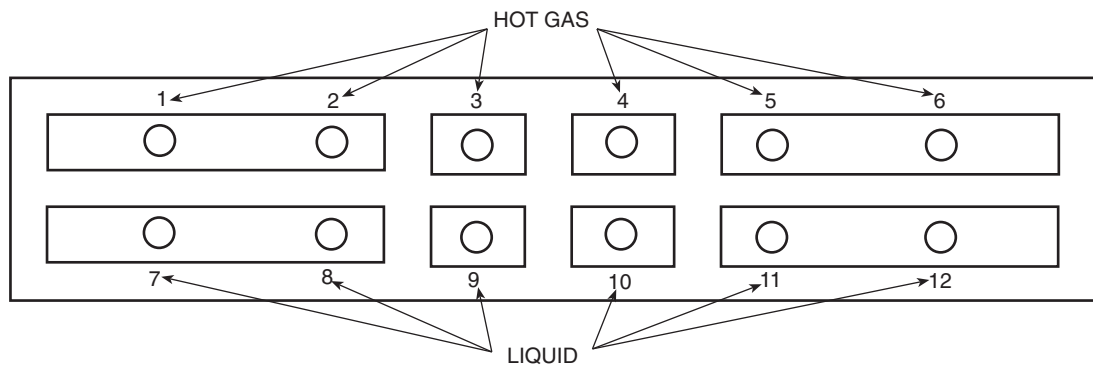
CONDENSER 09DK	COIL CONNECTION		
	Type	No.	Size (in.)
020,024	Hot Gas	1	1 1/8 ODM
		3	1 1/8 ODF*
	Liquid	2	1/2 ODF
		4	7/8 ODF

NOTES:

1. Shaded manifolds may be field removed for 50/50 split.
2. All 50/50 splits may be field manifolded into a single 100% circuit.
3. Units may be manifolded to obtain desired coil circuiting.
4. Other circuiting arrangements are available for 09DK units. See the applicable Installation and Service Instructions for details.

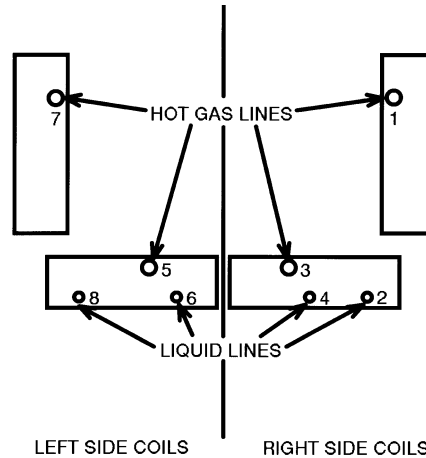
*Street elbow is factory supplied, field installed.

09DK044 COIL CONNECTIONS



PERCENT CAPACITY SPLIT	LINE TYPE	CONNECTION NUMBER	COIL CONNECTION in.-ODM
100	Hot Gas	1,6/2,3,4,5	1 3/8/1 1/8
	Liquid	7,12/8,9,10,11	7/8/5/8
74/26	Hot Gas	1,6/3,4	1 3/8/1 1/8
	Liquid	7,12/9,10	7/8/5/8
60/40	Hot Gas	1/6/3,4,5	1 3/8/1 3/8/1 1/8
	Liquid	7/12/9,10,11	7/8/7/8/5/8
53/47	Hot Gas	1/6/2,3,4,5	1 3/8/1 3/8
	Liquid	7/12/8,9,10,11	7/8/7/8/5/8/5/8
66/34	Hot Gas	1/6/2,3,4	1 3/8/1 3/8/1 1/8
	Liquid	7,12/8,9,10	7/8/7/8/5/8
40/13/13/34	Hot Gas	1/3/4/6	1 3/8/1 1/8/1 1/8/1 1/8
	Liquid	7/9/10/12	7/8/5/8/5/8/7/8

09DK054-084 COIL CONNECTIONS



09DK054,064

PERCENT CAPACITY SPLIT	LINE TYPE	CONNECTION NUMBER	COIL CONNECTION* in.-ODM	TUBING CONNECTION in.-ODM†	
100	Hot Gas	1,3,5,7	1 ¹ / ₈	1 ⁵ / ₈	
	Liquid	2,4,6,8	7 ⁷ / ₈	1 ⁷ / ₈	
50/50	Hot Gas	1,3,5,7	1 ¹ / ₈	1 ³ / ₈	1 ³ / ₈
	Liquid	2,4,6,8	7 ⁷ / ₈	7 ⁷ / ₈	7 ⁷ / ₈
66/34	Hot Gas	1,3,5/7	1 ¹ / ₈	1 ³ / ₈	1 ¹ / ₈
	Liquid	2,4,6/8	7 ⁷ / ₈	7 ⁷ / ₈	7 ⁷ / ₈
34/34/32	Hot Gas	1/7/3,5	1 ¹ / ₈	—	
	Liquid	2/8/4,6	7 ⁷ / ₈	—	
34/34/16/16	Hot Gas	1/7/3/5	1 ¹ / ₈	—	
	Liquid	2/8/4/6	7 ⁷ / ₈	—	

*Connection sizes reflect size of each coil header nozzle.

†A tubing package is factory supplied to facilitate field piping installation for the 100%, 50/50%, and 67/33% capacity split applications. See installation instructions for more information.

09DK074

PERCENT CAPACITY SPLIT	LINE TYPE	CONNECTION NUMBER	COIL CONNECTION* in.-ODM	TUBING CONNECTION in.-ODM†	
100	Hot Gas	1,3,5,7	1 ³ / ₈	2 ¹ / ₈	
	Liquid	2,4,6,8	7 ⁷ / ₈	1 ¹ / ₈	
50/50	Hot Gas	1,3,5,7	1 ³ / ₈	1 ⁵ / ₈	1 ⁵ / ₈
	Liquid	2,4,6,8	7 ⁷ / ₈	7 ⁷ / ₈	7 ⁷ / ₈
68/32	Hot Gas	1,3,5/7	1 ³ / ₈	1 ⁵ / ₈	1 ³ / ₈
	Liquid	2,4,6/8	7 ⁷ / ₈	1 ¹ / ₈	7 ⁷ / ₈
32/32/36	Hot Gas	1/7/3,5	1 ³ / ₈	—	
	Liquid	2/8/4,6	7 ⁷ / ₈	—	
32/32/18/18	Hot Gas	1/7/3/5	1 ³ / ₈	—	
	Liquid	2/8/4/6	7 ⁷ / ₈	—	

*Connection sizes reflect size of each coil header nozzle.

†A tubing package is factory supplied to facilitate field piping installation for the 100%, 50/50%, and 67/33% capacity split applications. See installation instructions for more information.

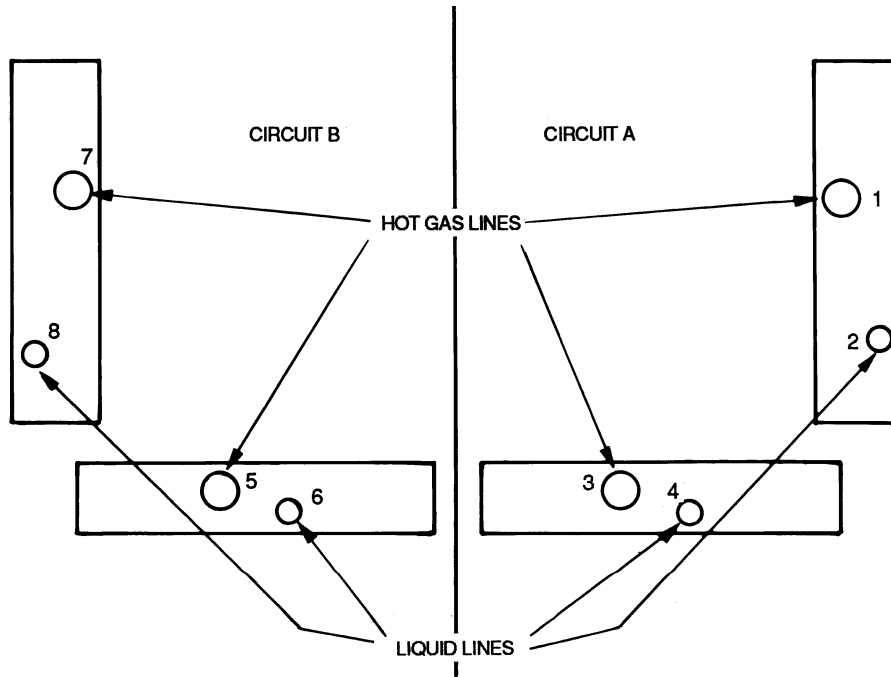
09DK084

PERCENT CAPACITY SPLIT	LINE TYPE	CONNECTION NUMBER	COIL CONNECTION* in.-ODM	TUBING CONNECTION in.-ODM†	
100	Hot Gas	1,3,5,7	1 ³ / ₈	2 ¹ / ₈	
	Liquid	2,4,6,8	7 ⁷ / ₈	1 ¹ / ₈	
50/50	Hot Gas	1,3,5,7	1 ³ / ₈	1 ⁵ / ₈	1 ⁵ / ₈
	Liquid	2,4,6,8	7 ⁷ / ₈	7 ⁷ / ₈	7 ⁷ / ₈
67/33	Hot Gas	1,3,5/7	1 ³ / ₈	1 ⁵ / ₈	1 ³ / ₈
	Liquid	2,4,6/8	7 ⁷ / ₈	1 ¹ / ₈	7 ⁷ / ₈
33/33/33	Hot Gas	1/7/3,5	1 ³ / ₈	—	
	Liquid	2/8/4,6	7 ⁷ / ₈	—	
33/33/17/17	Hot Gas	1/7/3/5	1 ³ / ₈	—	
	Liquid	2/8/4/6	7 ⁷ / ₈	—	

*Connection sizes reflect size of each coil header nozzle.

†A tubing package is factory supplied to facilitate field piping installation for the 100%, 50/50%, and 67/33% capacity split applications. See installation instructions for more information.

09DK094 COIL CONNECTIONS



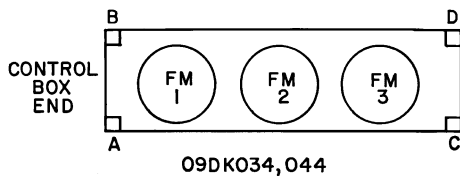
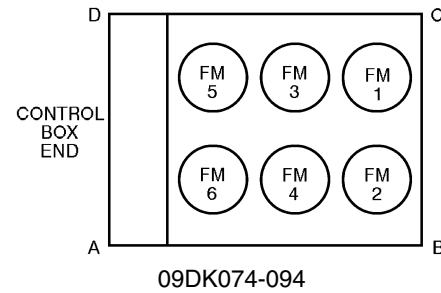
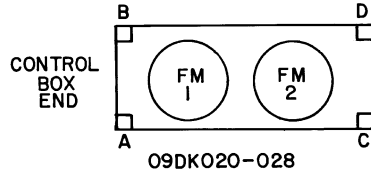
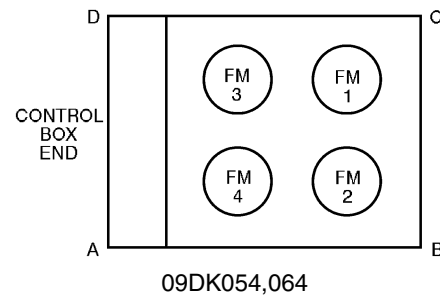
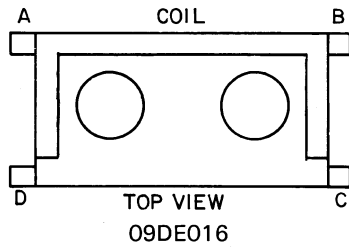
PERCENT CAPACITY SPLIT	LINE TYPE	COIL CONNECTION NUMBER	COIL CONNECTION in.-ODM*	TUBING CONNECTION in.-ODM†
100	Hot Gas	1,3,5,7	1 ³ / ₈	2 ¹ / ₈
	Liquid	2,4,6,8	7/ ₈	1/ ₈
50/50	Hot Gas	1,3/5,7	1 ³ / ₈	1 ⁵ / ₈ /1 ⁵ / ₈
	Liquid	2,4/6,8	7/ ₈	7/ ₈ /7/ ₈

*Connection sizes reflect size of each coil header nozzle.
 †A tubing package is factory supplied to facilitate field piping installation for the 100% capacity split applications. See installation instructions for more information.

Physical data (cont)



WEIGHT DISTRIBUTION (Lb)



UNIT	COIL TYPE	TOTAL WEIGHT (lb)	OPERATING CORNER WEIGHTS			
			A	B	C	D
09DE						
016	Cu/Al	465	122	120	111	112
	Cu/Cu	605	159	156	144	146
09DK						
020, 024	Cu/Al	797	186	186	212	212
	Cu/Cu	921	215	215	245	245
028	Cu/Al	983	299	229	262	262
	Cu/Cu	1137	268	268	300	300
034	Cu/Al	1495	349	349	399	399
	Cu/Cu	1700	396	396	454	454
044	Cu/Al	1676	391	391	447	447
	Cu/Cu	1984	462	462	529	529

UNIT 09DK	COIL TYPE	TOTAL WEIGHT (lb)	OPERATING CORNER WEIGHTS			
			A	B	C	D
054	Cu/Al	1695	452	425	396	422
	Cu/Cu	1983	524	497	468	494
064	Cu/Al	1845	489	462	434	459
	Cu/Cu	2278	598	571	542	568
074	Cu/Al	2200	618	526	486	571
	Cu/Cu	2617	722	630	589	675
084	Cu/Al	2421	673	581	541	626
	Cu/Cu	3099	843	751	709	796
094	Cu/Al	2850	769	676	658	747
	Cu/Cu	3560	960	845	821	934

LEGEND

Al — Aluminum
Cu — Copper
FM — Fan Motor



REFRIGERANT CIRCUIT DATA

CONDENSER	09DE		09DK											
	016		020,024				028				034			
COIL														
No. of Circuits*	2	2	1	1	2	1	1	2	1	2	1	1	2	1
Cap. (%/ckt)	50	50	67	33	50	60	40	40	20	50	60	40	40	20
REFRIGERANT														
Min Chg (lb/ckt)	4.75	10.59	14.12	7.06	11.77	14.12	9.41	9.41	4.71	17.53	21.04	14.03	14.03	7.01
Opt Chg (lb/ckt)	6.00	12.46	16.61	8.31	13.84	16.61	11.08	11.08	5.54	20.63	24.76	16.50	16.50	8.25
Vol (cu ft/ckt)	0.39	0.30	0.40	0.20	0.33	0.40	0.26	0.26	0.14	0.49	0.59	0.39	0.39	0.20
STORAGE CAP.														
(lb/ckt)†														
R-12	24.3	19.2	25.7	12.7	21.1	25.3	16.9	16.9	8.4	31.3	37.6	25.0	25.0	12.5
R-22	22.1	17.5	23.3	11.7	19.3	23.2	15.4	15.4	7.7	28.7	34.4	23.0	23.0	11.5
R-500	21.4	16.5	22.1	10.9	18.2	21.8	14.5	14.5	7.3	26.9	32.3	21.5	21.5	10.8
R-502	22.5	18.3	24.5	12.1	20.2	24.2	16.1	16.1	8.1	29.9	35.9	23.9	23.9	12.0
R-134a	24.3	19.2	25.7	12.7	21.1	25.3	16.9	16.9	8.4	31.3	37.6	25.0	25.0	12.5

CONDENSER	09DK										
	044										
COIL											
No. of Circuits*	1	1	2	1	1	1	1	1	1	1	
Cap. (%/ckt)	40	34	13	73	27	67	33	60	40	53	47
REFRIGERANT											
Min Chg (lb/ckt)	21.04	17.36	6.84	38.40	14.20	35.07	17.53	31.56	21.04	27.88	24.72
Opt Chg (lb/ckt)	24.75	20.62	8.25	45.17	16.71	41.25	20.62	37.13	24.75	32.80	29.08
Vol (cu ft/ckt)	0.60	0.52	0.19	1.09	0.40	1.0	0.49	0.89	0.60	0.79	0.70
STORAGE CAP.											
(lb/ckt)†											
R-12	38.1	32.4	12.4	69.6	25.7	64.0	31.3	57.2	38.1	50.5	44.8
R-22	34.8	29.6	11.3	63.6	23.5	58.1	29.0	52.3	34.8	46.2	40.9
R-500	32.8	27.8	10.6	59.8	22.1	54.6	27.3	49.1	32.8	43.4	38.4
R-502	36.4	31.0	11.8	66.5	24.6	51.0	30.1	54.7	36.4	48.3	42.8
R-134a	38.1	32.4	12.4	69.6	25.7	64.0	31.3	57.2	38.1	50.5	44.8

CONDENSER	09DK							
	054				064			
COIL								
No. of Circuits*	2	1	1	2	2	1	2	2
Cap. (%/ckt)	50	66	34	16	50	66	34	16
REFRIGERANT								
Min Chg (lb/ckt)	24.0	32.0	16.0	8.0	36.0	48.0	25.0	11.0
Opt Chg (lb/ckt)	28.0	37.0	19.0	9.0	43.0	56.0	29.0	13.0
Vol (cu ft/ckt)	0.68	0.89	0.46	0.21	1.01	1.32	0.69	0.32
STORAGE CAP.								
(lb/ckt)†								
R-12	43.0	57.0	30.0	14	64.0	85.0	44.0	20.0
R-22	40.0	52.0	27.0	12	59.0	78.0	40.0	19.0
R-500	37.0	49.0	26.0	12	55.0	73.0	38.0	17.0
R-502	41.0	55.0	28.0	13	61.0	81.0	42.0	19.0
R-134a	43.0	57.0	30.0	14	64.0	85.0	44.0	20.0

CONDENSER	09DK								
	074			084				094	
COIL									
No. of Circuits*	2	1	2	2	2	1	2	2	2
Cap. (%/ckt)	50	68	32	18	50	67	33	17	50
REFRIGERANT									
Min Chg (lb/ckt)	35.0	48.0	22.0	12.0	52.0	70.0	35.0	17.0	57.8
Opt Chg (lb/ckt)	41.0	56.0	26.0	15.0	62.0	82.0	41.0	21.0	68.0
Vol (cu ft/ckt)	0.97	1.32	0.62	0.35	1.46	1.95	0.97	0.49	1.64
STORAGE CAP.									
(lb/ckt)†									
R-12	63.0	85.0	40.0	22.0	95.0	127.0	63.0	32.0	104.7
R-22	57.0	78.0	37.0	21.0	87.0	116.0	58.0	29.0	95.7
R-500	54.0	74.0	35.0	19.0	82.0	109.0	55.0	27.0	90.0
R-502	60.0	82.0	39.0	21.0	91.0	121.0	61.0	30.0	100.1
R-134a	63.0	85.0	40.0	22.0	95.0	127.0	63.0	32.0	104.7

*See pages 4-7 for circuiting arrangements.

†Storage capacity calculated for 80% liquid and 20% vapor at 90 F.

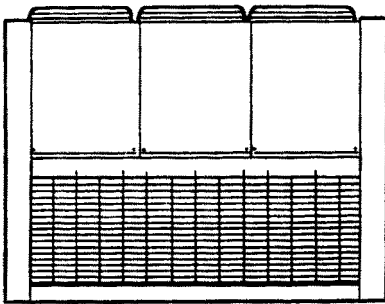
Options and accessories



OPTION/ACCESSORY	FOR USE WITH	OPTION	ACCESSORY
EnviroShield™ Condenser Coil	09DE,09DK	X	
Motormaster® I Head Pressure Control	09DE016 09DK020-044		X
Coil Grille	09DE016		X
Fan Cycling Control	09DE016 09DK020-044		X
Fan Sound Reduction Kit	09DK054-094		X
Security Grille Package	09DK054-094		X
Control Transformer	09DK054-094		X
Condenser Coil Hail Guard	09DK054-094		X
Motormaster V Head Pressure Control	09DK054-094		X

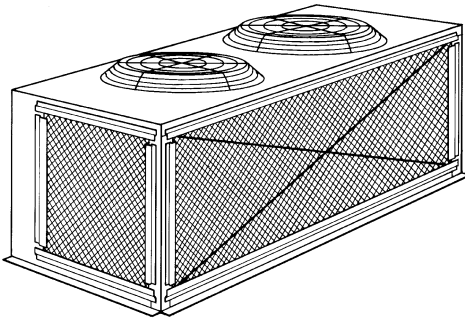
SECURITY GRILLE (09DK054-094: 09DK074,084 SHOWN)

SIDE VIEW



The security grilles protect the condenser coils from debris or vandalism after the unit has been installed. Upper condenser coil grilles are available to protect vertical coils. Lower end and side grilles are available to protect the area beneath the coils.

COIL GRILLE (09DE016)

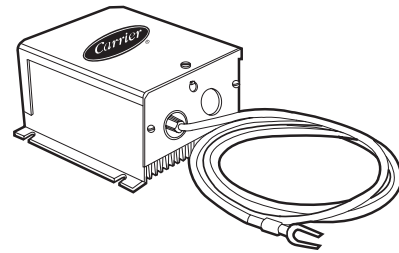


Protects coil from external damage and prevents leaves and other debris from entering fins (available for field installation on 09DE016 only).

FAN CYCLING CONTROL

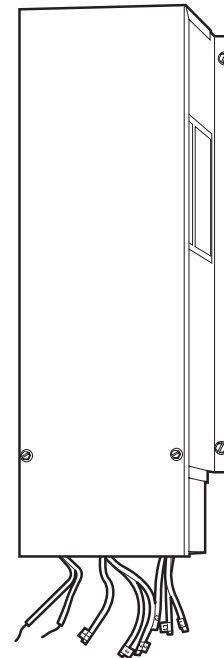
During intermediate seasons, proper condensing temperature is controlled by fan control packages which permit shutoff of one or 2 condenser fans. These packages are also required when using the Motormaster head pressure control (09DE016, 09DK020-044 units).

MOTORMASTER I HEAD PRESSURE CONTROL (09DE, 09DK020-044)



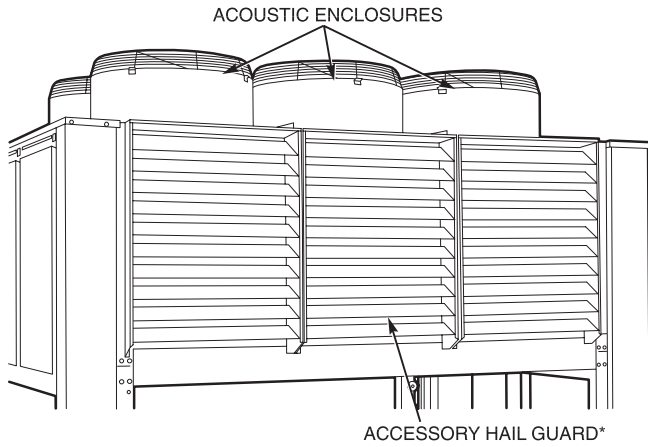
This exclusive solid-state device automatically modulates fan speed from full to zero rpm to maintain proper condensing temperature at low ambient temperature conditions to -20 F.

MOTORMASTER V HEAD PRESSURE CONTROL (09DK054-094)



The Motormaster V head pressure control is used to permit low ambient operation down to -20 F by modulating the fan speed on each of the primary fans (1 and 2). The standard factory-installed motors are compatible with the Motormaster V control.

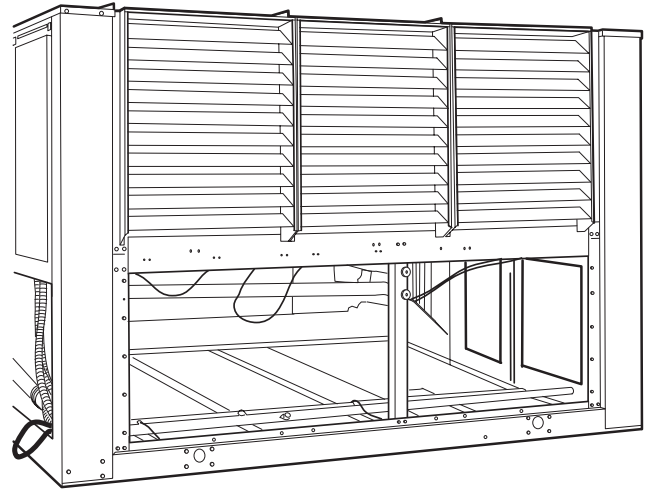
**FAN SOUND REDUCTION KIT
(09DK054-094)**



*Hail guard not required.

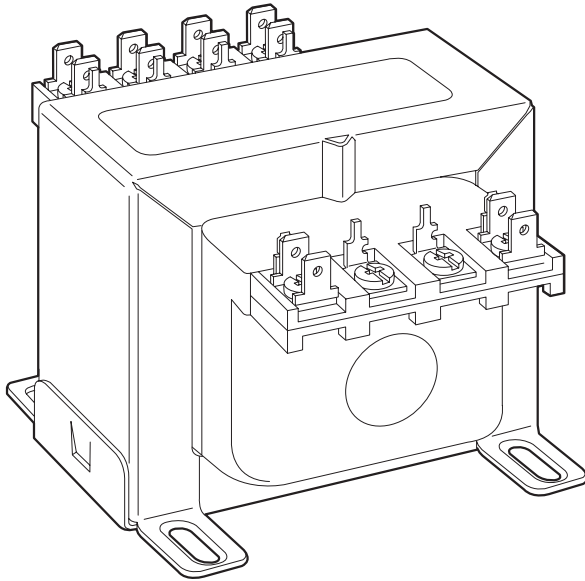
The fan sound reduction kit consists of a specially designed system of fans and acoustic enclosures for reducing sound levels without compromising unit performance. A fan motor change is not required and the fan system is compatible with Motormaster® V device. Two kits are required for the 09DK054,064 units and three kits are required for the 09DK074-094 units.

**CONDENSER COIL HAIL GUARD
(09DK054-094)**



This accessory protects the coils against damage from hail and other flying debris. Two packages are required for 09DK054 and 064 and three packages required for 09DK074-094.

**CONTROL TRANSFORMER
(09DK054-094)**



The control transformer is used to convert 200-208/230/460 v to 115 v for use on 115-v control systems, utilizing power from the main unit power connection.

Enviro-Shield™ condenser options — Several options are available to match coil protection to site conditions for optimum durability. See table below and refer to the Application Data for selection guidance. Consult your Carrier representative for further information.

CONDENSER COIL OPTIONS

COPPER-TUBE COILS WITH ENVIRO-SHIELD OPTION*	ENVIRONMENT					Combined Industrial/ Coastal
	Standard	Mild Coastal	Moderate Coastal	Severe Coastal	Industrial	
Al Fins (Standard Coils)	X					
Cu Fins			X			
Al Fins, E-Coated					X	
Cu Fins, E-Coated				X		X
Al Fins, Pre-coated		X				

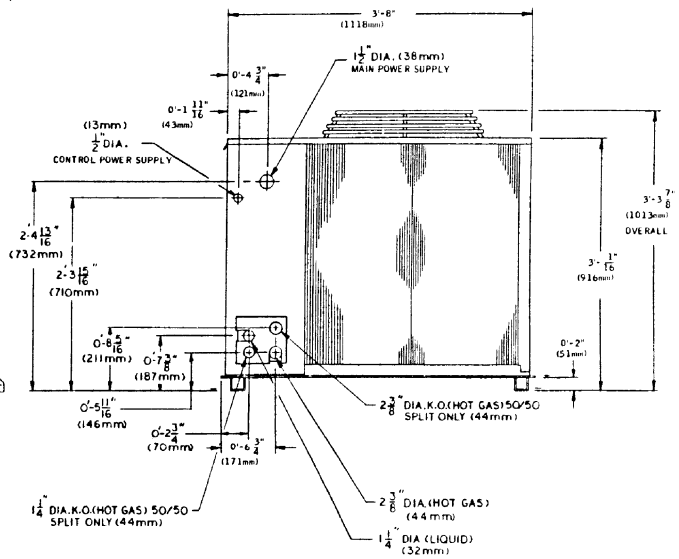
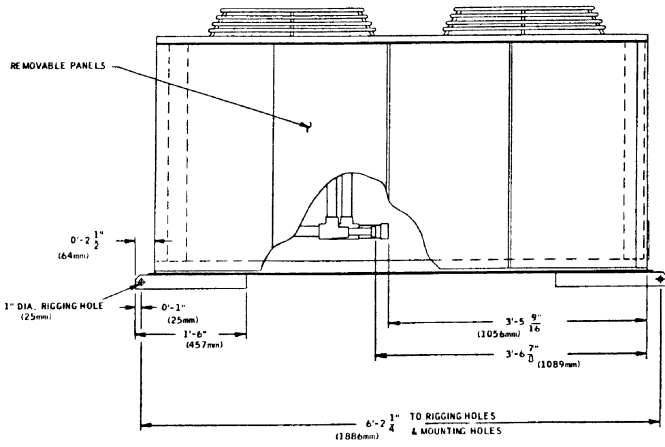
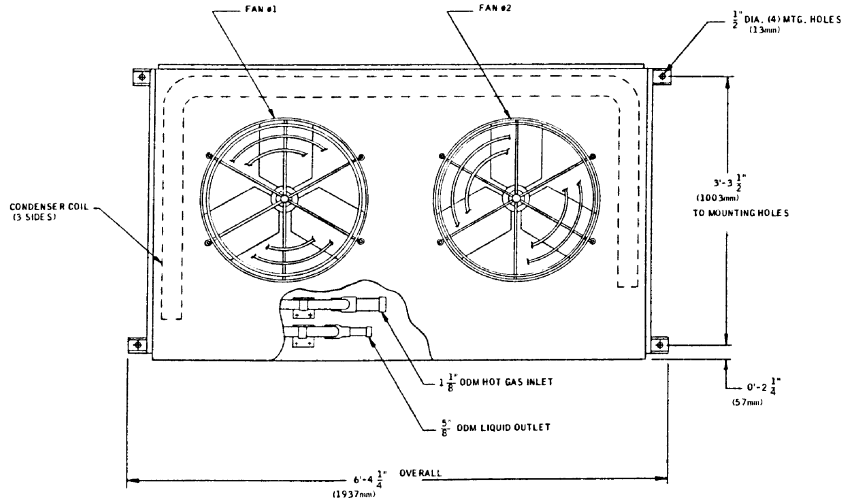
LEGEND

- Al — Aluminum
- Cu — Copper
- E-Coated — Epoxy Coating Applied to Entire Coil Assembly
- Enviro-Shield — Family of Coil Protection Options
- Pre-Coated — Epoxy Coating Applied to Fin Stock Material

Base unit dimensions



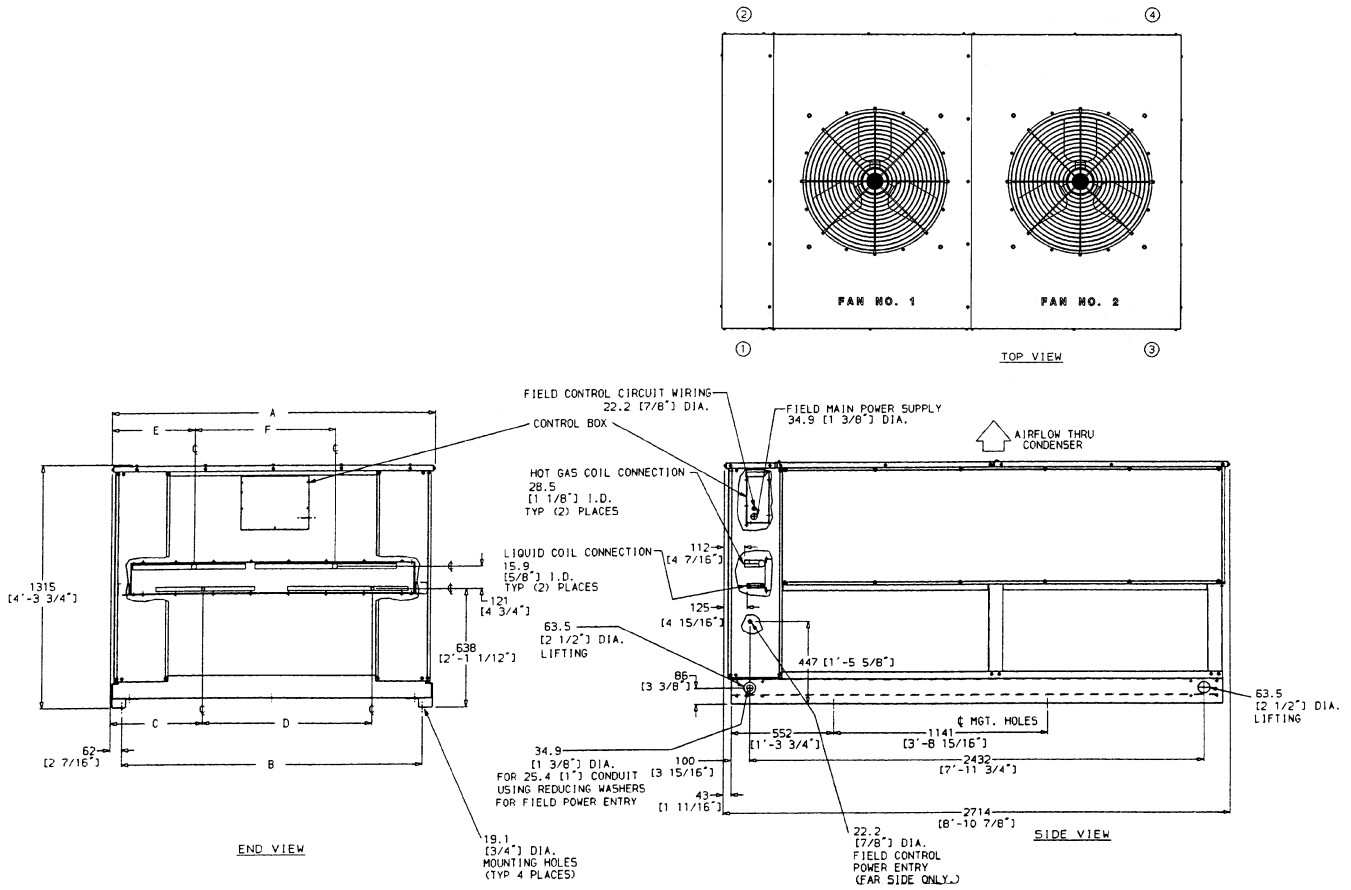
09DE016



UNIT	WEIGHT
09DE016	465 lb (211 kg)

NOTE: See page 28 for service clearances.

09DK020-028



UNIT	A	B	C	D	E	F
09DK-020, 024	1131	1007	240	432	228	559
09DK-020C, 024C	[3'-8 1/2"]	[3'-3 11/16"]	[9'- 7/16"]	[1'-5"]	[0'-9"]	[1'-10"]
09DK-028	1742	1619	496	914	445	762
09DK-028C	[5'-8 5/8"]	[5'-3 3/4"]	[1'-7 9/16"]	[3'-0"]	[1'-5 1/2"]	[2'-6"]

NOTES:

1. There must be 1220 mm [4'-0"] for service and for unrestricted airflow on all sides of unit.
2. There must be minimum 2440 mm [8'-0"] clear air space above unit.
3. Dimensions are in millimeters. Dimensions in [] are in ft-in.
4. The approximate operating weight of the unit is as follows:

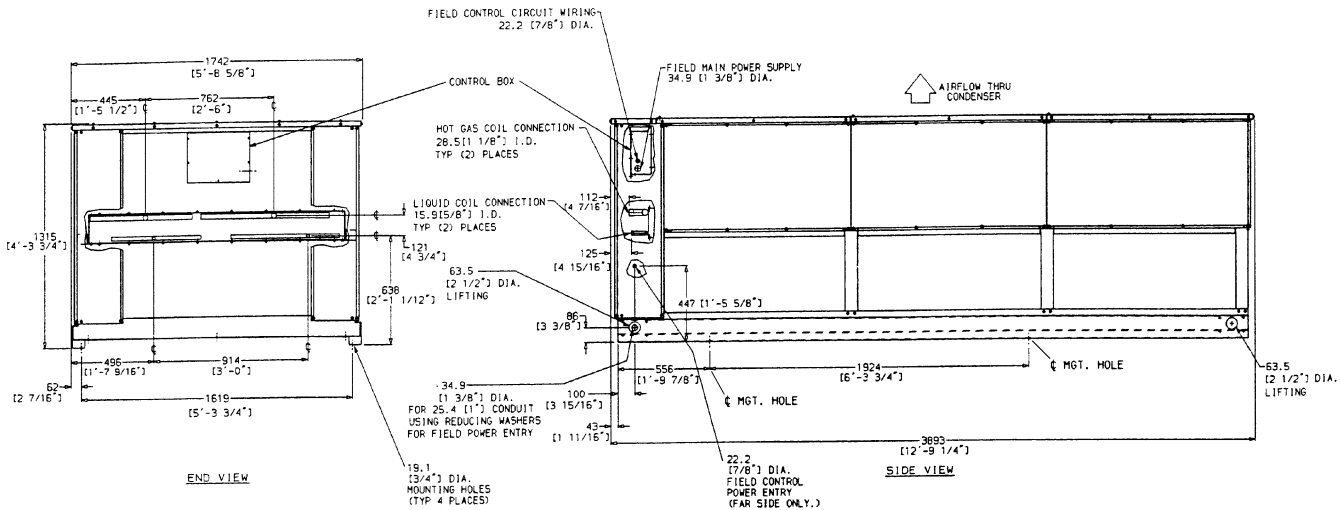
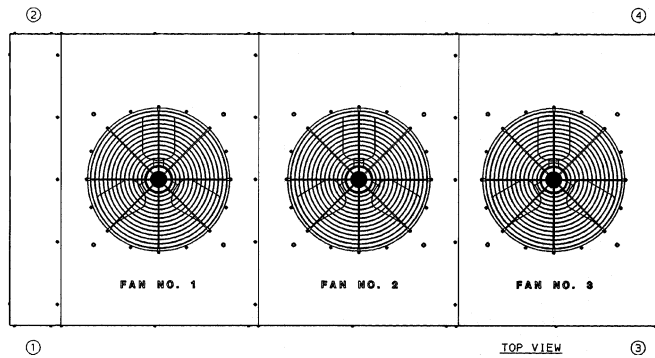
UNIT	TOTAL		OPERATING WT. AT SUPPORT POINTS			
			① and ②		③ and ④	
	Wt lb	Wt kg	Wt lb	Wt kg	Wt lb	Wt kg
09DK-020, 024	797	361.5	186	84.4	212	96.2
09DK-020C, 024C	921	417.8	215	97.5	245	111.1
09DK-028	983	445.9	229	103.9	262	118.8
09DK-028C	1137	515.7	268	121.6	300	136.1

5. The letter C after model size refers to copper tube/copper fin coils.

Base unit dimensions (cont)



09DK034



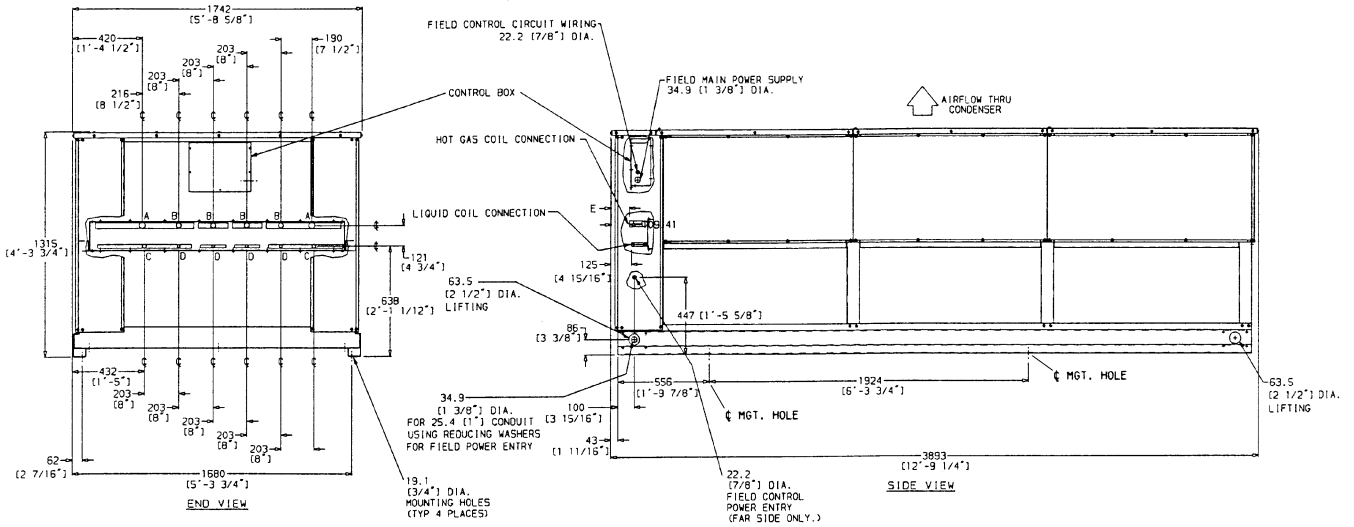
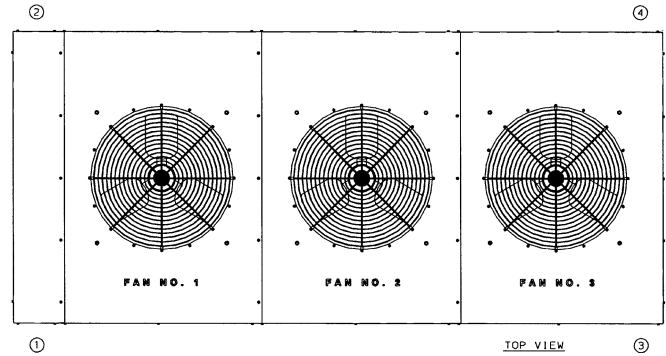
NOTES:

1. There must be 1220 mm [4'-0"] for service and for unrestricted airflow on all sides of unit.
2. There must be minimum 2440 mm [8'-0"] clear air space above unit.
3. Dimensions are in millimeters. Dimensions in [] are in ft-in.
4. The approximate operating weight of the unit is as follows:

UNIT	TOTAL		OPERATING WT. AT SUPPORT POINTS			
			① and ②		③ and ④	
	Wt lb	Wt kg	Wt lb	Wt kg	Wt lb	Wt kg
09DK-034	1495	678.1	349	158.3	399	181.0
09DK-034C	1700	771.1	396	179.6	454	205.9

5. The letter C after model size refers to copper tube/copper fin coils.

09DK044



UNIT	A	B	C	D	E
09DK-044	34.9 ID [1 ³ / ₈ "]	28.5 ID [1 ¹ / ₈ "]	22.2 ID [7 ⁷ / ₈ "]	15.9 ID [5 ⁵ / ₈ "]	See Note 4
09DK-044C					

NOTES:

1. There must be 1220 mm [4'-0"] for service and for unrestricted airflow on all sides of unit.
2. There must be minimum 2440 mm [8'-0"] clear air space above unit.
3. Dimensions are in millimeters. Dimensions in [] are in ft-in.
4. Dimension "E" for 34.9 mm ID is 118 mm [4⁵/₈"].
Dimension "E" for 28.5 mm ID is 112 mm [4⁷/₈"].
5. The approximate operating weight of the unit is as follows:

UNIT	TOTAL		OPERATING WT. AT SUPPORT POINTS			
			① and ②		③ and ④	
	Wt lb	Wt kg	Wt lb	Wt kg	Wt lb	Wt kg
09DK-044	1676	760.2	391	177.4	447	202.8
09DK-044C	1984	900.0	462	209.6	529	240.0

6. The letter C after model size refers to copper tube/copper fin coils.

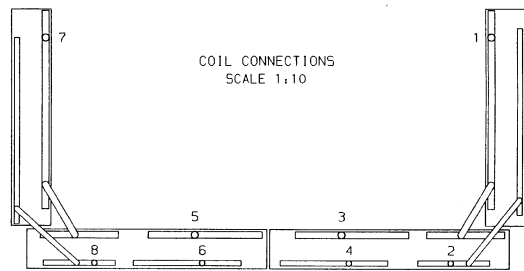
Base unit dimensions (cont)



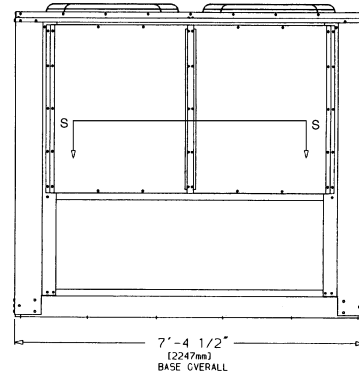
09DK054,064 (SEE PAGE 19 FOR POWER WIRING ACCESS HOLES)

NOTES:

- The approximate operating weight of the unit is:
 09DK-054 — 1695 lb [769 kg]
 09DK-054C — 1983 lb [900 kg]
 09DK-064 — 1845 lb [837 kg]
 09DK-064C — 2278 lb [1033 kg]
- Unit must have clearances for airflow as follows:
 Top — Do not restrict in any way
 Ends — 5 ft [1524 mm]
 Sides — 6 ft [1829 mm]
- All units are shipped with a capacity split tubing kit. This kit may be used by the field to obtain 100%, 50/50% and 66/34% capacity splits. To obtain a 34/34/32% capacity split, coils must be manifolded by the field. Coils are factory circuited for a 34/34/16/16% capacity split.
- The letter C after model size refers to copper tube/copper fin coils.



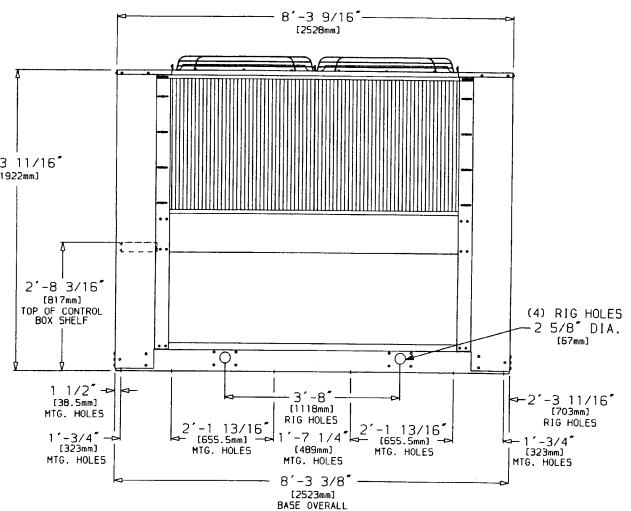
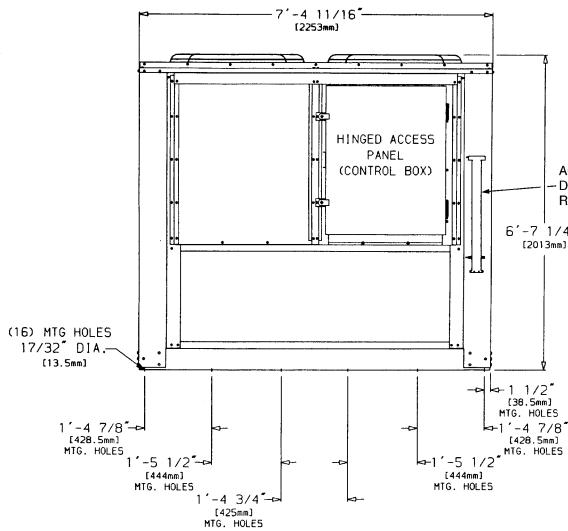
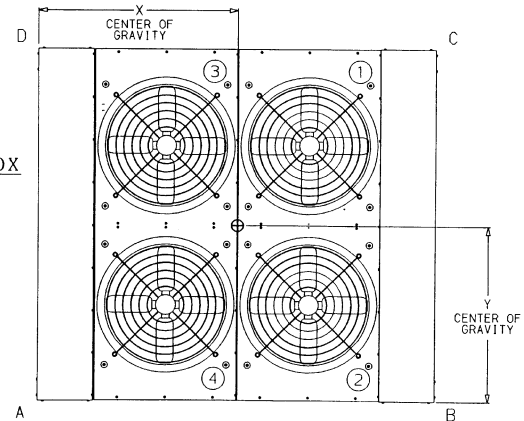
HEADER
END



UNIT	DIMENSION Y	DIMENSION X	OPERATING CORNER WEIGHTS			
			A	B	C	D
09DK-054	3'-6 11/16" [1084 mm]	4'-1 7/8" [1222 mm]	452 lb [205 kg]	425 lb [193 kg]	396 lbs [180 kg]	422 lb [191 kg]
09DK-054C	3'-6 7/8" [1090 mm]	4'-5 1/16" [1227 mm]	524 lb [238 kg]	497 lb [225 kg]	468 lbs [212 kg]	494 lb [224 kg]
09DK-064	3'-6 3/4" [1087 mm]	4'-3 1/16" [1224 mm]	489 lb [222 kg]	462 lb [210 kg]	434 lbs [197 kg]	459 lb [208 kg]
09DK-064C	3'-7 1/8" [1095 mm]	4'-1 1/2" [1232 mm]	598 lb [271 kg]	571 lb [259 kg]	542 lbs [246 kg]	568 lb [258 kg]

CAPACITY SPLIT	CONNECTIONS			
	Type	Number	Size	
100%	Hot Gas	1, 3, 5, 7	1 1/8" ID	
	Liquid	2, 4, 6, 8	7/8" ID	
50/50%	Hot Gas	1, 3, 5, 7	1 1/8" ID	
	Liquid	2, 4, 6, 8	7/8" ID	
66/34%	Hot Gas	1, 3, 5, 7	1 1/8" ID	
	Liquid	2, 4, 6, 8	7/8" ID	
34/34/32%	Hot Gas	1, 7, 3, 5	1 1/8" ID	
	Liquid	2, 8, 4, 6	7/8" ID	
34/34/16/16%	Hot Gas	1, 7, 3, 5	1 1/8" ID	
	Liquid	2, 8, 4, 6	7/8" ID	

CONTROL BOX
END

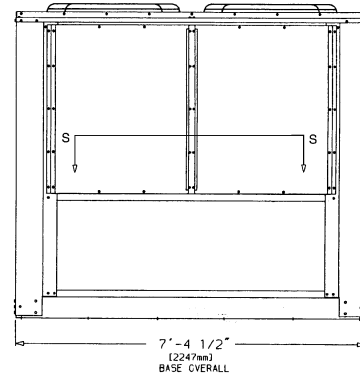
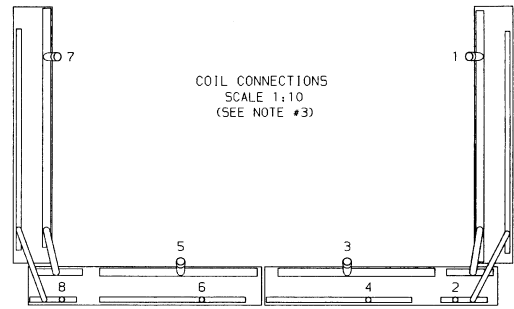


09DK074,084 (SEE PAGE 19 FOR POWER WIRING ACCESS HOLES)

NOTES:

1. The approximate operating weight of the unit is:
 09DK-074 — 2200 lb [998 kg]
 09DK-074C — 2617 lb [1187 kg]
 09DK-084 — 2421 lb [1098 kg]
 09DK-084C — 3099 lb [1406 kg]
2. Unit must have clearances for airflow as follows:
 Top — Do not restrict in any way
 Ends — 5 ft [1524 mm]
 Sides — 6 ft [1829 mm]
3. All units are shipped with a capacity split tubing kit. This kit may be used by the field to obtain 100%, 50/50% and 66/33% capacity splits. To obtain a 33/33/33% capacity split, coils must be manifolded by the field. Coils are factory circuited for a 33/33/17/17% capacity split.
4. The letter C after model size refers to copper tube/copper fin coils.

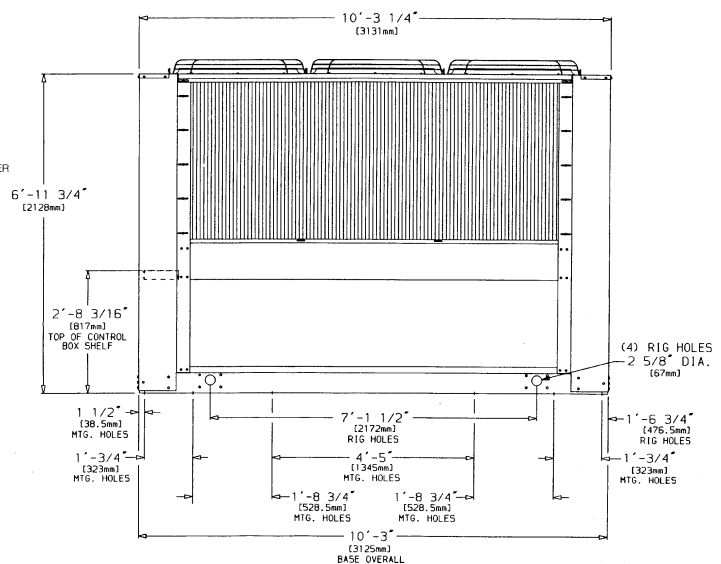
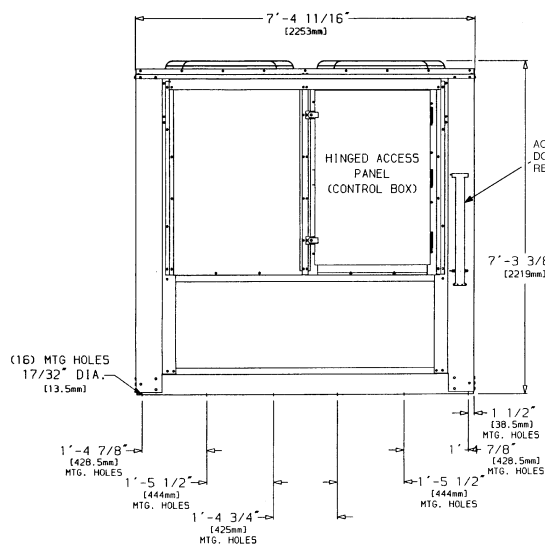
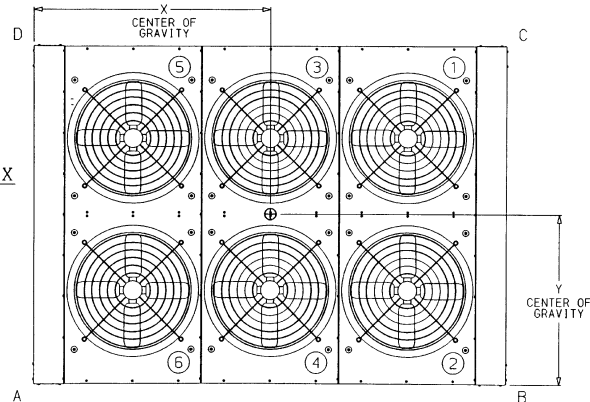
HEADER
END



UNIT	DIMENSION Y	DIMENSION X	OPERATING CORNER WEIGHTS			
			A	B	C	D
09DK-074	3'-6 1/2" [1080 mm]	4'- 8 11/16" [1440 mm]	618 lb [280 kg]	526 lb [239 kg]	486 lbs [220 kg]	571 lb [259 kg]
09DK-074C	3'-6 13/16" [1087 mm]	4'- 9 3/8" [1458 mm]	722 lb [328 kg]	630 lb [286 kg]	589 lbs [267 kg]	675 lb [306 kg]
09DK-084	3'-6 5/8" [1082 mm]	4'- 9 1/8" [1450 mm]	673 lb [305 kg]	581 lb [264 kg]	541 lbs [245 kg]	626 lb [284 kg]
09DK-084C	3'-7" [1092 mm]	4'-10 1/8" [1476 mm]	843 lb [382 kg]	751 lb [341 kg]	709 lbs [322 kg]	796 lb [361 kg]

CAPACITY SPLIT	CONNECTIONS			Size
	Type	Number	Size	
100%	Hot Gas	1, 3, 5, 7	1 3/8" ID	
	Liquid	2, 4, 6, 8	7/8" ID	
50/50%	Hot Gas	1, 3, 5, 7	1 3/8" ID	
	Liquid	2, 4, 6, 8	7/8" ID	
67/33%	Hot Gas	1, 3, 5, 7	1 3/8" ID	
	Liquid	2, 4, 6, 8	7/8" ID	
33/33/33%	Hot Gas	1, 7, 3, 5	1 3/8" ID	
	Liquid	2, 8, 4, 6	7/8" ID	
33/33/17/17%	Hot Gas	1, 7, 3, 5	1 3/8" ID	
	Liquid	2, 8, 4, 6	7/8" ID	

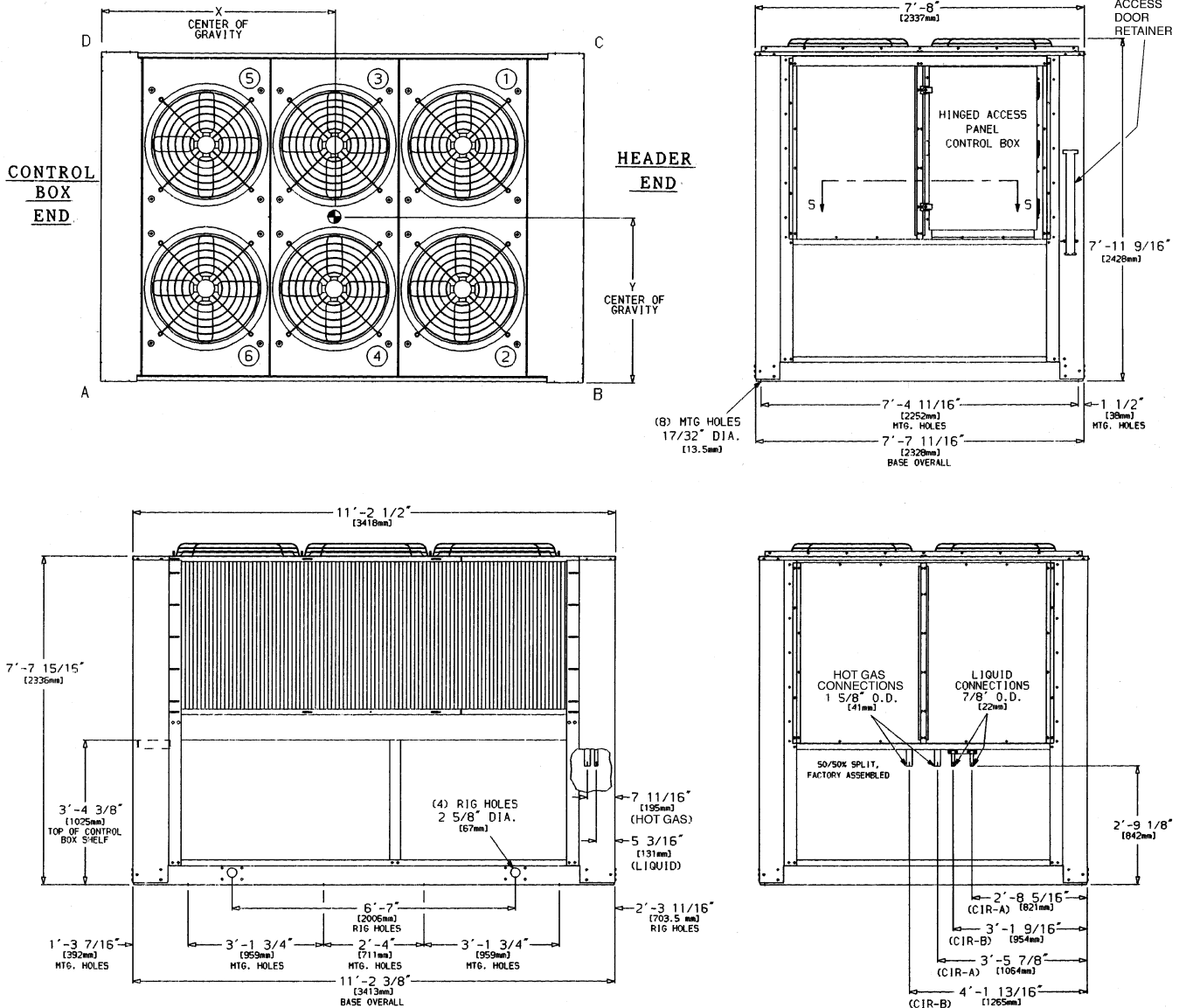
CONTROL BOX
END



Base unit dimensions (cont)



09DK094 (SEE PAGE 19 FOR POWER WIRING ACCESS HOLES)

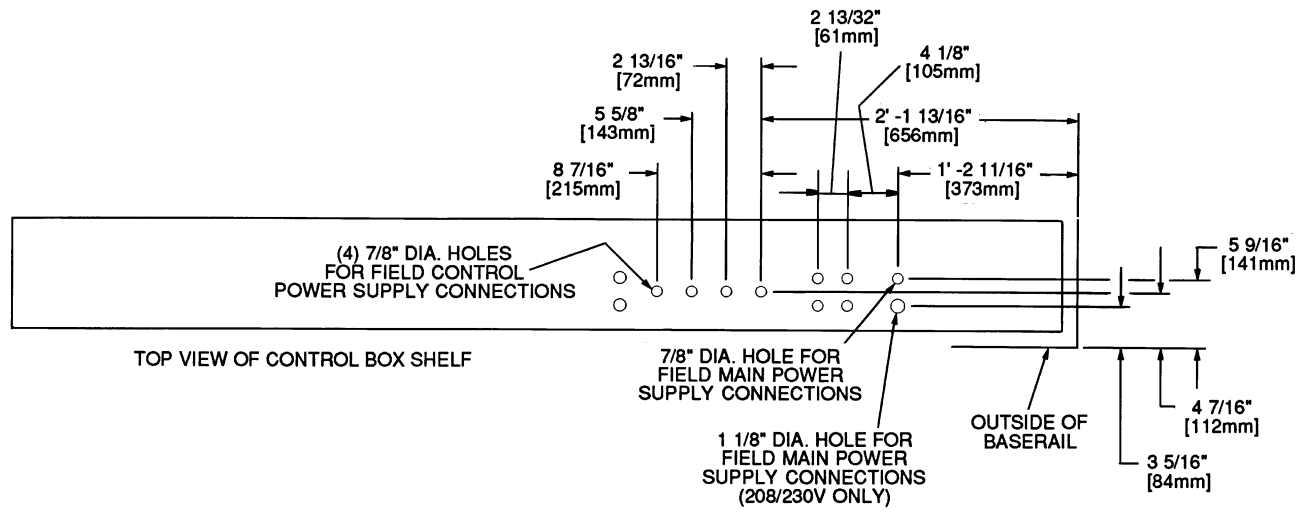


UNIT	DIMENSION Y	DIMENSION X	OPERATING CORNER WEIGHTS			
			A	B	C	D
09DK-094	5'-27/8" [1597 mm]	3'-93/16" [1148 mm]	769 lb [349 kg]	676 lb [307 kg]	658 lbs [299 kg]	747 lb [399 kg]
09DK-094C	5'-27/8" [1597 mm]	3'-93/16" [1148 mm]	960 lb [436 kg]	845 lb [383 kg]	821 lbs [372 kg]	934 lb [424 kg]

NOTES:

- The approximate operating weight of the unit is:
09DK-094 — 2850 lb [1293 kg]
09DK-094C — 3560 lb [1615 kg]
- Unit must have clearances for airflow as follows:
Top — Do not restrict in any way
Ends — 5 ft [1524 mm]
Sides — 6 ft [1829 mm]
- Mounting holes may be used to mount unit to concrete pad. They are not recommended for mounting unit to spring isolators. If spring isolators are used, a perimeter support channel between the unit and the isolators is recommended.
- The letter C after model size refers to copper tube/copper fin coils.

POWER WIRING ACCESS HOLES, 09DK054-094 UNITS



Selection procedure (with example)



I Select minimum or maximum charge ratings.

List the refrigerant, total heat rejection (THR), suction and discharge temperatures as determined from compressor data.

II Determine condensing temperature (saturated discharge temperature minus discharge line loss).

III Determine temperature difference (condensing temperature minus entering-air temperature).

IV Enter Condenser Ratings table (minimum or maximum charge as determined in Step 1) at selected refrigerant and established temperature difference (TD).

Read across to total heat rejection equal to or greater than required. Interpolate if necessary. Read unit size.

EXAMPLE: (Maximum Charge)

Given:

R-22, Maximum Charge	
THR (including subcooling)	29.4 Tons
Saturated Discharge Temperature	123.8 F
Saturated Suction Temperature	40 F
Entering-Air Temperature	95 F
Discharge Line Loss	2 F

Cond Temp = 123.8 F - 2 F = 121.8 F

TD = 121.8 F - 95 F = 26.8 F

Interpolate in Condenser Ratings table (maximum charge) and obtain capacity of 09DK028 as 29.8 tons and 09DK024 as 23.1 tons. Select the 09DK028.

EXAMPLE: (Minimum Charge)

Given:

R-22, Minimum Charge	
THR	15.6 Tons
Saturated Discharge Temperature	122 F
Saturated Suction Temperature	40 F
Entering-Air Temperature	95 F
Discharge Line Loss	2 F

Cond Temp = 122 F - 2 F = 120 F

TD = 120 F - 95 F = 25 F

Enter Condenser Ratings table (minimum charge) and select 09DE016 with 15.9 tons THR.

Performance data



Condenser ratings

MINIMUM REFRIGERANT CHARGE (5 F Subcooling)

REFRIG	TD*	TOTAL HEAT REJECTION (Tons)										
		09DE	09DK									
		016	020	024	028	034	044	054	064	074	084	094
12 and 500	10	5.9	7.1	8.4	10.8	13.9	17.3	21.6	24.5	31.1	33.7	37.4
	15	8.8	10.6	12.6	16.2	20.9	26.0	32.1	38.2	46.4	50.2	56.1
	20	11.7	14.3	16.7	21.5	27.8	34.9	42.6	50.6	61.6	66.6	74.7
	25	14.7	17.7	20.9	27.0	34.9	43.3	52.9	63.1	76.6	83.0	93.2
	30	17.6	21.3	25.2	32.3	41.7	52.0	63.3	75.6	91.7	99.4	111.8
	35	20.5	24.9	29.3	37.8	48.8	60.7	74.1	88.2	106.9	116.0	130.6
	40	23.5	28.2	33.4	43.1	55.7	69.4	84.5	100.5	122.2	132.4	149.1
22 and 502	10	6.4	7.5	9.0	11.7	15.1	19.8	23.5	26.6	33.8	36.7	40.7
	15	9.6	11.3	13.5	17.5	22.6	29.7	34.9	41.5	50.5	54.6	61.0
	20	12.7	15.4	18.1	23.2	30.0	39.2	46.4	55.1	67.0	72.5	81.3
	25	15.9	19.2	22.6	29.2	37.6	49.0	57.7	68.8	83.6	90.5	101.7
	30	19.1	23.0	27.2	35.0	45.1	59.0	69.1	82.5	100.1	108.5	122.0
	35	22.3	26.9	31.6	40.8	52.6	68.9	80.7	96.1	116.5	126.4	142.3
	40	25.5	30.5	36.1	46.6	60.2	78.7	92.2	109.7	133.3	144.5	162.7

REFRIG	TD*	TOTAL HEAT REJECTION (Tons)									
		09DK									
		020	024	028	034	044	054	064	074	084	094
134a	10	7.3	8.7	11.4	14.7	19.2	22.8	25.8	32.8	35.6	39.5
	15	11.0	13.1	17.0	22.0	28.8	33.9	40.3	49.0	53.0	59.2
	20	14.9	17.6	22.5	29.1	38.0	45.0	53.5	65.0	70.4	78.9
	25	18.6	21.9	28.3	36.5	47.6	56.0	66.8	81.1	87.8	98.7
	30	22.3	26.4	34.0	43.8	57.3	67.1	80.1	97.2	105.3	118.4
	35	26.1	30.7	39.6	51.0	66.9	78.3	93.3	113.1	122.7	138.2
	40	29.6	35.0	45.2	58.4	76.4	89.5	106.5	129.4	140.3	157.9

MAXIMUM REFRIGERANT CHARGE (15 F Subcooling)

REFRIG	TD*	TOTAL HEAT REJECTION (Tons)										
		09DE	09DK									
		016	020	024	028	034	044	054	064	074	084	094
12 and 500	20	11.2	13.6	15.9	20.5	26.5	34.5	40.5	48.7	59.1	64.3	71.8
	25	14.1	16.9	19.9	25.7	33.2	43.2	50.6	60.6	73.6	80.0	89.7
	30	16.9	20.3	24.0	30.8	39.7	52.0	60.9	72.7	88.3	95.8	107.6
	35	19.7	23.7	27.9	36.0	46.5	60.7	70.8	84.7	103.0	111.7	125.7
	40	22.5	26.9	31.8	41.1	53.1	69.4	80.8	96.7	117.3	127.6	143.5
22 and 502	20	12.3	14.7	17.2	22.1	28.6	37.3	43.8	52.6	63.8	69.4	77.5
	25	15.3	18.3	21.5	27.8	35.8	46.7	54.7	65.5	79.5	86.5	96.9
	30	18.4	21.9	25.9	33.3	43.0	56.2	65.8	78.6	95.4	103.5	116.3
	35	21.5	25.6	30.1	38.9	50.1	65.6	76.4	91.4	111.2	120.6	135.7
	40	24.6	29.1	34.4	44.4	57.3	75.0	87.3	104.5	126.8	137.9	155.1

REFRIG	TD*	TOTAL HEAT REJECTION (Tons)									
		09DK									
		020	024	028	034	044	054	064	074	084	094
134a	20	14.3	16.8	21.5	27.9	36.4	42.7	51.3	62.2	67.6	75.6
	25	17.8	20.9	27.0	34.7	45.3	53.3	63.8	77.5	84.3	94.5
	30	21.3	25.2	32.3	41.8	54.6	64.1	76.6	93.0	100.9	113.3
	35	25.0	29.2	37.7	48.6	63.6	74.5	89.1	108.4	117.5	132.2
	40	28.4	33.4	43.1	55.6	72.8	85.1	101.8	123.6	134.4	151.1

*TD (Temperature Difference) = Saturated Condensing Temperature (entering) — Entering-Air Temperature.

NOTES:

- Minimum charge gives higher heat rejection, since entire surface of condenser and subcooling circuit is used for condensing only. Minimum charge ratings, however, do not represent greatest potential system capacity. They are comparable to competitive ratings without subcooling.
- Use maximum charge when compressor, condenser, and evaporator are selected as a package and the components balanced to secure maximum benefits of 15 F subcooling (for example, in selecting 09DK condensers with Carrier compressor rated at 15 F

subcooling). Maximum charge activates the subcooling circuit, resulting in higher system capacity at slightly higher head pressure and corresponding condensing temperature. Liquid refrigerant leaves the system subcooled to a stable condition to allow greater length of refrigerant run or lift. See Application Data section, page 27, for available liquid lift information.

- Condenser subcooling = Saturated condensing temperature of refrigerant — Actual temperature of refrigerant leaving the coil.

Electrical data



		UNIT				FAN MOTORS			
Model	Volts	Phase	kW	MCA	MOCP	Total Fans	Phase	Hp	FLA (ea)
09DE	016	208-230	1.41	10.4	15	2	1	1/2	4.3
		460*		5.2					2.3
09DK	020	208/230	1.92	14.8	25	2	3/4	3/4	6.6
		460		7.4	15				3.3
		575		7.6	15				3.4
		380		8.8	15				3.9
	024	208/230	2.26	14.8	25	2	3/4	3/4	6.6
		460		7.4	15				3.3
		575		7.6	15				3.4
		380		8.8	15				3.9
	028	208/230	2.98	14.8	25	2	1	1	6.6
		460		7.4	15				3.3
		575		7.6	15				3.4
		380		8.8	15				3.9
034	208/230	3.86	21.4	30	3	3	1	6.6	
	460		10.7	15				3.3	
	575		11.0	15				3.4	
	380		12.7	20				3.9	
044	208/230	4.53	21.4	30	3	1	1	6.6	
	460		10.7	15				3.3	
	575		11.0	15				3.4	
	380		12.7	20				3.9	
054,064	208/230	6.20	25.8	30	4	1	1	(1,2) 5.5 (3,4) 6.6	
	460		12.9	15				(1,2) 2.8 (3,4) 3.3	
	575		14.5	15				(1-4) 3.4	
	380/415		13.7	15				(1,2) 3.0 (3,4) 3.4	
074-094	208/230	9.30	39.0	45	6	1	1	(1,2) 5.5 (3-6) 6.6	
	460		19.5	20				(1,2) 2.8 (3-6) 3.3	
	575		21.3	25				(1-6) 3.4	
	380/415		20.5	25				(1,2) 3.0 (3-6) 3.4	

LEGEND

- FLA** — Full Load Amps
- kW** — Total Fan Motor Power Input
- MCA** — Minimum Circuit Amps, Complies with NEC, Article 430-24
- MOCP** — Maximum Overcurrent Protection (Amps)
- NEC** — National Electrical Code
- UL** — Underwriters' Laboratories



*The 09DE016 unit is factory wired for 208-230 volts. It may be readily field converted to 460 volts.

NOTES:

1. Maximum allowable phase imbalance:
Voltage = 2%; Amps = 10%
2. Units are UL and UL, Canada approved for 208/230, 460 and 575 v.

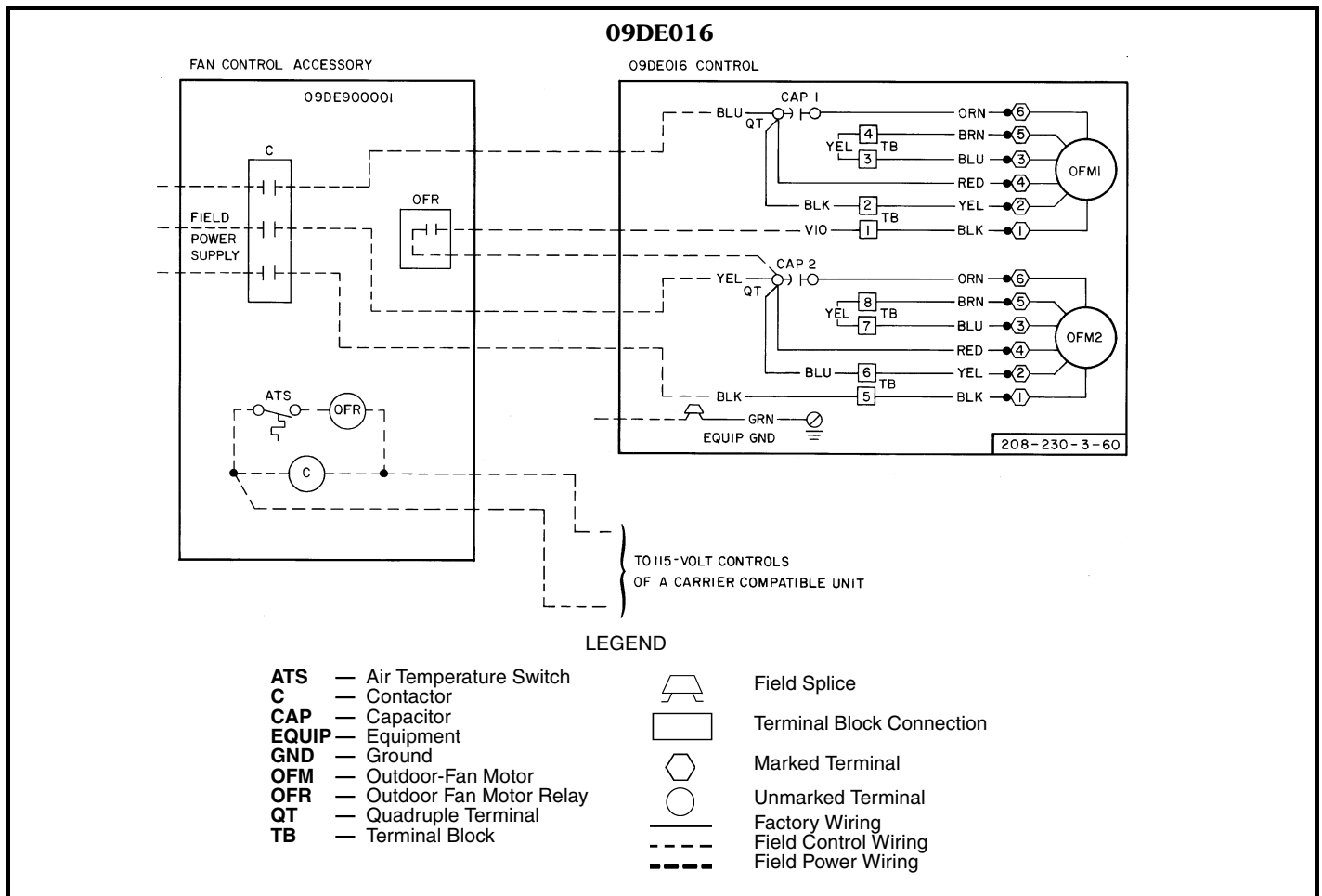
CONTROL CIRCUIT DATA (09DK020-094)

MAIN POWER VOLTAGE V-Ph-Hz	CONTROL VOLTAGE V-Ph-Hz	OVERCURRENT PROTECTION AMPS	
		020-044	054-094
208/230-3-60	115-1-60	7	10
460-3-60	115-1-60	7	10
575-3-60	115-1-60	7	10
380-3-60	230-1-60	7	10

NOTES:

1. 10 va is required for the 09DK020-044 control circuit, and 100 va is required for the 09DK054-094 control circuit.
2. Control circuits for the 09DE are not factory supplied. Fan contactors for these units are field supplied.

Typical wiring schematic



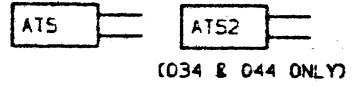
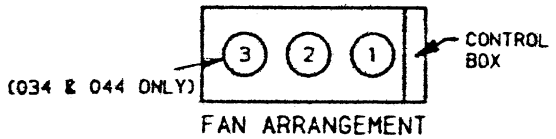
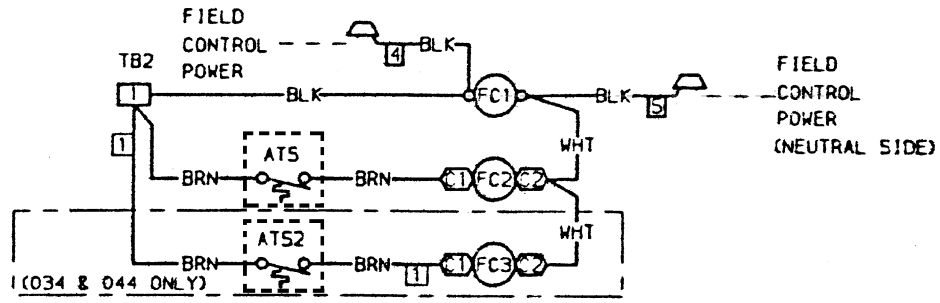
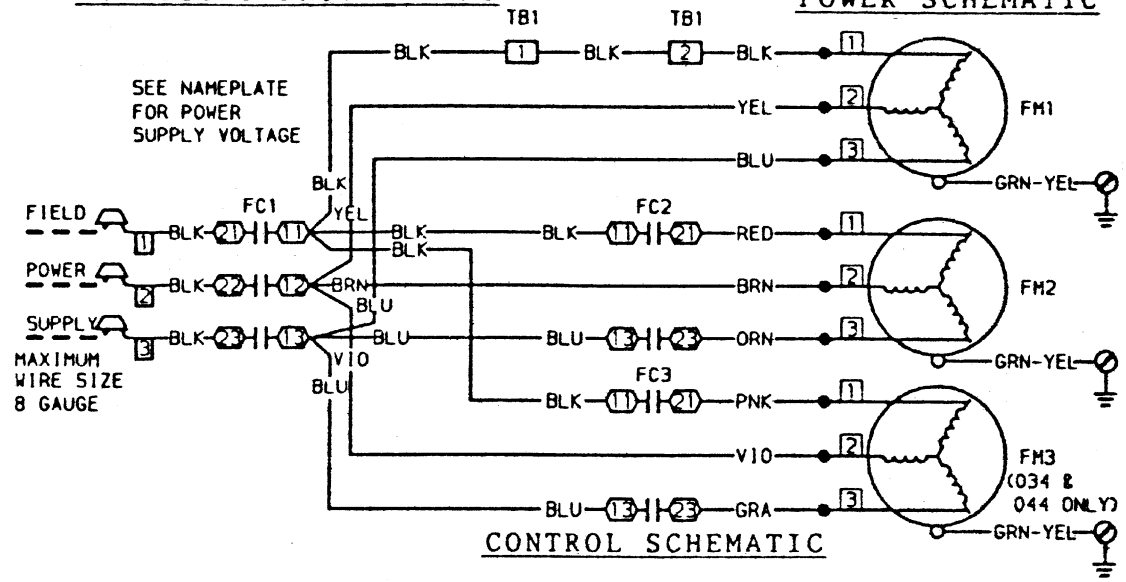
Typical wiring schematic (cont)



09DK020-044

ACCESSORY PKG. WIRING

POWER SCHEMATIC

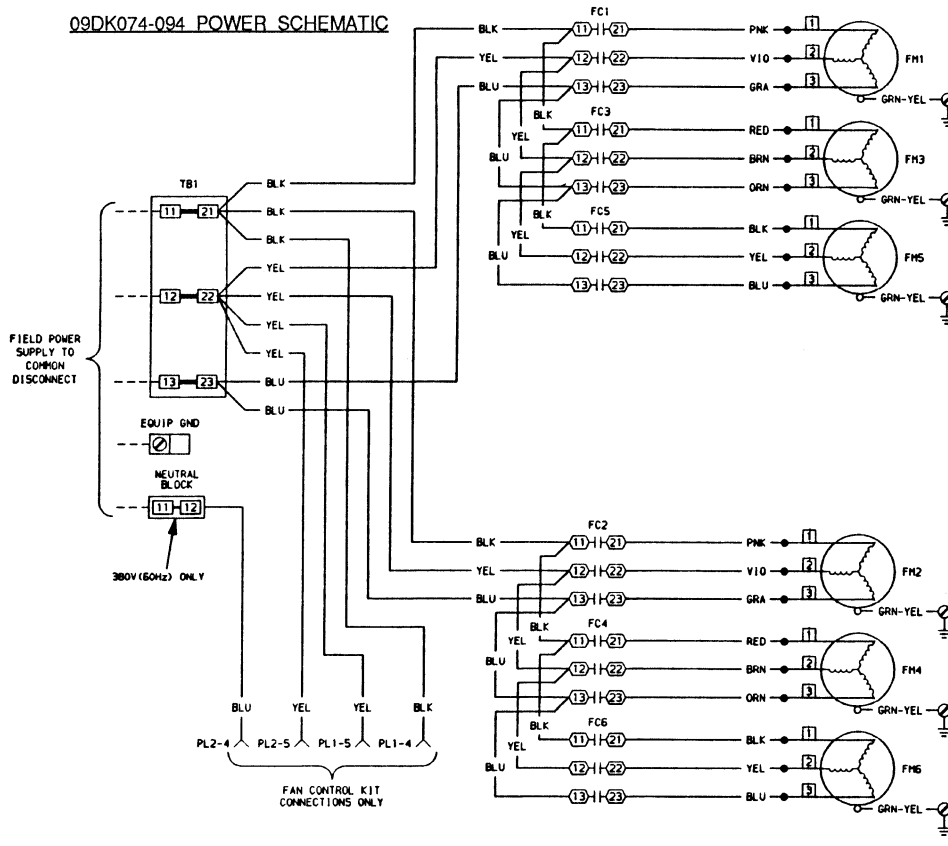


LEGEND

- ATS — Air Temperature Switch
- FC — Fan Contactor
- FM — Fan Motor
- TB — Terminal Block
- Field Splice
- Terminal Block Connection
- Marked Terminal
- Unmarked Terminal
- Factory Wiring
- Field Control Wiring
- Field Power Wiring

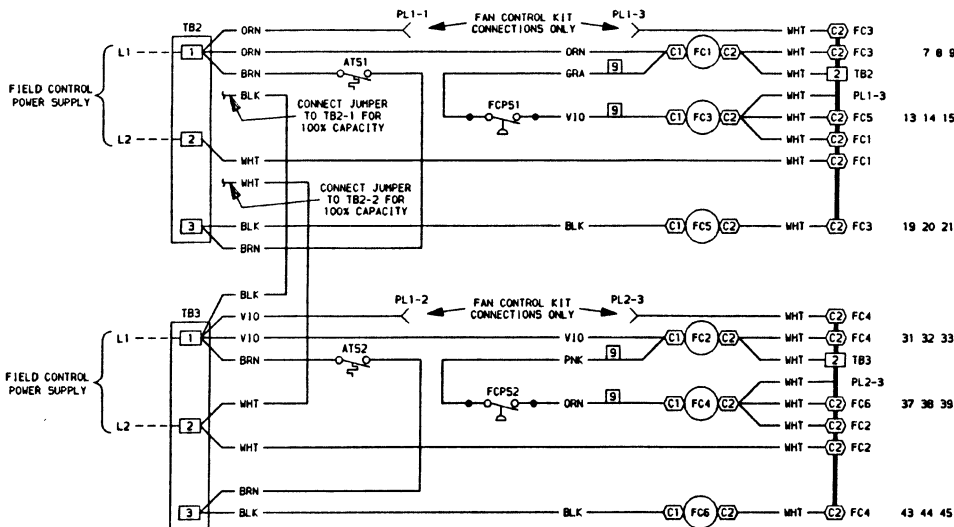
09DK074-094

09DK074-094 POWER SCHEMATIC

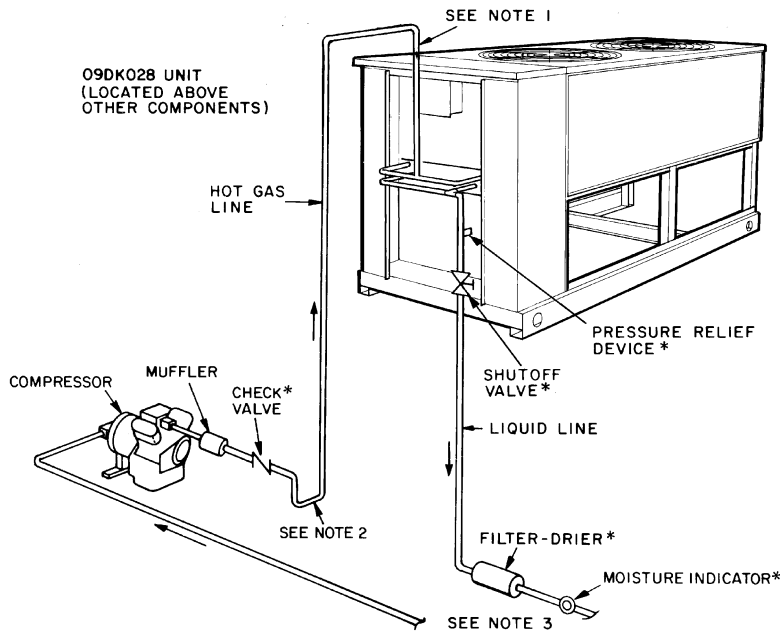


- LEGEND**
- ATS — Air Temperature Switch
 - EQUIP — Equipment
 - FC — Fan Contactor
 - FCPS — Fan Cycling Pressure Switch
 - FM — Fan Motor
 - GND — Ground
 - PL — Plug
 - TB — Terminal Block
- Terminal Block Connection
 Marked Terminal
 Unmarked Terminal
 Factory Wiring
 Field Control Wiring
 Field Power Wiring

09DK074-094 STANDARD CONTROL SCHEMATIC (100% & 50%/50% CAPACITY SPLITS)



09DK CONDENSER WITH SINGLE COMPRESSOR

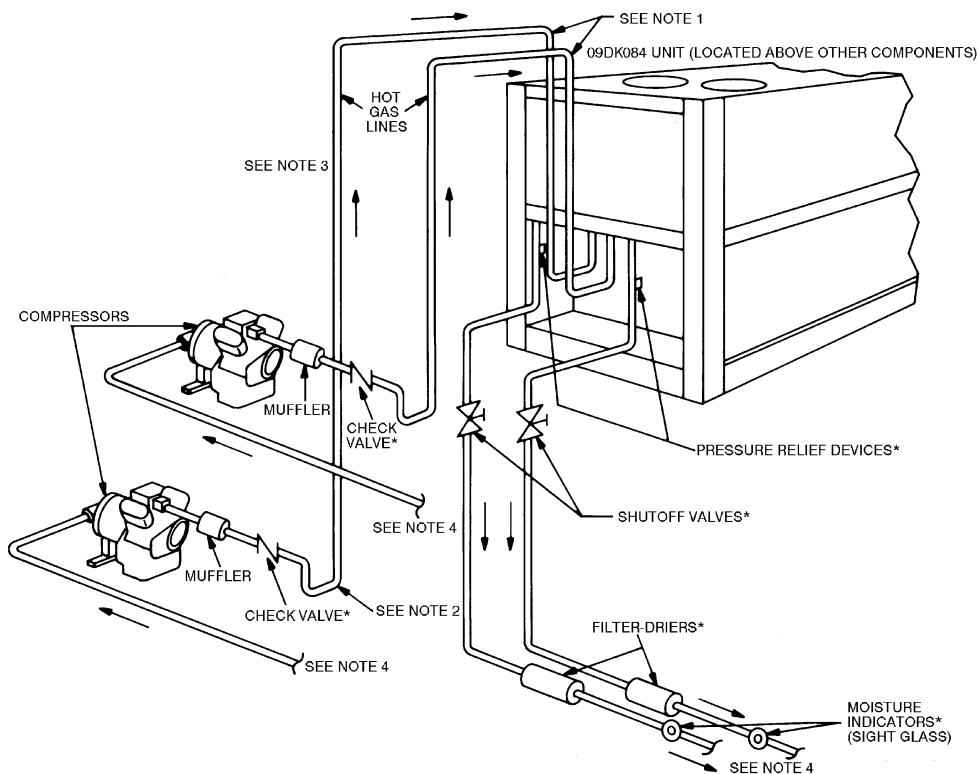


*Field supplied.

NOTES:

- Hot gas lines should rise above refrigerant level in condenser circuit. Double riser may be required; check compressor minimum capacity.
- Trap should be installed on hot gas lines to prevent condenser oil and refrigerant vapor migration from accumulating on compressor heads during off cycle.
- Refer to Carrier System Design Manual, part 3, or the Carrier E20-II® Software Refrigerant Piping program, for proper piping sizes and design.
- Pitch all horizontal lines downward in the direction of refrigerant flow.
- For piping lengths greater than 50 ft, provide support to liquid and gas lines near the connections to the coil.
- Single-phase motors (09DE016) require one field-supplied contactor to start all fans. Field-supplied contactors are not required when accessory fan cycling control package is furnished.
- Wiring and piping shown are general points-of-connection guides only and do not include details required for specific installations.
- All wiring must comply with applicable national and local codes.
- All piping must follow standard refrigerant piping practices.
- For pressure relief requirements, see latest revision of ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) Standard 15, Safety Code for Mechanical Refrigeration.
- All 09DK units have factory-installed contactors.

09DK CONDENSER WITH DUAL SPLIT SYSTEM



Application data



Unit performance with ductwork

Ductwork added to equipment installed indoors results in added external static pressure, which affects fan performance and condenser capacity. The table below lists performance comparisons for operating with free air discharge and various external static pressures.

PERFORMANCE COMPARISONS — FREE AIR DISCHARGE VS STATIC PRESSURES

EXTERNAL STATIC (in. wg)	% CFM DECREASE	% THR DECREASE	APPROX % SYSTEM DECREASE
0.1	8.5	5.2	2.6
0.2	14.2	8.9	4.9
0.3	19.8	12.2	6.1
0.4	24.9	16.1	8.1
0.5	29.9	19.1	9.6

THR — Total Heat Rejection

Liquid lift

The amount of liquid lift available before refrigerant flashing occurs depends on the amount of liquid subcooling in the system.

All 09DE and 09DK condensers have positive subcooling when applied with an optimum charge. With subcooling, it is possible to overcome an appreciable friction drop and/or static head (due to the elevation of the liquid metering device above the condenser).

When 09DE and 09DK condensers are applied with a minimum charge, minimal subcooling in the condenser is realized; therefore, if subcooling is required it must be obtained by external means such as a liquid suction inter-changer.

The average amount of liquid lift available from the 09DE and 09DK condensers is shown in the accompanying table.

AVAILABLE LIQUID LIFT (ft)*

REFRIGERANT		R-22		R-502		R-134a	
Unit		Temperature Difference (F)†					
		20	30	20	30	20	30
09DE	016	75	71	75	70	—	—
09DK	020,024	77	67	77	61		
	028	78	68	78	62		
	034	80	70	80	64	—	—
	044	75	65	75	60		
	054	60	50	60	44	29	26
	064	41	31	41	25	20	6
	074	44	34	44	28	18	7
	084	51	41	51	35	22	10
	094	41	31	41	25	18	1

*Allows 7 psi drop for liquid line accessories and 2° F liquid line loss with maximum charge.

†Saturated Condensing Temperature (entering) – Entering Air Temperature (dry bulb) °F.

NOTES:

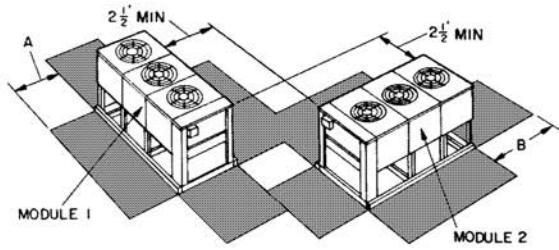
1. Data based on 15 F subcooling, and unit circuiting of 100% for the 09DE units, and 50/50% or 53/47% for the 09DK units.
2. Available subcooling is greatly reduced when R-12 or R-500 is used in these units. It is recommended that the evaporator is at the same level as the condenser, or lower.
3. Subcooling = Saturated condensing temperature of refrigerant — Actual temperature of refrigerant leaving the coil.

Application data (cont)



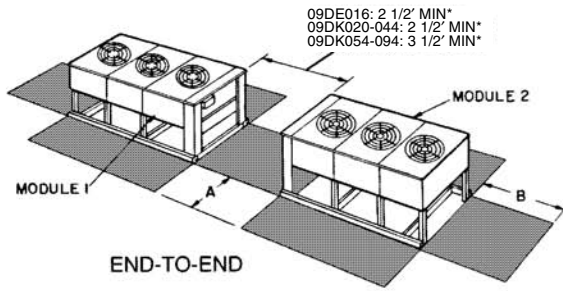
Multiple condenser arrangements

09DE,DK



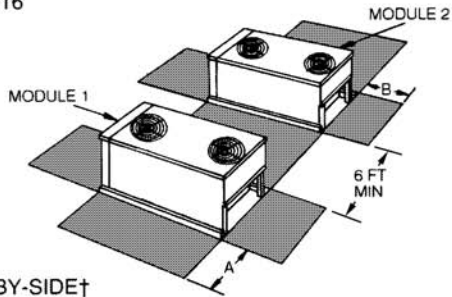
PERPENDICULAR

09DE,DK



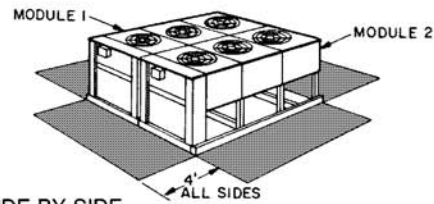
END-TO-END

09DE016



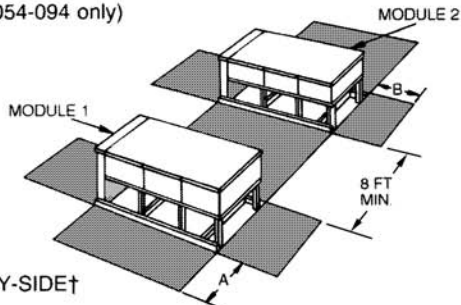
SIDE-BY-SIDE†

09DK (020-044 only)



SIDE-BY-SIDE

09DK (054-094 only)



SIDE-BY-SIDE†

Space for Service and Airflow

*For clearances between controls and grounded surfaces, check local codes.
†Observe minimum recommended space requirements.

09		DIMENSIONS (ft)	
		A	B
DE	016	3	2
	020,024	4	4
	028		
	034 044		
DK	054	6	5
	064		
	074		
	084		
	094		



Head pressure control

General — Efficient operation of the evaporator thermostatic expansion valves requires a 90 F minimum saturated condensing temperature when compressors are operating at 100% capacity, 80 F for 75% compressor capacity, and 70 F for 50 and 25% compressor capacity.

A drop in entering outdoor-air temperature results in a lower saturated condensing temperature. When the outdoor-air temperature drops below the minimum temperatures listed in the Minimum Outdoor-Air Operating Temperature table on page 30, head pressure control is required.

Head pressure controls — Head pressure on the 09DE016 and 09DK020-094 units may be controlled by fan cycling supplemented by Motormaster® control. Fan cycling control is available as an accessory on the 09DE and 09DK020-044 units. Motormaster I is also available on these units with fan cycling.

On 09DK054-094 condensers, fan cycling controls are standard (nominal 67/33%, 33/33/33%, 33/33/17/17%). Head pressure can also be controlled by fan cycling controls supplemented by the accessory Motormaster V solid-state head pressure controller. See accessory installation instructions for more information.

Fan cycling — The fan cycling control, used primarily during intermediate seasons, cycles one fan on the 09DE016 unit, one fan on 09DK020-028 units, 2 fans on 09DK034-064 units, and 4 fans on 09DK074-094 units.

Motormaster I head pressure control (09DE, 09DK020-044) — When outdoor temperatures are low enough to cause low condensing pressures, the Motormaster control modulates the motor speed of one condenser fan from full to zero rpm to maintain a constant saturated condensing temperature for full year-round head pressure control. The Motormaster I control can be used only with suitable motors. It may be used as the sole control on single-fan units but must be used in conjunction with fan cycling control on multiple-fan units. If condensers 09DK020-044 are applied to separate refrigeration cycles,

special problems arise when controlling head pressure from a single control point. For such applications, more positive system control can be ensured by using individual condensers and head pressure controls.

Motormaster V head pressure control — Available for 09DK054-094 units only, this head pressure control maintains the proper condensing temperature at low ambient temperature conditions to -20 F and is compatible with the standard factory-installed 3-phase motors (in positions 1 and 2).

Process applications

Process applications are defined as heat rejection loads that are not related to or significantly affected by outside ambient conditions. Process applications tend to have constant heat rejection requirements throughout the year. Consequently, these applications may require switching the set points on standard accessory fan cycle controls. Consult Application Engineering for assistance in designing and selecting process systems.

E-coated aluminum-fin and copper fin coils

E-coated aluminum-fin coils have a flexible and durable epoxy coating uniformly applied to all coil surfaces. Unlike brittle phenolic dip and bake coatings, E-coat provides superior protection with unmatched flexibility, edge coverage, metal adhesion, thermal performance, and most importantly, corrosion resistance.

E-coated coils provide this protection since all coil surfaces are completely encapsulated from environmental contamination. This coating is especially suitable in industrial environments.

E-coated copper-fin coils have the same flexible and durable epoxy coating as E-coated aluminum-fin coils. However, this option combines the natural salt and environmental resistance of all-copper construction with high levels of corrosion protection. This coating is recommended for harsh combinations of coastal and industrial environments.

Application data (cont)



MINIMUM OUTDOOR-AIR OPERATING TEMPERATURE

UNIT	HEAD PRESSURE CONTROL	TD	COMPRESSOR CAPACITY %*				
			100	75	50	25	
			Minimum Outdoor Temperature (F) (See Note 2)				
09DE016	None	30	60	57	55	62	
		25	65	61	57	64	
		20	70	65	60	65	
	Fan Cycling, One Fan	30	35	40	44	58	
		25	45	47	49	60	
		20	54	54	53	63	
	Motormaster® I Control	30	-20	-20	-20	-20	
		25	-20	-20	-20	-20	
		20	-20	-20	-20	-20	
09DK	020-028	None	30	60	57	55	62
			25	65	61	57	64
			20	70	65	60	65
		Fan Cycling, One Fan	30	29	34	38	51
			25	38	40	42	53
			20	47	47	46	56
	Motormaster I Control	30	-20	-20	-20	-20	
		25	-20	-20	-20	-20	
		20	-20	-20	-20	-20	
	034, 044	None	30	60	57	55	62
			25	65	61	57	64
			20	70	65	60	65
		Fan Cycling, 2 Fans	30	12	19	22	43
			25	22	25	29	47
			20	31	31	36	51
	Motormaster I Control	30	-20	-20	-20	-20	
		25	-20	-20	-20	-20	
		20	-20	-20	-20	-20	
054, 064	FCPS, 2 Fans†	30	29	34	38	51	
		25	38	40	42	53	
		20	47	47	46	56	
	Motormaster V Control	30	-20	-20	-20	-20	
074-094	FCPS 2 Fans, ATS 2 Fans†	30	12	19	22	43	
		25	22	25	29	47	
		20	31	31	36	51	
	Motormaster V Control	30	-20	-20	-20	-20	
		25	-20	-20	-20	-20	
		20	-20	-20	-20	-20	

LEGEND

Intermediate Season

Winter Season

ATS — Air Temperature Switch

FCPS — Fan Cycling Pressure Switch

TD — Temperature Difference

= Saturated Condensing Temperature (Entering)

- Entering-Air Temperature

*Interpolation permitted.

†Additional FCPSs are needed for nominal 67/33, 33/33/33, and 33/33/17/17% capacity split applications.

NOTES:

- Fans on the 09DK054-094 units are controlled by an ATS or FCPS.
- Minimum outdoor temperatures are determined for indoor and outdoor unit combinations of the same capacity. However, for 09DK020 (17½ ton) outdoor unit, the minimum outdoor temperatures shown are determined for combination with a 15-ton indoor unit.

APPENDIX

F

CADNA OUTPUT



Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height	Coordinates			
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night					(dB)	(Hz)	(m)	X
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)	(min)	(min)	(min)					(m)	(m)	(m)		
RTU11 11T Condenser (2 fan)	~	SS_VR_RTU11c	83.8	83.8	83.8	Lw	COND_RTU_RN011		0.0	0.0	0.0				60.00	0.00	0.00	0.0		(none)	0.10	g	452903.02	5018293.87	102.20
RTU11 11T Exhaust Fan	~	SS_VR_RTU11e	91.6	91.6	91.6	Lw	EF_RTU_6		0.0	0.0	0.0				60.00	0.00	0.00	0.0		(none)	1.10	g	452904.89	5018292.56	102.10
RTU12 6T Condenser (1 fan)	~	SS_VR_RTU12c	80.8	80.8	80.8	Lw	COND_RTU_RN006		0.0	0.0	0.0				60.00	0.00	0.00	0.0		(none)	0.10	g	452906.54	5018295.97	102.20
RTU12 6T Exhaust Fan	~	SS_VR_RTU12e	82.4	82.4	82.4	Lw	EF_RTU_2		0.0	0.0	0.0				60.00	0.00	0.00	0.0		(none)	1.10	g	452905.01	5018297.10	102.10
Vimy Ridge School Bus Idling	~	SS_VR_Bld1	99.5	99.5	99.5	Lw	MT_Idle		0.0	0.0	0.0				15.00	0.00	0.00	0.0		(none)	2.40	r	452880.82	5018330.63	95.10
Vimy Ridge School Bus Idling	~	SS_VR_Bld2	99.5	99.5	99.5	Lw	MT_Idle		0.0	0.0	0.0				15.00	0.00	0.00	0.0		(none)	2.40	r	452865.69	5018336.56	95.22
Vimy Ridge School Bus Idling	~	SS_VR_Bld3	99.5	99.5	99.5	Lw	MT_Idle		0.0	0.0	0.0				15.00	0.00	0.00	0.0		(none)	2.40	r	452852.24	5018343.07	95.33
Vimy Ridge School Bus Idling	~	SS_VR_Bld4	99.5	99.5	99.5	Lw	MT_Idle		0.0	0.0	0.0				15.00	0.00	0.00	0.0		(none)	2.40	r	452838.89	5018349.38	95.40
Vimy Ridge School Bus Idling	~	SS_VR_Bld5	99.5	99.5	99.5	Lw	MT_Idle		0.0	0.0	0.0				15.00	0.00	0.00	0.0		(none)	2.40	r	452824.49	5018356.11	95.40

Line Sources

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src.		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Day	Evening	Night
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)	(min)	(min)	(min)	(dB)	(Hz)		(km/h)	(km/h)	(km/h)	
Vimy Ridge Bus Movement	~	SS_VR_BUSM	86.8	-20.2	-20.2	66.6	-40.4	-40.4	PWL-Pt	MT_Move		0.0	0.0	0.0				0.0		(none)	5.0	0.0	0.0	10.0		

Receiver
Name: LOC_A
ID: LOC_A
X: 452708.22 m
Y: 5018390.42 m
Z: 94.50 m

Point Source, ISO 9613, Name: "RTU2 30T Exhaust Fan", ID: "SS_VR_RTU2e"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
1	452805.38	5018332.62	102.10	0	D	A	97.7	0.0	0.0	0.0	0.0	52.1	1.1	-3.0	0.0	0.0	5.9	0.0	0.0	0.0	41.

Point Source, ISO 9613, Name: "RTU4 30T Exhaust Fan", ID: "SS_VR_RTU2e"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
2	452825.43	5018327.03	102.10	0	D	A	97.7	0.0	0.0	0.0	0.0	53.5	1.2	-3.0	0.0	0.0	7.5	0.0	0.0	0.0	38.

Point Source, ISO 9613, Name: "RTU5 30T Exhaust Fan", ID: "SS_VR_RTU4e"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
4	452858.12	5018312.56	102.10	0	D	A	97.7	0.0	0.0	0.0	0.0	55.6	1.4	-3.0	0.0	0.0	10.0	0.0	0.0	0.0	33.

Point Source, ISO 9613, Name: "Vimy Ridge School Bus Idling", ID: "SS_VR_Bld15"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
6	452824.49	5018356.11	95.40	0	D	A	99.5	0.0	-6.0	0.0	0.0	52.7	3.6	-3.1	0.0	0.0	0.0	0.0	0.0	0.0	40.

Point Source, ISO 9613, Name: "RTU2 30T Condenser (3 fan)", ID: "SS_VR_RTU2c"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
9	452803.21	5018333.97	102.20	0	D	A	92.5	0.0	0.0	0.0	0.0	51.9	0.7	-3.0	0.0	0.0	4.8	0.0	0.0	0.0	38.

Point Source, ISO 9613, Name: "Vimy Ridge School Bus Idling", ID: "SS_VR_Bld14"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
12	452838.89	5018349.38	95.40	0	D	A	99.5	0.0	-6.0	0.0	0.0	53.7	3.9	-3.4	0.0	0.0	0.0	0.0	0.0	0.0	39.

Point Source, ISO 9613, Name: "RTU4 30T Condenser (3 fan)", ID: "SS_VR_RTU4c"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
25	452827.27	5018325.96	102.20	0	D	A	92.5	0.0	0.0	0.0	0.0	53.6	0.8	-3.0	0.0	0.0	6.3	0.0	0.0	0.0	34.

Point Source, ISO 9613, Name: "Vimy Ridge School Bus Idling", ID: "SS_VR_Bld13"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
43	452852.24	5018343.07	95.33	0	D	A	99.5	0.0	-6.0	0.0	0.0	54.6	4.2	-3.7	0.0	0.0	0.0	0.0	0.0	0.0	38.

Point Source, ISO 9613, Name: "Vimy Ridge School Bus Idling", ID: "SS_VR_Bld12"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
65	452865.69	5018336.56	95.22	0	D	A	99.5	0.0	-6.0	0.0	0.0	55.4	4.5	-3.9	0.0	0.0	0.0	0.0	0.0	0.0	37.

Point Source, ISO 9613, Name: "Vimy Ridge School Bus Idling", ID: "SS_VR_Bld11"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
66	452880.82	5018330.63	95.10	0	D	A	99.5	0.0	-6.0	0.0	0.0	56.2	4.8	-4.1	0.0	0.0	0.0	0.0	0.0	0.0	36.

Point Source, ISO 9613, Name: "RTU5 30T Condenser (3 fan)", ID: "SS_VR_RTU5c"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
69	452856.16	5018314.04	102.20	0	D	A	92.5	0.0	0.0	0.0	0.0	55.4	0.9	-3.0	0.0	0.0	5.4	0.0	0.0	0.0	33.

Point Source, ISO 9613, Name: "RTU7 11T Exhaust Fan", ID: "SS_VR_RTU7e"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
73	452865.17	5018314.12	102.10	0	D	A	91.6	0.0	0.0	0.0	0.0	55.8	0.7	-3.0	0.0	0.0	6.2	0.0	0.0	0.0	31.

Point Source, ISO 9613, Name: "RTU11 11T Condenser (2 fan)", ID: "SS_VR_RTU11c"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(/
193	452903.02	5018293.87	102.20	0	D	A	83.8	0.0	0.0	0.0	0.0	57.8	1.1	-3.0	0.0	0.0	7.2	0.0	0.0	20.

Point Source, ISO 9613, Name: "RTU9 6T Exhaust Fan", ID: "SS_VR_RTU9e"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(/
206	452875.64	5018298.92	102.10	0	D	A	82.4	0.0	0.0	0.0	0.0	56.6	0.9	-3.0	0.0	0.0	7.5	0.0	0.0	20.

Point Source, ISO 9613, Name: "RTU12 6T Exhaust Fan", ID: "SS_VR_RTU12e"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(/
210	452905.01	5018297.10	102.10	0	D	A	82.4	0.0	0.0	0.0	0.0	57.8	1.0	-3.0	0.0	0.0	4.9	0.0	0.0	21.

Point Source, ISO 9613, Name: "RTU8 6T Condenser (1 fan)", ID: "SS_VR_RTU8c"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(/
286	452874.06	5018308.69	102.20	0	D	A	80.8	0.0	0.0	0.0	0.0	56.3	1.0	-3.0	0.0	0.0	7.3	0.0	0.0	19.

Point Source, ISO 9613, Name: "RTU9 6T Condenser (1 fan)", ID: "SS_VR_RTU9c"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(/
292	452877.16	5018297.97	102.20	0	D	A	80.8	0.0	0.0	0.0	0.0	56.7	1.0	-3.0	0.0	0.0	7.4	0.0	0.0	18.

Point Source, ISO 9613, Name: "RTU12 6T Condenser (1 fan)", ID: "SS_VR_RTU12c"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(/
348	452906.54	5018295.97	102.20	0	D	A	80.8	0.0	0.0	0.0	0.0	57.8	1.1	-3.0	0.0	0.0	4.8	0.0	0.0	20.

Receiver

Name: R01_W
 ID: R01_W
 X: 452584.61 m
 Y: 5018452.62 m
 Z: 97.96 m

Point Source, ISO 9613, Name: "RTU6 11T Exhaust Fan", ID: "SS_RTU6e"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
1	452624.82	5018419.58	101.75	0	D	A	91.6	0.0	0.0	0.0	0.0	45.4	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	49.

Point Source, ISO 9613, Name: "RTU4 11T Exhaust Fan", ID: "SS_RTU4e"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
2	452619.53	5018401.66	101.75	0	D	A	85.4	0.0	0.0	0.0	0.0	46.8	0.4	-3.0	0.0	0.0	5.4	0.0	0.0	0.0	35.

Point Source, ISO 9613, Name: "RTU6 11T Condenser (2 fan)", ID: "SS_RTU6c"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
4	452626.15	5018419.53	101.85	0	D	A	83.8	0.0	0.0	0.0	0.0	45.5	0.4	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	40.

Point Source, ISO 9613, Name: "RTU3 11T Exhaust Fan", ID: "SS_RTU3e"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
7	452650.78	5018399.12	101.75	0	D	A	87.4	0.0	0.0	0.0	0.0	49.6	0.5	-3.0	0.0	0.0	6.3	0.0	0.0	0.0	34.

Point Source, ISO 9613, Name: "RTU5 11T Exhaust Fan", ID: "SS_RTU5e"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
49	452648.71	5018421.11	101.75	0	D	A	85.4	0.0	0.0	0.0	0.0	48.1	0.4	-3.0	0.0	0.0	6.7	0.0	0.0	0.0	33.

Point Source, ISO 9613, Name: "RTU4 11T Condenser (2 fan)", ID: "SS_RTU4c"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
52	452618.23	5018401.67	101.85	0	D	A	83.8	0.0	0.0	0.0	0.0	46.7	0.4	-3.0	0.0	0.0	4.8	0.0	0.0	0.0	34.

Point Source, ISO 9613, Name: "RTU5 11T Condenser (2 fan)", ID: "SS_RTU5c"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
76	452647.04	5018421.35	101.85	0	D	A	83.8	0.0	0.0	0.0	0.0	47.9	0.5	-3.0	0.0	0.0	5.2	0.0	0.0	0.0	33.

Point Source, ISO 9613, Name: "RTU1 11T Exhaust Fan", ID: "SS_RTU1e"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
79	452669.55	5018409.26	101.75	0	D	A	85.4	0.0	0.0	0.0	0.0	50.6	0.5	-3.0	0.0	0.0	9.7	0.0	0.0	0.0	27.

Point Source, ISO 9613, Name: "Air Cooled VRF Condenser 1", ID: "SS_CU1Ac"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
82	452662.08	5018413.18	102.44	0	D	A	84.5	0.0	0.0	0.0	0.0	49.8	0.5	-3.0	0.0	0.0	5.2	0.0	0.0	0.0	31.

Point Source, ISO 9613, Name: "Air Cooled VRF Condenser 2", ID: "SS_CU1B"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
103	452663.29	5018412.63	102.44	0	D	A	84.5	0.0	0.0	0.0	0.0	49.9	0.5	-3.0	0.0	0.0	5.3	0.0	0.0	0.0	31.

Point Source, ISO 9613, Name: "RTU3 11T Condenser (2 fan)", ID: "SS_RTU3c"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
105	452650.16	5018399.55	101.85	0	D	A	83.8	0.0	0.0	0.0	0.0	49.5	0.5	-3.0	0.0	0.0	6.2	0.0	0.0	0.0	30.

Point Source, ISO 9613, Name: "RTU1 11T Condenser (2 fan)", ID: "SS_RTU1c"

Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	l/a dB	Optime dB	K0 (dB)	Di (dB)	Adiv (dB)	Aatm (dB)	Agr (dB)	Afol (dB)	Ahous (dB)	Abar (dB)	Cmet (dB)	RL (dB)	Lr dB(/	
107	452671.09	5018409.30	101.85	0	D	A	83.8	0.0	0.0	0.0	0.0	50.7	0.6	-3.0	0.0	0.0	7.5	0.0	0.0	0.0	27.

Point Source, ISO 9613, Name: "RTU2 6T Exhaust Fan", ID: "SS_RTU2e"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
110	452685.92	5018398.51	101.75	0	D	A	82.4	0.0	0.0	0.0	0.0	52.2	0.6	-3.0	0.0	0.0	8.6	0.0	0.0	24.

Point Source, ISO 9613, Name: "RTU2 6T Condenser (1 fan)", ID: "SS_RTU2c"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
132	452685.94	5018397.41	101.85	0	D	A	80.8	0.0	0.0	0.0	0.0	52.2	0.7	-3.0	0.0	0.0	5.7	0.0	0.0	25.

Receiver

Name: LOC_A

ID: LOC_A

X: 452708.22 m

Y: 5018390.42 m

Z: 94.50 m

Road, TNM, Name: "Kelly Farm Road", ID: "RD_KFRd"													
Nr.	X (m)	Y (m)	Z (m)	Refl.	DEN	Freq. (Hz)	Lw dB(A)	Ad (dB)	Aair (dB)	Agr (dB)	Afol (dB)	RL (dB)	Lr dB(A)
1	452880.97	5018359.45	92.63	0	D	A	52.7	-21.1	0.0	-2.2	0.0	0.0	33.8
2	452836.41	5018379.31	92.77	0	D	A	52.7	-18.3	0.0	2.0	0.0	0.0	32.3
3	452802.98	5018394.20	92.88	0	D	A	52.7	-18.8	0.0	6.0	0.0	0.0	27.9
6	452780.70	5018404.13	92.95	0	D	A	52.7	-16.6	0.0	-4.2	0.0	0.0	40.3
9	452758.42	5018414.06	93.02	0	D	A	52.7	-14.1	0.0	-4.4	0.0	0.0	42.9
13	452741.71	5018421.51	93.07	0	D	A	52.7	-15.5	0.0	-4.5	0.0	0.0	41.7
24	452730.57	5018426.47	93.11	0	D	A	52.7	-14.9	0.0	-4.6	0.0	0.0	42.4
41	452719.96	5018431.20	93.14	0	D	A	52.7	-15.3	0.0	33.9	0.0	0.0	3.5
62	452709.89	5018435.69	93.17	0	D	A	52.7	-15.9	0.0	33.1	0.0	0.0	3.7
90	452694.78	5018442.42	93.22	0	D	A	52.7	-14.3	0.0	31.5	0.0	0.0	6.9
117	452674.63	5018451.40	93.28	0	D	A	52.7	-16.5	0.0	32.5	0.0	0.0	3.6
137	452654.49	5018460.38	93.35	0	D	A	52.7	-18.6	0.0	33.4	0.0	0.0	0.7
192	452636.22	5018468.51	93.40	0	D	A	52.7	-21.1	0.0	26.5	0.0	0.0	5.1
196	452882.80	5018363.56	92.63	0	D	A	52.7	-21.1	0.0	-2.8	0.0	0.0	34.3
201	452838.23	5018383.42	92.77	0	D	A	52.7	-18.4	0.0	5.7	0.0	0.0	28.6
204	452804.80	5018398.32	92.88	0	D	A	52.7	-18.9	0.0	6.5	0.0	0.0	27.2
207	452782.51	5018408.25	92.95	0	D	A	52.7	-16.9	0.0	-4.1	0.0	0.0	39.9
210	452760.22	5018418.18	93.02	0	D	A	52.7	-14.7	0.0	-4.3	0.0	0.0	42.4
213	452743.51	5018425.63	93.07	0	D	A	52.7	-16.2	0.0	-4.5	0.0	0.0	40.9
216	452732.36	5018430.60	93.11	0	D	A	52.7	-15.7	0.0	-4.5	0.0	0.0	41.5
226	452721.22	5018435.57	93.14	0	D	A	52.7	-15.7	0.0	33.9	0.0	0.0	3.0
236	452710.06	5018440.54	93.18	0	D	A	52.7	-16.3	0.0	33.9	0.0	0.0	2.5
247	452693.34	5018447.99	93.23	0	D	A	52.7	-14.7	0.0	32.6	0.0	0.0	5.4
252	452671.03	5018457.93	93.30	0	D	A	52.7	-16.9	0.0	32.1	0.0	0.0	3.6
256	452648.73	5018467.87	93.37	0	D	A	52.7	-19.0	0.0	32.6	0.0	0.0	1.0
283	452633.72	5018474.56	93.42	0	D	A	52.7	-24.9	0.0	31.0	0.0	0.0	-3.3
284	452880.97	5018359.45	96.19	0	D	A	51.3	-21.1	0.0	-2.4	0.0	0.0	32.6
285	452836.41	5018379.31	96.33	0	D	A	51.3	-18.3	0.0	-2.5	0.0	0.0	35.5
286	452802.98	5018394.20	96.44	0	D	A	51.3	-18.8	0.0	-3.2	0.0	0.0	35.8
288	452780.70	5018404.13	96.51	0	D	A	51.3	-16.6	0.0	-3.0	0.0	0.0	37.8
290	452758.42	5018414.06	96.58	0	D	A	51.3	-14.1	0.0	-2.7	0.0	0.0	39.9
292	452741.71	5018421.51	96.63	0	D	A	51.3	-15.5	0.0	-2.6	0.0	0.0	38.4
294	452730.57	5018426.47	96.67	0	D	A	51.3	-14.9	0.0	-2.5	0.0	0.0	39.0
302	452719.96	5018431.20	96.70	0	D	A	51.3	-15.3	0.0	32.6	0.0	0.0	3.4
314	452709.89	5018435.69	96.73	0	D	A	51.3	-15.9	0.0	33.0	0.0	0.0	2.5
324	452694.78	5018442.42	96.78	0	D	A	51.3	-14.3	0.0	32.8	0.0	0.0	4.2
336	452674.63	5018451.40	96.84	0	D	A	51.3	-16.5	0.0	33.1	0.0	0.0	1.7
342	452654.49	5018460.38	96.91	0	D	A	51.3	-18.6	0.0	32.7	0.0	0.0	0.1
369	452636.22	5018468.51	96.96	0	D	A	51.3	-21.1	0.0	25.5	0.0	0.0	4.7
372	452882.80	5018363.56	96.19	0	D	A	51.3	-21.1	0.0	-2.8	0.0	0.0	33.0
375	452838.23	5018383.42	96.33	0	D	A	51.3	-18.4	0.0	-2.5	0.0	0.0	35.3
378	452804.80	5018398.32	96.44	0	D	A	51.3	-19.0	0.0	-3.2	0.0	0.0	35.6
381	452782.51	5018408.25	96.51	0	D	A	51.3	-16.9	0.0	-3.1	0.0	0.0	37.5
383	452760.22	5018418.18	96.58	0	D	A	51.3	-14.7	0.0	-2.7	0.0	0.0	39.4
385	452743.51	5018425.63	96.63	0	D	A	51.3	-16.2	0.0	-2.6	0.0	0.0	37.7
388	452732.36	5018430.60	96.67	0	D	A	51.3	-15.7	0.0	-2.5	0.0	0.0	38.1
393	452721.22	5018435.57	96.70	0	D	A	51.3	-15.7	0.0	32.2	0.0	0.0	3.4
399	452710.06	5018440.54	96.74	0	D	A	51.3	-16.3	0.0	32.8	0.0	0.0	2.2
406	452693.34	5018447.99	96.79	0	D	A	51.3	-14.7	0.0	32.6	0.0	0.0	4.0
414	452671.03	5018457.93	96.86	0	D	A	51.3	-17.0	0.0	31.9	0.0	0.0	2.5
425	452648.73	5018467.87	96.93	0	D	A	51.3	-19.0	0.0	30.8	0.0	0.0	1.5
436	452633.72	5018474.56	96.98	0	D	A	51.3	-24.9	0.0	27.3	0.0	0.0	-0.9

Road, TNM, Name: "Kelly Farm Road", ID: "RD_KFRd"													
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	Ad	Aair	Agr	Afol	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
438	452880.97	5018359.45	94.06	0	D	A	49.4	-21.1	0.0	-3.3	0.0	0.0	31.7
439	452836.41	5018379.31	94.20	0	D	A	49.4	-18.3	0.0	-3.3	0.0	0.0	34.4
440	452802.98	5018394.20	94.30	0	D	A	49.4	-18.8	0.0	-4.3	0.0	0.0	35.0
441	452780.70	5018404.13	94.37	0	D	A	49.4	-16.6	0.0	-4.3	0.0	0.0	37.2
443	452758.42	5018414.06	94.44	0	D	A	49.4	-14.1	0.0	-3.9	0.0	0.0	39.2
445	452741.71	5018421.51	94.50	0	D	A	49.4	-15.5	0.0	-3.6	0.0	0.0	37.5
446	452730.57	5018426.47	94.53	0	D	A	49.4	-14.9	0.0	-3.4	0.0	0.0	38.0
449	452719.96	5018431.20	94.56	0	D	A	49.4	-15.3	0.0	36.1	0.0	0.0	-2.0
454	452709.89	5018435.69	94.60	0	D	A	49.4	-15.8	0.0	36.3	0.0	0.0	-2.8
458	452694.78	5018442.42	94.64	0	D	A	49.4	-14.3	0.0	34.2	0.0	0.0	0.9
464	452674.63	5018451.40	94.71	0	D	A	49.4	-16.5	0.0	33.3	0.0	0.0	-0.4
467	452654.49	5018460.38	94.77	0	D	A	49.4	-18.6	0.0	33.7	0.0	0.0	-2.8
482	452636.22	5018468.51	94.83	0	D	A	49.4	-21.1	0.0	27.2	0.0	0.0	1.1
483	452882.80	5018363.56	94.06	0	D	A	49.4	-21.1	0.0	-3.9	0.0	0.0	32.2
484	452838.23	5018383.42	94.20	0	D	A	49.4	-18.4	0.0	-3.2	0.0	0.0	34.2
486	452804.80	5018398.32	94.30	0	D	A	49.4	-18.9	0.0	-4.5	0.0	0.0	34.9
487	452782.51	5018408.25	94.37	0	D	A	49.4	-16.9	0.0	-4.3	0.0	0.0	36.9
489	452760.22	5018418.18	94.44	0	D	A	49.4	-14.6	0.0	-4.0	0.0	0.0	38.8
490	452743.51	5018425.63	94.50	0	D	A	49.4	-16.2	0.0	-3.8	0.0	0.0	36.9
492	452732.36	5018430.60	94.53	0	D	A	49.4	-15.7	0.0	-3.6	0.0	0.0	37.3
494	452721.22	5018435.57	94.57	0	D	A	49.4	-15.7	0.0	35.6	0.0	0.0	-1.9
503	452710.06	5018440.54	94.60	0	D	A	49.4	-16.3	0.0	35.5	0.0	0.0	-2.4
508	452693.34	5018447.99	94.65	0	D	A	49.4	-14.7	0.0	34.0	0.0	0.0	0.7
511	452671.03	5018457.93	94.72	0	D	A	49.4	-16.9	0.0	32.6	0.0	0.0	-0.2
515	452648.73	5018467.87	94.79	0	D	A	49.4	-19.0	0.0	32.4	0.0	0.0	-2.0
526	452633.72	5018474.56	94.84	0	D	A	49.4	-24.9	0.0	29.9	0.0	0.0	-5.4
535	452621.36	5018474.91	93.46	0	D	A	52.7	-23.2	0.0	26.6	0.0	0.0	2.9
543	452610.02	5018479.59	93.50	0	D	A	52.7	-25.6	0.0	32.2	0.0	0.0	-5.1
553	452618.47	5018480.97	93.47	0	D	A	52.7	-21.3	0.0	29.1	0.0	0.0	2.3
605	453101.25	5018042.37	92.73	0	D	A	52.7	-30.8	0.0	18.7	0.0	0.0	3.1
623	453088.32	5018073.74	92.79	0	D	A	52.7	-33.8	0.0	14.6	0.0	0.0	4.3
845	453083.48	5018085.49	92.82	0	D	A	52.7	-40.3	0.0	9.4	0.0	0.0	3.0
1095	453080.00	5018093.94	92.83	0	D	A	52.7	-35.3	0.0	12.8	0.0	0.0	4.5
1152	453073.44	5018109.84	92.87	0	D	A	52.7	-33.3	0.0	14.0	0.0	0.0	5.4
1190	453067.98	5018123.09	92.89	0	D	A	52.7	-37.1	0.0	22.9	0.0	0.0	-7.4
1239	453064.22	5018132.20	92.91	0	D	A	52.7	-35.3	0.0	16.2	0.0	0.0	1.2
1358	453061.10	5018139.77	92.93	0	D	A	52.7	-39.1	0.0	16.0	0.0	0.0	-2.5
1386	453058.31	5018146.54	92.94	0	D	A	52.7	-35.8	0.0	13.2	0.0	0.0	3.7
1427	453055.56	5018153.22	92.95	0	D	A	52.7	-39.1	0.0	17.7	0.0	0.0	-4.1
1569	453052.12	5018161.56	92.97	0	D	A	52.7	-34.9	0.0	13.9	0.0	0.0	3.9
1603	453048.14	5018171.20	92.99	0	D	A	52.7	-35.6	0.0	16.2	0.0	0.0	0.9
1662	453044.66	5018179.64	93.01	0	D	A	52.7	-35.6	0.0	15.9	0.0	0.0	1.1
1720	453041.36	5018187.66	93.02	0	D	A	52.7	-35.7	0.0	19.5	0.0	0.0	-2.5
1771	453039.18	5018192.94	93.03	0	D	A	52.7	-40.1	0.0	14.1	0.0	0.0	-1.6
1801	453036.77	5018198.80	93.04	0	D	A	52.7	-34.9	0.0	25.7	0.0	0.0	-7.9
1822	453033.90	5018205.76	93.06	0	D	A	52.7	-37.3	0.0	21.6	0.0	0.0	-6.2
1913	453029.70	5018215.95	93.08	0	D	A	52.7	-33.2	0.0	8.4	0.0	0.0	11.0
1919	453107.08	5018040.04	92.72	0	D	A	52.7	-31.8	0.0	18.9	0.0	0.0	1.9
1923	453095.74	5018067.56	92.78	0	D	A	52.7	-33.9	0.0	14.6	0.0	0.0	4.2
1949	453090.80	5018079.55	92.80	0	D	A	52.7	-40.4	0.0	9.3	0.0	0.0	3.0
2019	453087.25	5018088.16	92.82	0	D	A	52.7	-35.4	0.0	12.7	0.0	0.0	4.6
2036	453080.56	5018104.37	92.85	0	D	A	52.7	-33.3	0.0	13.9	0.0	0.0	5.4
2052	453075.00	5018117.87	92.88	0	D	A	52.7	-37.2	0.0	22.8	0.0	0.0	-7.3
2093	453071.17	5018127.16	92.90	0	D	A	52.7	-35.4	0.0	16.1	0.0	0.0	1.2
2107	453067.98	5018134.88	92.91	0	D	A	52.7	-39.2	0.0	15.9	0.0	0.0	-2.5
2117	453065.14	5018141.78	92.93	0	D	A	52.7	-35.9	0.0	13.1	0.0	0.0	3.7
2125	453062.33	5018148.59	92.94	0	D	A	52.7	-39.1	0.0	17.6	0.0	0.0	-4.1
2151	453058.83	5018157.09	92.96	0	D	A	52.7	-34.9	0.0	13.7	0.0	0.0	4.0
2176	453054.77	5018166.93	92.98	0	D	A	52.7	-35.6	0.0	15.8	0.0	0.0	1.2
2205	453051.23	5018175.53	92.99	0	D	A	52.7	-35.7	0.0	15.4	0.0	0.0	1.5
2242	453047.86	5018183.70	93.01	0	D	A	52.7	-35.8	0.0	19.0	0.0	0.0	-2.1
2261	453045.64	5018189.09	93.02	0	D	A	52.7	-40.2	0.0	13.8	0.0	0.0	-1.4
2275	453043.17	5018195.06	93.03	0	D	A	52.7	-35.0	0.0	25.0	0.0	0.0	-7.3

Road, TNM, Name: "Kelly Farm Road", ID: "RD_KFRd"													
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	Ad	Aair	Agr	Afol	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
2283	453040.25	5018202.16	93.05	0	D	A	52.7	-37.4	0.0	20.7	0.0	0.0	-5.4
2342	453035.48	5018213.73	93.07	0	D	A	52.7	-32.5	0.0	5.9	0.0	0.0	14.3
2356	452621.36	5018474.91	97.02	0	D	A	51.3	-23.2	0.0	25.7	0.0	0.0	2.5
2358	452610.02	5018479.59	97.06	0	D	A	51.3	-25.6	0.0	32.9	0.0	0.0	-7.2
2361	452618.47	5018480.97	97.03	0	D	A	51.3	-21.3	0.0	31.3	0.0	0.0	-1.3
2373	453101.25	5018042.37	96.29	0	D	A	51.3	-30.8	0.0	16.4	0.0	0.0	4.1
2377	453088.32	5018073.74	96.35	0	D	A	51.3	-33.8	0.0	12.9	0.0	0.0	4.6
2388	453083.48	5018085.49	96.38	0	D	A	51.3	-40.3	0.0	7.5	0.0	0.0	3.5
2428	453080.00	5018093.94	96.39	0	D	A	51.3	-35.3	0.0	11.2	0.0	0.0	4.8
2445	453073.44	5018109.84	96.43	0	D	A	51.3	-33.3	0.0	11.4	0.0	0.0	6.6
2456	453067.98	5018123.09	96.45	0	D	A	51.3	-37.1	0.0	21.2	0.0	0.0	-7.0
2479	453064.22	5018132.20	96.47	0	D	A	51.3	-35.3	0.0	14.4	0.0	0.0	1.6
2488	453061.10	5018139.77	96.49	0	D	A	51.3	-39.1	0.0	14.1	0.0	0.0	-2.0
2500	453058.31	5018146.54	96.50	0	D	A	51.3	-35.8	0.0	11.1	0.0	0.0	4.4
2503	453055.56	5018153.22	96.51	0	D	A	51.3	-39.1	0.0	16.5	0.0	0.0	-4.3
2527	453052.12	5018161.56	96.53	0	D	A	51.3	-34.9	0.0	12.2	0.0	0.0	4.3
2541	453048.14	5018171.20	96.55	0	D	A	51.3	-35.6	0.0	14.9	0.0	0.0	0.8
2579	453044.66	5018179.64	96.57	0	D	A	51.3	-35.6	0.0	14.7	0.0	0.0	1.0
2600	453041.36	5018187.66	96.58	0	D	A	51.3	-35.7	0.0	19.8	0.0	0.0	-4.2
2636	453039.18	5018192.94	96.59	0	D	A	51.3	-40.1	0.0	11.9	0.0	0.0	-0.7
2657	453036.77	5018198.80	96.60	0	D	A	51.3	-34.9	0.0	22.9	0.0	0.0	-6.5
2668	453033.90	5018205.76	96.62	0	D	A	51.3	-37.3	0.0	18.9	0.0	0.0	-4.9
2727	453029.70	5018215.95	96.64	0	D	A	51.3	-33.2	0.0	5.7	0.0	0.0	12.4
2737	453107.08	5018040.04	96.28	0	D	A	51.3	-31.8	0.0	16.6	0.0	0.0	2.9
2743	453095.74	5018067.56	96.34	0	D	A	51.3	-33.9	0.0	12.9	0.0	0.0	4.5
2762	453090.80	5018079.55	96.36	0	D	A	51.3	-40.4	0.0	7.4	0.0	0.0	3.5
2819	453087.25	5018088.16	96.38	0	D	A	51.3	-35.4	0.0	10.9	0.0	0.0	5.0
2843	453080.56	5018104.37	96.41	0	D	A	51.3	-33.3	0.0	11.3	0.0	0.0	6.7
2851	453075.00	5018117.87	96.44	0	D	A	51.3	-37.2	0.0	20.9	0.0	0.0	-6.8
2866	453071.17	5018127.16	96.46	0	D	A	51.3	-35.4	0.0	14.2	0.0	0.0	1.7
2877	453067.98	5018134.88	96.47	0	D	A	51.3	-39.2	0.0	13.9	0.0	0.0	-1.8
2889	453065.14	5018141.78	96.49	0	D	A	51.3	-35.9	0.0	10.9	0.0	0.0	4.5
2896	453062.33	5018148.59	96.50	0	D	A	51.3	-39.1	0.0	16.3	0.0	0.0	-4.2
2918	453058.83	5018157.09	96.52	0	D	A	51.3	-34.9	0.0	11.8	0.0	0.0	4.6
2928	453054.77	5018166.93	96.54	0	D	A	51.3	-35.6	0.0	14.2	0.0	0.0	1.4
2947	453051.23	5018175.53	96.55	0	D	A	51.3	-35.7	0.0	13.9	0.0	0.0	1.7
2973	453047.86	5018183.70	96.57	0	D	A	51.3	-35.8	0.0	18.4	0.0	0.0	-2.8
2985	453045.64	5018189.09	96.58	0	D	A	51.3	-40.2	0.0	12.0	0.0	0.0	-0.9
2992	453043.17	5018195.06	96.59	0	D	A	51.3	-35.0	0.0	22.0	0.0	0.0	-5.6
2996	453040.25	5018202.16	96.61	0	D	A	51.3	-37.4	0.0	17.6	0.0	0.0	-3.7
3040	453035.48	5018213.73	96.63	0	D	A	51.3	-32.5	0.0	2.7	0.0	0.0	16.1
3047	453031.89	5018222.44	96.65	0	D	A	51.3	-39.8	0.0	20.7	0.0	0.0	-9.2
3048	452922.65	5018340.57	92.46	0	D	A	52.7	-23.6	0.0	-1.8	0.0	0.0	30.8
3049	452924.53	5018344.66	92.46	0	D	A	52.7	-23.7	0.0	-1.9	0.0	0.0	30.9
3051	452574.25	5018486.70	93.63	0	D	A	52.7	-31.7	0.0	31.7	0.0	0.0	-10.8
3056	452569.49	5018486.49	93.65	0	D	A	52.7	-32.1	0.0	30.4	0.0	0.0	-9.8
3057	452565.61	5018486.32	93.66	0	D	A	52.7	-31.7	0.0	29.1	0.0	0.0	-8.2
3058	452562.62	5018486.19	93.67	0	D	A	52.7	-35.2	0.0	28.0	0.0	0.0	-10.6
3062	452571.15	5018491.07	93.64	0	D	A	52.7	-27.9	0.0	31.9	0.0	0.0	-7.2
3066	452563.36	5018490.73	93.67	0	D	A	52.7	-32.3	0.0	29.7	0.0	0.0	-9.3
3068	452559.32	5018490.55	93.68	0	D	A	52.7	-31.9	0.0	29.3	0.0	0.0	-8.6
3069	452556.19	5018490.42	93.69	0	D	A	52.7	-35.4	0.0	27.8	0.0	0.0	-10.6
3078	452621.36	5018474.91	94.88	0	D	A	49.4	-23.2	0.0	26.3	0.0	0.0	-0.1
3079	452610.02	5018479.59	94.92	0	D	A	49.4	-25.6	0.0	32.7	0.0	0.0	-8.9
3080	452618.47	5018480.97	94.90	0	D	A	49.4	-21.3	0.0	29.6	0.0	0.0	-1.5
3083	452598.79	5018483.09	93.54	0	D	A	52.7	-24.7	0.0	32.1	0.0	0.0	-4.2
3085	452606.24	5018485.89	93.52	0	D	A	52.7	-35.4	0.0	25.8	0.0	0.0	-8.5
3087	452598.16	5018487.88	93.55	0	D	A	52.7	-24.6	0.0	32.6	0.0	0.0	-4.5
3186	452303.28	5018592.96	94.10	0	D	A	52.7	-41.0	0.0	22.0	0.0	0.0	-10.3
3202	452275.31	5018648.91	94.10	0	D	A	52.7	-28.8	0.0	26.9	0.0	0.0	-3.0
3210	452250.74	5018698.03	94.10	0	D	A	52.7	-36.1	0.0	25.4	0.0	0.0	-8.8
3319	452309.99	5018589.60	94.10	0	D	A	52.7	-40.9	0.0	22.0	0.0	0.0	-10.2
3349	452282.48	5018644.62	94.10	0	D	A	52.7	-28.7	0.0	26.9	0.0	0.0	-3.0

Road, TNM, Name: "Kelly Farm Road", ID: "RD_KFRd"													
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	Ad	Aair	Agr	Afol	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
3379	453101.25	5018042.37	94.16	0	D	A	49.4	-30.8	0.0	18.0	0.0	0.0	0.6
3382	453088.32	5018073.74	94.22	0	D	A	49.4	-33.8	0.0	14.8	0.0	0.0	0.8
3396	453083.48	5018085.49	94.24	0	D	A	49.4	-40.3	0.0	9.2	0.0	0.0	-0.1
3421	453080.00	5018093.94	94.26	0	D	A	49.4	-35.3	0.0	10.9	0.0	0.0	3.3
3431	453073.44	5018109.84	94.29	0	D	A	49.4	-33.3	0.0	14.4	0.0	0.0	1.8
3440	453067.98	5018123.09	94.32	0	D	A	49.4	-37.1	0.0	22.4	0.0	0.0	-10.2
3456	453064.22	5018132.20	94.34	0	D	A	49.4	-35.3	0.0	16.7	0.0	0.0	-2.6
3463	453061.10	5018139.77	94.35	0	D	A	49.4	-39.1	0.0	16.4	0.0	0.0	-6.2
3472	453058.31	5018146.54	94.36	0	D	A	49.4	-35.8	0.0	13.6	0.0	0.0	0.1
3484	453055.56	5018153.22	94.38	0	D	A	49.4	-39.1	0.0	17.7	0.0	0.0	-7.4
3532	453052.12	5018161.56	94.39	0	D	A	49.4	-34.9	0.0	14.8	0.0	0.0	-0.2
3559	453048.14	5018171.20	94.41	0	D	A	49.4	-35.6	0.0	17.2	0.0	0.0	-3.3
3575	453044.66	5018179.64	94.43	0	D	A	49.4	-35.6	0.0	17.0	0.0	0.0	-3.3
3602	453041.36	5018187.66	94.45	0	D	A	49.4	-35.7	0.0	20.4	0.0	0.0	-6.7
3634	453039.18	5018192.94	94.46	0	D	A	49.4	-40.1	0.0	14.5	0.0	0.0	-5.2
3655	453033.90	5018205.76	94.48	0	D	A	49.4	-37.3	0.0	23.1	0.0	0.0	-11.0
3730	453029.70	5018215.95	94.50	0	D	A	49.4	-33.2	0.0	9.1	0.0	0.0	7.1
3734	453107.08	5018040.04	94.15	0	D	A	49.4	-31.8	0.0	18.1	0.0	0.0	-0.5
3735	453095.74	5018067.56	94.20	0	D	A	49.4	-33.9	0.0	14.7	0.0	0.0	0.8
3751	453090.80	5018079.55	94.23	0	D	A	49.4	-40.4	0.0	9.0	0.0	0.0	-0.0
3827	453087.25	5018088.16	94.25	0	D	A	49.4	-35.4	0.0	10.6	0.0	0.0	3.4
3849	453080.56	5018104.37	94.28	0	D	A	49.4	-33.3	0.0	14.2	0.0	0.0	1.8
3854	453075.00	5018117.87	94.30	0	D	A	49.4	-37.2	0.0	22.1	0.0	0.0	-9.9
3873	453071.17	5018127.16	94.32	0	D	A	49.4	-35.4	0.0	16.5	0.0	0.0	-2.5
3885	453067.98	5018134.88	94.34	0	D	A	49.4	-39.2	0.0	16.3	0.0	0.0	-6.1
3894	453065.14	5018141.78	94.35	0	D	A	49.4	-35.9	0.0	13.5	0.0	0.0	0.1
3897	453062.33	5018148.59	94.37	0	D	A	49.4	-39.1	0.0	17.5	0.0	0.0	-7.3
3940	453058.83	5018157.09	94.38	0	D	A	49.4	-34.9	0.0	14.6	0.0	0.0	-0.1
3952	453054.77	5018166.93	94.40	0	D	A	49.4	-35.6	0.0	16.9	0.0	0.0	-3.1
3972	453051.23	5018175.53	94.42	0	D	A	49.4	-35.7	0.0	16.7	0.0	0.0	-3.0
3994	453047.86	5018183.70	94.44	0	D	A	49.4	-35.8	0.0	20.1	0.0	0.0	-6.4
4009	453045.64	5018189.09	94.45	0	D	A	49.4	-40.2	0.0	14.6	0.0	0.0	-5.4
4035	453040.25	5018202.16	94.47	0	D	A	49.4	-37.4	0.0	22.2	0.0	0.0	-10.2
4073	453035.48	5018213.73	94.50	0	D	A	49.4	-32.5	0.0	7.2	0.0	0.0	9.7
4239	452922.65	5018340.57	96.02	0	D	A	51.3	-23.6	0.0	-2.1	0.0	0.0	29.8
4240	452924.53	5018344.66	96.02	0	D	A	51.3	-23.7	0.0	-2.3	0.0	0.0	29.9
4241	452574.25	5018486.70	97.19	0	D	A	51.3	-31.7	0.0	30.4	0.0	0.0	-10.8
4245	452569.49	5018486.49	97.21	0	D	A	51.3	-32.1	0.0	28.8	0.0	0.0	-9.5
4247	452565.61	5018486.32	97.22	0	D	A	51.3	-31.7	0.0	29.1	0.0	0.0	-9.5
4258	452571.15	5018491.07	97.20	0	D	A	51.3	-27.9	0.0	30.5	0.0	0.0	-7.1
4262	452563.36	5018490.73	97.23	0	D	A	51.3	-32.3	0.0	27.9	0.0	0.0	-8.8
4264	452559.32	5018490.55	97.24	0	D	A	51.3	-31.9	0.0	27.3	0.0	0.0	-7.9
4294	453026.66	5018223.20	93.08	0	D	A	52.7	-39.9	0.0	18.2	0.0	0.0	-5.5
4319	453024.74	5018227.40	93.07	0	D	A	52.7	-36.0	0.0	25.3	0.0	0.0	-8.7
4329	453019.34	5018239.22	93.01	0	D	A	52.7	-36.7	0.0	24.1	0.0	0.0	-8.1
4340	453016.88	5018244.59	92.99	0	D	A	52.7	-35.6	0.0	27.4	0.0	0.0	-10.4
4343	453013.35	5018252.33	92.95	0	D	A	52.7	-33.4	0.0	24.2	0.0	0.0	-5.0
4348	453009.43	5018260.92	92.92	0	D	A	52.7	-34.2	0.0	23.6	0.0	0.0	-5.1
4354	453007.19	5018265.82	92.89	0	D	A	52.7	-39.7	0.0	16.6	0.0	0.0	-3.6
4361	453005.61	5018269.29	92.88	0	D	A	52.7	-36.0	0.0	23.6	0.0	0.0	-7.0
4364	453002.83	5018275.38	92.85	0	D	A	52.7	-34.1	0.0	17.5	0.0	0.0	1.1
4366	452999.27	5018283.18	92.82	0	D	A	52.7	-33.4	0.0	13.1	0.0	0.0	6.1
4374	453030.57	5018225.46	93.08	0	D	A	52.7	-38.8	0.0	24.5	0.0	0.0	-10.6
4378	453028.32	5018230.39	93.06	0	D	A	52.7	-35.6	0.0	27.3	0.0	0.0	-10.3
4379	453025.70	5018236.13	93.04	0	D	A	52.7	-36.8	0.0	23.6	0.0	0.0	-7.7
4385	453023.19	5018241.61	93.01	0	D	A	52.7	-35.7	0.0	26.1	0.0	0.0	-9.2
4388	453019.59	5018249.50	92.98	0	D	A	52.7	-33.5	0.0	22.6	0.0	0.0	-3.5
4390	453015.58	5018258.28	92.94	0	D	A	52.7	-34.3	0.0	22.1	0.0	0.0	-3.8
4394	453013.30	5018263.28	92.91	0	D	A	52.7	-39.8	0.0	15.9	0.0	0.0	-2.9
4396	453011.68	5018266.82	92.90	0	D	A	52.7	-36.1	0.0	23.1	0.0	0.0	-6.6
4397	453008.85	5018273.03	92.87	0	D	A	52.7	-34.1	0.0	16.9	0.0	0.0	1.6
4398	453004.31	5018282.98	92.83	0	D	A	52.7	-31.8	0.0	12.5	0.0	0.0	8.4
4407	452390.38	5018474.67	94.10	0	D	A	52.7	-31.5	0.0	28.3	0.0	0.0	-7.1

Road, TNM, Name: "Kelly Farm Road", ID: "RD_KFRd"													
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	Ad	Aair	Agr	Afol	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
4677	452598.79	5018483.09	97.10	0	D	A	51.3	-24.7	0.0	32.9	0.0	0.0	-6.3
4679	452606.24	5018485.89	97.08	0	D	A	51.3	-35.4	0.0	23.0	0.0	0.0	-7.1
4680	452598.16	5018487.88	97.11	0	D	A	51.3	-24.6	0.0	32.3	0.0	0.0	-5.6
4699	452313.07	5018573.37	97.66	0	D	A	51.3	-34.1	0.0	25.8	0.0	0.0	-8.5
4747	452305.82	5018587.89	97.66	0	D	A	51.3	-37.2	0.0	23.2	0.0	0.0	-9.1
4762	452303.28	5018592.96	97.66	0	D	A	51.3	-41.0	0.0	17.4	0.0	0.0	-7.1
4781	452275.31	5018648.91	97.66	0	D	A	51.3	-28.8	0.0	24.4	0.0	0.0	-1.9
4783	452255.72	5018688.08	97.66	0	D	A	51.3	-39.5	0.0	21.5	0.0	0.0	-9.7
4784	452250.74	5018698.03	97.66	0	D	A	51.3	-36.1	0.0	21.5	0.0	0.0	-6.3
4790	452318.65	5018572.27	97.66	0	D	A	51.3	-35.5	0.0	21.7	0.0	0.0	-5.9
4826	452312.48	5018584.61	97.66	0	D	A	51.3	-37.1	0.0	23.2	0.0	0.0	-9.0
4837	452309.99	5018589.60	97.66	0	D	A	51.3	-40.9	0.0	17.4	0.0	0.0	-7.0
4866	452282.48	5018644.62	97.66	0	D	A	51.3	-28.7	0.0	24.4	0.0	0.0	-1.9
4869	452263.21	5018683.15	97.66	0	D	A	51.3	-39.4	0.0	21.5	0.0	0.0	-9.6
4871	452258.22	5018693.14	97.66	0	D	A	51.3	-35.9	0.0	24.3	0.0	0.0	-8.9
4886	452586.83	5018485.63	93.58	0	D	A	52.7	-29.0	0.0	31.6	0.0	0.0	-8.0
4888	452579.79	5018486.37	93.61	0	D	A	52.7	-28.2	0.0	31.3	0.0	0.0	-6.8
4889	452587.68	5018490.07	93.58	0	D	A	52.7	-29.8	0.0	32.7	0.0	0.0	-9.8
4890	452580.99	5018490.77	93.61	0	D	A	52.7	-28.2	0.0	31.9	0.0	0.0	-7.5
5092	453026.66	5018223.20	96.64	0	D	A	51.3	-39.9	0.0	15.9	0.0	0.0	-4.5
5111	453024.74	5018227.40	96.63	0	D	A	51.3	-36.0	0.0	21.6	0.0	0.0	-6.3
5113	453021.91	5018233.59	96.60	0	D	A	51.3	-35.5	0.0	24.2	0.0	0.0	-8.4
5115	453019.34	5018239.22	96.57	0	D	A	51.3	-36.7	0.0	24.0	0.0	0.0	-9.4
5120	453016.88	5018244.59	96.55	0	D	A	51.3	-35.6	0.0	23.7	0.0	0.0	-8.1
5125	453013.35	5018252.33	96.51	0	D	A	51.3	-33.4	0.0	19.7	0.0	0.0	-1.8
5129	453009.43	5018260.92	96.48	0	D	A	51.3	-34.2	0.0	18.7	0.0	0.0	-1.6
5137	453007.19	5018265.82	96.45	0	D	A	51.3	-39.7	0.0	16.2	0.0	0.0	-4.6
5140	453005.61	5018269.29	96.44	0	D	A	51.3	-36.0	0.0	23.0	0.0	0.0	-7.7
5142	453002.83	5018275.38	96.41	0	D	A	51.3	-34.1	0.0	15.5	0.0	0.0	1.8
5144	452999.27	5018283.18	96.38	0	D	A	51.3	-33.4	0.0	11.3	0.0	0.0	6.6
5153	453030.57	5018225.46	96.64	0	D	A	51.3	-38.8	0.0	20.7	0.0	0.0	-8.2
5159	453028.32	5018230.39	96.62	0	D	A	51.3	-35.6	0.0	22.8	0.0	0.0	-7.1
5162	453025.70	5018236.13	96.60	0	D	A	51.3	-36.8	0.0	21.5	0.0	0.0	-7.0
5167	453023.19	5018241.61	96.57	0	D	A	51.3	-35.7	0.0	21.3	0.0	0.0	-5.8
5171	453019.59	5018249.50	96.54	0	D	A	51.3	-33.5	0.0	17.7	0.0	0.0	0.1
5173	453015.58	5018258.28	96.50	0	D	A	51.3	-34.3	0.0	17.3	0.0	0.0	-0.3
5190	453013.30	5018263.28	96.47	0	D	A	51.3	-39.8	0.0	14.2	0.0	0.0	-2.7
5191	453011.68	5018266.82	96.46	0	D	A	51.3	-36.1	0.0	21.4	0.0	0.0	-6.2
5192	453008.85	5018273.03	96.43	0	D	A	51.3	-34.1	0.0	13.9	0.0	0.0	3.3
5194	453004.31	5018282.98	96.39	0	D	A	51.3	-31.8	0.0	10.0	0.0	0.0	9.5
5196	452496.39	5018468.76	93.90	0	D	A	52.7	-33.4	0.0	29.1	0.0	0.0	-9.8
5211	452491.09	5018471.31	93.91	0	D	A	52.7	-32.3	0.0	31.3	0.0	0.0	-10.9
5220	452390.38	5018474.67	97.66	0	D	A	51.3	-31.5	0.0	23.6	0.0	0.0	-3.8
5273	452355.92	5018511.60	97.66	0	D	A	51.3	-30.3	0.0	26.2	0.0	0.0	-5.1
5603	452922.65	5018340.57	93.89	0	D	A	49.4	-23.6	0.0	-3.1	0.0	0.0	28.8
5604	452924.53	5018344.66	93.89	0	D	A	49.4	-23.7	0.0	-3.2	0.0	0.0	28.9
5623	452571.15	5018491.07	95.06	0	D	A	49.4	-27.9	0.0	31.8	0.0	0.0	-10.3
5709	452994.64	5018289.93	92.77	0	D	A	52.7	-33.2	0.0	13.0	0.0	0.0	6.5
5710	452982.39	5018302.51	92.66	0	D	A	52.7	-28.2	0.0	-1.6	0.0	0.0	26.1
5711	452988.79	5018302.39	92.69	0	D	A	52.7	-27.0	0.0	-1.7	0.0	0.0	27.3
5713	452586.83	5018485.63	97.14	0	D	A	51.3	-29.0	0.0	32.1	0.0	0.0	-9.8
5717	452579.79	5018486.37	97.17	0	D	A	51.3	-28.2	0.0	32.2	0.0	0.0	-9.0
5720	452587.68	5018490.07	97.14	0	D	A	51.3	-29.8	0.0	31.3	0.0	0.0	-9.8
5725	452580.99	5018490.77	97.17	0	D	A	51.3	-28.2	0.0	30.9	0.0	0.0	-7.8
5730	452952.97	5018325.02	92.44	0	D	A	52.7	-27.1	0.0	-2.0	0.0	0.0	27.6
5731	452955.30	5018328.87	92.44	0	D	A	52.7	-27.1	0.0	-1.7	0.0	0.0	27.3
6373	452598.79	5018483.09	94.97	0	D	A	49.4	-24.7	0.0	32.2	0.0	0.0	-7.5
6376	452606.24	5018485.89	94.94	0	D	A	49.4	-35.4	0.0	24.7	0.0	0.0	-10.7
6377	452598.16	5018487.88	94.97	0	D	A	49.4	-24.6	0.0	32.1	0.0	0.0	-7.3
6484	452275.31	5018648.91	95.53	0	D	A	49.4	-28.8	0.0	25.9	0.0	0.0	-5.3
6571	452282.48	5018644.62	95.53	0	D	A	49.4	-28.7	0.0	25.9	0.0	0.0	-5.3
6587	452496.39	5018468.76	97.46	0	D	A	51.3	-33.4	0.0	28.5	0.0	0.0	-10.5
6790	453026.66	5018223.20	94.51	0	D	A	49.4	-39.9	0.0	19.2	0.0	0.0	-9.7

Road, TNM, Name: "Kelly Farm Road", ID: "RD_KFRd"													
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	Ad	Aair	Agr	Afol	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
6823	453013.35	5018252.33	94.38	0	D	A	49.4	-33.4	0.0	23.4	0.0	0.0	-7.5
6827	453009.43	5018260.92	94.34	0	D	A	49.4	-34.2	0.0	23.8	0.0	0.0	-8.6
6834	453007.19	5018265.82	94.32	0	D	A	49.4	-39.7	0.0	17.7	0.0	0.0	-8.0
6840	453005.61	5018269.29	94.30	0	D	A	49.4	-36.0	0.0	24.4	0.0	0.0	-11.1
6841	453002.83	5018275.38	94.28	0	D	A	49.4	-34.1	0.0	18.0	0.0	0.0	-2.6
6842	452999.27	5018283.18	94.24	0	D	A	49.4	-33.4	0.0	13.7	0.0	0.0	2.3
6873	453019.59	5018249.50	94.40	0	D	A	49.4	-33.5	0.0	23.2	0.0	0.0	-7.3
6881	453015.58	5018258.28	94.36	0	D	A	49.4	-34.3	0.0	23.0	0.0	0.0	-7.9
6888	453013.30	5018263.28	94.34	0	D	A	49.4	-39.8	0.0	17.0	0.0	0.0	-7.4
6889	453011.68	5018266.82	94.32	0	D	A	49.4	-36.1	0.0	23.9	0.0	0.0	-10.6
6893	453008.85	5018273.03	94.30	0	D	A	49.4	-34.1	0.0	17.8	0.0	0.0	-2.5
6894	453004.31	5018282.98	94.25	0	D	A	49.4	-31.8	0.0	13.5	0.0	0.0	4.1
6897	452390.38	5018474.67	95.52	0	D	A	49.4	-31.5	0.0	26.9	0.0	0.0	-8.9
7196	452244.63	5018711.45	94.10	0	D	A	52.7	-36.8	0.0	26.5	0.0	0.0	-10.6
7200	452232.18	5018741.95	94.10	0	D	A	52.7	-32.2	0.0	28.8	0.0	0.0	-8.3
7201	452217.48	5018777.96	94.10	0	D	A	52.7	-33.8	0.0	28.8	0.0	0.0	-9.9
7206	452239.13	5018736.81	94.10	0	D	A	52.7	-32.1	0.0	28.8	0.0	0.0	-8.3
7207	452224.65	5018772.30	94.10	0	D	A	52.7	-33.7	0.0	28.8	0.0	0.0	-9.9
7347	452994.64	5018289.93	96.33	0	D	A	51.3	-33.2	0.0	10.5	0.0	0.0	7.6
7348	452982.39	5018302.51	96.22	0	D	A	51.3	-28.2	0.0	-2.1	0.0	0.0	25.3
7349	452988.79	5018302.39	96.25	0	D	A	51.3	-27.0	0.0	-2.1	0.0	0.0	26.4
7561	452325.25	5018549.08	94.10	0	D	A	52.7	-30.4	0.0	29.5	0.0	0.0	-7.2
7586	452331.61	5018546.44	94.10	0	D	A	52.7	-30.4	0.0	29.8	0.0	0.0	-7.4
7595	452952.97	5018325.02	96.00	0	D	A	51.3	-27.1	0.0	-2.4	0.0	0.0	26.6
7596	452955.30	5018328.87	96.00	0	D	A	51.3	-27.1	0.0	-2.1	0.0	0.0	26.3
8126	452580.99	5018490.77	95.03	0	D	A	49.4	-28.2	0.0	31.6	0.0	0.0	-10.5
8140	452451.84	5018459.74	94.03	0	D	A	52.7	-31.1	0.0	32.6	0.0	0.0	-11.0
8204	452244.63	5018711.45	97.66	0	D	A	51.3	-36.8	0.0	22.0	0.0	0.0	-7.5
8206	452232.18	5018741.95	97.66	0	D	A	51.3	-32.2	0.0	25.2	0.0	0.0	-6.0
8208	452217.48	5018777.96	97.66	0	D	A	51.3	-33.8	0.0	25.0	0.0	0.0	-7.5
8209	452207.98	5018801.24	97.66	0	D	A	51.3	-37.2	0.0	25.1	0.0	0.0	-11.1
8214	452239.13	5018736.81	97.66	0	D	A	51.3	-32.1	0.0	25.2	0.0	0.0	-6.0
8215	452224.65	5018772.30	97.66	0	D	A	51.3	-33.7	0.0	25.0	0.0	0.0	-7.4
8216	452213.69	5018799.14	97.66	0	D	A	51.3	-35.4	0.0	25.1	0.0	0.0	-9.2
8599	452335.30	5018529.05	97.66	0	D	A	51.3	-34.1	0.0	20.2	0.0	0.0	-3.0
8644	452325.25	5018549.08	97.66	0	D	A	51.3	-30.4	0.0	16.6	0.0	0.0	4.3
8670	452341.20	5018527.33	97.66	0	D	A	51.3	-34.5	0.0	21.0	0.0	0.0	-4.2
8675	452331.61	5018546.44	97.66	0	D	A	51.3	-30.4	0.0	16.5	0.0	0.0	4.5
9143	452994.64	5018289.93	94.20	0	D	A	49.4	-33.2	0.0	13.5	0.0	0.0	2.8
9144	452982.39	5018302.51	94.09	0	D	A	49.4	-28.2	0.0	-3.0	0.0	0.0	24.2
9145	452988.79	5018302.39	94.12	0	D	A	49.4	-27.0	0.0	-3.0	0.0	0.0	25.3
9162	452952.97	5018325.02	93.86	0	D	A	49.4	-27.1	0.0	-3.3	0.0	0.0	25.6
9163	452955.30	5018328.87	93.86	0	D	A	49.4	-27.1	0.0	-3.0	0.0	0.0	25.3
9183	452451.84	5018459.74	97.59	0	D	A	51.3	-31.1	0.0	29.0	0.0	0.0	-8.7
9682	453121.56	5017964.72	92.81	0	D	A	52.7	-30.3	0.0	13.7	0.0	0.0	8.6
9688	453126.01	5017965.37	92.81	0	D	A	52.7	-30.4	0.0	13.9	0.0	0.0	8.4
0164	452232.18	5018741.95	95.53	0	D	A	49.4	-32.2	0.0	27.8	0.0	0.0	-10.5
0172	452239.13	5018736.81	95.53	0	D	A	49.4	-32.1	0.0	27.8	0.0	0.0	-10.5
0200	452499.40	5018475.10	97.44	0	D	A	51.3	-32.5	0.0	29.5	0.0	0.0	-10.7
0334	452968.80	5018314.98	92.55	0	D	A	52.7	-31.1	0.0	-1.7	0.0	0.0	23.3
0335	452971.39	5018318.66	92.55	0	D	A	52.7	-31.1	0.0	-1.9	0.0	0.0	23.5
0453	452325.25	5018549.08	95.53	0	D	A	49.4	-30.4	0.0	27.7	0.0	0.0	-8.7
0467	452331.61	5018546.44	95.53	0	D	A	49.4	-30.4	0.0	27.8	0.0	0.0	-8.7
0492	452464.37	5018456.36	97.55	0	D	A	51.3	-33.1	0.0	28.6	0.0	0.0	-10.4
0532	453121.56	5017964.72	96.37	0	D	A	51.3	-30.3	0.0	11.8	0.0	0.0	9.2
0534	453126.01	5017965.37	96.37	0	D	A	51.3	-30.4	0.0	11.9	0.0	0.0	9.0
0889	452968.80	5018314.98	96.11	0	D	A	51.3	-31.1	0.0	-2.2	0.0	0.0	22.4
0890	452971.39	5018318.66	96.11	0	D	A	51.3	-31.1	0.0	-2.4	0.0	0.0	22.5
1157	453132.20	5017910.09	92.92	0	D	A	52.7	-32.9	0.0	-0.8	0.0	0.0	20.6
1158	453136.54	5017911.26	92.92	0	D	A	52.7	-32.9	0.0	-0.8	0.0	0.0	20.6
1280	453121.56	5017964.72	94.23	0	D	A	49.4	-30.3	0.0	12.7	0.0	0.0	6.4
1281	453126.01	5017965.37	94.23	0	D	A	49.4	-30.4	0.0	12.7	0.0	0.0	6.3
1814	453132.20	5017910.09	96.48	0	D	A	51.3	-32.9	0.0	-1.9	0.0	0.0	20.3

Road, TNM, Name: "Kelly Farm Road", ID: "RD_KFRd"													
Nr.	X	Y	Z	Ref.	DEN	Freq.	Lw	Ad	Aair	Agr	Afol	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
1816	453136.54	5017911.26	96.48	0	D	A	51.3	-32.9	0.0	-1.9	0.0	0.0	20.3
1817	452968.80	5018314.98	93.97	0	D	A	49.4	-31.1	0.0	-3.0	0.0	0.0	21.3
1818	452971.39	5018318.66	93.97	0	D	A	49.4	-31.1	0.0	-3.2	0.0	0.0	21.5
1823	453114.07	5018006.99	92.71	0	D	A	52.7	-35.2	0.0	17.8	0.0	0.0	-0.3
1836	453110.76	5018018.64	92.69	0	D	A	52.7	-41.1	0.0	18.7	0.0	0.0	-7.2
1839	453119.41	5018004.66	92.72	0	D	A	52.7	-37.4	0.0	17.6	0.0	0.0	-2.3
1849	453116.10	5018016.30	92.70	0	D	A	52.7	-37.2	0.0	19.0	0.0	0.0	-3.5
2656	453114.07	5018006.99	96.27	0	D	A	51.3	-35.2	0.0	15.9	0.0	0.0	0.2
2661	453110.76	5018018.64	96.25	0	D	A	51.3	-41.1	0.0	16.3	0.0	0.0	-6.1
2663	453119.41	5018004.66	96.28	0	D	A	51.3	-37.4	0.0	15.6	0.0	0.0	-1.6
2673	453116.10	5018016.30	96.26	0	D	A	51.3	-37.2	0.0	16.6	0.0	0.0	-2.4
2674	453144.62	5017877.74	92.97	0	D	A	52.7	-35.8	0.0	-0.8	0.0	0.0	17.7
2675	453148.46	5017880.09	92.97	0	D	A	52.7	-35.8	0.0	-0.8	0.0	0.0	17.7
2676	453132.20	5017910.09	94.34	0	D	A	49.4	-32.9	0.0	-2.6	0.0	0.0	19.1
2677	453136.54	5017911.26	94.34	0	D	A	49.4	-32.9	0.0	-2.6	0.0	0.0	19.1
3657	453144.62	5017877.74	96.53	0	D	A	51.3	-35.8	0.0	-1.9	0.0	0.0	17.4
3658	453148.46	5017880.09	96.53	0	D	A	51.3	-35.8	0.0	-1.8	0.0	0.0	17.4
3663	453114.07	5018006.99	94.14	0	D	A	49.4	-35.2	0.0	16.5	0.0	0.0	-2.3
3667	453110.76	5018018.64	94.12	0	D	A	49.4	-41.1	0.0	18.0	0.0	0.0	-9.8
3672	453119.41	5018004.66	94.15	0	D	A	49.4	-37.4	0.0	16.3	0.0	0.0	-4.3
3674	453116.10	5018016.30	94.12	0	D	A	49.4	-37.2	0.0	18.2	0.0	0.0	-6.0
4470	453144.62	5017877.74	94.39	0	D	A	49.4	-35.8	0.0	-2.6	0.0	0.0	16.2
4471	453148.46	5017880.09	94.39	0	D	A	49.4	-35.8	0.0	-2.6	0.0	0.0	16.2

Road, TNM, Name: "Findlay Road", ID: "RD_FRd"													
Nr.	X	Y	Z	Ref.	DEN	Freq.	Lw	Ad	Aair	Agr	Afol	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
557	452809.26	5018193.29	93.10	0	D	A	52.7	-20.8	0.0	-0.5	0.0	0.0	32.3
560	452810.78	5018189.05	93.10	0	D	A	52.7	-21.0	0.0	-0.5	0.0	0.0	32.1
2362	453201.81	5018577.05	93.10	0	D	A	52.7	-23.9	0.0	-1.7	0.0	0.0	30.5
2363	453203.99	5018573.11	93.10	0	D	A	52.7	-23.9	0.0	-1.7	0.0	0.0	30.5
2364	452809.26	5018193.29	96.66	0	D	A	51.3	-20.8	0.0	-1.5	0.0	0.0	32.0
2365	452810.78	5018189.05	96.66	0	D	A	51.3	-21.0	0.0	-1.4	0.0	0.0	31.6
2366	452960.49	5018352.97	92.36	0	D	A	52.7	-22.3	0.0	-2.6	0.0	0.0	33.0
2367	452964.62	5018351.17	92.36	0	D	A	52.7	-22.5	0.0	-2.5	0.0	0.0	32.7
3074	453201.81	5018577.05	96.66	0	D	A	51.3	-23.9	0.0	-2.6	0.0	0.0	30.1
3075	453203.99	5018573.11	96.66	0	D	A	51.3	-23.9	0.0	-2.6	0.0	0.0	30.1
3076	452960.49	5018352.97	95.92	0	D	A	51.3	-22.3	0.0	-2.9	0.0	0.0	31.9
3077	452964.62	5018351.17	95.92	0	D	A	51.3	-22.5	0.0	-2.9	0.0	0.0	31.7
3081	452693.98	5018175.25	93.24	0	D	A	52.7	-23.5	0.0	5.5	0.0	0.0	23.6
3082	452693.62	5018170.77	93.24	0	D	A	52.7	-23.7	0.0	5.4	0.0	0.0	23.6
3368	452809.26	5018193.29	94.53	0	D	A	49.4	-20.8	0.0	-1.6	0.0	0.0	30.2
3369	452810.78	5018189.05	94.53	0	D	A	49.4	-21.0	0.0	-1.7	0.0	0.0	30.1
4095	452923.01	5018273.98	92.58	0	D	A	52.7	-37.6	0.0	10.1	0.0	0.0	5.0
4107	452923.79	5018275.54	92.57	0	D	A	52.7	-39.6	0.0	8.0	0.0	0.0	5.1
4118	452924.41	5018276.75	92.57	0	D	A	52.7	-39.5	0.0	18.0	0.0	0.0	-4.9
4123	452925.17	5018278.27	92.57	0	D	A	52.7	-37.8	0.0	24.6	0.0	0.0	-9.7
4144	452927.90	5018283.66	92.55	0	D	A	52.7	-37.1	0.0	22.8	0.0	0.0	-7.3
4151	452932.16	5018292.09	92.53	0	D	A	52.7	-30.7	0.0	16.6	0.0	0.0	5.4
4152	452935.15	5018298.00	92.51	0	D	A	52.7	-36.5	0.0	10.8	0.0	0.0	5.4
4153	452940.23	5018308.05	92.48	0	D	A	52.7	-28.0	0.0	-1.6	0.0	0.0	26.2
4165	452927.00	5018271.90	92.58	0	D	A	52.7	-38.0	0.0	9.6	0.0	0.0	5.1
4180	452927.77	5018273.42	92.57	0	D	A	52.7	-39.7	0.0	7.7	0.0	0.0	5.3
4195	452928.39	5018274.65	92.57	0	D	A	52.7	-39.6	0.0	17.6	0.0	0.0	-4.6
4201	452929.17	5018276.20	92.57	0	D	A	52.7	-37.9	0.0	23.8	0.0	0.0	-9.0
4227	452931.95	5018281.70	92.55	0	D	A	52.7	-37.2	0.0	22.8	0.0	0.0	-7.4
4235	452933.19	5018284.15	92.54	0	D	A	52.7	-36.2	0.0	20.8	0.0	0.0	-4.3
4236	452936.29	5018290.28	92.52	0	D	A	52.7	-30.8	0.0	16.0	0.0	0.0	5.9
4237	452939.33	5018296.30	92.51	0	D	A	52.7	-36.6	0.0	10.6	0.0	0.0	5.4
4238	452944.34	5018306.19	92.48	0	D	A	52.7	-28.3	0.0	-1.6	0.0	0.0	26.0
4667	452566.97	5018165.34	93.11	0	D	A	52.7	-25.8	0.0	35.6	0.0	0.0	-8.7
4669	452565.56	5018160.27	93.11	0	D	A	52.7	-25.4	0.0	35.5	0.0	0.0	-8.2
4670	452742.55	5018175.05	93.13	0	D	A	52.7	-24.6	0.0	3.7	0.0	0.0	24.4

Road, TNM, Name: "Findlay Road", ID: "RD_FRd"

Nr.	X	Y	Z	Ref.	DEN	Freq.	Lw	Ad	Aair	Agr	Afol	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
4671	452742.95	5018170.57	93.13	0	D	A	52.7	-24.8	0.0	3.6	0.0	0.0	24.3
4672	452656.43	5018177.51	93.28	0	D	A	52.7	-24.8	0.0	5.6	0.0	0.0	22.2
4673	452656.29	5018173.01	93.28	0	D	A	52.7	-25.0	0.0	5.5	0.0	0.0	22.2
4674	452693.98	5018175.25	96.80	0	D	A	51.3	-23.5	0.0	1.5	0.0	0.0	26.3
4676	452693.62	5018170.77	96.80	0	D	A	51.3	-23.7	0.0	1.6	0.0	0.0	26.0
4681	453201.81	5018577.05	94.53	0	D	A	49.4	-23.9	0.0	-3.4	0.0	0.0	29.0
4682	453203.99	5018573.11	94.53	0	D	A	49.4	-23.9	0.0	-3.4	0.0	0.0	28.9
4878	452960.49	5018352.97	93.79	0	D	A	49.4	-22.3	0.0	-3.9	0.0	0.0	31.0
4879	452964.62	5018351.17	93.79	0	D	A	49.4	-22.5	0.0	-3.8	0.0	0.0	30.8
4880	452599.42	5018173.10	93.16	0	D	A	52.7	-26.4	0.0	34.6	0.0	0.0	-8.4
4881	452616.09	5018176.14	93.20	0	D	A	52.7	-32.7	0.0	5.9	0.0	0.0	14.1
4883	452598.72	5018168.40	93.16	0	D	A	52.7	-27.1	0.0	34.3	0.0	0.0	-8.7
4884	452615.39	5018171.44	93.20	0	D	A	52.7	-31.1	0.0	5.7	0.0	0.0	15.9
4916	452923.01	5018273.98	96.14	0	D	A	51.3	-37.6	0.0	13.4	0.0	0.0	0.4
4960	452923.79	5018275.54	96.13	0	D	A	51.3	-39.6	0.0	10.1	0.0	0.0	1.6
4971	452924.41	5018276.75	96.13	0	D	A	51.3	-39.5	0.0	21.9	0.0	0.0	-10.1
5008	452929.12	5018286.07	96.10	0	D	A	51.3	-36.1	0.0	22.9	0.0	0.0	-7.7
5010	452932.16	5018292.09	96.09	0	D	A	51.3	-30.7	0.0	16.9	0.0	0.0	3.7
5011	452935.15	5018298.00	96.07	0	D	A	51.3	-36.5	0.0	8.5	0.0	0.0	6.3
5012	452940.23	5018308.05	96.04	0	D	A	51.3	-28.0	0.0	-2.4	0.0	0.0	25.7
5033	452927.00	5018271.90	96.14	0	D	A	51.3	-38.0	0.0	11.3	0.0	0.0	2.1
5049	452927.77	5018273.42	96.13	0	D	A	51.3	-39.7	0.0	8.8	0.0	0.0	2.8
5054	452928.39	5018274.65	96.13	0	D	A	51.3	-39.6	0.0	19.9	0.0	0.0	-8.2
5070	452930.44	5018278.72	96.12	0	D	A	51.3	-40.0	0.0	22.2	0.0	0.0	-10.9
5072	452931.07	5018279.95	96.12	0	D	A	51.3	-39.3	0.0	21.7	0.0	0.0	-9.7
5077	452931.95	5018281.70	96.11	0	D	A	51.3	-37.2	0.0	24.5	0.0	0.0	-10.4
5080	452933.19	5018284.15	96.10	0	D	A	51.3	-36.2	0.0	22.1	0.0	0.0	-6.9
5081	452936.29	5018290.28	96.08	0	D	A	51.3	-30.8	0.0	15.6	0.0	0.0	4.9
5082	452939.33	5018296.30	96.07	0	D	A	51.3	-36.6	0.0	8.6	0.0	0.0	6.1
5083	452944.34	5018306.19	96.04	0	D	A	51.3	-28.3	0.0	-2.2	0.0	0.0	25.3
5084	453074.13	5018502.96	92.47	0	D	A	52.7	-26.4	0.0	-2.4	0.0	0.0	28.7
5085	453076.64	5018499.22	92.47	0	D	A	52.7	-26.4	0.0	-2.4	0.0	0.0	28.6
5643	452566.97	5018165.34	96.67	0	D	A	51.3	-25.8	0.0	30.4	0.0	0.0	-4.9
5649	452565.56	5018160.27	96.67	0	D	A	51.3	-25.4	0.0	30.4	0.0	0.0	-4.4
5650	452742.55	5018175.05	96.69	0	D	A	51.3	-24.6	0.0	1.0	0.0	0.0	25.7
5652	452742.95	5018170.57	96.69	0	D	A	51.3	-24.8	0.0	1.1	0.0	0.0	25.5
5654	452890.55	5018233.81	92.85	0	D	A	52.7	-29.2	0.0	9.8	0.0	0.0	13.6
5659	452901.63	5018243.73	92.75	0	D	A	52.7	-29.0	0.0	9.4	0.0	0.0	14.3
5660	452893.82	5018230.70	92.85	0	D	A	52.7	-29.1	0.0	10.0	0.0	0.0	13.6
5664	452904.91	5018240.62	92.74	0	D	A	52.7	-29.3	0.0	9.7	0.0	0.0	13.6
5665	452656.43	5018177.51	96.84	0	D	A	51.3	-24.8	0.0	1.6	0.0	0.0	24.9
5666	452656.29	5018173.01	96.84	0	D	A	51.3	-25.0	0.0	1.6	0.0	0.0	24.7
5668	452914.54	5018260.39	92.64	0	D	A	52.7	-26.4	0.0	10.0	0.0	0.0	16.3
5678	452922.37	5018272.81	92.58	0	D	A	52.7	-41.1	0.0	22.2	0.0	0.0	-10.7
5682	452918.41	5018258.10	92.64	0	D	A	52.7	-26.5	0.0	9.9	0.0	0.0	16.3
5696	452860.03	5018212.94	93.07	0	D	A	52.7	-26.5	0.0	-1.1	0.0	0.0	27.2
5697	452862.02	5018208.90	93.07	0	D	A	52.7	-26.6	0.0	-1.1	0.0	0.0	27.1
5700	452599.42	5018173.10	96.72	0	D	A	51.3	-26.4	0.0	30.7	0.0	0.0	-5.8
5701	452616.09	5018176.14	96.76	0	D	A	51.3	-32.7	0.0	1.9	0.0	0.0	16.7
5704	452598.72	5018168.40	96.72	0	D	A	51.3	-27.1	0.0	30.8	0.0	0.0	-6.5
5706	452615.39	5018171.44	96.76	0	D	A	51.3	-31.1	0.0	1.9	0.0	0.0	18.3
5732	452693.98	5018175.25	94.67	0	D	A	49.4	-23.5	0.0	4.8	0.0	0.0	21.1
5733	452693.62	5018170.77	94.67	0	D	A	49.4	-23.7	0.0	4.6	0.0	0.0	21.0
5935	452453.99	5018132.62	93.58	0	D	A	52.7	-34.5	0.0	28.4	0.0	0.0	-10.3
6300	452447.01	5018125.53	93.67	0	D	A	52.7	-34.6	0.0	28.1	0.0	0.0	-10.0
6578	453074.13	5018502.96	96.03	0	D	A	51.3	-26.4	0.0	-3.0	0.0	0.0	27.9
6579	453076.64	5018499.22	96.03	0	D	A	51.3	-26.4	0.0	-3.0	0.0	0.0	27.9
6625	452982.77	5018403.00	92.21	0	D	A	52.7	-27.1	0.0	-2.9	0.0	0.0	28.4
6626	452986.85	5018401.10	92.21	0	D	A	52.7	-27.2	0.0	-2.8	0.0	0.0	28.2
6627	452629.63	5018177.37	93.25	0	D	A	52.7	-27.1	0.0	5.8	0.0	0.0	19.8
6628	452629.91	5018172.88	93.25	0	D	A	52.7	-27.3	0.0	5.6	0.0	0.0	19.8
6634	452923.01	5018273.98	94.00	0	D	A	49.4	-37.6	0.0	12.1	0.0	0.0	-0.3
6651	452923.79	5018275.54	94.00	0	D	A	49.4	-39.6	0.0	9.5	0.0	0.0	0.3

Road, TNM, Name: "Findlay Road", ID: "RD_FRd"

Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	Ad	Aair	Agr	Afol	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
6653	452924.41	5018276.75	94.00	0	D	A	49.4	-39.5	0.0	20.1	0.0	0.0	-10.2
6683	452929.12	5018286.07	93.97	0	D	A	49.4	-36.1	0.0	22.6	0.0	0.0	-9.3
6685	452932.16	5018292.09	93.95	0	D	A	49.4	-30.7	0.0	17.3	0.0	0.0	1.4
6686	452935.15	5018298.00	93.93	0	D	A	49.4	-36.5	0.0	9.8	0.0	0.0	3.1
6687	452940.23	5018308.05	93.90	0	D	A	49.4	-28.0	0.0	-2.9	0.0	0.0	24.3
6699	452927.00	5018271.90	94.00	0	D	A	49.4	-38.0	0.0	11.2	0.0	0.0	0.2
6707	452927.77	5018273.42	94.00	0	D	A	49.4	-39.7	0.0	9.0	0.0	0.0	0.7
6710	452928.39	5018274.65	94.00	0	D	A	49.4	-39.6	0.0	19.4	0.0	0.0	-9.6
6734	452933.19	5018284.15	93.97	0	D	A	49.4	-36.2	0.0	22.0	0.0	0.0	-8.7
6736	452936.29	5018290.28	93.95	0	D	A	49.4	-30.8	0.0	16.7	0.0	0.0	1.9
6737	452939.33	5018296.30	93.93	0	D	A	49.4	-36.6	0.0	9.7	0.0	0.0	3.1
6738	452944.34	5018306.19	93.90	0	D	A	49.4	-28.3	0.0	-2.9	0.0	0.0	24.0
6752	452890.55	5018233.81	96.41	0	D	A	51.3	-29.2	0.0	8.3	0.0	0.0	13.9
6754	452901.63	5018243.73	96.31	0	D	A	51.3	-29.0	0.0	7.0	0.0	0.0	15.3
6755	452893.82	5018230.70	96.41	0	D	A	51.3	-29.1	0.0	8.1	0.0	0.0	14.1
6759	452904.91	5018240.62	96.30	0	D	A	51.3	-29.3	0.0	8.3	0.0	0.0	13.6
6760	453031.58	5018469.87	92.13	0	D	A	52.7	-27.8	0.0	-2.6	0.0	0.0	27.5
6761	453034.78	5018466.70	92.13	0	D	A	52.7	-27.8	0.0	-2.6	0.0	0.0	27.4
7211	452914.54	5018260.39	96.20	0	D	A	51.3	-26.4	0.0	8.2	0.0	0.0	16.8
7216	452918.41	5018258.10	96.20	0	D	A	51.3	-26.5	0.0	8.0	0.0	0.0	16.8
7226	452566.97	5018165.34	94.54	0	D	A	49.4	-25.8	0.0	34.1	0.0	0.0	-10.4
7231	452565.56	5018160.27	94.54	0	D	A	49.4	-25.4	0.0	34.0	0.0	0.0	-10.0
7232	452742.55	5018175.05	94.56	0	D	A	49.4	-24.6	0.0	2.8	0.0	0.0	22.0
7233	452742.95	5018170.57	94.56	0	D	A	49.4	-24.8	0.0	2.6	0.0	0.0	22.0
7234	452860.03	5018212.94	96.63	0	D	A	51.3	-26.5	0.0	-1.9	0.0	0.0	26.7
7235	452862.02	5018208.90	96.63	0	D	A	51.3	-26.6	0.0	-1.8	0.0	0.0	26.5
7350	452656.43	5018177.51	94.71	0	D	A	49.4	-24.8	0.0	4.9	0.0	0.0	19.7
7351	452656.29	5018173.01	94.71	0	D	A	49.4	-25.0	0.0	4.7	0.0	0.0	19.7
7352	453008.81	5018444.69	92.10	0	D	A	52.7	-28.1	0.0	-2.7	0.0	0.0	27.3
7353	453012.31	5018441.87	92.10	0	D	A	52.7	-28.2	0.0	-2.7	0.0	0.0	27.2
7423	452325.14	5018033.67	94.10	0	D	A	52.7	-35.0	0.0	24.8	0.0	0.0	-7.2
7486	452351.50	5018057.61	94.10	0	D	A	52.7	-29.6	0.0	25.1	0.0	0.0	-2.1
7538	452347.91	5018048.27	94.10	0	D	A	52.7	-28.5	0.0	27.0	0.0	0.0	-2.8
7622	452440.09	5018127.97	97.29	0	D	A	51.3	-35.4	0.0	26.5	0.0	0.0	-10.6
7715	452453.99	5018132.62	97.14	0	D	A	51.3	-34.5	0.0	25.7	0.0	0.0	-8.9
7729	452461.63	5018135.18	97.07	0	D	A	51.3	-36.0	0.0	25.6	0.0	0.0	-10.3
7888	452447.01	5018125.53	97.23	0	D	A	51.3	-34.6	0.0	25.2	0.0	0.0	-8.5
8031	452877.27	5018223.03	92.99	0	D	A	52.7	-28.7	0.0	-1.9	0.0	0.0	25.8
8033	452884.43	5018228.45	92.92	0	D	A	52.7	-37.2	0.0	9.8	0.0	0.0	5.7
8034	452880.30	5018219.69	92.98	0	D	A	52.7	-28.7	0.0	-1.9	0.0	0.0	25.9
8035	452887.47	5018225.10	92.91	0	D	A	52.7	-39.2	0.0	9.4	0.0	0.0	4.0
8036	452982.77	5018403.00	95.77	0	D	A	51.3	-27.1	0.0	-3.2	0.0	0.0	27.4
8037	452986.85	5018401.10	95.77	0	D	A	51.3	-27.2	0.0	-3.1	0.0	0.0	27.2
8038	452599.42	5018173.10	94.58	0	D	A	49.4	-26.4	0.0	33.8	0.0	0.0	-10.8
8039	452616.09	5018176.14	94.63	0	D	A	49.4	-32.7	0.0	5.3	0.0	0.0	11.4
8041	452615.39	5018171.44	94.62	0	D	A	49.4	-31.1	0.0	5.1	0.0	0.0	13.3
8120	452629.63	5018177.37	96.81	0	D	A	51.3	-27.1	0.0	1.7	0.0	0.0	22.5
8121	452629.91	5018172.88	96.81	0	D	A	51.3	-27.3	0.0	1.8	0.0	0.0	22.3
8154	453074.13	5018502.96	93.89	0	D	A	49.4	-26.4	0.0	-3.9	0.0	0.0	26.9
8155	453076.64	5018499.22	93.89	0	D	A	49.4	-26.4	0.0	-3.9	0.0	0.0	26.9
8156	453031.58	5018469.87	95.69	0	D	A	51.3	-27.8	0.0	-3.1	0.0	0.0	26.6
8157	453034.78	5018466.70	95.69	0	D	A	51.3	-27.8	0.0	-3.1	0.0	0.0	26.6
8355	452890.55	5018233.81	94.28	0	D	A	49.4	-29.2	0.0	8.9	0.0	0.0	11.3
8359	452901.63	5018243.73	94.17	0	D	A	49.4	-29.0	0.0	10.0	0.0	0.0	10.4
8360	452893.82	5018230.70	94.28	0	D	A	49.4	-29.1	0.0	8.9	0.0	0.0	11.4
8361	452904.91	5018240.62	94.17	0	D	A	49.4	-29.3	0.0	9.7	0.0	0.0	10.4
8362	453008.81	5018444.69	95.66	0	D	A	51.3	-28.1	0.0	-3.2	0.0	0.0	26.3
8363	453012.31	5018441.87	95.66	0	D	A	51.3	-28.2	0.0	-3.2	0.0	0.0	26.3
8429	452325.14	5018033.67	97.66	0	D	A	51.3	-35.5	0.0	23.4	0.0	0.0	-7.6
8504	452351.50	5018057.61	97.66	0	D	A	51.3	-30.1	0.0	23.7	0.0	0.0	-2.5
8580	452347.91	5018048.27	97.66	0	D	A	51.3	-28.7	0.0	23.6	0.0	0.0	-1.0
8812	452373.75	5018077.79	94.10	0	D	A	52.7	-38.1	0.0	22.1	0.0	0.0	-7.5
8875	452389.60	5018091.97	94.10	0	D	A	52.7	-30.4	0.0	14.8	0.0	0.0	7.5

Road, TNM, Name: "Findlay Road", ID: "RD_FRd"

Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	Ad	Aair	Agr	Afol	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
8929	452382.33	5018079.43	94.10	0	D	A	52.7	-32.9	0.0	29.4	0.0	0.0	-9.5
8979	452398.19	5018093.61	94.10	0	D	A	52.7	-32.6	0.0	30.7	0.0	0.0	-10.6
8980	452914.54	5018260.39	94.06	0	D	A	49.4	-26.4	0.0	10.6	0.0	0.0	12.5
8988	452918.41	5018258.10	94.06	0	D	A	49.4	-26.5	0.0	10.4	0.0	0.0	12.6
8999	452877.27	5018223.03	96.55	0	D	A	51.3	-28.7	0.0	-2.6	0.0	0.0	25.2
9000	452884.43	5018228.45	96.48	0	D	A	51.3	-37.2	0.0	7.8	0.0	0.0	6.3
9001	452880.30	5018219.69	96.54	0	D	A	51.3	-28.7	0.0	-2.4	0.0	0.0	25.1
9005	452887.47	5018225.10	96.47	0	D	A	51.3	-39.2	0.0	7.8	0.0	0.0	4.3
9006	452994.36	5018424.99	92.12	0	D	A	52.7	-29.6	0.0	-2.8	0.0	0.0	25.9
9007	452998.16	5018422.59	92.12	0	D	A	52.7	-29.7	0.0	-2.8	0.0	0.0	25.8
9039	452860.03	5018212.94	94.50	0	D	A	49.4	-26.5	0.0	-2.3	0.0	0.0	25.2
9040	452862.02	5018208.90	94.50	0	D	A	49.4	-26.6	0.0	-2.3	0.0	0.0	25.1
9147	452720.39	5018173.54	93.18	0	D	A	52.7	-29.5	0.0	5.4	0.0	0.0	17.8
9148	452720.39	5018169.04	93.18	0	D	A	52.7	-29.7	0.0	5.2	0.0	0.0	17.7
9160	452764.47	5018177.85	93.11	0	D	A	52.7	-29.6	0.0	2.2	0.0	0.0	20.9
9161	452765.56	5018173.49	93.11	0	D	A	52.7	-29.8	0.0	2.1	0.0	0.0	20.9
9689	452982.77	5018403.00	93.63	0	D	A	49.4	-27.1	0.0	-4.2	0.0	0.0	26.5
9690	452986.85	5018401.10	93.63	0	D	A	49.4	-27.2	0.0	-4.1	0.0	0.0	26.3
9712	452629.63	5018177.37	94.67	0	D	A	49.4	-27.1	0.0	5.1	0.0	0.0	17.2
9713	452629.91	5018172.88	94.67	0	D	A	49.4	-27.3	0.0	4.9	0.0	0.0	17.2
9780	452410.59	5018109.96	94.03	0	D	A	52.7	-32.5	0.0	25.6	0.0	0.0	-5.5
9823	452422.09	5018119.08	93.91	0	D	A	52.7	-35.0	0.0	27.9	0.0	0.0	-10.2
9925	452417.51	5018109.71	93.99	0	D	A	52.7	-30.5	0.0	29.8	0.0	0.0	-7.6
9953	453031.58	5018469.87	93.55	0	D	A	49.4	-27.8	0.0	-4.1	0.0	0.0	25.7
9954	453034.78	5018466.70	93.55	0	D	A	49.4	-27.8	0.0	-4.1	0.0	0.0	25.6
0012	452373.75	5018077.79	97.66	0	D	A	51.3	-38.3	0.0	20.2	0.0	0.0	-7.2
0072	452389.60	5018091.97	97.66	0	D	A	51.3	-30.6	0.0	12.1	0.0	0.0	8.6
0105	452382.33	5018079.43	97.66	0	D	A	51.3	-32.9	0.0	26.1	0.0	0.0	-7.7
0160	452398.19	5018093.61	97.66	0	D	A	51.3	-32.7	0.0	28.8	0.0	0.0	-10.2
0176	452994.36	5018424.99	95.68	0	D	A	51.3	-29.6	0.0	-3.2	0.0	0.0	24.9
0177	452998.16	5018422.59	95.68	0	D	A	51.3	-29.7	0.0	-3.2	0.0	0.0	24.8
0319	452720.39	5018173.54	96.74	0	D	A	51.3	-29.5	0.0	1.5	0.0	0.0	20.3
0320	452720.39	5018169.04	96.74	0	D	A	51.3	-29.7	0.0	1.6	0.0	0.0	20.0
0332	453008.81	5018444.69	93.53	0	D	A	49.4	-28.1	0.0	-4.1	0.0	0.0	25.4
0333	453012.31	5018441.87	93.53	0	D	A	49.4	-28.2	0.0	-4.1	0.0	0.0	25.3
0354	452325.14	5018033.67	95.52	0	D	A	49.4	-35.0	0.0	23.0	0.0	0.0	-8.7
0383	452351.50	5018057.61	95.53	0	D	A	49.4	-29.7	0.0	21.6	0.0	0.0	-1.8
0439	452347.91	5018048.27	95.53	0	D	A	49.4	-28.5	0.0	26.1	0.0	0.0	-5.2
0440	452764.47	5018177.85	96.67	0	D	A	51.3	-29.6	0.0	0.2	0.0	0.0	21.5
0441	452765.56	5018173.49	96.67	0	D	A	51.3	-29.8	0.0	0.3	0.0	0.0	21.2
0526	452877.27	5018223.03	94.41	0	D	A	49.4	-28.7	0.0	-3.1	0.0	0.0	23.8
0528	452884.43	5018228.45	94.34	0	D	A	49.4	-37.2	0.0	8.6	0.0	0.0	3.6
0529	452880.30	5018219.69	94.41	0	D	A	49.4	-28.7	0.0	-3.1	0.0	0.0	23.9
0530	452887.47	5018225.10	94.34	0	D	A	49.4	-39.2	0.0	8.3	0.0	0.0	1.8
0662	452410.59	5018109.96	97.59	0	D	A	51.3	-32.6	0.0	22.9	0.0	0.0	-4.2
0724	452422.09	5018119.08	97.47	0	D	A	51.3	-35.0	0.0	25.1	0.0	0.0	-8.8
0870	452417.51	5018109.71	97.55	0	D	A	51.3	-30.5	0.0	27.1	0.0	0.0	-6.3
0956	452373.75	5018077.79	95.53	0	D	A	49.4	-38.1	0.0	20.3	0.0	0.0	-9.0
1031	452389.60	5018091.97	95.53	0	D	A	49.4	-30.4	0.0	14.7	0.0	0.0	4.3
1139	452994.36	5018424.99	93.55	0	D	A	49.4	-29.6	0.0	-4.2	0.0	0.0	24.0
1140	452998.16	5018422.59	93.55	0	D	A	49.4	-29.7	0.0	-4.2	0.0	0.0	23.9
1159	452720.39	5018173.54	94.60	0	D	A	49.4	-29.5	0.0	4.6	0.0	0.0	15.2
1160	452720.39	5018169.04	94.60	0	D	A	49.4	-29.7	0.0	4.5	0.0	0.0	15.2
1170	452764.47	5018177.85	94.53	0	D	A	49.4	-29.6	0.0	1.1	0.0	0.0	18.7
1171	452765.56	5018173.49	94.53	0	D	A	49.4	-29.8	0.0	1.0	0.0	0.0	18.7
1236	452173.89	5017923.81	94.42	0	D	A	52.7	-33.2	0.0	22.7	0.0	0.0	-3.2
1278	452177.34	5017920.91	94.42	0	D	A	52.7	-33.2	0.0	21.4	0.0	0.0	-1.9
1326	452254.93	5017994.03	94.13	0	D	A	52.7	-33.3	0.0	20.4	0.0	0.0	-1.0
1380	452256.98	5017990.02	94.13	0	D	A	52.7	-33.3	0.0	22.7	0.0	0.0	-3.3
1477	452410.59	5018109.96	95.45	0	D	A	49.4	-32.5	0.0	26.1	0.0	0.0	-9.3
1658	452141.52	5017884.43	94.58	0	D	A	52.7	-33.6	0.0	21.5	0.0	0.0	-2.4
1723	452131.60	5017864.89	94.66	0	D	A	52.7	-41.3	0.0	20.9	0.0	0.0	-9.5
1805	452147.94	5017885.23	94.57	0	D	A	52.7	-34.4	0.0	17.9	0.0	0.0	0.4

Road, TNM, Name: "Findlay Road", ID: "RD_FRd"

Nr.	X	Y	Z	Ref.	DEN	Freq.	Lw	Ad	Aair	Agr	Afol	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
1991	452173.89	5017923.81	97.98	0	D	A	51.3	-33.2	0.0	19.0	0.0	0.0	-0.9
2052	452177.34	5017920.91	97.98	0	D	A	51.3	-33.2	0.0	17.5	0.0	0.0	0.6
2108	452254.93	5017994.03	97.69	0	D	A	51.3	-33.3	0.0	16.6	0.0	0.0	1.4
2156	452256.98	5017990.02	97.69	0	D	A	51.3	-33.3	0.0	20.3	0.0	0.0	-2.3
2205	452141.52	5017884.43	98.14	0	D	A	51.3	-33.6	0.0	19.5	0.0	0.0	-1.7
2257	452131.60	5017864.89	98.22	0	D	A	51.3	-41.3	0.0	18.4	0.0	0.0	-8.4
2337	452147.94	5017885.23	98.13	0	D	A	51.3	-34.4	0.0	15.4	0.0	0.0	1.5
2390	452310.80	5018021.81	94.10	0	D	A	52.7	-34.9	0.0	20.7	0.0	0.0	-2.9
2437	452313.53	5018018.22	94.10	0	D	A	52.7	-34.9	0.0	23.5	0.0	0.0	-5.7
2483	452287.16	5018008.81	94.10	0	D	A	52.7	-39.9	0.0	20.2	0.0	0.0	-7.4
2506	452296.82	5018013.15	94.10	0	D	A	52.7	-36.5	0.0	15.9	0.0	0.0	0.2
2546	452293.87	5018006.89	94.10	0	D	A	52.7	-35.7	0.0	20.5	0.0	0.0	-3.6
2583	452303.54	5018011.23	94.10	0	D	A	52.7	-42.4	0.0	15.7	0.0	0.0	-5.4
2634	452432.69	5018120.33	93.83	0	D	A	52.7	-35.4	0.0	25.4	0.0	0.0	-8.2
2717	452173.89	5017923.81	95.85	0	D	A	49.4	-33.2	0.0	21.5	0.0	0.0	-5.3
2754	452177.34	5017920.91	95.85	0	D	A	49.4	-33.2	0.0	20.3	0.0	0.0	-4.1
2800	452310.80	5018021.81	97.66	0	D	A	51.3	-34.9	0.0	17.0	0.0	0.0	-0.5
2838	452313.53	5018018.22	97.66	0	D	A	51.3	-34.9	0.0	22.0	0.0	0.0	-5.6
2885	452287.16	5018008.81	97.66	0	D	A	51.3	-39.9	0.0	16.8	0.0	0.0	-5.4
2946	452296.82	5018013.15	97.66	0	D	A	51.3	-36.5	0.0	13.1	0.0	0.0	1.7
2971	452293.87	5018006.89	97.66	0	D	A	51.3	-35.7	0.0	18.2	0.0	0.0	-2.6
3018	452303.54	5018011.23	97.66	0	D	A	51.3	-42.4	0.0	12.8	0.0	0.0	-3.9
3084	452254.93	5017994.03	95.55	0	D	A	49.4	-33.3	0.0	19.8	0.0	0.0	-3.7
3156	452256.98	5017990.02	95.55	0	D	A	49.4	-33.3	0.0	22.2	0.0	0.0	-6.1
3202	452431.42	5018124.68	97.38	0	D	A	51.3	-34.9	0.0	27.0	0.0	0.0	-10.6
3216	452432.69	5018120.33	97.39	0	D	A	51.3	-35.4	0.0	23.0	0.0	0.0	-7.2
3321	452141.52	5017884.43	96.01	0	D	A	49.4	-33.6	0.0	20.6	0.0	0.0	-4.8
3414	452147.94	5017885.23	95.99	0	D	A	49.4	-34.4	0.0	18.4	0.0	0.0	-3.3
3451	452277.45	5018004.78	94.10	0	D	A	52.7	-36.8	0.0	23.1	0.0	0.0	-7.2
3500	452276.32	5017999.48	94.10	0	D	A	52.7	-39.2	0.0	20.3	0.0	0.0	-6.9
3606	452219.98	5017971.52	94.23	0	D	A	52.7	-37.0	0.0	26.7	0.0	0.0	-11.0
3656	452222.59	5017967.86	94.23	0	D	A	52.7	-37.0	0.0	23.1	0.0	0.0	-7.4
3718	452235.67	5017977.58	94.18	0	D	A	52.7	-37.3	0.0	18.9	0.0	0.0	-3.5
3730	452207.23	5017959.81	94.29	0	D	A	52.7	-37.3	0.0	25.6	0.0	0.0	-10.3
3760	452210.67	5017956.91	94.29	0	D	A	52.7	-37.3	0.0	26.0	0.0	0.0	-10.7
3788	452196.12	5017948.37	94.34	0	D	A	52.7	-37.7	0.0	24.4	0.0	0.0	-9.4
3833	452199.11	5017945.01	94.34	0	D	A	52.7	-37.7	0.0	21.9	0.0	0.0	-6.9
3879	452310.80	5018021.81	95.53	0	D	A	49.4	-34.9	0.0	19.8	0.0	0.0	-5.3
3906	452313.53	5018018.22	95.53	0	D	A	49.4	-34.9	0.0	22.3	0.0	0.0	-7.8
3961	452287.16	5018008.81	95.53	0	D	A	49.4	-39.9	0.0	19.1	0.0	0.0	-9.6
4006	452296.82	5018013.15	95.53	0	D	A	49.4	-36.5	0.0	16.2	0.0	0.0	-3.3
4049	452293.87	5018006.89	95.53	0	D	A	49.4	-35.7	0.0	20.8	0.0	0.0	-7.1
4095	452303.54	5018011.23	95.53	0	D	A	49.4	-42.4	0.0	15.9	0.0	0.0	-8.8
4218	452277.45	5018004.78	97.66	0	D	A	51.3	-36.8	0.0	20.5	0.0	0.0	-6.0
4251	452276.32	5017999.48	97.66	0	D	A	51.3	-39.2	0.0	18.0	0.0	0.0	-5.9
4298	452219.98	5017971.52	97.79	0	D	A	51.3	-37.0	0.0	24.1	0.0	0.0	-9.8
4319	452222.59	5017967.86	97.79	0	D	A	51.3	-37.0	0.0	19.8	0.0	0.0	-5.5
4342	452232.90	5017981.14	97.74	0	D	A	51.3	-37.3	0.0	24.5	0.0	0.0	-10.5
4409	452235.67	5017977.58	97.74	0	D	A	51.3	-37.3	0.0	14.8	0.0	0.0	-0.7
4441	452207.23	5017959.81	97.85	0	D	A	51.3	-37.4	0.0	22.8	0.0	0.0	-8.9
4469	452210.67	5017956.91	97.85	0	D	A	51.3	-37.3	0.0	23.2	0.0	0.0	-9.2
4486	452196.12	5017948.37	97.90	0	D	A	51.3	-37.9	0.0	19.7	0.0	0.0	-6.4
4508	452199.11	5017945.01	97.90	0	D	A	51.3	-38.4	0.0	18.7	0.0	0.0	-5.8
4524	452277.45	5018004.78	95.53	0	D	A	49.4	-36.8	0.0	19.9	0.0	0.0	-7.3
4564	452276.32	5017999.48	95.53	0	D	A	49.4	-39.2	0.0	19.7	0.0	0.0	-9.6
4624	452222.59	5017967.86	95.66	0	D	A	49.4	-37.0	0.0	21.2	0.0	0.0	-8.7
4671	452235.67	5017977.58	95.60	0	D	A	49.4	-37.3	0.0	18.5	0.0	0.0	-6.4
4822	452199.11	5017945.01	95.76	0	D	A	49.4	-37.8	0.0	19.0	0.0	0.0	-7.4