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Arizona Department of Transportation

Environmental Planning

FINAL

Noise Analysis Technical Report

Interstate 10: Junction Interstate 19 to Kolb Road

State Route 210: Golf Links Road to I-10

Federal Project No. 010-E(210)S

ADOT Project No. 010 PM 260 H7825 01 L

Submittal Date: 6/7/2019

Submittal Number (3)

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EXECUTIVE SUMMARY

Project Objectives

The Arizona Department of Transportation (ADOT), in cooperation with the Federal Highway Administration (FHWA), the City of Tucson, and Pima County, is proposing improvements to the corridors of Interstate 10 (I-10) and State Route 210 (SR 210), within the city of South Tucson, the city of Tucson, and unincorporated Pima County, Arizona. The project limits along I-10 begin at its junction with I-19 at milepost (MP) 260.79 and continue east to Kolb Road at MP 272.30. The SR 210 project limits begin at Golf Links Road and extend south along Alvernon Way to I-10 (MP 265.0). SR 210 is also known as Aviation Parkway or East Aviation Parkway. Throughout this document the term State Route 210 or SR 210 would be used. In addition, the term “project limits” is used to represent the construction footprint (area of disturbance), while the term “project area” includes surrounding land outside but adjacent to the project limits. The term “project vicinity” is used to denote a more expansive landscape context. The project has been evaluated in an Initial Design Concept Report (DCR) and Environmental Assessment (EA) for the I-10: Jct. I-19 to Kolb Road (Tucson – Benson Highway), SR 210: Golf Links Road to I-10 (Barraza – Aviation Parkway). Two Build Alternatives (I & IV) and the No-Build Alternative have been evaluated.

Current Noise Environment

Land use in the project area may be categorized as Federal Highway Administration (FHWA) Activity Category B, C, E, F and G as defined in the Code of Federal Regulations (CFR) Title 23 Part 772 (23 CFR 772) and ADOT Noise Abatement Requirements (NAR) (ADOT, 2017). Residential areas within the study area, which for the purposes of this noise analysis is defined as within 650 feet of the future edge of pavement for the two Build Alternatives, include single-family, multi-family (apartments), mobile home and recreational vehicle communities. These uses were evaluated as Category B in this noise study. Category C uses include schools, parks, a sports complex, multi-use pedestrian paths and trails and a historic building, each afforded protection as Department of Transportation Act of 1966 Section 4(f) resources in addition to a privately funded school, a non-profit institutional structure and a government health facility. The 4(f) properties were evaluated for mitigation per Category C noise abatement criteria per 23 CFR 772 and the ADOT NAR. Evaluation of these properties per 23 CFR 774.15 is not addressed in this report; however, the noise level predictions reported inform the evaluation of 4(f) properties completed for the EA.

Commercial uses within the study area include hotels/motels, restaurants, gas stations/truck stops with convenience stores/food service, office buildings and office parks categorized as Activity Category E. Locations with an outdoor use (pool, sitting, dining or common area) were included in the evaluation of potential noise impacts. Residential planned area developments (PAD) and a vacant residentially zoned parcel were evaluated as Category G uses. Category F land uses, such as industrial and warehouse areas were not included in the study.

Noise measurements were generally recorded before and during the morning (7 a.m. to 9 a.m.) peak traffic period and before the evening (4 p.m. to 6 p.m.) peak traffic period. Traffic volumes

are highest but still free flowing within the study area during these periods. Additional measurements were recorded during midday hours (approximately 9:30 a.m. – 4:30 p.m.) for noise model validation purposes. Measurements ranged between 51 A-weighted decibels dB(A) in an open desert area located adjacent to the Desert View neighborhood near the I-10/Valencia Road interchange and approximately 630 feet from the freeway to 69 dBA in the Windmere Hotel parking lot located southeast of the I-10/Park Avenue interchange and approximately 220 feet from the freeway.

The two proposed design alternatives, Alternative I and IV, would add additional capacity to the I-10 from 6th avenue on the west end of the project at milepost (MP) 260.79 to MP 272.30, east of Kolb Road. The freeway would be widened from its current two-lanes in the eastbound (EB) and westbound (WB) directions to four lanes west of Kino Parkway, three lanes between Kino Parkway and Alvernon Way, and five lanes west of Alvernon Way. Additionally, the proposed project would reconstruct seven service interchanges, remove the Palo Verde interchange and replace it with an interchange at Country Club Drive and add a system-to-system interchange at Alvernon Way between the I-10 and SR 210. SR 210 replaces Alvernon Way north to Golf Links Road, where the existing would also be reconfigured. As such, the project is considered a Type I project per 23 Code of Federal Regulations (CFR) Part 772.5 and a determination of impacts and mitigation must be considered under 23 CFR 772 and NEPA.

Noise Impact Information

This analysis was performed in compliance with the current (May 2017) *ADOT Noise Abatement Requirements (NAR)*. The ADOT NAR establishes official policy on highway noise and describes the process that is used in determining traffic noise impacts and evaluating abatement measures. The ADOT NAR is based on the noise levels approaching the FHWA Noise Abatement Criteria (NAC). ADOT defines “approaching” as within 1 dBA of the FHWA NAC for Activity Categories A, B, C, D, and E. There are no noise impact thresholds for Activity Category F or G. ADOT requires that feasible and reasonable measures be considered and evaluated to abate traffic noise at all identified traffic noise impacts.

A summary of noise analysis parameters is presented in **Table ES-1**. In general, peak hour noise levels are predicted to increase above the 2040 No-Build, with the number of noise-sensitive land uses (receptors) impacted by Build Alternative I and Build Alternative IV virtually identical.

Table ES-1. Summary of Noise Analysis

I-10, Jct. I-19 to Kolb Road; SR 210 Golf Links to I-10				
Noise Analysis Parameters	Existing 2017	Future 2040		
		No-Build	Alt I	Alt IV
No. of Modeled Receivers	593	593	592 ¹	592 ¹
No. of Representative Noise Receptors	1626	1626	1625	1625
Range of Peak Hour Noise Levels, dBA	55 - 77	56 - 78	57 - 80	57 - 80
No. of Receptors Exceeding the ADOT Noise Abatement Criteria (NAC)	497	733.5	856.5	857
No. of Barriers Evaluated for Mitigation	N/A	N/A	27 (16) ²	26 (15) ³

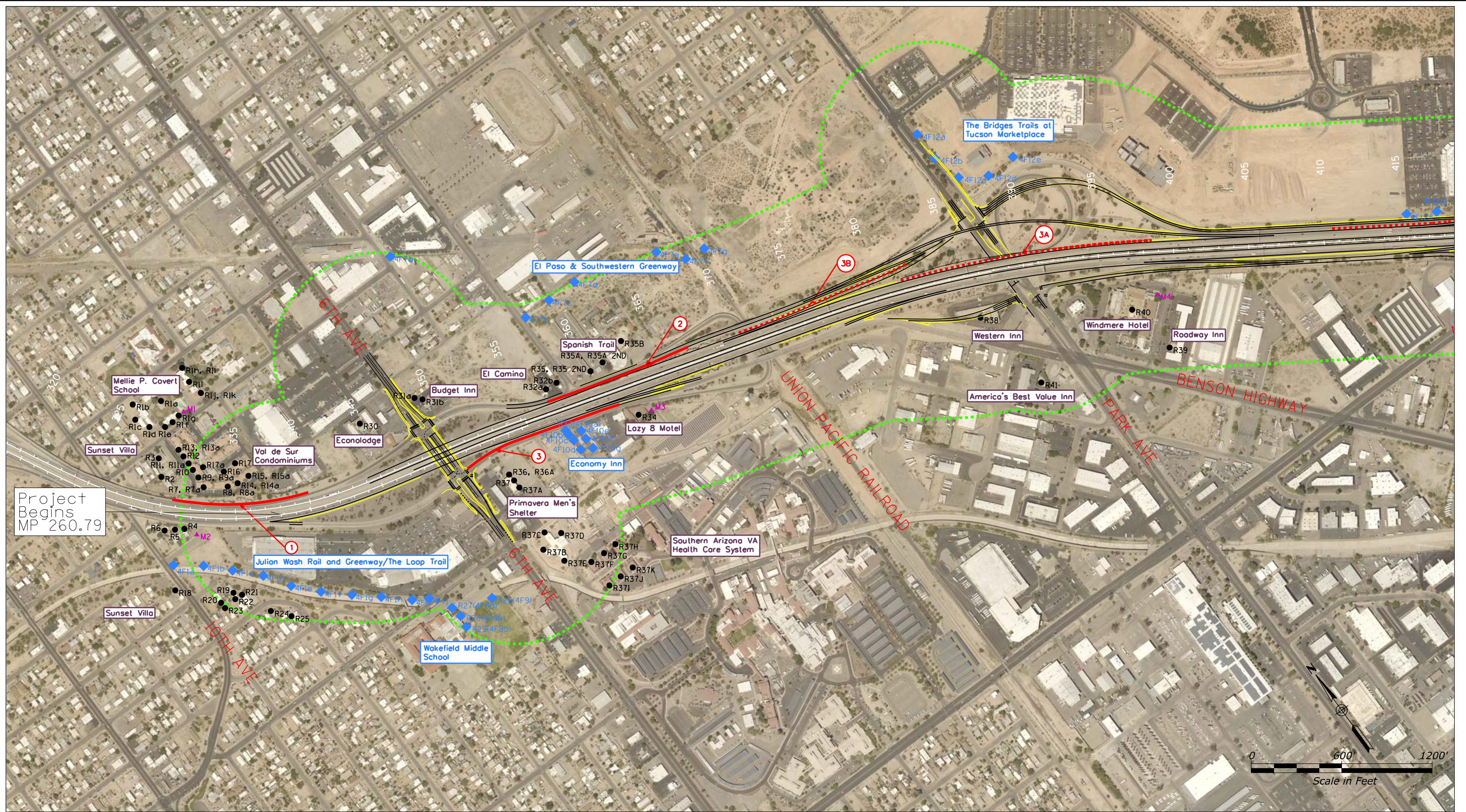
I-10, Jct. I-19 to Kolb Road; SR 210 Golf Links to I-10				
Noise Analysis Parameters	Existing 2017	Future 2040		
		No-Build	Alt I	Alt IV
No. of Barriers Satisfying ADOT Noise Abatement Requirements (NAR) Reasonableness and Feasibility Criterion	N/A	N/A	11	10
Total Cost of Recommended Mitigation	N/A	N/A	\$18,889,362	\$21,354,210
Cost of Recommended Mitigation Unique to Each Alternative	N/A	N/A	\$17,122,032	\$19,586,880
<ol style="list-style-type: none"> 1. One receiver representing a hotel pool area, will be removed by both Build Alternatives. 2. Of the 27 total walls evaluated for Build Alternative I, 16 are unique to this alternative and 11 are common with Build Alternative IV. 3. Of the 26 total walls evaluated for Build Alternative IV, 15 are unique to this alternative and 11 are common with Build Alternative I. 4. Mitigation cost is based on \$35/ft² for new construction; \$85/ft² for wall segments on structure. 				

Noise Abatement Measures Determination (Recommended/Not Recommended)

ADOT considers mitigation for noise sensitive areas predicted to be impacted by highway traffic noise levels from ADOT’s transportation improvement projects. The noise level impact determination used in this analysis is based on the ADOT Noise Abatement Requirements (NAR), dated May 2017. Noise barriers (walls) were considered as mitigation measures that would provide noise shielding to impacted locations. Reasonableness and feasibility criteria were evaluated for each proposed noise wall or wall combination (two or more wall) per ADOT NAR guidelines.

A total of 27 noise walls were evaluated to provide mitigation of future (2040) peak hour noise levels associated with Build Alternative I with 16 walls unique to this alternative between Palo Verde Road and Kolb Road. A total of 26 noise walls were evaluated to provide mitigation of future peak hour noise levels associated with Build Alternative IV with 15 walls unique to this alternative between Palo Verde Road and Kolb Road. The 10 walls proposed west of Palo Verde Road and the future I-10/SR 210 system-to-system interchange at Alvernon Way and one wall proposed north of Golf Links Road are common to both Build Alternatives, which are identical in terms of design for this segment of the project. Between Palo Verde Road and Kolb Road, the combination freeway with outside collector distributor lanes proposed for Build Alternative IV influences peak hour traffic noise levels relative to Alternative I.

Eleven of the walls evaluated for Build Alternative I meet all ADOT NAR requirements and are recommended and the remaining 16 walls are not recommended. Ten of the walls evaluated for Build Alternative IV are also recommended for future consideration and the remaining 16 walls are not recommended. The cost of mitigation for Build Alternative IV would exceed the cost of mitigation for Build Alternative I by approximately \$2.5M based on these recommendations. The difference is primarily due to variations in noise wall height and length between the two Build Alternatives necessary to achieve reasonable and feasible mitigation. All recommendations are based on preliminary (15% or less) design information and should be reevaluated at future stages of design.



APPENDIX A



I-10 Jct. I-19 to Kolb Road
 SR 210 - Golf Links Road to I-10
 TRACS No. H7825 01L, 010-E(210)S

**INTERSTATE 10
 NOISE WALL LOCATIONS
 ALTERNATIVE I/IV**

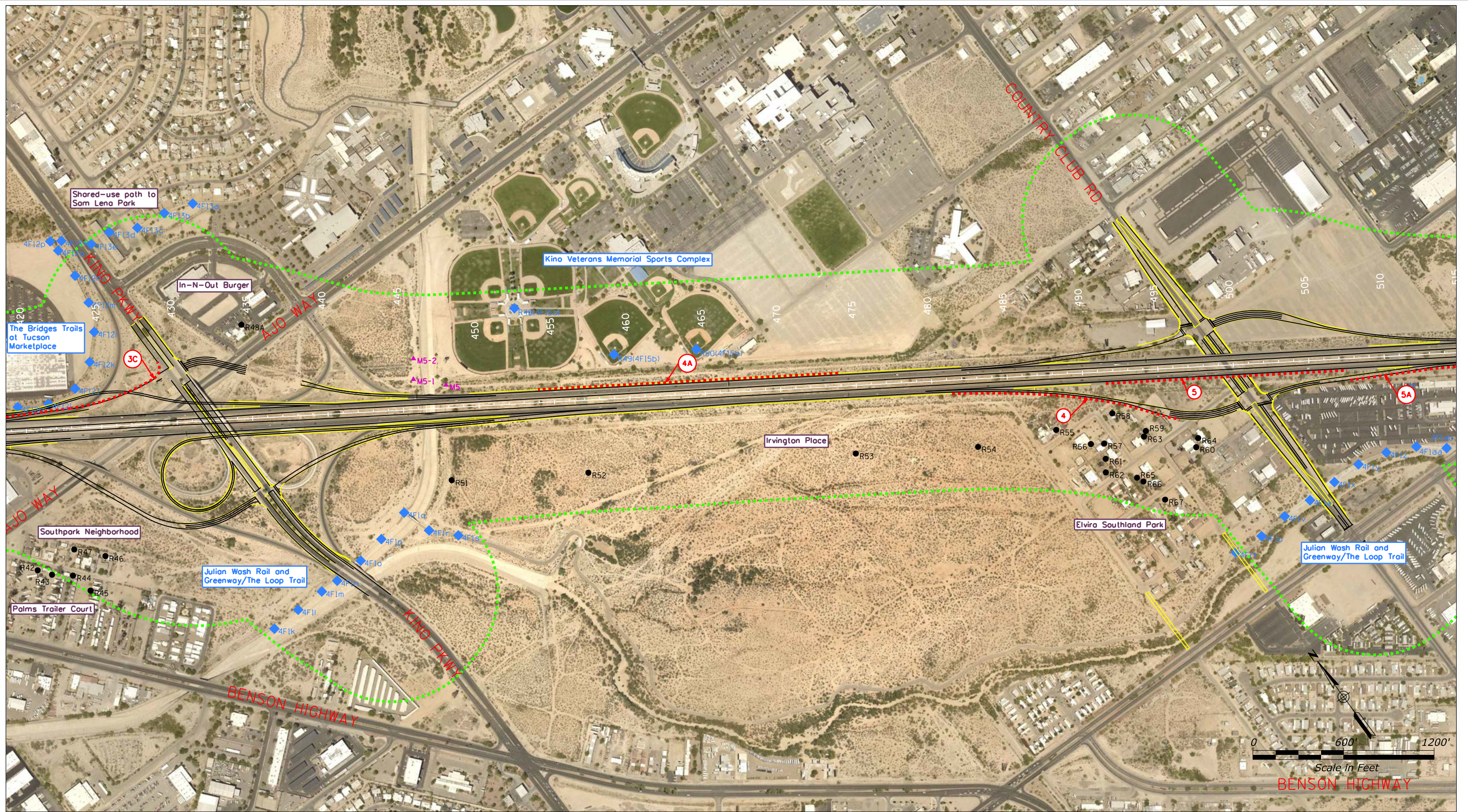
LEGEND

- RECOMMENDED NOISE WALL ———
- NOISE WALL NOT RECOMMENDED - - - - -
- EDGE OF PAVEMENT ———
- STUDY LIMITS - · - · -

- NOISE RECEIVER ●
- MONITORING LOCATION ▲
- 4(F) RESOURCE ◆

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APPENDIX A



I-10 Jct. I-19 to Kolb Road
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**INTERSTATE 10
 NOISE WALL LOCATIONS
 ALTERNATIVE I/IV**

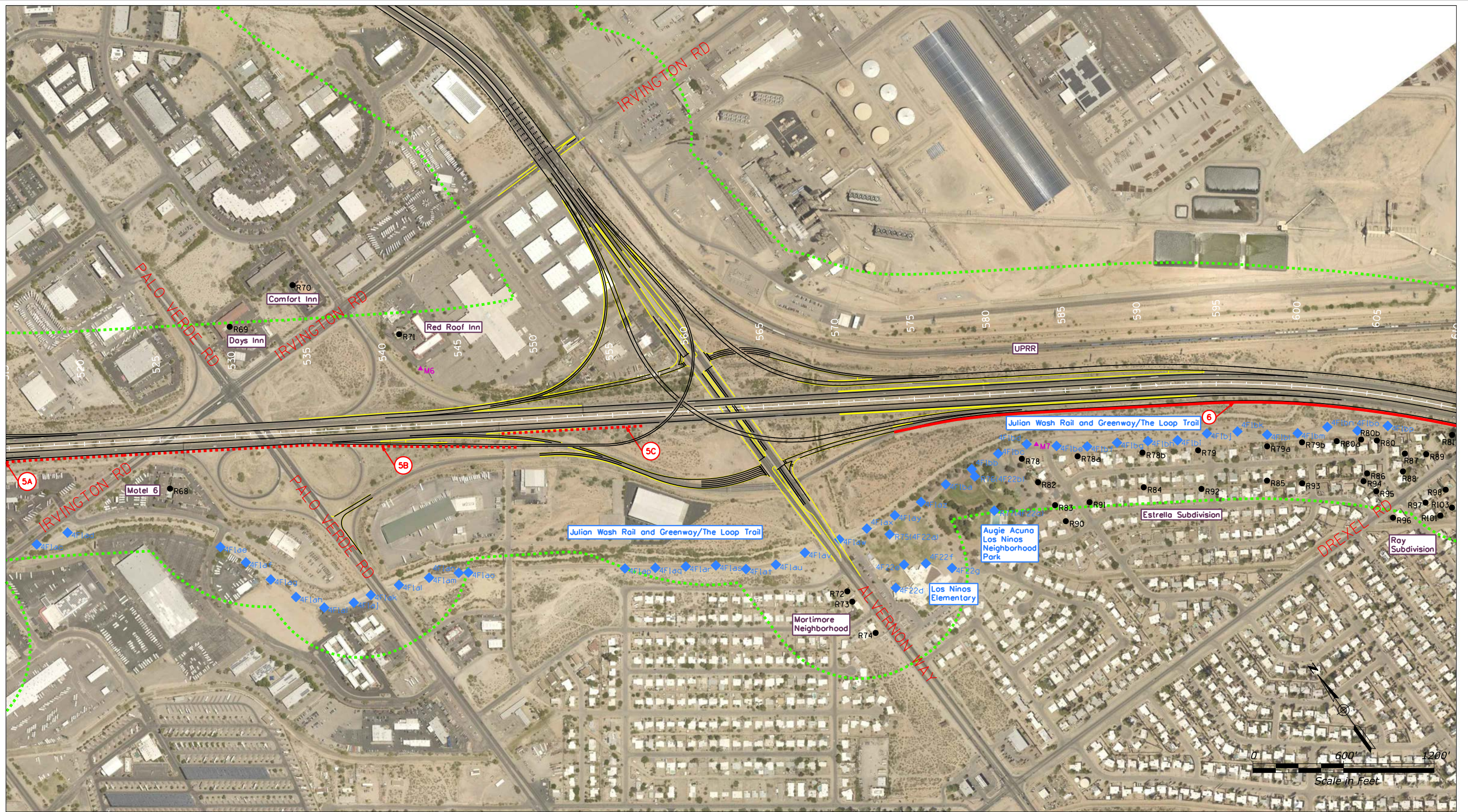
LEGEND

- RECOMMENDED NOISE WALL ———
- NOISE WALL NOT RECOMMENDED - - - - -
- EDGE OF PAVEMENT ———
- STUDY LIMITS - · - · -

- NOISE RECEIVER ●
- MONITORING LOCATION ▲
- 4(F) RESOURCE ◆

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APPENDIX A



I-10 Jct. I-19 to Kolb Road
 SR 210 - Golf Links Road to I-10
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**INTERSTATE 10
 NOISE WALL LOCATIONS
 ALTERNATIVE I**

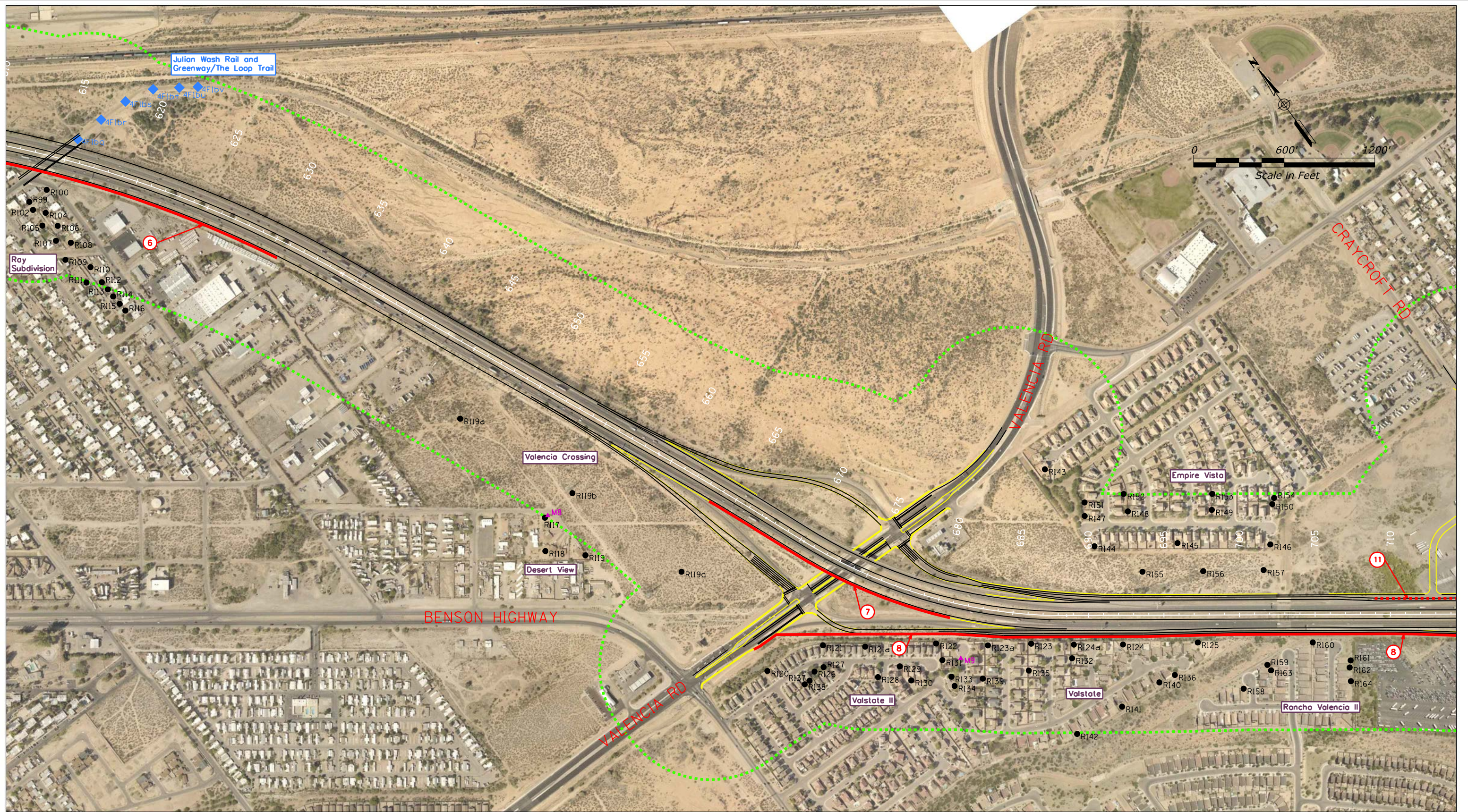
LEGEND

- RECOMMENDED NOISE WALL ————
- NOISE WALL NOT RECOMMENDED ······
- EDGE OF PAVEMENT ————
- STUDY LIMITS - - - - -

- NOISE RECEIVER ●
- MONITORING LOCATION ▲
- 4(F) RESOURCE ◆

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APPENDIX A



I-10 Jct. I-19 to Kolb Road
 SR 210 - Golf Links Road to I-10
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**INTERSTATE 10
 NOISE WALL LOCATIONS
 ALTERNATIVE I**

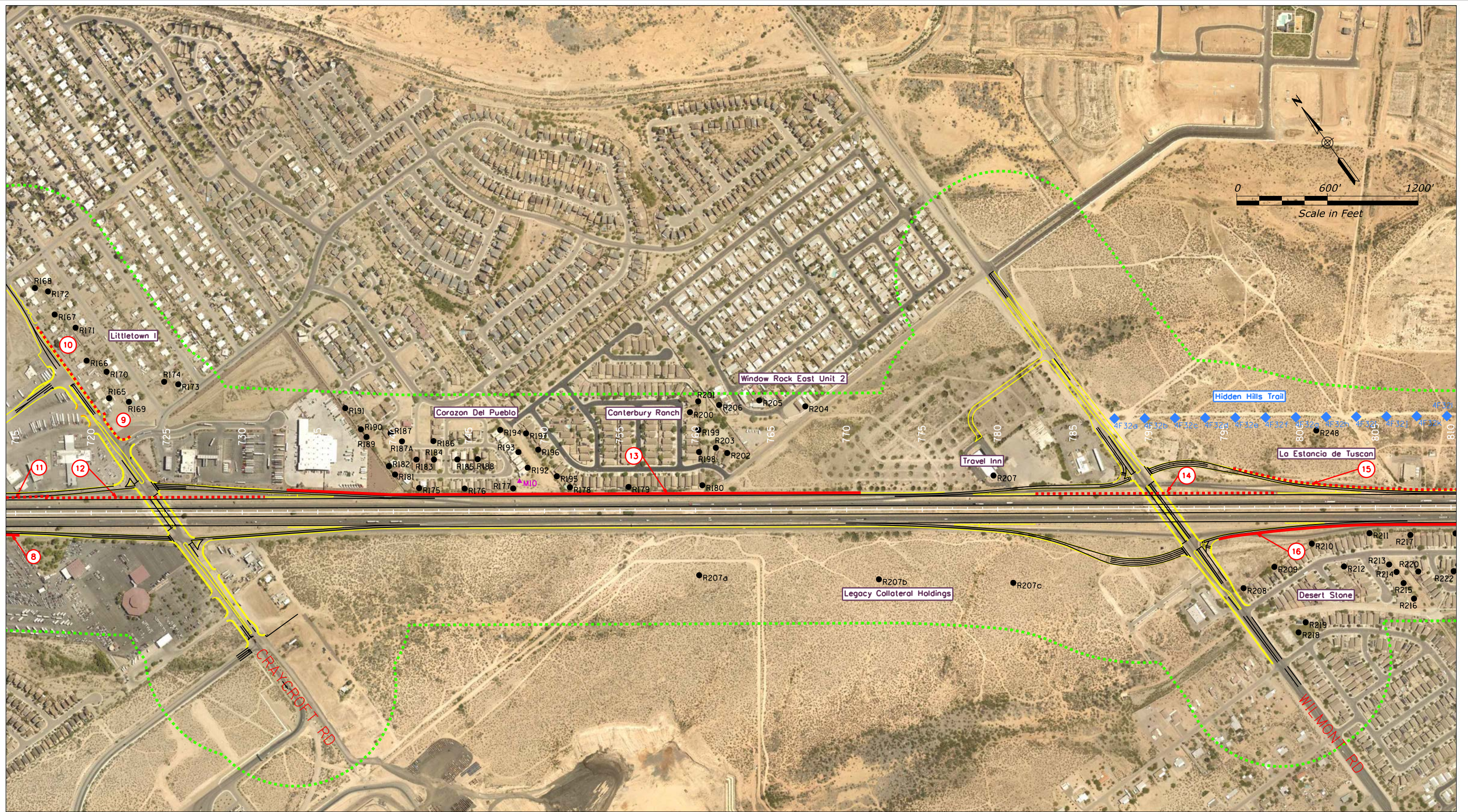
LEGEND

- RECOMMENDED NOISE WALL ———
- NOISE WALL NOT RECOMMENDED - - - - -
- EDGE OF PAVEMENT ———
- STUDY LIMITS - · - · -

- NOISE RECEIVER ●
- MONITORING LOCATION ▲
- 4(F) RESOURCE ◆

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APPENDIX A



**INTERSTATE 10
NOISE WALL LOCATIONS
ALTERNATIVE I**

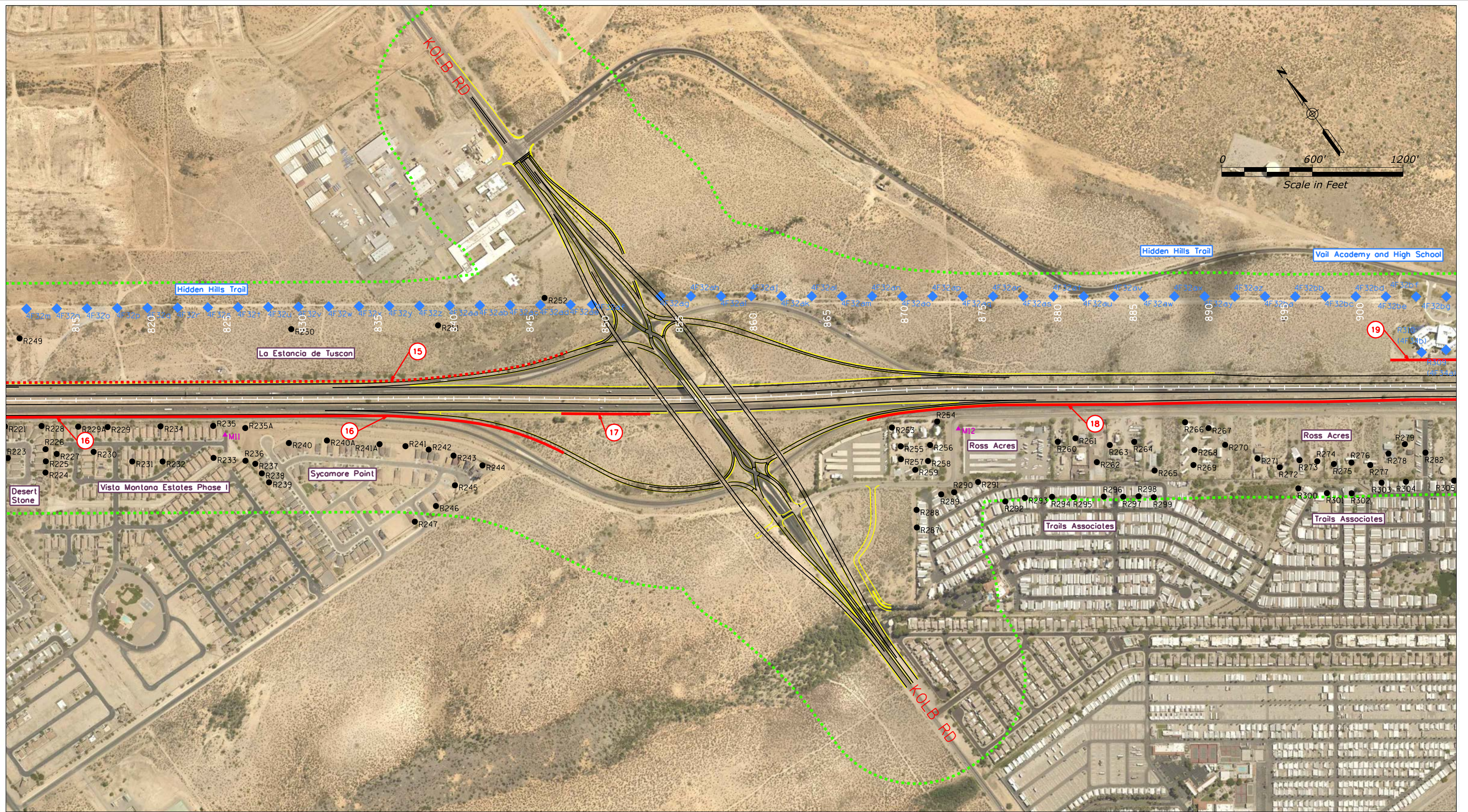
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- RECOMMENDED NOISE WALL ————
- NOISE WALL NOT RECOMMENDED - - - - -
- EDGE OF PAVEMENT ————
- STUDY LIMITS - - - - -
- NOISE RECEIVER ●
- MONITORING LOCATION ▲
- 4(F) RESOURCE ◆

I-10 Jct. I-19 to Kolb Road
SR 210 - Golf Links Road to I-10
TRACS No. H7825 01L, 010-E(210)S

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APPENDIX A



**INTERSTATE 10
NOISE WALL LOCATIONS
ALTERNATIVE I**

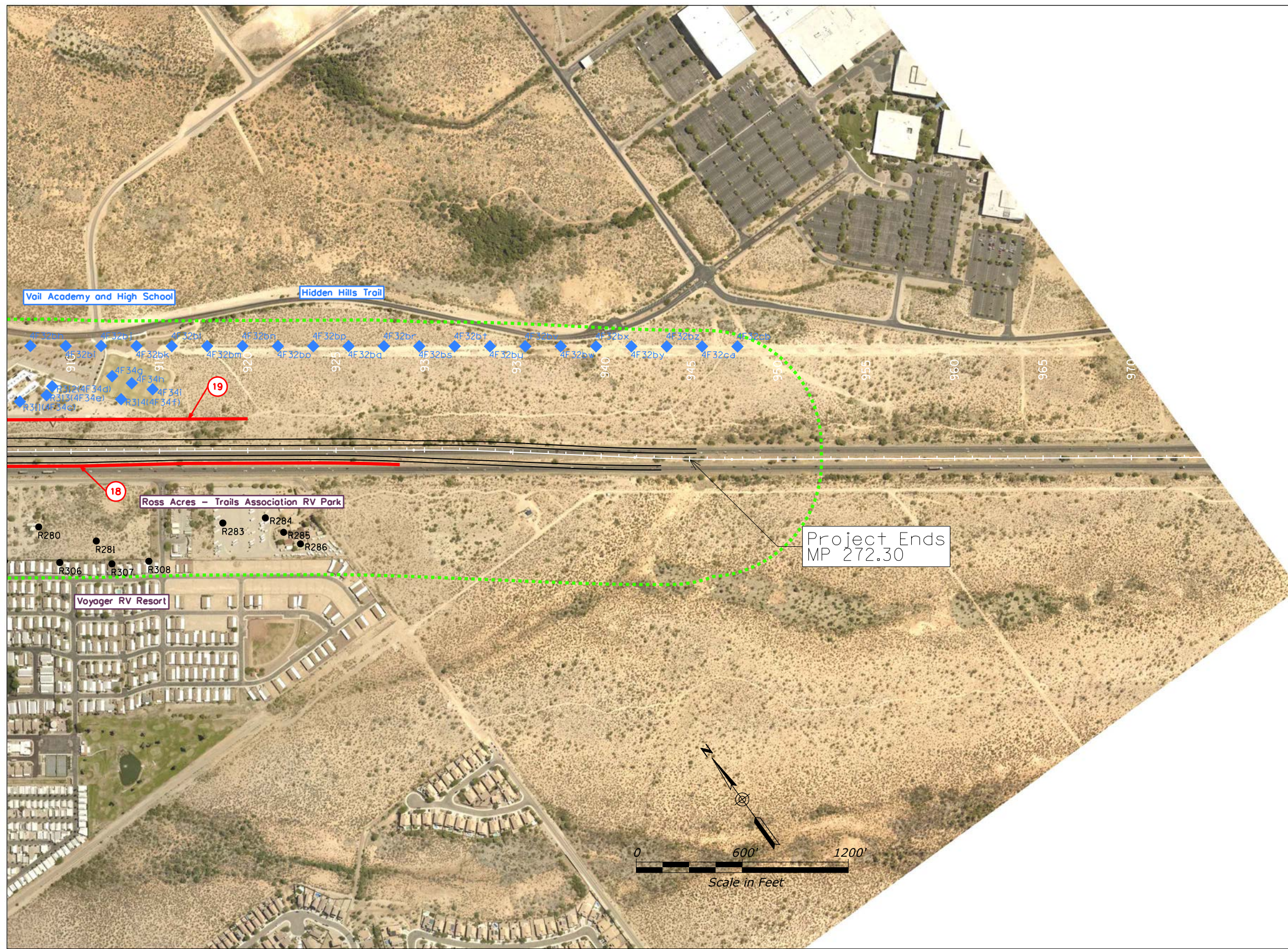
LEGEND

- RECOMMENDED NOISE WALL ————
- NOISE WALL NOT RECOMMENDED - - - - -
- EDGE OF PAVEMENT ————
- STUDY LIMITS - · - · -
- NOISE RECEIVER ●
- MONITORING LOCATION ▲
- 4(F) RESOURCE ◆

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I-10 Jct. I-19 to Kolb Road
SR 210 - Golf Links Road to I-10
TRACS No. H7825 01L, 010-E(210)S



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I-10 Jct. I-19 to Kolb Road
 SR 210 - Golf Links Road to I-10
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**INTERSTATE 10
 NOISE WALL LOCATIONS
 ALTERNATIVE I**

LEGEND

- RECOMMENDED NOISE WALL ———
- NOISE WALL NOT RECOMMENDED ·····
- EDGE OF PAVEMENT ———
- STUDY LIMITS - - - - -

- NOISE RECEIVER ●
- MONITORING LOCATION ▲
- 4(F) RESOURCE ◆

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