Noise Study Report

Addendum

Interstate 10 Corridor Project

In the Counties of San Bernardino and Los Angeles

07-LA-10 PM 44.9/48.3
08-SBD-10 PM 0.0/R37.0

EA 0C2500
EFIS ID 0800000040

August 2015

Caltrans

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Draft

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Summary

This addendum to the I-10 Corridor Project Noise Study Report (NSR) was prepared to analyze whether feasible noise abatement would be possible for impacted receivers located south of the Union Pacific Railroad (UPRR) railroad tracks with a soundwall located on private property. Soundwalls are being considered on private property because 1) UPRR will not allow soundwalls to be constructed on their R/W, 2) soundwall analysis was only performed on the shoulder of I-10, and 3) soundwalls located on the shoulder of I-10 would not provide feasible noise abatement and meet the design goal, as established in the NSR.

The purpose of this Noise Study Report (NSR) Addendum is to evaluate traffic noise impacts and abatement under the requirements of Title 23, Part 772 of the Code of Federal Regulations (Title 23 CFR 772) "Procedures for Abatement of Highway Traffic Noise." Title 23 CFR 772 provides procedures for preparing operational and construction noise studies as well as evaluating noise abatement considered for federal and federal-aid highway projects. According to Title 23 CFR 772.3, all highway projects that are developed in conformance with this regulation are deemed to be in conformance with Federal Highway Administration (FHWA) noise standards.

The California Department of Transportation (Caltrans), in cooperation with the San Bernardino Associated Governments (SANBAG), proposes to add freeway lanes through all or a portion of the 33-mile long stretch of I-10 from the Los Angeles/San Bernardino (LA/SB) county line to Ford Street in San Bernardino County. The project limits including transition areas extend from approximately 0.4 mile west of White Avenue in the City of Pomona at Post Mile (PM) 44.9 to Live Oak Canyon Road in the City of Yucaipa at PM 37.0. However, for the purpose of this addendum to the I-10 Corridor Project Noise Study Report (NSR) (Parsons, 2015), the project limits extend from Cherry Avenue in the City of Fontana to Cedar Avenue in the City of Bloomington (San Bernardino County).

This addendum analyzes land uses south of I-10 in three distinct segments that are based on major local interchanges. The three segments are:

- Segment 9 – West of Cherry Avenue to Citrus Avenue
- Segment 10 – Citrus Avenue to Sierra Avenue
- Segment 11 – Sierra Avenue to west of Cedar Avenue

Railroad tracks run parallel to I-10 from Segment 9 to 16. However, the study limits of this addendum are land uses south of I-10 in Segments 9, 10, and 11. This is because there are no outdoor use areas south of the train tracks within the study limits in Segments 12 through 14 and the UPRR flyover structure on retaining walls in Segments 15 and 16 would nullify all efforts to provide feasible noise abatement with a soundwall located on private property.

This report analyzes noise barriers with heights from 8 to 24 feet to determine feasible noise abatement for Alternatives 2 and 3. Soundwalls are considered feasible when they

provide at least 5 dB of noise reduction. The Noise Reduction Design Goal, which is one measure in determining whether a soundwall is reasonable, is achieved when a barrier is predicted to provide a noise reduction of at least 7 dB at one or more benefitted receivers. The following summarizes the range of existing and predicted future traffic noise levels, number of impacts, number of soundwalls, number of benefitted land uses, and range of their reasonable allowances per segment for each alternative.

Alternative 2:

Segment 9:

Existing Traffic and Train Noise Levels: 59 to 70 dBA
Future Traffic Noise Level Range: 58 to 69 dBA
Number of Impacts: Three
Number of Proposed Soundwalls: None
Number of Benefitted Land Uses: N/A
Reasonable Allowance: N/A

Segment 10:

Existing Traffic and Train Noise Levels: 62 to 72 dBA
Future Traffic Noise Level Range: 59 to 69 dBA
Number of Impacts: Five
Number of Proposed Soundwalls: Two
Number of Benefitted Land Uses: Nine
Reasonable Allowance Range: $71,000 to $639,000

Segment 11:

Existing Traffic and Train Noise Levels: 61 to 65 dBA
Future Traffic Noise Level Range: 63 to 65 dBA
Number of Impacts: None
Number of Proposed Soundwalls: None
Number of Benefitted Land Uses: N/A
Reasonable Allowance Range: N/A

Alternative 3:

Segment 9:

Existing Traffic and Train Noise Levels: 59 to 70 dBA
Future Traffic Noise Level Range: 59 to 69 dBA
Number of Impacts: Five
Number of Proposed Soundwalls: Two
Number of Benefitted Land Uses: Four
Reasonable Allowance Range: $71,000 to $213,000

Segment 10:

Existing Traffic and Train Noise Levels: 62 to 72 dBA

Future Traffic Noise Level Range: 59 to 69 dBA

Number of Impacts: Five

Number of Proposed Soundwalls: One

Number of Benefitted Land Uses: Nine

Reasonable Allowance Range: $71,000 to $639,000

Segment 11:

Existing Traffic and Train Noise Levels: 63 to 65 dBA

Future Traffic Noise Level Range: 64 to 66 dBA

Number of Impacts: Two

Number of Proposed Soundwalls: One

Number of Benefitted Land Uses: Two

Reasonable Allowance Range: $142,000 to $213,000

The total reasonable allowance for Alternative 2 ranges from $71,000 to $639,000 and the total reasonable allowance for Alternative 3 ranges from $284,000 to $1,065,000.

Details about the number of benefited receivers per soundwall as well as insertion losses and abated noise levels are provided in Chapter 3 and Appendix A.

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Chapter 1. Introduction

Caltrans, in cooperation with the San Bernardino Associated Governments (SANBAG), proposes to add freeway lanes through all or a portion of the 33-mile long stretch of I-10 from the Los Angeles/San Bernardino (LA/SB) county line to Ford Street in San Bernardino County. The project limits including transition areas extend from approximately 0.4 mile west of White Avenue in the City of Pomona at Post Mile (PM) 44.9 to Live Oak Canyon Road in the City of Yucaipa at PM 37.0. However, for the purpose of this addendum to the I-10 Corridor Project Noise Study Report (NSR) (Parsons, 2015), the project limits extend from Cherry Avenue in the City of Fontana to Cedar Avenue in the City of Bloomington (San Bernardino County).

This addendum to the NSR analyzes land uses south of I-10 in three distinct segments that are based on major local interchanges. The three segments are:

- Segment 9 – West of Cherry Avenue to Citrus Avenue
- Segment 10 – Citrus Avenue to Sierra Avenue
- Segment 11 – Sierra Avenue to west of Cedar Avenue

The addendum includes (a) roadway traffic noise modeling using FHWA's Traffic Noise Model version 2.5 (TNM 2.5); (b) train noise using the Federal Transit Administration's (FTA's) procedures; and (c) feasible noise abatement measures.

This addendum to the I-10 Corridor Project Noise Study Report (NSR) was prepared to analyze whether feasible noise abatement would be possible for impacted receivers located south of the Union Pacific Railroad (UPRR) railroad tracks with a soundwall located on private property. Soundwalls are being considered on private property because 1) UPRR will not allow soundwalls to be constructed on their R/W, 2) soundwall analysis was only performed on the shoulder of I-10, and 3) soundwalls located on the shoulder of I-10 would not provide feasible noise abatement and meet the design goal, as established in the NSR.

Railroad tracks run parallel to I-10 from Segment 9 to 16. However, the study limits of this addendum are land uses south of I-10 in Segments 9, 10, and 11. This is because there are no outdoor use areas south of the train tracks within the study limits in Segments 12 through 14 and the UPRR flyover structure on retaining walls in Segments 15 and 16 would nullify all efforts to provide feasible noise abatement with a soundwall located on private property.

The areas south of I-10 in Segments 9, 10, and 11 are mixed use containing both residential and commercial uses on the same property. The study area was examined in detail to confirm that the outdoor use areas are properly represented using the latest available information. As a result, some of the NSR receivers have been moved to represent the frequent outdoor use areas and not other uses such as storage or commercial uses. Furthermore, additional receivers have been added to determine an accurate count of benefitted residences if the soundwalls are determined to be feasible and meet the design goal.

Refer to the NSR (Parsons, 2015) Chapter 3 for the Fundamentals of Traffic Noise, Chapter 4 for Federal Regulations and State Policies, Chapter 5 for noise measurement procedures, Chapter 6 for a detailed description of existing land uses, and Chapter 8 for construction noise.

Chapter 2. Study Methods and Procedures

2.1. Prediction Methods

Receivers located on the south side of I-10 in Segments 9 through 11 are exposed to train noise in addition to traffic noise; therefore, the composite noise levels of trains and I-10 traffic were modeled for these receivers. However, noise impacts are based on traffic noise levels only.

2.1.1. Traffic Noise Model

FHWA's Traffic Noise Model version 2.5 (TNM 2.5) was used for the traffic noise computations (FHWA, 2004). Refer to Chapter 5.3.1 of the NSR (Parsons, 2015) for a full explanation of study methods and procedures used to calculate traffic noise levels.

2.1.2. Train Noise Levels

Train noise was estimated using the latest version of the noise model based on Federal Transit Administration (FTA) General Transit Noise Assessment methodology (FTA, 2006). As such, FTA's *Noise Impact Assessment Spreadsheet* was used to generate train noise levels prior to abatement (FTA, 2007). Please refer to Chapter 5.3.2 of the NSR (Parsons, 2015) for a full explanation of study methods and procedures used to calculate train noise.

In Segments 9 through 11, the Union Pacific Railroad (UPRR) mainline runs parallel to the eastbound I-10 mainline. Because there are no at-grade crossings or passenger stations within the study areas of Segments 9 through 11, train horn noise was not considered in the noise assessment.

Cruising speeds and the number of peak-hour operations were assumed to be constant for all receivers along the UPRR mainline south of the I-10 eastbound lanes for Segments 9 and 10; however, two different speeds were used in Segment 11 due to the West Colton Receiving and Departure yards south of the UPRR mainline.

In Segment 11, train operations were divided to through trains and trains that go into the yard. In these areas, for the modeling purpose, it was assumed that trains on the tracks next to I-10 will be traveling at the cruising speed. Because there are no set patterns how trains are moving around in the yard, operations in the yard were modeled on a single track at the middle of the yard at a speed limit of 10 mph to represent different movements in the yard.

Because a barrier located on private property would be between the source of the train noise and receiver, the barrier would obstruct train noise as well as traffic noise. Therefore, when calculating the noise prediction with barrier noise levels, the calculated attenuated train noise is added to the traffic noise levels with barrier calculated from TNM at all heights.

The attenuated train noise is calculated by applying a fundamental barrier insertion loss calculation to the train noise levels produced by FTA's *Noise Impact Assessment Spreadsheet*. The barrier insertion loss calculation is based on the geometric relationships between the distances and elevations of the source(s), barriers, and receivers.

There are properties with receivers which include existing property walls that would affect train noise. In which case, a barrier attenuation adjustment is applied in the FTA *Noise Impact Assessment Spreadsheet* for those receivers to determine the design year train noise level. However, when calculating the attenuated train noise levels with barrier heights of 8 to 24-feet, the barrier attenuation adjustment is removed from the FTA spreadsheet for these receivers. Otherwise, the barrier insertion loss would be applied to an already attenuated noise level.

2.1.3. Existing Noise Determination

The following procedure was used for estimating the existing noise levels for modeling-only receivers that are affected by train noise: Areas where the existing noise measurement includes train noise contributions, the existing noise levels for modeling-only receivers will be estimated from the "Design Year No-Build Traffic + Train Noise Levels." This will apply to receivers south of I-10 in Segments 9, 10, and 11.

2.2. Methods for Identifying Traffic Noise Impacts and Consideration of Abatement

Traffic noise impacts are considered to occur at receiver locations where predicted design-year traffic noise levels are at least 12 dB greater than existing noise levels, or where predicted design year traffic noise levels approach or exceed the NAC for the applicable activity category. Where traffic noise impacts are identified, noise abatement must be considered for reasonability and feasibility as required by Title 23 CFR 772 and the Protocol.

Chapter 3. Future Noise Environment, Impacts, and Considered Abatement

This addendum was prepared to determine future traffic noise impacts of the proposed project at frequent human use areas within the highway corridor for the land uses south of I-10 in Segments 9, 10, and 11. The future worst case traffic noise levels at frequent outdoor human use areas along the project corridor was modeled for the No-Build Alternative and the two build alternatives to determine appropriate abatement measures. The future train noise levels were also modeled and combined with the traffic noise levels in determining appropriate abatement measures. This section discusses the future noise environment and feasible noise abatement measures for impacted locations.

3.1. Future Noise Environment and Impacts

Tables in Appendix A summarize the predicted traffic noise levels for the existing and design-year No-Build Alternative 1 condition, as well as for design-year Build Alternatives 2 and 3. Tables in Appendix A also show the predicted train noise levels as well as composite traffic and train noise levels. Appendix B lists the addresses of modeled noise receivers. TNM files as well as the FTA Spreadsheets are contained on a CD that is located under Appendix D.

Modeling results in Appendix A indicate that predicted worst-hour traffic noise levels ($L_{eq[h]}$) without train noise for the design-year with-project conditions approach or exceed the NAC of 67 dBA for Activity Categories B land uses at several residences throughout the study limits. Therefore, traffic noise impacts are predicted to occur at Activity Category B land uses within the project area. Accordingly, noise abatement must be considered at those locations. Only traffic noise was considered in determining impacts because train noise is not related to the project.

3.2. Preliminary Noise Abatement Analysis

In accordance with Title 23 CFR 772, noise abatement is considered where traffic noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. Noise barrier analysis was conducted by placing soundwalls on private property in this addendum. Refer to Chapter 7.2 of the NSR (Parsons, 2015) for barrier analysis conducted on the shoulder of I-10.

Each noise barrier has been evaluated for feasibility based on achievable noise reduction (5 dB or more) at the outdoor frequent use areas of the representative receivers. Noise reduction of both traffic and train noise has been considered for each barrier. For each noise barrier determined to be acoustically feasible, it was determined if the Caltrans acoustical design goal could be achieved, then reasonable cost allowances were calculated. Tables in Appendix A summarize the existing noise levels as well as predicted future noise levels at receiver locations for soundwalls with heights ranging from 8 to 24

feet. The maximum height of 24 feet was analyzed on private property when feasible noise reduction plus achieving the design goal was not possible with lower soundwalls.

The Caltrans acoustical design goal must be met for a noise barrier to be considered reasonable. The design goal is that a barrier must be predicted to provide at least 7 dB of noise reduction at one or more benefitted receivers. In addition, the estimated cost to build the noise barrier should be equal to or less than the total cost allowance of benefited receivers calculated for the barrier to be considered reasonable from a cost perspective. The cost calculations of the noise barrier should include all items appropriate and necessary for construction of the barrier, such as traffic control, drainage modification, retaining walls, and other items. Construction cost estimates are not provided in this NSR, but they are presented in the Noise Abatement Decision Report (NADR) Addendum.

Preliminary information on the physical location, length, and height of noise barriers is provided in this report. If pertinent parameters change substantially during the final project design, preliminary noise barrier designs may be modified or eliminated from the final project. A final decision on the construction of location specific noise abatement will be made upon completion of the project design.

The minimum heights and locations of the soundwalls that would provide feasible abatement and achieve the 7 dB design goal are shown graphically in the figures in Appendix C. However, in the NADR, an effort should be made to achieve the greatest noise reduction possible within the calculated abatement allowance.

The minimum barrier height required to cut the line-of-sight from each receiver to the exhaust stacks of heavy trucks has been calculated for all feasible barriers. These heights were evaluated through calculations performed by TNM 2.5.

The following discussion considers land uses south of I-10 in Segments 9, 10, and 11. Tables 7-1 through 7-5 summarize the data used to assess the abatement cost allowances at each of the considered barrier heights. The following analysis presents predicted future traffic and train noise levels at various receivers and abatement measures for the two alternatives. Predicted noise levels are shown in Appendix A.

3.2.1. Alternative 2

Alternative 2 would extend the existing HOV lane in each direction of I-10 from the current HOV terminus near Haven Avenue in the City of Ontario to Ford Street in the City of Redlands. The study limits of this addendum are land uses south of I-10 between Cherry Avenue and Cedar Avenue. Tables A-1 through A-3 in Appendix A present the results of the barrier analysis. Figures 74 through 83 in Appendix C show the proposed alignment of Alternative 2 for Segments 9, 10, and 11.

UPRR train lines run parallel to I-10 on the south side throughout Segments 9, 10, and 11. The tracks are at grade and train noise affects the existing and future predicted noise levels at receivers located south of I-10. However, train noise is not considered when determining impacts because train noise is not related to the I-10 Corridor Project.

3.2.1.1. SEGMENT 9 – WEST OF CHERRY AVENUE TO CITRUS AVENUE

Existing exterior traffic and train noise levels south of I-10 range from 59 to 70 dBA for Receivers R9.19 through R9.38. The future predicted exterior traffic noise levels south of I-10 in Segment 9, excluding train noise, range from 58 to 69 dBA. One area approaches or exceeds the NAC for Activity Category B; therefore, consideration of noise abatement is required. Table A-1 in Appendix A shows the existing and future noise levels, as well as barrier analysis, for Segment 9 with Alternative 2.

Areas with Proposed Noise Abatement

There are no frequent outdoor use areas in this segment that are impacted by the project where it is feasible to apply standard noise abatement techniques while meeting the design goal of 7 dB of noise reduction.

Areas without Noise Abatement

Receiver R9.29: Traffic noise impact would occur at two multi-family and one single-family residences along the eastbound side of I-10. The soundwall analysis results summarized in Table A-1 in Appendix A demonstrate that feasible noise reduction is possible at the three single-family and multi-family residences represented by Receiver R9.29; however, the design goal cannot be met with a soundwall located on private property. Figure 76 in Appendix C show the location and length of the analyzed soundwall.

3.2.1.2. SEGMENT 10 – CITRUS AVENUE TO SIERRA AVENUE

Existing exterior traffic and train noise levels south of I-10 range from 62 to 72 dBA for Receivers R10.15 through R10.24. The future predicted exterior traffic noise levels south of I-10 in Segment 10, excluding train noise, range from 59 to 69 dBA. Two areas approach or exceed the NAC for Activity Category B; therefore, consideration of noise abatement is required. Table A-2 in Appendix A shows the existing and future noise levels, as well as barrier analysis, for Segment 10 with Alternative 2.

Areas with Proposed Noise Abatement

Soundwall S1818: Soundwall S1818 would be located south of I-10 on private property and would provide feasible noise abatement and meet the design goal by providing a 7 dB reduction for the frequent outdoor use areas of one single-family residence represented by Receiver R10.17. Table 3-1 summarizes the range of allowances for each feasible noise abatement measure considered. Figure 78 in Appendix C shows the location, minimum length, and height required for this soundwall to provide feasible traffic noise abatement and meet the design goal.

Table 3-1. Summary of Reasonableness Determination Data – Alternative 2 – Soundwall S1818[a]

Barrier I.D.: S1818	8-Foot Barrier	10-Foot Barrier	12-Foot Barrier	14-Foot Barrier	16-Foot Barrier
Number of Benefited Receivers	N/A	N/A	N/A	1	1
Reasonable Allowance Per Benefited Receiver	N/A	N/A	N/A	$71,000	$71,000
Total Reasonable Allowance	N/A	N/A	N/A	$71,000	$71,000
	18-Foot Barrier	**20-Foot Barrier**	**22-Foot Barrier**	**24-Foot Barrier**	**--**
Number of Benefited Receivers	1	9	9	9	--
Reasonable Allowance Per Benefited Receiver	$71,000	$71,000	$71,000	$71,000	--
Total Reasonable Allowance	$71,000	$639,000	$639,000	$639,000	--

Note: N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] An NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

Soundwall S1834: Soundwall S1834 would be located south of I-10 on private property and would provide feasible noise abatement for the frequent outdoor use areas of eight single-family residences represented by Receivers R10.19 and R10.20B. This soundwall would also meet the design goal by providing a 7 dB reduction in traffic noise level at R10.20B. Table 3-2 summarizes the range of allowances for each feasible noise abatement measure considered. Figure 79 in Appendix C shows the location, minimum length, and height required for this soundwall to provide feasible traffic noise abatement and meet the design goal.

Table 3-2. Summary of Reasonableness Determination Data – Alternative 2 – Soundwall S1834[a]

Barrier I.D.: S1834	8-Foot Barrier	10-Foot Barrier	12-Foot Barrier	14-Foot Barrier	16-Foot Barrier
Number of Benefited Receivers	N/A	N/A	4	8	8
Reasonable Allowance Per Benefited Receiver	N/A	N/A	$71,000	$71,000	$71,000
Total Reasonable Allowance	N/A	N/A	$284,000	$568,000	$568,000
	18-Foot Barrier	**20-Foot Barrier**	**22-Foot Barrier**	**24-Foot Barrier**	**--**
Number of Benefited Receivers	8	8	8	8	--
Reasonable Allowance Per Benefited Receiver	$71,000	$71,000	$71,000	$71,000	--
Total Reasonable Allowance	$568,000	$568,000	$568,000	$568,000	--

Note: N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] An NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

Areas without Noise Abatement

There are no frequent outdoor use areas in this segment that are impacted by the project where it was not feasible to apply standard noise abatement techniques

3.2.1.3. SEGMENT 11 – SIERRA AVENUE TO CEDAR AVENUE

Existing exterior traffic and train noise levels south of I-10 range from 61 to 65 dBA for Receivers R11.45 through R11.49. The future predicted exterior traffic noise levels south of I-10 in Segment 11, excluding train noise, range from 63 to 65 dBA; therefore, there would be no traffic noise impacts. Table A-3 in Appendix A shows the existing and future noise levels for Segment 11 with Alternative 2.

Areas with Proposed Noise Abatement

There are no outdoor use areas in this segment that are impacted by the project; therefore, noise abatement is not required.

Areas without Noise Abatement

There are no outdoor use areas in this segment that are impacted by the project; therefore, noise abatement is not required.

3.2.2. Alternative 3

Alternative 3 would provide two Express Lanes in each direction of I-10 from the Los Angeles/San Bernardino county line to California Street (near SR-210) in the City of Redlands and one Express Lane in each direction from California Street to Ford Street in the City of Redlands. The study limits of this addendum are land uses south of I-10 between Cherry Avenue and Cedar Avenue. Tables A-4 through A-6 in Appendix A present the results of the barrier analysis. Figures 129 through 138 in Appendix C show the proposed alignment of Alternative 3 for Segments 9, 10, and 11.

UPRR train lines run parallel to I-10 on the south side throughout Segments 9, 10, and 11. The tracks are at grade and train noise affects the existing and future predicted noise levels at receivers located south of I-10. However, train noise is not considered when determining impacts because train noise is not related to the I-10 Corridor Project.

3.2.2.1. SEGMENT 9 – WEST OF CHERRY AVENUE TO CITRUS AVENUE

Existing exterior traffic and train noise levels south of I-10 range from 59 to 70 dBA for receivers R9.19 through R9.38. The future predicted exterior traffic noise levels south of I-10 in Segment 9, excluding train noise, range from 59 to 69 dBA. Several areas approach or exceed the NAC for Activity Category B; therefore, consideration of noise abatement is required. Table A-4 in Appendix A shows the existing and future noise levels, as well as barrier analysis, for Segment 9 with Alternative 3.

Areas with Proposed Noise Abatement

Soundwall S1708: Soundwall S1708 would be located south of I-10 on private property and would provide feasible noise abatement for the frequent outdoor use areas of two single-family residences represented by Receivers R9.21A and R9.22. This soundwall

would also meet the design goal by providing a 7 dB reduction in traffic noise levels at Receiver R9.21A. Receiver R9.23 would also meet the design goal of 7 dB of attenuation; however, this receiver does not represent an outdoor use area. Table 3-3 summarizes the range of allowances for each feasible noise abatement measure considered. Figure 130 in Appendix C shows the location, minimum length, and height required for this soundwall to provide feasible traffic noise abatement and meet the design goal.

Table 3-3. Summary of Reasonableness Determination Data – Alternative 3 – Soundwall S1708[a]

Barrier I.D.: S1708	**8-Foot Barrier**	**10-Foot Barrier**	**12-Foot Barrier**	**14-Foot Barrier**	**16-Foot Barrier**
Number of Benefited Receivers	N/A	N/A	N/A	N/A	1
Reasonable Allowance Per Benefited Receiver	N/A	N/A	N/A	N/A	$71,000
Total Reasonable Allowance	N/A	N/A	N/A	N/A	$71,000
	18-Foot Barrier	**20-Foot Barrier**	**22-Foot Barrier**	**24-Foot Barrier**	**--**
Number of Benefited Receivers	1	1	2	2	--
Reasonable Allowance Per Benefited Receiver	$71,000	$71,000	$71,000	$71,000	--
Total Reasonable Allowance	$71,000	$71,000	$142,000	$142,000	--

Note: N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] An NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

Soundwall S1748: Soundwall S1748 would be located south of I-10 on private property and would provide feasible noise abatement and meet the design goal by providing a 7 dB reduction for the frequent outdoor use areas of three single-family residences represented by Receiver R9.29. Table 3-4 summarizes the range of allowances for each feasible noise abatement measure considered. Figure 131 in Appendix C shows the location, minimum length, and height required for this soundwall to provide feasible traffic noise abatement and meet the design goal.

Table 3-4. Summary of Reasonableness Determination Data – Alternative 3 – Soundwall S1748[a]

Barrier I.D.: S1748	8-Foot Barrier	10-Foot Barrier	12-Foot Barrier	14-Foot Barrier	16-Foot Barrier
Number of Benefited Receivers	N/A	N/A	N/A	3	3
Reasonable Allowance Per Benefited Receiver	N/A	N/A	N/A	$71,000	$71,000
Total Reasonable Allowance	N/A	N/A	N/A	$213,000	$213,000
	18-Foot Barrier	**20-Foot Barrier**	**22-Foot Barrier**	**24-Foot Barrier**	**--**
Number of Benefited Receivers	3	3	3	3	--
Reasonable Allowance Per Benefited Receiver	$71,000	$71,000	$71,000	$71,000	--
Total Reasonable Allowance	$213,000	$213,000	$213,000	$213,000	--

Note: N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] An NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

Areas without Noise Abatement

Receiver R9.36A: Traffic noise impacts would occur at one single-family residence along the eastbound side of I-10. The soundwall analysis results summarized in Table A-4 in Appendix A demonstrate that while feasible noise reduction is possible at the single-family residence represented by Receiver R9.36A, the 7 dB design goal could not be met. Figure 132 and 133 in Appendix C show this receiver and analyzed soundwalls.

3.2.2.2. SEGMENT 10 – CITRUS AVENUE TO SIERRA AVENUE:

Existing exterior traffic and train noise levels south of I-10 range from 62 to 72 dBA for Receivers R10.15 through R10.24. The future predicted exterior traffic noise levels south of I-10 in Segment 10, excluding train noise, range from 59 to 69 dBA. Two areas approach or exceed the NAC for Activity Category B; therefore, consideration of noise abatement is required. Table A-5 in Appendix A shows the existing and future noise levels, as well as barrier analysis, for Segment 10 with Alternative 3.

Areas with Proposed Noise Abatement

Soundwall S1818: Soundwall S1818 would be located south of I-10 on private property and would provide feasible noise abatement for the frequent outdoor use areas of nine single-family residences represented by Receivers R10.17A and R10.17. This soundwall would also meet the design goal by providing a 7 dB reduction in traffic noise levels at Receiver R10.17. Table 3-5 summarizes the range of allowances for each feasible noise abatement measure considered. Figure 133 in Appendix C show the location, minimum length, and height required for this soundwall to provide feasible traffic noise abatement and meet the design goal.

Table 3-5. Summary of Reasonableness Determination Data – Alternative 3 – Soundwall S1818[a]

Barrier I.D.: S1818	8-Foot Barrier	10-Foot Barrier	12-Foot Barrier	14-Foot Barrier	16-Foot Barrier
Number of Benefited Receivers	N/A	N/A	N/A	1	1
Reasonable Allowance Per Benefited Receiver	N/A	N/A	N/A	$71,000	$71,000
Total Reasonable Allowance	N/A	N/A	N/A	$71,000	$71,000
	18-Foot Barrier	**20-Foot Barrier**	**22-Foot Barrier**	**24-Foot Barrier**	**--**
Number of Benefited Receivers	1	1	9	9	--
Reasonable Allowance Per Benefited Receiver	$71,000	$71,000	$71,000	$71,000	--
Total Reasonable Allowance	$71,000	$71,000	$639,000	$639,000	--

Note: N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] An NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

Areas without Noise Abatement

Receiver R10.20B: Traffic noise impacts would occur at four single-family residences along the eastbound side of I-10. The soundwall analysis results summarized in Table A-5 in Appendix A demonstrate that feasible noise reduction is possible at eight single-family residences represented by Receiver R10.19 and R10.20B; however, the design goal cannot be met with a soundwall located on private property. Figure 134 in Appendix C shows this receiver and analyzed soundwall.

3.2.2.3. SEGMENT 11 – SIERRA AVENUE TO CEDAR AVENUE

Existing exterior traffic and train noise levels south of I-10 range from 61 to 65 dBA for Receivers R11.45 through R11.49. The future predicted exterior traffic noise levels south of I-10 in Segment 11, excluding train noise, range from 64 to 66 dBA. One area approaches or exceeds the NAC for Activity Categories B; therefore, consideration of noise abatement is required. Table A-6 in Appendix A shows the existing and future noise levels, as well as barrier analysis, for Segment 11 with Alternative 3.

Areas with Proposed Noise Abatement

Soundwall S1934: Soundwall S1934 would be located on private property along eastbound I-10. This soundwall would provide feasible noise abatement and meet the design goal by providing a 7 dB reduction for two single-family residences represented by Receiver R11.47. Table 3-6 summarizes the range of reasonable allowances for the feasible noise abatement measure considered. Figure 137 in Appendix C shows the location, minimum length, and height required for this soundwall to provide feasible traffic noise abatement.

Table 3-6. Summary of Reasonableness Determination Data – Alternative 3 – Soundwall S1934[a]

Barrier I.D.: S1934	8-Foot Barrier	10-Foot Barrier	12-Foot Barrier	14-Foot Barrier	16-Foot Barrier
Number of Benefited Receivers	N/A	N/A	2	2	2
Reasonable Allowance Per Benefited Receiver	N/A	N/A	$71,000	$71,000	$71,000
Total Reasonable Allowance	N/A	N/A	$142,000	$142,000	$142,000
	18-Foot Barrier	**20-Foot Barrier**	**22-Foot Barrier**	**24-Foot Barrier**	**--**
Number of Benefited Receivers	3	3	3	3	--
Reasonable Allowance Per Benefited Receiver	$71,000	$71,000	$71,000	$71,000	--
Total Reasonable Allowance	$213,000	$213,000	$213,000	$213,000	--

Note: N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

[a] An NADR will be prepared that will identify noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

Areas without Noise Abatement

There are no frequent outdoor use areas in this segment that are impacted by the project where it was not feasible to apply standard noise abatement techniques

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Chapter 4. References

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Appendix A Predicted Future Noise Levels and Noise Barrier Analysis

Table A-1 – Predicted Future Noise Levels and Barrier Analysis – Segment 9 - Alternative 2

Receiver I.D.	Barrier I.D. and Location [11]	Land Use [2]	Number of Dwelling Units	Existing Traffic + Train Noise Level Leq(h), dBA [1,3]	I-10 Corridor Project Future Worst Hour Noise Levels - Leq(h), dBA [1]										Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefitted Receivers (NBR)														
					Design Year Train Noise Level Leq(h), dBA [1]	Design Year No Build Traffic Noise Level Leq(h), dBA [1]	Design Year No Build Traffic + Train Noise Level Leq(h), dBA [1,12]	Design Year Build Traffic Noise Level Leq(h), dBA [1,13]	Design Year Build Traffic + Train Noise Level Leq(h), dBA [1,12]	Design Year No Build Traffic + Train Noise Level Minus Existing Conditions Leq(h), dBA	Design Year Build Traffic Noise Level Minus No Build Conditions Leq(h), dBA	Design Year Build Traffic + Train Noise Level Minus No Build Traffic + Train Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type [4,13]	8 feet			10 feet			12 feet			14 feet			16 feet		
															Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*
R 9.19 [B,7]	--	SFR	3	60 [E]	61	60	63	60	63	3	0	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.20 [B]		SFR	3	63 [E]	64	61	66	62	66	3	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.21	--	SFR/MFR	10	64 [E]	64	63	67	64	67	3	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.21A		SFR	1	65 [E]	66	64	68	65	68	3	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.22 [W]		SFR	1	65 [M,ST3]	67	64	68	65	69	3	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.23 [B]		COM	--	69 [M,ST3A,CAL]	67	64	69	65	69	--	1	0	E (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.25 [B]	--	SFR	3	63 [E]	63	62	66	63	66	3	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.26 [B]		SFR	3	63 [E]	63	63	66	64	67	3	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.27 [W]		SFR	1	59 [E]	56	58	60	58	60	1	0	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.28 [W]		SFR	1	61 [E]	57	60	62	61	62	1	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.29	Private Property	SFR/MFR	3	67 [E]	64	66	68	67	68	1	1	0	B (67)	A/E	67	1	*0*	65	3	*0*	64	4	*0*	64	4	*0*	63	5	*3*
R 9.30	--	SFR	3	63 [E]	60	61	64	62	64	1	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.31 [8]		COM	1	70 [M,ST4]	68	68	71	69	71	1	1	0	E (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.32		COM	1	69 [E]	67	68	70	68	71	1	0	1	E (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.33 [W,7]	--	MH	6	61 [E]	57	59	61	60	62	0	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.34 [W,7]		SFR	5	62 [E]	57	61	62	62	63	0	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.35 [W]		COM	1	68 [M,LT3]	64	65	68	66	68	0	1	0	E (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.36 [W]		SFR	2	65 [E]	60	63	65	64	65	0	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.36A		SFR	1	68 [E]	65	64	68	65	68	0	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.37		SFR	3	68 [E]	65	64	68	65	68	0	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.37A		SFR	1	66 [E]	64	61	66	62	66	0	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.38 [W]		SFR	1	67 [E]	66	62	67	62	67	0	0	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

1 - Leq(h) are A-weighted, peak hour noise levels in decibels.

2 - Land Use: SFR - single-family residence; MFR - multi-family residence; MH - mobile home; MED - medical facility; SCH - educational center; COM - commercial; MOT - motel; REC - recreational; REL - religious institution.

3 - M - Measured noise level; STxx or LTxx - measurement site number; E - estimated from No Build noise level and measurement sites; CAL - model calibration site; Hxx - in/outdoor measurement.

4 - S = Substantial Increase (12 dBA or more); A/E = Approach or exceed NAC.

5 - Barrier height needed to meet requirements at adjacent receiver(s).

6 - Second story receiver.

7 - Non first row residences.

8 - This noise measurement site was chosen for monitoring purposes and was not located at an outdoor use area; however, this site is representative of nearby outdoor use areas.

9 - This noise measurement site will be a take.

10 - Per the Highway Design Manual, the maximum height of a noise barrier should not exceed 14 feet in height when located 15 feet or less from edge of traveled way.

11 - Barrier Type: P - proposed; X - existing; D - replacement in kind; If a Location is provided and there is no Barrier I.D., a soundwall was analyzed at this location but did not meet the feasibility and/or design goal requirements. "--" indicates that no barrier was analyzed in front of the corresponding receivers.

12 - Year 2035 train noise levels were calculated from the *Regional Rail Simulation Findings Technical Appendix*.

13 - When train noise levels are provided, noise impacts are based on noise levels from the column labeled "Design Year Build Traffic Noise Level Leq(h), dBA."

B - Includes the benefit of an existing building or building row.

R - The minimum height to meet feasibility requirements and design goal.

T - Minimum height required to block the line-of-sight from the receiver to truck exhaust stacks.

W - Includes the benefit of an existing soundwall or property wall.

Table A-1 – Predicted Future Noise Levels and Barrier Analysis – Segment 9 - Alternative 2 (Cont'd)

Receiver I.D.	Barrier I.D. and Location [11]	Land Use[2]	Number of Dwelling Units	Existing Traffic + Train Noise Level Leq(h), dBA[1,3]	I-10 Corridor Project Future Worst Hour Noise Levels - Leq(h), dBA[1]										Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefitted Receivers (NBR)														
															18 feet			20 feet			22 feet			24 feet			--		
					Design Year Train Noise Level Leq(h), dBA[1]	Design Year No Build Traffic Noise Level Leq(h), dBA[1]	Design Year No Build Traffic + Train Noise Level Leq(h), dBA[1,12]	Design Year Build Traffic Noise Level Leq(h), dBA[1,13]	Design Year Build Traffic + Train Noise Level Leq(h), dBA[1,12]	Design Year No Build Traffic + Train Noise Level Minus Existing Conditions Leq(h), dBA	Design Year Build Traffic Noise Level Minus No Build Conditions Leq(h), dBA	Design Year Build Traffic + Train Noise Level Minus No Build Traffic + Train Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type[4,13]	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*
R 9.29	Private Property	SFR/MFR	3	67 [E]	64	66	68	67	68	1	1	0	B (67)	A/E	63	5	*3*	62	6	*3*	62	6	*3*	62	6	*3*	--	--	--

Notes:

1 - Leq(h) are A-weighted, peak hour noise levels in decibels.
2 - Land Use: SFR - single-family residence; MFR - multi-family residence; MH - mobile home; MED - medical facility; SCH - educational center; COM - commercial; MOT - motel; REC - recreational; REL - religious institution.
3 - M - Measured noise level; STxx or LTxx - measurement site number; E - estimated from No Build noise level and measurement sites; CAL - model calibration site; Hxx - in/outdoor measurement.
4 - S = Substantial Increase (12 dBA or more); A/E = Approach or exceed NAC.
5 - Barrier height needed to meet requirements at adjacent receiver(s).
6 - Second story receiver.
7 - Non first row residences.
8 - This noise measurement site was chosen for monitoring purposes and was not located at an outdoor use area; however, this site is representative of nearby outdoor use areas.
9 - This noise measurement site will be a take.
10 - Per the Highway Design Manual, the maximum height of a noise barrier should not exceed 14 feet in height when located 15 feet or less from edge of traveled way.
11 - Barrier Type: P - proposed; X - existing; D - replacement in kind; If a Location is provided and there is no Barrier I.D., a soundwall was analyzed at this location but did not meet the feasibility and/or design goal requirements. "--" indicates that no barrier was analyzed in front of the corresponding receivers.
12 - Year 2035 train noise levels were calculated from the *Regional Rail Simulation Findings Technical Appendix*.
13 - When train noise levels are provided, noise impacts are based on noise levels from the column labeled "Design Year Build Traffic Noise Level Leq(h), dBA."
B - Includes the benefit of an existing building or building row.
R - The minimum height to meet feasibility requirements and design goal.
T - Minimum height required to block the line-of-sight from the receiver to truck exhaust stacks.
W - Includes the benefit of an existing soundwall or property wall.

Table A-2 – Predicted Future Noise Levels and Barrier Analysis – Segment 10 - Alternative 2

Receiver I.D.	Barrier I.D. and Location [11]	Land Use [2]	Number of Dwelling Units	Existing Traffic + Train Noise Level Leq(h), dBA [1,3]	I-10 Corridor Project Future Worst Hour Noise Levels - Leq(h), dBA [1]										Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefitted Receivers (NBR)														
					Design Year Train Noise Level Leq(h), dBA [1]	Design Year No Build Traffic Noise Level Leq(h), dBA [1]	Design Year No Build Traffic + Train Noise Level Leq(h), dBA [1,12]	Design Year Build Traffic Noise Level Leq(h), dBA [1,13]	Design Year Build Traffic + Train Noise Level Leq(h), dBA [1,12]	Design Year No Build Traffic + Train Noise Level Minus Existing Conditions Leq(h), dBA	Design Year Build Traffic Noise Level Minus No Build Conditions Leq(h), dBA	Design Year Build Traffic + Train Noise Level Minus No Build Traffic + Train Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type [4,13]	8 feet			10 feet			12 feet			14 feet			16 feet		
															Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*
R 10.15	--	SFR	3	66 [M,ST5]	66	60	67	60	67	1	0	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.15A		SFR	3	63	60	62	64	63	65	1	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.16 [W]		SFR	5	65 [E]	60	64	66	65	66	1	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.16A [W,8]		--	--	69 [M,ST7,CAL]	68	68	71	69	72	2	1	1	B (67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.17A	S1818[P] Private Property	SFR	8	67 [E]	63	65	67	65	67	0	0	0	B (67)	NONE	66	1	*0*	65	2	*0*	64	3	*0*	63	4	*0*	63	4	*0*
R 10.17 [W]		SFR	1	70 [E]	67	67	70	68	70	0	1	0	B (67)	A/E	69	1	*0*	68	2	*0*	66 [T]	4	*0*	65	5	*1*	64	6	*1*
R 10.18	--	SFR	3	64 [E]	59	63	64	64	65	0	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.19	S1834[P] Private Property	SFR	4	66 [E]	63	64	66	65	67	0	1	1	B (67)	NONE	65	2	*0*	64	3	*0*	63	4	*0*	62	5	*4*	61	6	*4*
R 10.20 [8]		--	--	70 [M,LT5,CAL]	66	67	70	68	71	0	1	1	B (67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.20B		SFR	4	68	65	66	68	67	69	0	1	1	B (67)	A/E	67	2	*0*	65 [T]	4	*0*	64	5	*4*	63	6	*4*	63	6	*4*
R 10.20A [7]		SFR	16	63 [E]	60	60	63	61	63	0	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.21		COM	1	72 [E]	69	68	72	68	72	0	0	0	B (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.22		SFR	2	66 [E]	62	63	66	64	66	0	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.23 [7]		SFR	12	62 [E]	59	58	62	59	62	0	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.24		SFR	2	64 [E]	61	60	64	60	64	0	0	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

1 - Leq(h) are A-weighted, peak hour noise levels in decibels.
2 - Land Use: SFR - single-family residence; MFR - multi-family residence; MH - mobile home; MED - medical facility; SCH - educational center; COM - commercial; MOT - motel; REC - recreational; REL - religious institution.
3 - M - Measured noise level; STxx or LTxx - measurement site number; E - estimated from No Build noise level and measurement sites; CAL - model calibration site; Hxx - in/outdoor measurement.
4 - S = Substantial Increase (12 dBA or more); A/E = Approach or exceed NAC.
5 - Barrier height needed to meet requirements at adjacent receiver(s).
6 - Second story receiver.
7 - Non first row residences.
8 - This noise measurement site was chosen for monitoring purposes and was not located at an outdoor use area; however, this site is representative of nearby outdoor use areas.
9 - This noise measurement site will be a take.
10 - Per the Highway Design Manual, the maximum height of a noise barrier should not exceed 14 feet in height when located 15 feet or less from edge of traveled way.
11 - Barrier Type: P - proposed; X - existing; D - replacement in kind; If a Location is provided and there is no Barrier I.D., a soundwall was analyzed at this location but did not meet the feasibility and/or design goal requirements. "--" indicates that no barrier was analyzed in front of the corresponding receivers.
12 - Year 2035 train noise levels were calculated from the *Regional Rail Simulation Findings Technical Appendix*.
13 - When train noise levels are provided, noise impacts are based on noise levels from the column labeled "Design Year Build Traffic Noise Level Leq(h), dBA."
B - Includes the benefit of an existing building or building row.
R - The minimum height to meet feasibility requirements and design goal.
T - Minimum height required to block the line-of-sight from the receiver to truck exhaust stacks.
W - Includes the benefit of an existing soundwall or property wall.

Table A-2 – Predicted Future Noise Levels and Barrier Analysis – Segment 10 - Alternative 2 (Cont'd)

Receiver I.D.	Barrier I.D. and Location [11]	Land Use[2]	Number of Dwelling Units	Existing Traffic + Train Noise Level Leq(h), dBA[1,3]	I-10 Corridor Project Future Worst Hour Noise Levels - Leq(h), dBA[1]										Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefitted Receivers (NBR)														
															18 feet			20 feet			22 feet			24 feet			--		
					Design Year Train Noise Level Leq(h), dBA[1]	Design Year No Build Traffic Noise Level Leq(h), dBA [1]	Design Year No Build Traffic + Train Noise Level Leq(h), dBA [1,12]	Design Year Build Traffic Noise Level Leq(h), dBA[1,13]	Design Year Build Traffic + Train Noise Level Leq(h), dBA [1,12]	Design Year No Build Traffic + Train Noise Level Minus Existing Conditions Leq(h), dBA	Design Year Build Traffic Noise Level Minus No Build Conditions Leq(h), dBA	Design Year Build Traffic + Train Noise Level Minus No Build Traffic + Train Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type[4,13]	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*
R 10.17A	S1818[P] Private Property	SFR	8	67 [E]	63	65	67	65	67	0	0	0	B (67)	NONE	63	4	*0*	62	5	*8*	62	5	*8*	62	5	*8*	--	--	--
R 10.17 [W]		SFR	1	70 [E]	67	67	70	68	70	0	1	0	B (67)	A/E	**63 [R]**	**7**	***1***	63	7	*1*	63	7	*1*	62	8	*1*	--	--	--
R 10.19	S1834[P] Private Property	SFR	4	66 [E]	63	64	66	65	67	0	1	1	B (67)	NONE	**61 [R]**	**6**	***4***	61	6	*4*	60	7	*4*	60	7	*4*	--	--	--
R 10.20 [8]		--	--	70 [M,LT5,CAL]	66	67	70	68	71	0	1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.20B		SFR	4	68	65	66	68	67	69	0	1	1	B (67)	A/E	**62 [R]**	**7**	***4***	62	7	*4*	62	7	*4*	62	7	*4*	--	--	--

Notes:

1 - Leq(h) are A-weighted, peak hour noise levels in decibels.
2 - Land Use: SFR - single-family residence; MFR - multi-family residence; MH - mobile home; MED - medical facility; SCH - educational center; COM - commercial; MOT - motel; REC - recreational; REL - religious institution.
3 - M - Measured noise level; STxx or LTxx - measurement site number; E - estimated from No Build noise level and measurement sites; CAL - model calibration site; Hxx - in/outdoor measurement.
4 - S = Substantial Increase (12 dBA or more); A/E = Approach or exceed NAC.
5 - Barrier height needed to meet requirements at adjacent receiver(s).
6 - Second story receiver.
7 - Non first row residences.
8 - This noise measurement site was chosen for monitoring purposes and was not located at an outdoor use area; however, this site is representative of nearby outdoor use areas.
9 - This noise measurement site will be a take.
10 - Per the Highway Design Manual, the maximum height of a noise barrier should not exceed 14 feet in height when located 15 feet or less from edge of traveled way.
11 - Barrier Type: P - proposed; X - existing; D - replacement in kind; If a Location is provided and there is no Barrier I.D., a soundwall was analyzed at this location but did not meet the feasibility and/or design goal requirements. "--" indicates that no barrier was analyzed in front of the corresponding receivers.
12 - Year 2035 train noise levels were calculated from the *Regional Rail Simulation Findings Technical Appendix*.
13 - When train noise levels are provided, noise impacts are based on noise levels from the column labeled "Design Year Build Traffic Noise Level Leq(h), dBA."
B - Includes the benefit of an existing building or building row.
R - The minimum height to meet feasibility requirements and design goal.
T - Minimum height required to block the line-of-sight from the receiver to truck exhaust stacks.
W - Includes the benefit of an existing soundwall or property wall.

Table A-3 – Predicted Future Noise Levels and Barrier Analysis – Segment 11 – Alternative 2

Receiver I.D.	Barrier I.D. and Location [11]	Land Use[2]	Number of Dwelling Units	Existing Traffic + Train Noise Level Leq(h), dBA[1,3]	I-10 Corridor Project Future Worst Hour Noise Levels - Leq(h), dBA[1]										Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefitted Receivers (NBR)														
															8 feet			10 feet			12 feet			14 feet			16 feet		
					Design Year Train Noise Level Leq(h), dBA[1]	Design Year No Build Traffic Noise Level Leq(h), dBA[1]	Design Year No Build Traffic + Train Noise Level Leq(h), dBA[1,12]	Design Year Build Traffic Noise Level L eq(h), dBA[1,13]	Design Year Build Traffic + Train Noise Level Leq(h), dBA[1,12]	Design Year No Build Traffic + Train Noise Level Minus Existing Conditions Leq(h), dBA[1,14]	Design Year Build Traffic Noise Level Minus No Build Conditions Leq(h), dBA[1]	Design Year Build Traffic + Train Noise Level Minus No Build Traffic + Train Conditions Leq(H), dBA[1,12]	Activity Category (NAC)	Impact Type[4,13]	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*
R 11.45		SFR	1	64 [E]	68	64	69	65	70	5	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 11.46 [W]		SFR	2	63 [M,LT7]	66	63	68	63	68	5	0	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 11.47	--	SFR	2	64 [E]	67	65	69	65	69	5	0	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 11.47A		SFR	1	61 [E]	64	62	66	63	67	5	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 11.48 [8]		--	--	65 [M,ST10]	68	65	70	66	70	5	1	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 11.49	--	COM	1	63 [E]	65	64	68	65	68	5	1	0	E (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

1 - Leq(h) are A-weighted, peak hour noise levels in decibels.
2 - Land Use: SFR - single-family residence; MFR - multi-family residence; MH - mobile home; FS - fire station; SCH - educational center; COM - commercial; MOT - motel; REC - recreational; REL - religious institution.
3 - M - Measured noise level; STxx or LTxx - measurement site number; E - estimated from No Build noise level and measurement sites; CAL - model calibration site.
4 - S = Substantial Increase (12 dBA or more); A/E = Approach or exceed NAC.
5 - Barrier height needed to meet requirements at adjacent receiver(s).
6 - Second story receiver.
7 - Non first row residences.
8 - This noise measurement site was chosen for monitoring purposes and was not located at an outdoor use area; however, this site is representative of nearby outdoor use areas.
9 - This noise measurement site will be a take and was chosen for monitoring purposes only.
10 - Per the Highway Design Manual, the maximum height of a noise barrier should not exceed 14 feet in height when located 15 feet or less from edge of traveled way.
11 - Barrier Type: P - proposed; X - existing; D - replacement in kind; If a location is provided and there is no Barrier I.D., a soundwall was analyzed at this location but did not meet the feasibility and/or design goal requirements. "--" indicates that no barrier was analyzed in front of the corresponding receivers.
12 - Year 2035 train noise levels were calculated from the *Regional Rail Simulation Findings Technical Appendix.*
13 - When train noise levels are provided, noise impacts are based on noise levels from the column labeled "Design Year Build Noise Level Leq(h), dBA".
14 - Noise measurements LT7 and ST10 were conducted when train cars were parked on tracks reducing the existing traffic and train noise levels.
B - Includes the benefit of an existing building or building row.
R - The minimum height to meet feasibility requirements and design goal.
T - Minimum height required to block the line-of-sight from the receiver to truck exhaust stacks.
W - Includes the benefit of an existing soundwall or property wall.

Table A-4 – Predicted Future Noise Levels and Barrier Analysis – Segment 9 – Alternative 3

Receiver I.D.	Barrier I.D. and Location [11]	Land Use[2]	Number of Dwelling Units	Existing Traffic + Train Noise Level Leq(h), dBA[1,3]	I-10 Corridor Project Future Worst Hour Noise Levels - Leq(h), dBA[1]										Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefitted Receivers (NBR)														
					Design Year Train Noise Level Leq(h), dBA[1]	Design Year No Build Traffic Noise Level Leq(h), dBA [1]	Design Year No Build Traffic + Train Noise Level Leq(h), dBA [1,12]	Design Year Build Traffic Noise Level Leq(h), dBA[1,13]	Design Year Build Traffic + Train Noise Level Leq(h), dBA [1,12]	Design Year No Build Traffic + Train Noise Level Minus Existing Conditions Leq(h), dBA	Design Year Build Traffic Noise Level Minus No Build Conditions Leq(h), dBA	Design Year Build Traffic + Train Noise Level Minus No Build Traffic + Train Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type[4,13]	8 feet			10 feet			12 feet			14 feet			16 feet		
															Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*
R 9.19 [B,7]	--	SFR	3	60 [E]	61	60	63	61	64	3	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.20 [B]		SFR	3	63 [E]	64	61	66	63	67	3	2	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.21	S1708[P] / Private Property	SFR/MFR	10	64 [E]	64	63	67	65	67	3	2	0	B (67)	NONE	67	0	*0*	66	1	*0*	66	1	*0*	65	2	*0*	64	3	*0*
R 9.21A		SFR	1	65 [E]	66	64	68	65	69	3	1	1	B (67)	NONE	66	3	*0*	66	3	*0*	65	4	*0*	65	4	*0*	64	5	*1*
R 9.22 [W]		SFR	1	65 [M,ST3]	67	64	68	66	69	3	2	1	B (67)	A/E	67	2	*0*	67	2	*0*	66	3	*0*	66	3	*0*	65	4	*0*
R 9.23 [B]		COM	--	69 [M,ST3A,CAL]	67	64	69	66	70	--	2	1	E (72)	NONE	69	1	--	66	4	--	65	5	--	65	5	--	64	6	--
R 9.25 [B]	--	SFR	3	63 [E]	63	62	66	63	66	3	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.26 [B]		SFR	3	63 [E]	63	63	66	65	67	3	2	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.27 [W]		SFR	1	59 [E]	56	58	60	59	61	1	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.28 [W]		SFR	1	61 [E]	57	60	62	61	63	1	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.29	S1748[P] / Private Property	SFR/MFR	3	67 [E]	64	66	68	67	69	1	1	1	B (67)	A/E	67	2	*0*	66	3	*0*	65	4	*0*	64	5	*3*	63	6	*3*
R 9.30	--	SFR	3	63 [E]	60	61	64	62	65	1	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.31 [8]		COM	1	70 [M,ST4]	68	68	71	69	72	1	1	1	E (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.32		COM	1	69 [E]	67	68	70	69	71	1	1	1	E (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.33 [W,7]	Private Property	MH	6	61 [E]	57	59	61	60	62	0	1	1	B (67)	NONE	--	--	--	--	--	--	62	0	*0*	62	0	*0*	61	1	*0*
R 9.34 [W,7]		SFR	5	62 [E]	57	61	62	62	63	0	1	1	B (67)	NONE	--	--	--	--	--	--	63	0	*0*	62	1	*0*	62	1	*0*
R 9.35 [W]		COM	1	68 [M,LT3]	64	65	68	67	69	0	2	1	E (72)	NONE	--	--	--	67	2	*0*	66	3	*0*	65	4	*0*	64	5	*1*
R 9.36 [W]		SFR	2	65 [E]	60	63	65	65	66	0	2	1	B (67)	NONE	--	--	--	65	1	*0*	64	2	*0*	64	2	*0*	63	3	*0*
R 9.36A		SFR	1	68 [E]	65	64	68	66	68	0	2	0	B (67)	A/E	68	0	*0*	66	2	*0*	65	3	*0*	64	4	*0*	64	4	*0*
R 9.37		SFR	3	68 [E]	65	64	68	65	68	0	1	0	B (67)	NONE	67	1	*0*	66	2	*0*	65	3	*0*	65	3	*0*	64	4	*0*
R 9.37A	--	SFR	1	66 [E]	64	61	66	63	66	0	2	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 9.38 [W]		SFR	1	67 [E]	66	62	67	63	68	0	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

1 - Leq(h) are A-weighted, peak hour noise levels in decibels.
2 - Land Use: SFR - single-family residence; MFR - multi-family residence; MH - mobile home; MED - medical facility; SCH - educational center; COM - commercial; MOT - motel; REC - recreational; REL - religious institution.
3 - M - Measured noise level; STxx or LTxx - measurement site number; E - estimated from No Build noise level and measurement sites; CAL - model calibration site; Hxx - in/outdoor measurement.
4 - S = Substantial Increase (12 dBA or more); A/E = Approach or exceed NAC.
5 - Barrier height needed to meet requirements at adjacent receiver(s).
6 - Second story receiver.
7 - Non first row residences.
8 - This noise measurement site was chosen for monitoring purposes and was not located at an outdoor use area; however, this site is representative of nearby outdoor use areas.
9 - This noise measurement site will be a take.
10 - Per the Highway Design Manual, the maximum height of a noise barrier should not exceed 14 feet in height when located 15 feet or less from edge of traveled way.
11 - Barrier Type: P - proposed; X - existing; D - replacement in kind; If a Location is provided and there is no Barrier I.D., a soundwall was analyzed at this location but did not meet the feasibility and/or design goal requirements. "--" indicates that no barrier was analyzed in front of the corresponding receivers.
12 - Year 2035 train noise levels were calculated from the *Regional Rail Simulation Findings Technical Appendix*.
13 - When train noise levels are provided, noise impacts are based on noise levels from the column labeled "Design Year Build Traffic Noise Level Leq(h), dBA."
B - Includes the benefit of an existing building or building row.
R - The minimum height to meet feasibility requirements and design goal.
T - Minimum height required to block the line-of-sight from the receiver to truck exhaust stacks.
W - Includes the benefit of an existing soundwall or property wall.

Table A-4 – Predicted Future Noise Levels and Barrier Analysis – Segment 9 – Alternative 3 (Cont'd)

Receiver I.D.	Barrier I.D. and Location [11]	Land Use[2]	Number of Dwelling Units	Existing Traffic + Train Noise Level Leq(h), dBA[1,3]	I-10 Corridor Project Future Worst Hour Noise Levels - Leq(h), dBA[1]										Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefitted Receivers (NBR)														
					Design Year Train Noise Level Leq(h), dBA[1]	Design Year No Build Traffic Noise Level Leq(h), dBA [1]	Design Year No Build Traffic + Train Noise Level Leq(h), dBA [1,12]	Design Year Build Traffic Noise Level Leq(h), dBA[1,13]	Design Year Build Traffic + Train Noise Level Leq(h), dBA [1,12]	Design Year No Build Traffic + Train Noise Level Minus Existing Conditions Leq(h),dBA	Design Year Build Traffic Noise Level Minus No Build Conditions Leq(h),dBA	Design Year Build Traffic + Train Noise Level Minus No Build Traffic + Train Conditions Leq(h),dBA	Activity Category (NAC)	Impact Type[4,13]	18 feet			20 feet			22 feet			24 feet			--		
															Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*
R 9.21	S1708[P] / Private Property	SFR/MFR	10	64 [E]	64	63	67	65	67	3	2	0	B (67)	NONE	64	3	*0*	64	3	*0*	63	4	*0*	63	4	*0*	--	--	--
R 9.21A		SFR	1	65 [E]	66	64	68	65	69	3	1	1	B (67)	NONE	63	6	*1*	63	6	*1*	63	6	*1*	62	7	*1*	--	--	--
R 9.22 [W]		SFR	1	65 [M,ST3]	67	64	68	66	69	3	2	1	B (67)	A/E	65	4	*0*	65	4	*0*	65	4	*0*	**64** [R]	**5**	*1*	--	--	--
R 9.23 [B]		COM	--	69 [M,ST3A,CAL]	67	64	69	66	70	--	2	1	E (72)	NONE	64	6	--	64	6	--	63	7	--	63	7	--	--	--	--
R 9.29	S1748[P] / Private Property	SFR/MFR	3	67 [E]	64	66	68	67	69	1	1	1	B (67)	A/E	63	6	*3*	63	6	*3*	63	6	*3*	**62** [R]	**7**	*3*	--	--	--
R 9.33 [W,7]	Private Property	MH	6	61 [E]	57	59	61	60	62	0	1	1	B (67)	NONE	61	1	*0*	61	1	*0*	60	2	*0*	60	2	*0*	--	--	--
R 9.34 [W,7]		SFR	5	62 [E]	57	61	62	62	63	0	1	1	B (67)	NONE	61	2	*0*	61	2	*0*	61	2	*0*	61	2	*0*	--	--	--
R 9.35 [W]		COM	1	68 [M,LT3]	64	65	68	67	69	0	2	1	E (72)	NONE	64	5	*1*	64	5	*1*	63	6	*1*	63	6	*1*	--	--	--
R 9.36 [W]		SFR	2	65 [E]	60	63	65	65	66	0	2	1	B (67)	NONE	63	3	*0*	62	4	*0*	62	4	*0*	62	4	*0*	--	--	--
R 9.36A		SFR	1	68 [E]	65	64	68	66	68	0	2	0	B (67)	A/E	63	5	*1*	63	5	*1*	62	6	*1*	62	6	*1*	--	--	--
R 9.37		SFR	3	68 [E]	65	64	68	65	68	0	1	0	B (67)	NONE	64	4	*0*	64	4	*0*	64	4	*0*	64	4	*0*	--	--	--

Notes:

1 - Leq(h) are A-weighted, peak hour noise levels in decibels.
2 - Land Use: SFR - single-family residence; MFR - multi-family residence; MH - mobile home; MED - medical facility; SCH - educational center; COM - commercial; MOT - motel; REC - recreational; REL - religious institution.
3 - M - Measured noise level; STxx or LTxx - measurement site number; E - estimated from No Build noise level and measurement sites; CAL - model calibration site; Hxx - in/outdoor measurement.
4 - S = Substantial Increase (12 dBA or more); A/E = Approach or exceed NAC.
5 - Barrier height needed to meet requirements at adjacent receiver(s).
6 - Second story receiver.
7 - Non first row residences.
8 - This noise measurement site was chosen for monitoring purposes and was not located at an outdoor use area; however, this site is representative of nearby outdoor use areas.
9 - This noise measurement site will be a take.
10 - Per the Highway Design Manual, the maximum height of a noise barrier should not exceed 14 feet in height when located 15 feet or less from edge of traveled way.
11 - Barrier Type: P - proposed; X - existing; D - replacement in kind; If a Location is provided and there is no Barrier I.D., a soundwall was analyzed at this location but did not meet the feasibility and/or design goal requirements. "--" indicates that no barrier was analyzed in front of the corresponding receivers.
12 - Year 2035 train noise levels were calculated from the *Regional Rail Simulation Findings Technical Appendix*.
13 - When train noise levels are provided, noise impacts are based on noise levels from the column labeled "Design Year Build Traffic Noise Level Leq(h), dBA."
B - Includes the benefit of an existing building or building row.
R - The minimum height to meet feasibility requirements and design goal.
T - Minimum height required to block the line-of-sight from the receiver to truck exhaust stacks.
W - Includes the benefit of an existing soundwall or property wall.

Table A-5 – Predicted Future Noise Levels and Barrier Analysis – Segment 10 – Alternative 3

Receiver I.D.	Barrier I.D. and Location [11]	Land Use[2]	Number of Dwelling Units	Existing Traffic + Train Noise Level Leq(h), dBA[1,3]	I-10 Corridor Project Future Worst Hour Noise Levels - Leq(h), dBA[1]										Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefitted Receivers (NBR)														
					Design Year Train Noise Level Leq(h), dBA[1]	Design Year No Build Traffic Noise Level Leq(h), dBA[1]	Design Year No Build Traffic + Train Noise Level Leq(h), dBA[1,12]	Design Year Build Traffic Noise Level Leq(h), dBA[1,13]	Design Year Build Traffic + Train Noise Level Leq(h), dBA[1,12]	Design Year No Build Traffic + Train Noise Level Minus Existing Conditions Leq(h), dBA	Design Year Build Traffic Noise Level Minus No Build Conditions Leq(h), dBA	Design Year Build Traffic + Train Noise Level Minus No Build Traffic + Train Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type[4,13]	8 feet			10 feet			12 feet			14 feet			16 feet		
															Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*
R 10.15	--	SFR	3	66 [M,ST5]	66	60	67	61	67	1	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.15A			3	63	60	62	64	63	65	1	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.16 [W]		SFR	5	65 [E]	60	64	66	65	66	1	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.16A [W,8]		--	--	69 [M,ST7,CAL]	68	68	71	69	72	2	1	1	B (67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.17A	S1818[P] Private Property	SFR	8	67 [E]	63	65	67	65	67	0	0	0	B (67)	NONE	66	1	*0*	65	2	*0*	65	2	*0*	64	3	*0*	63	4	*0*
R 10.17 [W]		SFR	1	70 [E]	67	67	70	67	70	0	0	0	B (67)	A/E	69	1	*0*	68	2	*0*	66 [T]	4	*0*	65	5	*1*	65	5	*1*
R 10.18	--	SFR	3	64 [E]	59	63	64	64	65	0	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.19	Private Property	SFR	4	66 [E]	63	64	66	64	67	0	0	1	B (67)	NONE	65	2	*0*	64	3	*0*	63	4	*0*	62	5	*4*	62	5	*4*
R 10.20 [8]		--	--	70 [M,LT5,CAL]	66	67	70	67	70	0	0	0	B (67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.20B		SFR	4	68	65	66	68	66	68	0	0	0	B (67)	A/E	67	1	*0*	65 [T]	3	*0*	64	4	*0*	64	4	*0*	63	5	*4*
R 10.20A [7]	--	SFR	16	63 [E]	60	60	63	61	63	0	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.21		COM	1	72 [E]	69	68	72	68	72	0	0	0	B (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.22		SFR	2	66 [E]	62	63	66	64	66	0	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.23 [7]		SFR	12	62 [E]	59	58	62	59	62	0	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.24		SFR	2	64 [E]	61	60	64	61	64	0	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

1 - Leq(h) are A-weighted, peak hour noise levels in decibels.
2 - Land Use: SFR - single-family residence; MFR - multi-family residence; MH - mobile home; MED - medical facility; SCH - educational center; COM - commercial; MOT - motel; REC - recreational; REL - religious institution.
3 - M - Measured noise level; STxx or LTxx - measurement site number; E - estimated from No Build noise level and measurement sites; CAL - model calibration site; Hxx - in/outdoor measurement.
4 - S = Substantial Increase (12 dBA or more); A/E = Approach or exceed NAC.
5 - Barrier height needed to meet requirements at adjacent receiver(s).
6 - Second story receiver.
7 - Non first row residences.
8 - This noise measurement site was chosen for monitoring purposes and was not located at an outdoor use area; however, this site is representative of nearby outdoor use areas.
9 - This noise measurement site will be a take.
10 - Per the Highway Design Manual, the maximum height of a noise barrier should not exceed 14 feet in height when located 15 feet or less from edge of traveled way.
11 - Barrier Type: P - proposed; X - existing; D - replacement in kind; If a Location is provided and there is no Barrier I.D., a soundwall was analyzed at this location but did not meet the feasibility and/or design goal requirements. "--" indicates that no barrier was analyzed in front of the corresponding receivers.
12 - Year 2035 train noise levels were calculated from the *Regional Rail Simulation Findings Technical Appendix*.
13 - When train noise levels are provided, noise impacts are based on noise levels from the column labeled "Design Year Build Traffic Noise Level Leq(h), dBA."
B - Includes the benefit of an existing building or building row.
R - The minimum height to meet feasibility requirements and design goal.
T - Minimum height required to block the line-of-sight from the receiver to truck exhaust stacks.
W - Includes the benefit of an existing soundwall or property wall.

Table A-5 – Predicted Future Noise Levels and Barrier Analysis – Segment 10 – Alternative 3 (Cont'd)

Receiver I.D.	Barrier I.D. and Location [11]	Land Use[2]	Number of Dwelling Units	Existing Traffic + Train Noise Level Leq(h), dBA[1,3]	I-10 Corridor Project Future Worst Hour Noise Levels - Leq(h), dBA[1]										Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefitted Receivers (NBR)														
					Design Year Train Noise Level Leq(h), dBA[1]	Design Year No Build Traffic Noise Level Leq(h), dBA[1]	Design Year No Build Traffic + Train Noise Level Leq(h), dBA[1,12]	Design Year Build Traffic Noise Level Leq(h), dBA[1,13]	Design Year Build Traffic + Train Noise Level Leq(h), dBA[1,12]	Design Year No Build Traffic + Train Noise Level Minus Existing Conditions Leq(h), dBA	Design Year Build Traffic Noise Level Minus No Build Conditions Leq(h), dBA	Design Year Build Traffic + Train Noise Level Minus No Build Traffic + Train Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type[4,13]	18 feet			20 feet			22 feet			24 feet			--		
															Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*	Train + Traffic Noise Leq(h)	I.L.	*NBR*
R 10.17A	S1818[P] Private Property	SFR	8	67	63	65	67	65	67	0	0	0	B (67)	NONE	63	4	*0*	63	4	*0*	**62** [R]	**5**	***8***	62	5	*8*	--	--	--
R 10.17 [W]		SFR	1	70 [E]	67	67	70	67	70	0	0	0	B (67)	A/E	64	6	*1*	64	6	*1*	**63** [R]	**7**	***1***	63	7	*1*	--	--	--
R 10.19	Private Property	SFR	4	66 [E]	63	64	66	64	67	0	0	1	B (67)	NONE	62	5	*4*	61	6	*4*	61	6	*4*	61	6	*4*	--	--	--
R 10.20 [8]		--	--	70 [M,LT5,CAL]	66	67	70	67	70	0	0	0	B (67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 10.20B		SFR	4	68	65	66	68	66	68	0	0	0	B (67)	A/E	63	5	*4*	63	5	*4*	62	6	*4*	62	6	*4*	--	--	--

Notes:

1 - Leq(h) are A-weighted, peak hour noise levels in decibels.

2 - Land Use: SFR - single-family residence; MFR - multi-family residence; MH - mobile home; MED - medical facility; SCH - educational center; COM - commercial; MOT - motel; REC - recreational; REL - religious institution.

3 - M - Measured noise level; STxx or LTxx - measurement site number; E - estimated from No Build noise level and measurement sites; CAL - model calibration site; Hxx - in/outdoor measurement.

4 - S = Substantial Increase (12 dBA or more); A/E = Approach or exceed NAC.

5 - Barrier height needed to meet requirements at adjacent receiver(s).

6 - Second story receiver.

7 - Non first row residences.

8 - This noise measurement site was chosen for monitoring purposes and was not located at an outdoor use area; however, this site is representative of nearby outdoor use areas.

9 - This noise measurement site will be a take.

10 - Per the Highway Design Manual, the maximum height of a noise barrier should not exceed 14 feet in height when located 15 feet or less from edge of traveled way.

11 - Barrier Type: P - proposed; X - existing; D - replacement in kind; If a Location is provided and there is no Barrier I.D., a soundwall was analyzed at this location but did not meet the feasibility and/or design goal requirements. "--" indicates that no barrier was analyzed in front of the corresponding receivers.

12 - Year 2035 train noise levels were calculated from the *Regional Rail Simulation Findings Technical Appendix*.

13 - When train noise levels are provided, noise impacts are based on noise levels from the column labeled "Design Year Build Traffic Noise Level Leq(h), dBA."

B - Includes the benefit of an existing building or building row.

R - The minimum height to meet feasibility requirements and design goal.

T - Minimum height required to block the line-of-sight from the receiver to truck exhaust stacks.

W - Includes the benefit of an existing soundwall or property wall.

Table A-6 – Predicted Future Noise Levels and Barrier Analysis – Segment 11 – Alternative 3

Receiver I.D.	Barrier I.D. and Location [11]	Land Use[2]	Number of Dwelling Units	Existing Traffic + Train Noise Level Leq(h), dBA[1,3]	I-10 Corridor Project Future Worst Hour Noise Levels - Leq(h), dBA[1]										Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefitted Receivers (NBR)														
					Design Year Train Noise Level Leq(h), dBA[1]	Design Year No Build Traffic Noise Level Leq(h), dBA[1]	Design Year No Build Traffic + Train Noise Level Leq(h), dBA[1,12]	Design Year Build Traffic Noise Level Leq(h), dBA[1,13]	Design Year Build Traffic + Train Noise Level Leq(h), dBA[1,12]	Design Year No Build Traffic + Train Noise Level Minus Existing Conditions Leq(h), dBA[14]	Design Year Build Traffic Noise Level Minus No Build Conditions Leq(h), dBA	Design Year Build Traffic + Train Noise Level Minus No Build Traffic + Train Conditions Level Leq(H), dBA[12]	Activity Category (NAC)	Impact Type[4,13]	8 feet			10 feet			12 feet			14 feet			16 feet		
															Traffic + Train Noise Leq(h)	I.L.	*NBR*	Traffic + Train Noise Leq(h)	I.L.	*NBR*	Traffic + Train Noise Leq(h)	I.L.	*NBR*	Traffic + Train Noise Leq(h)	I.L.	*NBR*	Traffic + Train Noise Leq(h)	I.L.	*NBR*
R 11.45	--	SFR	1	64 [E]	68	64	69	65	70	5	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 11.46 [W]		SFR	2	63 [M,LT7]	66	63	68	64	68	5	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 11.47	S1934[P] Private Property	SFR	2	64 [E]	67	65	69	66	70	5	1	1	B (67)	A/E	68 [T]	2	*0*	68	2	*0*	65	5	*2*	64	6	*2*	**63 [R]**	**7**	***2***
R 11.47A		SFR	1	61 [E]	64	62	66	65	68	5	3	2	B (67)	NONE	67	1	*0*	67 [T]	1	*0*	66	2	*0*	65	3	*0*	64	4	*0*
															18 feet			**20 feet**			**22 feet**			**24 feet**			**--**		
R 11.47	S1934[P] Private Property	SFR	2	64 [E]	67	65	69	66	70	5	1	1	B (67)	A/E	62	8	*2*	61	9	*2*	61	9	*2*	60	10	*2*	--	--	--
R 11.47A		SFR	1	61 [E]	64	62	66	65	68	5	3	2	B (67)	NONE	63	5	*1*	63	5	*1*	62	6	*1*	62	6	*1*	--	--	--
R 11.48 [8]	--	--	--	65 [M,ST10]	68	65	70	66	70	5	1	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R 11.49		COM	1	63 [E]	65	64	68	66	69	5	2	1	E (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

1 - Leq(h) are A-weighted, peak hour noise levels in decibels.
2 - Land Use: SFR - single-family residence; MFR - multi-family residence; MH - mobile home; FS - fire station; SCH - educational center; COM - commercial; MOT - motel; REC - recreational; REL - religious institution.
3 - M - Measured noise level; STxx or LTxx - measurement site number; E - estimated from No Build noise level and measurement sites; CAL - model calibration site; Hxx - in/outdoor measurement.
4 - S = Substantial Increase (12 dBA or more); A/E = Approach or exceed NAC.
5 - Barrier height needed to meet requirements at adjacent receiver(s).
6 - Second story receiver.
7 - Non first row residences.
8 - This noise measurement site was chosen for monitoring purposes and was not located at an outdoor use area; however, this site is representative of nearby outdoor use areas.
9 - This noise measurement site will be a take and was chosen for monitoring purposes only.
10 - Per the Highway Design Manual, the maximum height of a noise barrier should not exceed 14 feet in height when located 15 feet or less from edge of traveled way.
11 - Barrier Type: P - proposed; X - existing; D - replacement in kind; If a location is provided and there is no Barrier I.D., a soundwall was analyzed at this location but did not meet the feasibility and/or design goal requirements. "--" indicates that no barrier was analyzed in front of the corresponding receivers.
12 - Year 2035 train noise levels were calculated from the *Regional Rail Simulation Findings Technical Appendix.*
13 - When train noise levels are provided, noise impacts are based on noise levels from the column labeled "Design Year Build Noise Level Leq(h), dBA".
14 - Noise measurements LT7 and ST10 were conducted when train cars were parked on tracks reducing the existing traffic and train noise levels.
B - Includes the benefit of an existing building or building row.
R - The minimum height to meet feasibility requirements and design goal.
T - Minimum height required to block the line-of-sight from the receiver to truck exhaust stacks.
W - Includes the benefit of an existing soundwall or property wall.

Appendix B Street Addresses for Modeled Noise Receivers

Table B-1 – Street Addresses for Modeled Receivers – Segment 9

RECEIVER I.D.	ADDRESS or LOCATION	LAND USE [1]	NUMBER of DWELLING UNITS
R9.19	14561 Boyle Ave, Fontana, CA 92337	SFR	3
R9.20	14592 Boyle Ave, Fontana, CA 92337	SFR	3
R9.21	14652 Boyle Ave, Fontana, CA 92337	SFR/MFR	10
R9.21A	14682 Boyle Ave, Fontana, CA 92337	SFR	1
R9.22/ST3	10388 Redwood Ave, Fontana, CA 92337	SFR	1
R9.23/ST3A/CAL	10388 Redwood Ave, Fontana, CA 92337	COM	--
R9.25	14730 Boyle Ave, Fontana, CA 92337	SFR	3
R9.26	14780 Boyle Ave, Fontana, CA 92337	SFR	3
R9.27	10430 Hemlock Ave, Fontana, CA 92337	SFR	1
R9.28	10409 Hemlock Ave, Fontana, CA 92337	SFR	1
R9.29	15264 Boyle Ave, Fontana, CA 92337	SFR/MFR	3
R9.30	10422 Sultana Ave, Fontana, CA 92337	SFR	3
R9.31/ST4	10338 Poplar Ave, Fontana, CA 92337	COM	1
R9.32	10355 Poplar Ave, Fontana, CA 92337	SFR	1
R9.33	15798 Slover Ave, Fontana, CA 92337	SFR	6
R9.34	15859 Boyle Ave, Fontana, CA 92337	SFR	5
R9.35/LT3	15842 Boyle Ave, Fontana, CA 92337	COM	1
R9.36	15862 Boyle Ave, Fontana, CA 92337	SFR	2
R9.36A	15890 Boyle Ave, Fontana, CA 92337	SFR	1
R9.37	15920 Boyle Ave, Fontana, CA 92337	SFR	3
R9.37A	16010 Boyle Ave, Fontana, CA 92337	SFR	1
R9.38	16032 Boyle Ave, Fontana, CA 92337	SFR	1

Note:

1 - Land Use: SFR - single-family residence; MFR - multi-family residence; COM - Commercial.

Table B-2 – Street Addresses for Modeled Receivers – Segment 10

RECEIVER I.D.	ADDRESS or LOCATION	LAND USE [1]	NUMBER of DWELLING UNITS
R10.15/ST5	16112 Boyle Ave, Fontana, CA 92337	SFR	3
R10.15A	16190 Boyle Ave, Fontana, CA 92337	SFR	3
R10.16	16222 Boyle Ave, Fontana, CA 92337	SFR	5
R10.16A/ST7/CAL	16222 Boyle Ave, Fontana, CA 92337	--	--
R10.17A	16284 Boyle Ave, Fontana, CA 92337	SFR	8
R10.17	10349 Oleander Ave, Fontana, CA 92337	SFR	1
R10.18	16398 Boyle Ave, Fontana, CA 92337	SFR	3
R10.19	10372 Palm Dr, Fontana, CA 92337	SFR	4
R10.20/LT5/CAL	16558 Boyle Ave, Fontana, CA 92337	--	--
R10.20B	16572 Boyle Ave, Fontana, CA 92337	SFR	4
R10.20A	16645 Boyle Ave, Fontana, CA 92337	SFR	16
R10.21	16666 Boyle Ave, Fontana, CA 92337	COM	1
R10.22	16748 Boyle Ave, Fontana, CA 92337	SFR	2
R10.23	16860 Slover Ave, Fontana, CA 92337	SFR	12
R10.24	16868 Boyle Ave, Fontana, CA 92337	SFR	2

Note:

1 - Land Use: SFR - single-family residence; MFR - multi-family residence; COM - Commercial.

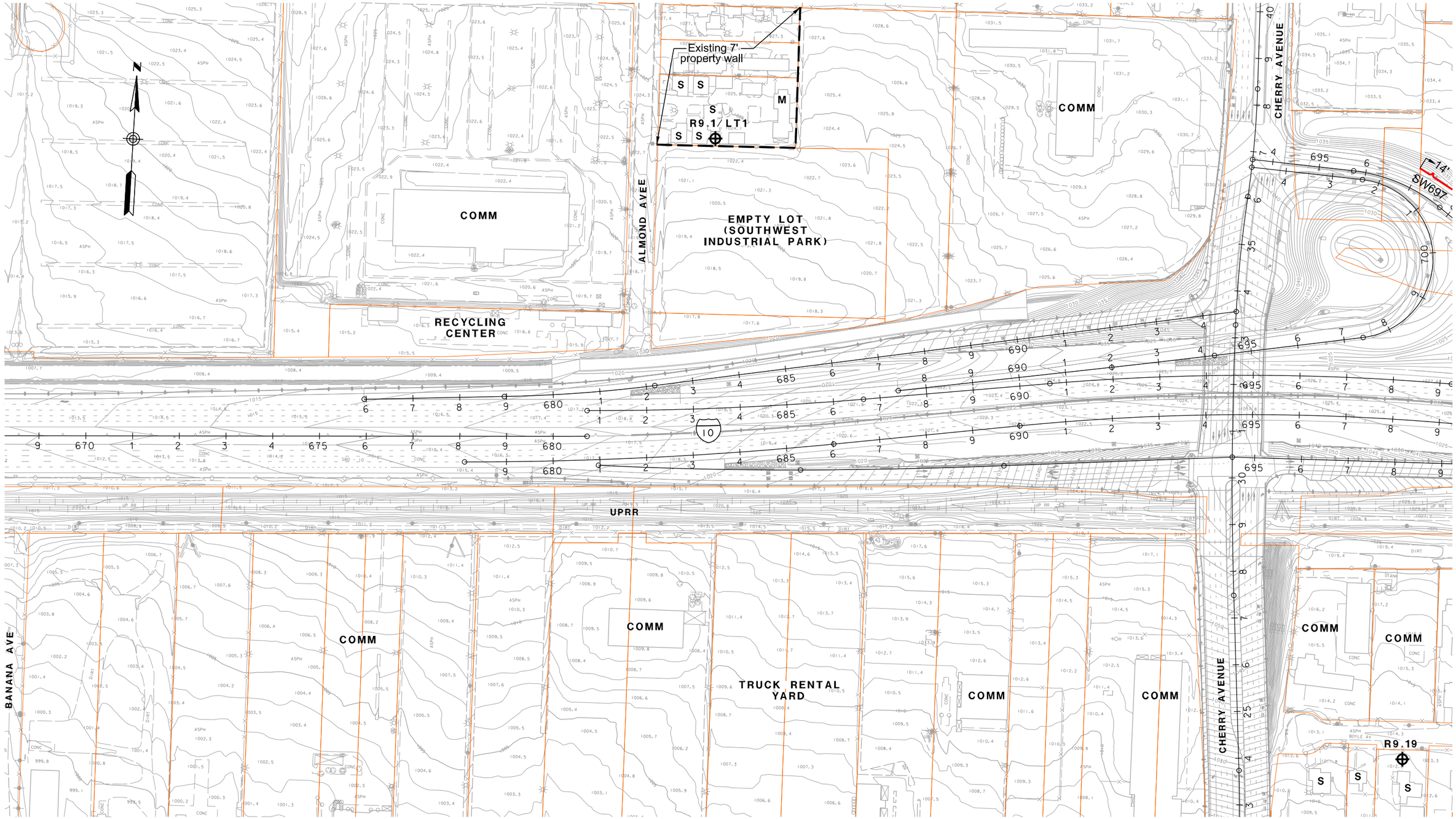
Table B-3 – Street Addresses for Modeled Receivers – Segment 11

RECEIVER I.D.	ADDRESS or LOCATION	LAND USE [1]	NUMBER of DWELLING UNITS
R11.45	10330 Alder Avenue, Bloomington, CA 92316	SFR	1
R11.46/LT7	10349 Alder Avenue, Bloomington, CA 92316	SFR	2
R11.47	10346 Locust Avenue # 1, Bloomington, CA 92316	SFR	2
R11.47A	10356 Locust Ave, Bloomington, CA 92316	SFR	1
R11.48/ST10	10346 Locust Avenue # 1, Bloomington, CA 92316	--	--
R11.49	18298 Slover Avenue, Bloomington, CA 92316	COM	1

1 - Land Use: SFR - single-family residence; MFR - multi-family residence; COM - Commercial.

Alternative 1 -

No-Build Alternative



LEGEND

- RXX - RECEIVER SITE
- CAL - CALIBRATION SITE
- LT - LONG-TERM MEASUREMENT
- ST - SHORT-TERM MEASUREMENT

- SFR OR S - SINGLE FAMILY RESIDENCE
- MFR OR M - MULTI-FAMILY RESIDENCE
- COMM OR C - COMMERCIAL/NO OUTSIDE ACTIVITIES
- HXX - IN/OUTDOOR MEASUREMENT

- EXISTING PROPERTY WALL
- EXISTING SOUNDWALL
- RETAINING WALL
- SAFETY BARRIER

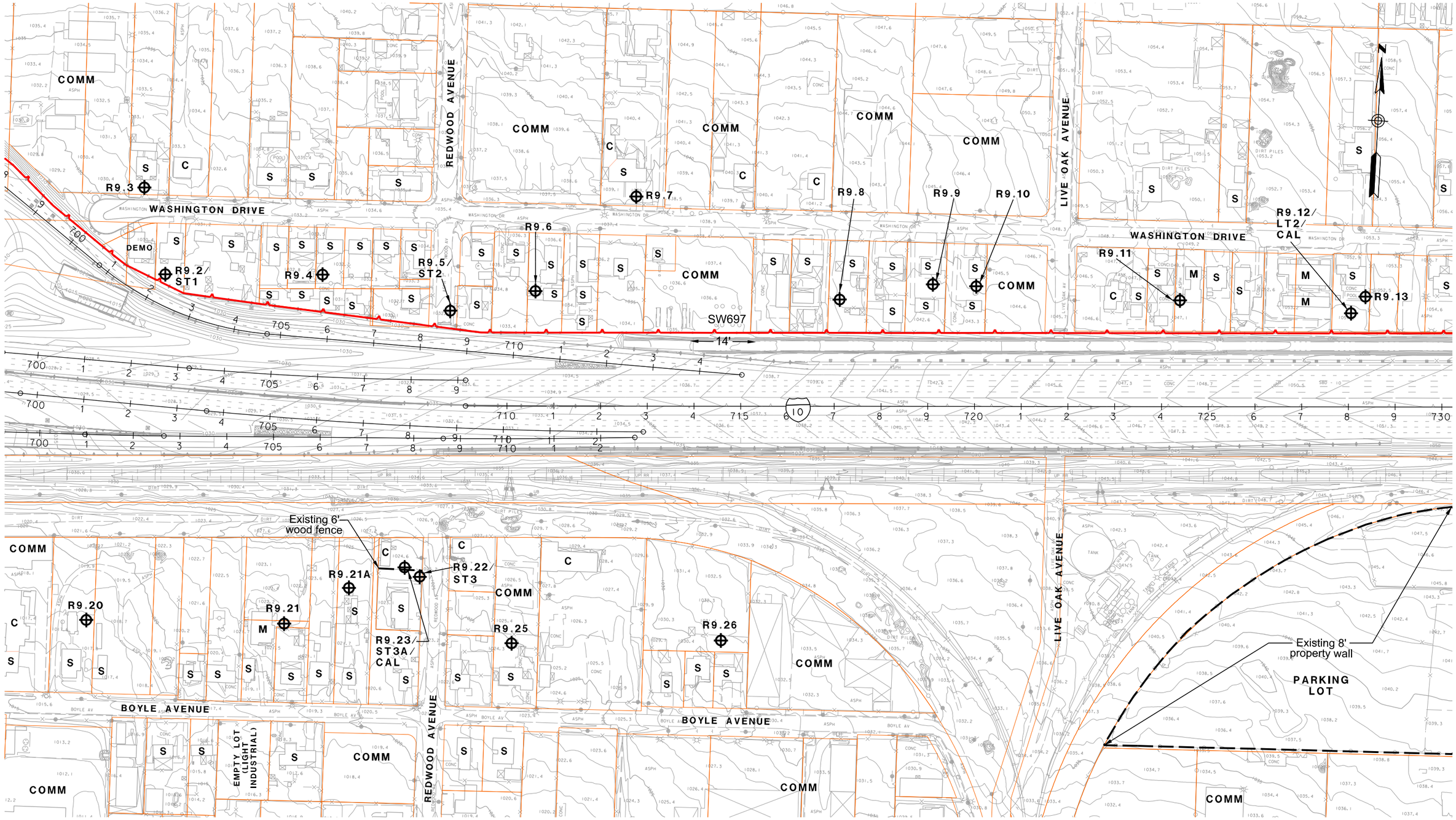
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 1
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 28



LEGEND

- RXX - RECEIVER SITE
- CAL - CALIBRATION SITE
- LT - LONG-TERM MEASUREMENT
- ST - SHORT-TERM MEASUREMENT

- SFR OR S - SINGLE FAMILY RESIDENCE
- MFR OR M - MULTI-FAMILY RESIDENCE
- COMM OR C - COMMERCIAL/NO OUTSIDE ACTIVITIES
- HXX - IN/OUTDOOR MEASUREMENT

- EXISTING PROPERTY WALL
- EXISTING SOUNDWALL
- RETAINING WALL
- SAFETY BARRIER

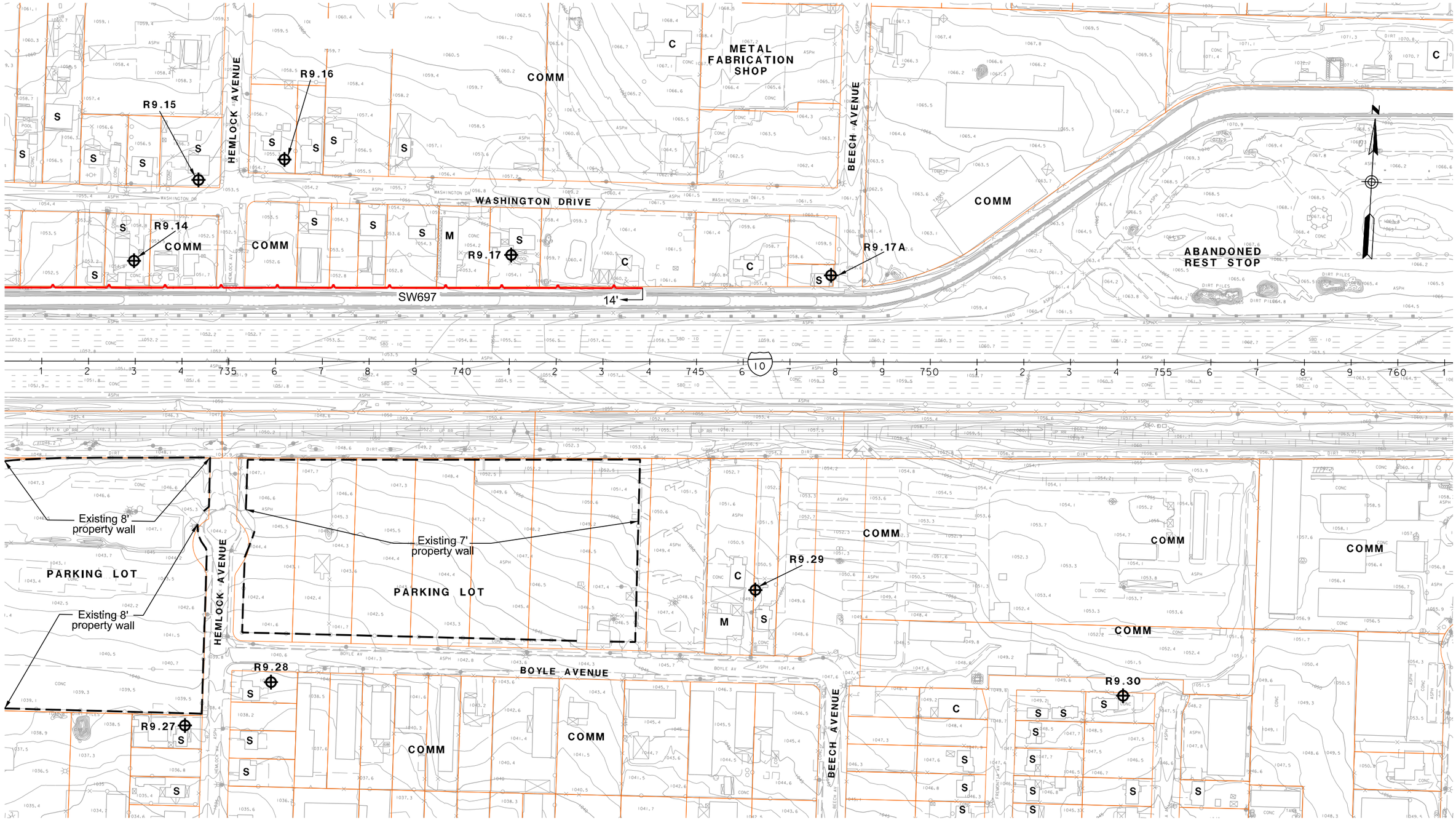
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 1
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 29



LEGEND

- RXX - RECEIVER SITE
- CAL - CALIBRATION SITE
- LT - LONG-TERM MEASUREMENT
- ST - SHORT-TERM MEASUREMENT

- SFR OR S - SINGLE FAMILY RESIDENCE
- MFR OR M - MULTI-FAMILY RESIDENCE
- COMM OR C - COMMERCIAL/NO OUTSIDE ACTIVITIES
- HXX - IN/OUTDOOR MEASUREMENT

- EXISTING PROPERTY WALL
- EXISTING SOUNDWALL
- RETAINING WALL
- SAFETY BARRIER

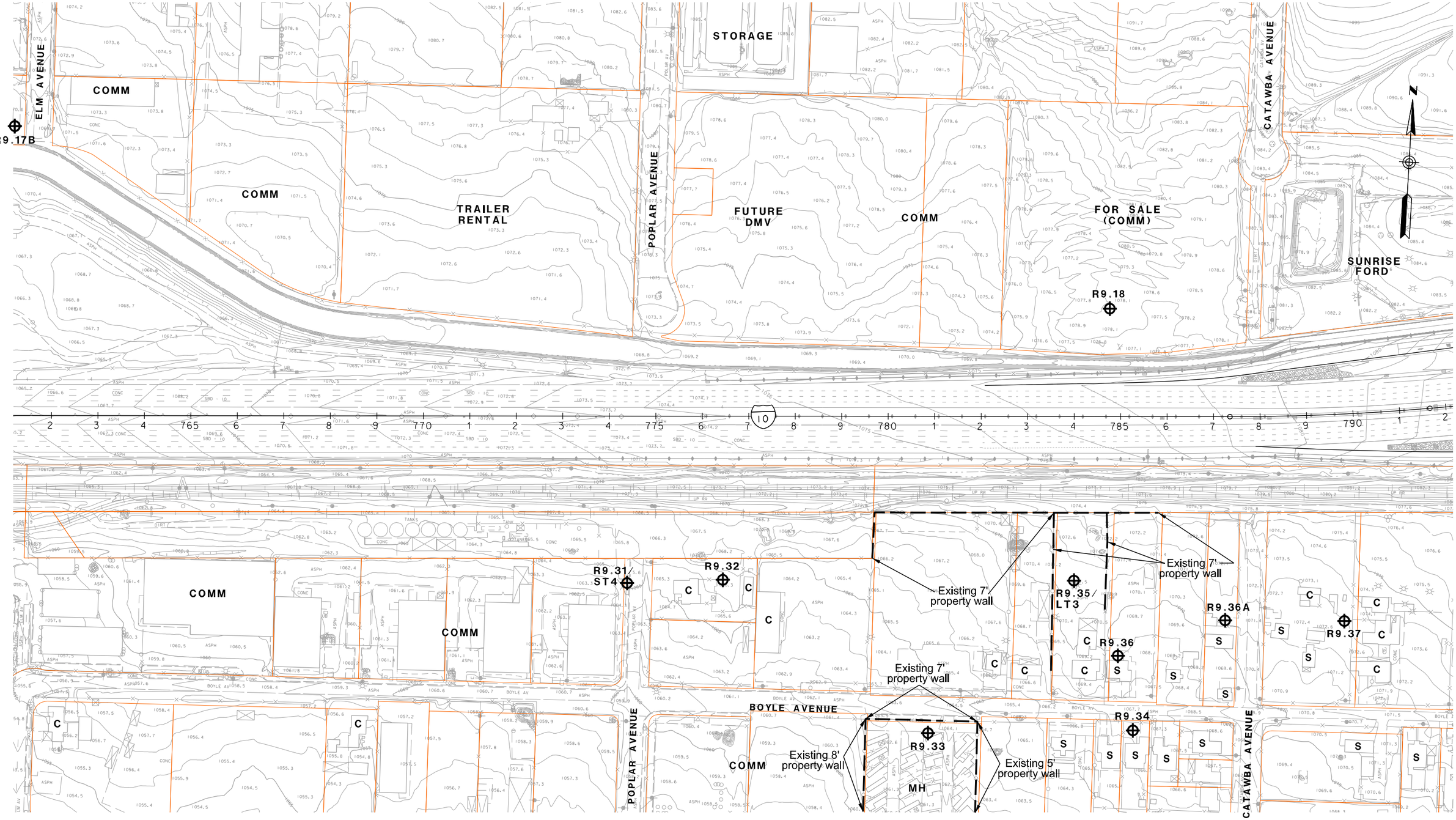
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 1 NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 30



LEGEND

- RXX - RECEIVER SITE
- CAL - CALIBRATION SITE
- LT - LONG-TERM MEASUREMENT
- ST - SHORT-TERM MEASUREMENT

- SFR OR S - SINGLE FAMILY RESIDENCE
- MFR OR M - MULTI-FAMILY RESIDENCE
- COMM OR C - COMMERCIAL/NO OUTSIDE ACTIVITIES
- HXX - IN/OUTDOOR MEASUREMENT

- EXISTING PROPERTY WALL
- EXISTING SOUNDWALL
- RETAINING WALL
- SAFETY BARRIER

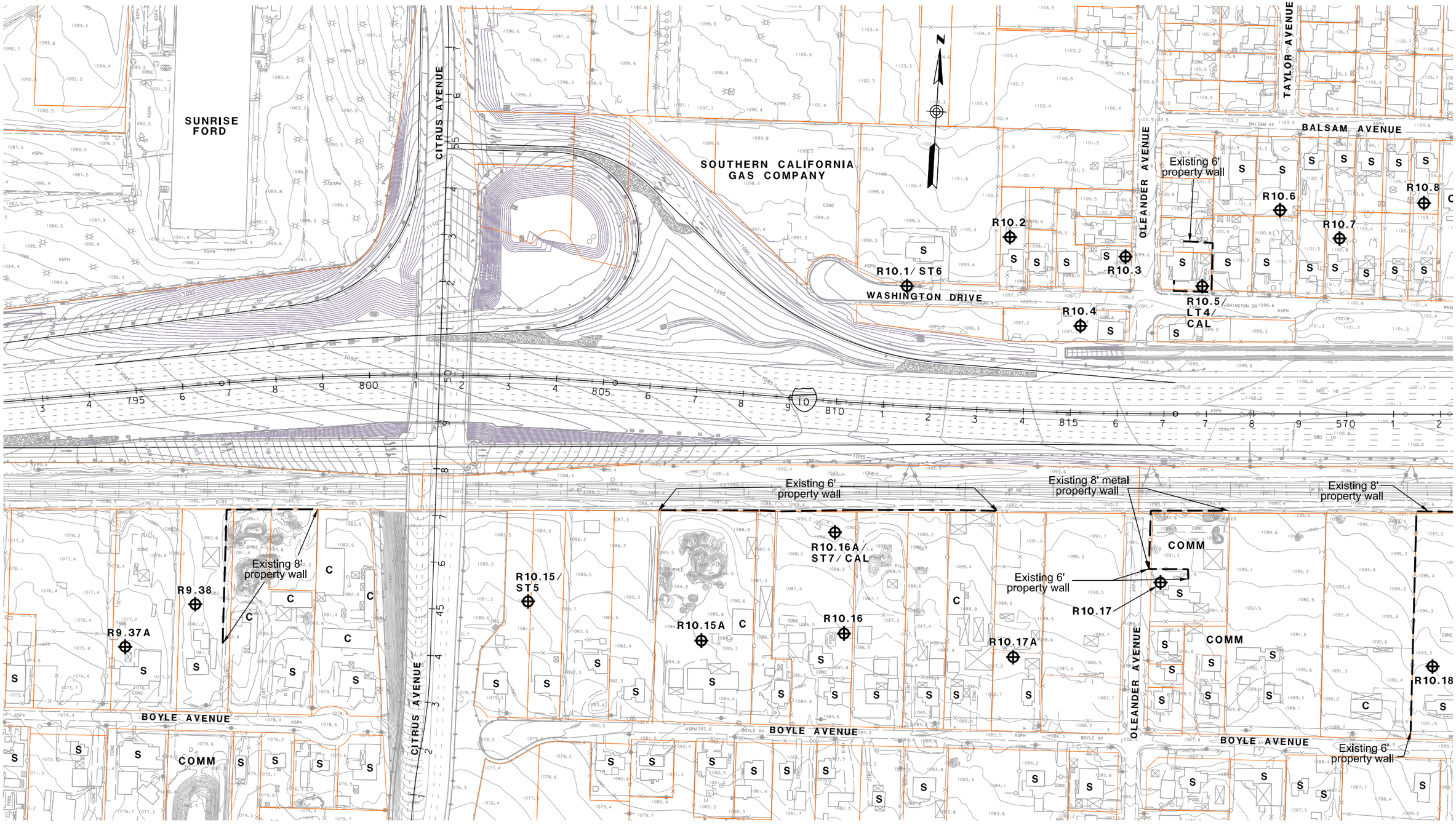
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 1
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 31



LEGEND

- RXX - RECEIVER SITE
- CAL - CALIBRATION SITE
- LT - LONG-TERM MEASUREMENT
- ST - SHORT-TERM MEASUREMENT

- SFR OR S - SINGLE FAMILY RESIDENCE
- MFR OR M - MULTI-FAMILY RESIDENCE
- COMM OR C - COMMERCIAL/NO OUTSIDE ACTIVITIES
- HXX - IN/OUTDOOR MEASUREMENT

- EXISTING PROPERTY WALL
- EXISTING SOUNDWALL
- RETAINING WALL
- SAFETY BARRIER

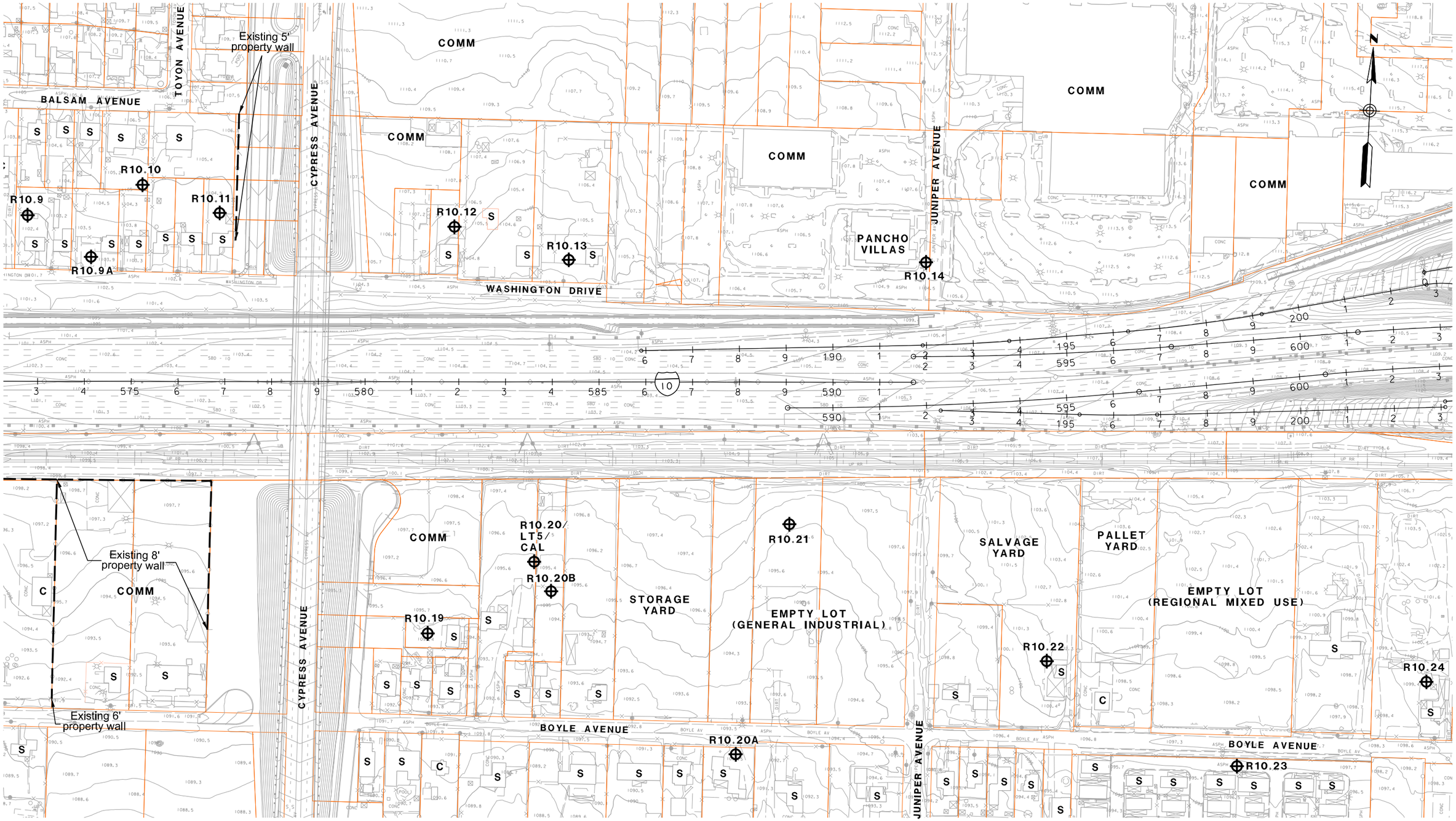
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 1 NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 32



LEGEND

- RXX - RECEIVER SITE
- CAL - CALIBRATION SITE
- LT - LONG-TERM MEASUREMENT
- ST - SHORT-TERM MEASUREMENT

- SFR OR S - SINGLE FAMILY RESIDENCE
- MFR OR M - MULTI-FAMILY RESIDENCE
- COMM OR C - COMMERCIAL/NO OUTSIDE ACTIVITIES
- HXX - IN/OUTDOOR MEASUREMENT

- EXISTING PROPERTY WALL
- EXISTING SOUNDWALL
- RETAINING WALL
- SAFETY BARRIER

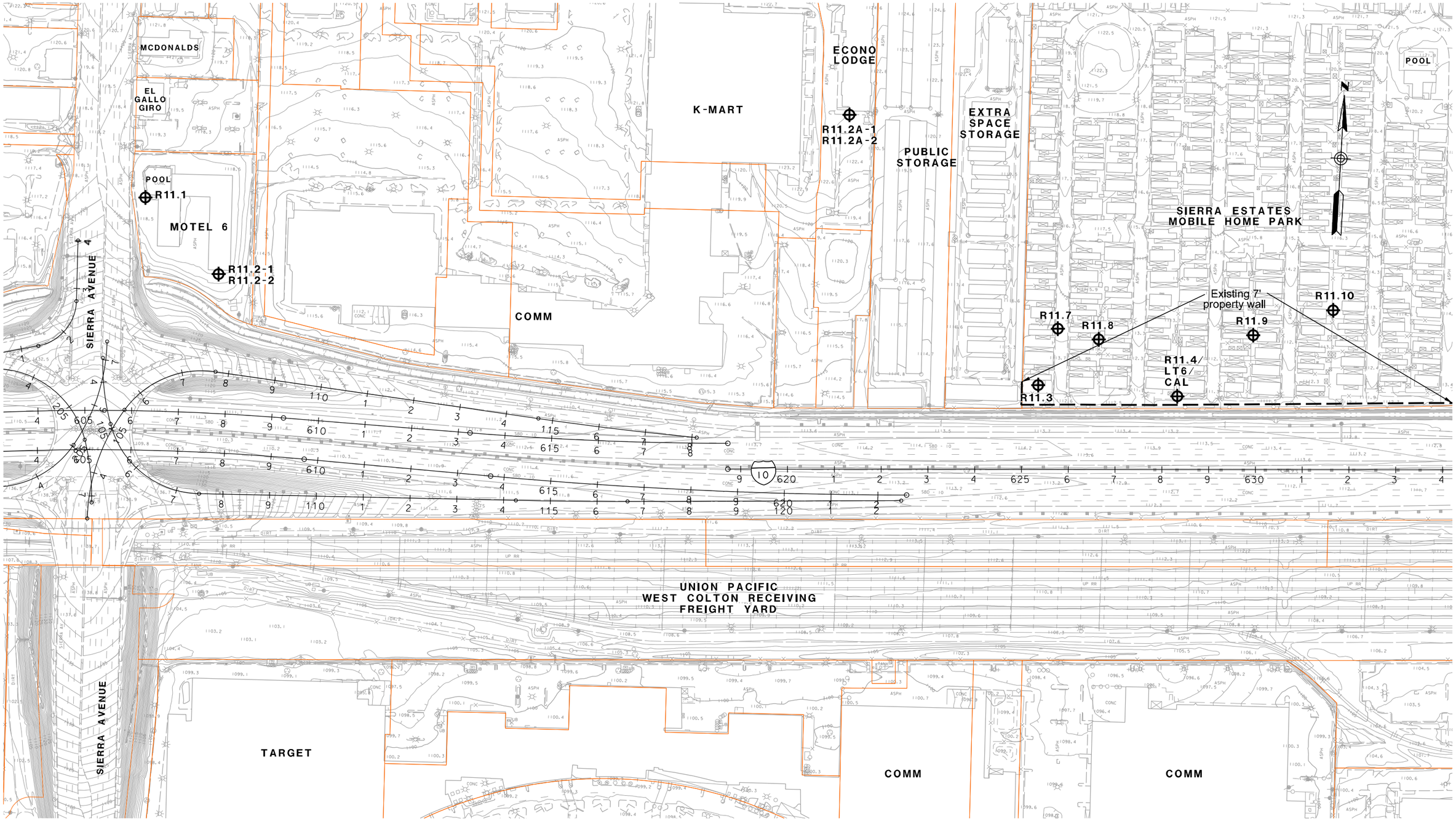
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 1
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 33



LEGEND

- RXX - RECEIVER SITE
- CAL - CALIBRATION SITE
- LT - LONG-TERM MEASUREMENT
- ST - SHORT-TERM MEASUREMENT

- SFR OR S - SINGLE FAMILY RESIDENCE
- MFR OR M - MULTI-FAMILY RESIDENCE
- COMM OR C - COMMERCIAL/NO OUTSIDE ACTIVITIES
- HXX - IN/OUTDOOR MEASUREMENT

- EXISTING PROPERTY WALL
- EXISTING SOUNDWALL
- RETAINING WALL
- SAFETY BARRIER

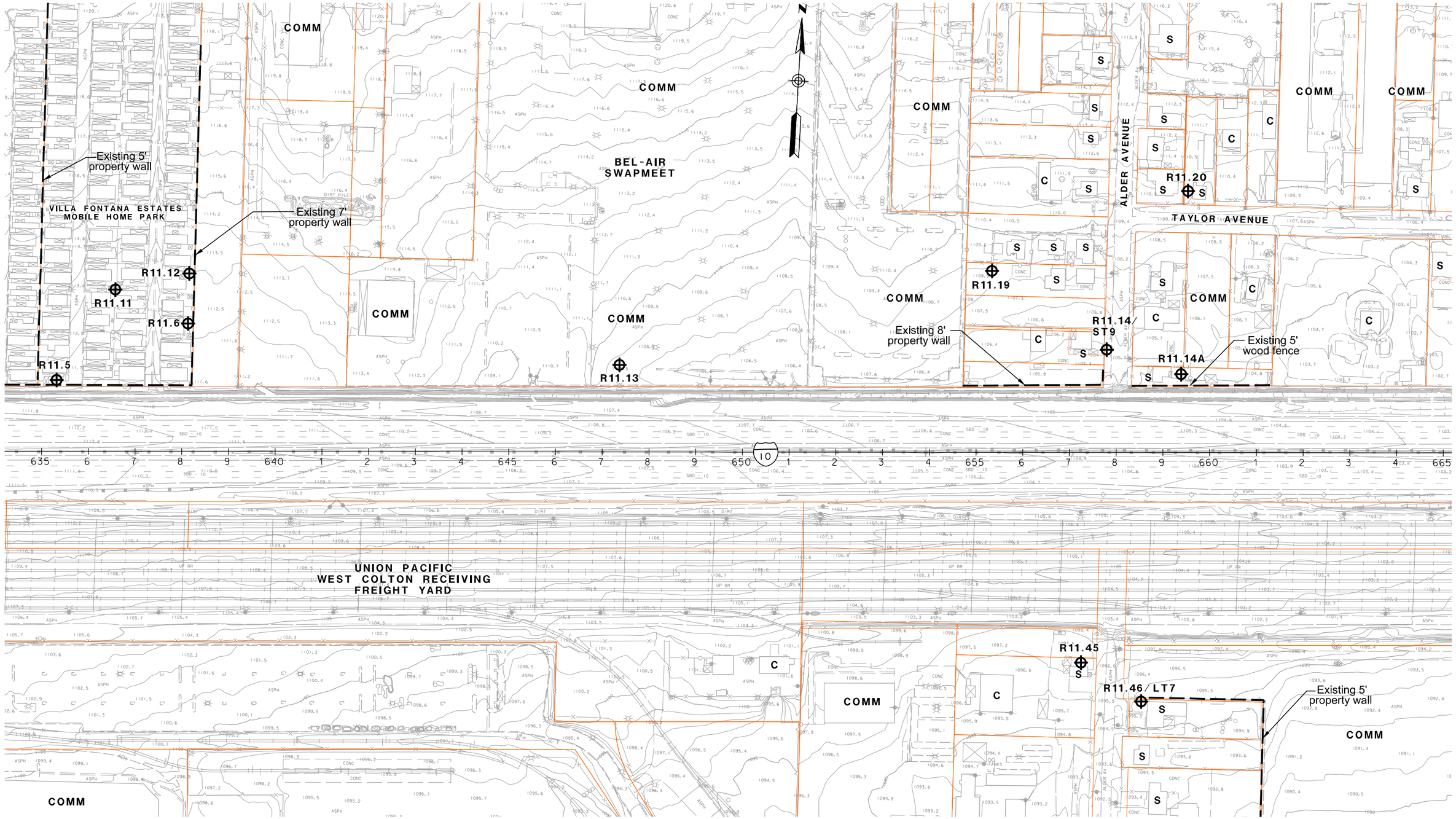
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 1
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 34



LEGEND

- RXX - RECEIVER SITE
- CAL - CALIBRATION SITE
- LT - LONG-TERM MEASUREMENT
- ST - SHORT-TERM MEASUREMENT

- SFR OR S - SINGLE FAMILY RESIDENCE
- MFR OR M - MULTI-FAMILY RESIDENCE
- COMM OR C - COMMERCIAL/NO OUTSIDE ACTIVITIES
- HXX - IN/OUTDOOR MEASUREMENT

- EXISTING PROPERTY WALL
- EXISTING SOUNDWALL
- RETAINING WALL
- SAFETY BARRIER

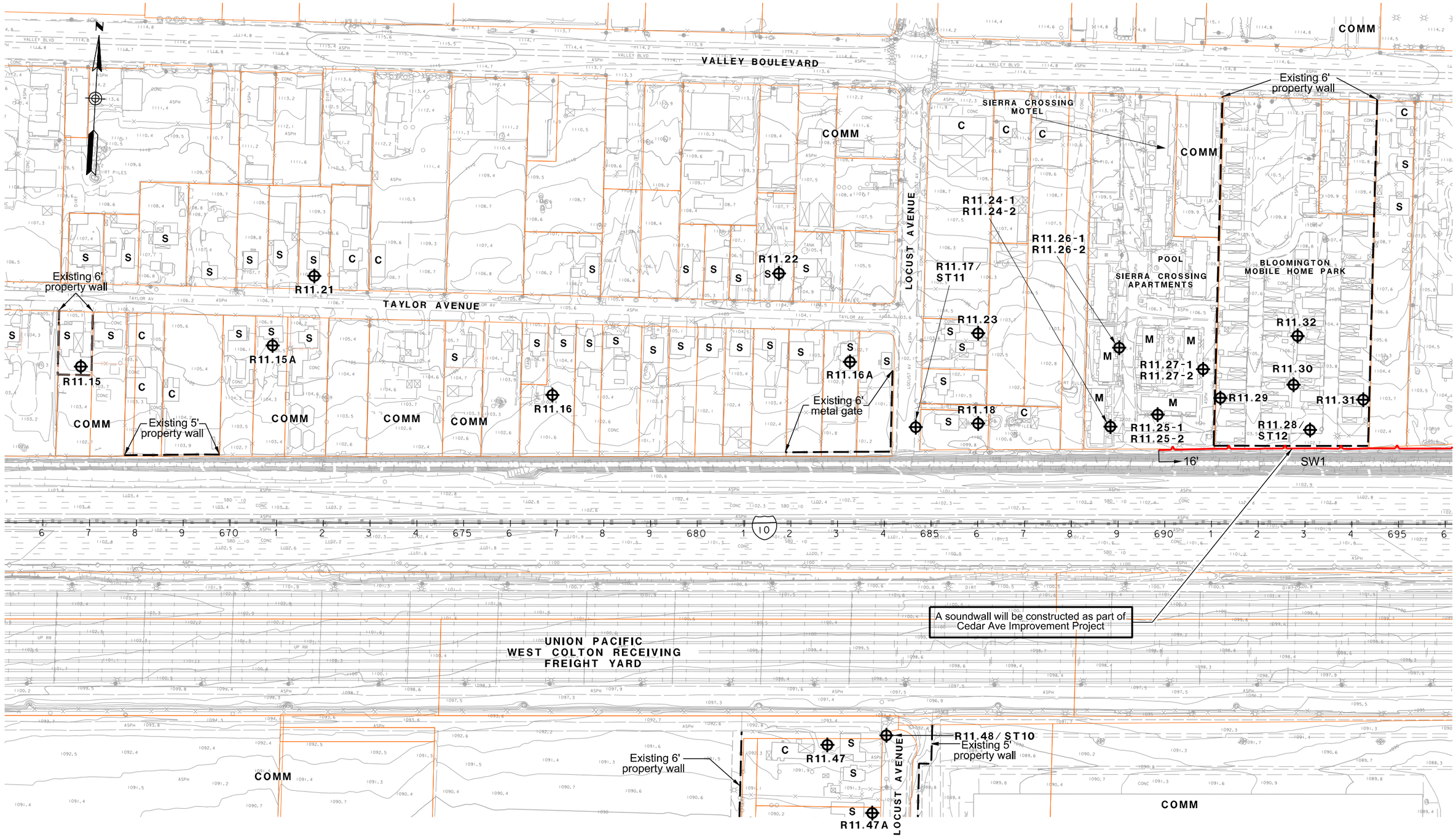
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 1
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 35



LEGEND

- RXX - RECEIVER SITE
- CAL - CALIBRATION SITE
- LT - LONG-TERM MEASUREMENT
- ST - SHORT-TERM MEASUREMENT

- SFR OR S - SINGLE FAMILY RESIDENCE
- MFR OR M - MULTI-FAMILY RESIDENCE
- COMM OR C - COMMERCIAL/NO OUTSIDE ACTIVITIES
- HXX - IN/OUTDOOR MEASUREMENT

- EXISTING PROPERTY WALL
- EXISTING SOUNDWALL
- RETAINING WALL
- SAFETY BARRIER

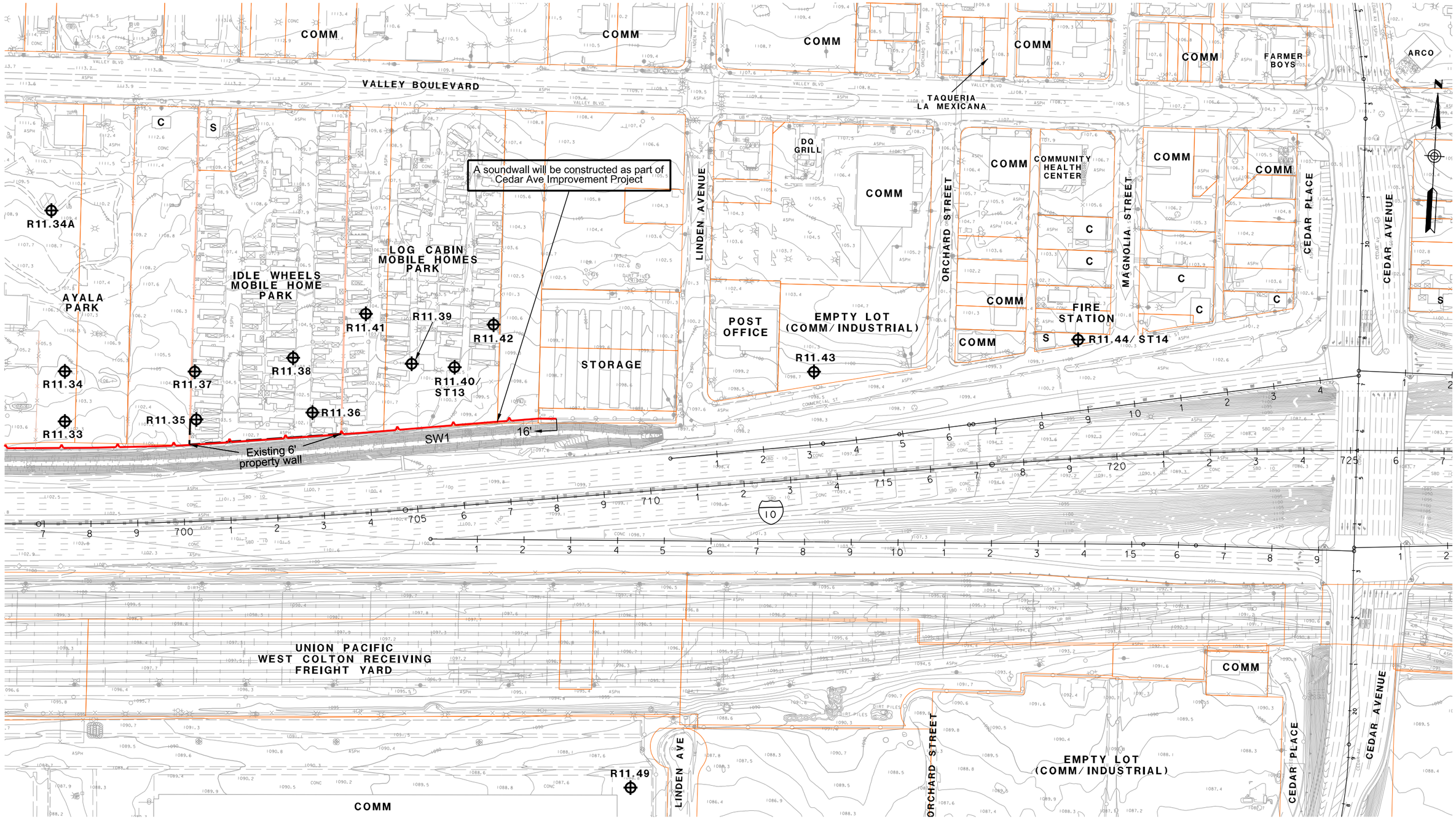
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 1 NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 36



LEGEND

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1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 1
NOISE RECEIVER & BARRIER LOCATIONS

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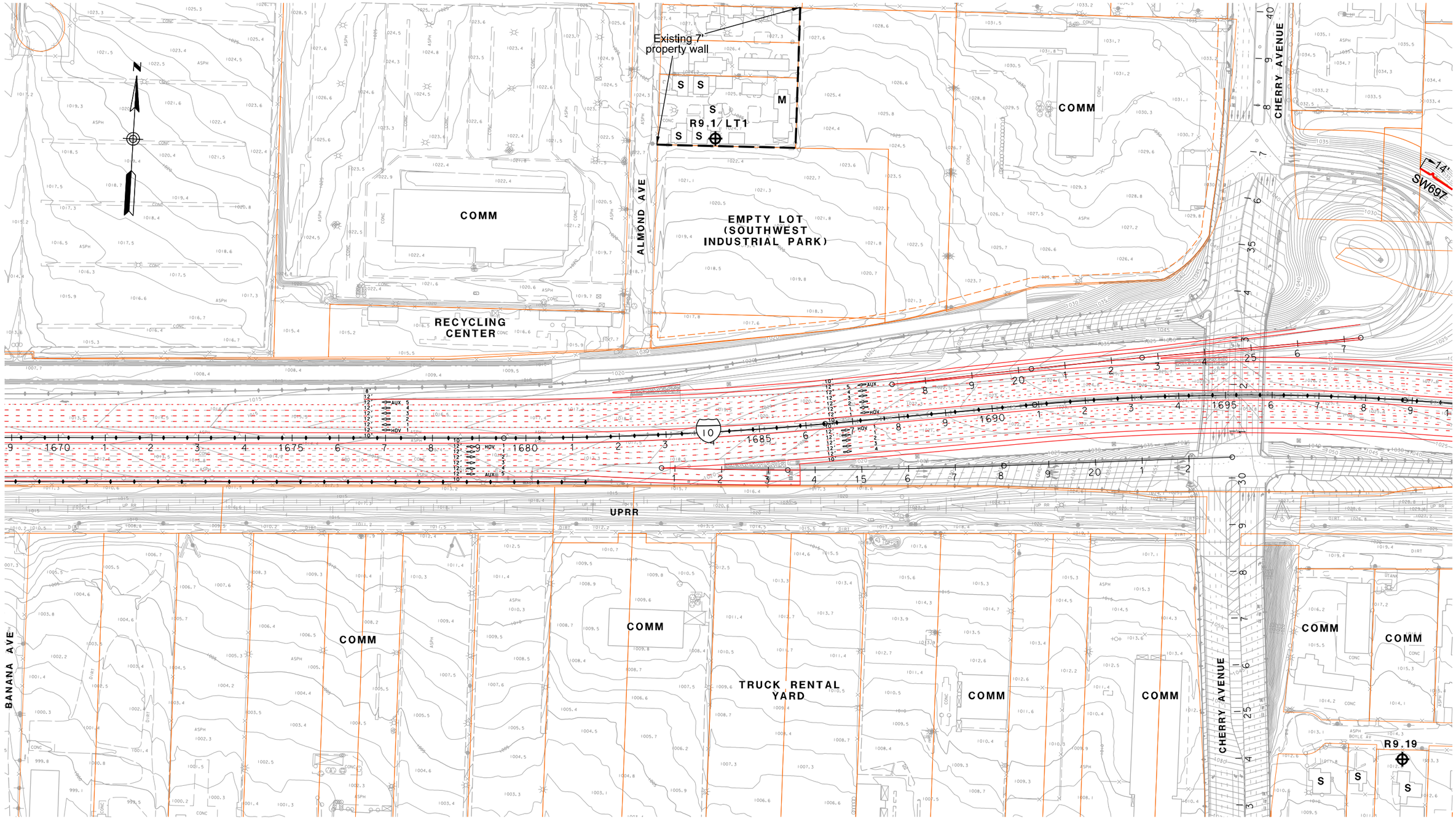
FIGURE 37

Alternative 2 -

One High-Occupancy Vehicle Lane in Each Direction



LEGEND

- RXX - RECEIVER SITE
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- EXISTING SOUNDWALL
- PROPOSED SOUNDWALL
- REPLACEMENT IN KIND SOUNDWALL
- ANALYZED SOUNDWALL
- RETAINING WALL
- SAFETY BARRIER

1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 2
NOISE RECEIVER & BARRIER LOCATIONS

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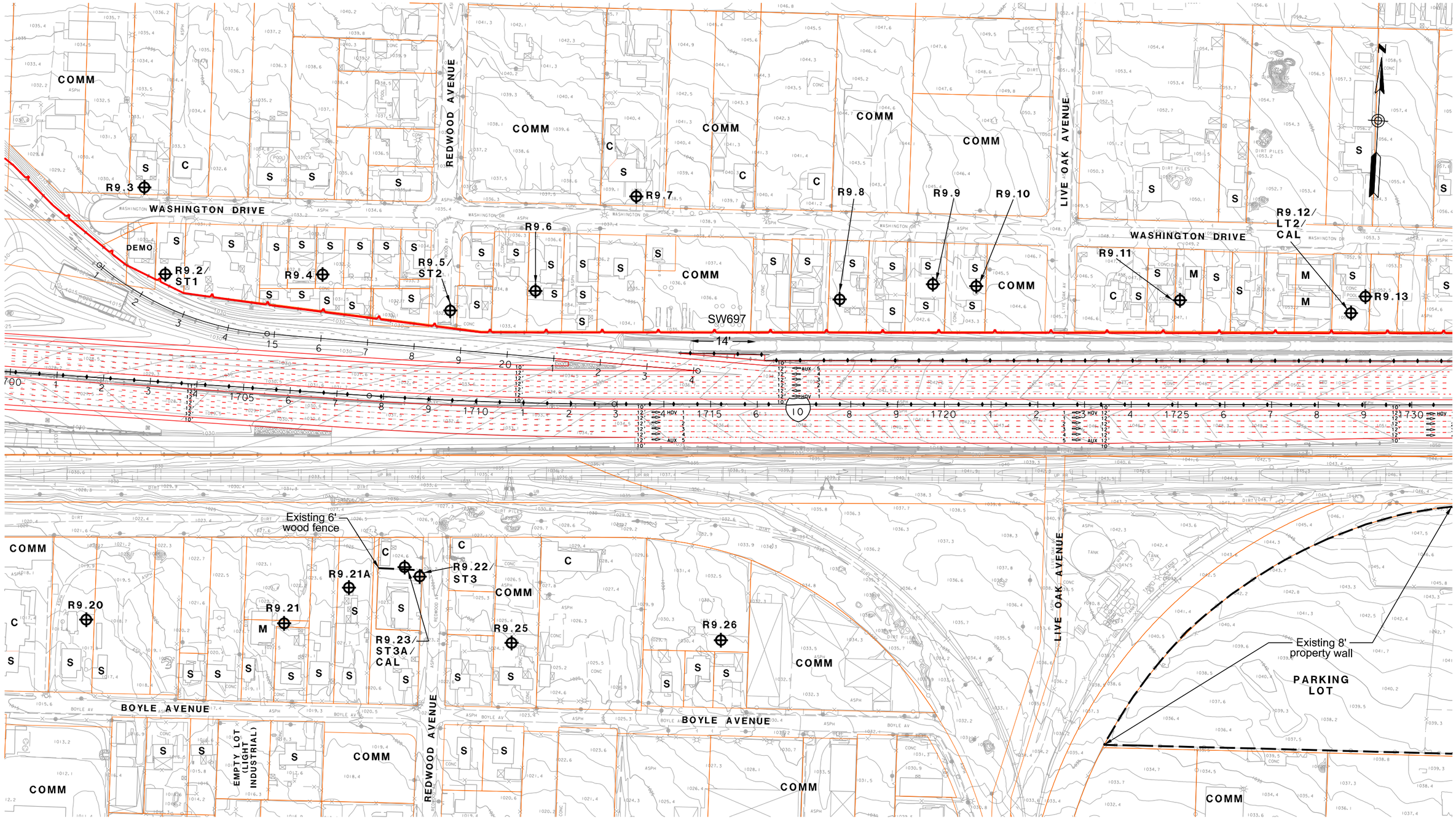
FIGURE 74



LEGEND

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- RETAINING WALL
- SAFETY BARRIER

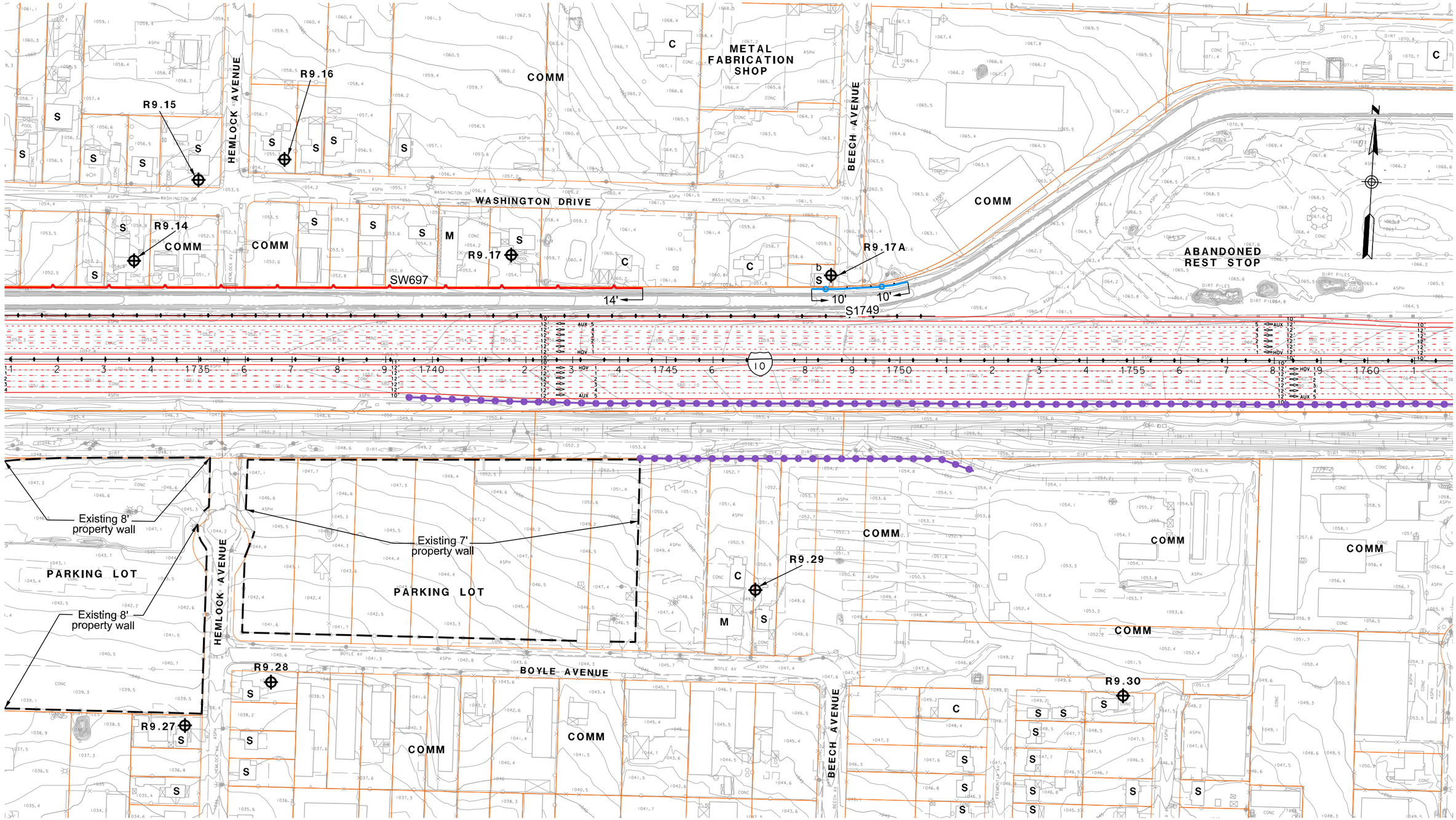
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 2
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 75



LEGEND

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- RETAINING WALL
- SAFETY BARRIER

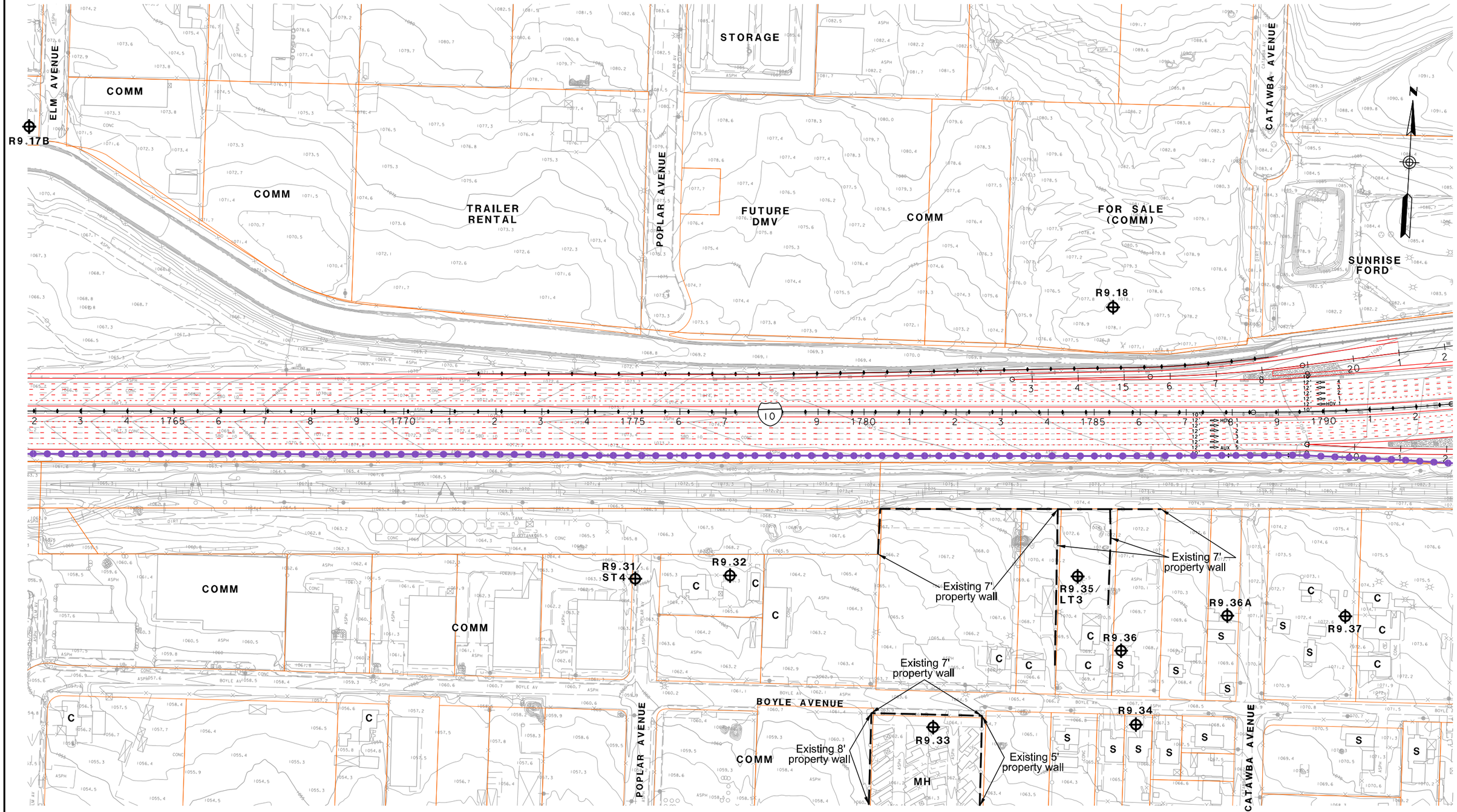
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 2
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 76



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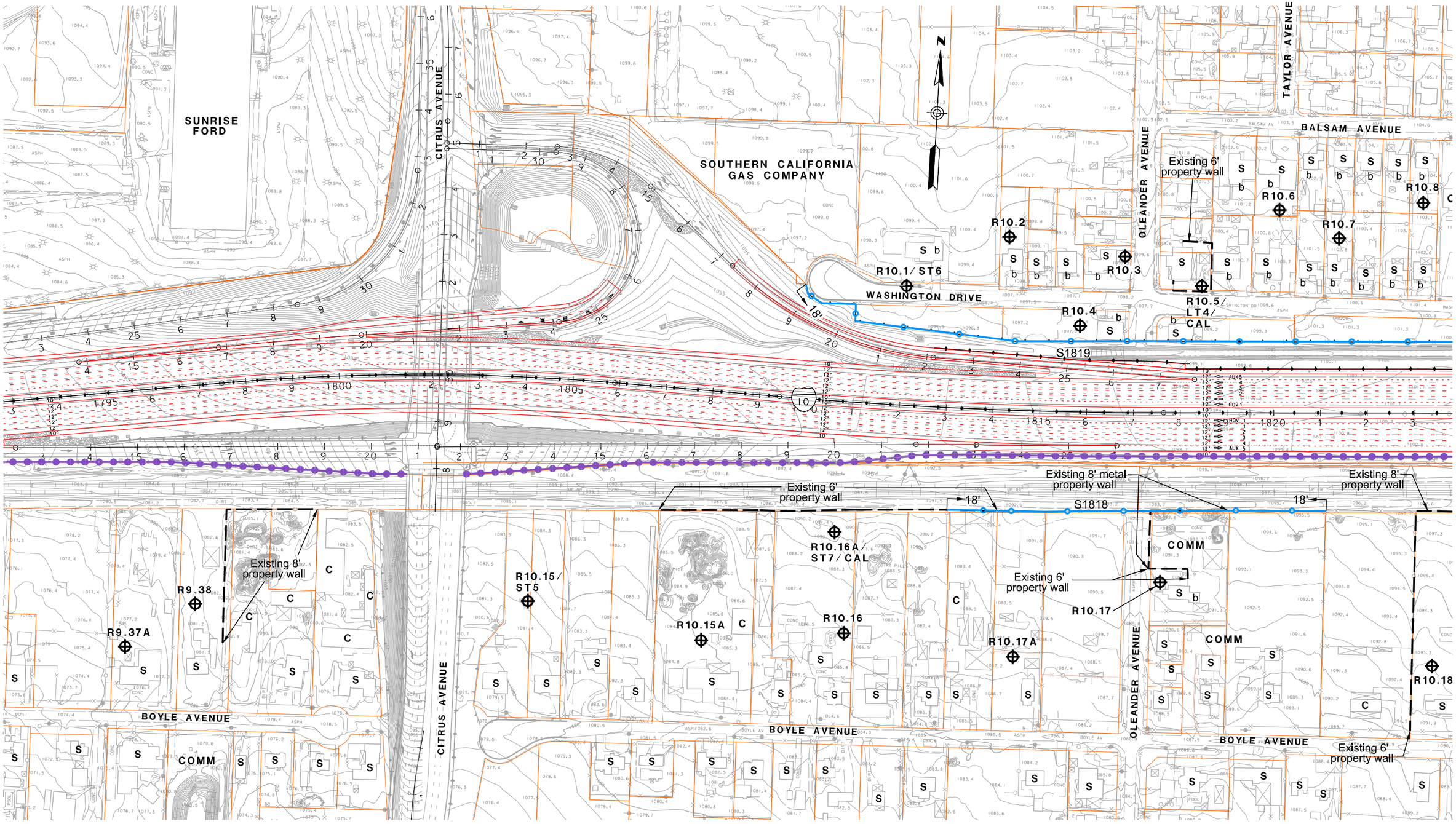
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 2
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 77



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- SAFETY BARRIER

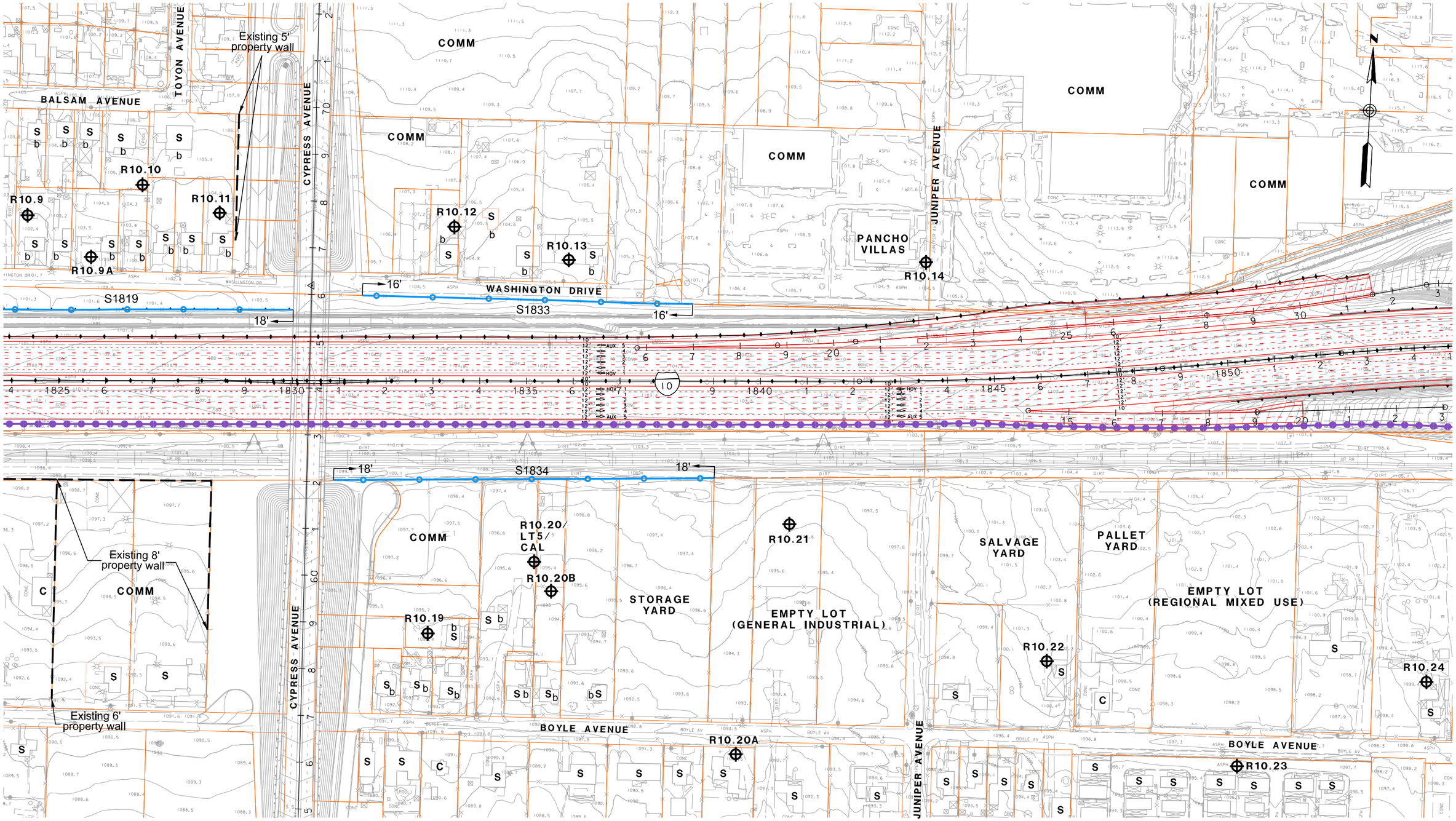
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 2
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 78



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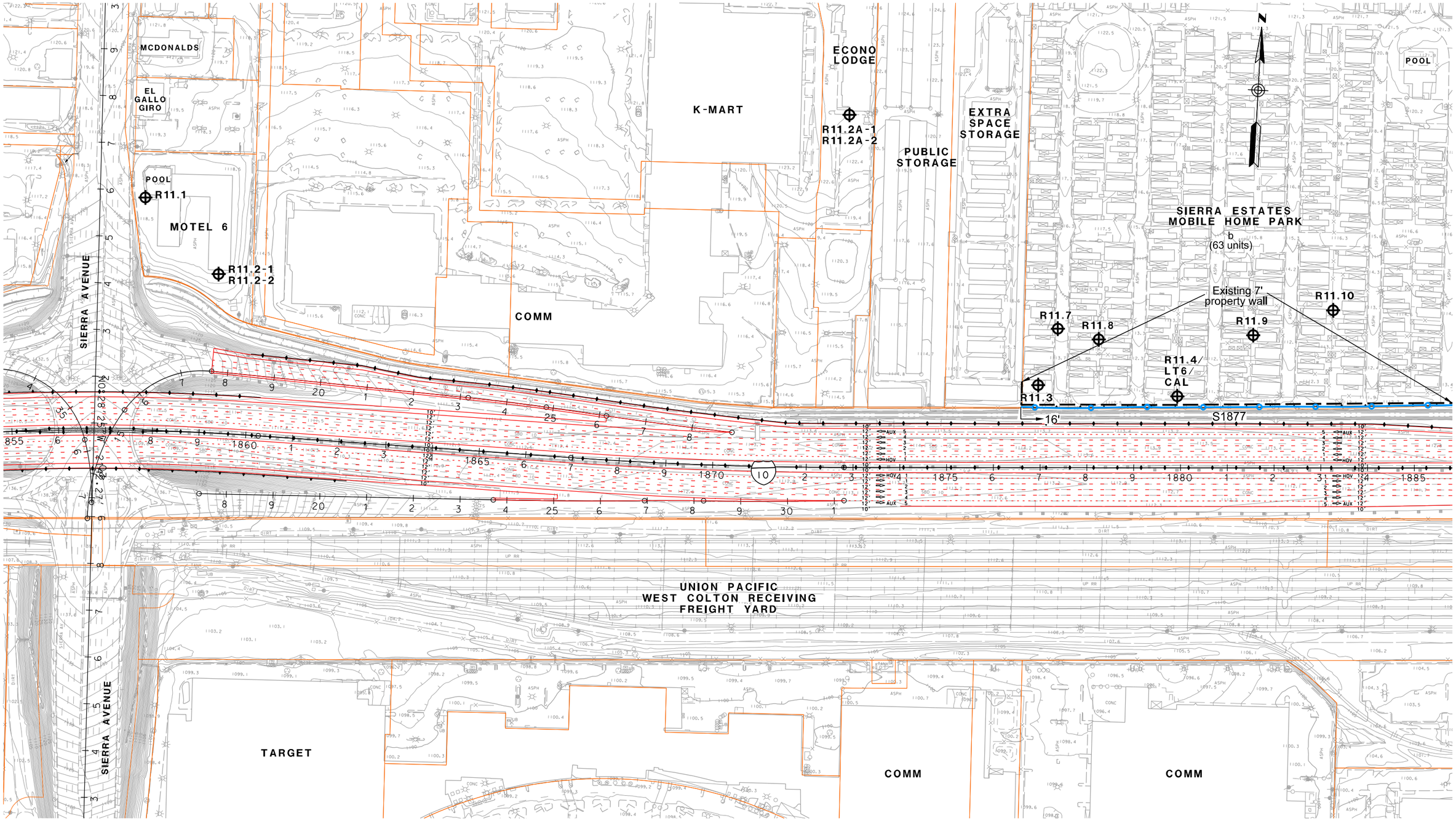
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 2
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 79



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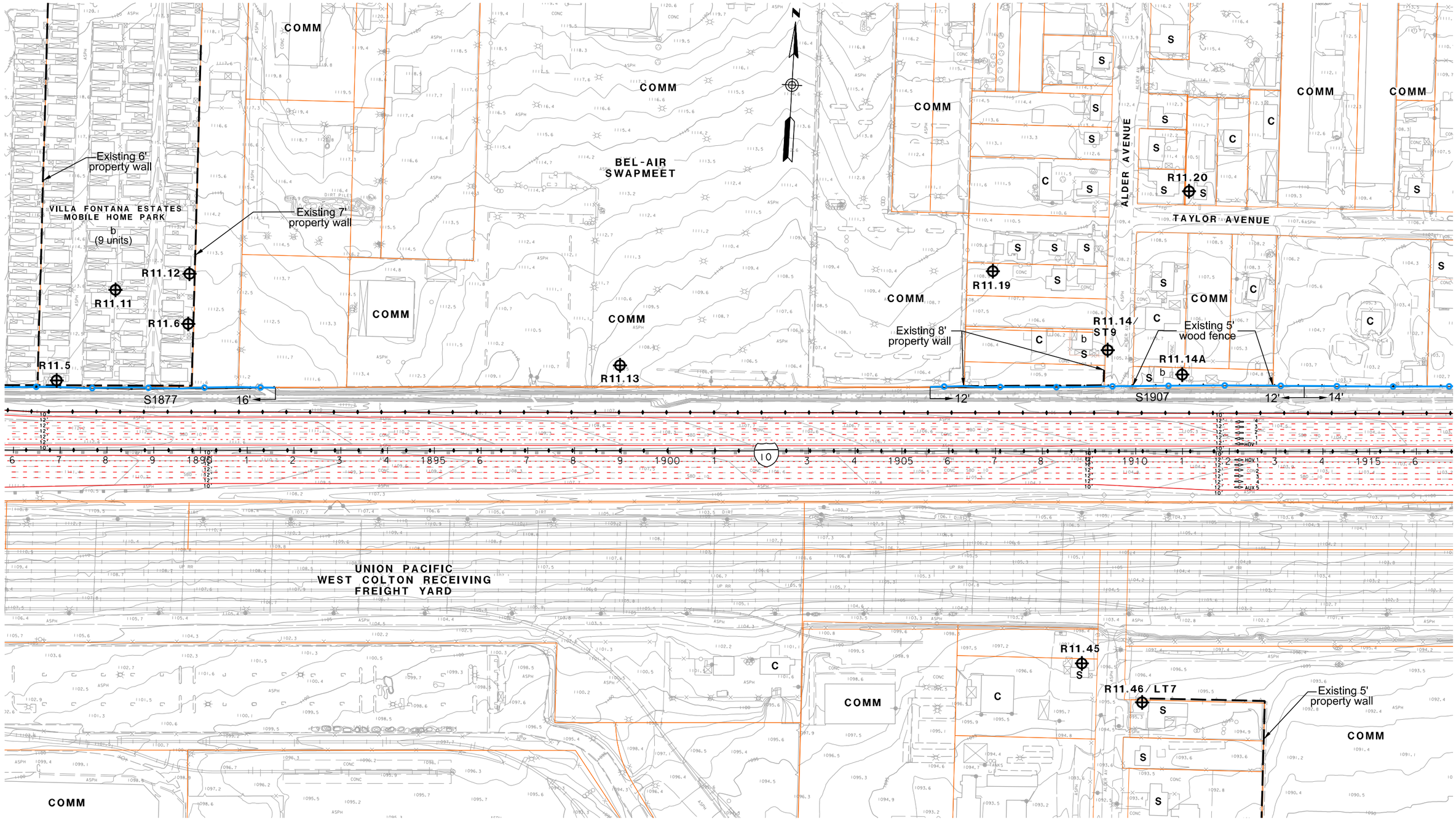
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 2
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 80



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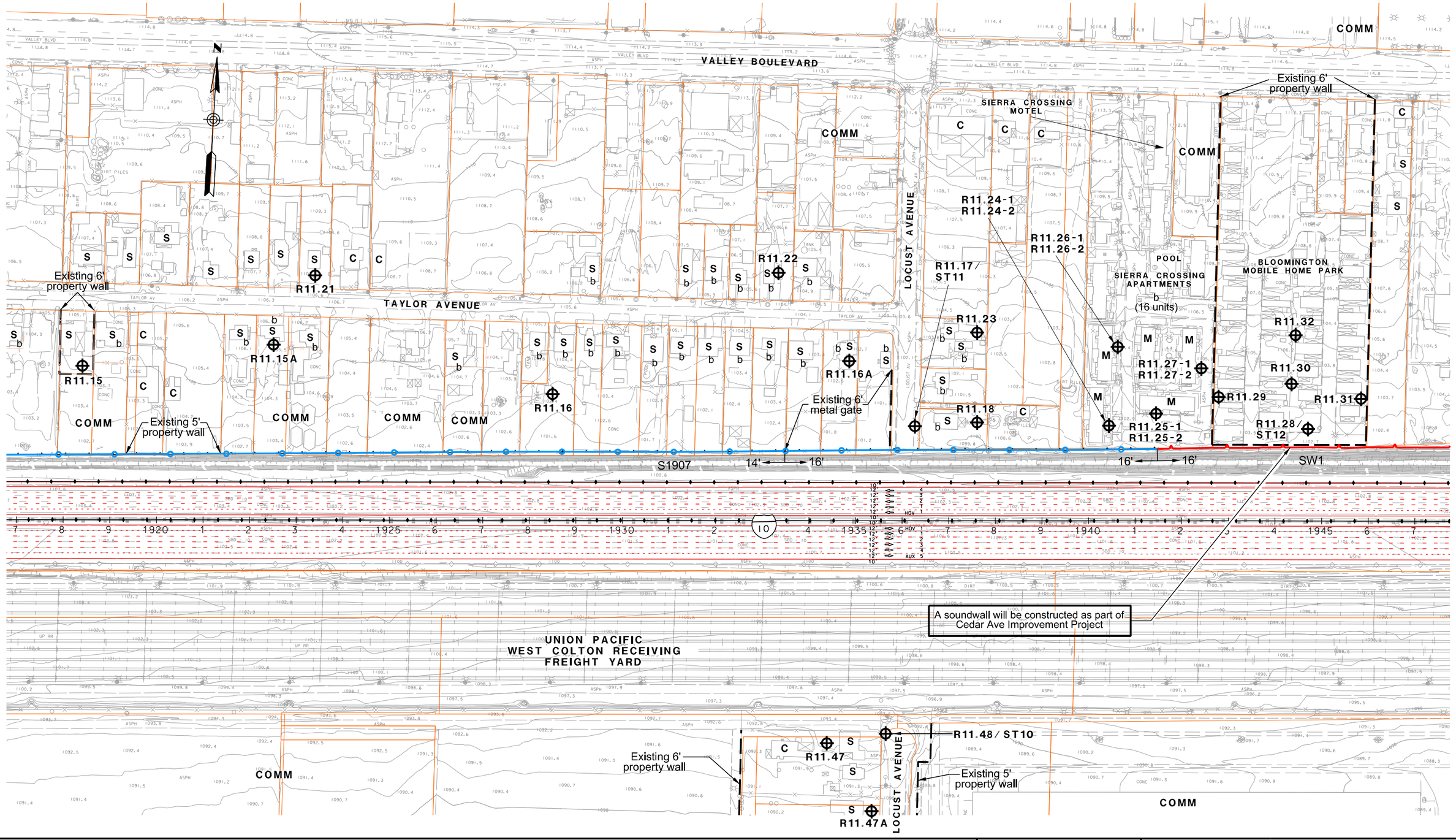
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 2
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 81



LEGEND

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- RETAINING WALL
- SAFETY BARRIER

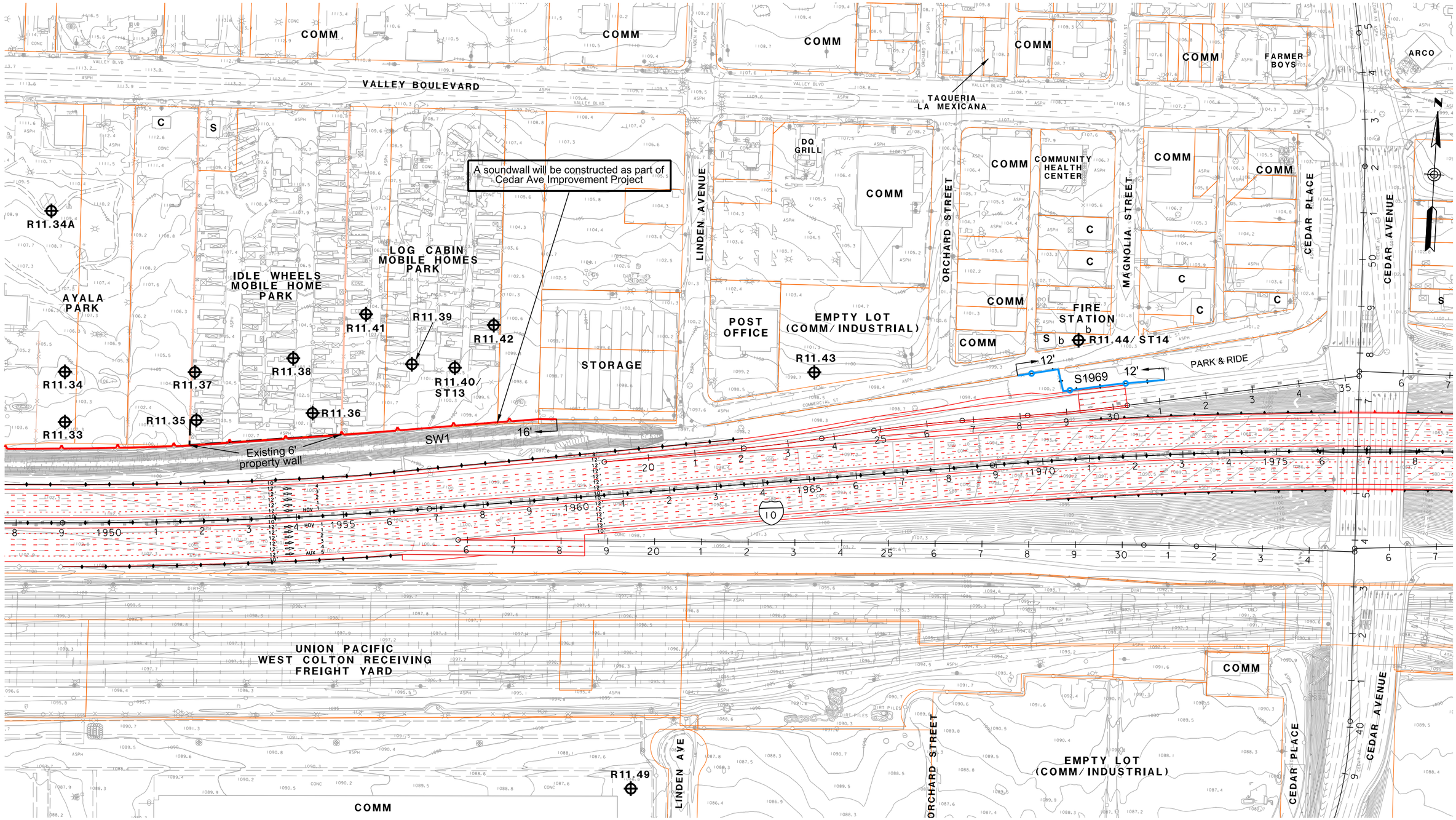
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 2
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 82



LEGEND

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- PROPOSED SOUNDWALL
- REPLACEMENT IN KIND SOUNDWALL
- ANALYZED SOUNDWALL
- RETAINING WALL
- SAFETY BARRIER

1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 2
NOISE RECEIVER & BARRIER LOCATIONS

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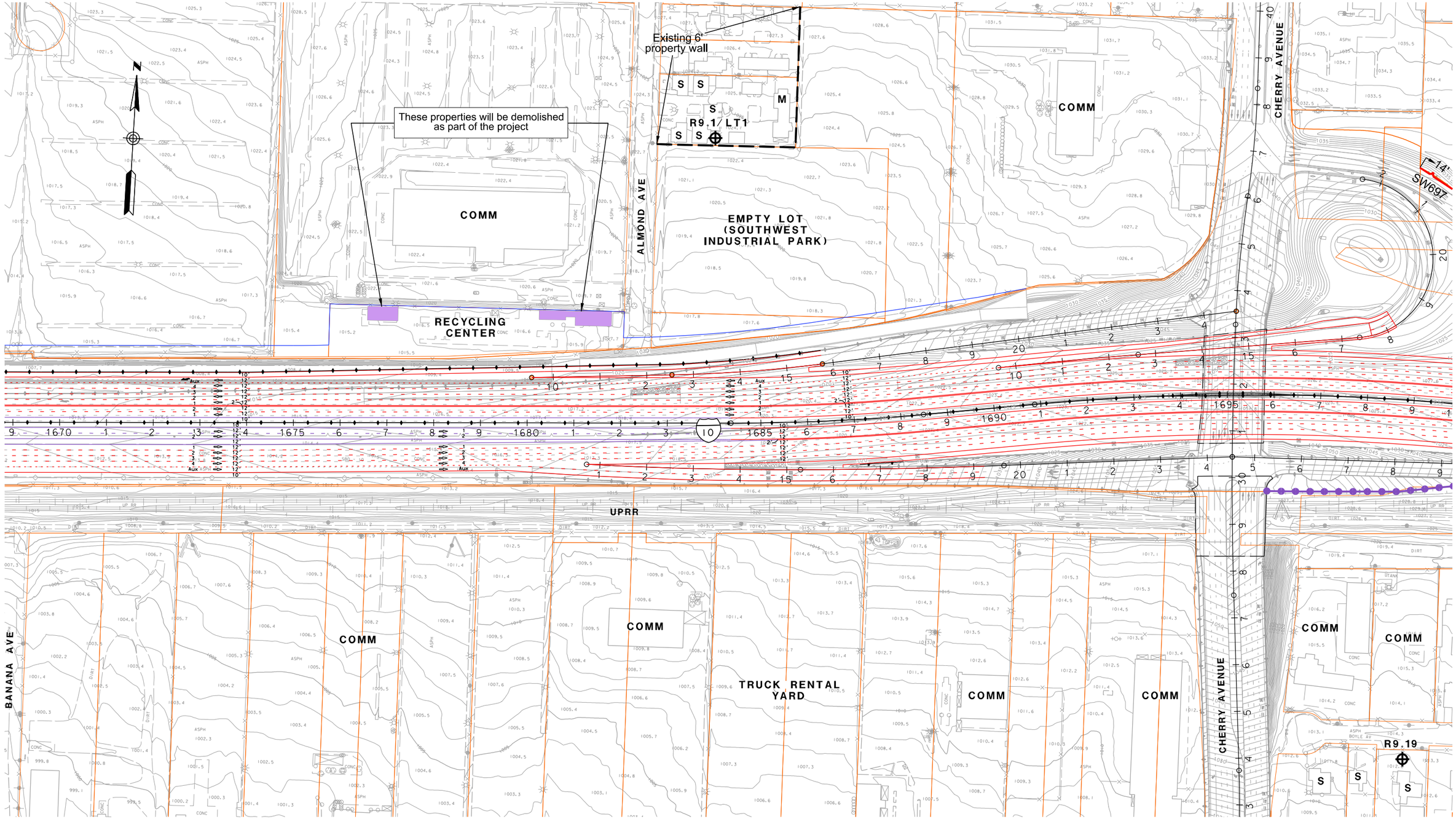
FIGURE 83

Alternative 3 -

Two Express Lanes in Each Direction



LEGEND

- RXX - RECEIVER SITE
- CAL - CALIBRATION SITE
- LT - LONG-TERM MEASUREMENT
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- PROPOSED SOUNDWALL
- REPLACEMENT IN KIND SOUNDWALL
- ANALYZED SOUNDWALL
- RETAINING WALL
- SAFETY BARRIER

1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 3
NOISE RECEIVER & BARRIER LOCATIONS

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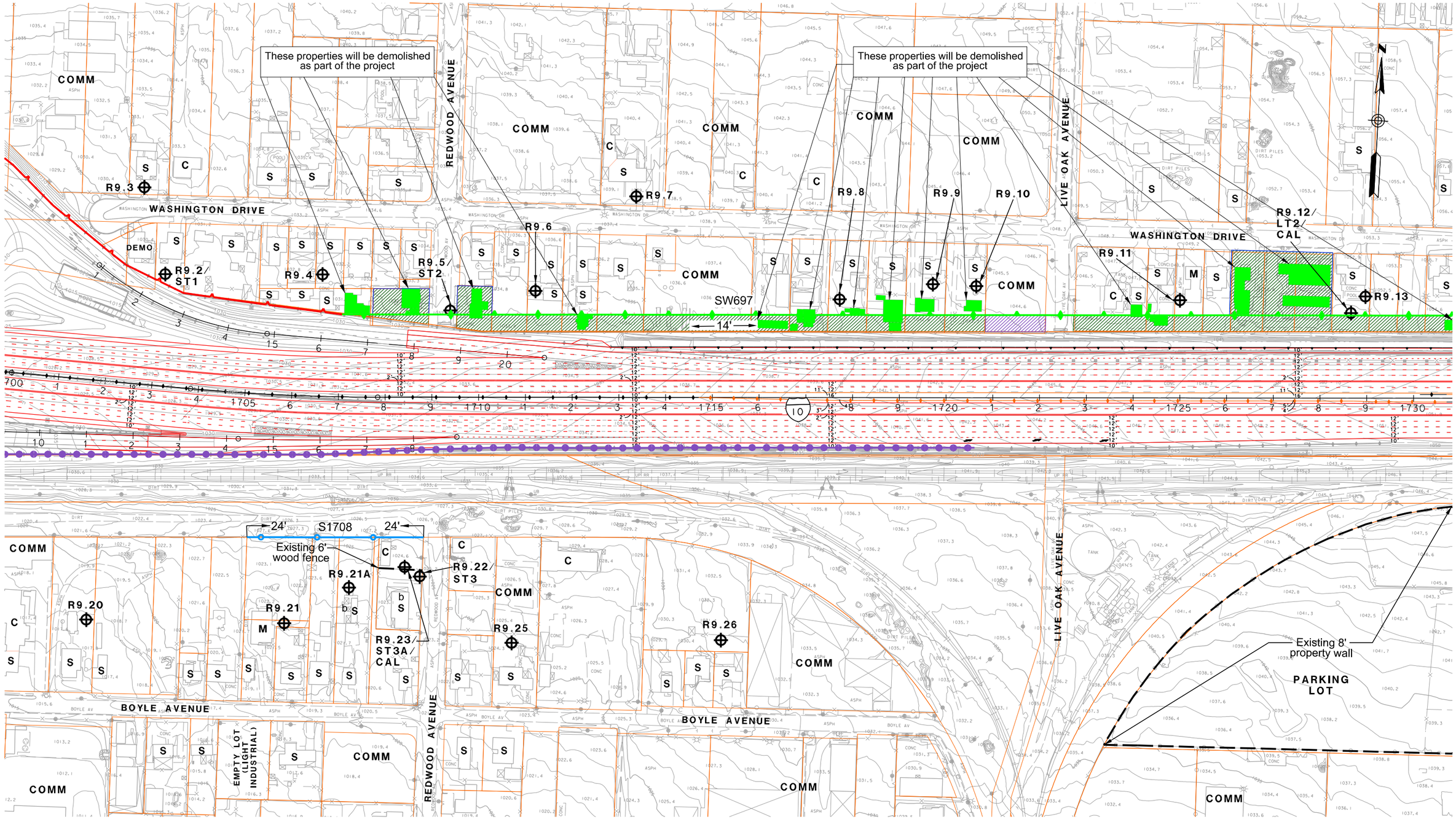
FIGURE 129



LEGEND

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- CAL - CALIBRATION SITE
- LT - LONG-TERM MEASUREMENT
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- REPLACEMENT IN KIND SOUNDWALL
- ANALYZED SOUNDWALL
- RETAINING WALL
- SAFETY BARRIER

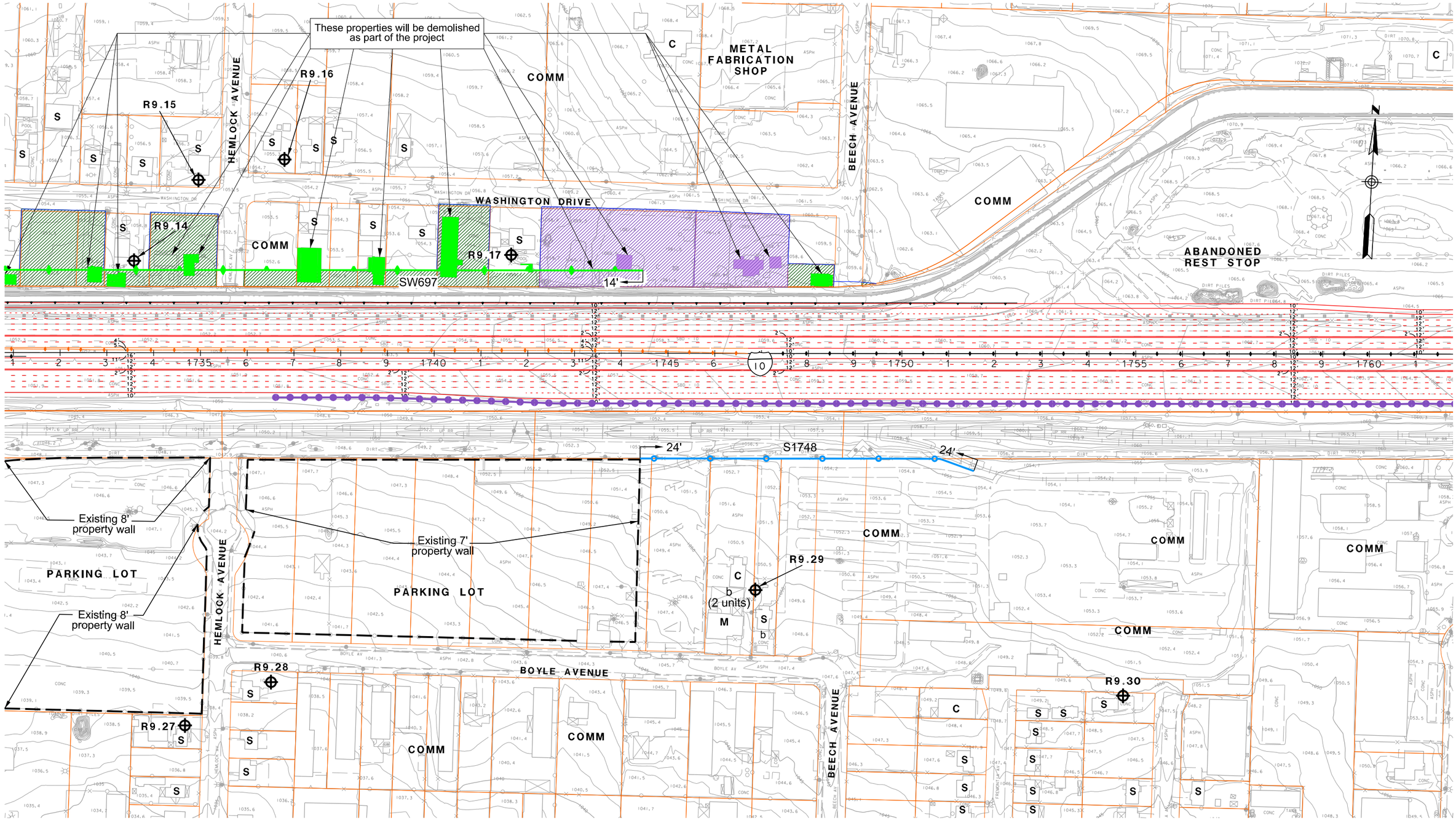
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 3
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 130



LEGEND

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- RETAINING WALL
- SAFETY BARRIER

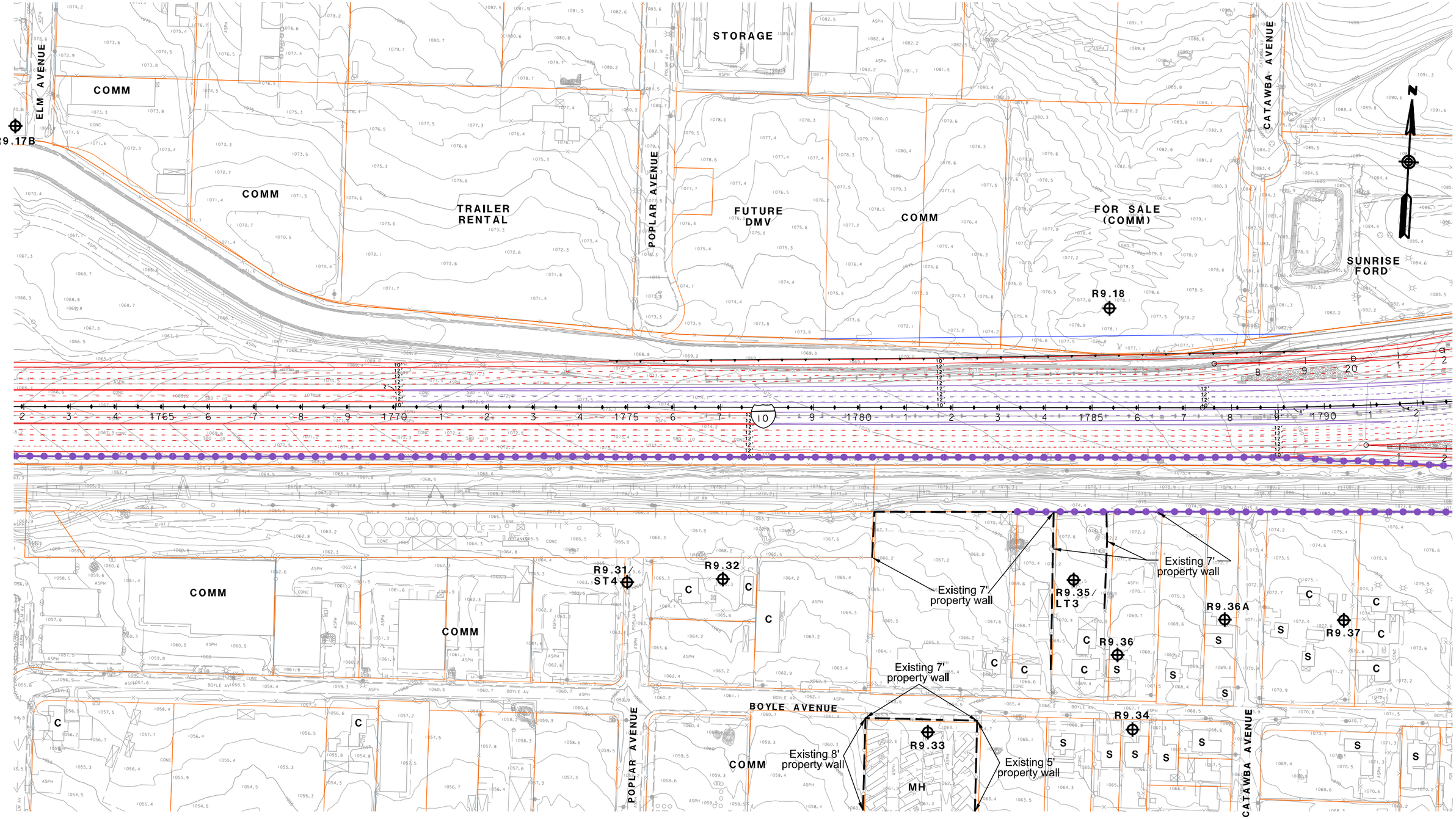
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 3
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 131



LEGEND

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- SAFETY BARRIER

1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 3
NOISE RECEIVER & BARRIER LOCATIONS

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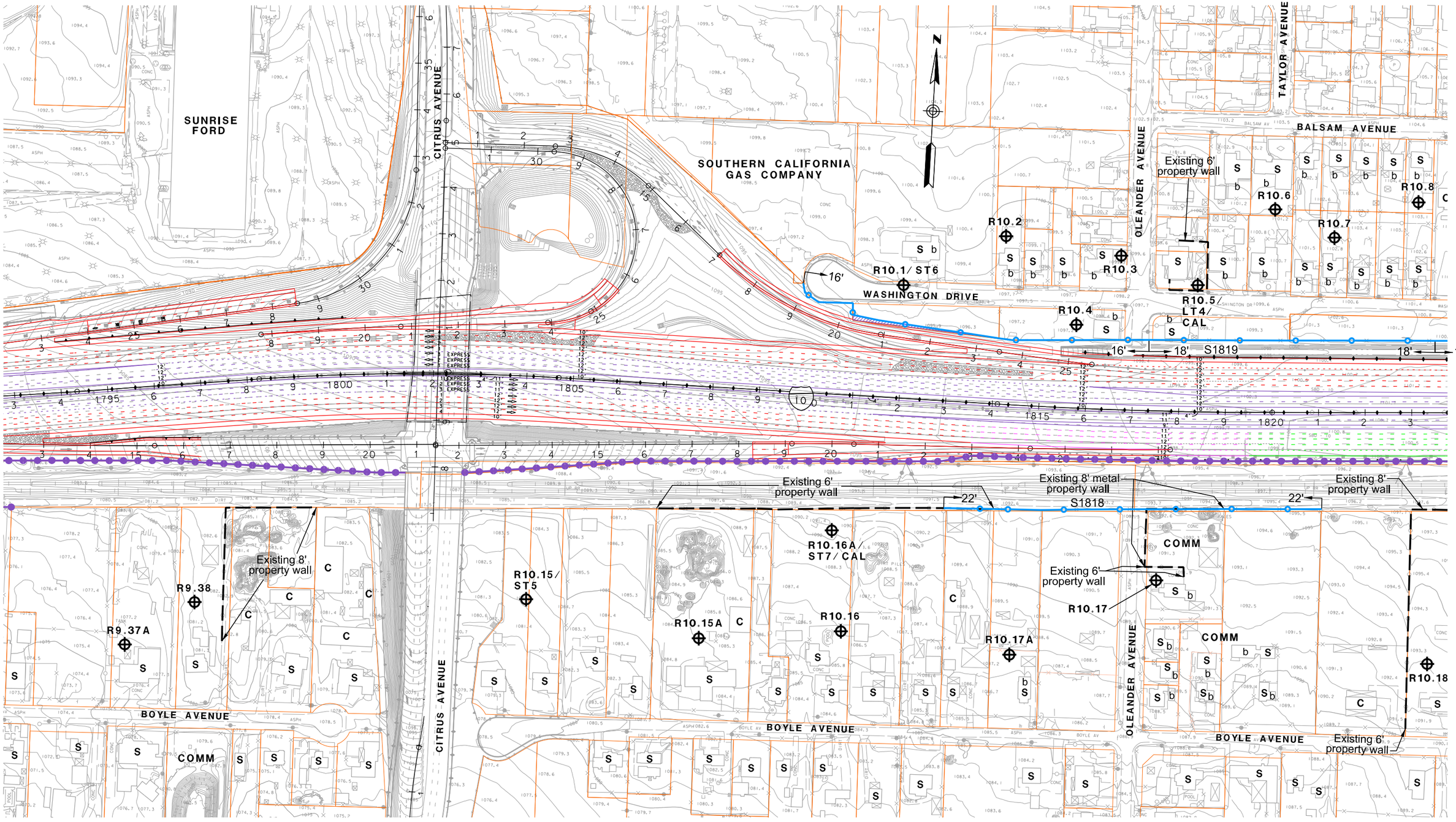
FIGURE 132



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1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 3
NOISE RECEIVER & BARRIER LOCATIONS

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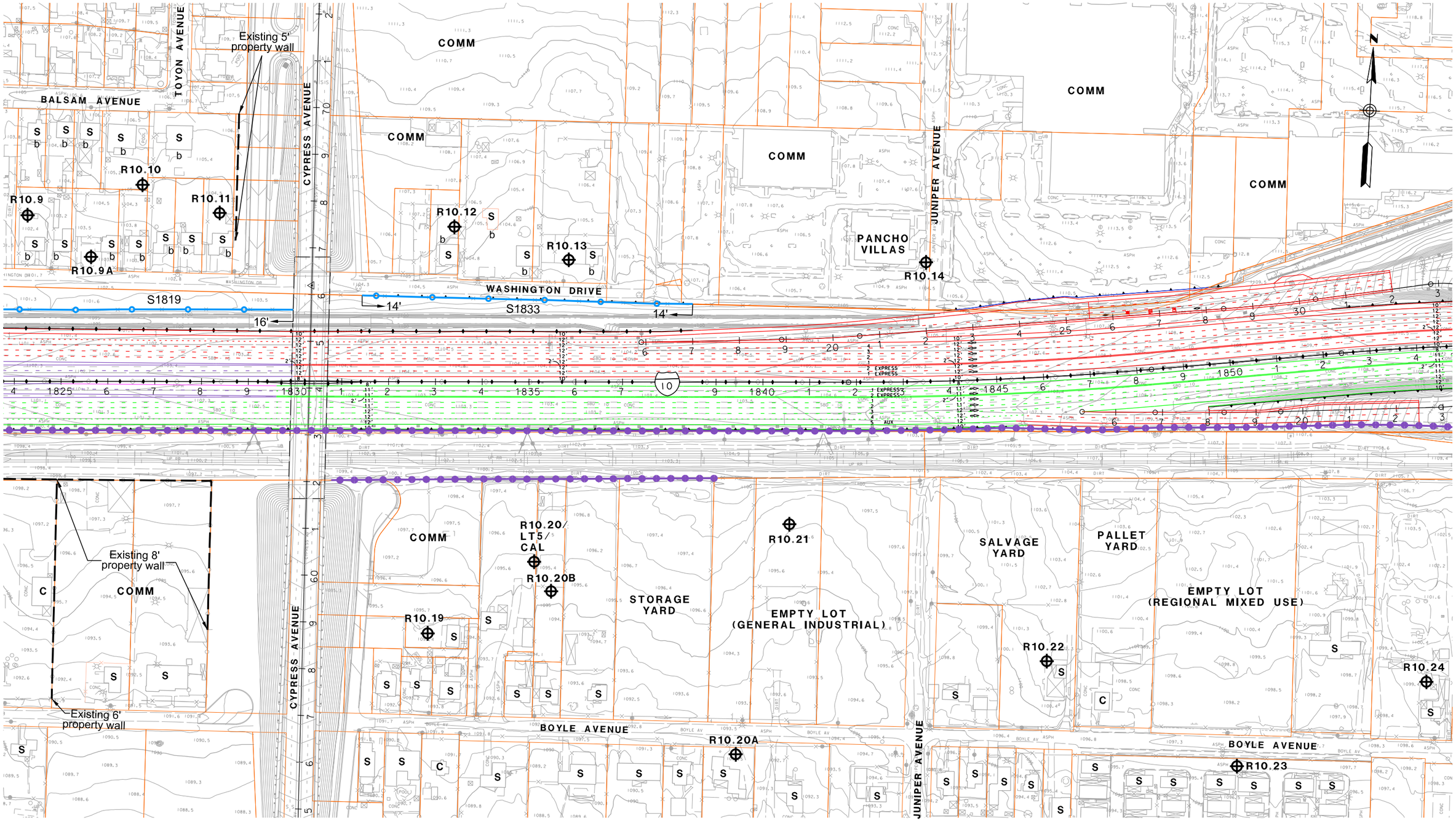
FIGURE 133



LEGEND

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1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 3
NOISE RECEIVER & BARRIER LOCATIONS

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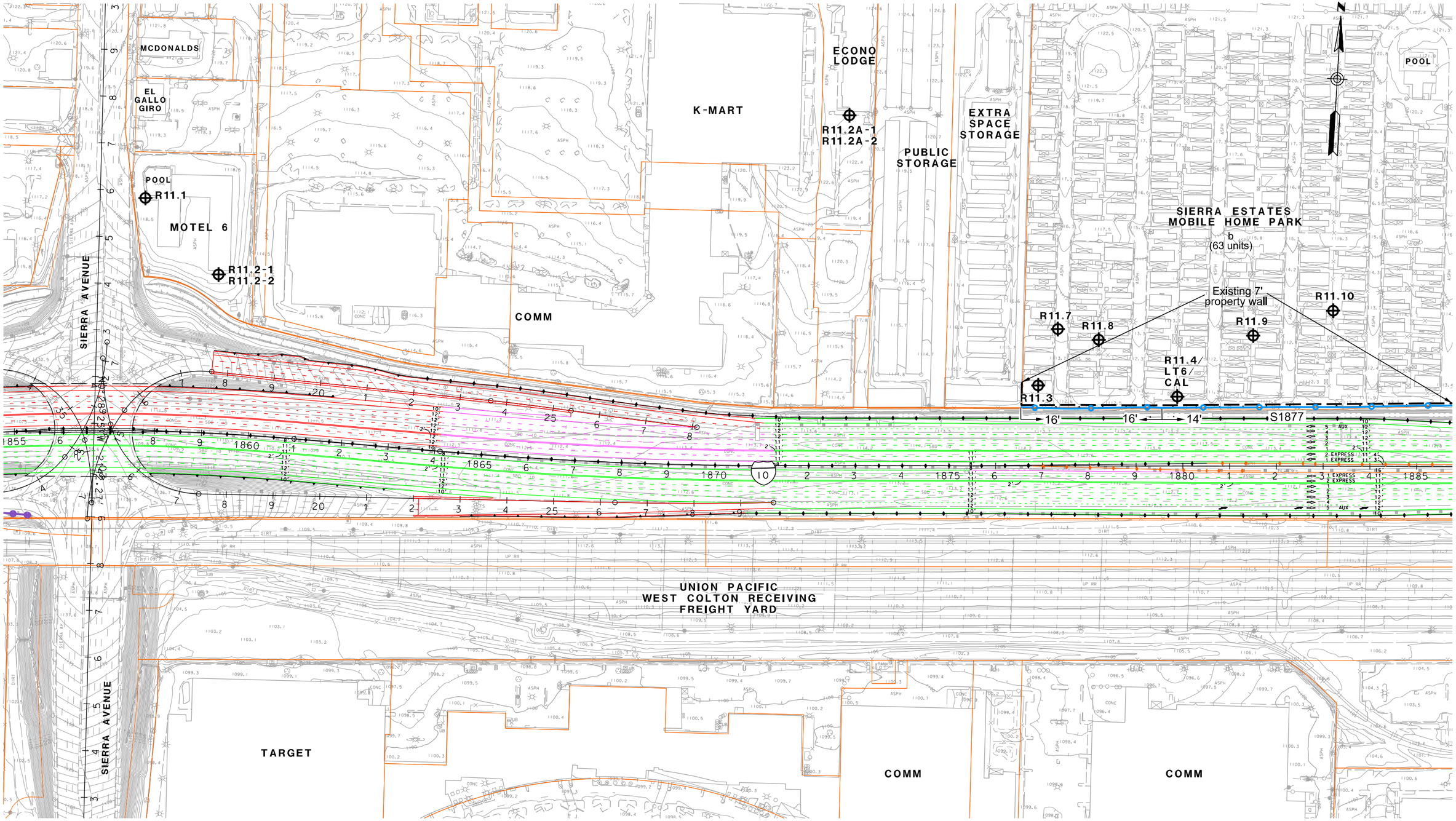
FIGURE 134



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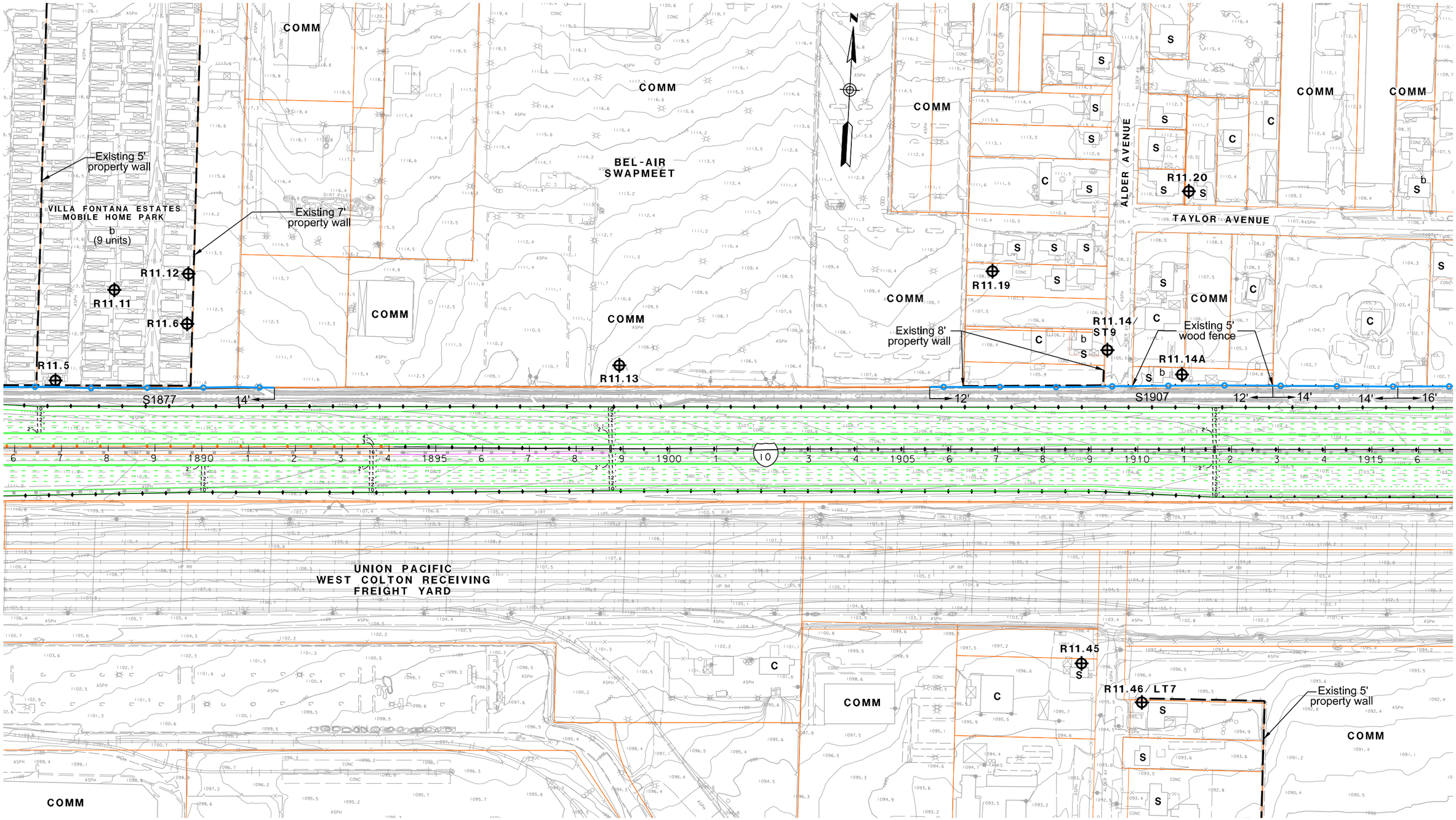
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 3
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 135



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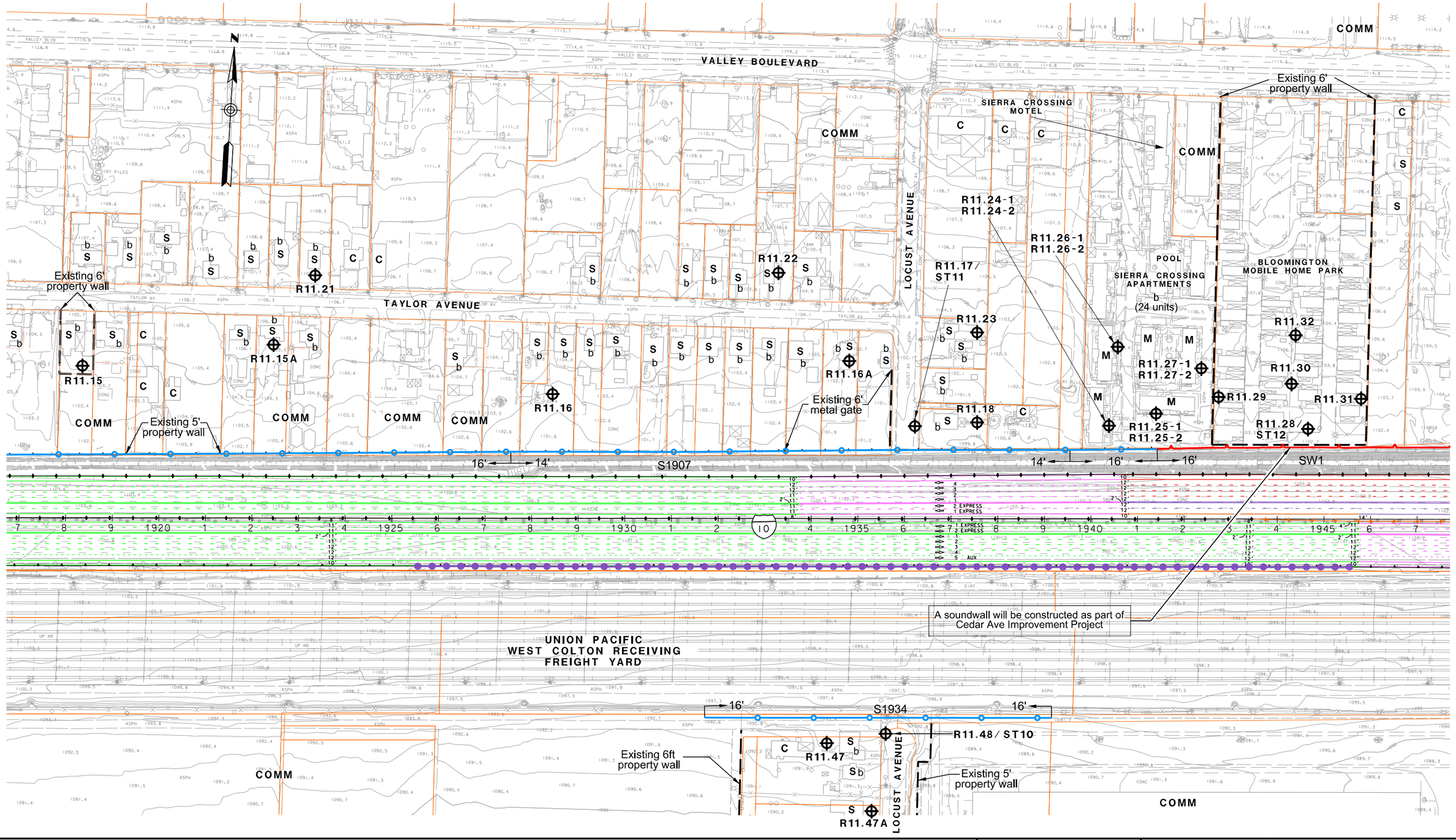
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 3
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 136



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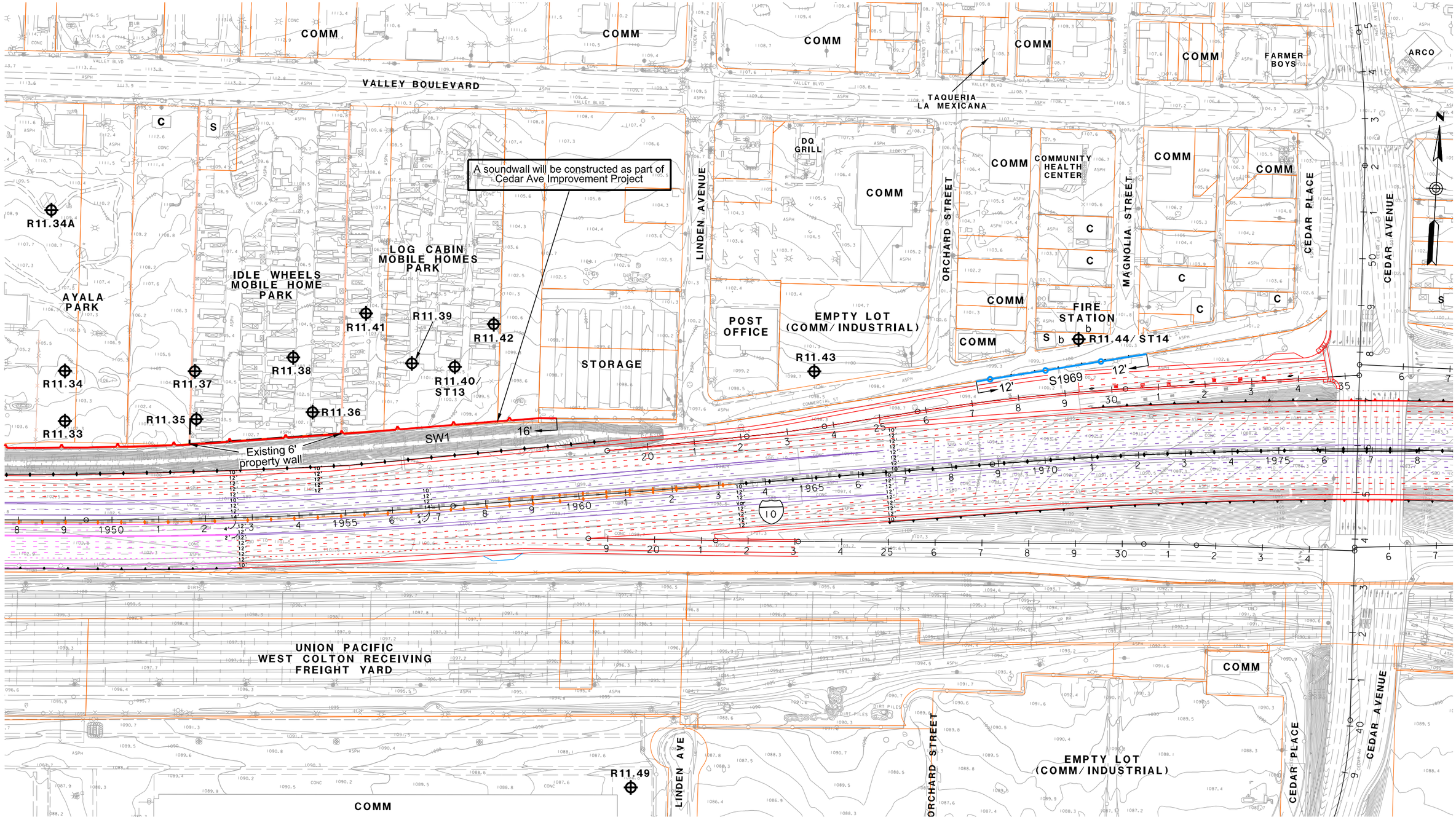
1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 3
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 137



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- SFR OR S - SINGLE FAMILY RESIDENCE
- MFR OR M - MULTI-FAMILY RESIDENCE
- COMM OR C - COMMERCIAL/NO OUTSIDE ACTIVITIES
- HXX - IN/OUTDOOR MEASUREMENT
- EXISTING PROPERTY WALL
- EXISTING SOUNDWALL
- PROPOSED SOUNDWALL
- REPLACEMENT IN KIND SOUNDWALL
- ANALYZED SOUNDWALL
- RETAINING WALL
- SAFETY BARRIER

1in : 200ft

0 ft 100ft 200ft 300ft

I-10 CORRIDOR ALTERNATIVE 3
NOISE RECEIVER & BARRIER LOCATIONS

AUGUST 6, 2015

FIGURE 138