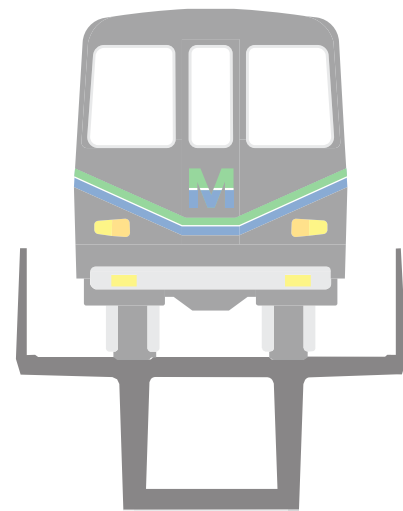
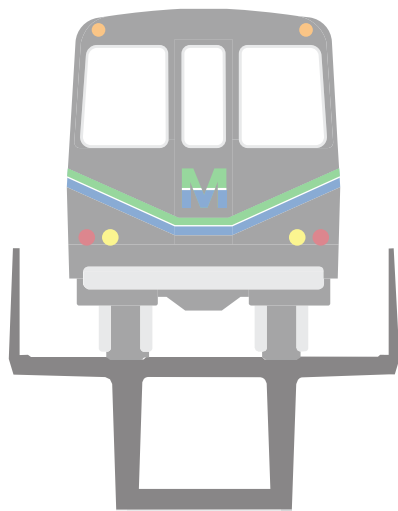




Non-Motorized Overpass at SR 5/US1 And SW 27th Avenue Executive Summary



March 9, 2017

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Non-Motorized Overpass at SR 5/US1 and SW 27th Ave (FM No. 421053-3-12-03)

EXECUTIVE SUMMARY

Project Description: Concept and Feasibility Analysis for a non-motorized overpass for pedestrian and bicycles to support the Underline adjacent to US 1 at SW 27th Avenue.

Purpose: The Department requested a conceptual and feasibility analysis to identify, evaluate and recommend potential alignments for a non-motorized overpass.

This conceptual analysis consisted of:

- Typical Section Analysis
- Horizontal and Vertical Geometric Analysis
- Traffic Control Analysis

Background: This study was conducted at US 1 at 27th Avenue adjacent to the Underline, a proposed 10 mile signature linear park and urban trail. The Underline will serve as a gateway to the adjacent communities, by improving physical access from north to south running from underneath the Metrorail line and parallel to US1.

Need: At this specific location, the traffic congestion is impacting the safety of pedestrians and bicyclists crossing 27th Avenue.

Methodology: The feasibility study included the following tasks:

- Field review of existing conditions
- Analyze existing Right of Way Maps and Survey (topography)
- Obtain aerial images of the proposed study area
- Performed horizontal and vertical geometric analysis
- Coordination with local companies that manufacture pre-fabricated bridges to obtain preliminary cost estimates and engineering specifications
- Performed a conceptual Right of Way cost analysis of the adjacent properties within the study area
- Development of design criteria
- Development of concept alternatives including typical section, plan and profile.

Existing Conditions: US 1 at 27th Avenue is a skewed intersection adjacent to the Coconut Grove Metrorail station on the southwest side. There are 3 designated pedestrian access points from these streets. To the north and east, the station is accessed by busy arterials including 27th Avenue and US 1, respectively. There are north/south pedestrian signals and high visibility pedestrian crossings in all directions at US 1 at 27th Avenue. There are good on-site pedestrian facilities providing sidewalks and wide non-motorized facilities between the streets and the station. It should be noted that there is a fence along US 1 prohibiting/channeling pedestrian and bicycle traffic from crossing US 1 mid-block to access the station.

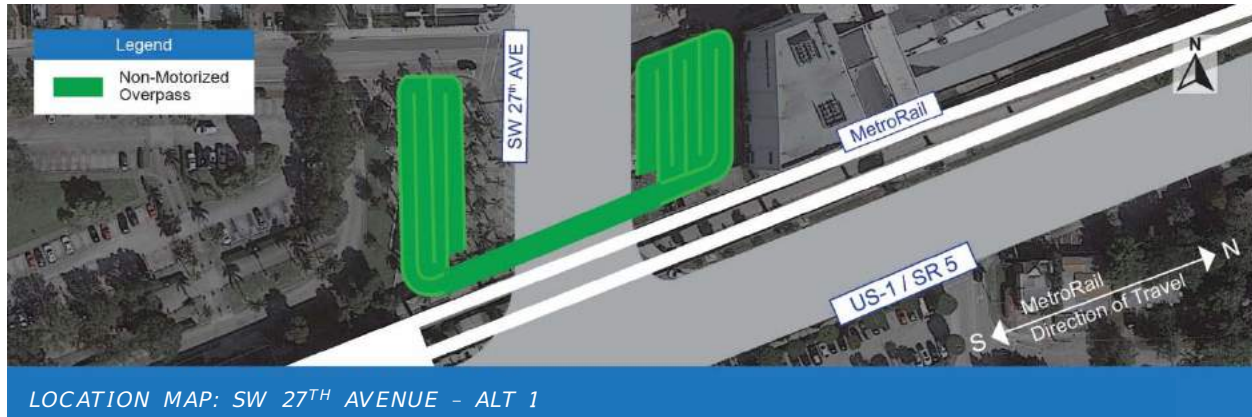
There are no bicycle lanes on the streets and arterials directly accessing the station, however, there is a direct access to the M-Path.

Non-Motorized Overpass at SR 5/US1 and SW 27th Ave (FM No. 421053-3-12-03)

Proposed Improvements:

Alternative 1

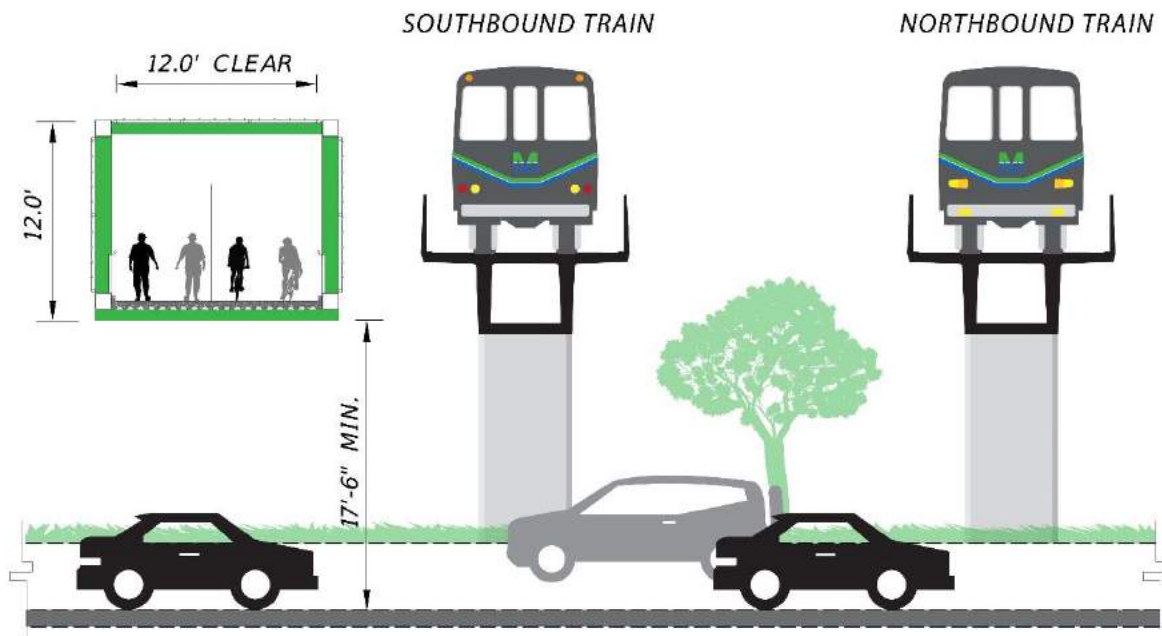
The proposal is a non-motorized pedestrian and bicyclist overpass consisting of a 200 foot long prefabricated bridge and a combination of curvilinear and switchback access ramps with grades between 2-3%. Structural options include a closed box (Gateway (See Typical Section)) or open box (Link) with a minimum 12 foot effective walkway width.



The overpass will be placed on the north side of the Metrorail alignment (**See Appendix A, Sheet 1**) due to lateral clearance constraints along the south side between the Metrorail alignment and the US-1/SR-5 travel way at this location. This alternative will include the use of the existing Coconut Grove Metrorail station plaza located on the northwest quadrant of the intersection and the acquisition of the existing building (2753 SW 27th Avenue) located on the northeast quadrant of the intersection.

A 12 foot effective width walkway while maintaining adequate lateral clearance to the Metrorail cannot be achieved with linear access ramps at this location; therefore, we are proposing the use of switchback (180 degree turns) access ramps with grades ranging from 2 to 3% to meet the ground elevations of the Underline located underneath the Metrorail. This will be achieved by using retaining walls, where the grade separation is greater than 5ft, and gravity walls where the access ramps elevations are less than 5ft. Type 3 Sunshine Infill Panel will be placed along the retaining wall system to provide protection for pedestrians and bicyclists.

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SW 27th AVENUE: ALTERNATIVE 1 - SWITCHBACK

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Alternative 2

Alternative 2 consists of a non-motorized pedestrian and bicyclist overpass installed on the south side of the Metrorail alignment (See Appendix A, Sheet 2 thru 7). Although this alternative does not include right-of-way acquisition, it would require a 1,260 foot long prefabricated bridge and minor re-alignment to the US-1 southbound approach to the SW 27th Avenue intersection (See Appendix A, Sheets 5 thru 7).

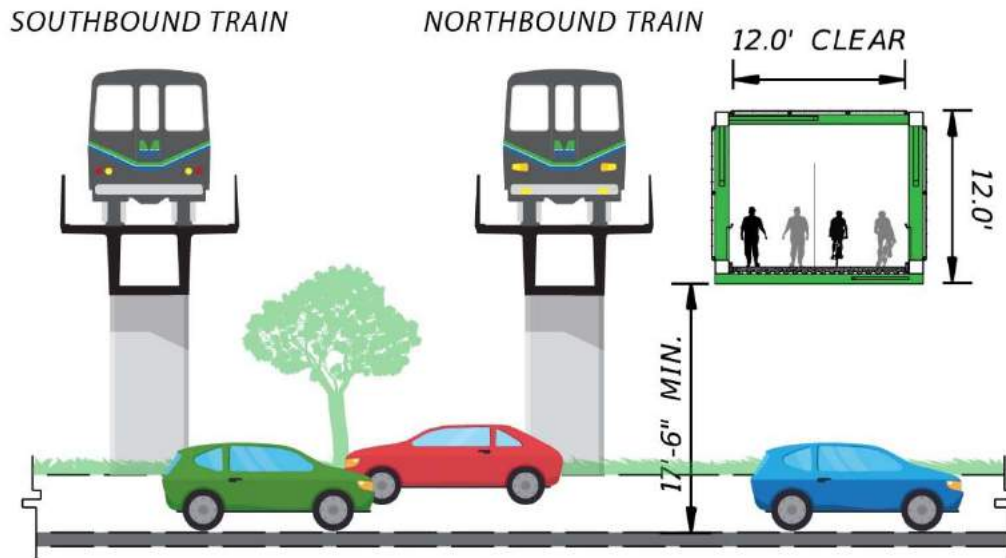


The lateral offset required between the Metrorail, combined with a minimum 12ft effective width walkway, causes the proposed bridge to encroach onto the US1/SR5 travel way.

Due to physical constraints and to meet vertical clearance criteria, the bridge is extended west of the limits of the Coconut Grove Metrorail station where the Metrorail alignment curves away from US 1. Once the Metrorail alignment curves away from US 1, the access ramps will begin with a grade of 3% to meet the ground elevation at the underline located underneath the Metrorail. This will be achieved by using retaining walls where the grade separation is greater than 5 ft. and gravity walls where the access ramp elevation are less than 5 ft. Lateral offset will have to be addressed by providing barrier and guardrail protection to bridge piers and retaining walls.

East of 27th Avenue the Metrorail alignment does not taper away from US-1. In order to construct the proposed overpass, the re-alignment of southbound US-1 approach to SW 27th Avenue would be required which would include minor widening towards the median and reconstruction of curb and gutter, traffic separators, minor drainage and milling & resurfacing along with signing & pavement markings.

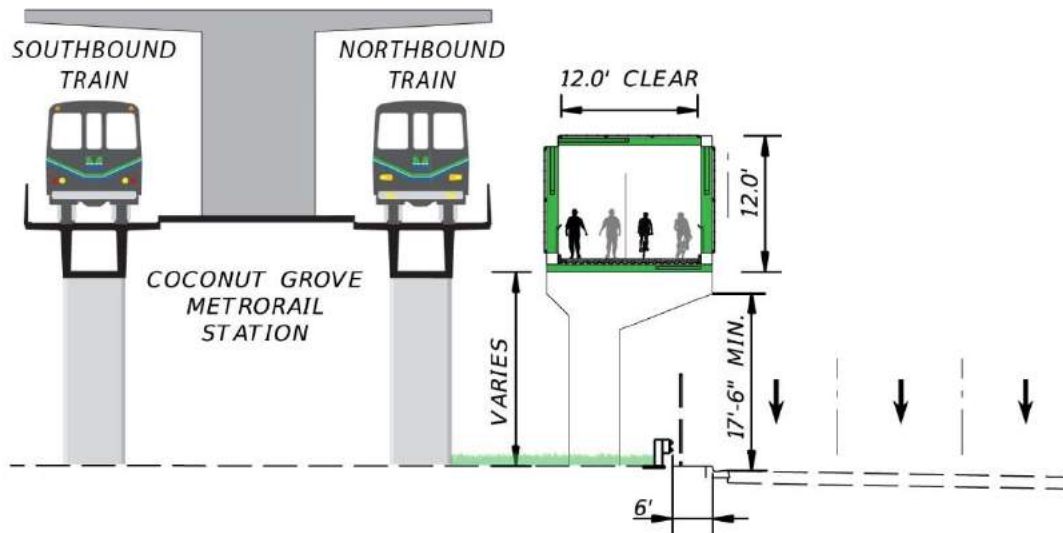
Non-Motorized Overpass at SR 5/US1 and SW 27th Ave (FM No. 421053-3-12-03)



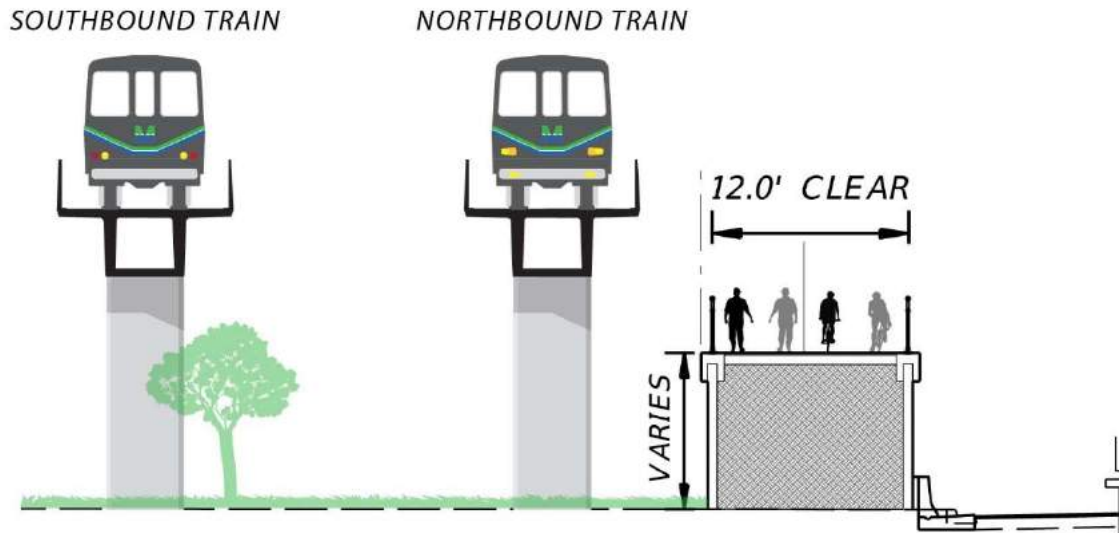
SW 27th AVENUE: ALTERNATIVE 2 - REALIGNMENT

The existing substandard traffic separator (SB left to SW 26 Avenue) would need to be extended, and the travel lanes would be shifted providing room for a 2.5 foot shoulder and concrete barrier wall shielding the linear access ramp (**See Appendix A, Sheets 5 thru 7**). The north approach would use a combination of retaining walls and gravity walls similar to the south approach to meet the ground elevation of the underline. Due to the increased construction cost of a longer bridge and its impacts to the US-1 alignment, alternative 2 is the most expensive alternative.

Non-Motorized Overpass at SR 5/US1 and SW 27th Ave (FM No. 421053-3-12-03)



SW 27th AVENUE: ALTERNATIVE 2 - REALIGNMENT - WEST OF 27TH AVENUE

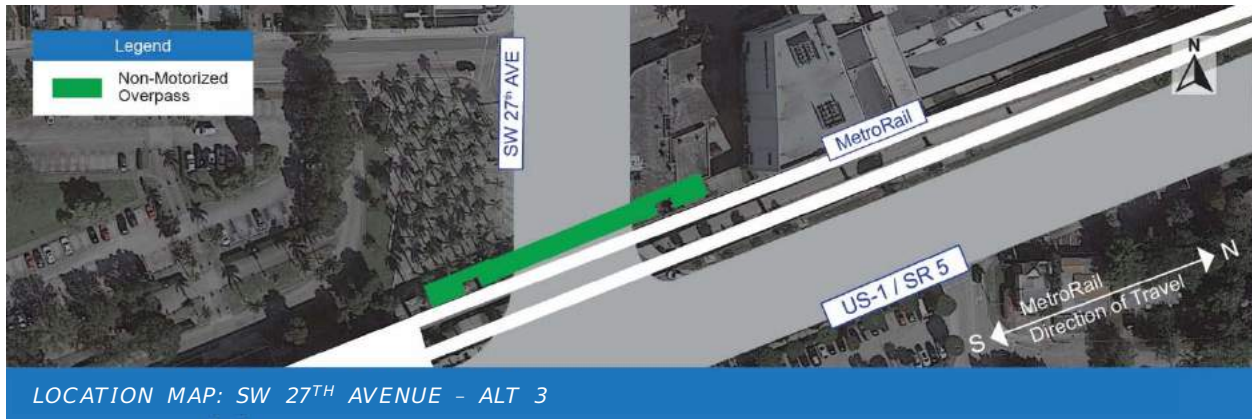


SW 27th AVENUE: ALTERNATIVE 2 - REALIGNMENT - EAST OF 27TH AVENUE

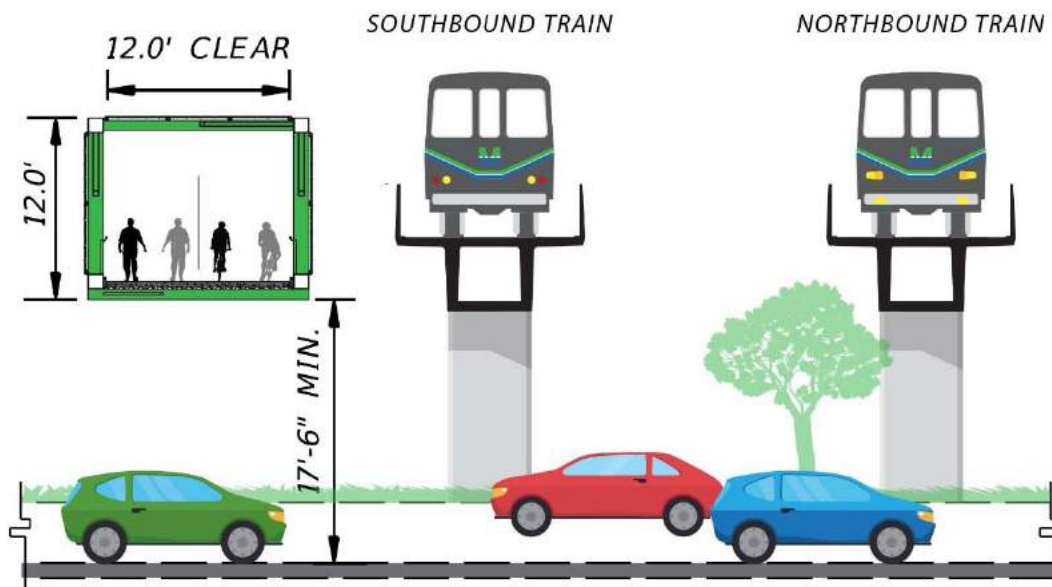
Non-Motorized Overpass at SR 5/US1 and SW 27th Ave (FM No. 421053-3-12-03)

Alternative 3

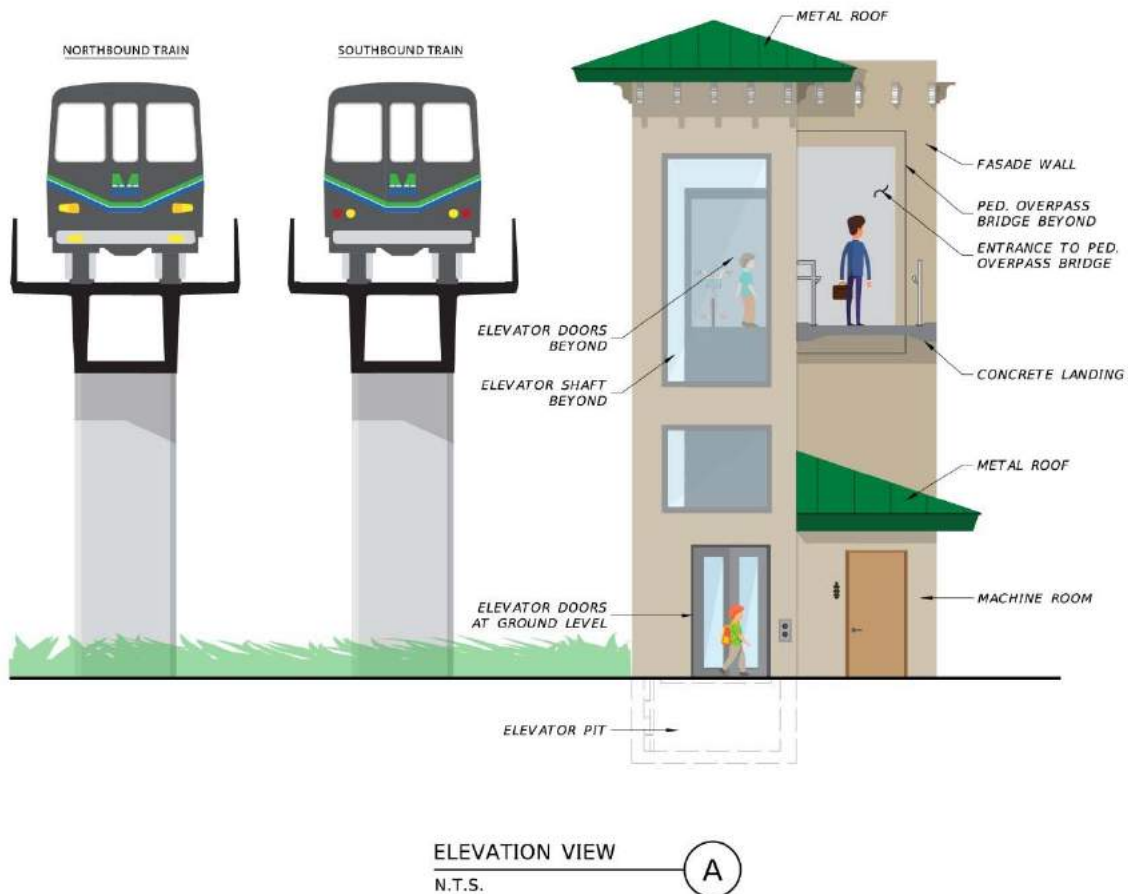
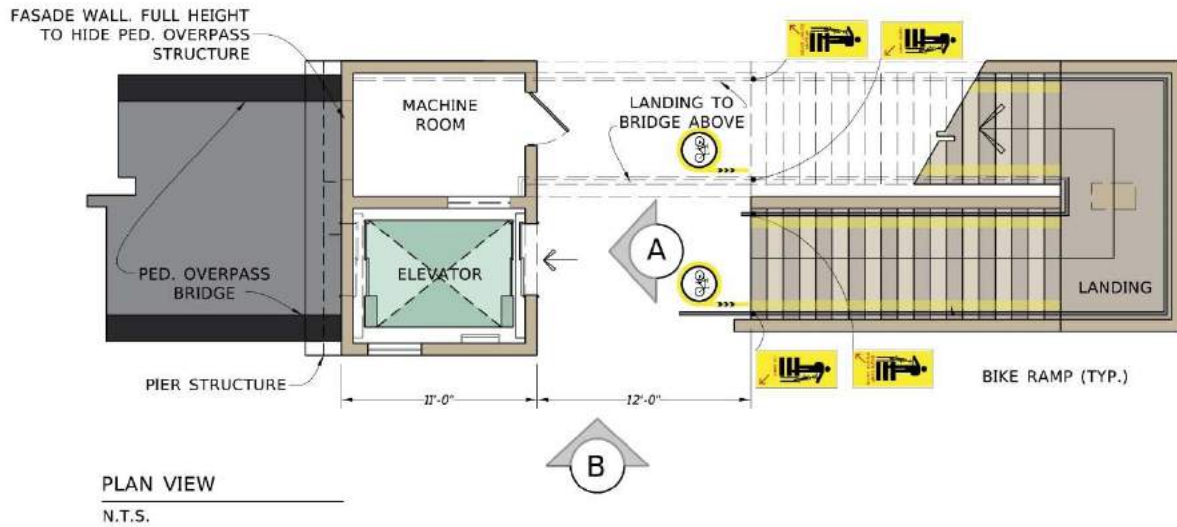
Proposed alternative 3 is a non-motorized pedestrian and bicyclist overpass consisting of a 140 foot long prefabricated bridge and a combination of elevators and stairs. Structural options include a closed box (Gateway (See Details and Typical Section)) or open box (Link) with a minimum 12 foot effective walkway width.



The overpass will be placed on the north side of the Metrorail alignment (**See Appendix A, Sheet 8**) due to lateral clearance constraints along the south side between the Metrorail alignment and the US-1/SR-5 travel way at this location. This alternative will include the use of the existing Coconut Grove Metrorail station plaza located on the northwest quadrant of the intersection and the partial acquisition of the existing building (2753 SW 27th Avenue) located on the northeast quadrant of the intersection.



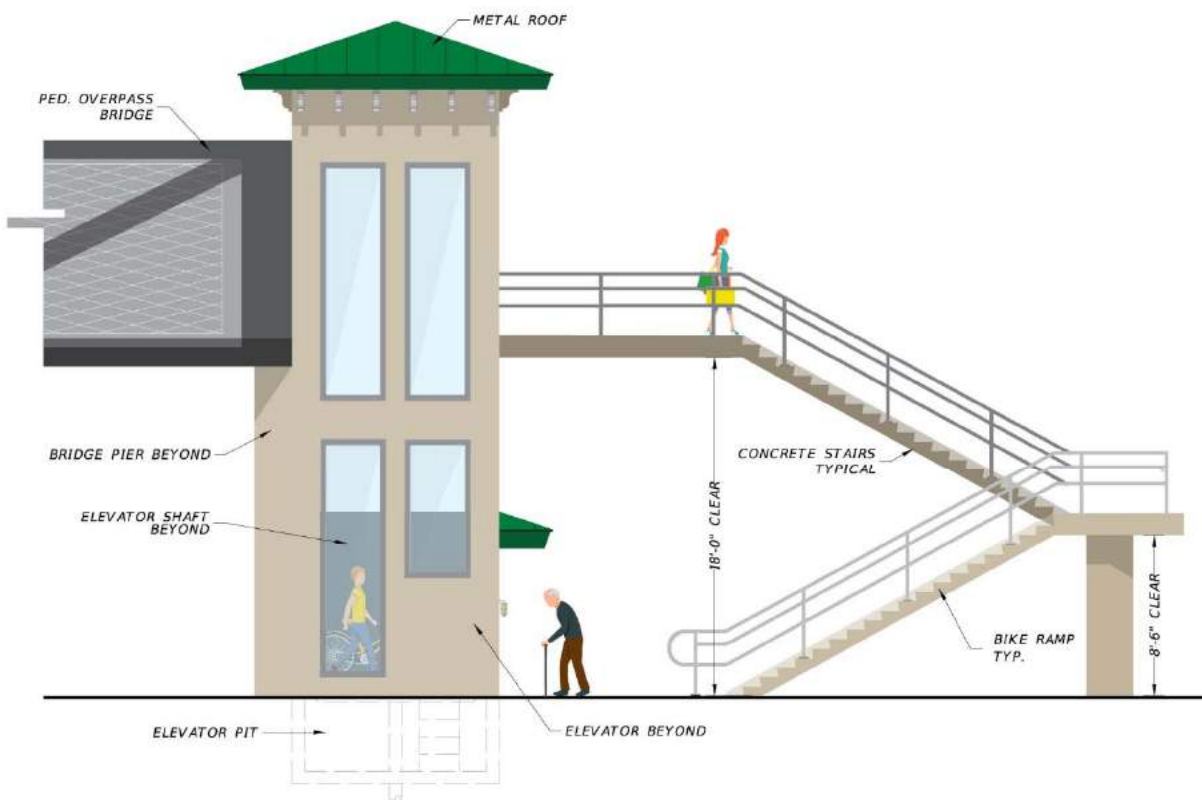
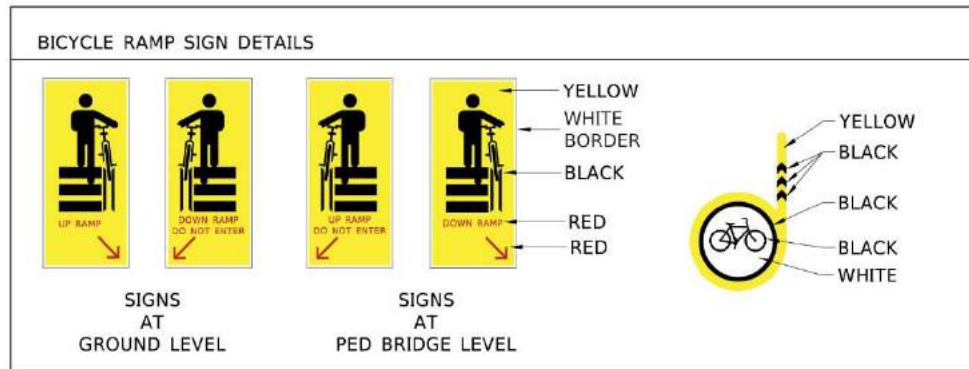
Non-Motorized Overpass at SR 5/US1 and SW 27th Ave (FM No. 421053-3-12-03)



A 12 foot effective width walkway while maintaining adequate lateral clearance to the Metrorail cannot be achieved with linear access ramps at this location, therefore, we are proposing the use of one 8' x 6' elevator on each side of the bridge and stairs for

Non-Motorized Overpass at SR 5/US1 and SW 27th Ave (FM No. 421053-3-12-03)

alternative and emergency use. This will be achieved by designing and constructing a structural building and a machine room for the elevators. The stairs would include new bike ramps similar to an installation at the Metrorail station at the Stephen P. Clark Center allowing bicyclist to easily roll their bicycles while they walk up the stairs.



ELEVATION VIEW
N.T.S.

B

Non-Motorized Overpass at SR 5/US1 and SW 27th Ave (FM No. 421053-3-12-03)

Traffic Control: No lane closures are required for the construction of the bridge piers, the elevators, the construction of the retaining walls, gravity walls and shared-use path. Only very short duration closures may be expected to provide access to construction equipment. Pedestrian access will be maintained using Standard Index 660.

For the mounting/assembling of the bridge superstructure, a temporary detour, closing NW 27th Avenue, will be required, and NW 32th Avenue/SR972-Coral Way can be used as a detour route. Lane closures on NW 27th Avenue will be required in order to erect the bridge superstructure. Night operations are recommended.

The Traffic Control Plan for the realignment of US1 will be in accordance with Standard Index Series 600 (Design Standards).

Right of Way Availability: Based on our analysis, for proposed alternative 1, an estimated area of 11,305 square feet will have to be acquired at the property located at 2753 SW 27th Avenue. An estimated area of approximately 11,400 square feet from the property belonging to Miami Dade County (Metrorail) will have to be transferred to the Department.

For proposed alternative 2, there is no proposed right of way acquisition.

Based on our analysis, for proposed alternative 3, an estimated area of 3,614 square feet will have to be acquired at the property located at 2753 SW 27th Avenue. An estimated area of approximately 4,587 square feet from the property belonging to Miami Dade County (Metrorail) will have to be transferred to the Department.

Miami Dade Transit Concerns: In consultation with Miami Dade Transit, 5' of clearance from the drip edge of the Metrorail structure to the proposed overpass structure is feasible, however, there are a number of concerns.

- The proximity of the 750 kV electrified third rail which is next to the Metrorail tracks.
- Noise level from the Metrorail will be significant to the pedestrians and bicyclists, therefore, further analysis of the noise will be required.
- The proximity of the existing Metrorail foundations to the proposed overpass foundations. Any construction near their foundations have a time restriction from 1am to 4am.

For alternatives 1 and 3, District 6 Right of Way informed us that Miami Dade Transit is conducting a feasibility study for a proposed building within the park at the existing Coconut Grove Metrorail station plaza located on the northwest quadrant of the intersection.

Non-Motorized Overpass at SR 5/US1 and SW 27th Ave (FM No. 421053-3-12-03)

Schedule

PEDESTRIAN OVERPASS AT US 1 AND SW 27TH AVENUE - ALTERNATIVE 1			
No.	Activity Description	Design (Working Days)	Construction (Working Days)
1	200'X12' TRUSS	45	120
2	APPROVAL OF DRAWINGS	30	
3	SUBSTRUCTURE	60	90
4	ROADWAY (WALLS AND PATH)	180	215
Schedule Total Days (Calendar Days)		252	301

PEDESTRIAN OVERPASS AT US 1 AND SW 27TH AVENUE - ALTERNATIVE 2			
No.	Activity Description	Design (Working Days)	Construction (Working Days)
1	140'X12' TRUSS (9 Spans)	45	170
2	APPROVAL OF DRAWINGS	30	
3	SUBSTRUCTURE	90	170
4	ROADWAY (WALLS AND PATH)	180	300
Schedule Total Days (Calendar Days)		252	420

PEDESTRIAN OVERPASS AT US 1 AND SW 27TH AVENUE - ALTERNATIVE 3			
No.	Activity Description	Design (Working Days)	Construction (Working Days)
1	140'X12' TRUSS	45	120
2	APPROVAL OF DRAWINGS	30	
3	ELEVATOR	15	60
4	SUBSTRUCTURE	60	90
5	BRIDGE DECK, BUILDING STRUCTURE	180	279
Schedule Total Days (Calendar Days)		252	391

*Based on the FDOT Guideline for Establishing Construction Contract Duration (July 2010)

Non-Motorized Overpass at SR 5/US1 and SW 27th Ave (FM No. 421053-3-12-03)

Cost Estimate

Alternative 1

The estimated construction cost is \$3,220,589.43. The estimated Right of Way cost is \$3,391,500.00 (complete building demolition). The total Right of Way and Construction cost estimate is **\$6,612,089.43**.

Alternative 2

The estimated construction cost is **\$7,550,219.72**. No right of way acquisition is required.

Alternative 3

The estimated construction cost is \$3,053,316.32. The estimated Right of Way cost is \$3,092,900.00 (includes business damages, partial demolition and partial building refacing and reconstruction). The Total Right of Way and Construction cost estimate is **\$6,146,216.32**.

The cost estimate for the pre-fabricated bridge was obtained from the manufacturer.

The cost estimate for the elevator was obtained from the manufacturer.

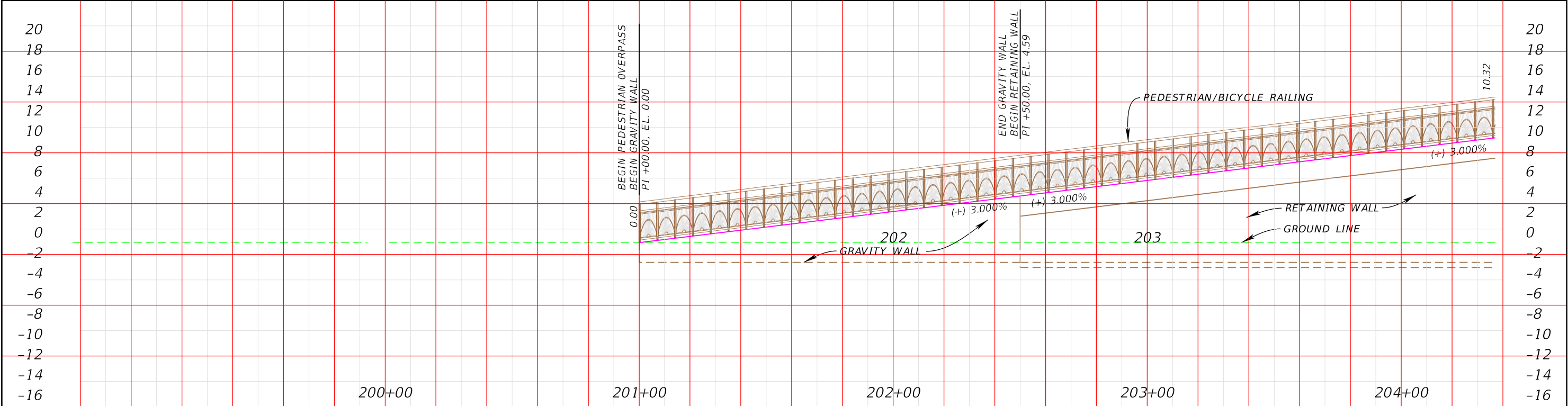
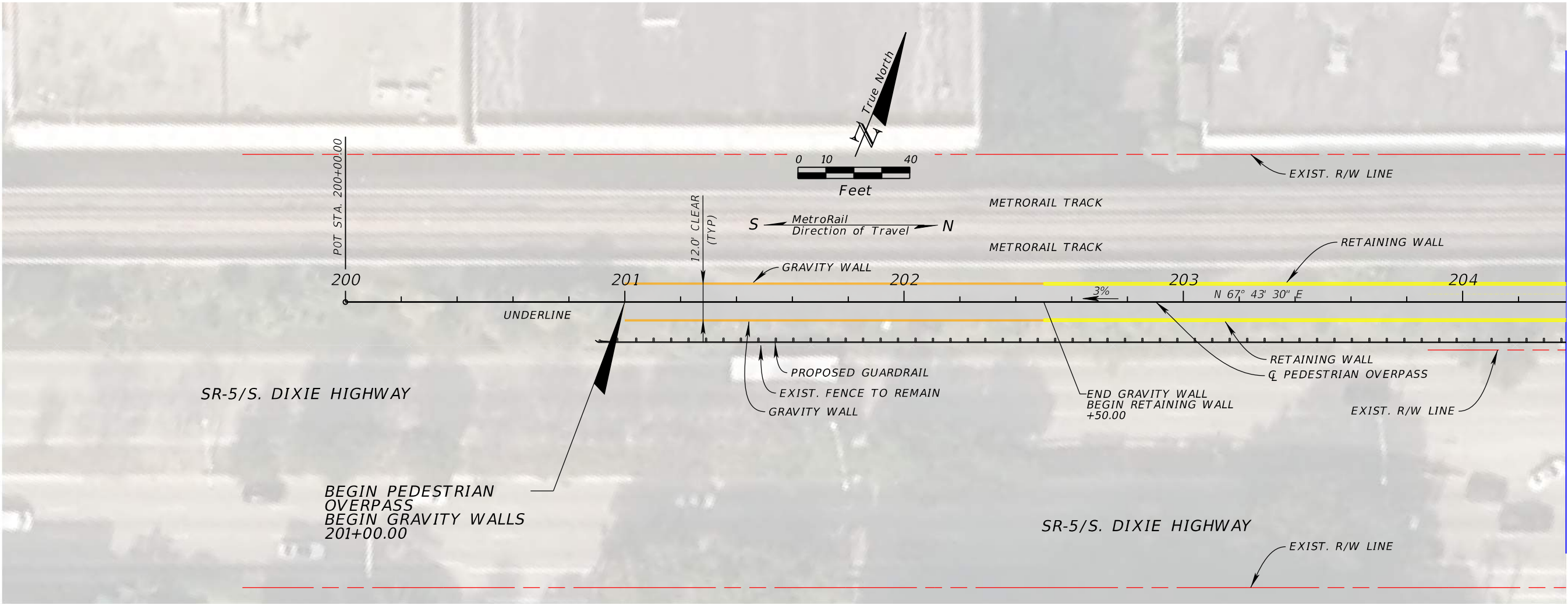
The Right of Way cost estimate is based on market information provided by the District 6 Right of Way Office.

The estimates are based on the Master Pay Item List (January 2016 to June 2016 – Area 13).

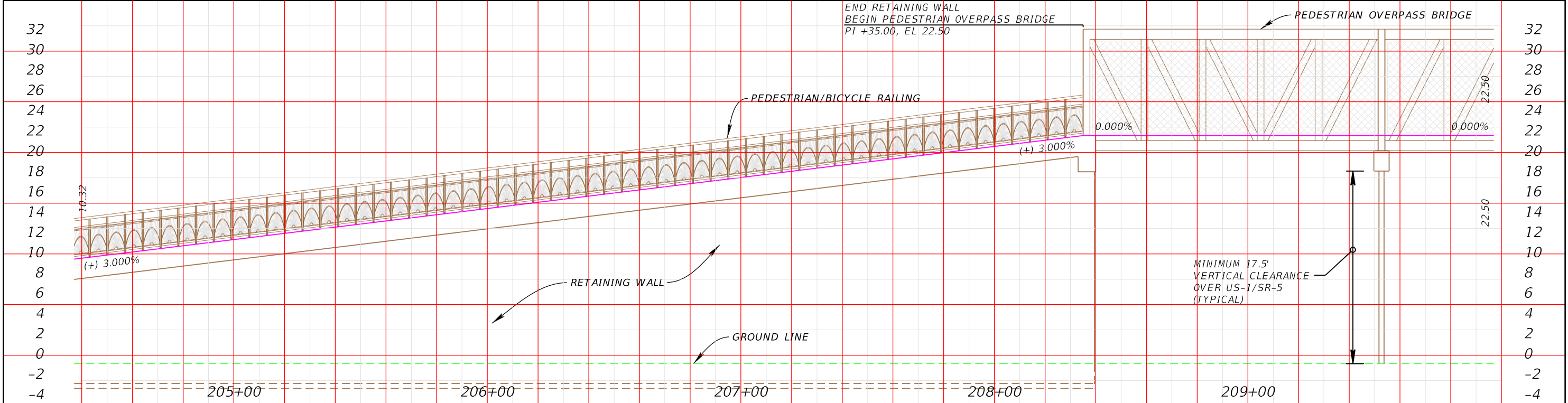
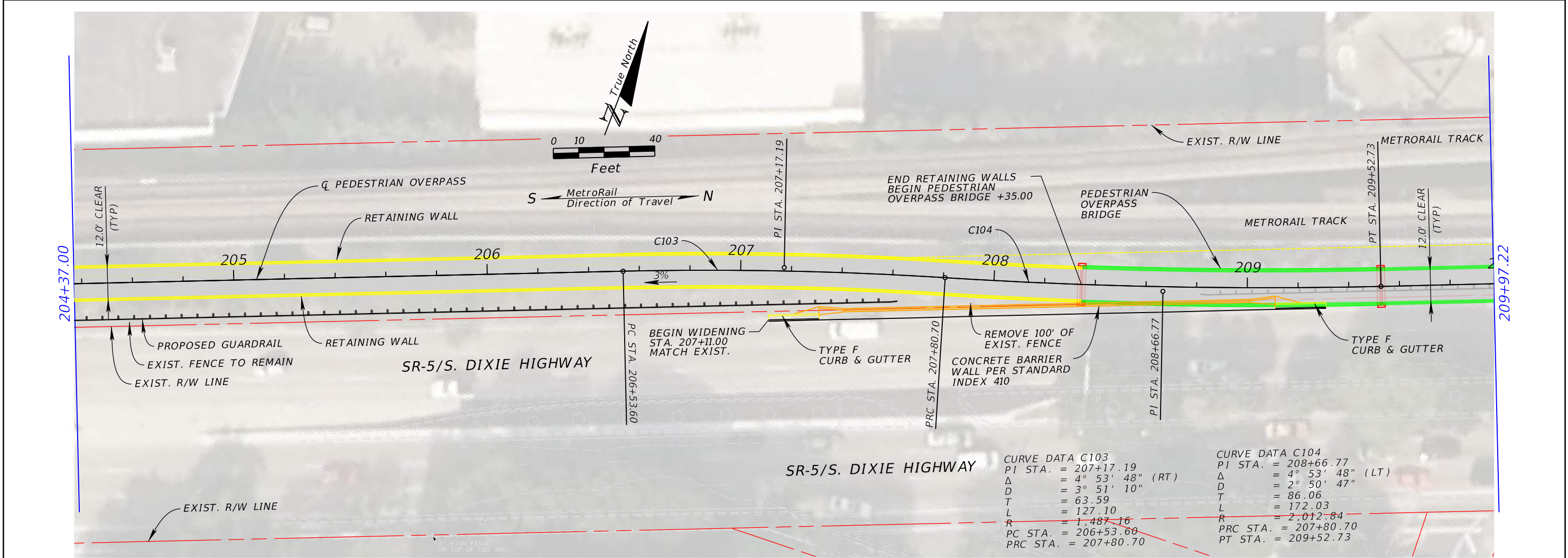
Fatal Flaws: No fatal flaws were identified and a more detailed analysis should be continued.

Recommendations: Based on this study's findings, the non-motorized overpass improvement is recommended for further design development as a safety project under the Highway Safety Program.

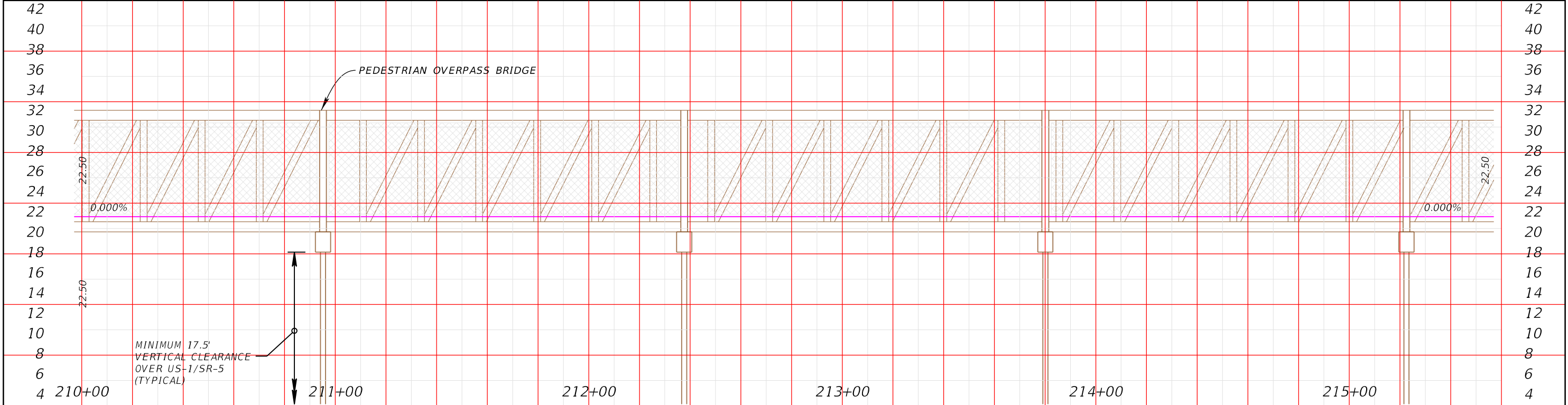
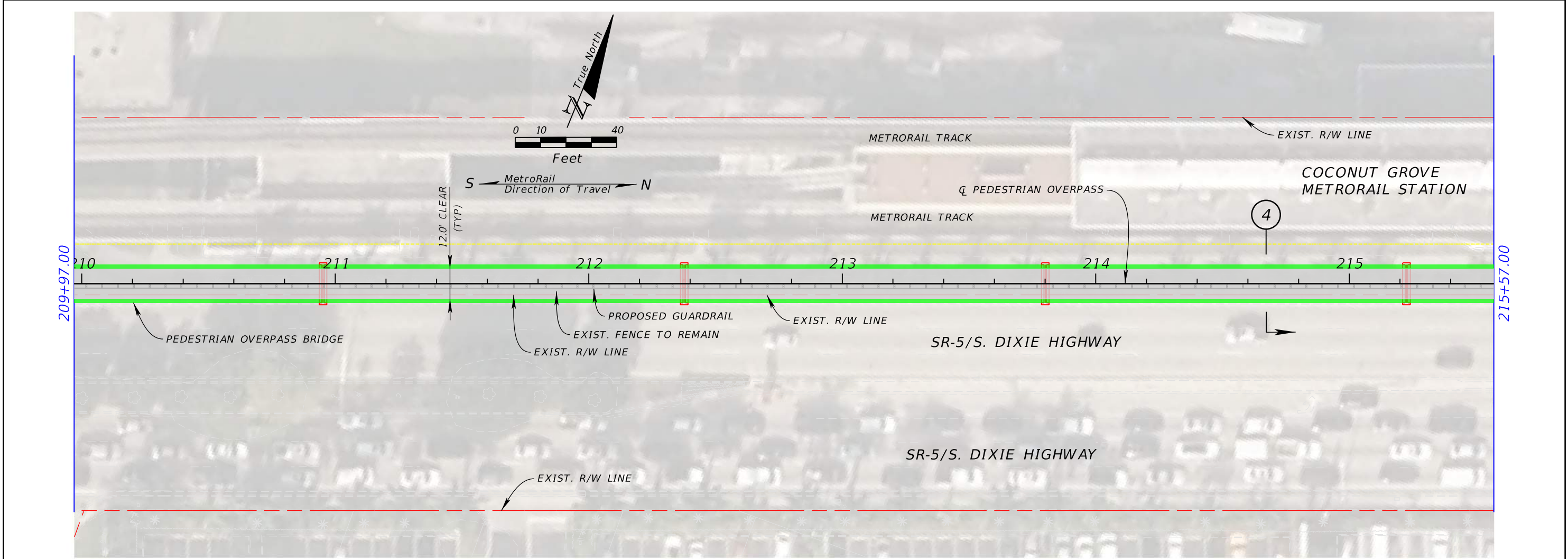
APPENDIX A



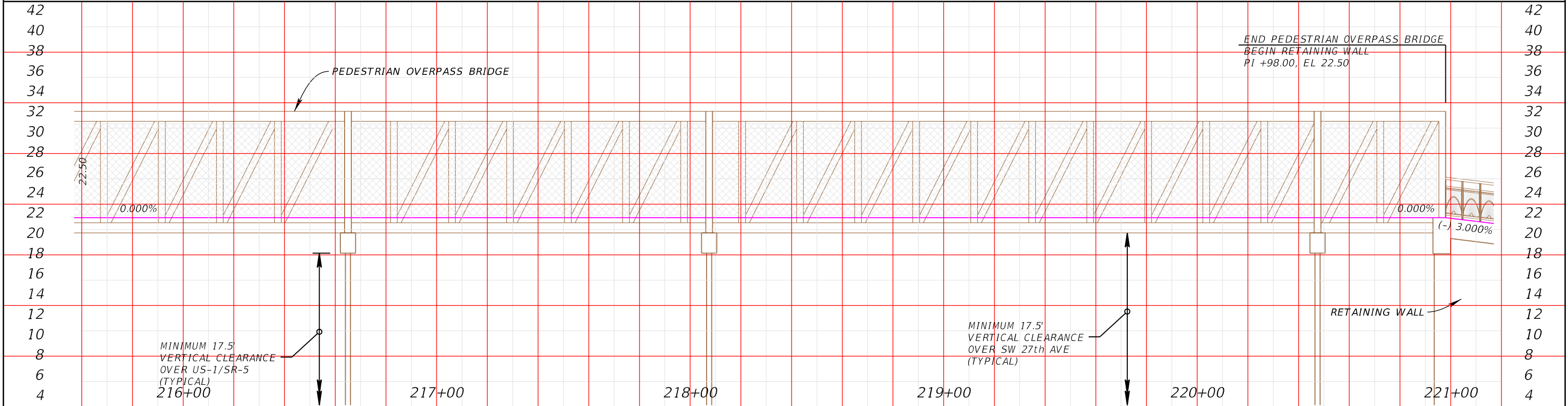
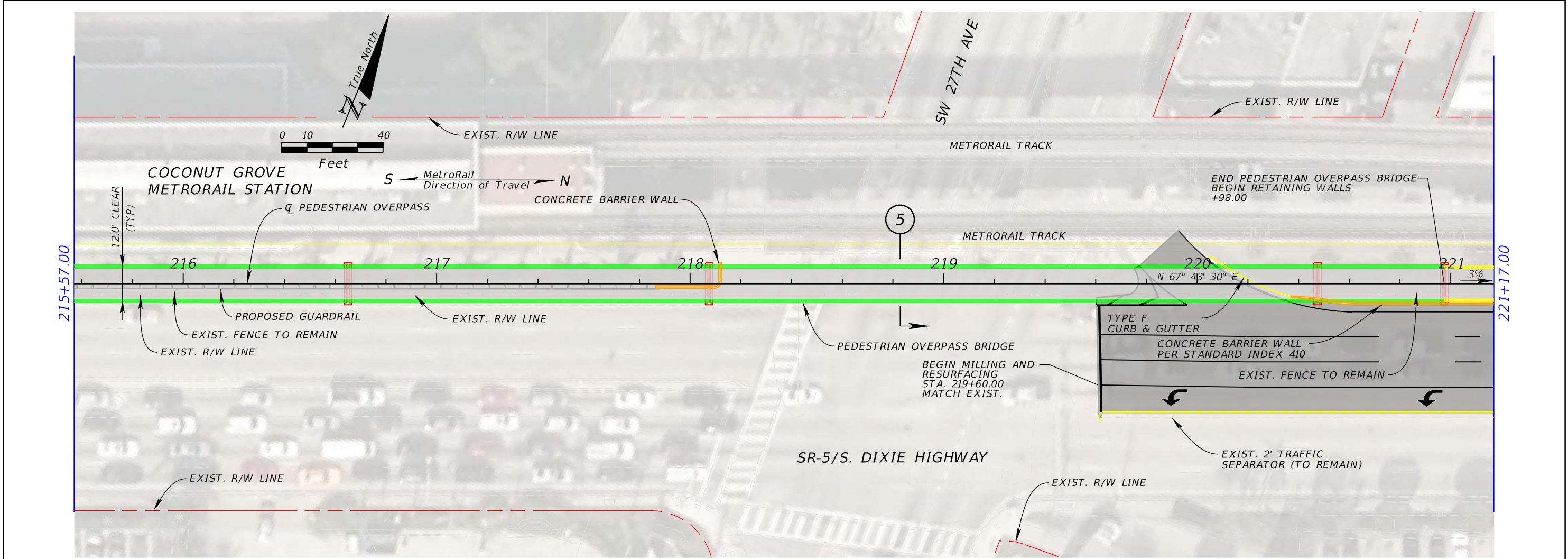
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DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID			
					SR-5	MIAMI-DADE	421053-3-12-03			



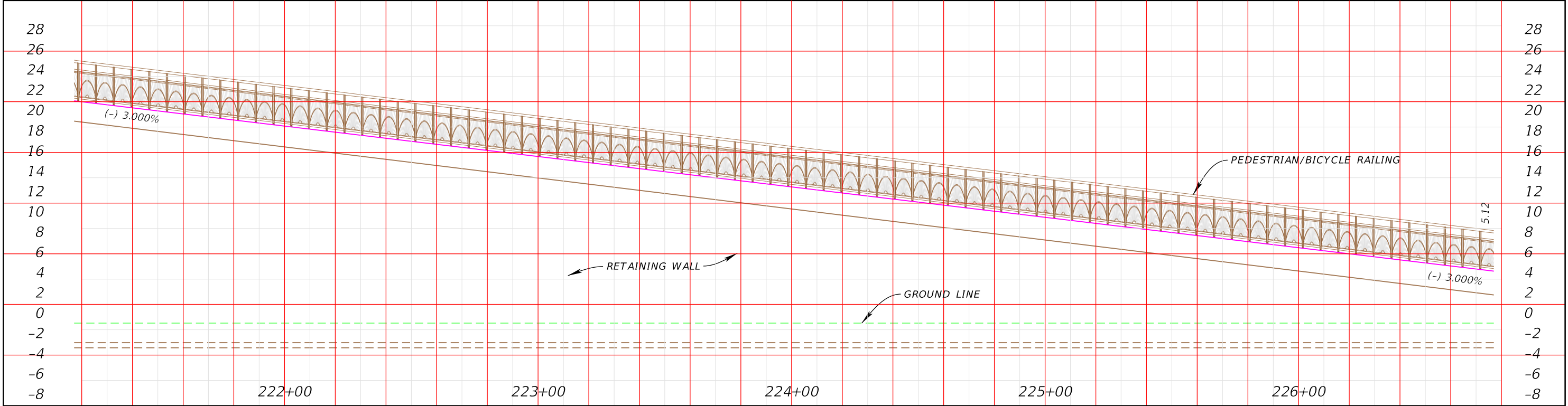
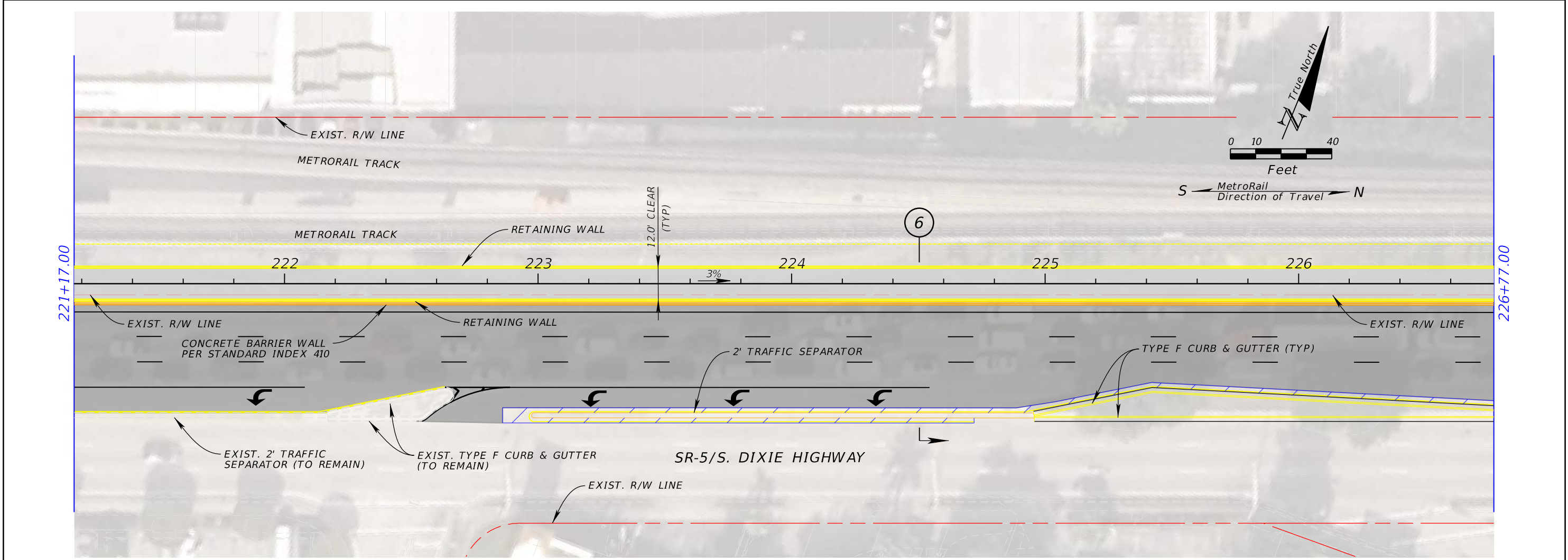
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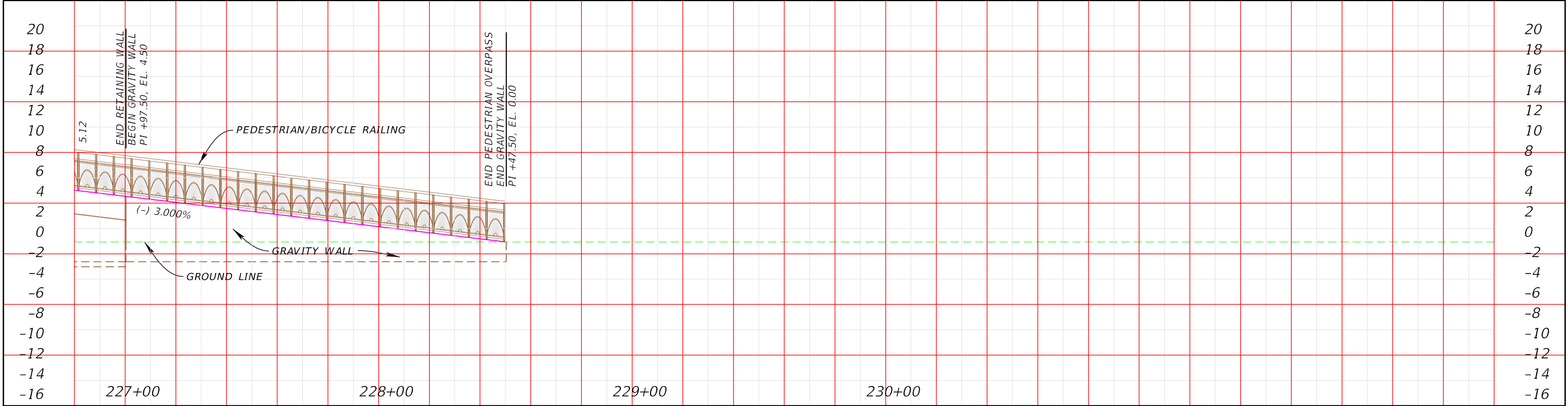
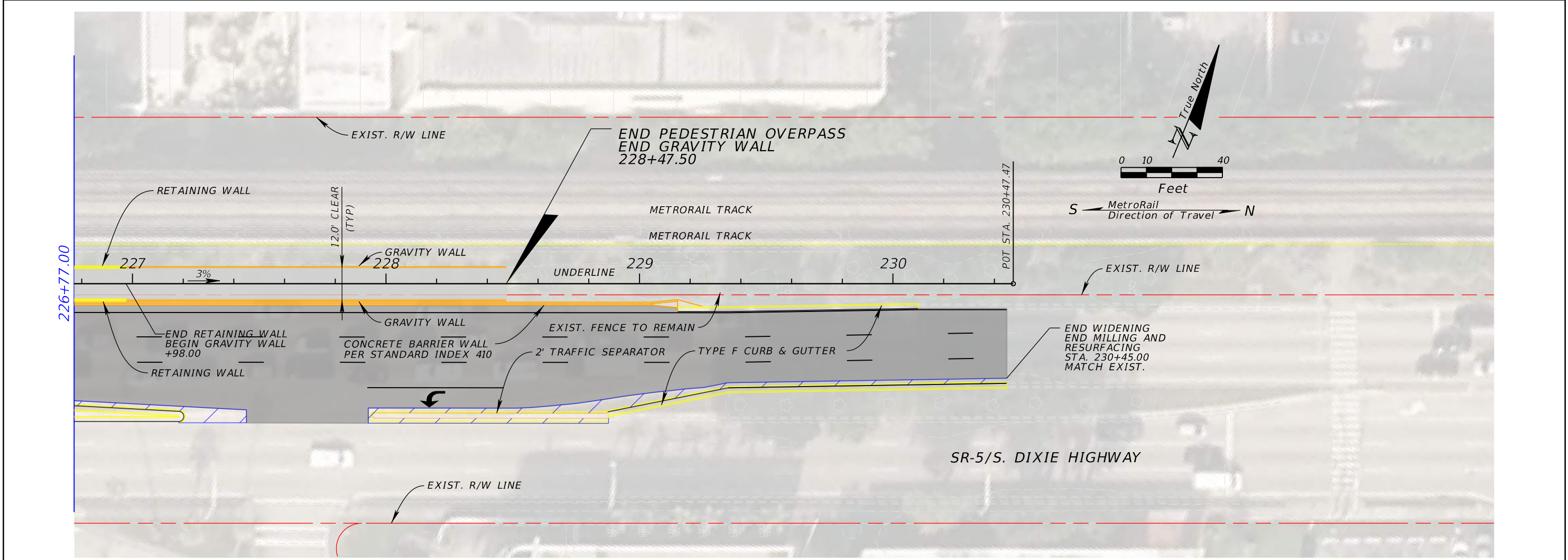
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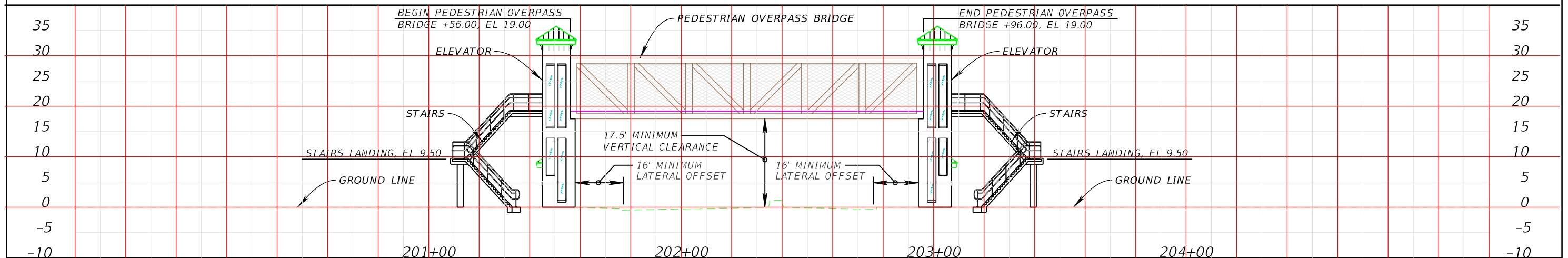
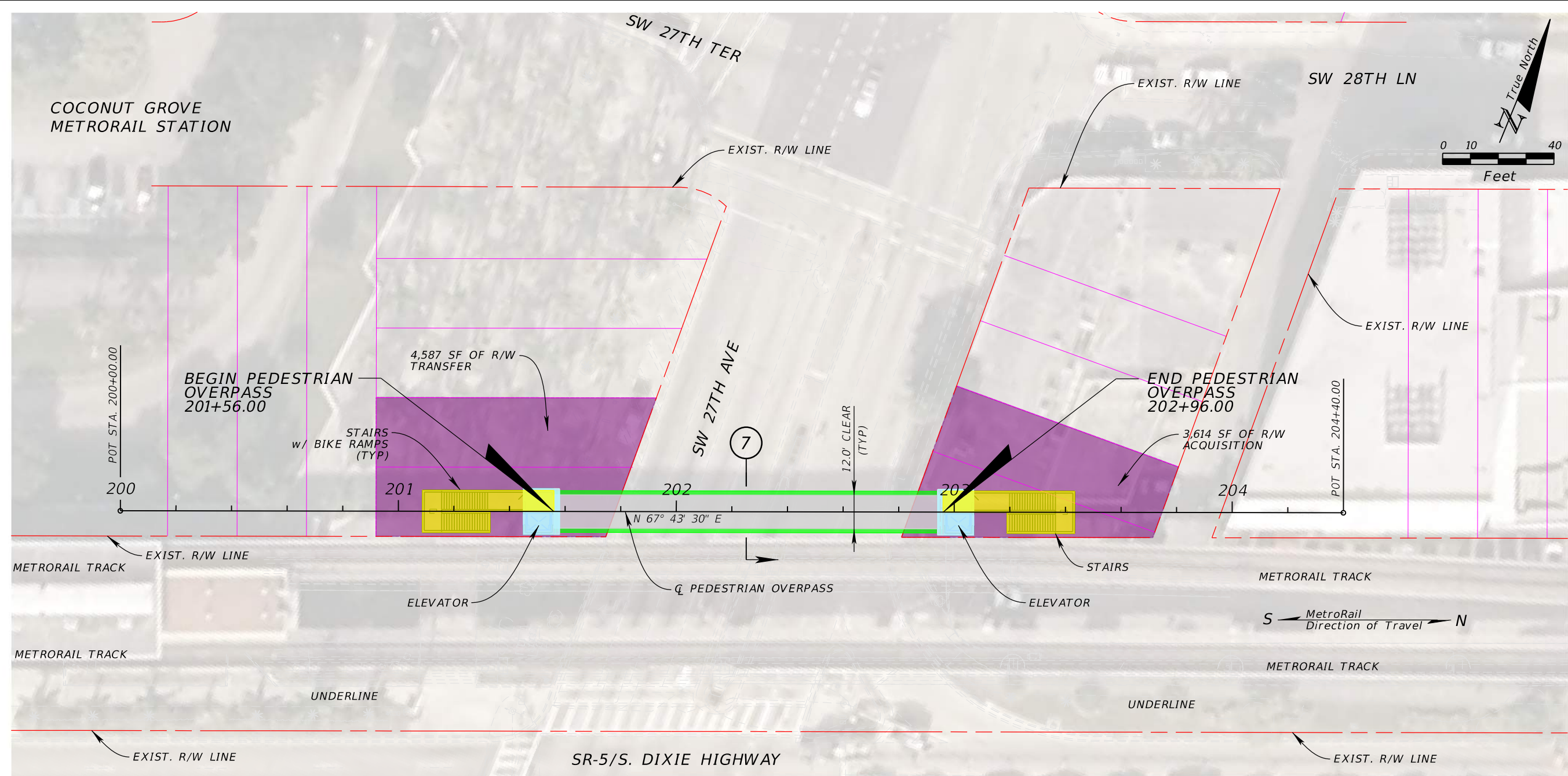
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DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
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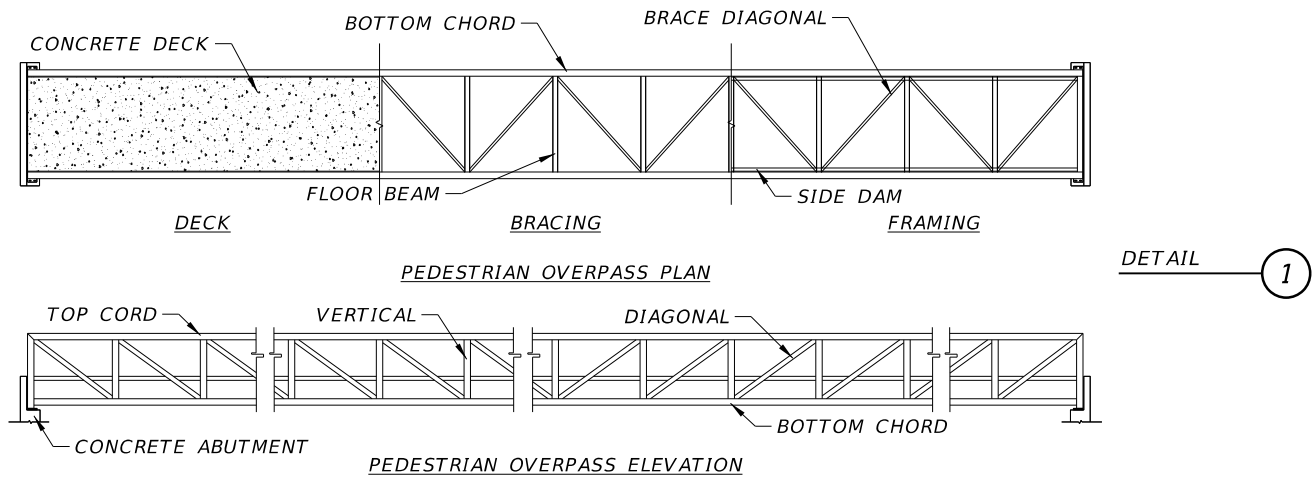
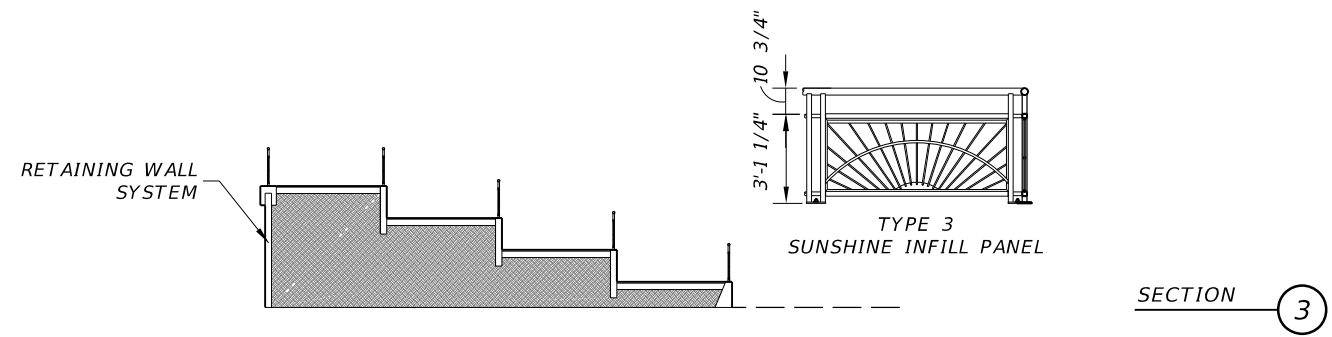
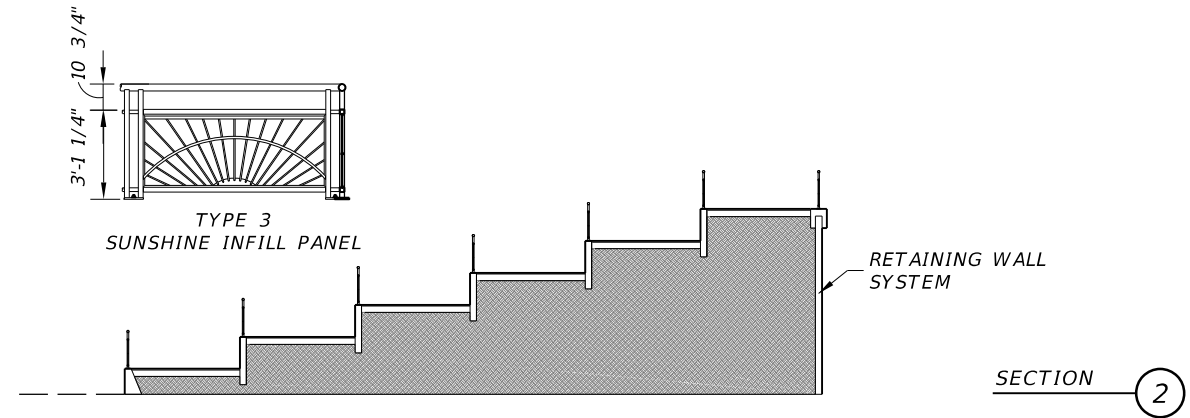
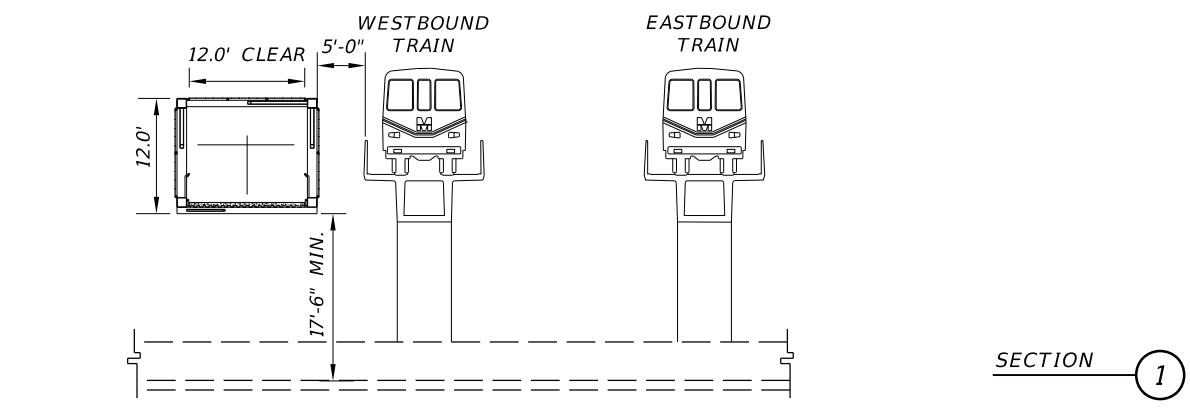


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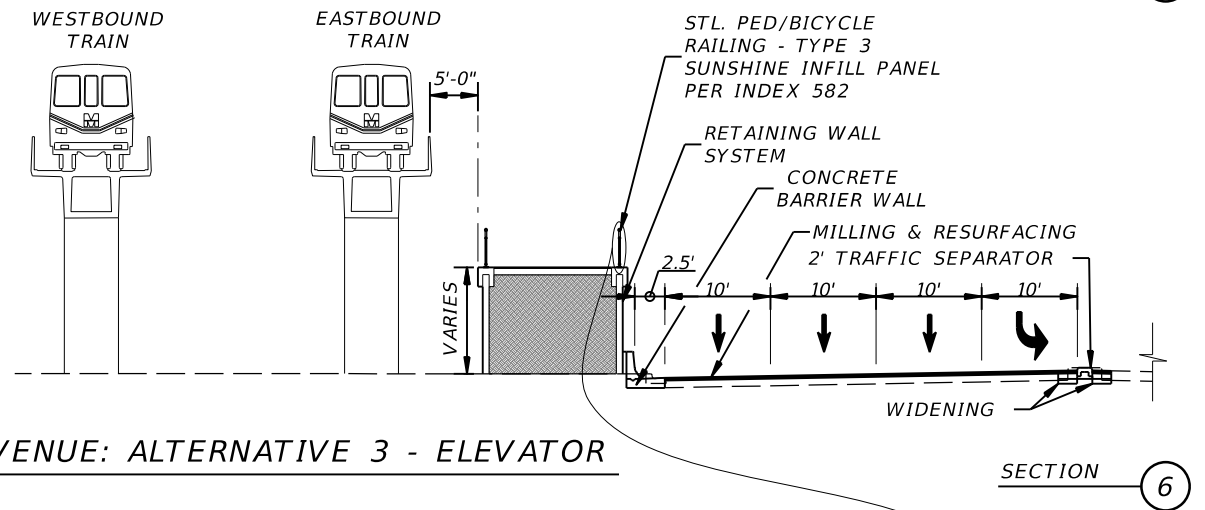
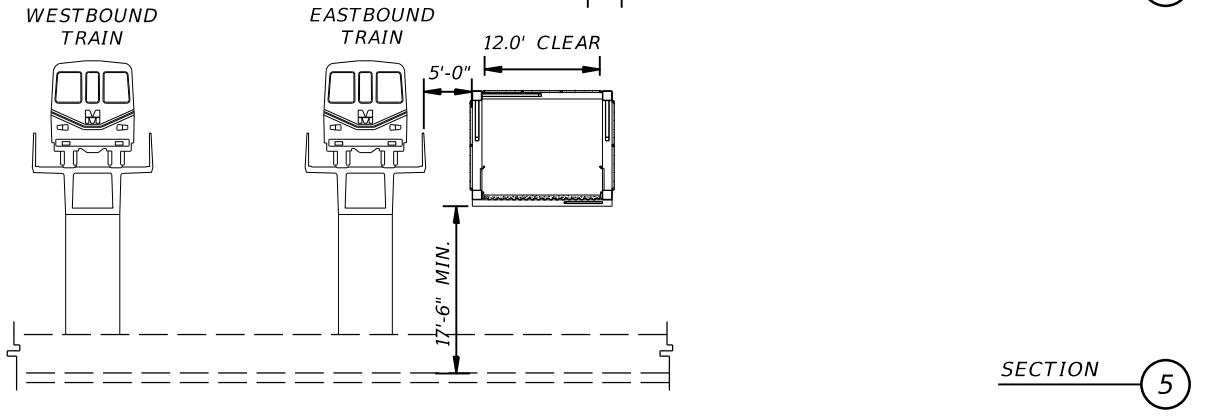
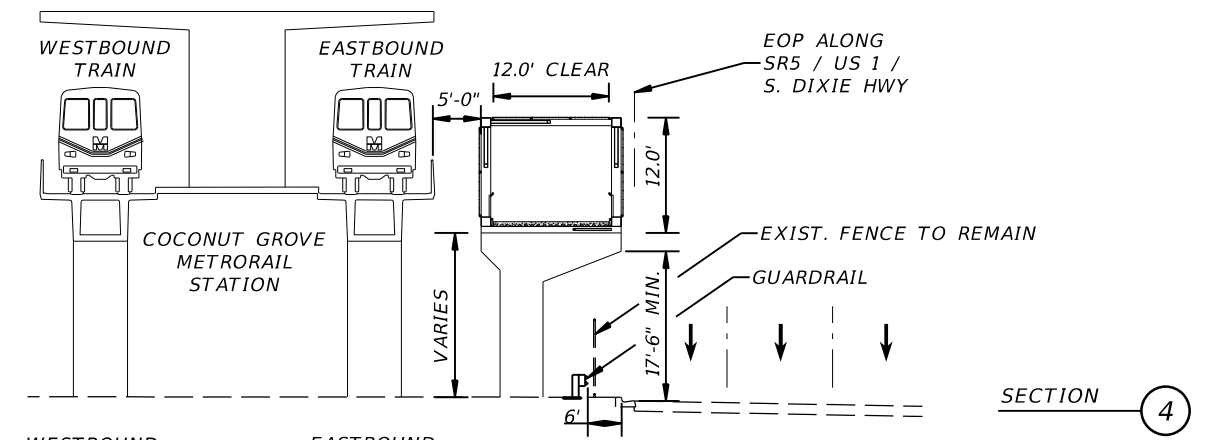


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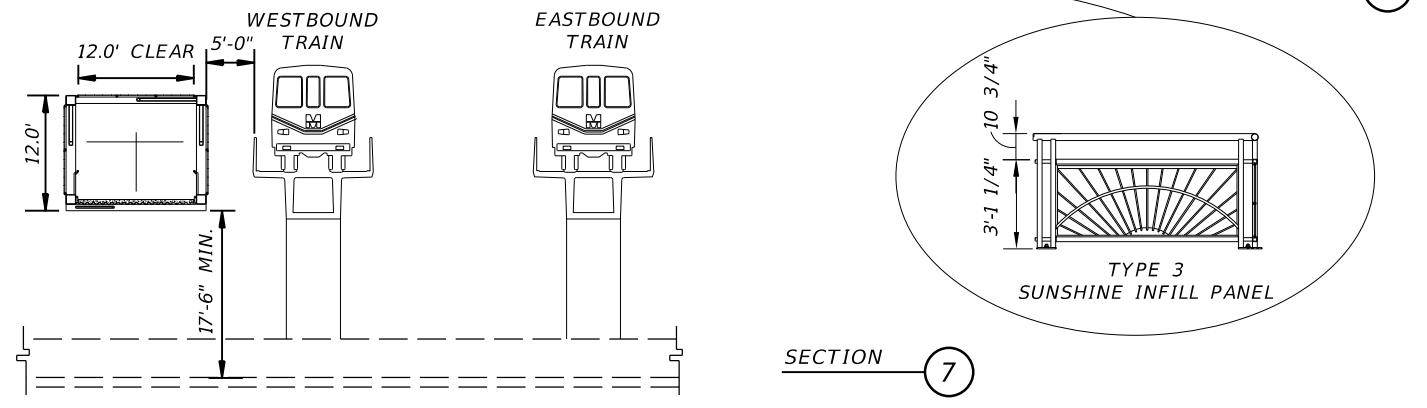
SW 27th. AVENUE: ALTERNATIVE 1 - SWITCHBACK RAMPS



SW 27th. AVENUE: ALTERNATIVE 2 - REALIGNMENT

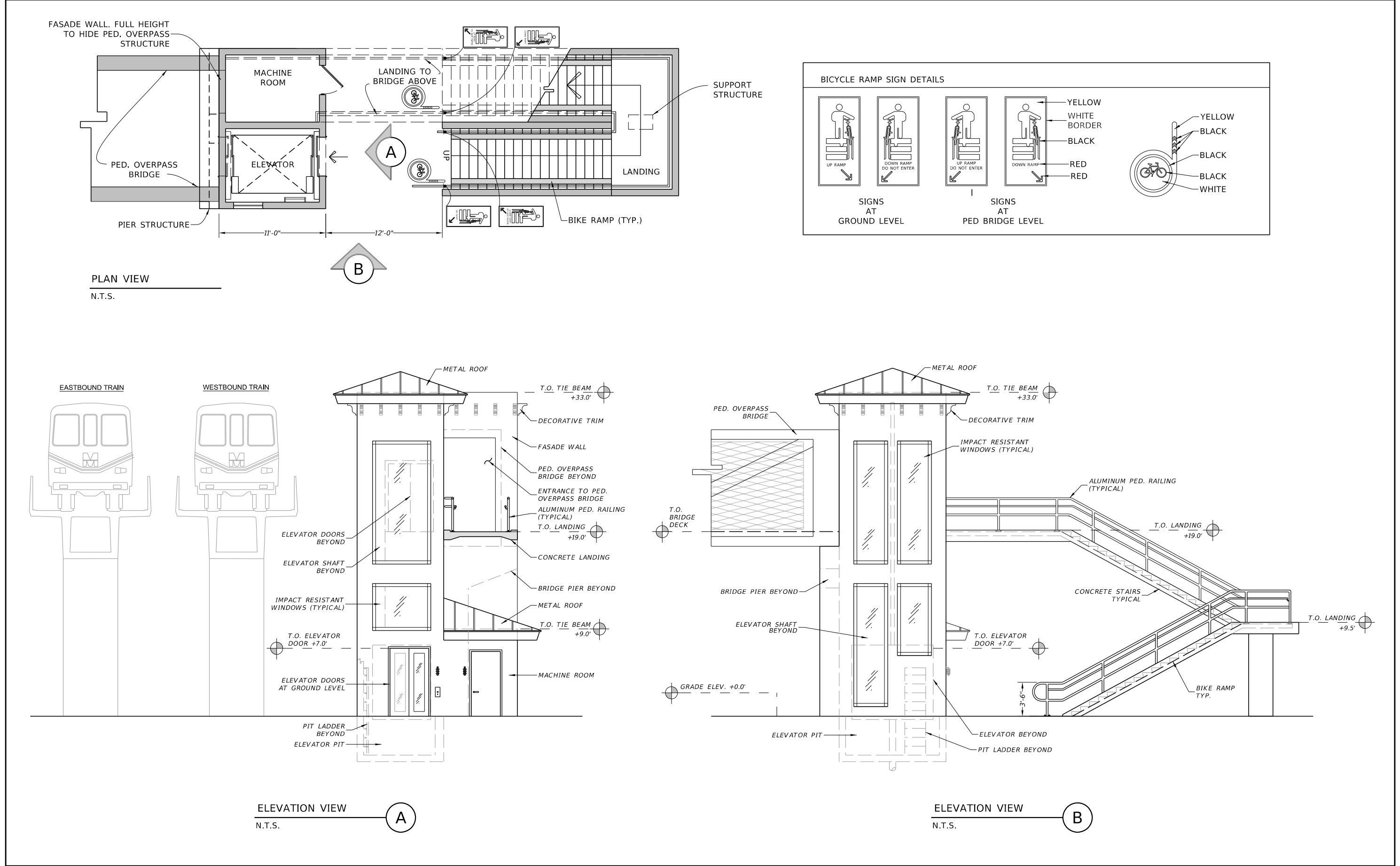


SW 27th. AVENUE: ALTERNATIVE 3 - ELEVATOR



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DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
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