



An Employee-Owned Company

February 9, 2026

Mr. John Ly
U-Stor-It
501 West Broadway, Suite 2020
San Diego, CA 92101

Reference: Noise Analysis for the Winchester Road U-Stor-It Project, County of Riverside, California
(RECON Number 10398)

Dear Mr. Ly:

The purpose of this report is to assess potential noise impacts from construction and operation of the Winchester Road U-Stor-It Project (project). Noise impacts were evaluated using standards established by the County of Riverside (County).

1.0 Project Description

The project site is located at 33890 Winchester Road in the unincorporated community of Winchester in Riverside County, California. The 11.12-acre project site is currently undeveloped. The project is situated immediately southeast of Winchester Road/State Route 79 (SR-79) and south of Elmhurst Lane and Coventry Lane. Land uses surrounding the project site include Commercial Retail (CR) to the west, Open-Space Conservation (OS-C) to the northwest and Rural Residential (RR) to the north, east, and south. Figure 1 shows the regional location. Figure 2 shows an aerial photograph of the project site and vicinity.

The project would construct seven one-story self-storage buildings totaling 113,915 square feet and 130 recreational vehicle storage spaces. The project would also consist of off-site roadway improvements to Coventry Lane and drainage improvements at the Coventry Lane and Keller Road intersection. Further, in accordance with California Department of Transportation (Caltrans) standards and requirements, the project would install an off-site barricade with reflective signage to close access to Elmhurst Lane and Coventry Lane from Winchester Road/SR-79. Construction staging would take place on the project site. Figure 3 shows the proposed site plan.

2.0 Environmental Setting

2.1 Noise Terminology

Sound levels are described in units called the decibel (dB). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3 dB decrease. Additionally, in technical terms, sound levels are described as either a "sound power level" or a "sound pressure level," which while commonly confused, are two distinct characteristics of sound.

Both share the same unit of measure, the dB. However, sound power, expressed as L_{pw} , is the energy converted into sound by the source. The L_{pw} is used to estimate how far a noise will travel and to predict the sound levels at various distances from the source. As sound energy travels through the air, it creates a sound wave that exerts pressure on

receivers such as an eardrum or microphone and is the sound pressure level. Noise measurement instruments only measure sound pressure, and noise level limits used in standards are generally sound pressure levels.

The human ear is not equally sensitive to all frequencies within the sound spectrum. To accommodate this phenomenon, the A-scale, which approximates the frequency response of the average young ear when listening to most ordinary everyday sounds, was devised. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Therefore, the "A-weighted" noise scale is used for measurements and standards involving the human perception of noise. Noise levels using A-weighted measurements are designated with the notation dB(A).

The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important. In addition, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors has been developed. The noise descriptors used for this study are the one-hour equivalent noise level (L_{eq}) and the maximum equivalent noise level (L_{max}). The L_{max} is the maximum generated noise level while the L_{eq} is the average noise level over a specified period of time, typically one-hour. Sound from a small, localized source (approximating a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern, known as geometric spreading. The sound level decreases or drops off at a rate of 6 dB(A) for each doubling of the distance.

The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site (such as parking lots or smooth bodies of water) receives no additional ground attenuation, and the changes in noise levels with distance (drop-off rate) are simply the geometric spreading of the source. A soft site (such as soft dirt, grass, or scattered bushes and trees) receives an additional ground attenuation value of 1.5 dB(A) per doubling of distance. Thus, a point source over a soft site would attenuate at 7.5 dB(A) per doubling of distance.

Human perception of noise has no simple correlation with acoustical energy. A change in noise levels is generally perceived as follows: 3 dB(A) barely perceptible, 5 dB(A) readily perceptible, and 10 dB(A) perceived as a doubling or halving of noise (California Department of Transportation [Caltrans] 2013).

2.2 Applicable Standards

2.2.1 Construction

The County regulates noise in accordance with Chapter 9.52, Noise Regulations of the Riverside County Municipal Code (Municipal Code) Section 9.52.020[1] states that sound emanating from private construction projects located within a quarter mile from an inhabited dwelling is exempt from the provisions of Chapter 9.52, if construction occurs between the hours of 6:00 a.m. and 6:00 p.m. during the months of June through September, and between the hours of 7:00 a.m. and 6:00 p.m. during the months of October through May. The Municipal Code does not establish a quantitative construction noise level limit. For the purposes of this analysis, the Federal Transit Administration recommended threshold of 80 dB(A) L_{eq} at noise sensitive residential land uses was used.

2.2.2 Operation

Section 9.52.030 of the Municipal Code defines a sensitive receptor as a land use that is sensitive to noise including, but not limited to, residences, schools, hospitals, churches, rest homes, cemeteries, or public libraries. Section 9.52.040 establishes noise level standards based on land use designation. The project site as well as the properties to the north, east, and south of the project site are designated as Rural Residential (RR) with a Community Development Overlay (CDO). The property northwest of the project site, across Winchester Road is designated as Commercial

Retail and the properties south of the intersection of Coventry Lane and Keller Road and designated as Medium Density Residential. The noise level limits for the land use designations are summarized in Table 1.

Table 1 County of Riverside Municipal Code Noise Level Limits		
General Plan Land Use Designation	Noise Level Limit [dB(A) L_{eq}]	
	7:00 a.m. – 10:00 p.m.	10:00 p.m. – 7:00 a.m.
Rural Residential	45	45
Medium Density Residential	55	45
Commercial Retail	65	55
dB(A) L_{eq} = A-weighted decibels average noise level SOURCE: County of Riverside Municipal Code Section 9.52.040.		

3.0 Existing Conditions

Existing noise levels in the vicinity of the project site are dominated by vehicle traffic on SR-79. Based on Caltrans traffic and truck counts, the segment of SR-79 adjacent to the project site carries 26,000 daily trips with a vehicle mix of 91.0 percent automobiles, 5.8 percent medium trucks, and 3.2 percent heavy trucks (Caltrans 2022a, 2022b). Using Federal Highway Administration (FHWA) algorithms, it was calculated that existing noise levels on the project site range from approximately 77 Community Noise Equivalent Level (CNEL) at the boundary closest to SR-79 to 66 CNEL at the boundary furthest from SR-79. FHWA traffic noise calculations are provided in Attachment 1.

4.0 Methodology

Noise level predictions and contour mapping for construction and on-site noise sources were developed using noise modeling software, SoundPlan Essential, version 4.1 (Navcon Engineering 2018). SoundPLAN calculates noise propagation based on the International Organization for Standardization method (ISO 9613-2 – Acoustics, Attenuation of Sound during Propagation Outdoors). The model calculates noise levels at selected receiver locations using input parameter estimates such as total noise generated by each noise source; distances between sources, barriers, and receivers; and shielding provided by intervening terrain, barriers, and structures. The model outputs can be developed as noise level contour maps or noise levels at specific receivers. In all cases, receivers were modeled at five feet above ground elevation, which represents the average height of the human ear.

4.1 Construction

Project construction activities would include grading, building construction, paving, and site roadway improvements to Coventry Lane and drainage improvements at the Coventry Lane and Keller Road intersection. Project construction noise would be generated by diesel engine-driven construction equipment used for site preparation and grading, building construction, loading, unloading, and placing materials and paving. Diesel engine-driven trucks would also bring materials to the project site and remove the soils from excavation.

Construction equipment with a diesel engine typically generates maximum noise levels from 70 to 95 dB(A) L_{eq} at a distance of 50 feet (FHWA 2006 and 2008; Federal Transit Authority 2006). During construction, equipment moves to different locations and goes through varying load cycles, and there are breaks for the operators and for non-equipment tasks, such as measurement. Table 2 summarizes typical construction equipment noise levels and duty cycles.

The loudest construction noise levels typically occur during the grading phase. Grading noise levels were modeled assuming the simultaneous operation of a dozer, a loader, and an excavator for a total sound power level of 116 dB(A) L_{pw} . Noise levels were modeled as an area source over the entire footprint of the project site and over the footprint of the off-site roadway and intersection improvements area.

Table 2 Typical Construction Equipment Noise Levels		
Equipment	Noise Level at 50 Feet [dB(A) L_{eq}]	Typical Duty Cycle
Auger Drill Rig	85	20%
Backhoe	80	40%
Blasting	94	1%
Chain Saw	85	20%
Clam Shovel	93	20%
Compactor (ground)	80	20%
Compressor (air)	80	40%
Concrete Mixer Truck	85	40%
Concrete Pump	82	20%
Concrete Saw	90	20%
Crane (mobile or stationary)	85	20%
Dozer	85	40%
Dump Truck	84	40%
Excavator	85	40%
Front End Loader	80	40%
Generator (25 kilovolt amps or less)	70	50%
Generator (more than 25 kilovolt amps)	82	50%
Grader	85	40%
Hydra Break Ram	90	10%
Impact Pile Driver (diesel or drop)	95	20%
In situ Soil Sampling Rig	84	20%
Jackhammer	85	20%
Mounted Impact Hammer (hoe ram)	90	20%
Paver	85	50%
Pneumatic Tools	85	50%
Pumps	77	50%
Rock Drill	85	20%
Roller	74	40%
Scraper	85	40%
Tractor	84	40%
Vacuum Excavator (vac-truck)	85	40%
Vibratory Concrete Mixer	80	20%
Vibratory Pile Driver	95	20%

SOURCE: Federal Highway Administration 2006 and 2008, Federal Transit Authority 2006.
dB(A) L_{eq} = A-weighted decibels average noise level

4.2 Operation

The operational noise sources on the project site are anticipated to be those that would be typical of any RV parking and self-storage facility. Based on similar operational uses, on-site operational noise sources associated with the

project are anticipated to be RV parking, Variable Refrigerant Flow (VRF) units, and heating, ventilation, and air conditioning (HVAC) units.

RV noise at the project site would include idling and air brake activity. Based on noise measurements taken at an RV facility, RV idling and air brakes generate a noise level of 62.4 dB(A) L_{eq} at 50 feet (Urban Crossroads 2017). It was assumed that it would take an RV up to five minutes to park. Taking this duration into account, hourly noise levels would be 51.6 dB(A) L_{eq} at 50 feet per RV, which is equivalent to a sound power level of approximately 83 dB(A). Based on the Traffic Circulation Assessment, the project would generate two peak hour RV trips (Linscott, Law & Greenspan, Engineers 2024). The RV noise level was modeled as an area source at RV parking locations.

The project would also include three VRF outdoor units located adjacent to Buildings E, F, and G. VRF generate a maximum noise level of 58 dB(A) L_{eq} at 3.3 feet from the unit, which is equivalent to a sound power level of 66 dB(A) L_{pw} . The office would also require an HVAC unit. Typically, a capacity of one ton per 340 square feet would be required for large office buildings. It was assumed that the office would have similar cooling requirements. The 967-square-foot office would require a 3-ton unit. Based on review of manufacturer specifications for a sample Carrier unit, a representative noise level for a 3-ton unit would be a sound power level of 73 dB(A) L_{pw} . Specifications for the VRF and HVAC units are provided in Attachment 2.

5.0 Noise Impact Analysis

5.1 Construction

Noise associated with project construction would potentially result in short-term impacts to surrounding properties. As discussed in Section 2.2.2, land uses surrounding the project site consist of Rural Residential uses. The parcel to the west across SR-79 is designated as Commercial Retail in the Keller Crossing Specific Plan. The properties south of the intersection of Coventry Lane and Keller Road and designated as Medium Density Residential. An open space conservation area is located northwest of the project site. Noise levels were modeled at a series of 15 receivers located at the properties adjacent to the project site and the off-site improvement area. The results are summarized in Table 3. Modeled receiver locations and construction noise contours are shown on Figure 4. SoundPLAN data is contained in Attachment 3.

As shown in Figure 4, construction noise levels are not anticipated to exceed the Federal Transit Administration's recommended threshold of 80 dB(A) L_{eq} outside of the project boundary. Noise levels at the adjacent residential uses would be 76 dB(A) L_{eq} or less. Construction activities would only occur during the times allowable by the Municipal Code (6:00 a.m. and 6:00 p.m. during the months of June through September, and between the hours of 7:00 a.m. and 6:00 p.m. during the months of October through May). No construction activities that generate impulsive noise levels would be required. Although the existing nearby residences would be exposed to construction noise levels that could be heard above ambient conditions, the exposure would be temporary and would only occur during the daytime hours. Therefore, temporary increases in noise levels during construction would be less than significant.

Table 3 Construction Noise Levels			
Receiver	Land Use	Construction Noise Level Limit [dB(A) L_{eq}]	Construction Noise Level [dB(A) L_{eq}]
1	Rural Residential	80	67
2	Rural Residential	80	67
3	Rural Residential	80	66
4	Commercial Retail	--	63
5	Rural Residential	80	67
6	Rural Residential	80	74
7	Rural Residential	80	60
8	Rural Residential	80	67
9	Rural Residential	80	74
10	Rural Residential	80	64
11	Rural Residential	80	74
12	Medium Density Residential	80	72
13	Rural Residential	80	76
14	Rural Residential	80	63
15	Rural Residential	80	63

dB(A) L_{eq} = A-weighted decibels equivalent noise level.

5.2 Operation

The operational noise sources on the project site are anticipated to be those that would be typical of any RV parking and self-storage facility. Based on similar operational uses, on-site operational noise sources associated with the project are anticipated to be RV parking, VRF units, and HVAC units. Using the on-site noise source parameters discussed in Section 4.2, noise levels were modeled at a series of 10 receivers located at the adjacent properties. The results are summarized in Table 4. Figure 5 shows the operational noise contours along with the modeled receivers. SoundPLAN data is included in Attachment 4.

Table 4 Operational Noise Levels			
Receiver	Land Use	Noise Level Limit Daytime/Nighttime [dB(A) L_{eq}]	Operational Noise Level [dB(A) L_{eq}]
1	Rural Residential	45/45	35
2	Rural Residential	45/45	34
3	Rural Residential	45/45	27
4	Commercial Retail	65/55	26
5	Rural Residential	45/45	28
6	Rural Residential	45/45	38
7	Rural Residential	45/45	27
8	Rural Residential	45/45	26
9	Rural Residential	45/45	25
10	Rural Residential	45/45	28
11	Rural Residential	45/45	24
12	Medium Density Residential	55/45	22
13	Rural Residential	45/45	23
14	Rural Residential	45/45	22
15	Rural Residential	45/45	23

dB(A) L_{eq} = A-weighted decibels equivalent noise level.

As shown in Table 4, operational noise levels would range from 22 to 38 dB(A) L_{eq} at the adjacent uses. Project operation would not exceed the County's most restrictive noise level limit of 45 dB(A) L_{eq} , and operational noise impacts would be less than significant.

5.3 Vehicle Traffic Noise

The project was also evaluated to determine if the addition of project-generated trips would result in a significant direct or cumulative increase in noise at nearby noise sensitive land uses. The project would increase traffic volumes on local roadways, specifically SR-79, Keller Road, and Coventry Lane. Noise level increases would be greatest nearest the project site, which would represent the greatest concentration of project-related traffic. Traffic noise is primarily a function of volume, vehicle mix, speed, and proximity. For purposes of this evaluation, the vehicle mix, speed, and proximity are assumed to remain constant. Thus, the primary factor affecting noise levels would be increased traffic volumes.

The Federal Interagency Committee on Noise (FICON) guidance provides an established source of criteria to assess the impacts of substantial temporary or permanent increase in baseline ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without project (baseline) noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dB(A) or readily perceptible, 3 dB(A) or barely perceptible, and 1.5 dB(A) depending on the underlying without project noise levels for noise-sensitive uses. These levels of increases and their perceived acceptance are consistent with guidance provided by both the FHWA and Caltrans.

Based on this guidance, long-term traffic noise that affects sensitive land uses would be considered substantial and constitute a significant noise impact if the project would:

- Increase noise levels by 5 dB or more where the no project noise level is less than 60 CNEL;
- Increase noise levels by 3 dB or more where the no project noise level is 60 CNEL to 65 CNEL; or
- Increase noise levels by 1.5 dB or more where the no project noise level is greater than 65 CNEL.

Based on the Traffic Circulation Assessment prepared for the project, the project would generate a total of 183 daily trips (Linscott, Law & Greenspan, Engineers 2024). Based on Caltrans traffic counts, the daily traffic volume on SR-79 in the vicinity of the project site is 26,000 average daily traffic (Caltrans 2022a). The addition of 183 project-related vehicle trips to SR-79 would result in a 0.1 dB increase in noise at 50 feet from SR-79, which would not be an audible increase in noise and would not exceed the threshold identified above. Keller Road has an existing traffic volume of 1,700 average daily traffic (Urban Crossroads 2022). The addition of 183 project-related vehicle trips to Keller Road would result in a noise increase of 0.5 dB, which would not be an audible increase in noise and would not exceed the threshold identified above. No existing traffic volume data is available for Coventry Lane as it is a rural residential road. However, 183 project-related daily trips traveling at 25 miles per hour would generate a noise level of 46.2 CNEL at 50 feet, which is considered compatible with all land use types and is typical of a rural road. Additionally, the existing noise environment is dominated by vehicle traffic on SR-79. Based on existing traffic volumes on SR-79, noise levels in the vicinity of Coventry Lane are approximately 64.6 CNEL. The addition of noise from vehicle traffic on Coventry Lane would not result in any measurable increase, and project-related traffic would not result in a significant increase in ambient noise levels. FHWA calculations are provided in Attachment 1. The project would result in noise level increases less than the thresholds identified above. Therefore, the project would not result in the exposure of noise sensitive land uses to significant noise levels, and impacts would be less than significant.

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6.0 Conclusions

Based on the preceding analysis, the project is not anticipated to generate construction or operational noise levels that exceed the applicable noise limits. Impacts associated with the project would be less than significant.

If you have any questions about the results of this analysis, please contact me at jfleming@reconenvironmental.com or (619) 308-9333 extension 177.

Sincerely,


Jessica Fleming
Noise Specialist

JLF:jg:sjg

cc: Mr. Peter Nora, U-Stor-It

7.0 Certification

The following is a list of preparers, persons, and organizations involved with the noise assessment.

RECON Environmental, Inc.

Jessica Fleming, County-approved Noise Consultant
Morgan Weintraub, Associate Project Manager
Jennifer Gutierrez, Production Specialist
Steven Gaughran, Production Specialist
Frank McDermott, GIS Manager

8.0 References Cited

California Department of Transportation (Caltrans)
2013 Technical Noise Supplement. November.

2022a Traffic Volumes: Annual Average Daily Traffic for All Vehicles on California State Highways. Year 2022.
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2022b Truck Traffic: Annual Average Daily Truck Traffic for Truck Traffic on California State Highways. Year 2022.
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2006 Roadway Construction Noise Model User's Guide. FHWA-HEP-05-054, SOT-VNTSC-FHWA-05-01. Final Report. January.

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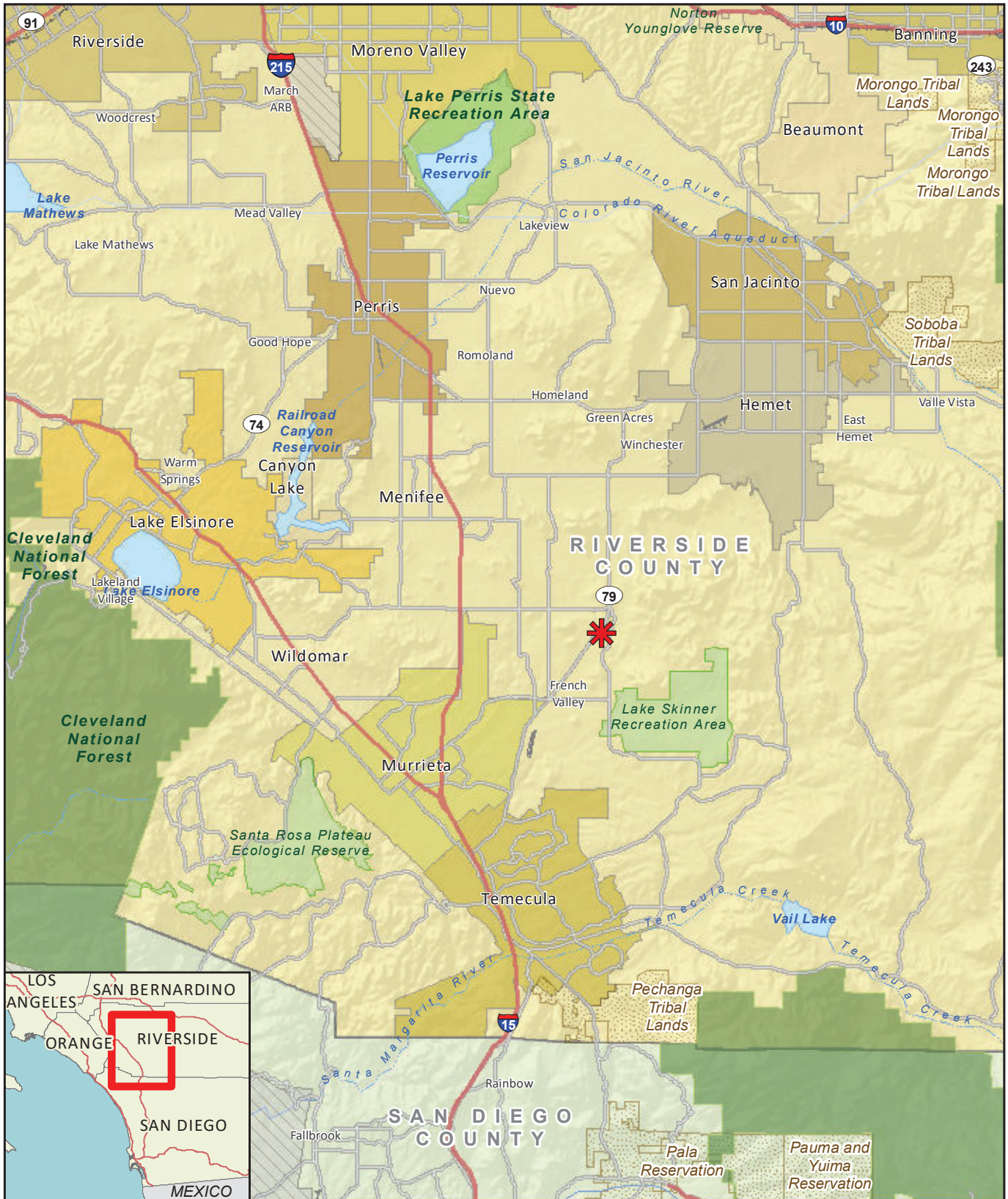
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Linscott, Law & Greenspan, Engineers
2024 Traffic Circulation Assessment for the Proposed U-Stor-It Self & RV Storage Project. LLG Reference 2.23.4711.1. December 9, 2024.

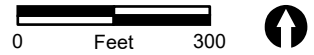
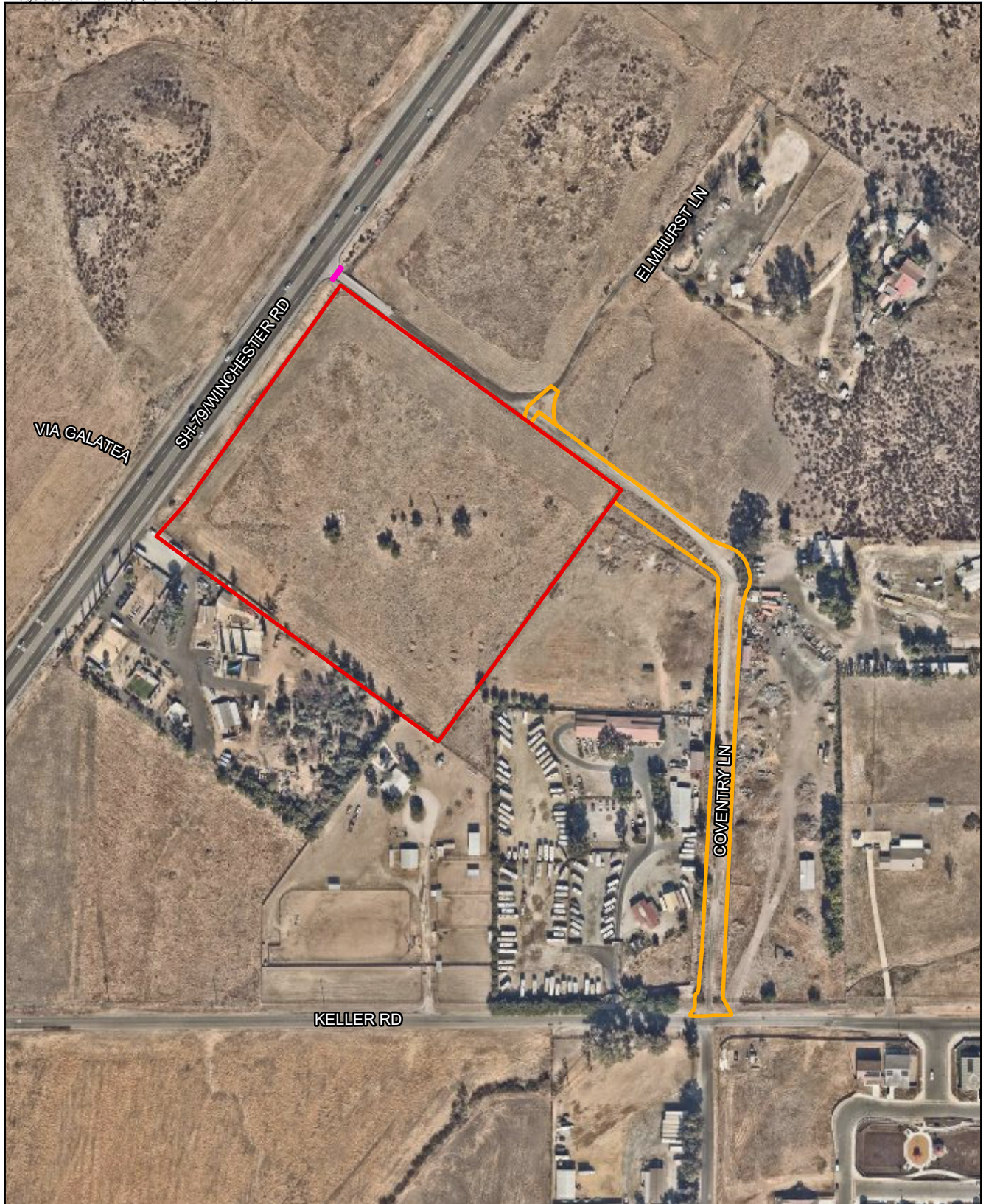
Navcon Engineering, Inc.
2018 SoundPLAN Essential version 4.1.

Urban Crossroads
2017 Smith Ranch Self-Storage Noise Impact Analysis. City of Wildomar. August 9.
2022 Keller Crossing Specific Plan Traffic Study. County of Riverside. January 20.



 Project Location

FIGURE 1
Regional Location






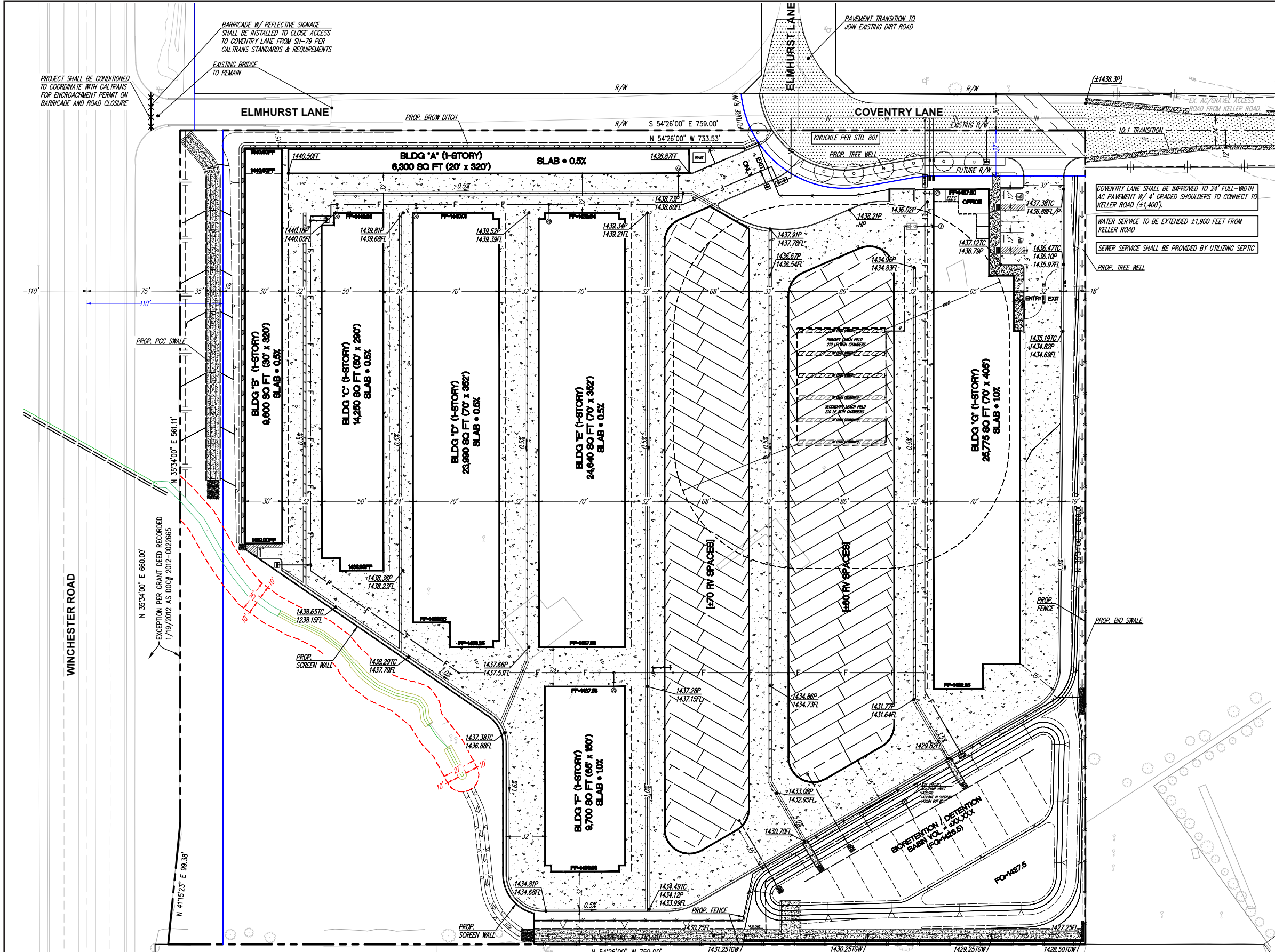
-  Project Parcel
-  Off-site Improvements
-  Barricade Area

FIGURE 2

Project Location on Aerial Photograph



EXISTING LEGEND

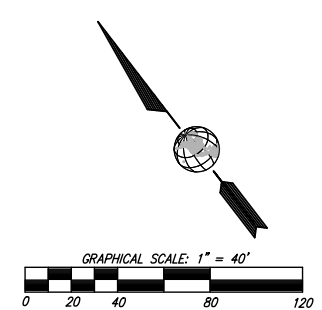
ITEM	SYMBOL
PROPERTY LINE	---
CENTERLINE	----
RIGHT-OF-WAY	----
EX. CONTOURS
EX. CURB & GUTTER	----

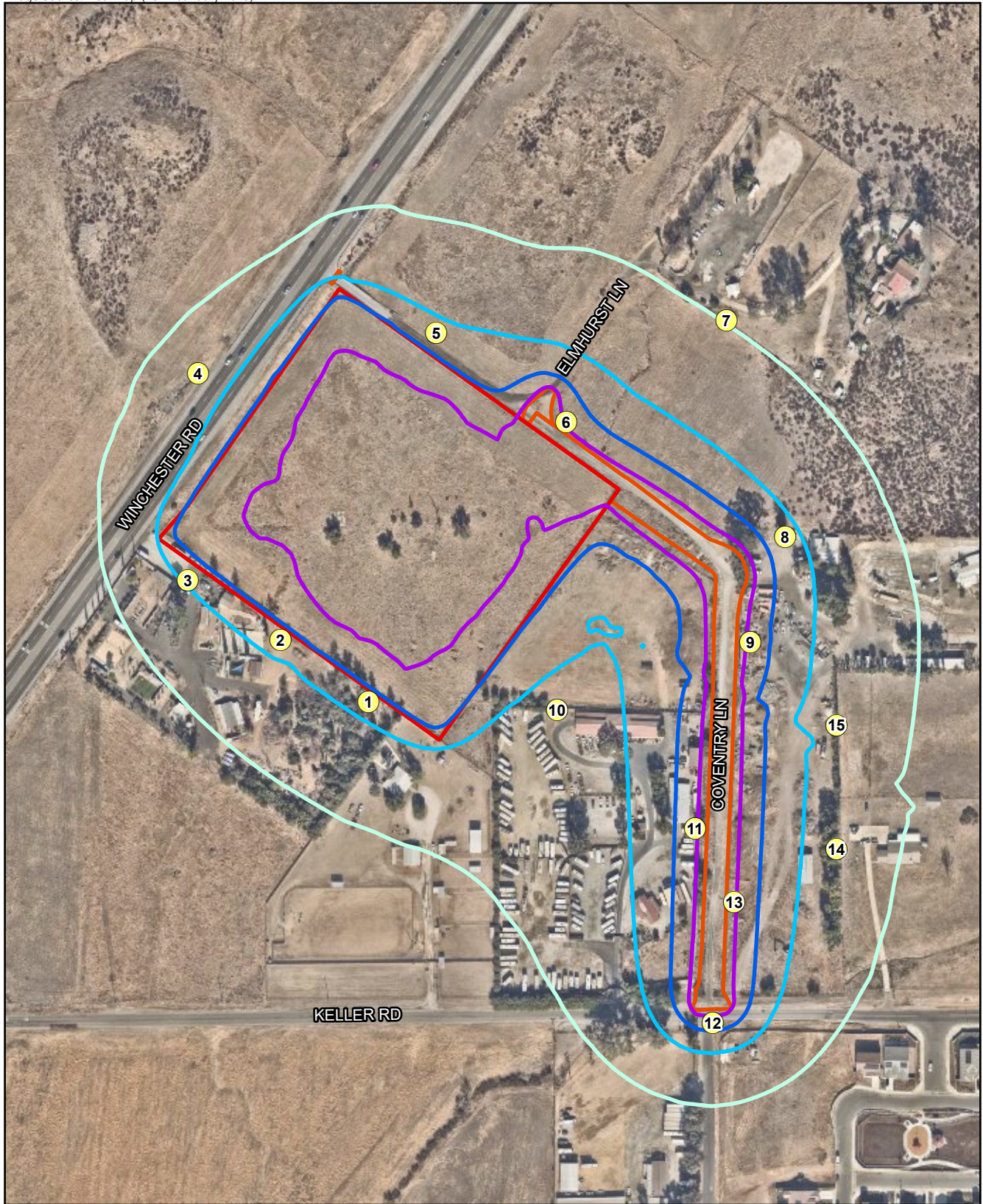
PROPOSED LEGEND

ITEM	SYMBOL
PROPOSED CONTOURS
PROPOSED GRADE BREAK	-----
PROPOSED FINISH FLOOR ELEVATION	FF-378.00
PROPOSED TOP OF CURB ELEVATION	374.00TC
PROPOSED PAVEMENT ELEVATION	374.00P
PROPOSED TOP OF WALL ELEVATION	374.00TW
PROPOSED FLOWLINE ELEVATION	374.00FL
PROPOSED FINISHED GRADE ELEVATION	374.00FG
PROPOSED GRADIENT	1.1%
PROPOSED 6" PCC CURB	-----
PROPOSED 6" PCC CURB & GUTTER	-----
PROPOSED BUILDING	-----
PROPOSED PARKING STALL STRIPING	-----
PROPOSED HANDICAP STRIPING	-----
PROPOSED PVT. STORM DRAIN	-----
PROPOSED RIPRAP STABILIZATION	-----
PROPOSED PVT. STORM DRAIN INLET/CLEAN OUT/CONNECTION	-----
PROPOSED SWALE	-----
PROPOSED PVT. PCC PAVEMENT WALK	-----
PROPOSED PVT. PCC PAVEMENT DRIVE AISLE	-----
PROPOSED PVT. BIORETENTION	-----

GRADING INFORMATION:

RAW CUT (TO FINISH SURFACE)	7,476 CY
RAW FILL (TO FINISH SURFACE)	16,081 CY
UNDERCUTS	9,774 CY
REMEDIAL FILL	2,506 CY
IMPORT/EXPORT	1,338 (FILL)





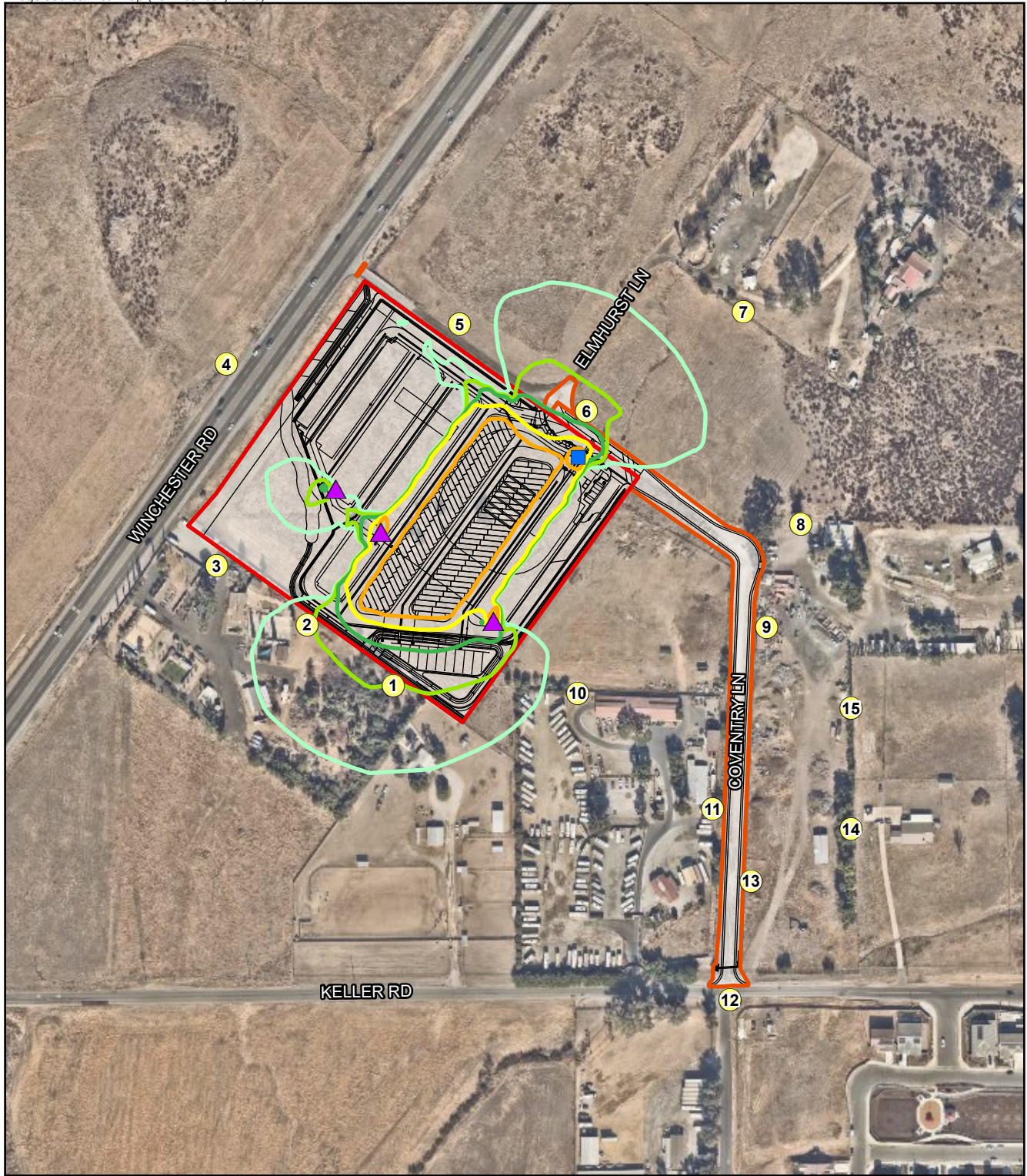
- Project Boundary
- Off-site Improvements
- Receivers






Construction Noise Contours

- 60 dB(A) L_{eq}
- 65 dB(A) L_{eq}
- 70 dB(A) L_{eq}
- 75 dB(A) L_{eq}



FIGURE 4
Construction Noise Contours



-  Project Boundary
-  Off-site Improvements
-  HVAC
-  VRF
-  Receivers

Operational Noise Contours


-  30 dB(A) L_{eq}
-  35 dB(A) L_{eq}
-  40 dB(A) L_{eq}
-  45 dB(A) L_{eq}
-  50 dB(A) L_{eq}



FIGURE 5
Operational Noise Contours

ATTACHMENTS

ATTACHMENT 1

FHWA RD-77-108 Vehicle Traffic Noise Calculations

**FHWA RD-77-108
Traffic Noise Prediction Model**

Data Input Sheet

Project Name : Winchester U-Stor-It
Project Number : 10398
Modeled Condition : SR-79

Surface Refelction: CNEL
Assessment Metric: Hard
Peak ratio to ADT: 10.00
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway Name	Traffic Vol.	Speed	Distance	% Autos	%MT	% HT	Day %	Eve %	Night %	K-Factor
			(Mph)	to CL							
1	SR-79 - western project boundary	26,000	65	70	91.00	5.80	3.20	77.00	10.00	13.00	
2	SR-79 - eastern project boundary	26,000	65	812	91.00	5.80	3.20	77.00	10.00	13.00	
3	SR-79 - near Coventry Lane (1,100 feet)	26,000	65	1100	91.00	5.80	3.20	77.00	10.00	13.00	
4	SR-79 - 50 feet without project	26,000	65	50	91.00	5.80	3.20	77.00	10.00	13.00	
5	SR-79 - 50 feet with project	26,183	65	50	91.00	5.80	3.20	77.00	10.00	13.00	

**FHWA RD-77-108
Traffic Noise Prediction Model**

Predicted Noise Levels

Project Name : Winchester U-Stor-It
Project Number : 10398
Modeled Condition : SR-79
Assessment Metric: Hard

Segment	Roadway Name	Noise Levels, dBA Hard				Distance to Traffic Noise Level Contours, Feet					
		Auto	MT	HT	Total	75 dB	70 dB	65 dB	60 dB	55 dB	50 dB
1	SR-79 - western project boundary	74.6	68.8	69.7	76.6	101	320	1,012	3,200	10,118	31,996
2	SR-79 - eastern project boundary	64.0	58.2	59.0	66.0	102	323	1,022	3,233	10,222	32,326
3	SR-79 - near Coventry Lane (1,100 feet)	62.6	56.8	57.7	64.6	100	317	1,003	3,172	10,032	31,724
4	SR-79 - 50 feet without project	76.1	70.3	71.1	78.1	102	323	1,021	3,228	10,209	32,283
5	SR-79 - 50 feet with project	76.1	70.3	71.2	78.1	102	323	1,021	3,228	10,209	32,283

**FHWA RD-77-108
Traffic Noise Prediction Model**

Data Input Sheet

Project Name : Winchester U-Stor-It
Project Number : 10398
Modeled Condition : Keller Road

Surface Refelction: CNEL
Assessment Metric: Hard
Peak ratio to ADT: 10.00
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway Name	Traffic Vol.	Speed	Distance	% Autos	%MT	% HT	Day %	Eve %	Night %	K-Factor
			(Mph)	to CL							
1	Keller Road - without project	1,700	45	50	97.00	2.00	1.00	77.00	10.00	13.00	
2	Keller Road - with project	1,883	45	50	97.00	2.00	1.00	77.00	10.00	13.00	

**FHWA RD-77-108
Traffic Noise Prediction Model**

Predicted Noise Levels

Project Name : Winchester U-Stor-It
Project Number : 10398
Modeled Condition : Keller Road
Assessment Metric: Hard

Segment	Roadway Name	Noise Levels, dBA Hard					Distance to Traffic Noise Level Contours, Feet				
		Auto	MT	HT	Total	75 dB	70 dB	65 dB	60 dB	55 dB	50 dB
1	Keller Road - without project	59.9	51.3	52.8	61.1	2	6	20	64	204	644
2	Keller Road - with project	60.3	51.7	53.2	61.6	2	7	23	72	229	723

FHWA RD-77-108
Traffic Noise Prediction Model

Data Input Sheet

Project Name : Winchester U-Stor-It
Project Number : 10398
Modeled Condition : Coventry Lane

Surface Refelction: CNEL
Assessment Metric: Hard
Peak ratio to ADT: 10.00
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway Name	Traffic Vol.	Speed	Distance	% Autos	%MT	% HT	Day %	Eve %	Night %	K-Factor
			(Mph)	to CL							
1	Conventry Lane - Project Only	183	25	50	97.00	2.00	1.00	77.00	10.00	13.00	

FHWA RD-77-108
Traffic Noise Prediction Model

Predicted Noise Levels

Project Name : Winchester U-Stor-It
Project Number : 10398
Modeled Condition : Coventry Lane
Assessment Metric: Hard

Segment	Roadway Name	Noise Levels, dBA Hard					Distance to Traffic Noise Level Contours, Feet				
		Auto	MT	HT	Total	75 dB	70 dB	65 dB	60 dB	55 dB	50 dB
1	Conventry Lane - Project Only	42.9	37.6	42.3	46.2	0	0	1	2	7	21

ATTACHMENT 2

VRF and HVAC Specifications

SSMS-e Single VRF Outdoor Unit MCY-MAP0367HS-UL—Heat Pump

TOSHIBA
Carrier

Submittal Data

Job Data _____ Location _____
 Buyer _____ Buyer PO # _____ Carrier # _____
 Unit Number _____ Model Number _____
 Performance Data Certified By _____ Date _____



SSMS-e VRF Heat Pump Features

- 3, 4, and 5-ton single-phase modules available
- Modules have inverter-driven twin rotary compressor
- 591 ft (180 m) actual total system piping (liquid line)
- 328 ft (100 m) actual piping length from outdoor unit to furthest fan coil
- Up to 330 ft (100 m) control wiring between outdoor units
- Up to 6560 ft (2000 m) control wiring between the outdoor units and indoor units
- Operating temperature range Cooling (db): 23 to 122 F (–5 to 50 C)
- Heating (wb): –13 to 60 F (–25 to 15.6 C)
- Protection: high pressure sensor and switch, low pressure sensor, process controller board fuse, inverter overload protection
- 7-year compressor limited warranty, 5-year parts limited warranty

Header Unit Model		MCY-MAP0367HS-UL	
PERFORMANCE			
Nominal Cooling Capacity	Btu/h	36,000	
Nominal Heating Capacity	Btu/h	40,000	
Maximum Total Connected Indoor Unit Capacity		Up to 135%	
COOLING EFFICIENCY†			
SEER, Ducted FCUs	Btu/Wh	17.70	
SEER, Ductless FCUs	Btu/Wh	22.70	
HEATING EFFICIENCY†			
HSPF, Ducted FCUs		10.50	
HSPF, Ductless FCUs		11.50	
Fan Type (Qty)		Propeller (2)	
Airflow	CFM	4520	
Combined System Sound Pressure, Cooling/Heating	dBA	52.0/56.0	
ELECTRICAL			
Power Supply	V/Ph/Hz	208-230/1/60	
Minimum Circuit Amps (MCA)	A	36.3	
Recommended Fuse Size	A	40	

COMPRESSORS		
Type (Number)		Hermetic Twin Rotary (1)
Motor Output	kW	3.75
FAN MOTOR		
Motor Type (Steps)	Propeller Fan (2)	
Motor Output	kW	0.10 + 0.10
PHYSICAL DATA		
Pipe Connection Size - Liquid (High Pressure)	in.	3/8 (Flare)
Pipe Connection Size - Gas (Low Pressure)	in.	5/8 (Flare)
Refrigerant	R-410A	
Factory Charge††	lb	14.8
External Finish	Munsell 1Y8.5/0.5	
Unit Width	in.	39.8
Unit Height	in.	61.0
Unit Depth	in.	14.6
Unit Net Weight	lb	311

LEGEND

db — Dry Bulb
 SEER — Seasonal Energy Efficiency Ratio
 FCU — Fan Coil Unit
 HSPF — Heating Seasonal Performance Factor
 wb — Wet Bulb

†Rated per AHRI (Air-Conditioning, Heating and Refrigeration Institute) 1230 Standard.

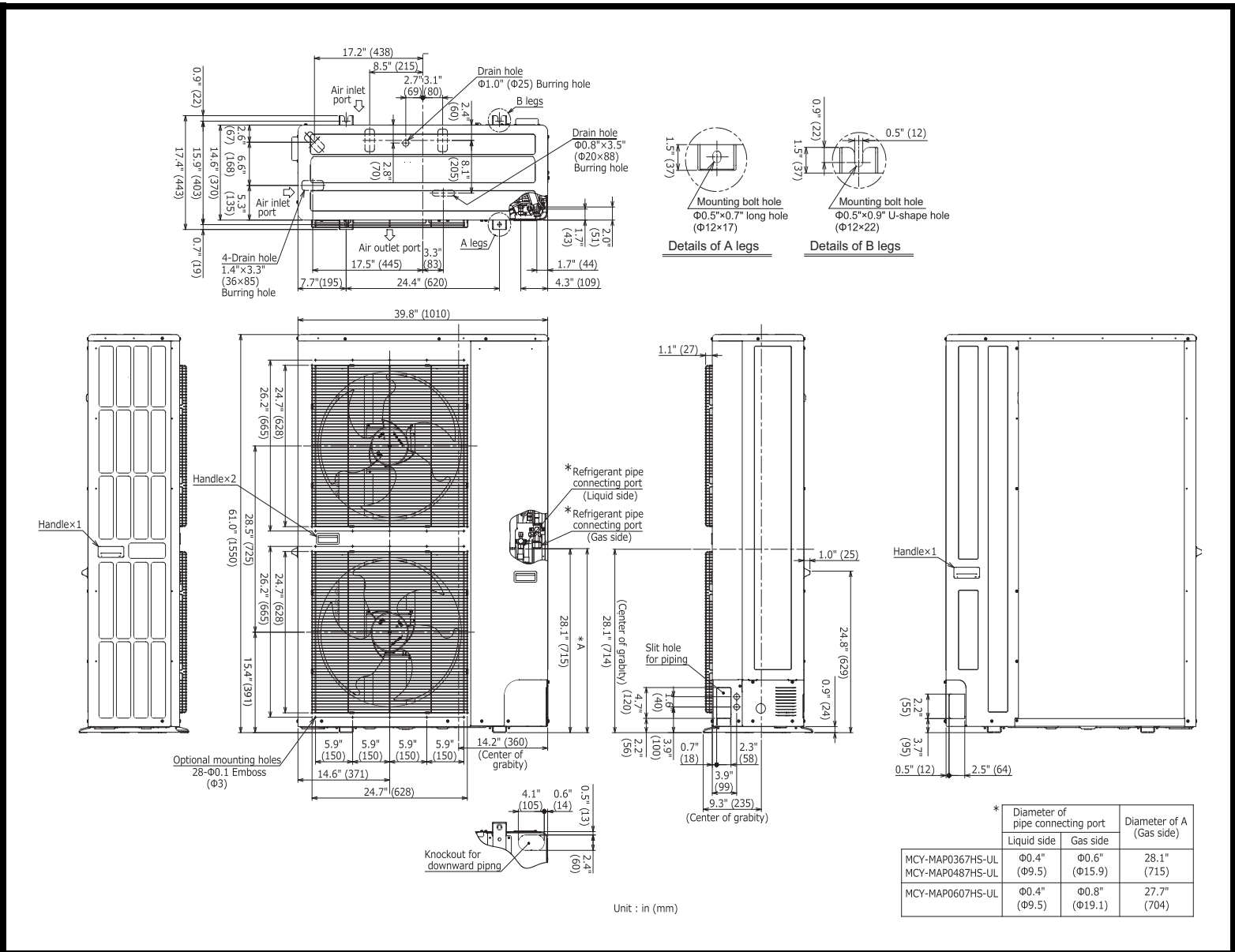
Cooling: Indoor 80°F (27°C) db/67°F (20°C) wb; Outdoor 95°F (35°C) db

Heating: Indoor 70°F (21°C) db; Outdoor 47°F (8°C) db/43°F (6°C) wb

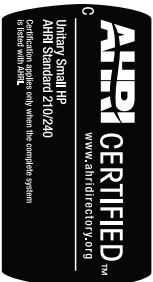
††Additional charge required.

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

OUTDOOR UNIT HEAT PUMP MCY-MAP0367HS-UL DIMENSIONAL DRAWING



	* Diameter of pipe connecting port		Diameter of A (Gas side)
	Liquid side	Gas side	
MCY-MAP0367HS-UL	$\Phi 0.4"$ ($\Phi 9.5$)	$\Phi 0.6"$ ($\Phi 15.9$)	28.1" (715)
MCY-MAP0487HS-UL	$\Phi 0.4"$ ($\Phi 9.5$)	$\Phi 0.8"$ ($\Phi 19.1$)	27.7" (704)



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Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

Form MCY-MAP0367HS-UL_01

Pg 2

1-17

Replaces: NEW

Guide Specifications
Single-Phase Heat Pump
Variable Refrigerant Flow Outdoor Units

Size Range:

Nominal Cooling Capacity Range: 36,000 to 60,000 Btu/h

Nominal Heating Capacity Range: 40,000 to 66,000 Btu/h

Toshiba Carrier Model Number:

MCY-MAP--7HS-UL

Part 1 - General

1.01 SYSTEM DESCRIPTION

- A. The heat pump variable refrigerant flow system is a two-pipe system consisting of a single outdoor units, multiple indoor units of various types and capacities, individual or central indoor unit controls with on/off temperature settings, all connected by fully insulated refrigerant lines utilizing factory supplied, fully insulated, branching kits. Indoor units are connected to condensate piping that shall be terminated to the nearest drain point.
- B. The system shall be fully capable of providing heating or cooling as requested by the individual indoor zones that can consist of single or multiple indoor units. The heating priority shall be the default factory setting and can be changed to cooling, majority or a single zone priority.
- C. The maximum number of connected indoor units shall not exceed 9.
- D. The total connected indoor unit capacity shall range between 50 and 135% of the outdoor unit capacity based on indoor unit type & size selected.

1.02 QUALITY ASSURANCE

- A. Units shall be listed by ETL (Engineering Testing Laboratory) and be evaluated in accordance with UL standard 1995, 4th. edition.
- B. Units shall be listed in the AHRI directory.
- C. All units shall meet the Federal minimum efficiency standards and be tested per AHRI 210/240 Standard.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Units shall be shipped in one piece and shall be stored and handled per unit manufacturer's recommendations.

1.04 WARRANTY (For Inclusion by Specifying Engineer)

Part 2 - Products

2.01 EQUIPMENT

A. General:

Factory-assembled, single piece air-cooled outdoor unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, and the single inverter-driven twin rotary compressor.

- 1. The maximum sound pressure rating shall not exceed 55 dBA in cooling and 58 dBA in heating. Sound pressure ratings are measured at a distance of 3.3 ft out and 4.9 ft up from the front of the outdoor unit (fan discharge side).
- 2. The outdoor unit shall include an oversized accumulator and a liquid tank for proper heating performance while allowing the indoor unit PMV (pulse modulating valve) metering device to shut off completely when a zone is satisfied.
- 3. The outdoor unit shall be protected by a high-pressure switch, high-pressure sensor, low-pressure sensor, fusible plugs, PC board, and inverter overload protector.
- 4. The outdoor unit shall be capable of operating in cooling mode down to 23 F dry bulb ambient air temperature, and down to -13 F wet bulb ambient air temperature in heating.

B. Unit Cabinet:

- 1. Unit cabinet shall be constructed of pre-coated steel, finished on both inside and outside.
- 2. Unit access panels shall be removable with minimal screws and shall provide full access to the compressor, fans, and control components.
- 3. Compressor shall be isolated in a compartment and have an acoustic wrap to assure quiet operation.

4. The outdoor unit control panel shall include a sliding window to access adjustable controls and an LED display for setup and diagnostics.
 5. Unit cabinet shall be capable of withstanding 500-hour salt spray test per Federal Test Standard No. 141 (method 6061).
- C. Fans:
1. Outdoor fans shall discharge air horizontally and be driven by a DC inverter variable speed motor with 32 steps.
 2. Outdoor fan motor shall be totally-enclosed with permanently-lubricated bearings.
 3. Motor shall be protected by internal thermal overload protection.
 4. Fan blade shall be non-metallic and shall be statically and dynamically balanced.
 5. Outdoor fans shall be protected by a metallic protective grille.
- D. Compressors:
1. Each outdoor unit shall be equipped with a single inverter-driven twin rotary compressor with full range control to an accuracy of ± 0.1 Hz.
 2. Compressor shall be totally enclosed in the machine compartment.
 3. Internal overloads shall protect the compressor from over-temperature operation.
 4. Motor shall be suitable for operation in an R-410A refrigerant atmosphere.
 5. Compressor assembly shall be installed on rubber vibration isolators.
- E. Outdoor Coil:
1. Coil shall be constructed of aluminum fins mechanically bonded to seamless copper tubes, which are cleaned, dehydrated, and sealed.
 2. The coil configuration shall be 2-sided.
 3. The coil fins shall have a factory-applied corrosion resistant blue-fin finish.
- F. Controls and Safeties:
- Operating controls and safeties shall be factory selected, assembled, and tested. The minimum control functions shall include the following:
1. Controls:
 - a. Compressor speed to match the refrigerant flow and capacity with the system requirements.
 - b. Outdoor fan motor speed for higher efficiency and lower sound.
 - c. Oil control for improved system reliability and comfort.
 - d. Pulse modulating valve control for precise control of the refrigerant distribution and accurate capacity management to avoid starving any units.
 2. Safeties:

The following safety devices shall be part of the condensing unit:

 - a. High-pressure switch
 - b. Fuses
 - c. Fusible plug
 - d. Overcurrent relay for the compressor
 - e. Thermal protectors for compressor and fan motor
 - f. Compressor time delay
 - g. Overcurrent sensor
 - h. Compressor suction and discharge temperature sensor
 - i. Compressor suction and discharge pressure sensor
- G. Electrical Requirements:
1. All sizes shall utilize 208/230-1-60 field power supply.
 2. Two-core, stranded, shielded low voltage cable shall be required for communication between outdoor and indoor units.
 3. All power and control wiring must be installed per NEC and all local electrical codes.
- H. Refrigerant Piping and Line Lengths:
1. Piping connections shall be from the front or the bottom of the unit. The unit shall be capable of operating with maximum connected refrigerant line lengths up to 591 (ft) actual based on total system capacity and refrigerant amount.
 2. The outdoor unit shall have the ability to operate with a maximum height of 164 ft between the outdoor and the lowest indoor unit.

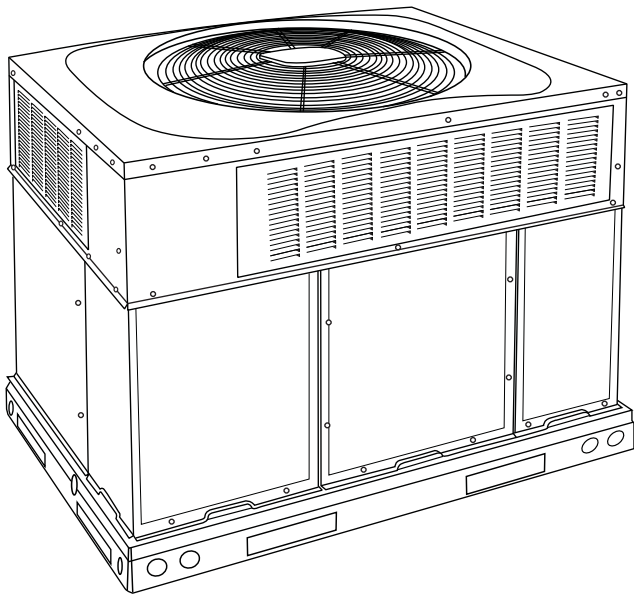
3. The maximum distance between the outdoor unit and the furthest fan coil shall not exceed 328 ft actual or 410 ft equivalent. No line size changes or oil traps shall be required.
 4. The system shall be capable of operating when the height difference between the upper and the lower fan coil is 49 ft.
- I. Auxiliary Refrigerant Components:
1. All field-supplied copper tubing connecting the outdoor unit to the indoor unit shall use factory-supplied branching kits consisting of either Y joints or headers to ensure even refrigerant flow.
 2. To ensure piping flexibility, the system shall allow having Y joints or headers downstream of another header.

50VG-A

Performance™ 16 SEER 2-Stage Packaged
Air Conditioner System with Puron® (R-410A)
Refrigerant
Single and Three Phase
2 to 5 Nominal Tons (Sizes 24-60)



Product Data



A09033

Fig. 1 - Unit 50VG-A

Single-Packaged Products with Energy-Saving Features and Puron® refrigerant.

- 15.0-16.0 SEER / 12.0-12.5 EER
- Factory-Installed TXV
- Multi-speed ECM Blower Motor - Standard
- Sound levels as low as 72dBA
- Two Stages of Cooling
- Dehumidification Feature

FEATURES/BENEFITS

One-piece cooling unit with optional electric heater, low sound levels, easy installation, low maintenance, and dependable performance.

Puron Environmentally Sound Refrigerant is Carrier's unique refrigerant designed to help protect the environment. Puron is an HFC refrigerant which does not contain chlorine that can harm the ozone layer. Puron refrigerant is in service in millions of systems proving highly reliable, environmentally sound performance.

Easy Installation

Factory-assembled package is a compact, fully self-contained, electric cooling unit that is prewired, pre-piped, and pre-charged for minimum installation expense. These units are available in a variety of standard cooling sizes with voltage options to meet residential and light commercial requirements. Units are lightweight and install easily on a rooftop or at ground level. The high tech composite base eliminates rust problems associated with ground level applications.

Innovative Unit Base Design

On the inside a high-tech composite material will not rust and incorporates a sloped drain pan which improves drainage and helps inhibit mold, algae and bacterial growth. On the outside metal base rails provide added stability as well as easier handling and rigging.

Convertible duct configuration

Unit is designed for use in either downflow or horizontal applications. Each unit is converted from horizontal to downflow and includes horizontal duct covers. Downflow operation is provided in the field to allow vertical ductwork connections. The basepan seals on the bottom openings to ensure a positive seal in the vertical airflow mode.

Efficient operation High-efficiency design offers SEER (Seasonal Energy Efficiency Ratios) of up to 16.0. (See page 4.)

Durable, dependable components

Scroll Compressors have 2 stages of cooling and are designed for high efficiency. Each compressor is hermetically sealed against contamination to help promote longer life and dependable operation. Each compressor also has vibration isolation to provide quieter operation. All compressors have internal high pressure and overcurrent protection.

Multi-speed ECM Blower Motor is standard on all 50VG-A.

Direct-drive PSC (Permanent Split Capacitor) condenser-fan motors are designed to help reduce energy consumption and provide for cooling operation down to 40°F (4.4°C) outdoor temperature. Motormaster® II low ambient kit is available as a field-installed accessory.

Thermostatic Expansion Valve - A hard shutoff, balance port TXV maintains a constant superheat at the evaporator exit (cooling cycle) resulting in higher overall system efficiency.

Refrigerant system is designed to provide dependability. Liquid filter driers are used to promote clean, unrestricted operation. Each unit leaves the factory with a full refrigerant charge. Refrigerant service connections make checking operating pressures easier.

High and Low Pressure Switches provide added reliability for the compressor.

Indoor and Outdoor coils are computer-designed for optimum heat transfer and efficiency. The indoor coil is fabricated from copper tube and aluminum fins and is located inside the unit for protection against damage. The outdoor coil is internally mounted on the top tier of the unit.

Low sound ratings ensure a quiet indoor and outdoor environment with sound ratings as low as 72dBA. (See Page 4.)

Easy to service cabinets provide easy 3 panel accessibility to serviceable components during maintenance and installation. The basepan with integrated drain pan provides easy ground level installation with a mounting pad. A nesting feature ensures a positive basepan to roof curb seal when the unit is roof mounted. A convenient 3/4-in. (19.05 mm) wide perimeter flange makes frame mounting on a rooftop easy.

AHRI* CAPACITIES

Cooling Capacities and Efficiencies

Unit Model 50VG-A	Nominal Tons	Standard CFM (High / Low Stage)	Net Cooling Capacities - Btuh (High Stage)	EER @A**	SEER†
24	2	800 / 600	23000	12.0	15.0
30	2-1/2	1000 / 750	29000	12.0	15.0
36	3	1200 / 900	35400	12.5	16.0
42	3-1/2	1400 / 1050	42000	12.5	16.0
48	4	1600 / 1200	47500	12.3	16.0
60	5	1750 / 1200	57000	12.3	16.0

LEGEND

dB—Sound Levels (decibels)

db—Dry Bulb

SEER—Seasonal Energy Efficiency Ratio

wb—Wet Bulb

COP—Coefficient of Performance

* Air Conditioning, Heating & Refrigeration Institute.

**At "A" conditions—80°F (26.7°C) indoor db/67°F (19.4°C) indoor wb & 95°F (35°C) outdoor db.

† Rated in accordance with U.S. Government DOE Department of Energy) test procedures and/or AHRI Standards 210/240.

Notes:

1. Ratings are net values, reflecting the effects of circulating fan heat.

Ratings are based on:

Cooling Standard: 80°F (26.7°C) db, 67°F wb (19.4°C) indoor entering—air temperature and 95°F db (35°C) outdoor entering—air temperature.

2. Before purchasing this appliance, read important energy cost and efficiency information available from AHRIdirectory.org.

50VG-A

A-WEIGHTED SOUND POWER LEVEL (dBA)

Model 50VG-A	Sound Ratings (dBA)	TYPICAL OCTAVE BAND SPECTRUM (dBA without tone adjustment)						
		125	250	500	1000	2000	4000	8000
24	73	60.0	62.5	68.5	68.5	64.0	60.0	53.0
30	77	57.5	67.0	73.5	72.0	67.0	61.0	52.5
36	73	62.5	65.5	67.5	68.0	65.5	60.0	52.5
42	73	60.5	63.5	68.0	68.0	66.0	60.5	53.0
48	72	60.0	63.5	66.0	67.0	63.5	58.5	49.5
60	75	69.0	67.0	69.0	68.0	65.0	61.5	54.0

NOTE: Tested in accordance with AHRI Standard 270 (not listed in AHRI).

ATTACHMENT 3

SoundPLAN Data – Construction

10398 Winchester U-Stor-It
SoundPLAN Data - Construction

Source name	Reference	Noise	Corrections		
		Level dB(A)	Cwall dB(A)	CI dB(A)	CT dB(A)
Construction	Lw/unit	116.3	-	-	-
Off-Site Road Construction	Lw/unit	116.3	-	-	-

10398 Winchester U-Stor-It
SoundPLAN Data - Construction

No.	Coordinates		Height (meters)	Noise
	X (meters)	Y (meters)		Level dB(A)
1	491715.87	3721038.15	436.75	67.4
2	491658.43	3721078.66	437.33	67.3
3	491598.04	3721117.69	438.11	65.7
4	491604.67	3721252.47	442.93	62.5
5	491760.06	3721278.98	441.60	66.7
6	491844.76	3721220.80	439.64	74.3
7	491949.34	3721287.08	440.21	59.9
8	491987.63	3721145.68	441.38	66.5
9	491964.94	3721077.10	439.27	73.9
10	491838.86	3721033.00	436.77	63.9
11	491928.86	3720955.57	437.03	74.2
12	491940.39	3720828.74	435.95	72.2
13	491954.39	3720907.81	436.78	75.7
14	492021.10	3720942.40	437.81	62.8
15	492021.10	3721023.10	438.43	62.9

Receivers

ATTACHMENT 4

SoundPLAN Data – Operation

10398 Winchester U-Stor-It
 SoundPLAN Data - Operation

Source name	Reference	Noise	Corrections		
		Level dB(A)	Cwall dB(A)	CI dB(A)	CT dB(A)
RV Parking	Lw/unit	86.7	-	-	-
VRF1	Lw/unit	66	-	-	-
VRF2	Lw/unit	66	-	-	-
VRF3	Lw/unit	66	-	-	-
Office HVAC	Lw/unit	73	-	-	-

10398 Winchester U-Stor-It
SoundPLAN Data - Operation

No.	Coordinates		Height (meters)	Noise
	X	Y		Level dB(A)
1	491715.87	3721038.15	436.75	34.9
2	491658.43	3721078.66	437.33	34.2
3	491598.04	3721117.69	438.11	26.7
4	491604.67	3721252.47	442.93	26.3
5	491760.06	3721278.98	441.60	27.6
6	491844.76	3721220.80	439.67	37.6
7	491949.34	3721287.08	440.21	27.2
8	491987.63	3721145.68	441.38	25.9
9	491964.94	3721077.10	439.27	25.3
10	491838.86	3721033.00	436.77	28.4
11	491928.86	3720955.57	437.03	24.4
12	491940.39	3720828.74	435.95	21.8
13	491954.39	3720907.81	436.78	23.0
14	492021.10	3720942.40	437.81	22.3
15	492021.10	3721023.10	438.43	23.1

Source name	Noise Level dB(A)
1 1.FI 34.9 0.0	
Office HVAC	14.1
RV Parking	34.7
VRF1	-5.3
VRF2	15.4
VRF3	15.5
2 1.FI 34.2 0.0	
Office HVAC	15.8
RV Parking	34.1
VRF1	14.3
VRF2	5.0
VRF3	3.7
3 1.FI 26.7 0.0	
Office HVAC	12.1
RV Parking	26.1
VRF1	16.4
VRF2	6.7
VRF3	-7.4
4 1.FI 26.3 0.0	
Office HVAC	13.5
RV Parking	25.8
VRF1	13.4
VRF2	2.9
VRF3	-11.2
5 1.FI 27.6 0.0	
Office HVAC	21.3
RV Parking	26.4
VRF1	-6.4
VRF2	-1.9
VRF3	-10.0
6 1.FI 37.6 0.0	
Office HVAC	32.5
RV Parking	35.9
VRF1	-7.6
VRF2	7.6
VRF3	-7.9
7 1.FI 27.2 0.0	
Office HVAC	16.9
RV Parking	26.7
VRF1	-12.3
VRF2	2.6
VRF3	-11.3
8 1.FI 25.9 0.0	
Office HVAC	9.6
RV Parking	25.8
VRF1	-12.5
VRF2	-8.7
VRF3	-5.9
9 1.FI 25.3 0.0	
Office HVAC	2.4
RV Parking	25.2
VRF1	-12.8
VRF2	3.8
VRF3	-3.4
10 1.FI 28.4 0.0	
Office HVAC	3.1
RV Parking	27.9
VRF1	-9.2
VRF2	5.2
VRF3	18.8
11 1.FI 24.4 0.0	
Office HVAC	-1.8
RV Parking	24.2
VRF1	-12.8
VRF2	3.7
VRF3	9.9
12 1.FI 21.8 0.0	
Office HVAC	-4.7
RV Parking	21.6
VRF1	-14.9
VRF2	0.9
VRF3	7.5
13 1.FI 23.0 0.0	
Office HVAC	-3.5
RV Parking	22.8
VRF1	-12.3
VRF2	2.2
VRF3	7.7
14 1.FI 22.3 0.0	
Office HVAC	-3.8
RV Parking	22.1
VRF1	-15.2
VRF2	1.0
VRF3	6.6
15 1.FI 23.1 0.0	
Office HVAC	-1.0
RV Parking	23.0
VRF1	-14.8
VRF2	1.9
VRF3	-3.0