SEPTA Jenkintown-Wyncote Station ADA Improvement Project
Conceptual Design Alternatives Description
January 24, 2018

Introduction

This report was prepared to evaluate the alternative design considerations that were studied during the design phase of this project. Outlined are the alternatives studied and their impact on the project.

I. General Site Features and Constraints

The station has several physical features and constraints that impact the potential solutions for achieving ADA-compliant access to level boarding platforms. These include:

West Avenue access: This drop-off/pick-up and pedestrian access point is approximately 4 feet 5 inches above the existing low-level platform elevation, which is also the top elevation of the existing eastern tunnel access. An accessible route must be provided between these two levels and between West Avenue and the new high-level platforms.

Greenwood Avenue bridge: The recently reconstructed bridge creates a few physical challenges. Although reconstruction improved the situation by eliminating a pier at the back of the platform, there is a choke point between the west abutment and the track bed in which a 12-foot-wide wide platform with a 5-foot-wide sidewalk behind and a two-way vehicular circulation roadway must be accommodated. This geometry constraint is further exacerbated by the proximity of the existing Communication & Signals (C&S) building immediately north of the bridge abutment that further limits potential footprint for station functions.

Existing station canopies: The existing station canopies extend southward and end under the existing Greenwood Avenue bridge.

Station building and waiting rooms: The existing station building is contiguous with the inbound platform canopy and, along with its various components, such as canopies and the outbound waiting area, is listed separately as an independent resource.

Parking: Parking at the station occurs in three primary locations: (1) the north lot, which is north of the existing station and has 187 parking spaces, including some parking for the building tenant; (2) the station lot immediately south of the station building, which provides short-term parking as well as drop-off/pick-up for the west side of the station (when the station building has been leased, this lot has served as parking for the tenant); and (3) the south lot, which provides 364 parking spaces.

II. Cross-track Circulation Options

There are several options for ADA-compliant cross-track circulation that have been studied at this station. These can be categorized as follows:

Reuse of existing tunnel options: There are two basic alternates for reuse of the existing tunnel for ADA-compliant cross-track circulation: (1) adding new elevators at the east and west or (2) adding ramps at the east and west. These options are discussed further in Section IV. Consolidated Options.

New pedestrian overpass options: There are two basic alternates for the introduction of a pedestrian overpass for ADA-compliant cross-track circulation: placing the overpass north or south of the existing Greenwood Avenue bridge. These options are discussed further in Section IV. Consolidated Options.

Other cross-track circulation options: Two other basic alternates for achieving ADA-compliant crosstrack circulation at the station include: (1) a new pedestrian grade crossing within the station

environs or (2) a new tunnel south of the existing Greenwood Avenue bridge. While the tunnel options warrant conceptual evaluation, a grade crossing at the station is not a reasonable alternative because of the frequency of train movements, both through the station and stopping at the station, as well as the very limited site distance to the north. The safety risks that would be created by a new grade crossing are too significant to consider this approach as a viable option.

III. Level Boarding Platform Location Options

There are three basic options for achieving ADA-compliant level boarding at this station. These are categorized below:

Undercut the existing track and rail bed: The cost and operational impacts associated with undercutting the track bed would be enormous due to the required length of track (approximately 2,000 feet) that would be needed to be undercut to lower the track 3 feet 4 inches in this station. This includes on each end of the platform a 150-foot tangent, two 200-foot vertical curves, and a 1% grade differential. Retaining walls would be required for at least 1,300 feet of the cut because of the relationship between the lowered track and adjacent existing grade elevations. The lower elevation increases the potential for flooding to the south as well as the potential for interference with the junction of the Doylestown and West Trenton branches to the north, thus requiring even more significant rework of the existing infrastructure. To the north where the line splits to Noble and Glenside, the 1,000-foot runout is within the trackwork. This would introduce significant cost increases associated with trackwork, systems, and the overhead contact power system (OCS) modifications.

To the south, the tie-in is within a crossover. Crossovers are on vertical tangents. The options here would be: (1) increase the tie-in grade to tie in before impacting the crossover or (2) lengthen the tie-in by approximately 400 feet to include the crossover in tangent. At the least, the leading 8 feet of platform and the existing platform foundations would require some level of reconstruction to accommodate a new retaining wall, or potentially need to be completely demolished and reconstructed. Any undercut would require re-profiling and lowering of the existing catenary. Utility impacts would be significant; among others, there is an existing buried duct bank along the outside of the outbound track. There could be a vertical clearance impact on the storm drain crossing the track between the outbound waiting room and the Greenwood Ave bridge; more than likely, because of the decreased earthen cover over the pipe, the pipe structure would require strengthening.

The cutting would also necessitate demolition of the existing tunnel due to the limited existing vertical clearance between the top of the rail and the top of the tunnel.

This option is not prudent and was dismissed from detailed study.

Locate new high-level platforms in the immediate area of the existing station building (SK-07): The existing six-car 450-foot-long platforms start just south of the north end of the existing station building, running southward to just south of the south face of the existing Greenwood Avenue bridge. Locating new platforms that are 12 feet wide and 4 feet high would necessitate complete demolition of the existing inbound and outbound canopies and would require that platforms be narrowed to approximately 6 feet against the station building because of the existing 10 feet of clearance between the building and the track edge. This reduced platform width may not be sufficient to meet the minimum ADA requirements and would create a safety hazard for both station building occupants and the customers on the platform. Also, the resulting 4-foot-wide access/egress corridor between the new high-level inbound platform and the station building would result in a major impediment to accessing the main entrance of the station building. The outbound platform would also be reduced to substandard width at the outbound waiting room as the clearance between the edge of platform and

the face of the building is 13 feet. Locating the stairs and ramps required to access the platform also creates similar conflicts. Coupling these issues with any cross-track scenario north of the Greenwood Avenue bridge would only exacerbate the conflicts. For these basic reasons, all options assume the construction of new high-level platforms to the south of the existing station building as the most reasonable approach to achieving ADA compliance at the station.

This option is not prudent and was dismissed from detailed study.

Locate new high-level platforms south of the existing station in the area of the Greenwood Avenue bridge and south (SK-08): In this scenario, the new six-car 525-feet-long high-level platforms would start in the area of the Greenwood Avenue bridge and run south from there. The platforms could be constructed while the current low-level platforms remain in service. The new outbound platform would be situated so that the accessible route from West Avenue would land at platform level, and a ramp would connect to the existing low-level outbound platform. The platform would not interfere with the existing outbound waiting room or other fabric in this area. An area of safe dispersal would be required at the south end of the outbound platform.

The inbound platform would be located in an existing row of parking that abuts the rail right of way, requiring the loss of parking. Additional parking would be lost to accommodate the various means of cross-track circulation if they are developed south of the bridge. Depending on the northern terminus of the inbound platform, there will be impacts to the existing canopies, but the existing station parking lot, drop-off area, and area immediately adjacent to the station building would not be compromised. A ramp would connect to the existing low-level platform to the north, and both stairs and ramps would connect to grade at appropriate intervals in the south lot.

SEPTA has decided to locate toilet rooms at the new platforms, where they would best benefit customers. The implementation of the new Key payment system, which obviates the need for a ticket agent, make continued staffing of a SEPTA ticketing office unnecessary. The ticket function currently located in the existing station building will be decommissioned regardless of the cross-track option that is selected.

IV. Consolidated Options

In overlaying the cross-track circulation and level boarding options, it is clear that not all of these options are interchangeable. For example, undercutting the track in the station would require demolition of the existing tunnel because the existing distance between the top of the tunnel and the existing platform elevation requires that the top of the tunnel be lowered to maintain structural clearance between the tracks and tunnel.

The following are options that have been studied in some detail, with ADA compliance, site geometry, constructability, impacts to historic fabric, parking impacts, and vehicular/pedestrian access as primary considerations.

Construct ramps and reuse the existing underpass (SK-01): This option would eliminate the need to construct a new overpass or tunnel and would continue to locate the pedestrian crossing close to the existing station building. New ramps would need to be approximately 170 feet long (1/13 slope, plus landings at 30 inches vertically for the 11-foot 7-inch vertical differential between the existing platform and tunnel). This translates to a cut in the ground for a switchback ramp of approximately 13 feet wide by 80 feet long before it could be covered by sidewalk. This would have to be covered by a canopy and surrounded by a guardrail to 3 feet 8 inches above grade. The existing tunnel and stairs would undergo cosmetic and lighting improvements.

Design Factors and Constraints:

1. Eliminates the need for a new overpass or underpass, associated elevators, and stair construction
2. Maintains cross-track circulation in the location it exists today, increasing customer interaction with the historic station environs.
3. Requires the elimination of fewer existing parking spaces in the south lot.
4. There is no reasonable means to fit the ramp geometry parallel to the tracks on the west side of the station, maintain vehicular circulation, and maintain short-term parking. The switchback ramp would have to run east-west, effectively creating a physical barrier (and a cut in the ground) between the vehicular roadbed and the station, eliminating short-term parking near the station building and compromising the drop-off/pickup function.
5. A new 10-foot-tall canopy approximately 16 feet wide by 84 feet long would need to be constructed in close proximity to the existing station building and canopies.
6. At the east, the ramp structure would either need to be placed in the drainage swale immediately southeast of the outbound shelter (creating a significant challenge to the current drainage system function) or would require demolition of portions of the outbound shelter and enclosures. The same basic geometry would be required at the east as described at the west, with the added requirement to get from West Avenue down 4 feet 5 inches to the platform level, thus requiring an additional ramp length of approximately 65 feet that could not be contiguous with the tunnel ramp. Taken together, this would be approximately 235 feet of ramp length in a very constricted area on the east side, which would all need to be covered by new canopies immediately adjacent to the existing shelter.
7. Significant demolition of existing fabric would likely be required.
8. Construction would be extremely difficult below track level, with ground water conditions in the area immediately around the tunnel level, but would be required to create a clear and safe connection between the ramps and the tunnel at both sides.
9. Limits where high-level platforms could be constructed.
10. Places cross-track circulation away from the nexus of parking.
11. Creates significant travel distance between the cross-track circulation and the high-level platforms. *
12. Assuming that high-level platforms are located south of the bridge because of horizontal conflicts, the path of travel is extended for customers using the south lot and walking into the neighborhoods to the southwest.
13. The tunnel would still be tight in width, damp, and subject to flooding from groundwater penetration.
14. Parking capacity would be decreased due to the ramp construction.
15. Lengthy below-grade walkways are a less desirable passenger experience from both a security and an aesthetic perspective.
16. The tunnel and new underground stations would require additional safety and security elements as compared to above-ground cross-track circulation routes.

Install elevators at the existing underpass (SK-02): This option would eliminate the need to construct a new overpass or tunnel and would continue to locate the pedestrian crossing close to the existing station building. In this option, elevators would be utilized to reach the tunnel elevation. The elevator would be approximately 12 feet wide by 10 feet deep and have a clear height of 18 feet above grade where they are located. Elevator control rooms approximately 60 square feet in size would be required on each side of the tracks and may be able to be placed within the adjacent building spaces with some modification. The tunnel and stairs would undergo cosmetic and lighting improvements. On the

outbound side, either a ramp between the West Avenue entry and the existing platform level would be required or the elevator would need to be a three-stop type with openings at West Avenue, the platform, and the tunnel. If the ramp approach was taken, this would result in a 65-foot-long by 6-footwide structure.

Design Factors and Constraints:

1. Maintains cross-track circulation in the location it exists today, increasing customer interaction with the historic station environs.
2. Requires the elimination of fewer existing parking spaces in the south lot.
3. The elevators would not fit below the existing canopy roofs where they would need to be located. This would require demolition of existing canopies.
4. The glass and steel elevator shafts would be located in close proximity to the existing station building and the existing outbound waiting room in order to be immediately adjacent to the existing tunnel. This would create significant physical and visual obstructions adjacent to these structures.
5. Significant demolition of the existing fabric would be required.
6. Both the ramp and the three-stop elevator approach to providing accessibility at the West Street entry would cause significant impacts to the constrained area around the tunnel entry at the east side.
7. Construction would be extremely difficult below track level, with ground water conditions in the area immediately around the tunnel level, but would be required to create a clear and safe connection between the ramps and the tunnel at both sides.
8. Limits where high-level platforms could be constructed.
9. Places cross-track circulation away from the nexus of parking.
10. Assuming that high-level platforms are located south of the station because of horizontal conflicts, the path of travel is extended for customers using the south lot and walking into the neighborhoods to the southwest.
11. The tunnel would still be tight in width, damp, and subject to flooding from groundwater penetration.
12. Creates significant travel distance between the cross-track circulation and the high-level platforms. *

Construct a pedestrian overpass on the north side of the Greenwood Avenue bridge (SK-03 A-C): This option would locate a pedestrian overpass north of the bridge in the area between the bridge and the existing station building. This would include elevators and stairs towers on both sides of the tracks to a bridge located approximately 24 feet above the top of the existing rail. It would be 12 feet wide. In this location, one of three basic approaches would be required: (1) the existing vehicular roadway that connects the south and north lots (and allows vehicles from the south lot headed to the east and north to bypass Glenside Road and exit to the Greenwood Avenue bridge without impacting the neighborhood to the west) would be closed and that area used for the west elevator and stairs; (2) the pedestrian overpass could be located further north, requiring the demolition of the outbound waiting room to accommodate the east stair and elevator and the elimination of short-term parking and the reconfiguration of the western drop-off/pick-up area; or (3) the existing communication & signals (C&S) building would need to be demolished and the stair and elevator would be located there, thus maintaining the vehicular access between the south and north lots. The existing catenary tower would need to be extended to permit the required clearance around the overpass and elevators.

Design Factors and Constraints:

1. Maintains cross-track circulation in a similar location to where it exists today, increasing customer interaction with the historic station environs.
2. Requires the elimination of fewer existing parking spaces in the south lot.
3. Eliminates the need to work below track level and in close proximity to the existing station building.
4. Crossing the track above grade is a desirable passenger experience from both a safety and security perspective.
5. New overpass, elevator, and stair structure where one does not currently exist.
6. Depending on which option is advanced, it could eliminate the north-south vehicular access under the Greenwood Avenue bridge, or it would require the demolition of the either the C&S building or the outbound waiting room building, both of which are contributing elements of the station and/or district
7. Interferes with drainage structure and flow on the east.
8. Depending on which of options 3A-3C is advanced, it would impact the west station parking area.
9. Impacts the west accessible drop-off/pick-up area.
10. Requires modification to the existing catenary structures.
11. Locating an elevator at the existing C&S building would increase the span of the overpass, having an increased cost impact on the structure.

Construct a pedestrian underpass on the south side of the Greenwood Avenue bridge with elevators (SK-04): This option would locate a new pedestrian underpass south of the bridge and the south end of the east bridge abutment. This would include elevators and stairs towers on both sides of the tracks to a new 10-foot-wide by 9-foot-tall tunnel located approximately 12 feet below the top of the existing rail. The tunnel, stair, and elevator excavation would need to be carefully coordinated with the existing stone wall to the east and the catenary tower foundation to the west. The pedestrian bridge structural support, stairs and elevator would need to be located in such a way as to minimize the loss of parking and to maintain north-south vehicular access under the Greenwood Avenue bridge. The tunnel and elevators would require deep excavation and would impact rail operations during construction. The new platform location would include toilet rooms and a heated shelter.

Design Factors and Constraints:

1. Limited vertical structure height and scale.
2. Minimal impacts to the existing station canopies.
3. Close proximity to high-level platforms.*
4. Construction of an underpass will require interruption to rail service due to the need to install a temporary rail bridge over the location of the tunnel construction and maintain the rail bridge until the tunnel is complete and ready to back fill.
5. The elevation of rock in the vicinity of the underpass is higher than the bottom of the tunnel excavation requiring rock excavation, which will further increase the time required to construct the tunnel. The rock excavation techniques, along with the increased duration to excavate the rock, will require additional rail service impacts beyond that required to excavate the tunnel in soil.
6. The two issues above also result in making the cost of construction of the tunnel greater than the cost to construct an overpass.
7. Controlling leakage in tunnels is always challenging and requires constant maintenance of a pumping system.
8. Passing through the tunnel is a less desirable passenger experience from both a security and an aesthetic perspective.

9. Loss of parking in the south lot.

Construct a pedestrian underpass on the south side of the Greenwood Avenue Bridge with ramps (SK05): Similar to the previous option, this option would locate a new pedestrian underpass south of the bridge and the south end of the east bridge abutment. This would include ramps and stairs on both sides of the tracks instead of elevators. The ramp length between the tunnel and platform would be approximately 275 feet, including landings. Excavation would need to be carefully coordinated with the existing stone wall to the east and the catenary tower foundations on both sides of the track. The ramp would need to be located in such a way as to minimize the loss of parking and maintain north-south vehicular access under the Greenwood Avenue bridge. The tunnel and elevators would require deep excavation and would impact rail operations during construction.

Design Factors and Constraints:

1. Eliminates the need for a new overpass, associated elevators, and stair construction.
2. Minimal impact to the existing station canopies.
3. Close proximity to high-level platforms. *
4. Construction of an underpass will require interruption to rail service due to the need to install a temporary rail bridge over the location of the tunnel construction and maintain the rail bridge until the tunnel is complete and ready to back fill.
5. The elevation of rock in the vicinity of the underpass is higher than the bottom of the tunnel excavation requiring rock excavation, which will further increase the time required to construct the tunnel. The rock excavation techniques, along with the increased duration to excavate the rock, will require additional rail service impacts beyond that required to excavate the tunnel in soil.
6. The two issues above also result in making the cost of construction of the tunnel greater than the cost to construct an overpass.
7. Controlling leakage in tunnels is always challenging and requires constant maintenance of a pumping system.
8. Passing through the tunnel and lengthy below-grade ramps is a less desirable passenger experience from both a security and an aesthetic perspective.
9. Loss of parking at the south lot, which would be more significant than the tunnel/elevator and overpass/elevator approach.
10. Requires significant canopy structures over the 275-foot length of ramp on each side of the railroad.

Construct a pedestrian overpass on the south side of the Greenwood Avenue bridge(SK-06): This option would locate a new pedestrian overpass south of the Greenwood Avenue bridge and its southern bridge abutment. This approach to cross track circulation would include elevators and stairs towers on both sides of the tracks serving a pedestrian bridge located approximately 24 feet above the top of the existing rail. The existing catenary tower would need to be extended to permit the required clearance around the overpass and elevators. The overpass would be 12 feet wide. The new platform location would include toilet rooms and a heated shelter.

Design Factors and Constraints:

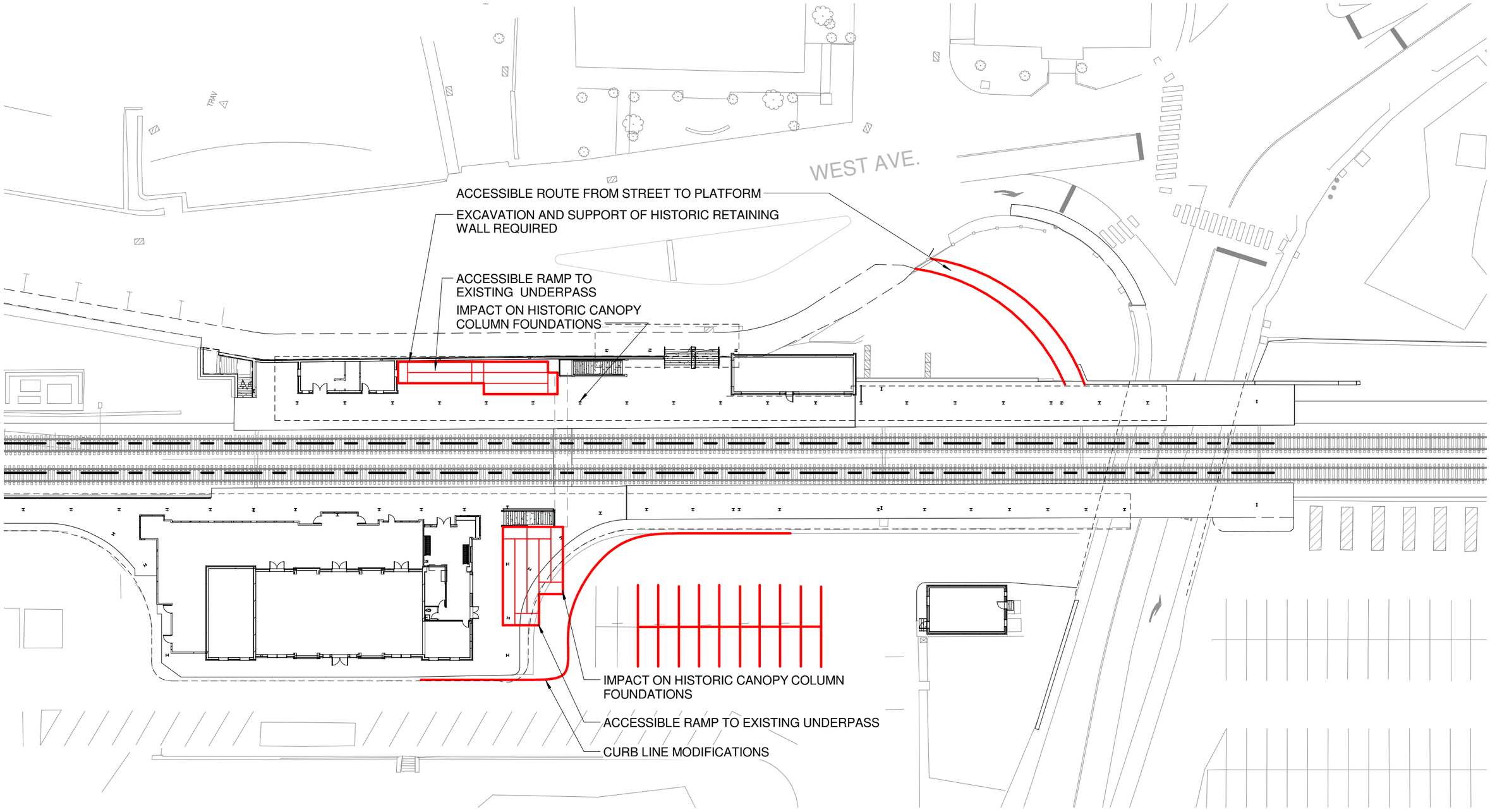
1. Limited impacts to parking in the south lot beyond what is required for the high-level platform construction.

2. Eliminates the need to work below track level and near the existing station building.
3. Minimal impact to the existing station canopies.
4. Crossing the track above grade is a desirable passenger experience from both a security and an aesthetic perspective.
5. New overpass, elevator, and stair structure where one does not currently exist.
6. Requires modification to the existing catenary structures.
7. Loss of parking at the south lot.
8. Requires the extension of two catenary towers.

*For the purposes of clarity, all discussion of options presupposes the location of new high-level platforms south of the existing station building, with a northern terminus either north of or under the Greenwood Avenue bridge.

Conclusion

In conclusion, the above report outlines an evaluation of the proposed design alternatives studied during the design phase and their respective impact on the project.



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JENKINTOWN-WYNCOTE

STATION IMPROVEMENTS

date:

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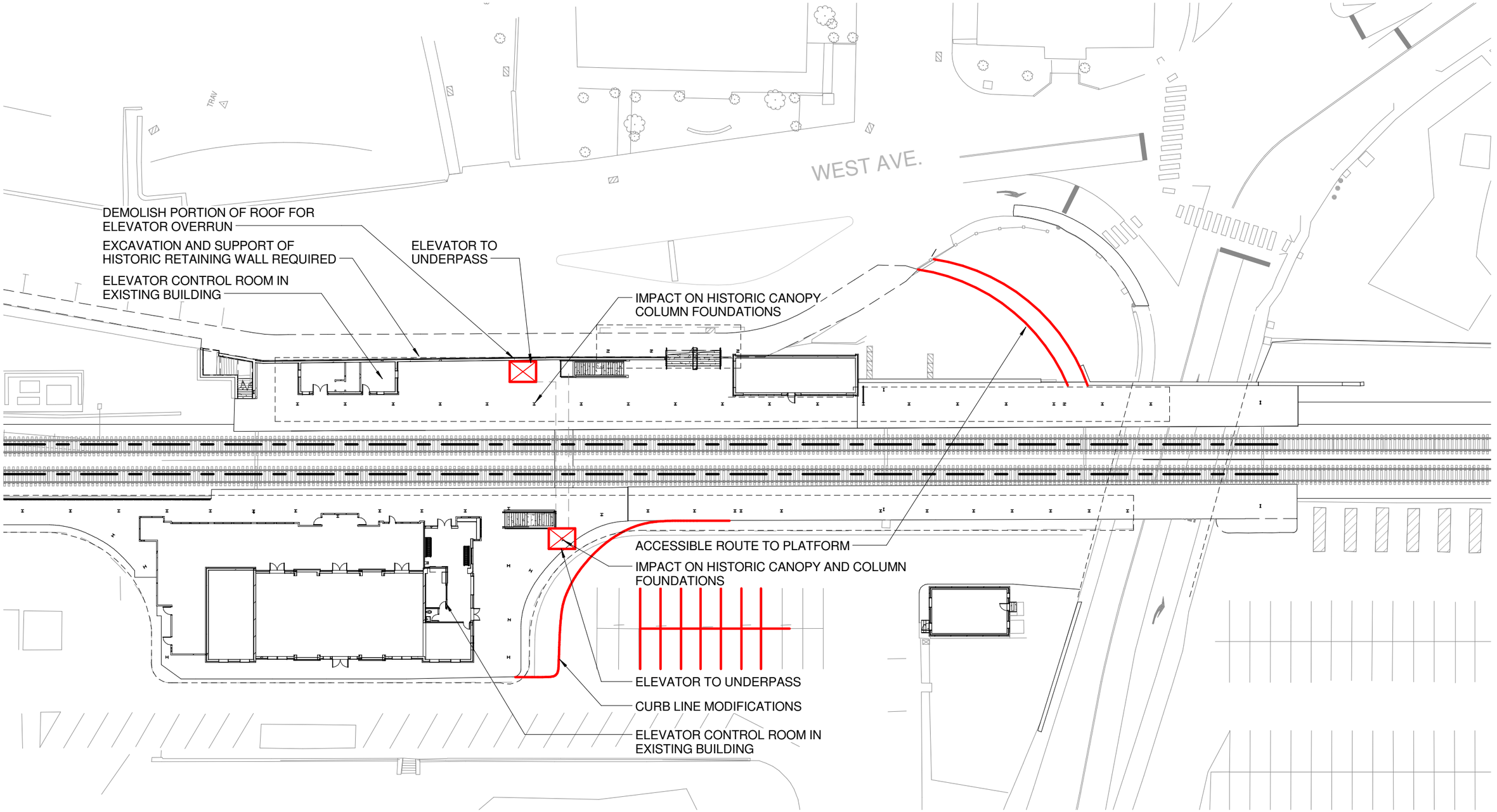
SK-01



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SK-02

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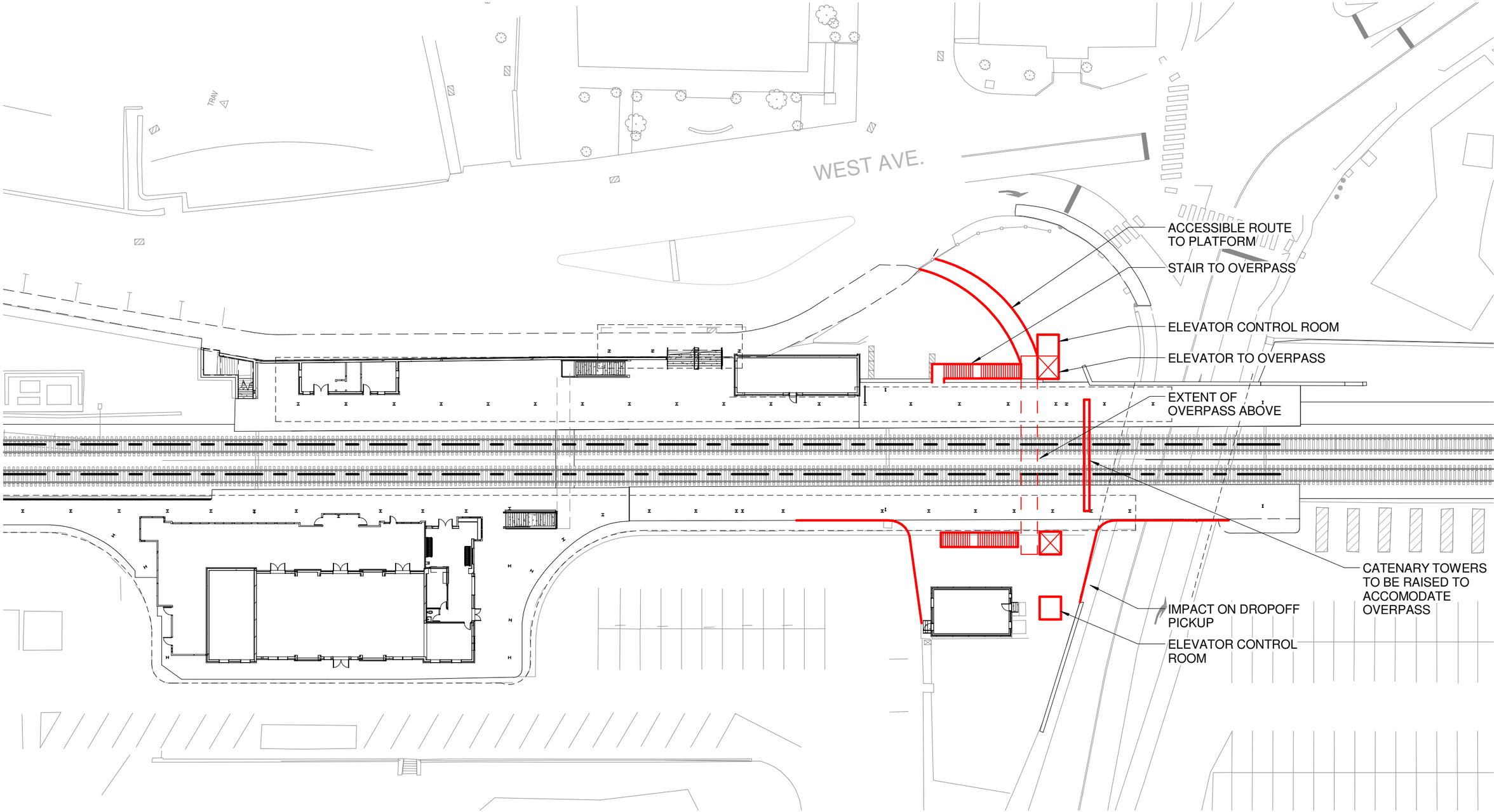
SK-02



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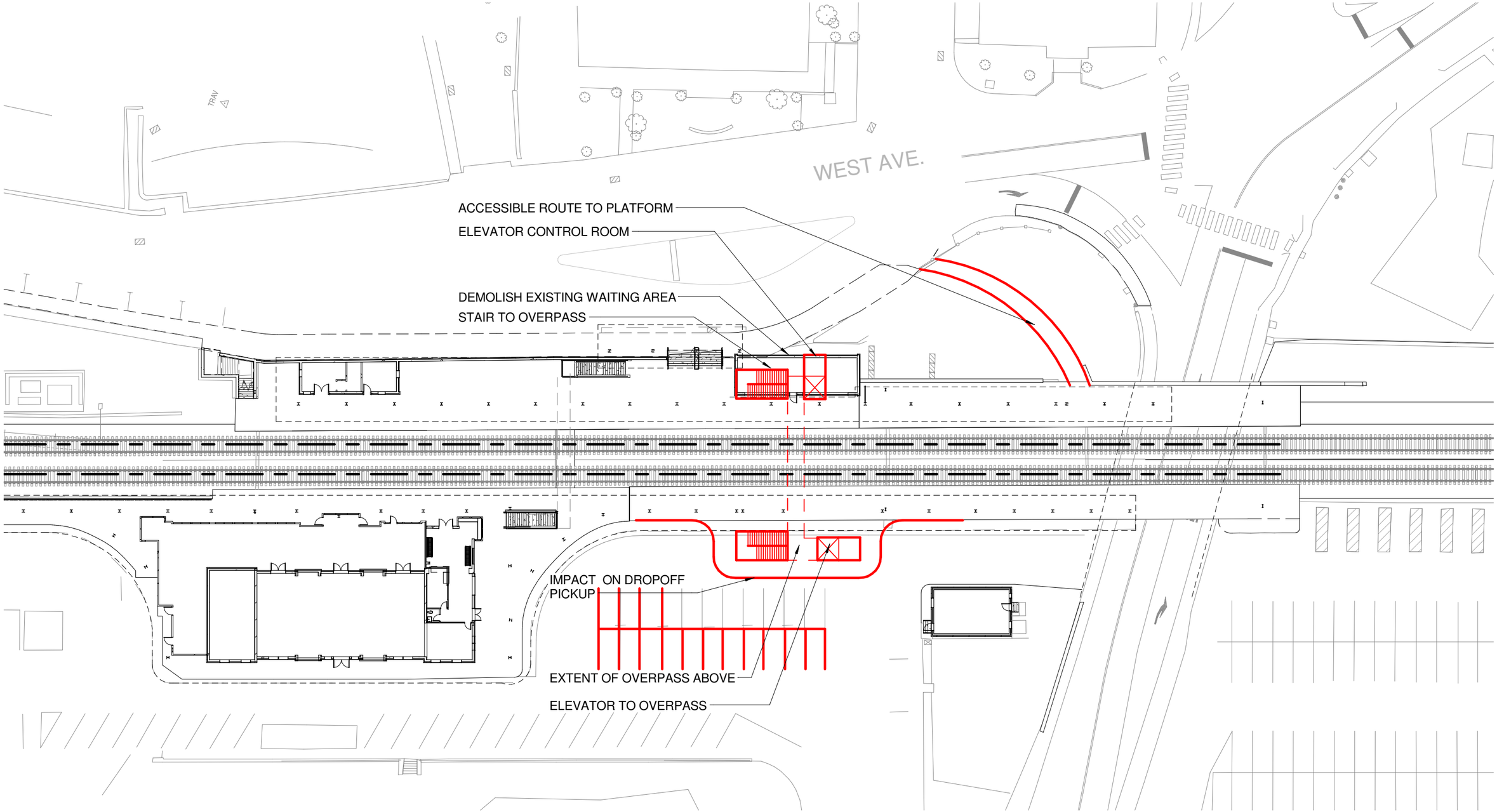
SK-03A



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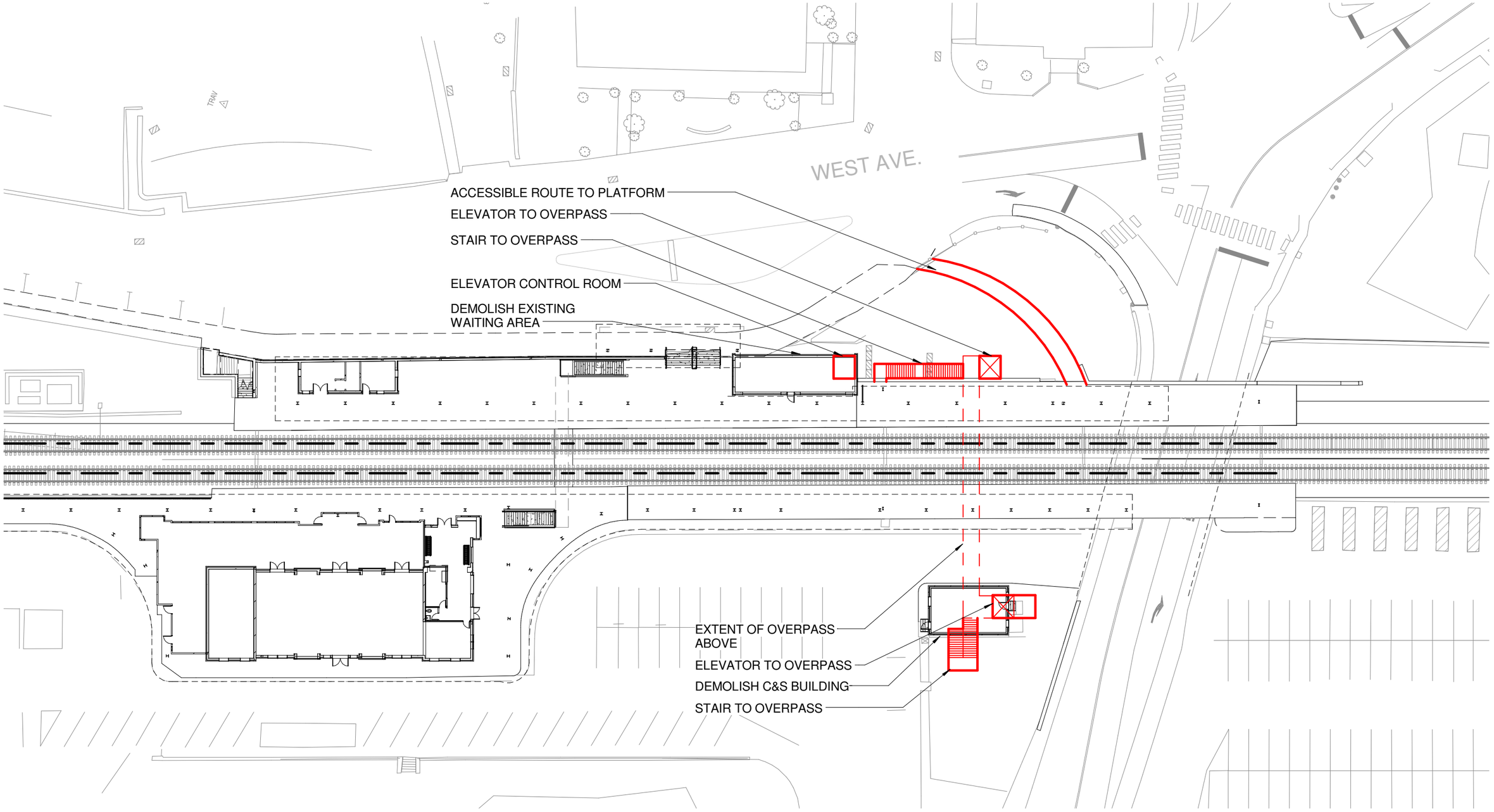

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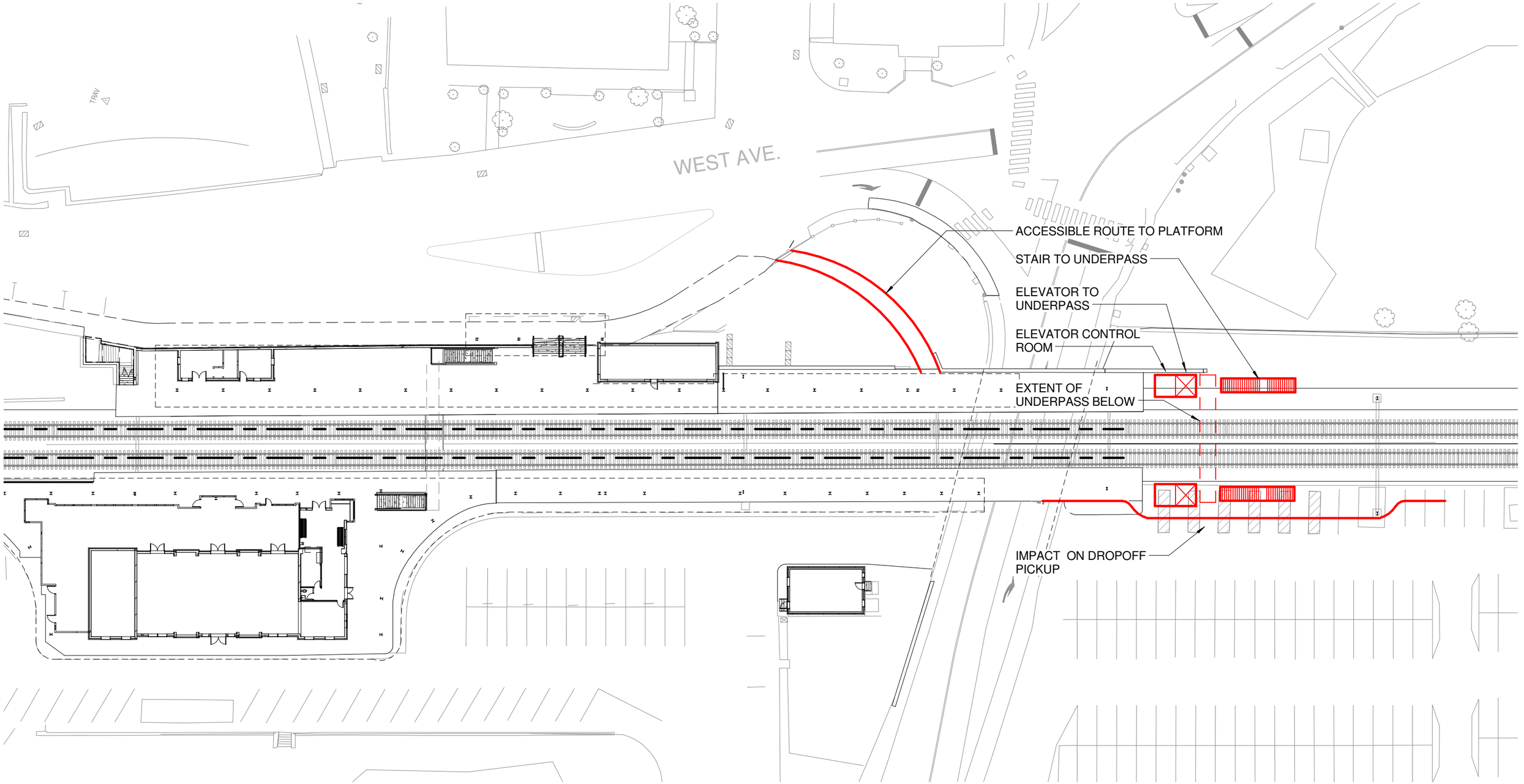
SK-03C



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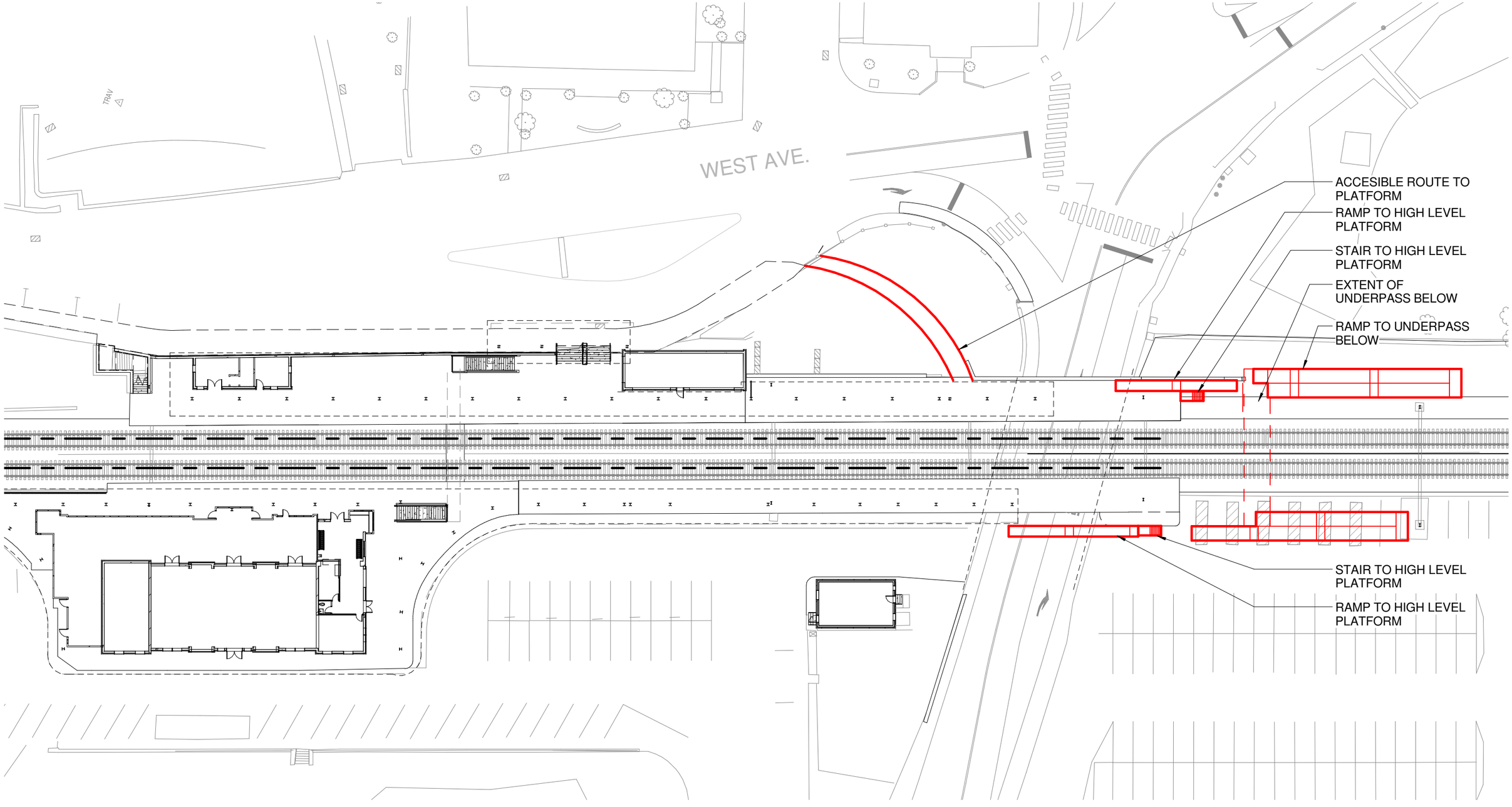
SK-04



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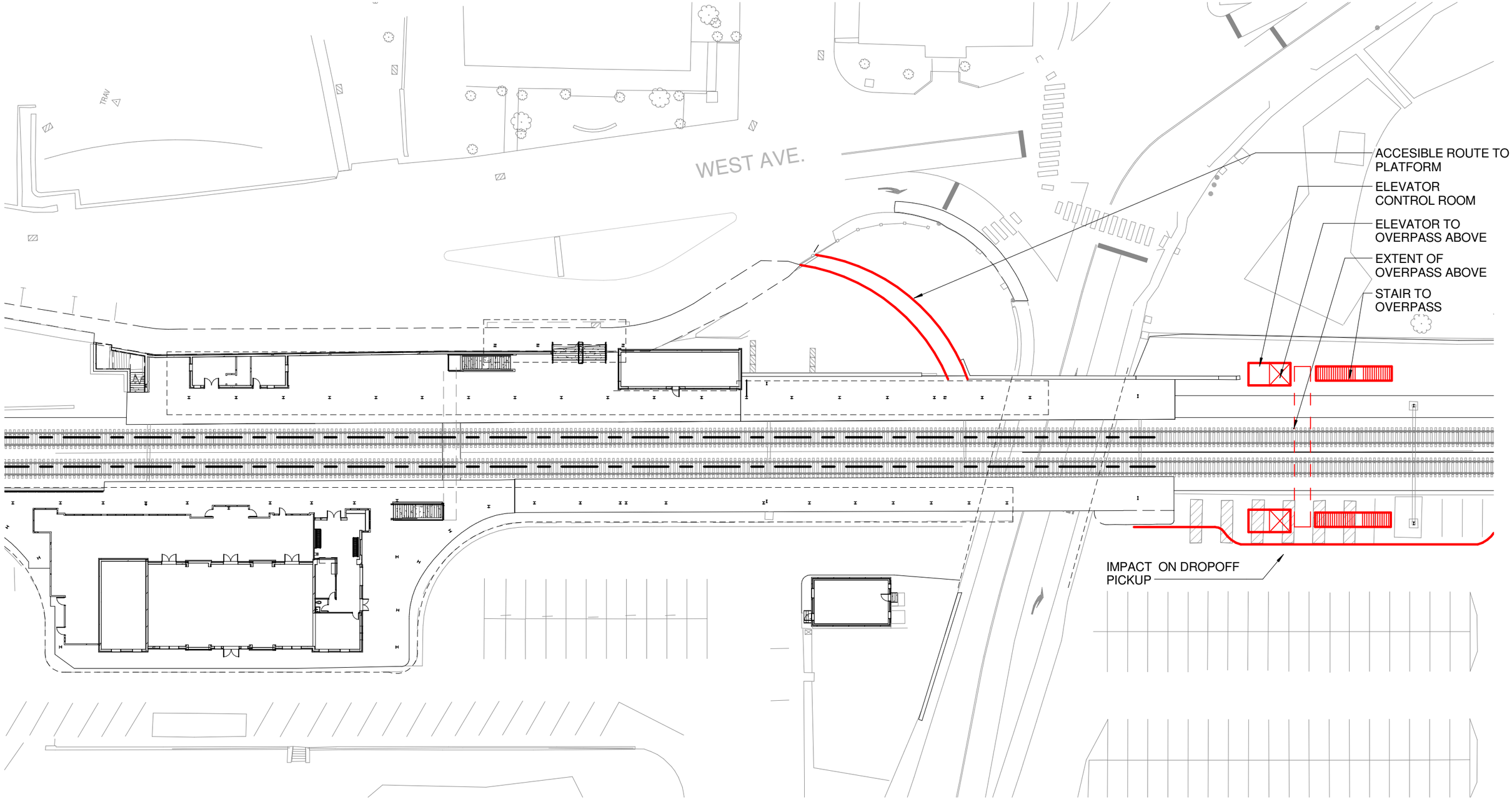
SK-05



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SK-06

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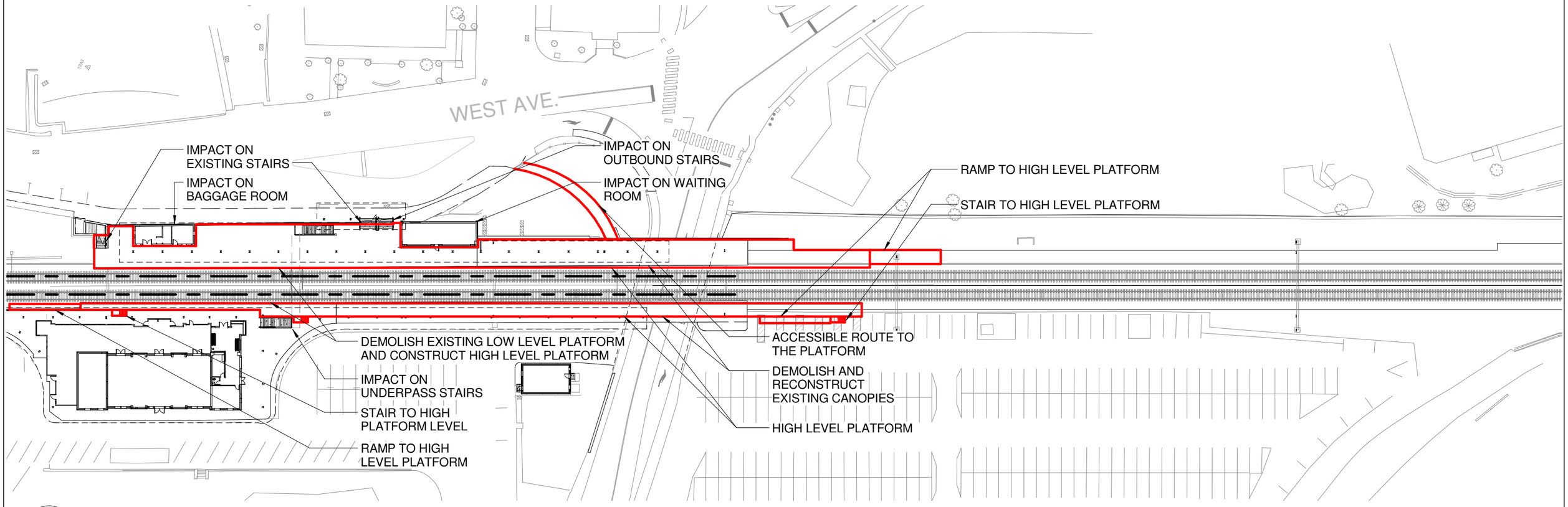
SK-06



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SK-07

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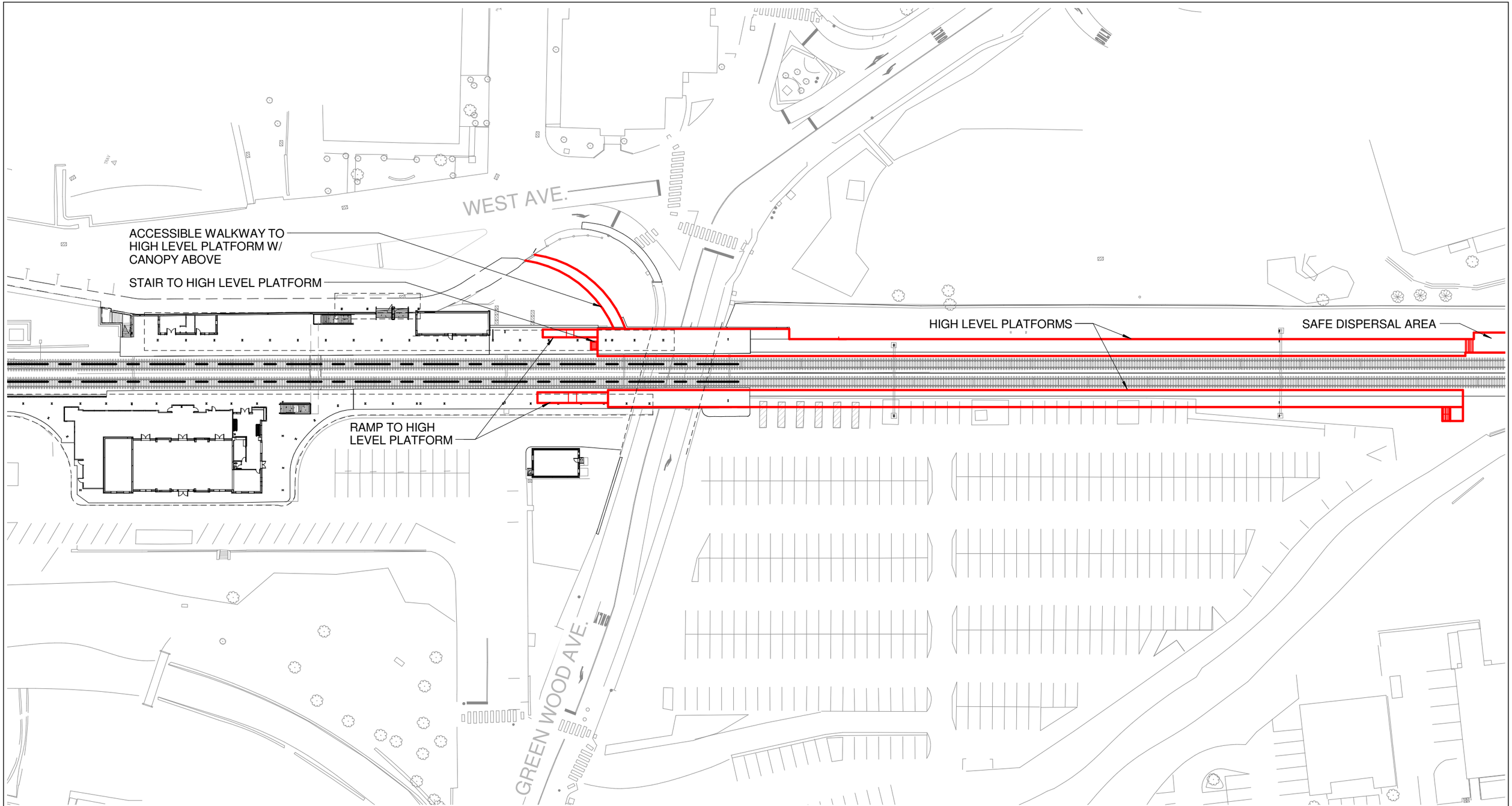
SK-07



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SK-08