NORFOLK SOUTHERN
PITTSBURGH VERTICAL CLEARANCE PROJECTS
ALTERNATIVES ANALYSIS REPORT

City of Pittsburgh and Swissvale Borough
Allegheny County, PA

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NORFOLK SOUTHERN

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1.0 Introduction

Norfolk Southern Railway Company (NSR), in cooperation with and funding through the Pennsylvania Department of Transportation (PennDOT), is proposing a group of five projects collectively referred to as the Pittsburgh Vertical Clearance Projects in the City of Pittsburgh, Allegheny County, Pennsylvania. The projects would remove the final remaining vertical clearance restrictions that result in chokepoints and other hindrances to the efficient flow of intermodal rail traffic on the Pittsburgh and Fort Wayne Rail Lines. The Pittsburgh Vertical Clearance Projects are necessary to meet future freight rail transportation demand, to promote the efficient transportation of goods between Chicago and the New York/New Jersey commercial markets, and to improve mobility and safety for freight traffic through the Pittsburgh region. In addition, these railway improvement projects would support truck-rail intermodal facilities by allowing for reliable double-stack intermodal traffic between Chicago and the New York/New Jersey commercial markets (a PennDOT goal under Pennsylvania's 2015 State Rail Plan[1], developed in compliance with Federal Railroad Administration requirements and with the Rail Freight Preservation and Improvement Act of 1984, as amended, Public Law 587-119.) The Purpose and Need Statement for these projects can be found in **Appendix A** and on the project website at www.nscorp.com/content/nscorp/en/in-your-community/the-pittsburgh-vertical-clearance-projects.html.

The Pittsburgh and Fort Wayne lines are two of three existing NSR mainlines through Pittsburgh. The Pittsburgh and Fort Wayne lines were completed in 1852 and include the approximately 50-foot-wide right-of-way and two mainline tracks serving the Chicago to New York/New Jersey corridor. Only single-stack trains currently can utilize these lines because of height elevation limitations due to clearance restrictions at several bridge locations in the Pittsburgh area. In 2019, the Pittsburgh Line through Pittsburgh's Central Business District, East End neighborhoods, and eastern suburbs averaged 21 trains per day, while the Fort Wayne Line averaged 34 trains per day through Pittsburgh's North Side neighborhoods. By 2045, according to the high-growth scenario presented in the 2015 Pennsylvania State Rail Plan[1], traffic is forecasted to increase to 50 trains per day on the Pittsburgh Line and 62 trains per day on the Fort Wayne Line if no clearance improvements are made to the bridges. The third mainline, on the south side of the city, is referred to as the Monongahela (Mon) Line. The Mon Line averaged 34 freight trains per day in 2019 and is expected to remain at 34 trains per day in 2045 because the line is currently operating at capacity. By 2045, according to the low-growth scenario presented in the 2020 Pennsylvania State Rail Plan[2], traffic is forecasted to increase to 42 trains per day on the Pittsburgh Line and 56 trains per day on the Fort Wayne Line if no clearance improvements are made to the bridges. With implementation of the projects, the predicted number of trains per day on the Pittsburgh Line drops to 49 under the high-growth scenario and 32 under the low-growth scenario. On the Fort Wayne Line, the predicted number of trains per day drops to 58 under the high-growth scenario and 45 under the low-growth scenario with implementation of the projects.

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[1] Pennsylvania Department of Transportation 2015 Rail Plan. https://www.penndot.gov/Doing-Business/Transit/InformationandReports/Documents/2015%20Pennsylvania%20State%20Rail%20Plan%20(low).pdf.

[2] Pennsylvania Department of Transportation 2020 Rail Plan. https://www.penndot.pa.gov/Doing-Business/RailFreightAndPorts/Planning/Documents/2020%20Pennsylvania%20State%20Rail%20Plan/2020%20Pennsylvania%20State%20Rail%20Plan.pdf.

This alternatives analysis is being prepared in compliance with Pennsylvania Act 120 and the Pennsylvania History Code. When there is state funding but no federal funding, such as for this project, PennDOT follows Section 2002 of the Pennsylvania Administrative Code of 1929, which defines the powers and duties held by PennDOT under Commonwealth of Pennsylvania Act 120 of P.L. 356 (Act 120), amended Section 2002, as codified at Title 71 of the Pennsylvania Code, 71 Pa.C.S. § 512 (Section 2002 of Act 120). Act 120 of P.L. 356 amended Section 2002 in 1970 to add requirements to consider the effects of transportation routes or facilities on environmental and other resources. Section 2002 requires that the Department consider impacts to 23 natural, social, and cultural resources for any planned transportation project. This alternatives analysis will only evaluate resources that could influence the selection of a preferred alternative for each project location. The Act 120 Environmental Document will analyze impacts of the preferred alternative on all 23 resources for each project location in accordance with PennDOT guidance.

Section 2002 of Act 120 created a state counterpart to Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966. Section 4(f) of the U.S. Department of Transportation Act of 1966 stipulates that the Federal Highway Administration and other Department of Transportation agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless there are no prudent and feasible alternatives to using those resources, and the proposed project plans include all possible planning to minimize harm to the property or the project has a de minimis impact on the property. (See PennDOT Publication No. 349 [Jan. 25, 2018] for additional information.) Section 2002 also requires PennDOT to evaluate alternatives and minimize harm to resources whenever a transportation corridor or facility is built or expanded in such a way as to use any land from recreation areas, wildlife and waterfowl refuges, historic sites, forest, wilderness, game lands, or public parks. Section 2002 of Act 120 requires that the analysis include reasonable and prudent alternatives to the use of any such lands and requires that such corridor or facility is planned and constructed so as to minimize harm to these resources.

2.0 Corridor Alternatives

This section describes the preliminary corridor-level alternatives considered to meet the projects' purpose and need. NSR, in consultation with PennDOT, considered a reasonable range of alternatives under Section 2002 of Act 120 and associated PennDOT guidance.[3] The range of alternatives was developed based on input from community representatives, governmental agencies and officials, elected leaders, and the general public. Each alternative corridor was assessed as to whether it would meet the purpose and needs of the project, whether it could be constructed in accordance with sound engineering judgment, whether it would result in impacts of an extraordinary magnitude, and its potential to avoid and minimize impacts to Section 2002 resources.

[3] PennDOT guidance applicable to Section 2002 of Act 120 incorporates or considers a number of other agency guidance including the U.S. Department of Transportation (Federal Highway Administration, Federal Railroad Administration), U.S. Environmental Protection Agency, Department of Conservation and Natural Resources, Pennsylvania Historical and Museum Commission, and others.

2.1 No Build Alternative

The No Build Alternative represents future conditions without any project to promote the efficient transportation of goods between Chicago and the New York/New Jersey commercial markets or to improve mobility and safety for freight traffic through the Pittsburgh region. The No Build Alternative assumes that NSR will continue to use the existing rail line infrastructure without changes to the vertical clearance along the line. The No Build Alternative provides a baseline against which the impacts of implementing the build alternatives are measured. NSR's assessments of the No Build Alternative as a baseline demonstrates that under the No Build Alternative, the Pittsburgh Line would experience increases in train movements to accommodate forecasted freight rail demand, and the increased train movements would be exacerbated due to the restriction on double-stack trains because of the clearance limitations on the Pittsburgh and Fort Wayne lines. Associated secondary and cumulative effects under the Pennsylvania History Code include the consideration of air, noise, and vibration impacts that would be experienced under the No Build Alternative due to the larger number of train movements as opposed to alternatives that accommodate double-stack trains. The latter have greater freight capacity that allows for a reduced number of trains to move the same amount of freight. Under the No Build Alternative, more trains would be required through the Fort Wayne Line in Pittsburgh's North Side neighborhoods and Pittsburgh Line in the City of Pittsburgh to meet future rail freight demand. The No Build Alternative was carried into detailed study.

2.2 Bypass Line (New Line) Alternative

The Bypass Line Alternative would be a newly built rail line located along a new right-of-way. The Bypass Alternative would require new routing and would be required to have an appropriate connection to the existing interstate rail system. Two tracks traversing through the Pittsburgh region would be required to fulfill the capacity needs of the project. Rail safety and operational requirements would require a right-of-way width of at least 50 feet. Cut, fill, and blasting would be required to meet rail engineering specifications for rail slope and safety due to topographic variation. Rail/automobile crossings would be required to permit freight rail traffic and reduce rail/automobile conflict. Rail/automobile crossings would involve clearances to accommodate double-stack trains as well as potential signaling, grade separation, bridge, tunnel, and other engineered routing. The potential for crossing waterbodies and sensitive or protected areas is significant under the Bypass Line Alternative. As compared to use of existing right-of-way, the Bypass Line Alternative would have greater impacts to socioeconomic, cultural (historic and archaeological), and environmental resources in light of the new right-of-way required. Impacts would include effects to any neighborhood through which the new right-of-way would pass and would require land acquisition/condemnation and new transportation/pass through impacts. In addition, the exponential cost of a bypass route, including significant property acquisitions that would be required, further discounts this option as a viable alternative, as it would be significantly more than the standard required to meet the project's purpose and need. The Bypass Line Alternative would not be a reasonable and prudent alternative and was dismissed from further consideration.

2.3 Mon Line Alternative

The Mon Line Alternative assumes use of the existing Mon Line to accommodate future freight rail demand identified in the Purpose and Need Statement. The Mon Line has a 3-mile single-tracked segment that includes a tunnel and an adjacent bridge over the Monongahela River. Although the Mon Line is cleared for double-stack freight movement, it has substantial capacity constraints due to a single-track line through a tunnel and a major river crossing, thus causing further delay and capacity issues for freight transit between Chicago and the East Coast. In order to increase the Mon Line's capacity to accommodate its current traffic along with the projected traffic demand, the existing tunnel and the major river crossing would both need to be widened to accommodate at least a double-track alignment. As such, cut, fill, and blasting would be required through the tunnel to meet rail engineering specifications, and bridge work would entail crossing a major waterbody, and may impact sensitive or protected areas. The Mon Line Alternative would have greater impacts to environmental resources in light of the additional width of right-of-way required. This alternative also may require land acquisition/condemnation. In addition, the properties adjacent to the Mon Line are prone to unpredictable landslides and are not owned by NSR. These incidents can cause and have caused hazardous conditions, impacts on public safety, and substantial transportation interruption and reliability concerns for freight movement. The threats cannot be addressed by NSR, PennDOT, or any reasonable and prudent alternative to meet the purpose and need as a result of third-party ownership and the substantial engineering feasibility considerations. The Mon Line cannot accommodate future freight rail demand to meet the purpose and need without significant modification, which is not reasonable and prudent due to physical restraints and topography. Additionally, the Mon Line Alternative does not meet operational safety and reliability requirements to meet future freight rail demand and the purpose and need.

Due to the major physical constraints and engineering factors, along with the cost of major tunnel and bridge expansions and required safety measures that would need to be addressed by third-party landowners, the Mon Line was dismissed from further consideration.

2.4 Conemaugh Line Alternative

The Conemaugh Line Alternative assumes use of NSR's existing Conemaugh Line between Conpitt Junction (east of Bolivar, Pennsylvania) and Federal Street on Pittsburgh's North Side to accommodate future freight rail demand identified in the Purpose and Need Statement. In order to accommodate future freight rail demand to meet the purpose and need, the Conemaugh Line would require the reconstruction of sections of double track that have been removed. The line has 10 vertical obstructions that also would need to be addressed to achieve the required vertical clearance to accommodate double stack trains. The Conemaugh Line runs through less densely populated areas than the Pittsburgh Line; however, the Conemaugh Line contains a greater number of at-grade crossings in small towns, which makes the route less desirable from a safety perspective. From an operational perspective, the Conemaugh Line is a longer and less efficient route than the Pittsburgh Line. Much of the Conemaugh Line follows the Kiskiminetas River, and the route has an excessive number of curves that limit train speed.

This alternative would not avoid impacts along the Fort Wayne Line in Pittsburgh's North Side neighborhoods but would not require modifications to the Pittsburgh Line in the City of Pittsburgh and its eastern suburbs. The Conemaugh Line would require the reconstruction of sections of double track within the rail right-of-way that have been previously removed.

Improvement of the Conemaugh Line to meet the project's purpose and need is not considered reasonable and prudent. The Conemaugh Line Alternative has a reduced ability to meet forecasted traffic demands due to its configuration, curves, and slower track speed. The Conemaugh Line Alternative has facility deficiencies including 10 vertical clearance constraints that present potential impact issues such that the alternative would not represent a reduction in impacts. In addition, the alternative would involve substantial costs to complete double tracking of the line and address vertical clearance issues at 10 crossings. Therefore, the Conemaugh Line Alternative was dismissed from further consideration.

2.5 Pittsburgh/Fort Wayne Line Alternative

The Pittsburgh/Fort Wayne lines serve rail freight traffic in interstate commerce and operate as a primary link through Pittsburgh between Chicago and the New York/New Jersey commercial markets. The Pittsburgh/Fort Wayne lines are the preferred route for time-sensitive intermodal freight, in large part because they avoid the hazardous conditions and delays experienced on the Mon Line discussed in Section 2.3. Furthermore, the Pittsburgh/Fort Wayne lines are the shortest route between Chicago and the East Coast and the use of that route increases network fluidity while reducing transit time. However, the current configuration of the Pittsburgh/Fort Wayne lines does not meet the need for projected freight rail demand with its current clearance limitations for double-stack trains. Only single stack trains currently can traverse these lines due to vertical clearance restrictions at several bridge locations.

To meet the project purpose and need, the Pittsburgh/Fort Wayne lines were assessed for locations with substandard vertical clearance that were not already considered for replacement. Six locations with vertical obstructions preventing efficient movement of freight, especially time-sensitive intermodal freight, by rail between Chicago and New York/New Jersey, were identified: Washington Avenue Bridge, Swissvale (PT-344.91); Amtrak Station Canopy, Pittsburgh (PT-353.20), W. North Avenue Bridge, Pittsburgh (PC-1.60); Pennsylvania Avenue Bridge, Pittsburgh (PC-1.82); Columbus Avenue Bridge, Pittsburgh (PC-2.17); and Ohio Connecting (OC) Bridge Flyover, Pittsburgh (PC-3.38). However, the OC Bridge Flyover has been removed from the overall Pittsburgh Vertical Clearance Projects. See **Figure 2-1** for a location map. Addressing the vertical obstructions along the Pittsburgh and Fort Wayne lines meets the purpose and need of the project and it would not result in impacts of an extraordinary magnitude since improvements would occur along an existing rail line and the work at each bridge or structure would be confined to an area immediately surrounding the bridge or structure. The Pittsburgh/Fort Wayne Alternative was carried into detailed study.

2.6 Alternatives Studied in Detail

An assessment of the alternatives carried forward into detailed study, including the No Build Alternative and the four project locations identified for the Pittsburgh/Fort Wayne Alternative corridor, is included in the subsequent chapters. The assessment includes the consideration of both the beneficial and the adverse impacts of project alternatives under consideration. For purposes of this analysis, low potential was assigned when the alternative is considered to have no or beneficial impacts to a resource; moderate potential was assigned when the alternative is considered to have minimal potential impacts to a resource; and high potential was assigned when the alternative is considered to have the potential to adversely impact a resource prior to mitigation. However, it is important to note that high potential to impact a resource does not equate to the projects as a whole having significant impacts.

3.0 Washington Avenue Bridge

The Washington Avenue Bridge is located in the Borough of Swissvale, Allegheny County, Pennsylvania, and carries Washington Avenue over NSR's tracks, the Martin Luther King Jr. East Busway (owned and maintained by Port Authority of Allegheny County), and Waverly Street (owned and maintained by Swissvale Borough). See **Figure 3-1** for a location map.

Alternatives have been identified to address the purpose and need for the Pittsburgh Vertical Clearance Projects and to meet PUC requirements. Below is a brief description of each alternative that will be discussed in further detail later in this chapter:

- Alternative 1 - No Build Alternative
- Alternative 2 - Repair and raise bridge to achieve 22' vertical clearance
- Alternative 3 - Repair substructure and lower tracks to achieve 22' vertical clearance
- Alternative 4 - Combination repair and raise bridge and lower tracks to achieve 22' vertical clearance

In addition to the four alternatives listed above, a design modification to minimize impacts of the preferred alternative was analyzed and is discussed in Section 3.3.6.

Conceptual plans and profiles for each Build alternative as well as typical sections can be found in **Appendix B.** Conceptual cost estimates for each Build alternative can be found in **Appendix C**. An Alternatives Comparison Matrix is included in **Appendix D**.

3.1 Environmental Considerations

As noted in Chapter 1, this section discusses those resources that could influence the selection of a preferred alternative for this project location. The Act 120 document will analyze impacts of the preferred alternative on these and the remaining of the 23 resource categories.

3.1.1 Hazardous or Residual Waste Sites

The potential for contaminated materials was identified during the Phase I Environmental Site Assessment (ESA) conducted for the Washington Avenue Bridge Project and are as follows:

- It is anticipated that the bridge paint contains lead because of the age of the bridge.
- The bridge should be inspected for asbestos-containing materials.
- Surface staining from an undocumented release was present on adjacent property, although it is not anticipated that the work will affect that off-site area.
- Shallow soil under the Washington Avenue Bridge may have been impacted by flaking lead-based paint as observed during the field view and during previous bridge inspections.

- Historic fill (e.g., slag, cinders and fly ash) may be present beneath the railroad ballast, since these materials have been commonly used as fill in Allegheny County. These materials sometimes contain elevated concentrations of metals and/or polynuclear aromatic hydrocarbons.
- Groundwater is expected to be relatively shallow within the project area and may also be perched within the existing ballast. There are potential offsite sources of groundwater contamination in the area, but there is no groundwater data within the railroad right-of-way that document existing conditions. Records indicate groundwater is not used as a source of drinking water.

3.1.2 Historic Properties

The area of potential effects (APE) for the Washington Avenue Bridge Project contains one historic property, the Pennsylvania Railroad: Main Line (Harrisburg to Pittsburgh) Railroad Corridor Historic District, which was determined eligible for the National Register of Historic Places (NRHP) on September 14, 1993. As part of the current study, contributing elements of the railroad corridor historic district were identified within the 5,090-foot segment of the corridor contained within the APE. Project historians identified three contributing elements as follows: the Washington Avenue Bridge; the stone retaining walls along the Palmer Street approaches to Washington Avenue; and the decorative wrought iron railings atop the Palmer Street retaining walls.

3.1.3 Section 2002 Resources

There is one Section 2002 resource located in the project vicinity, the NRHP-eligible Pennsylvania Railroad: Main Line (Harrisburg to Pittsburgh) Railroad Corridor Historic District. Since the Washington Avenue Bridge is a contributing element of the historic district, there will be a potential Section 2002 use of this resource regardless of which alternative is selected with the exception of the No Build Alternative.

3.1.4 Air Quality

The current National Ambient Air Quality Standard designations for the Pittsburgh area pollutants are:

- Marginal nonattainment for the 2008 ozone standard
- Maintenance for the 1971 carbon monoxide standard
- Maintenance for the 2006 PM2.5 standard
- Moderate nonattainment for the 2012 PM2.5 standard
- Nonattainment for the 2010 SO2 standard
- Attainment for lead
- Attainment for NO2

The proposed project will not have a direct effect on air quality with the exception of minor construction related emissions for Alternative 2, 3, and 4, which would consist of construction equipment regulated under U.S Environmental Protection Agency (EPA) emission standards. NSR has conducted a project-level air quality analysis for the Pittsburgh Vertical Clearance Projects corridor to evaluate secondary or indirect effects on air quality (see **Appendix E**). A general conformity determination is not required since there is no federal action or federal money being used for the project. The No Build Alternative would not result in any impacts to air quality. However, due to the inability to utilize more efficient double-stack containers and the need for additional train trips to accommodate future forecasted freight needs, with a commensurate increase in locomotive emissions for single-stack trains, future emissions would increase slightly under the No Build Alternative as compared to Alternatives 2, 3, and 4, where the more efficient double-stack trains would allow for fewer trains and lower locomotive emissions for the same freight needs. It is anticipated that Alternatives 2, 3, and 4 would have similar impacts on emissions levels. Therefore, from an emissions perspective, any of the approaches to achieving the needed vertical clearance at these locations are considered the same. With the Build alternatives, there would be a slight net reduction in annual regional locomotive operational emissions in comparison to both existing and future 2045 No Build emissions levels, and therefore no significant adverse impacts would result with implementation of the project.

3.1.5 Noise

Direct noise effects will be limited to construction related impacts. The No Build Alternative would have no noise effects. Any noise effects of the Build alternatives would be temporary and the difference between Build alternatives would not be significant.

Regarding indirect or secondary effects, NSR conducted a noise impact assessment to evaluate the potential impacts associated with the Pittsburgh Vertical Clearance Projects corridor (see **Appendix F**). Noise levels would be slightly higher under the No Build Alternative than Alternatives 2, 3, and 4 due to the greater number of single-stack trains that would be required to accommodate future rail traffic demand as compared to the fewer double-stack trains capable of carrying the same amount of rail freight. There were no sensitive land use sites above the Surface Transportation Board noise impact threshold identified near the Washington Avenue Bridge under the No Build or any of the Build alternatives for both the low-growth and high-growth scenarios. In addition, any impacted land uses under the future Build alternatives also would be impacted under the future No Build Alternative. It is anticipated that Alternatives 2, 3, and 4 would have similar impact on noise levels. The variation in vertical alignments of the Build alternatives is small, anticipated to be less than five feet. The dominant consideration for noise in these circumstances is the number of trains per day, and that would not be different for any of the Build alternatives for these projects. Therefore, from a noise perspective, any of the approaches to achieving the needed vertical clearance at these locations are considered the same.

3.1.6 Vibration

NSR conducted a vibration analysis for the Pittsburgh Vertical Clearance Projects corridor in accordance with the Pennsylvania History Code (see **Appendix F**). It is anticipated that there will be no impacts as a result of any alternative. Currently, the study corridor is defined as “heavily used” (i.e., more than 12 freight trains per day). Under future conditions there is no change to the train speeds or track locations, other than small reductions in vertical alignment in areas that would result in a negligible change in vibration. Therefore, both the No Build Alternative and Alternatives 2, 3, and 4 would only result in an increase in the number of trains per day. However, because the number of trains is not predicted to result in an increase of 3 VdB or greater at any vibration-sensitive land uses, there would be no vibration impacts under any of the alternatives.

3.2 Engineering Considerations

3.2.1 Roadway

The existing horizontal geometry along the Washington Avenue Bridge consists of a tangent across the bridge and a small horizontal curve located approximately 100' to the east of the bridge at the intersection with Center Street. The vertical grades along the existing bridge approaches are approximately 3.5% to the west of the bridge and approximately 5.5% to the east of bridge, with a slight grade across the bridge. Palmer Street intersects Washington Avenue immediately to the west of the bridge and there is currently insufficient sight distance from both northbound and southbound vehicles on Palmer Street looking east along Washington Avenue, which is attributable to the height of the bridge girders that extend above the bridge deck and roadway surface.

The existing roadway typical section along Washington Avenue on each side of the bridge consists of a curbed section that is approximately 35' wide and includes an eastbound and westbound travel lane with parking lanes in the southwestern and northeastern quadrants of the bridge. Sidewalks are located in all four quadrants of the bridge. The proposed typical section along Washington Avenue would match the existing.

3.2.2 Structure

The Washington Avenue Bridge is a steel through girder structure that was built in 1907. The two-span superstructure consists of a 2" bituminous wearing surface on a 5" brick wearing surface supported by an adjacent through girder-concrete-encased floorbeam system in Span 1 and a 6¾" reinforced concrete slab supported by a through girder-floorbeam-stringer system in Span 2. The center-to-center bearing lengths in Spans 1 and 2 are 88'-7¼" and 29'-10¾", respectively. The total structure length is 121'-6", and the bridge roadway width is 30'-0". The concrete encased floorbeams and W18 x 130 floorbeams in Spans 1 and 2 have a center-to-center spacing of 1'-6" and 4'-7", respectively. A 7'-0"-wide concrete sidewalk with chain-link fence is present along the north side of the bridge. The sidewalk along the south side of the bridge deck has been removed. A bituminous wedge curb and concrete curb are present along Spans 1 and 2, respectively.

The bridge is supported by stone masonry abutments and one steel pier bent skewed 70° 00' 00" with respect to the centerline of the superstructure. The foundation type is unknown.

The deck and superstructure are rated as poor because of holes in the deck and corrosion of the steel girders and floorbeams. The substructure is rated as fair for minor mortar pointing needs in the masonry abutments and some holes in the steel gusset plates at the pier bent.

All alternatives will maintain the current configuration of the superstructure. The existing roadway width across the bridge is 30’-0” curb to curb with a sidewalk on the north side of the bridge with a walkway width of approximately 5'-6".

3.2.3 Right-of-Way

In developing the Build alternatives, design options were identified to minimize the need for permanent or temporary easements. Temporary easements for construction are anticipated for Alternatives 2 and 4 for work along the sidewalks and at impacted business entrances in all four quadrants of the bridge.

3.2.4 Utilities

Utilities in the area include underground fiber optic, sewer, electric, gas, and water mains and aerial electric and communication lines. Decorative street lighting is located along Washington Avenue on both sides of the bridge. There are no utilities attached to the Washington Avenue Bridge.

3.3 Alternatives Description and Evaluation

3.3.1 Alternative 1—No Build Alternative

This alternative would consist of doing nothing to the existing Washington Avenue Bridge. However, this alternative would not meet the purpose and need. While No Build Alternative would not meet the purpose and need of the project, it is carried into the alternatives analysis as a basis of comparison with the Build alternatives.

3.3.2 Alternative 2—Repair and raise bridge to achieve 22’ vertical clearance

Alternative 2 would raise the bridge approximately 2'-2" in order to achieve 22' of vertical clearance over the railroad tracks. Work along Washington Avenue would extend approximately 175' to the west of the bridge and approximately 225' to the east of the bridge in order to raise the profile grade along the roadway and bridge to the required elevation. The work to the east would impact the intersection with Center Street and would require raising the southern leg of Center Street from the intersection. Approach work would include roadway pavement and sidewalk reconstruction. To the east of the bridge, the entrances to the businesses starting immediately adjacent to the bridge through the intersection with Center Street in the northern and southern quadrants would be impacted by raising the bridge. To the west of the bridge, the closure of Palmer Street, or signing as a right-turn only for northbound vehicles onto Washington Avenue, would be pursued, as the intersection sight distance would remain insufficient from Palmer Street looking to the east. In addition, raising the grade of this intersection would result in changing the vertical grades along both northbound and southbound Palmer Street and would require modifications to the wall and railing located along the western side of the railroad corridor. At least 12 business entrances and five business driveways located along the western approach to the bridge would also be impacted due to the raised profile along Washington Avenue.

A detour using the bridge carrying S. Braddock Avenue over the railroad tracks and located approximately 0.75 mile south of the Washington Avenue Bridge would be used during construction.

Utilities that would be impacted with Alternative 2 include utility poles (some with transformers) and decorative lighting poles along Washington Avenue on both sides of the bridge; a metered electric box located along the northern leg of Palmer Street; and, at a minimum, water and gas valve adjustments, with the potential for water and gas main relocations.

This alternative would require structural repairs to the Washington Avenue Bridge sufficient to allow jacking of the structure to raise it to the new elevation required. For the superstructure, the floorbeams and steel through girders would be strengthened at the jacking locations, and the deck in span 1 would be replaced.

For the substructure, the abutments would be strengthened with steel rods grouted into the masonry to meet the additional loading requirements due to the greater backfill loading. The steel pier bent would require strengthening of the corroded gusset plates and modifications to the bearing locations to provide the additional height required for the new vertical clearance.

Alternative 2 is anticipated to have a low to moderate potential for waste management impacts. Special provisions should be developed to properly manage painted steel during repairs, removal, and/or repainting. Additionally, the bridge should be inspected to determine if any special precautions would be needed with respect to asbestos-containing materials.

Alternative 2 would require repairs to the bridge superstructure and substructure in order to raise the bridge; however, these repairs would be minor and would have a low potential to affect character-defining features of the contributing bridge or the railroad corridor historic district. Alternative 2 would require modifications to buildings and driveway entrances on Washington Avenue. If buildings along Washington Avenue were determined to contribute to a historic district, this action would have a moderate potential to impact historic properties. Therefore, Alternative 2 is anticipated to have a low to moderate potential to impact historic properties, depending on whether a historic district exists on Washington Avenue.

3.3.3 Alternative 3—Repair substructure and lower tracks to achieve 22’ vertical clearance

Alternative 3 would lower the railroad tracks approximately 2'-2" in order to achieve 22' of vertical clearance. Work along the railroad corridor would extend approximately 1,600' to the south of the bridge and approximately 1400' to the north of the bridge in order to lower the railroad tracks to the required depth based on the necessary track design requirements. The work limits to the north of the bridge would end beyond the bridge carrying the tracks over S. Braddock Avenue. This alternative would require some minor work to the Washington Avenue Bridge substructures, but would not require work along Washington Avenue, Palmer Street, Waverly Street, or the adjacent busway.

Utilities that would be impacted with Alternative 3 would include a fiber optic line owned by Qwest Communications that would need to be relocated and an existing underdrain system that would require lowering.

This alternative would not require repairs to the superstructure, but the substructure’s abutments would be strengthened with steel rods grouted into the masonry to meet the additional loading requirements due to the increase in exposed height resulting in greater backfill loading. The steel pier bent would require strengthening of the corroded gusset plates. Walls along the busway would need to be investigated to check the additional backfill height that the new track profile would create when the face of the wall is exposed. The railroad structure that spans over S. Braddock Ave would need to be lowered by approximately 1’-0”. The existing structure would be supported on jacks, and the abutment stem would be partially removed to prepare for a reconstructed beam seat 1’-0” lower than the current beam seat. This would require shoring and phased railroad traffic at the S. Braddock Avenue Bridge. A 24-hour closure would be required to install the new beam seat and lower the bridge structure onto it.

Alternative 3 would require minor repairs to Washington Avenue Bridge's substructure; the associated track lowering would entail the removal of ballast and possibly other fill materials. Special provisions should be developed to properly manage painted steel during repairs, removal, and/or repainting. Additionally, the bridge should be inspected to determine if any special precautions would be needed with respect to asbestos-containing materials. Soils under the bridge should be tested for lead to determine if any special handling would be required.

Alternative 3 is anticipated to have a moderate impact for waste management due to the increased potential for management of groundwater from the track lowering. The depth to groundwater should be determined prior to excavation to determine if construction dewatering will be required. If groundwater is present, it should be tested for parameters required by the local sanitary sewer authority for its discharge permit.

Alternative 3 would require minor repairs to the Washington Avenue Bridge's substructure, but these repairs would not alter character-defining features of the bridge or railroad corridor; the associated track lowering would entail the removal of ballast and would not affect the characteristics of the railroad corridor historic district that qualify it for NRHP eligibility. No building entrances or driveways would be impacted. Therefore, Alternative 3 is anticipated to have a low potential to impact historic properties.

Impacts to Section 2002 resources, air quality, noise, and vibration would be the same or similar for each build alternative and are discussed in Sections 3.1.3, 3.1.4, 3.1.5, and 3.16, respectively.

3.3.4 Alternative 4—Combination repair and raise bridge and lower tracks to achieve 22' vertical clearance

Alternative 4 would raise the bridge approximately 9" and would lower the railroad tracks approximately 1'-3" in order to achieve 22' of vertical clearance over the railroad tracks. Work along Washington Avenue would extend approximately 175' to the west of the bridge and approximately 200' to the east of the bridge in order to raise the profile grade along the roadway and bridge to the required elevation. The impacts to building entrances and driveways along Washington Avenue, as well as impacts to Center Avenue and Palmer Street, would be similar to those in Alternative 2. Work along the railroad corridor would extend approximately 1,600' to the south of the bridge and approximately 800' to the north of the bridge in order to lower the railroad tracks to the required elevation based on the necessary track design requirements. The work limits to the north of the bridge would end before the bridge carrying the tracks over S. Braddock Avenue.

The detour as described in Alternative 2 would be used during construction.

Utilities that would be impacted with Alternative 4 would include utility poles (some with transformers) and decorative lighting poles along Washington Avenue on both sides of the bridge; a metered electric box located along the northern leg of Palmer Street; and, at a minimum, water and gas valve adjustments, with the potential for water and gas main relocations.

This alternative would require structural repairs to the superstructure to allow jacking operations to take place on the structure to raise it to the new elevation required. For the superstructure, the floorbeams and steel through girders would be strengthened at the jacking locations, and the deck would be replaced in span 1.

At the substructure, the abutments would be strengthened with steel rods grouted into the masonry to meet the additional loading requirements due to the greater backfill loading. The steel pier bent would require strengthening of the corroded gusset plates and modifications to the bearing locations to provide the additional height required for the new vertical clearance.

Like Alternative 3, Alternative 4 would require minor repairs to the bridge superstructure and substructure in order to raise the bridge and lower the tracks; however, the degree of bridge raising and track lowering would be less.

Special provisions would be developed to properly manage painted steel during repairs, removal, and/or repainting. Additionally, the bridge would be inspected to determine if any special precautions are needed with respect to asbestos-containing materials. Soils under the bridge would be tested for lead to determine if any special handling would be required.

Alternative 4 is anticipated to have a low to moderate impact for waste management because it is less likely to intercept shallow groundwater. The depth to groundwater should be determined prior to excavation to determine if construction dewatering would be required. If groundwater is present, it should be tested for parameters required by the local sanitary sewer authority for its discharge permit.

Similar to Alternatives 2 and 3, Alternative 4 would require minor repairs to the bridge superstructure and substructure in order to raise the bridge and lower the tracks; however, the degree of bridge raising and track lowering would be less. Associated bridge repairs and alterations to the track bed would be minor and would not affect character-defining features of the contributing bridge or the railroad corridor historic district. Therefore, Alternative 4 is anticipated to have a low potential to impact the railroad corridor historic district. Similar to Alternative 2, Alternative 4 would require modifications to buildings and driveway entrances on Washington Avenue, but the degree of modifications required would be less. If buildings along Washington Avenue were determined to contribute to a historic district, this action would have a moderate potential to impact historic properties. Therefore, Alternative 4 is anticipated to have a low to moderate potential to impact historic properties, depending on whether a historic district exists on Washington Avenue.

Impacts to Section 2002 resources, air quality, noise, and vibration would be the same or similar for each build alternative and are discussed in Sections 3.1.3, 3.1.4, 3.1.5, and 3.16, respectively.

3.3.5 Alternatives Comparison Summary

Alternative 1 would not meet the needs of the project and therefore can be eliminated from consideration. Alternative 2 would meet the project purpose and need, would result in the lowest total construction length, and is estimated to have the lowest construction cost of all of the alternatives, but would require a roadway detour during construction, would impact at least 12 business entrances and five driveways, and would have a low to moderate potential to impact historic properties within the project limits. Alternative 3 would meet the project purpose and need, would avoid a roadway detour during construction, and would avoid impacts to the nearby business entrances and driveways, but would have a moderate potential for encountering potentially contaminated material, would result in the greatest total construction length, and is estimated to have the highest construction cost of all of the alternatives. Alternative 4 would meet the project purpose and need, but would require a roadway detour during construction, would impact at least 12 business entrances and five driveways, and would result in the second greatest total construction length and overall construction cost due to work along both Washington Avenue and the railroad corridor. When accounting for impacts to the surrounding neighborhood, project complexity, and potential historic property impacts, Alternative 3 is recommended to be advanced for further consideration. A comparison matrix of the four identified alternatives is included in **Appendix D.**

3.3.6 Design Modification Options

Several design modification options were considered that involve adjustments to the vertical clearance. Following the assessment of engineering and locational considerations, a design modification option has been identified to lower the tracks to a minimum of 21'-9" vertical clearance. Applying this design modification to Alternative 3 (repair substructure and lower tracks) would lower the railroad tracks approximately 1'-11" in order to achieve 21'-9" of vertical clearance. (Note: the vertical clearance at mainline track 1 [west] would be increased by 1'-11" for 21'-9" clearance, and the vertical clearance at mainline track 2 [east] would be increased by approximately 1'-8" to 21'-10".) Work along the railroad corridor would extend approximately 1,600' to the south of the bridge and approximately 800' to the north of the bridge in order to lower the railroad tracks to the required elevation based on the necessary track design requirements. The work limits to the north of the bridge would end before the bridge carrying the tracks over S. Braddock Avenue. This design modification would not require any significant work to the Washington Avenue Bridge substructure; however, minor spall repairs and masonry repointing are anticipated. Work along Washington Avenue, Palmer Street, Waverly Street, or the adjacent busway would not be required.

There would be no impact to utilities with this design modification.

The design modification of Alternative 3 is anticipated to reduce the likelihood of encountering soil with elevated concentrations of substances or groundwater; therefore, impacts with respect to waste management would result in a low impact.

The design modification of Alternative 3 is anticipated to have a low potential to impact historic properties. Additionally, the impacts to the Washington Avenue Bridge abutments and to the Palmer Street retaining walls would be further minimized.

3.4 Selection of Preferred Alternative

Based on these considerations, Alternative 3–Repair substructure and lower tracks, with the design modification of lowering the tracks to 21'-9" vertical clearance, is the preferred alternative for the Washington Avenue Bridge Project.

4.0 Amtrak Station

The Amtrak Station is located in the City of Pittsburgh, Allegheny County, Pennsylvania, and carries traffic on the Pennsylvania Rail Line. See **Figure 4-1** for a location map.

Alternatives have been identified to address the purpose and need for the Pittsburgh Vertical Clearance Projects and to meet NS and Amtrak requirements. The alternatives will be discussed in further detail later in this report. Below is a brief description of each alternative:

- Alternative 1 - No Build Alternative
- Alternative 2 - Remove portion of trainshed
- Alternative 3 - Adjust trainshed roof beams to achieve 21'-0" vertical clearance

Conceptual plans and details for each Build alternative as well as sections can be found in **Appendix B.** Conceptual cost estimates for each Build alternative can be found in **Appendix C**. An Alternatives Comparison Matrix is included in **Appendix D**.

4.1 Environmental Considerations

As noted in Chapter 1, this section discusses those resources that could influence the selection of a preferred alternative for this project location. The Act 120 document will analyze impacts of the preferred alternative on these and the remaining of the 23 resource categories.

4.1.1 Hazardous or Residual Wastes

Potential hazardous materials identified during the Hazardous Materials Survey (WSP Global, Inc. 2018) conducted for the Amtrak Station Project are as follows:

- It has been confirmed through previous testing performed by WSP Global that lead-containing paint (LCP) is present on structural steel girders, steel beams, steel columns, electrical conduits, and roof drainpipes.
- Shallow soil under the Amtrak Station canopies may have been impacted by flaking lead-based paint.
- Asbestos-containing materials (ACM) have been identified in many areas of the trainshed and on the brick wall along Liberty Avenue. ACM cement (transite) panels are located throughout the trainshed on the exhaust areas. Wire insulation is located on the inside pendant light fixtures at track level and in the entire trainshed west and east sections.
- Historic fill (e.g., slag, cinders, and fly ash) may be present beneath the railroad ballast since these materials have been commonly used as fill in Allegheny County. These materials sometimes contain elevated concentrations of metals and/or polycyclic aromatic hydrocarbons.
- HID light fixtures in the west and east sections of the trainshed will be managed under the presumption that mercury vapor may be present.
- WSP Global's 2018 analysis indicated no presence of polychlorinated biphenyl (PCBs) containing equipment or caulk, and no equipment containing chlorofluorocarbons (CFCs). As it is possible that additional hazardous materials, including ACM, LCP, and PCB containing materials, may exist behind walls and other concealed spaces that were not accessible during WSP Global's sampling survey, if such materials are encountered during construction they will be managed in accordance with state, local, and federal requirements as applicable. Areas below the platform and track surface, as well as pipe trenches at the north side of the station along Liberty Avenue, will not be disturbed and were not included into the scope of work for this survey.

4.1.2 Historic Properties

The area of potential effects (APE) for the proposed undertaking contains three historic properties, the Pennsylvania Railroad Station, which was listed in the NRHP on April 22, 1976; the Pennsylvania Railroad

Station Rotunda, which was listed in the NRHP on April 11, 1973; and the Pennsylvania Railroad: Main Line (Harrisburg to Pittsburgh) Railroad Corridor Historic District, which was determined eligible for the NRHP on September 14, 1993. As part of the current study, contributing elements of the railroad corridor historic district were identified within the 1,800-foot segment of the corridor contained within the APE. Project historians identified two contributing elements of the railroad corridor historic district as functional components that were constructed during the corridor's period of significance and that retain historic integrity. These include the NRHP-listed 1898-1903 Daniel H. Burnham Pennsylvania Railroad Station (which includes the attached 1953-1958 McKim, Mead, and White trainshed and the undergrade bridge at Liberty Avenue, which partly supports two passenger platforms) and the NRHP-listed Pennsylvania Railroad Station Rotunda.

4.1.3 Section 2002 Resources

There are three Section 2002 resources located in the project vicinity, the NRHP-listed Pennsylvania Railroad Station; the NRHP-listed Pennsylvania Railroad Station Rotunda; and the NRHP-eligible Pennsylvania Railroad: Main Line (Harrisburg to Pittsburgh) Railroad Corridor Historic District. The trainshed is a contributing element of both the NRHP-listed Pennsylvania Railroad Station and the NRHP-eligible Pennsylvania Railroad: Main Line (Harrisburg to Pittsburgh) Railroad Corridor Historic District.

4.1.4 Air Quality

The current National Ambient Air Quality Standard designations for the Pittsburgh area pollutants are:

- Marginal nonattainment for the 2008 Ozone standard
- Maintenance for the 1971 Carbon Monoxide standard
- Maintenance for the 2006 PM2.5 standard
- Moderate nonattainment for the 2012 PM2.5 standard
- Nonattainment for the 2010 SO2 standard
- Attainment for Lead
- Attainment for NO2

The proposed project will not have a direct effect on air quality with the exception of minor construction related emissions for Alternatives 2 and 3, which would consist of construction equipment regulated under EPA emission standards. NSR has conducted a project-level air quality analysis for the Pittsburgh Vertical Clearance Projects corridor to evaluate secondary or indirect effects on air quality (see **Appendix E**). A general conformity determination is not required since there is no federal action or federal money being used for the project. The No Build Alternative would not result in any impacts to air quality. However, due to the inability to utilize more efficient double-stack containers and the need for additional train trips to accommodate future forecasted freight needs, with a commensurate increase in locomotive emissions for single-stack trains, future emissions would increase slightly under the No Build Alternative as compared to Alternatives 2 and 3 where the more efficient double-stack trains would allow for fewer trains and lower locomotive emissions for the same freight needs. It is anticipated that Alternatives 2 and 3 would have similar impacts on emissions levels. Therefore, from an emissions perspective, any of the approaches to achieving the needed vertical clearance at these locations are considered the same. With the Build alternatives, there would be a slight net reduction in annual regional locomotive operational emissions in comparison to both existing and future 2045 No Build emissions levels, and therefore no significant adverse impacts would result with implementation of the project.

4.1.5 Noise

Direct noise effects will be limited to construction related impacts. The No Build Alternative would have no noise effects. Noise effects of the Build alternatives would be temporary and the difference between Build alternatives would not be significant.

Regarding indirect or secondary effects, NSR conducted a noise impact assessment to evaluate the potential impacts associated with the Pittsburgh Vertical Clearance Projects corridor (see **Appendix F**). Noise levels would be slightly higher under the No Build Alternative than Alternatives 2 and 3 due to the greater number of single-stack trains that would be required to accommodate future rail traffic demand as compared to the fewer double-stack trains capable of carrying the same amount of rail freight. There were no sensitive land use sites above the Surface Transportation Board noise impact threshold identified near the Amtrak Station under the No Build Alternative or either of the Build alternatives for both the low-growth and high-growth scenarios. In addition, any impacted land uses under the future Build alternatives also would be impacted under the future No Build Alternative. It is anticipated that Alternatives 2 and 3 would have similar impact on noise levels. The dominant consideration for noise in these circumstances is the number of trains per day, and that would not be different for either of the Build alternatives for these projects. Therefore, from a noise perspective, any of the approaches to achieving the needed vertical clearance at these locations are considered the same.

4.1.6 Vibration

NSR conducted a vibration analysis for the Pittsburgh Vertical Clearance Projects corridor in consideration of guidance provided by the Pennsylvania History Code (see **Appendix F**). It is anticipated that there will be no impacts as a result of any alternative. Currently, the study corridor is defined as "heavily used" (i.e., more than 12 freight trains per day). Under future conditions there is no change to the train speeds or track locations, other than small reductions in vertical alignment in areas that would result in a negligible change in vibration. Therefore, both the No Build Alternative and Alternatives 2 and 3 would only result in an increase in the number of trains per day. However, because the number of trains is not predicted to result in an increase of 3 VdB or greater at any vibration-sensitive land uses, there would be no vibration impacts under any of the alternatives.

4.2 Engineering Considerations

4.2.1 Roadway

A detour will be required for Alternative 2 to remove a portion of the trainshed along Liberty Avenue. Alternative 3 will not require a detour as the structure will be modified without any roadway impact.

4.2.2 Structure

The purpose of this project is to increase the vertical clearance over existing Tracks 1 and 2 traveling through the Pittsburgh Amtrak Station. The existing vertical clearance varies with an 18'-8" minimum clearance. A minimum vertical clearance of 21'-0" is required. The existing structure will need to be modified at designated areas to increase the elevation of the bottom of the canopy structure. The limiting members in the station are the girders that span transversely across the railroad tracks.

4.2.3 Right-Of-Way

Temporary easements for construction are anticipated for Alternatives 2 and 3 for locations for cranes to operate and a construction compound/contractor laydown area.

4.2.4 Utilities

Abandoned utilities in the demolition area will be removed and capped off as needed. Inlet filter bags will be used to prevent debris from entering the inlet during a runoff event. Existing utilities in the project area include a Penn Power Company Electric Line, a PA American Water Line, and a Verizon telephone line. Telecom cables exist above ground and below ground.

4.3 Alternatives Description and Evaluation

4.3.1 Alternative 1—No Build Alternative

This alternative would consist of doing nothing to the existing structure at the Amtrak Station. While this alternative would not meet the purpose and need of the project, it is carried into the alternatives analysis as a basis of comparison with the Build alternatives.

4.3.2 Alternative 2—Remove portion of trainshed

Under Alternative 2, the trainshed would be removed between column lines A and B from column lines g (west end of the station) through 5 (column lines g to a and 1 to 5 are radial) to column line 14 (column line 14 is at the west side of I-579) and from column line 25 to 47. (See Appendix B, Alternative 2, pages S-11 through S-15.) This would provide clearances for Track 2. The trainshed would be removed between column lines C and D from column lines g (west end of the station) through 5 (column lines g to a and 1 to 5 are radial) to column line 14 (column line 14 is at the west side of I-579) and from column line 22 to 47. This will provide clearances for Track 1. All material would be removed back to the column line (see **Appendix B**). A waterproof cover would be placed over the stairways that are exposed by the removal of the trainshed. The curtain wall along Liberty Avenue would be removed down to the top of the windowsill. The remaining wall would be 3'-6" high. The work would be similar to the portion of the wall that was previously removed under I-579. The wall would be removed from column lines 4 through 14 and 25 through 46. A higher portion of the wall between column lines 46 and 47 would be retained to allow the Pennsylvania Railroad symbol to remain. A butterfly type canopy would be installed in the center of platform 3 (between column lines C and D) to protect Amtrak passengers. The canopy would be similar to the canopy under I-579.

The skylight glass panels and connection plates at the apex of the sloped skylight frame would be removed. The bolts that connect the panels to steel framing would be sheared and the panels would be removed intact. The removal of the existing masonry wall down to parapet height would then follow. Concrete parapet toppings would be added to match the height of the existing parapets between grids 15 and 25. Roof drains would be moved as needed.

Alternative 2 calls for the partial demolition of the structural wall along Liberty Avenue leading to a temporary traffic disturbance. A lane shift and detour plan are in order. Trees and seeding along the wall would be removed and later replanted. The existing road curb and water meters would be protected. Access to driveways and side roads would be maintained at all times.

Alternative 2 would not require any existing utility adjustments. Abandoned utilities that may be encountered will be removed and capped off as necessary.

Alternative 2 is anticipated to have a relatively higher potential for encountering contaminated materials compared to Alternative 3 due to proposed demolition activities. Special provisions will have to be developed to properly manage any ACM and/or LCP disturbance during repairs, removal, and/or repainting in accordance with applicable federal, state, and local requirements for protection of human health and the environment. Additionally, provisions will have to be developed to identify and manage any historic fill (e.g., slag, cinders, and fly ash) that may be present beneath the railroad ballast in the affected areas.

Alternative 2 would require extensive modifications to the trainshed including the removal of its roof over Tracks 1 and 2 and the removal of the northwest façade wall along Liberty Avenue. As noted above, the 1953-1958 McKim, Mead, and White trainshed is a contributing element of the NRHP-listed Pennsylvania Railroad Station and the NRHP-eligible Pennsylvania Railroad: Main Line (Harrisburg to Pittsburgh) Railroad Corridor Historic District. The Alternative 2 modifications would result in the partial demolition of a contributing element of both historic properties and are not in keeping with the Secretary of the Interior's Standards and Guidelines Rehabilitation**.** Therefore, Alternative 2 is anticipated to have a high potential to impact historic properties.

Since Alternative 2 would result in impacts to the Pennsylvania Railroad Station and Pennsylvania Railroad: Main Line (Harrisburg to Pittsburgh) Railroad Corridor Historic District, it would also have a high potential to impact Section 2002 resources.

4.3.3 Alternative 3—Adjust trainshed roof beams to achieve 21'-0" vertical clearance

Under Alternative 3, the existing structure would be modified and built up on the bottom portion of the girders at designated areas to increase the elevation of the bottom of the canopy structure (see **Appendix B**). The limiting members in the station are the girders that span transversely across the railroad tracks. The bottom flange and a portion of the web of the existing girder would be removed over the Tracks 1 and 2. To maintain the structural capacity, angles and plates would be added to the bottom of the existing girder to create a built-up shape. The stiffness of the proposed built-up shape would exceed the stiffness of the existing girder. With the addition of the new structural members on bottom and top of the existing, modifications to the exhaust chutes would be required. The existing asbestos exhaust chutes would be modified to ensure that the exhaust from the diesel engines does not adversely affect the passengers waiting for Amtrak trains.

This work would be performed over Track 1 and Track 2 and would involve the removal of the exhaust chute sections designated along with the steel members that carry it. Required work would include the removal of concrete from the designated beams over both tracks and roof sections as indicated on the drawings; trimming the identified girders over both tracks per the plans to obtain a minimum clearance of 21'-0"; the reinstallation of the exhaust chute framing and panels per the drawings and specifications; and the application of protective coatings to the girders and exposed steel over both tracks. This work would also involve the installation of foundations and new columns for two locations along both tracks.

Alternative 3 would not require any existing utility adjustments. Abandoned utilities that may be encountered will be removed and capped off as necessary.

Alternative 3 is anticipated to have a relatively lower potential for encountering hazardous materials compared to Alternative 2 due to proposed renovation activities. Special provisions will have to be developed to properly manage any ACM and/or LCP disturbance during repairs, removal, and/or repainting in accordance with applicable federal, state, and local requirements for protection of human health and the environment.

Alternative 3 would require the modification of alteration of girders over Tracks 1 and 2, including the removal of a bottom flange, the removal of a portion of the web, and the addition of angles and plates to the bottom of the existing girder. These minor alterations will not be visible on the exterior of the trainshed and will be only minimally visible from the building's interior. Therefore, Alternative 3 is anticipated to have a low to moderate potential to impact historic properties.

Since Alternative 3 results in only minor modifications of the trainshed, it is anticipated to have a low potential to impact Section 2002 resources.

4.3.4 Alternatives Comparison Summary

Alternative 1 would not meet the needs of the project and therefore can be eliminated from consideration. Alternative 2 would meet the project needs, is estimated to have the highest construction cost, would have minor roadway impacts during construction, and would have a high potential to impact historic properties and Section 2002 resources within the project limits. Alternative 3 would meet the project need, would avoid a roadway detour during construction, has the lowest construction cost, would have a low to moderate potential to impact historic properties, and a low potential to impact Section 2002 resources. Both Build alternatives would have a high potential for encountering contaminated materials, particularly asbestos. Alternative 2 would require more special provisions than Alternative 3 to properly manage the contaminated materials (ACM, LCP, and historic fill, etc.) due to the more extensive demolition activities. When accounting for impacts to the surrounding neighborhood, project complexity, and potential historic property and Section 2002 impacts, Alternative 3 is recommended to be advanced for further consideration. A comparison matrix of the identified alternatives is included in **Appendix D.**

4.4 Selection of Preferred Alternative

Based on these considerations, Alternative 3—Adjust trainshed roof beams to achieve 21'-0" vertical clearance is the preferred alternative for the Amtrak Station Project.

5.0 W. North Avenue Bridge

The W. North Avenue Bridge is located in the City of Pittsburgh, Allegheny County, Pennsylvania, and carries W. North Avenue and Brighton Road over four NSR tracks. See **Figure 5-1** for a location map.

Alternatives have been identified to address the purpose and need for the Pittsburgh Vertical Clearance Projects and to meet PUC requirements. Several bridge rehabilitation options were evaluated in the Historic Bridge Rehabilitation Analysis (Michael Baker International, Inc. 2020) prepared for the project and were determined not to comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Therefore, the rehabilitation alternatives were dismissed from further consideration. Below is a brief description of the alternatives that will be discussed in further detail later in this chapter:

- Alternative 1 - No Build Alternative
- Alternative 2 - Replace and raise bridge to achieve 22' vertical clearance
- Alternative 3 - Replace bridge and lower railroad tracks to achieve 22' vertical clearance
- Alternative 4 - Combination replace and raise bridge and lower railroad tracks to achieve 22' vertical clearance

In addition to the four alternatives listed above, a design modification to minimize impacts of the preferred alternative was analyzed and is discussed in Section 5.3.6.

Conceptual plans and profiles for each Build alternative as well as typical sections can be found in **Appendix B.** Conceptual cost estimates for each Build alternative can be found in **Appendix C**. An Alternatives Comparison Matrix is included in **Appendix D**.

5.1 Environmental Considerations

As noted in Chapter 1, this section discusses those resources that could influence the selection of a preferred alternative for this project location. The Act 120 document will analyze impacts of the preferred alternative on these and the remaining of the 23 resource categories.

5.1.1 Hazardous or Residual Waste Sites

The potential for contaminated materials was identified during the Phase I ESA conducted for the W. North Avenue Bridge Project and are as follows:

- It is anticipated that the bridge paint contains lead because of the age of the bridge. All work will comply with applicable lead material handling, safety, and disposal requirements.
- Shallow soil under the W. North Avenue Bridge may have been impacted by flaking lead-based paint.
- At some locations, black surface staining is present on the railroad ties and ballast.
- Historic fill (e.g., slag, cinders and foundry sand) may be present beneath the railroad ballast, since these materials have been commonly used as fill in Allegheny County. These materials sometimes contain elevated concentrations of metals and/or polynuclear aromatic hydrocarbons (PAHs).
- A former gasoline filling station (Spur Distributing Company Gasoline & Oil Service/Scott's Oil Company gasoline station) was located at 1119 Brighton Road, near the proposed retaining walls on the west side of Brighton Road and north of W. North Avenue.
- It should be noted that groundwater contamination sources may be present upgradient of the site. Most of the planned Build alternatives are not expected to encounter the uppermost aquifer. However, alternatives that require deep foundations and dewatering may encounter contamination within the uppermost aquifer. Furthermore, isolated lenses of contaminated perched groundwater may be present within the railroad ballast that could impact construction costs related to track-lowering alternatives.

5.1.2 Historic Properties

The APE for the proposed undertaking contains five NRHP-listed or -eligible historic districts: the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District, the Allegheny West Historic District, the Mexican War Streets Historic District, the Allegheny Commons Historic District, and the Allegheny Second Ward Industrial Historic District, and two individually NRHP-listed or -eligible properties: the International Harvester Company of America: Pittsburgh Branch House (International Harvester Building) and the Allegheny City Stables Building.

As part of the current study, contributing elements of the railroad corridor historic district were identified within the approximately 566’ segment of the corridor contained within the APE. Project historians identified the W. North Avenue Bridge[4] as well as the concrete retaining walls with stone coping along the northeast and southwest edges of the rail corridor, decorative wrought-iron fencing, standard three-rail railroad safety fencing, and an elevated out-of-service siding, all of which are attributable to the early-twentieth-century grade separation project as contributing elements of the railroad corridor historic district. The project APE contains four contributing buildings within the Allegheny Second Ward Industrial Historic District (the Hipwell Manufacturing Company Buildings, the International Harvester Building, the Katsafanas Coffee Company Building, and the Allegheny City Stables Building) and two contributing buildings within the Allegheny West Historic District: 907 Brighton Road and 913 Brighton Road.

5.1.3 Section 2002 Resources

There are seven historic property Section 2002 resources located in the project vicinity as discussed in the previous section. Allegheny Commons Park is both a historic district and a public park. Since the W. North Avenue Bridge is a contributing element of the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District, there will be a Section 2002 impact to this resource regardless of which Build alternative is selected.

5.1.4 Air Quality

The current National Ambient Air Quality Standard designations for the Pittsburgh area pollutants are:

- Marginal nonattainment for the 2008 ozone standard
- Maintenance for the 1971 carbon monoxide standard
- Maintenance for the 2006 PM2.5 standard
- Moderate nonattainment for the 2012 PM2.5 standard
- Nonattainment for the 2010 SO2 standard
- Attainment for lead
- Attainment for NO2

[4] The W. North Avenue Bridge was determined to be not individually eligible for the NRHP for its engineering significance on March 5, 2007, as part of the Pennsylvania Historic Bridge Inventory and Evaluation, which stated “the bridge is an example of a very common bridge type in widespread use for railroad and highway applications since the late 19th century…the bridge has no noteworthy features or details” (A.G. Lichtenstein & Associates, Inc. 1997). However, the same study found the bridge to be a contributing element of the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) railroad corridor historic district.

The proposed project will not have a direct effect on air quality with the exception of minor construction related emissions for Alternatives 2, 3, and 4, which would consist of construction equipment regulated under EPA emission standards. NSR has conducted a project-level air quality analysis for the Pittsburgh Vertical Clearance Projects corridor to evaluate secondary or indirect effects on air quality (see **Appendix E**). A general conformity determination is not required since there is no federal action or federal money being used for the project. The No Build Alternative would not result in any impacts to air quality. However, due to the inability to utilize more efficient double-stack containers and the need for additional train trips to accommodate future forecasted freight needs, with a commensurate increase in locomotive emissions for single-stack trains, future emissions would increase slightly under the No Build Alternative as compared to Alternatives 2, 3, and 4 where the more efficient double-stack trains would allow for fewer trains and lower locomotive emissions for the same freight needs. It is anticipated that Alternatives 2, 3, and 4 would have similar impacts on emissions levels. Therefore, from an emissions perspective, any of the approaches to achieving the needed vertical clearance at these locations are considered the same. With the Build alternatives, there would be a slight net reduction in annual regional locomotive operational emissions in comparison to both existing and future 2045 No Build emission levels, and therefore no significant adverse impacts would result with implementation of the project.

5.1.5 Noise

Direct noise effects will be limited to temporary construction-related impacts. The No Build Alternative would have no noise effects. Any noise effects of the Build alternatives would be temporary and the difference between Build alternatives would not be significant.

Regarding indirect or secondary effects, NSR has conducted a noise impact assessment to evaluate the potential impacts associated with the Pittsburgh Vertical Clearance Projects corridor (see **Appendix F**). Noise levels would be slightly higher under the No Build Alternative than Alternatives 2, 3, and 4 due to the greater number of single-stack trains that would be required to accommodate future rail traffic demand as compared to the fewer double-stack trains capable of carrying the same amount of rail freight. Existing noise levels were measured at four sites near the W. North Avenue Bridge Project location: the Iron Deer Playground at Allegheny Commons Park West, 710 W. North Avenue, 401 W. Commons, and 301 Cedar Avenue. All four of these locations contain both Category 2 (where people sleep) and Category 3 (institutional) land use categories. There were no Category 2 or Category 3 sensitive land use sites predicted to be above the Surface Transportation Board noise impact threshold identified near the W. North Avenue Bridge project location under both the No Build and all of the Build alternatives for both low-growth and high-growth scenarios. It is anticipated that Alternatives 2, 3, and 4 would have a similar impact on noise levels. The variation in vertical alignments of the Build alternatives is small, anticipated to be less than five feet. Changes in the vertical bridge alignment associated with the Build alternatives would result in generally imperceptible differences in noise levels that are within tenths of a decibel of one another. The dominant consideration for noise in these circumstances is the number of trains per day, and that would not be different for any of the Build alternatives for these projects. Therefore, from a noise perspective, any of the approaches to achieving the needed vertical clearance at these locations are considered the same.

5.1.6 Vibration

NSR conducted a vibration analysis for the Pittsburgh Vertical Clearance Projects corridor in consideration of guidance provided by the Pennsylvania History Code (see **Appendix F**). It is anticipated that there will be no impacts as a result of any alternative. Currently, the study corridor is defined as "heavily used" (i.e., more than 12 freight trains per day). Under future conditions there is no change to the train speeds or track locations, other than small reductions in vertical alignment in areas that would result in a negligible change in vibration. Therefore, both the No Build Alternative and Alternatives 2, 3, and 4 would only result in an increase in the number of trains per day. However, because the number of trains is not predicted to result in an increase of 3 VdB or greater at any vibration-sensitive land uses, there would be no vibration impacts under any of the alternatives.

5.2 Engineering Considerations

5.2.1 Roadway

W. North Avenue and Brighton Road intersect at a signalized 90 degree at-grade intersection. W. North Avenue is classified as a Neighborhood Collector with a design speed of 25 mph. Brighton Road is classified as a Community Collector with a design speed of 30 mph. W. North Avenue is currently a curbed roadway with one lane in each direction and an additional left turn lane provided on each side of the intersection. There are parking lanes adjacent to the eastbound lane on the west side of the intersection, prior to Rope Way, as well as adjacent to both lanes on the east side of the intersection. Brighton Road is also a curbed section with pavement markings that were recently replaced in 2021 with bike lanes in both directions, one 10' travel lane in both directions, and one additional 10' turn lane in each direction approaching the intersection. There are also 8' parking lanes in the northbound direction between Beech Avenue and West Ohio Street/Western Avenue and in the northbound direction just north of Eloise Street. Sidewalks are located on both sides of both roadways. Allegheny Commons Park, West Park Court apartments, and other businesses and residences are adjacent to the project area and border the existing sidewalk.

The existing vertical grades on all approaches to the intersection vary to a maximum 5% with a crest curve over the railroad. Both roadways are generally flat with grades of less than 5% farther away from the intersection.

5.2.2 Structure

The W. North Avenue/Brighton Road superstructure consists of two main, splayed through girders along the exterior and riveted steel, built-up floor beams along the interior that either frame into the through girders or span from abutment to abutment. The through girders are built-up, riveted steel members encased in concrete. The steel floor beams and diaphragms are also encased in concrete. The bridge is 88' in length with a curb-to-curb roadway width of 36' plus 11'-wide sidewalks on each side of the bridge. The bridge's substructure consists of reinforced concrete abutments and wingwalls. Adjacent sections of concrete retaining walls in the depressed railroad corridor have rock-faced, cut sandstone capstones. The structure carries four lanes of traffic on Brighton Road and three lanes of traffic on W. North Avenue.

The existing vertical clearance is 18'-2" above the tracks and does not meet minimum design requirements. The bridge is in fair to poor condition based on the most recent Bridge Inspection Report dated June 2021 and is currently posted for a 10-ton single vehicle and 19-ton combination vehicle weight restriction (Mackin Engineering Company 2021). The W. North Avenue Bridge superstructure is rated 4 or "poor condition" as the result of overall steel corrosion and collision damage to the bottom flange and web; the diaphragm at the location of the collision damage is bent as well. The bridge substructure is rated 5 or "fair condition"; all primary structural elements are sound but may have minor section loss, cracking, and spalling. The fascia girders are through girders, which are fracture critical and may result in a collapse or partial collapse of the bridge if they were to fail. The areas where cracking is likely to develop is underneath the gunite coating, which cannot be visually inspected. This structure does not have a drainage system but drains along the curbs to the end of structure.

The substructure consists of reinforced concrete abutments on spread footings for the south and north abutments. The substructure is fair, and all primary structural elements are sound but may have minor section loss, cracking, and spalling. At both abutments, the reinforced concrete backwall exhibits vertical cracking, some of which are 1/8" to 1/16" in width. On the bridge seats, one pedestal is spalled and there is undermining of some of the masonry plates. The concrete stem is in satisfactory condition with scaling and map cracking throughout.

5.2.3 Right-Of-Way

Minor right-of-way impacts, such as temporary easements for construction and sliver takes, are anticipated for Alternatives 2 and 4 for work along the sidewalks in the northwest, northeast, and southeast quadrants of the intersection, including impacts to the Allegheny Commons Park for fill slopes as described below. A larger permanent take is anticipated from the vacant parcel in the southwest quadrant due to the widening of W. North Avenue and an embankment slope. Temporary easements are also anticipated along the rail line for the construction of the wall buttressing in Alternative 3, including temporary impacts to Allegheny Commons Park.

5.2.4 Utilities

Utilities near the intersection of W. North Avenue and Brighton Road include 30" and 48" PWSA brick combination sewers along W. North Avenue and Brighton Road that combine into a 72" combination sewer that then flows southeast along the railroad retaining wall through the park. PWSA 16" and 24" waterlines are present along both approaches of W. North Avenue, the north approach of Brighton Road, and under the right-turn bypass from W. North Avenue to Brighton Road. A fire hydrant is located in the sidewalk on the northwest quadrant. Peoples Gas Company maintains a 6" gas line along Brighton Road and an 18" gas line along W. North Avenue that cross under the existing bridge deck. A Verizon duct bank runs along the north side of W. North Avenue and crosses under the existing bridge deck. Duquesne Light maintains an underground electric line along W. North Avenue and Brighton Road that crosses under the existing bridge deck. There are existing utility poles that carry aerial electric lines along W. North Avenue west of the intersection and along Brighton Road north of the intersection. A PWSA 30" lead-caulked cast iron water main and a Duquesne Light primary electric line (345kV/138kV) in two 8-5/8" oil-cooled steel conduits that cross under the railroad tracks and continue under Beech Avenue are located approximately 300' southeast of the W. North Avenue Bridge.

5.3 Alternatives Description and Evaluation

5.3.1 Alternative 1—No Build Alternative

This alternative would consist of doing nothing to the existing W. North Avenue Bridge. However, this alternative would not meet the project purpose and need. While the No Build Alternative would not meet the purpose and need of the project, it is carried into the alternatives analysis as a basis of comparison with the Build alternatives.

5.3.2 Alternative 2—Replace and raise bridge to achieve 22' vertical clearance

Alternative 2 would raise the bridge to achieve 22' of vertical clearance over the railroad corridor. Roadway approach work along W. North Avenue would extend approximately 180' to the west and 240' to the east of the bridge. Roadway approach work along Brighton Road would extend approximately 210' to the south and 355' to the north of the bridge. Approach work would include roadway pavement and sidewalk reconstruction, including the construction of retaining walls and toe walls with pedestrian railings. Due to the profile change, side street adjustments would be required along Rope Way, Beech Avenue, Eloise Street, and the Buncher Company property driveway at 1201 Brighton Road.

The existing lane configuration, including the Brighton Road bike and parking lanes, will be maintained in Alternative 2. A right turn bypass from eastbound W. North Avenue to southbound Brighton Road will be eliminated to exclude free flow traffic due to limited sight distance. "No Turn on Red" signs will be installed to increase safety. (Note: existing sight distance requirements are not met at this location either.)

The proposed vertical alignment would increase the profile grade to a maximum of 8% on W. North Avenue and 7% on Brighton Road to meet American Association of State Highway and Transportation Officials (AASHTO) standards for urban collectors. Sidewalk grades would follow the roadway profile with the exception of the sidewalk in the northwest quadrant, which is proposed to have a sidewalk length of approximately 90' consisting of a maximum of 30' lengths at 8.3% with three 5' long level landings for ease of pedestrian and wheeled assistance and consistent with applicable design, safety, and Americans with Disabilities Act (ADA) guidelines. The ramp runs would be separated from the roadway with a proposed landscape area in order to maintain access to the existing entry door at 810-822 W. North Avenue.

During the alternative development process, a more gradual profile grade adjustment was explored for W. North Ave utilizing a 7.25% grade from Rope Way to Brighton Road and 5% grade from Brighton Road to Buena Vista Street. This profile alternative extended the impacts 250' west of Rope Way, resulted in a bifurcated sidewalk, and further impacting garage and other entrances along the roadway. After coordination with the City, this alternative was removed from consideration due to impacts to historic properties and maintenance concerns.

The profile change would result in approximately 375' of toe wall with a bicycle-height fence along the exterior edge of the reconstructed sidewalk along both sides of Brighton Road on portions of each approach to the raised bridge. A 27' retaining wall with a protective fence would be needed in the northwest quadrant along W. North Avenue between the bridge and the proposed stairs to the existing walkway along the eastern exterior of the 810-822 W. North Avenue building due to the elevation difference between the sidewalk and the ground adjacent to the railroad corridor. Proposed fencing would be set along the exterior edge of the sidewalk in the southwest and northeast quadrants.

Both W. North Avenue and Brighton Road would be temporarily closed to traffic during bridge reconstruction. Brighton Road traffic would have a 2.5-mile detour across the Pennsylvania Avenue and West Ohio Street bridges. W. North Avenue traffic would have a 1.5-mile detour across the West Ohio Street Bridge.

Property impacts under Alternative 2 would include temporary construction impacts due to sidewalk replacement, driveway adjustments, and retaining wall and toe wall construction along several of the adjacent properties, along with permanent property acquisitions for embankment slopes in all four quadrants. Fill slopes in Allegheny Commons Park due to the bridge raising and bridge construction would require both permanent property takes consisting of sliver takes for fill slopes and temporary construction easements. The permanent property impact in the park would be approximately 0.09 acre consisting of sliver takes for fill slopes in the southeast quadrant of the project. The temporary impact in the park would be approximately 0.04 acre.

Utilities that would be impacted under Alternative 2 include utility poles along W. North Avenue west of the intersection and along Brighton Road north of the intersection. Verizon, Level 3, and Duquesne Light ductbanks, as well as the Peoples Natural Gas 18” gas line that cross along the existing bridge, would be replaced and installed on the new bridge structure. The existing fire hydrant would need to be removed and reset. Existing water and gas valves would need to be grade adjusted at their existing locations.

Alternative 2 would require the entire existing superstructure to be removed and the existing abutments to be increased in height and modified to facilitate the new superstructure. The proposed span length is 65’-9” measured from the centerline of bearings at Abutment 1 to the centerline of bearings at Abutment 2. This represents an increase of approximately 5.75’ over the existing span length (2.875’ at each abutment) to improve abutment stability considering the increased heights and increased superstructure reactions.

The proposed superstructure is a single-span prestressed concrete spread box beam bridge. The reinforced concrete deck would be 8” thick and is supported by 33 concrete box beams. The box beams would be flared, ranging in spacing from 6’-0” center to center at Abutment 2 to 7’-9 7/8” (-) center to center at Abutment 1, with three beams along the centerline of the bridge at 7’-9 7/8” (-), as required by the configuration of roadway lanes on the bridge. The box beams would be 48” wide and 30” deep.

The existing abutments would be increased in height to facilitate the increased vertical clearance. In addition, Abutment 2 would be lengthened to correspond with the new superstructure plan-view configuration. Backwalls would not be required for the revised abutments. Approach slabs would be provided at each abutment with sleeper slabs and pavement relief joints. The possibility of replacing backfill with lightweight material to reduce lateral loading would be considered with this alternative.

Alternative 2 is anticipated to have a low potential for waste management impacts. Management of contaminated groundwater is not expected for Alternative 2. Special provisions may be required for the management of painted steel in accordance with applicable Federal, state, and local requirements. In the event that historic fill containing potential hazardous materials (i.e., slag, cinders, and fly ash) is encountered during construction, special provisions will be developed to address the management and disposal of these materials.

Alternative 2 activities that could affect historic properties include the replacement of the W. North Avenue Bridge superstructure; repairs to the substructure necessary to raise the bridge; increasing the vertical grade of the bridge approaches and sidewalks; side street adjustments to accommodate the roadway profile change; temporary construction impacts due to sidewalk replacement, driveway adjustments and retaining wall and toe wall construction along several of the adjacent properties; permanent property acquisitions for embankment slopes in all four quadrants; and permanent property takes and temporary construction easements required for fill slopes in Allegheny Commons Park due to the bridge raising and construction.

Alternative 2 has a high potential to affect the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District. The alternative would require replacement of the W. North Avenue Bridge superstructure and repairs to the substructure necessary to raise the bridge. The W. North Avenue Bridge is a contributing element of the NRHP-eligible railroad corridor historic district, and its removal would affect the characteristics of the historic district that qualify it for NRHP eligibility. The existing through-girder superstructure would be replaced with a single-span prestressed concrete spread box beam bridge and would result in a substantial visual change within the railroad corridor historic district. The expanded footprint of the bridge to the southeast and northwest would alter and obscure the concrete retaining walls with stone coping, remove portions of the standard railroad safety railings north of the bridge, and remove portions of the decorative wrought-iron fencing south of the bridge in this grade-depressed section of the corridor. All of these elements contribute to the railroad corridor historic district and their removal would affect the characteristics that contribute to the historic significance of the district.

Alternative 2 has a low potential to affect the NRHP-listed Allegheny West Historic District. No project activities would occur within the boundary of the historic district. The proposed vertical alignment adjustment in the 800 block of Beech Avenue would terminate approximately 225' east of the historic district's eastern boundary and its nearest contributing property at 824 Beech Avenue. The vertical alignment adjustment in the 900 block of Brighton Road would terminate approximately 90' north of the historic district's northeast boundary and its nearest contributing property at 913 Brighton Road.

Alternative 2 has a low potential to affect the NRHP-listed Mexican War Streets Historic District. No project activities would occur within the boundary of the historic district. The proposed vertical alignment adjustment in the 700 block of W. North Avenue would terminate approximately 35' west of the historic district's southeast boundary at the corner of W. North Avenue and Buena Vista Street and approximately 185' south of its nearest contributing property at 1201 Buena Vista Street. The proposed vertical alignment adjustment in the 700 block of Eloise Street would terminate approximately 60' west of the historic district's western boundary along Drovers Way and approximately 60' west of its nearest contributing property at 1201 Buena Vista Street.

Alternative 2 has a moderate to high potential to affect the NRHP-listed Allegheny Commons Historic District. The proposed vertical alignment adjustment in the 700 block of W. North Avenue and in the 900 and 1000 blocks of Brighton Road would require temporary construction impacts due to sidewalk replacement, and toe wall construction, and permanent property acquisitions for fill slopes along a small portion of the historic district's north and west boundaries. The permanent property impact in the park would be approximately 0.09 acre and the temporary impact would be 0.04 acre. The replacement W. North Avenue Bridge would incorporate a triangular concrete covering over the railroad corridor extending approximately 35' east of the current outside edge of the present bridge and within the historic district. The existing bus shelter in the 700 block of W. North Avenue would be grade adjusted, and the existing retaining wall and pedestrian railing along the east side of Brighton Road would be replaced with a new retaining wall and pedestrian railing.

Alternative 2 has a moderate potential to affect the NRHP-eligible Allegheny Second Ward Industrial Historic District. Activities within the district would include approximately 160' of roadway approach work within the 800 block of W. North Avenue, a vertical alignment adjustment to Rope Way to accommodate the raised profile adjustment to W. North Avenue, roadway pavement and sidewalk reconstruction, and the construction of a fill slope and a retaining wall, both with pedestrian railings. The proposed vertical alignment adjustment in the 800 block of W. North Avenue would increase the profile grade to a maximum of 8%. Sidewalk grades would follow the roadway profile except for the sidewalk segment fronting the International Harvester Building, a contributing element of the historic district, which would have a sidewalk length of 90' consisting of 30' lengths of 8.3% with three 5' level landings, to meet ADA requirements. The ramp runs would be separated from the roadway with a proposed landscape area in order to maintain access to the building's existing main entrance. While the doorway would not require alteration, the partially infilled first-floor display windows east of the doorway would need to be shortened by raising the limestone water table and sills to accommodate the increased vertical alignment of the sidewalk. This same treatment was used on the building when W. North Avenue was initially grade separated ca. 1906, resulting in the stepped limestone water table seen on the building today. Concrete stairs would be constructed to access the existing walkway along the building's northeast façade, and a 27' retaining wall with a protective fence would be constructed along W. North Avenue between the stairs and the new bridge. The former Hipwell Manufacturing Company complex consists of five separate buildings, all of which contribute to the historic district. The proposed vertical alignment adjustment in the 800 block of W. North Avenue would only affect the eastern-most Hipwell building (825-829 W. North Avenue) where the profile of an approximately 25' segment of sidewalk would be raised to accommodate the new profile of W. North Avenue. The two remaining contributing buildings of the historic district located in the APE, the Katsafanas Coffee Company Building (828 W. North Avenue) and the Allegheny City Stables Building (836 W. North Avenue), would not be directly affected by project activities.

Alternative 2 has a moderate to high potential to affect the NRHP-listed International Harvester Building as noted in the above assessment of the Allegheny Second Ward Industrial Historic District. The building would be directly affected by the shortening of the first-floor display windows, the raising of the limestone water table and windowsills, and the construction of a concrete stair to access an existing walkway along the building's northeast facade.

Alternative 2 has a low potential to affect the NRHP-eligible Allegheny City Stables Building. No project activities would occur within the property boundary. The proposed vertical alignment adjustment in the 800 block of W. North Avenue would terminate approximately 100' east of the property boundary.

Overall, Alternative 2 is anticipated to have a moderate to high potential to impact historic properties.

This alternative would have a high potential to impact Section 2002 resources since it would result in the replacement of the contributing W. North Avenue Bridge superstructure as well as both temporary and permanent impacts to the Allegheny Commons Park/Historic District. It could also result in impacts to the Allegheny Second Ward Industrial Historic District and International Harvester Building, which is both a contributing element of the Second Ward Industrial Historic District and individually listed in the NRHP.

5.3.3 Alternative 3—Replace bridge and lower railroad tracks to achieve 22' vertical clearance

Alternative 3 would lower the railroad tracks to achieve 22' of vertical clearance and replace the bridge at the same roadway elevation. For the track lowering, buttressing of the existing retaining walls and site work would need to be performed for distances well beyond the W. North Avenue crossing. In order to accommodate the approximately 7,228' of required buttressing of the existing bridge abutments and adjacent retaining walls, the number of tracks would need to be reduced from four to three from Federal Street to just north of Pennsylvania Avenue, which would reduce the flexibility and fluidity of Norfolk Southern's operations through the area and incur increased operation costs. The work would entail the removal of all four tracks and associated turnouts and the reconfiguration of the CP Penn interlocking within the project limits. This would result in the significant interruption of interstate freight rail through the region. A new CP Penn interlocking would be constructed in addition to a new interlocking at Federal Street where the Conemaugh Line would be reduced from two tracks to one track. Approximately 7,700 track feet (TF) of new track, 16 new turnouts, and approximately 8,900 TF of track lining would be installed. Retaining present operational capacity with four tracks would be significantly more expensive, requiring the replacement of the existing retaining walls, potential impacts to three properties, major impacts to park property, and additional utility relocations.

The roadway work would require replacing existing approach slabs, reconstructing the W. North Avenue and Brighton Road intersection to the limits of the ADA ramps, highway lighting upgrades, traffic signal upgrades, and widening the western approach of W. North Avenue to Rope Way to provide the necessary lane configuration. Roadway approach work along W. North Avenue would extend approximately 150' to the west and 80' to the east of the bridge. Roadway approach work along Brighton Road would extend approximately 60' to the south and 80' to the north of the bridge. Existing bike lanes along Brighton Road would be maintained. A right turn bypass from eastbound W. North Avenue to southbound Brighton Road will be eliminated to exclude free flow traffic due to limited sight distance. "No Turn on Red" signs would be installed to increase safety. (Note: existing sight distance requirements are not met at this location either.)

Both W. North Avenue and Brighton Road would be closed to traffic during bridge reconstruction. Brighton Road traffic would have a 2.5-mile detour across the Pennsylvania Avenue and West Ohio Street Bridges. W. North Avenue traffic would have a 1.5-mile detour across the West Ohio Street Bridge.

Temporary construction easements would also be required along several properties, including through Allegheny Commons Park, for the construction of the wall buttressing. The temporary construction easements through the park would be approximately 0.94 acre of temporary disturbance.

Utilities that would be impacted under Alternative 3 include utility poles along W. North Avenue west of the intersection and along Brighton Road north of the intersection. Verizon, Level 3, and Duquesne Light ductbanks, as well as the Peoples Natural Gas 18" gas line, that cross along the existing bridge would be replaced and installed on the new bridge structure. The existing fire hydrant would need to be removed and reset. Existing water and gas valves would need to be grade adjusted in the vicinity of the bridge approach work. The PWSA 30" watermain and the 345kV/138kV high voltage Duquesne Light primary line would also need to be relocated. The relocations of the 30" watermain and 345kv/138kv high voltage Duquesne Light primary are both significant mains that would require considerable impacts outside the general project limits including: temporary interruptions to services; substantial coordination between the project design and construction teams and each utility; deep jack and bore pits to jack the utilities under the PWSA combined sewer; impacts to the Brighton and Beech intersection; and impacts to the park.

Alternative 3 would require the removal of the entire existing superstructure and require the existing abutments to be modified in height and width to facilitate the new superstructure. The proposed superstructure would be a single-span prestressed concrete spread box beam bridge. The reinforced concrete deck would be 8" thick and would be supported by 33 concrete box beams measuring 48" wide and 30" deep. The box beams would be flared, ranging in spacing from 6'-0" center to center at Abutment 2 to 7'-9 7/8" (-) center to center at Abutment 1, with three beams along the centerline of bridge at 7'-9 7/8" (-), as required by the configuration of the roadway lanes on the bridge. Abutment 2 would be lengthened to correspond with the new superstructure plan-view configuration. Backwalls would not be required for the revised abutments. Approach slabs would be provided at each abutment with sleeper slabs and pavement relief joints.

Alternative 3 is anticipated to have a moderate to high impact relative to the other alternatives for waste management due to the increased potential for management of contaminated historic fill and groundwater. Excavation is likely to require dewatering. Shallow groundwater was encountered just below the surface when test pits were excavated along the railroad retaining wall in 2020. Special provisions would be prepared for the testing, management, and disposal of historic fill and groundwater if encountered during construction. Special provisions would also be developed to properly manage painted steel during repairs, removal, and/or repainting similar to the other alternatives.

Alternative 3 activities that could affect historic properties include the replacement of the W. North Avenue bridge superstructure; modifications in height and width to the existing abutments to facilitate the new superstructure; roadway work, including replacing existing approach slabs, reconstructing the W. North Avenue and Brighton Road intersection to the limits of the ADA ramps, and widening the western approach of W. North Avenue and Rope Way to provide the necessary lane configuration; the buttressing of approximately 7,228' of existing retaining walls and bridge abutments; the reduction in the number of tracks from four to three; and temporary construction easements affecting several properties, including the Allegheny Commons Historic District.

Alternative 3 has a high potential to affect the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District. The alternative would require replacement of the W. North Avenue Bridge superstructure and repairs to the substructure necessary to raise the bridge. The W. North Avenue Bridge is a contributing element of the NRHP-eligible railroad corridor historic district, and its removal would affect the characteristics of the historic district that qualify it for NRHP eligibility. The existing through-girder superstructure would be replaced with a single-span prestressed concrete spread box beam bridge and would result in a substantial visual change within the railroad corridor historic district. The expanded footprint of the bridge to the southeast and northwest would alter and obscure the concrete retaining walls with stone coping, remove portions of the standard railroad safety railings north of the bridge, and remove portions of the decorative wrought-iron fencing south of the bridge in this grade depressed section of the corridor. All of these elements contribute to the railroad corridor historic district and their removal would affect the characteristics of the historic district that qualify it for NRHP eligibility. Minor repairs to the bridge's substructure, the removal of ballast, and the removal of one track would not affect the characteristics of the railroad corridor historic district that qualify it for NRHP eligibility. However, the required buttressing of approximately 7,228' the concrete retaining walls to provide stability necessary for track lowering would alter the design of the walls and reduce the clear width of the railroad corridor, which contribute to the character of the historic district, resulting in a high potential to impact the historic property.

Alternative 3 has a low potential to affect the NRHP-listed Allegheny West Historic District. No project activities would occur within the boundary of the historic district. The proposed roadway work in the 1000 block of Brighton Road would terminate approximately 275' north of the historic district's northeast boundary and nearest contributing property at 913 Brighton Road and would be located approximately 240' east of the historic district's eastern boundary and nearest contributing property at 824 Beech Avenue.

Alternative 3 has a low potential to affect the NRHP-listed Mexican War Streets Historic District. No project activities would occur within the boundary of the historic district. The proposed roadway work in the 700 block of W. North Avenue would terminate approximately 175' west of the historic district's southeast boundary at the corner of W. North Avenue and Buena Vista Street.

Alternative 3 has a moderate potential to affect the NRHP-listed Allegheny Commons Historic District. Temporary construction easements would be required for the construction of the wall buttressing. The temporary construction easements through the park would be approximately 0.94 acre. The replacement W. North Avenue Bridge would incorporate a triangular concrete covering over the railroad corridor extending approximately 35' east of the current outside edge of the present bridge and within the historic district.

Alternative 3 has a low potential to affect the NRHP-eligible Allegheny Second Ward Industrial Historic District. No project activities would occur within or adjacent to the property boundaries of the district's contributing buildings within the APE, including the International Harvester Building (810-822 W. North Avenue), the Katsafanas Coffee Company Building (828 W. North Avenue), the Allegheny City Stables Building (836 W. North Avenue), and the five buildings comprised by the former Hipwell Manufacturing Company complex (825-839 W. North Avenue). Project activities adjacent to the district's southern boundary along W. North Avenue and Rope Way would include the proposed bridge replacement and approach slab work and the widening of the western approach of W. North Avenue and Rope Way. While both activities would be within the viewshed of the district, the visual impact would be minor and would not affect the characteristics of the historic district that qualify it for the NRHP.

Alternative 3 has low potential to affect the NRHP-listed International Harvester Building as noted in the above assessment of the Allegheny Second Ward Industrial Historic District. No project activities would occur within or next to the property boundary. The proposed bridge replacement and approach slab work would terminate approximately 25' east of the property boundary, and the widening of the western approach of W. North Avenue and Rope Way to provide the necessary lane configuration would be located approximately 40' south of the building's south (front) façade. While both activities would be within the viewshed of the building, the visual impact to the International Harvester Building would be minor and would not affect the characteristics of the property that qualify it for the NRHP.

Alternative 3 has a low potential to affect the NRHP-eligible Allegheny City Stables Building. No project activities would occur within the property boundary. The proposed widening of the western approach of W. North Avenue and Rope Way in the 800 block of W. North Avenue would terminate approximately 130' east of the property boundary.

Overall, Alternative 3 is anticipated to have a moderate to high potential to impact historic properties.

This alternative would have a high potential to impact Section 2002 resources since it would result in the replacement of the contributing W. North Avenue Bridge superstructure as well as potential impacts to the Allegheny Commons Park/Historic District.

5.3.4 Alternative 4—Combination replace and raise bridge and lower railroad tracks to achieve 22' vertical clearance

Alternative 4 would raise the bridge a maximum of 3'-9" and lower the railroad tracks approximately 6" under the bridge to achieve 22' of vertical clearance over the railroad tracks. Roadway approach work along W. North Avenue would extend approximately 155' to the west and 240' to the east of the bridge. Roadway approach work along Brighton Road would extend approximately 210' to the south and 340' to the north of the bridge. Approach work would include roadway pavement and sidewalk reconstruction, including the construction of a retaining wall in the northwest quadrant and toe walls with pedestrian railings along Brighton Road. Due to the profile change, side street adjustments are required along Beech Avenue, Eloise Street, and the Buncher property driveway at 1201 Brighton Road.

The existing lane configuration, including the Brighton Road bike and parking lanes, would be maintained in Alternative 4. A right turn bypass from eastbound W. North Avenue to southbound Brighton Road would be eliminated to exclude free flow traffic due to limited sight distance. "No Turn on Red" signs would be installed to increase safety. (Note: existing sight distance requirements are not met at this location either.)

The proposed vertical alignment would increase the profile grade to be a maximum of 8% on W. North Avenue and a maximum of 6.8% on Brighton Road. Sidewalk grades would follow the roadway profile, with the exception of the sidewalk in the northwest quadrant, which is proposed to have a sidewalk length of 40' with ramp runs of 8.3% and two 5' level landings. The ramp runs would be separated from the roadway with a proposed landscape area in order to maintain access to the existing entry door at 810-822 W. North Avenue.

The profile change would result in approximately 365' of toe wall with a pedestrian handrail along the exterior edge of the reconstructed sidewalk along both sides of Brighton Road on both approaches to the raised bridge. A retaining wall of 27' with a protective fence would be needed in the northwest quadrant along W. North Avenue between the bridge and the proposed stairs to the existing walkway along the exterior of the 810-822 W. North Avenue building. Proposed fencing would be set along the exterior edge of the sidewalk in the southwest and northeast quadrants.

Work along the railroad corridor to lower the railroad tracks to the required elevation based on the necessary track design requirements would extend a total of approximately 3,310'. This total length includes approximately 1,225' southeast of the bridge, terminating just north of the West Ohio Street Bridge, and approximately 2,085' northwest of the bridge, terminating between the Pennsylvania Avenue and Columbus Avenue bridges. Several turnouts within the trackwork limits would require adjusting and the switching lead into the yard would need to be raised and adjusted.

Both W. North Avenue and Brighton Road would be closed during bridge reconstruction. Brighton Road traffic would have a 2.5-mile detour across the Pennsylvania Avenue and West Ohio Street bridges. W. North Avenue traffic would have a 1.5-mile detour across the West Ohio Street Bridge.

Property impacts under Alternative 4 would include temporary construction impacts due to sidewalk replacement, driveway adjustments, and retaining wall and toe wall construction along several of the adjacent properties, along with permanent property acquisitions for embankment slopes in all four quadrants. Fill slopes in Allegheny Commons Park due to the bridge raise and the bridge construction phase would require both permanent property takes and temporary construction easements. The permanent property impact in the park would be approximately 0.09 acre and the temporary impact would be 0.04 acre.

Utilities that would be impacted under Alternative 4 include utility poles along W. North Avenue west of the intersection and along Brighton Road north of the intersection. Verizon, Level 3, and Duquesne Light ductbanks, as well as the Peoples Natural Gas 18" gas line that cross along the existing bridge, would be replaced and installed on the new bridge structure. The existing fire hydrant would need to be removed and reset. Existing water and gas valves would need to be grade adjusted. The PWSA 30" watermain and the 345kV/138kV high voltage Duquesne Light primary line would need to be assessed for probable relocation due to a reduction in cover/embankment. If relocation is required, the 30" watermain and 345kv/138kv high voltage Duquesne Light primary are both significant mains that would require considerable impacts outside the general project limits including: temporary interruptions to services; substantial coordination between the project design and construction teams and each utility; deep jack and bore pits to jack the utilities under the PWSA combined sewer; impacts to the Brighton and Beech intersection; and impacts to the park.

Alternative 4 would require the removal of the entire existing superstructure and require the existing abutments to be modified in height and width to facilitate the new superstructure. The proposed superstructure would be a single-span prestressed concrete spread box beam bridge. The reinforced concrete deck would be 8" thick and would be supported by 33 concrete box beams measuring 48" wide and 30" deep. The box beams are flared, ranging in spacing from 6'-0" center to center at Abutment 2 to 7'-9 7/8" (-) center to center at Abutment 1, with three beams along the centerline of bridge at 7'-9 7/8" (-), as required by the configuration of roadway lanes on the bridge. Abutment 2 would be lengthened to correspond with the new superstructure plan-view configuration. Backwalls are not required for the revised abutments. Approach slabs would be provided at each abutment with sleeper slabs and pavement relief joints. The possibility of replacing backfill with lightweight material to reduce lateral loading would be considered with this alternative.

Alternative 4 is anticipated to have a low to moderate impact relative to the other alternatives for waste management due to the moderate potential for management of contaminated historic fill and groundwater. It is unlikely that groundwater would be encountered for Alternative 4. Special provisions would be prepared for the testing, management, and disposal of historic fill, if encountered during construction. Special provisions would also be developed to properly manage painted steel during repairs, removal, and/or repainting similar to other alternatives.

Alternative 4 activities that could affect historic properties include the replacement of the W. North Avenue bridge superstructure; repairs to the substructure necessary to raise the bridge; approximately 3,310' of track lowering, increasing the vertical grade of the bridge approaches and sidewalks; side street adjustments to accommodate the roadway profile change; temporary construction impacts due to sidewalk replacement, driveway adjustments, and retaining wall and toe wall construction along several of the adjacent properties; permanent property acquisitions for embankment slopes in all four quadrants; and permanent property takes and temporary construction easements required for fill slopes in Allegheny Commons Park due to the bridge raising and construction.

Alternative 4 has a high potential to affect the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District. The alternative would require replacement of the W. North Avenue Bridge superstructure, repairs to the substructure necessary to raise the bridge, and approximately 3,310' of track lowering. The W. North Avenue Bridge is a contributing element of the NRHP-eligible railroad corridor historic district, and its removal would affect the characteristics of the historic district that qualify it for NRHP eligibility. The existing through-girder superstructure would be replaced with a single-span prestressed concrete spread box beam bridge and would result in a substantial visual change within the railroad corridor historic district. The expanded footprint of the bridge to the southeast and northwest would alter and obscure the concrete retaining walls with stone coping, remove portions of the standard railroad safety railings north of the bridge, and remove portions of the decorative wrought-iron fencing south of the bridge in this grade depressed section of the corridor. All of these elements contribute to the railroad corridor historic district and their removal would affect the characteristics of the historic district that qualify it for NRHP eligibility. The removal of ballast for the track lowering, however, would not affect the characteristics of the historic district that qualify it for NRHP eligibility.

Alternative 4 has a low potential to affect the NRHP-listed Allegheny West Historic District. No project activities would occur within the boundary of the historic district. The proposed vertical alignment adjustment in the 800 block of Beech Avenue would terminate approximately 225' east of the historic district's eastern boundary and nearest contributing property at 824 Beech Avenue. The vertical alignment adjustment in the 900 block of Brighton Road would terminate approximately 90' north of the historic district's northeast boundary and nearest contributing property at 913 Brighton Road.

Alternative 4 has a low potential to affect the NRHP-listed Mexican War Streets Historic District. No project activities would occur within the boundary of the historic district. The proposed vertical alignment adjustment in the 700 block of W. North Avenue would terminate approximately 35' west of the historic district's southeast boundary at the corner of W. North Avenue and Buena Vista Street and approximately 185' south of its nearest contributing property at 1201 Buena Vista Street. The proposed vertical alignment adjustment in the 700 block of Eloise Street would terminate approximately 60' west of the historic district's western boundary along Drovers Way and approximately 60' west of its nearest contributing property at 1201 Buena Vista Street.

Alternative 4 has a moderate to high potential to affect the NRHP-listed Allegheny Commons Historic District. The proposed vertical alignment adjustment in the 700 block of W. North Avenue and in the 900 and 1000 blocks of Brighton Road would require temporary construction impacts due to sidewalk replacement and toe wall construction, and permanent property acquisitions for fill slopes along a small portion of the historic district's north and west boundaries. The permanent property impact in the park would be approximately 0.09 acre and the temporary impact in the park would be 0.04 acre. The replacement W. North Avenue Bridge would incorporate a triangular concrete covering over the railroad corridor extending approximately 35' east of the current outside edge of the present bridge and within the historic district. The existing bus shelter in the 700 block of W. North Avenue would be grade adjusted, and the existing retaining wall and pedestrian railing along the east side of Brighton Road would be replaced with a new retaining wall and pedestrian railing.

Alternative 4 has a moderate potential to affect the NRHP-eligible Allegheny Second Ward Industrial Historic District. Activities within the district would include approximately 160' of roadway approach work within the 800 block of W. North Avenue, a vertical alignment adjustment to Rope Way to accommodate the raised profile adjustment to W. North Avenue, roadway pavement and sidewalk reconstruction, and the construction of a fill slope and a retaining wall, both with pedestrian railings. The proposed vertical alignment adjustment in the 800 block of W. North Avenue would increase the profile grade to a maximum of 8%. Sidewalk grades would follow the roadway profile except for the sidewalk segment fronting the International Harvester Building, a contributing element of the historic district, which would have a sidewalk length of 90' consisting of 30' ramp runs of 8.3% with two 5' level landings. The ramp runs would be separated from the roadway with a proposed landscape area in order to maintain access to the building's existing main entrance. While the doorway would not require alteration, the partially infilled first-floor display windows east of the doorway would need to be shortened by raising the limestone water table and sills to accommodate the increased vertical alignment of the sidewalk. This same treatment was used on the building when W. North Avenue was initially grade separated ca. 1906, resulting in the stepped limestone water table seen on the building today. Concrete stairs would be constructed to access the existing walkway along the building's northeast façade, and a 27' retaining wall with a protective fence would be constructed along W. North Avenue between the stairs and the new bridge. The former Hipwell Manufacturing Company complex consists of five separate buildings, all of which contribute to the historic district. The proposed vertical alignment adjustment in the 800 block of W. North Avenue would only affect the eastern-most Hipwell building (825-829 W. North Avenue) where the profile of an approximately 25' segment of sidewalk would be raised to accommodate the new profile of W. North Avenue. The two remaining contributing buildings of the historic district located in the APE, the Katsafanas Coffee Company Building (828 W. North Avenue) and the Allegheny City Stables Building (836 W. North Avenue), would not be directly affected by project activities.

Alternative 4 has a moderate to high potential to affect the NRHP-listed International Harvester Building as noted in the above assessment of the Allegheny Second Ward Industrial Historic District. The building would be directly affected by the shortening of the first-floor display windows, the raising of the limestone water table and windowsills, and the construction of a concrete stair to access an existing walkway along the building's northeast facade.

Alternative 4 has a low potential to affect the NRHP-eligible Allegheny City Stables Building. No project activities would occur within the property boundary. The proposed vertical alignment adjustment in the 800 block of W. North Avenue would terminate approximately 100’ east of the property boundary.

Overall, Alternative 4 is anticipated to have a moderate to high potential to impact historic properties.

This alternative would have a high potential to impact Section 2002 resources since it would result in the replacement of the contributing W. North Avenue Bridge superstructure as well as both temporary and permanent impacts to the Allegheny Commons Park/Historic District. It could also result in impacts to the Allegheny Second Ward Industrial Historic District and International Harvester Building, which is both a contributing element of the Second Ward Industrial Historic District and individually listed in the NRHP.

5.3.5 Alternatives Comparison Summary

Alternative 1 would not meet the needs of the project and therefore can be eliminated from consideration. Alternative 2 would meet the project need and would result in the lowest construction cost and utility impacts but would require the most property impacts of any of the alternatives. Alternative 3 would meet the project need and would have the least property impacts; however, it would have the most utility impacts, would result in the greatest total construction length and cost, and four railroad tracks would not be able to be maintained through the corridor with this alternative. Alternative 4 would meet the project need but would result in the second greatest overall cost and construction length. It would also result in similar utility impacts as Alternative 3. When accounting for impacts to the surrounding community, project complexity, and potential historic and Section 2002 property impacts, Alternative 2 is recommended to be advanced for further consideration. A comparison matrix of the four identified alternatives is included in **Appendix D.**

5.3.6 Design Modification Options

A design modification was considered that involves an adjustment to the vertical alignment, typical section, and sidewalk treatment to maintain access to the entry door at the 810-822 W. North Avenue property and limit other property impacts.

The design modification would replace the bridge to 21’-4” vertical clearance instead of 22’-0” vertical clearance, while proposing the same vertical profile grades and impacts along W. North Avenue and Brighton Road as Alternative 2. The W. North Avenue profile has a maximum 8.0% grade on the west approach to the intersection and 7.15% grade on the east approach, with points of reverse vertical curvature on either side tying into flatter slopes from the intersection. The Brighton Road profile has a maximum 6.8% grade on the south approach and a 6.0% grade on the north approach to the intersection, with each of these grades tying into points of reverse vertical curvature on the south and north ends further from the intersection with flatter grades. Similar to Alternative 2, the design modification would maintain the existing lane configuration and bike lanes; however, construction limits of the design modification would be reduced 25’ on the western approach of W. North Avenue and 15’ on the northern approach of Brighton Road compared to Alternative 2 due to the lower vertical clearance over the railroad. The eastern approach of W. North Avenue and the southern approach of Brighton Road tie in at the same point as Alternative 2.

Impacts to utilities would be similar to the impacts from the proposed roadway and bridge work of Alternative 2.

Property impacts under the design modification would include temporary construction impacts due to sidewalk replacement, driveway adjustments, and retaining wall and toe wall construction along several of the adjacent properties, along with permanent property acquisitions for embankment slopes in all four quadrants. Fill slopes in Allegheny Commons Park due to the bridge raise and the bridge construction phase would require both permanent property takes and temporary construction easements. The permanent property impact in the park would be approximately 0.09 acre and the temporary impact would be 0.04 acre.

The design modification would have a reduced impact to the abutment reconstruction due to the lower vertical clearance but there would be no change to the superstructure from Alternatives 2 and 4.

The design modification is anticipated to have no benefit or drawbacks with respect to waste management when applied to Alternative 2.

The design modification is still anticipated to have a moderate to high potential to impact historic properties and high potential to impact Section 2002 resources, but some of the impacts would be minimized.

5.4 Selection of Preferred Alternative

Based on these considerations, Alternative 2–Replace and raise bridge, with the design modification of raising the bridge to 21’-4” vertical clearance is the preferred alternative for the W. North Avenue Bridge Project.

6.0 Pennsylvania Avenue Bridge

The Pennsylvania Avenue Bridge is located in the City of Pittsburgh, Allegheny County, Pennsylvania, and carries Pennsylvania Avenue over NSR tracks. See **Figure 6-1** for a location map.

Alternatives have been identified to address the purpose and need for the Pittsburgh Vertical Clearance Projects and to meet PUC requirements. Below is a brief description of the alternatives that will be discussed in further detail later in this chapter:

- Alternative 1 - No Build Alternative
- Alternative 2 - Replace and raise bridge to achieve 22’ vertical clearance
- Alternative 3 - Repair substructure and lower railroad tracks to achieve 22’ vertical clearance
- Alternative 4 - Combination replace and raise bridge and lower railroad tracks to achieve 22’ vertical clearance

In addition to the four alternatives listed above, a design modification to minimize impacts of the preferred alternative was analyzed and is discussed in Section 6.3.6.

Conceptual plans and profiles for each Build alternative as well as typical sections can be found in **Appendix B.** Conceptual cost estimates for each Build alternative can be found in **Appendix C**. An Alternatives Comparison Matrix is included in **Appendix D**.

6.1 Environmental Considerations

As noted in Chapter 1, this section discusses those resources that could influence the selection of a preferred alternative for this project location. The Act 120 document will analyze impacts of the preferred alternative on these and the remaining 23 resource categories.

6.1.1 Hazardous or Residual Waste

The potential for contaminated materials was identified during the Phase I ESA conducted for the Pennsylvania Avenue Bridge Project and are as follows:

- The bridge paint has been confirmed to contain cadmium, chromium, and lead. All work will comply with applicable lead material handling, safety, and disposal requirements.
- Shallow soil under the Pennsylvania Avenue Bridge may have been impacted by flaking lead-based paint.
- At some locations, black surface staining is present on the railroad ties and ballast.
- Historic fill (e.g., slag, cinders and fly ash) may be present beneath the railroad ballast, since these materials have been commonly used as fill in Allegheny County. These materials sometimes contain elevated concentrations of metals and/or polynuclear aromatic hydrocarbons (PAHs).
- It should be noted that groundwater contamination sources may be present upgradient of the site. Most of the planned Build alternatives are not expected to encounter the uppermost aquifer. However, alternatives that require deep foundations and dewatering may encounter contamination within the uppermost aquifer. Furthermore, isolated lenses of contaminated perched groundwater may be present within the railroad ballast that could impact construction costs related to track-lowering alternatives.

6.1.2 Historic Properties

The APE for the proposed undertaking contains two historic districts: the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District and the Allegheny Second Ward Industrial Historic District. As part of the current study, contributing elements of the railroad corridor historic district were identified within the approximately 265' segment of the corridor contained within the APE. Project historians identified the concrete retaining walls with stone coping along the northeast and southwest edges of this depressed section of the corridor, standard railroad safety railings, and decorative wrought-iron fencing, all of which are attributable to an early-twentieth-century, grade-separation project as contributing elements of the railroad corridor historic district. The project APE contains one contributing building within the Allegheny Second Ward Industrial Historic District, the "House of Metals" (Williams & Company) building, located at 901 Pennsylvania Avenue.

6.1.3 Section 2002 Resources

There are two Section 2002 resources located in the project vicinity as discussed in the previous section, the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District and the Allegheny Second Ward Industrial Historic District. Since the Pennsylvania Avenue Bridge is a noncontributing element of the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District, there will not be a Section 2002 impact to this resource regardless of which alternative is selected.

6.1.4 Air Quality

The current National Ambient Air Quality Standard designations for the Pittsburgh area pollutants are:

- Marginal nonattainment for the 2008 ozone standard
- Maintenance for the 1971 carbon monoxide standard
- Maintenance for the 2006 PM2.5 standard
- Moderate nonattainment for the 2012 PM2.5 standard
- Nonattainment for the 2010 SO2 standard
- Attainment for lead
- Attainment for NO2

The proposed project will not have a direct effect on air quality with the exception of minor construction related emissions for Alternatives 2, 3 and 4, which would consist of construction equipment regulated under EPA emission standards. NSR has conducted a project-level air quality analysis for the Pittsburgh Vertical Clearance Projects corridor to evaluate secondary or indirect effects on air quality (see **Appendix E**). A general conformity determination is not required since there is no federal action or federal money being used for the project. The No Build Alternative would not result in any impacts to air quality. However, due to the inability to utilize more efficient double-stack containers and the need for additional train trips to accommodate future forecasted freight needs, with a commensurate increase in locomotive emissions for single-stack trains, future emissions would increase slightly under the No Build Alternative as compared to Alternatives 2, 3, and 4 where the more efficient double-stack trains would allow for fewer trains and lower locomotive emissions for the same freight needs. It is anticipated that Alternatives 2, 3, and 4 would have similar impacts on emissions levels. Therefore, from an emissions perspective, any of the approaches to achieving the needed vertical clearance at these locations are considered the same. With the Build alternatives, there would be a slight net reduction in annual regional locomotive operational emissions in comparison to both existing and future 2045 No Build emission levels, and therefore no significant adverse impacts would result with implementation of the project.

6.1.5 Noise

Direct noise effects will be limited to temporary construction related impacts. The No Build Alternative would have no noise effects. Any noise effects of the Build alternatives would be temporary and the difference between Build alternatives would not be significant.

Regarding indirect or secondary effects, NSR has conducted a noise impact assessment to evaluate the potential impacts associated with the Pittsburgh Vertical Clearance Projects corridor (see **Appendix F**). Noise levels would be slightly higher under the No Build Alternative than Alternatives 2, 3, and 4 due to the greater number of single-stack trains that would be required to accommodate future rail traffic demand as compared to the fewer double-stack trains capable of carrying the same amount of rail freight. Under both the low-growth and high-growth scenarios, there were 13 Category 2 and no Category 3 sensitive land use sites above the Surface Transportation Board noise impact threshold identified near the Pennsylvania Avenue Bridge under both the No Build and all of the Build alternatives. It is anticipated that Alternatives 2, 3, and 4 would have a similar impact on noise levels. The variation in vertical alignments of the Build alternatives is small, anticipated to be less than five feet. Changes in the vertical bridge alignment associated with the Build alternatives would result in generally imperceptible differences in noise levels that are within tenths of a decibel of one another. The dominant consideration for noise in these circumstances is the number of trains per day, and that would not be different for any of the Build alternatives for these projects. Therefore, from a noise perspective, any of the approaches to achieving the needed vertical clearance at these locations are considered the same.

6.1.6 Vibration

NSR conducted a vibration analysis for the Pittsburgh Vertical Clearance Projects corridor in consideration of guidance provided by the Pennsylvania History Code (see **Appendix F**). It is anticipated that there will be no impacts as a result of any alternative. Currently, the study corridor is defined as "heavily used" (i.e., more than 12 freight trains per day). Under future conditions, there is no change to the train speeds or track locations other than small changes in vertical alignment in areas that would result in a negligible change in vibration. Therefore, both the No Build Alternative and Alternatives 2, 3, and 4 would only result in an increase in the number of trains per day. However, because the number of trains is not predicted to result in an increase of 3 VdB or greater at any vibration-sensitive land uses, there would be no vibration impacts under any of the alternatives.

6.2 Engineering Considerations

6.2.1 Roadway

Pennsylvania Avenue is classified as a Neighborhood Collector with a design speed of 25 mph. Pennsylvania Avenue is currently a curbed roadway having two lanes in each direction with parking permitted in the outside lane in the eastbound direction. Sidewalks are located on both sides of the roadway between the existing curb and legal right-of-way. The existing lane configuration of two 11'-0" travel lanes in each direction will be maintained. Multiple commercial drive entrances on both sides of the bridge along the north side of the roadway provide access to United States Postal Service (USPS) and other businesses. A large brick building, known as the House of Metals, is located adjacent to the back of sidewalk along the southwest quadrant and provides street-level access to multiple tenants, including the Allegheny County Office of Children, Youth and Families.

The existing vertical grades on both approaches to the bridge vary to a maximum 5% with a crest curve over the railroad. Both roadways are generally flat with grades less than 1% farther away from the intersection.

6.2.2 Structure

The existing bridge is a through-girder, simple-span bridge with a total length of approximately 153'. The roadway is supported by an 8" reinforced concrete composite deck with a 3" asphalt overlay, 32"-high safety shape parapets, and 5'-wide sidewalks on both sides of the bridge. The bridge's substructure consists of reinforced concrete abutments and wingwalls. The reinforced concrete abutments are founded on steel HP piles. Adjacent sections of concrete retaining walls in the depressed railroad corridor date from the early-twentieth-century grade separation project and have rock-faced, cut sandstone capstones. The roadway width is 46'-0" from curb to curb, and it currently carries four lanes of bi-directional traffic.

The existing vertical clearance is 19’-8” above the tracks and does not meet minimum design requirements. The bridge was constructed in 1986. No known significant structural repair or rehabilitation has taken place since the bridge was constructed. The bridge has been inspected approximately every two years. The most recent inspection, conducted in September 2020, found no critical issues and no issues requiring immediate attention. The superstructure consists of two 120” deep welded steel box girders. The box girders support 36” rolled floor beams spaced at approximately 7’-2¼” along the entire length of the bridge. The superstructure is supported by three pot bearings at each abutment. This structure does not have a drainage system but drains along the curbs to the end of structure.

Movement of the existing backwall against the superstructure and beams is undetermined and non-conclusive. Based on visual inspections, the abutments do not appear to have moved significantly to cause separation from surrounding existing walls. However, the movement is visually observed in the backwall area between the superstructure and beam. The overall condition of the substructure is in fair condition. The primary structural elements are sound but may have minor section loss, cracking, and spalling. The top surface of the west abutment backwall is edge spalled and chipped along the expansion dam and approach slab for the full deck width. A few hairline cracks extend across the top and along the vertical face of the backwall, which are visible on the underside. The west seat is generally in good condition, except for the bearing pedestals where additional deterioration was noted. The west right pedestal is edge-cracked and spalled with exposed rebar and adjacent delamination 15" D x 19" H x up to 3' W, which is undermining the masonry plate up to 1-1/2". The center pedestal exhibits a hairline crack from the bottom left corner to the face of the stem. The west left pedestal is in good condition with no issues. The west stem has a few partial to full height minor hairline cracks present. One full height diagonal hairline crack is noted between floor beams 22 and 23. Full height hairline cracks exist under the center pedestal. The east left and right pedestals are edge spalled 5’ W x 1” H x 8” D with voids exposing the anchor bolts and grout pockets. The east stem contains several hairline to fine vertical cracks near the center of the stem.

6.2.3 Right-Of-Way

Minor right-of-way impacts such as temporary easements for construction are anticipated for Alternatives 2 and 4 for construction of sidewalks and sidewalk moment slabs in all quadrants. Temporary easements are also anticipated along the rail line for the construction of the wall buttressing. Small, permanent sliver takes are anticipated from the USPS parcels in the northwest and northeast quadrant for the embankment slope for Alternatives 2 and 4.

6.2.4 Utilities

Utilities in the Pennsylvania Avenue project area include a Peoples Gas 12” steel gas main and a PWSA 12” ductile iron waterline in a 24” steel casing that both cross the existing bridge. Underground electric, underground street lighting, and gas and water service lines are present in the sidewalks. Fire hydrants are located in the sidewalk on all quadrants. Existing aerial utility poles are present on both sides of the roadway at the eastern end of the project.

An existing PWSA 42” combination sewer crosses under the tracks near the Pennsylvania Avenue Bridge. Also, within the NSRR corridor are two parallel fiber optic duct banks. An existing Elantic Fiber Optic duct bank is located on the north side of the tracks and a Century Link (QWEST) duct bank is located on the south side of the tracks.

6.3 Alternatives Description and Evaluation

6.3.1 Alternative 1—No Build Alternative

This alternative would consist of doing nothing to the existing Pennsylvania Avenue Bridge. However, this alternative would not meet the project need. While this alternative would not meet the purpose and need of the project, it is carried into the alternatives analysis as a basis of comparison with the Build alternatives.

6.3.2 Alternative 2—Replace and raise bridge to achieve 22’ vertical clearance

Alternative 2 would raise the bridge to achieve 22' of vertical clearance over the railroad tracks. Alternative 2 would elevate the proposed roadway profile to increase vertical clearance. Roadway approach work along Pennsylvania Avenue would extend approximately 150’ to the west and 250' to the east of the bridge. The proposed vertical alignment would increase the profile grade to a maximum of 8.0% on both approaches to the bridge. Due to the profile change, a driveway adjustment would be needed for the eastern USPS entrance at 206+80 LT. Approach work would include roadway pavement and sidewalk reconstruction, including the construction of sidewalk moment slab in all quadrants. Sidewalk grades would follow the roadway profile, except for the sidewalk in the southwest quadrant. Under Alternative 2, a bifurcated sidewalk in the southwest quadrant near Station 204+30 RT is required to maintain ADA-compliant access to the existing pedestrian entry door at 901 Pennsylvania Avenue. The bifurcated section of sidewalk is proposed to have an 80’-long and 4’-wide sidewalk ramp that is separated from the 4’-5” sidewalk along the roadway by a proposed pedestrian rail barrier.

The profile adjustment and bifurcated sidewalk will affect four tree planter boxes along the southwest quadrant in front of 901 Pennsylvania Avenue. One of the tree planter boxes would be replaced; however, the three tree boxes closest to the bridge and entrance door would not be replaced due to the sidewalk width required for the bifurcated sidewalk ramp.

Pennsylvania Avenue would be closed during bridge reconstruction. Traffic would have a 0.6-mile detour along Allegheny Avenue, across the W. North Avenue Bridge, and along Brighton Road.

Utilities that would be impacted with Alternative 2 include a Peoples Gas 12” steel gas main that crosses under the bridge and a PWSA 12” waterline in a 24” steel casing pipe. Both utilities would be replaced and installed on the new bridge structure.

This alternative would require the entire existing superstructure to be removed and the existing abutments to be increased in height and modified to facilitate the new superstructure. The existing abutments and wingwalls would be retained, but the top portions of the substructure would be reconstructed to facilitate the raised superstructure. Approach slabs would be provided at each abutment with sleeper slabs and pavement relief joints. The possibility of replacing backfill with lightweight material to reduce lateral loading would be considered with this alternative.

The proposed span length of the new superstructure would be 145'-0" measured from centerline of bearings at Abutment 1 to centerline of bearings at Abutment 2. The proposed superstructure would be a single-span, steel structure supported by two pony trusses, one at each fascia. Steel floor beams would span between the pony trusses at intervals of approximately 7'-3". The pony trusses would have a 15' preliminary truss height, and the floor beams would be approximately 28" deep.

Alternative 2 is anticipated to have a low to moderate potential for waste management impacts. Special provisions may be required for proper management of painted steel in accordance with applicable Federal, state, and local requirements. In the event of historic fill containing potential hazardous materials (e.g., slag, cinders, and fly ash) are encountered during construction, special provisions will be developed to handle, manage, and dispose these materials.

Alternative 2 activities that could affect historic properties include the replacement of the Pennsylvania Avenue bridge superstructure, repairs to the substructure necessary to raise the bridge, and increasing the vertical grade of the bridge approaches and sidewalks.

Alternative 2 has a low potential to affect the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District. The alternative would require replacement of the bridge superstructure and repairs to the substructure necessary to raise the bridge. The bridge's substructure and superstructure do not contribute to the NRHP-eligible Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District. Any repairs to the substructure would be minor and would have a low potential to visually affect the district's character-defining features. None of the activities would result in a change in the character of the property's historic use of rail operations, or a change in the visual, atmospheric, or audible elements that would diminish the integrity of the property's significant historic features. The existing through-girder superstructure would be replaced with a steel pony truss similar in scale and configuration to the original, ca. 1905 pony truss Pennsylvania Avenue bridge and would not result in a substantial visual change within the railroad corridor historic district.

Alternative 2 has a low to moderate potential to affect the Allegheny Second Ward Industrial Historic District. The alternative would require modification of the bridge approaches from a current maximum of 5% vertical grade to a maximum of 8.0% vertical grade for approximately 150' to the west and 250' to the east of the bridge. Sidewalk grades would also be steepened to follow the roadway profile, resulting in a variable increase in surface elevation along the north façade of 901 Pennsylvania Avenue from 0" to 11". A bifurcated sidewalk in the southwest quadrant with an 80'-long and 4'-wide sidewalk ramp that would be separated from the adjacent 4'-5"-wide sidewalk by a pedestrian handrail is proposed to avoid modifications to building entrances and to maintain ADA-compliant access to the existing entry door at 901 Pennsylvania Avenue, which contributes to Allegheny Second Ward Industrial Historic District. All basement-level window openings along the Pennsylvania Avenue-façade of the House of Metals Building are infilled with brick, so the raising of the sidewalk along the building would not affect character-defining features of the building. It is not expected that the raising of the street and sidewalk grade, the bifurcation of modern sidewalks, and the alteration of non-historic landscape elements would result in a substantial visual change within the historic district.

Overall, Alternative 2 is anticipated to have a low to moderate potential to impact historic properties.

Since no contributing elements of the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District and the Allegheny Second Ward Industrial Historic District are anticipated to be impacted by Alternative 2, this alternative would have a low potential to impact these Section 2002 resources.

6.3.3 Alternative 3—Repair substructure and lower railroad tracks to achieve 22' vertical clearance

Alternative 3 would lower the railroad tracks to achieve 22' of vertical clearance and repair the existing bridge. No roadway work or detour would be required.

For the track lowering, buttressing of the existing retaining walls (7,228 linear feet [LF]) and site work would need to be performed for distances well beyond the Pennsylvania Avenue crossing. To accommodate buttressing of the existing abutments and adjacent retaining walls, the number of tracks would need to be reduced from four to three, reducing the flexibility and fluidity of Norfolk Southern operations through the area and region, which would result in an increased operation cost to Norfolk Southern and resultant impacts on interstate commerce. All four tracks and associated turnouts would be removed to accommodate the site work and reconfiguration of the CP Penn interlocking, which is within the project limits. In addition, one of the four tracks would be removed from the West Ohio Street Bridge east to the Federal Street Bridge. A new CP Penn interlocking would be constructed in addition to a new interlocking at Federal Street where the Conemaugh Line would be reduced from two tracks to one track. Approximately 7,700 track feet (TF) of new track and 16 new turnouts would be installed. Approximately 8,900 TF of track lining would be included at the east end of the project. Approximately 7,228 LF of buttressing of the existing retaining walls would be necessary within the project limits.

Attempting to retain present operational capacity with four tracks would be significantly more expensive than the reduction to three tracks and wall buttressing solution proposed under Alternative 3. Retaining the fourth track would require the replacement of the retaining walls, potential impacts to three properties, impacts to a park property, and additional utility relocations.

Utilities that would be impacted under Alternative 3 include the replacement of the PWSA 30" watermain and the relocation of the 345kV/138kV high voltage Duquesne Light primary line. Underground fiber optic duct banks along both sides of the railroad trench would need to be relocated to lower depths.

Alternative 3 activities that could affect waste management impacts include the associated track lowering and utility work that would entail the removal of ballast and possibly other fill materials. No changes would be required to the bridge superstructure or substructure, and only minor repair of spalls and delaminations would be made to the substructure. Special provisions would be prepared for the testing and management of historic fill encountered during construction. Special provisions would also be developed to properly manage painted steel during repairs, removal, and/or repainting, if required, but impacts to steel should be minimal. All materials would be properly managed and disposed of if necessary. The depth to groundwater should be determined prior to excavation to determine if construction dewatering will be required. If groundwater is present, it would be properly managed and disposed of if necessary. Alternative 3 is anticipated to have a moderate to high impact relative to the other alternatives for waste management due to the increased potential for the management of historic fill and groundwater.

Alternative 3 activities that could affect historic properties include minor repairs to the bridge's substructure and the associated track lowering, which would entail the removal of ballast, the buttressing of the existing abutments and adjacent retaining walls, and the removal of one of the four extant tracks. Contributing elements of the NRHP-eligible Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District include concrete retaining walls with stone coping along the northeast and southwest edges of this depressed section of the corridor, standard railroad safety railings, and decorative wrought-iron fencing. The Pennsylvania Avenue Bridge, including both its substructure and superstructure, does not contribute to the historic district. Minor repairs to the bridge's substructure, the removal of ballast, and the removal of one track would not affect the characteristics of the railroad corridor historic district that qualify it for NRHP eligibility. However, buttressing the concrete retaining walls to provide stability necessary for track lowering would alter the design of the walls and reduce the clear width of the railroad corridor, which contribute to the character of the historic district, resulting in a moderate to high potential to impact the historic property.

While no building entrances or driveways would be impacted within the Allegheny Second Ward Industrial Historic District, the railroad corridor is a contributing element of the district, and its alteration resulting from the buttressing of the concrete retaining walls would affect the characteristics that qualify it for NRHP eligibility. Therefore, Alternative 3 is anticipated to also have a moderate to high potential to impact the Allegheny Second Ward Industrial Historic District.

Overall, Alternative 3 is anticipated to have a moderate to high potential to impact historic properties.

Since it is anticipated that Alternative 3 could result in impacts to contributing elements of the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District and the Allegheny Second Ward Industrial Historic District, this alternative would also have a moderate to high potential to result in impacts to these Section 2002 resources.

6.3.4 Alternative 4—Combination replace and raise bridge and lower railroad tracks to achieve 22' vertical clearance

Alternative 4 would raise the bridge and lower the railroad tracks under the bridge to achieve 22' of vertical clearance over the railroad tracks. Roadway approach work along Pennsylvania Avenue would extend approximately 160' to the west and 140' to the east of the bridge. The proposed vertical alignment would increase the profile grade to a maximum of 7.5% on the western approach and 7.0% on the eastern approach. Due to the profile change, a minimal driveway adjustment is needed for the eastern USPS entrance at 206+80 LT. Approach work would include roadway pavement and sidewalk reconstruction, including the construction of sidewalk moment slab in all quadrants. Sidewalk grades would follow the roadway profile, with the exception of the sidewalk in the southwest quadrant. Under Alternative 4, a bifurcated sidewalk in the southwest quadrant near Station 204+30 RT is required to maintain ADA-compliant access to the existing pedestrian entry door at 901 Pennsylvania Avenue. The bifurcated section of sidewalk which is proposed to have a 35'-long and 4'-wide sidewalk ramp that is separated from the 4'-5" sidewalk along the roadway with a pedestrian rail barrier.

The profile adjustment and bifurcated sidewalk will affect four tree planter boxes along the southwest quadrant in front of 901 Pennsylvania Avenue. Three of the tree planter boxes would be replaced;

however, one tree box closest to the bridge and entrance door would not be replaced due to the sidewalk width required for the bifurcated sidewalk ramp.

Work along the railroad corridor would extend approximately 2,360' to the south of the bridge, beyond W. North Avenue, and approximately 950' to the north of the bridge to lower the railroad tracks to the required elevation based on the necessary track design requirements. Track lowering would be accomplished by the removal of ballast. The work limits of the track lowering would not affect any of the adjacent yard railroad tracks, nor would wall buttressing be required.

Pennsylvania Avenue would be closed during bridge reconstruction. Traffic would have a 0.6-mile detour along Allegheny Avenue, across the W. North Avenue Bridge, and along Brighton Road.

Utilities that would be impacted with Alternative 4 include a Peoples Gas 12” steel gas main that crosses under the bridge and a PWSA 12” waterline in a 24” steel casing pipe. Both utilities would be replaced and installed on the new bridge structure. Lowering the tracks would also require the replacement of a PWSA 30” watermain and a 345kV/138kV high voltage Duquesne Light primary line. Underground fiber optic duct banks along both sides of the railroad trench would need to be relocated to lower depths.

This alternative would require the entire existing superstructure to be removed and the existing abutments to be increased in height and modified to facilitate the new superstructure. The existing abutments and wingwalls would be retained, but the top portions of the substructure would be reconstructed to facilitate the raised superstructure. Approach slabs would be provided at each abutment with sleeper slabs and pavement relief joints. The possibility of replacing backfill with lightweight material to reduce lateral loading would be considered with this alternative.

The proposed span length of the new superstructure would be 145’-0” measured from centerline of bearings at Abutment 1 to centerline of bearings at Abutment 2. The proposed superstructure would be a single-span, steel structure supported by two pony trusses, one at each fascia. Steel floor beams would span between the pony trusses at intervals of approximately 7’-3”. The pony trusses would have a 15-foot preliminary truss height, and the floor beams would be approximately 28” deep.

Alternative 4 activities that could affect waste management impacts include minor repairs to the bridge’s substructure, and the associated track lowering and utility work that would entail the removal of ballast and possibly other fill materials. The amount of excavation and potential for encountering groundwater is expected to be less than Alternative 3, but more than Alternative 2. Therefore, Alternative 4 is expected to have a moderate potential for waste management impacts relative to the other alternatives. Special provisions should be prepared for the testing and management of historic fill encountered during construction. Special provisions should also be developed to properly manage painted steel. All materials will be properly managed and disposed of if necessary. The depth to groundwater should be determined prior to excavation to determine if construction dewatering will be required. If groundwater is present, it will be properly managed and disposed of if necessary.

Similar to Alternative 2, Alternative 4 activities that could affect historic properties include the replacement of the Pennsylvania Avenue bridge superstructure; repairs to the substructure necessary to raise the bridge; increasing the vertical grade of the bridge approaches and sidewalks; and track lowering, which would entail the removal of ballast.

Alternative 4 would have a low potential to impact the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District. This alternative requires the replacement of the bridge superstructure and minor repairs to the substructure in order to raise the bridge and lower the tracks; however, the degree of bridge raising and track lowering would be less. The bridge's substructure and superstructure do not contribute to the NRHP-eligible Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District. The existing through-girder superstructure would be replaced with a steel pony truss similar in scale and configuration to the original, ca. 1905 pony truss Pennsylvania Avenue bridge and would not result in a substantial visual change within the railroad corridor historic district. Superstructure replacement, minor repairs to the substructure, and the removal of ballast for track lowering have a low potential to visually affect the district's character-defining features.

Like Alternative 2, Alternative 4 would have a low to moderate potential to impact the Allegheny Second Ward Industrial Historic District. This alternative would require modification of the bridge approaches but for less distance. Under Alternative 4, roadway approach work along Pennsylvania Avenue would extend approximately 160' to the west and 140' to the east of the bridge. Sidewalk grades would also be steepened to follow the roadway profile. A bifurcated sidewalk in the southwest quadrant with a 35'-long and 4'-wide sidewalk ramp that would be separated from the adjacent 4'-5"-wide sidewalk by a pedestrian handrail is proposed to avoid modifications to building entrances and to maintain ADA-compliant access to the existing entry door at 901 Pennsylvania Avenue, which contributes to Allegheny Second Ward Industrial Historic District. All basement-level window openings along the Pennsylvania Avenue-façade of 901 Pennsylvania Avenue (the House of Metals Building) are infilled with brick, so the raising of the sidewalk along the building would not affect character-defining features of the building. It is not expected that the raising of the street and sidewalk grade, the bifurcation of modern sidewalks, and the alteration of non-historic landscape elements would result in a substantial visual change within the historic district.

Overall, Alternative 4 is anticipated to have a low to moderate potential to impact historic properties.

Since no contributing elements of the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District and the Allegheny Second Ward Industrial Historic District are anticipated to be impacted by Alternative 4, this alternative would have a low potential to impact these Section 2002 resources.

6.3.5 Alternatives Comparison Summary

Alternative 1 would not meet the needs of the project and therefore can be eliminated from consideration. Alternative 2 would meet the project needs and would have the lowest potential to impact historic properties and Section 2002 resources as well as the lowest potential for encountering hazardous waste material. However, it would require a detour during construction, impacts to five properties, including both temporary and permanent impacts, as well as a driveway adjustment at the USPS facility. Alternative 3 would meet the project needs, would have no permanent property impacts, and would not require a detour. However, four railroad tracks could not be maintained through the corridor and this alternative would have the most potential to impact historic properties and Section 2002 resources and the most utility impacts due to the track lowering. It would also have a far greater cost than any of the other alternatives. Alternative 4 would meet the project needs but would require a detour during construction and would have similar property impacts as Alternative 2. This alternative would have a moderate potential to impact both historic properties and Section 2002 resources as well as hazardous waste material. It would also impact utilities to a greater extent due to the track lowering required. When accounting for impacts to the surrounding community, project complexity, and potential historic and Section 2002 property impacts, Alternative 2 is recommended to be advanced for further consideration. A comparison matrix of the identified alternatives is included in **Appendix D.**

6.3.6 Design Modification Options

A design modification option was considered that involves adjustments to the Pennsylvania Avenue vertical alignment. The design modification replaces and raises the bridge to 21'-2" of vertical clearance over the railroad instead of the 22'-0" of vertical clearance proposed in Alternative 2, while maintaining the existing railroad profile. The roadway reconstruction limits, vertical alignment, right-of-way impacts, utility impacts, and temporary traffic control are all the same as listed above in Alternative 4, but without the railroad track lowering. The bridge configuration would also be the same as Alternative 4.

Impacts to utilities with the design modification would be similar to the impacts from the proposed roadway and bridge work of Alternatives 2 and 4 but there would be no impacts to the 30" PWSA watermain and Duquesne Light primary that cross under the railroad tracks.

The design modification to reduce the required vertical clearance would have no added benefit for Alternative 2 with respect to waste management.

The design modification is anticipated to have a low to moderate potential to impact historic properties and Section 2002 resources because of the sidewalk modification required for 901 Pennsylvania Avenue, a contributing element of the NRHP-eligible Allegheny Second Ward Industrial Historic District.

6.4 Selection of Preferred Alternative

Based on these considerations, Alternative 2–Replace and raise bridge to achieve 22' of vertical clearance, with the design modification of replacing and raising the bridge to achieve 21'-2" of vertical clearance is the preferred alternative for the Pennsylvania Avenue Bridge Project.

7.0 Columbus Avenue Bridge

The Columbus Avenue Bridge is located in the City of Pittsburgh, Allegheny County, Pennsylvania, and carries Columbus Avenue over several NSR tracks. See **Figure 7-1** for a location map.

Alternatives have been identified to address the purpose and need for the Pittsburgh Vertical Clearance Projects and to meet PUC requirements. The alternatives will be discussed in further detail later in this chapter. Below is a brief description of each alternative:

- Alternative 1 - No Build Alternative
- Alternative 2 - Repair and raise bridge to achieve 22' vertical clearance
- Alternative 3A/3B - Repair substructure and lower tracks to achieve 22' vertical clearance
- Alternative 4 - Combination repair and raise bridge and lower tracks to achieve 22' vertical clearance

In addition to the five alternatives listed above, design modifications to minimize impacts of the preferred alternative was analyzed and is discussed in Section 7.3.7.

Conceptual plans and profiles for each Build alternative as well as typical sections can be found in **Appendix B.** Conceptual cost estimates for each Build alternative can be found in **Appendix C**. An Alternatives Comparison Matrix is included in **Appendix D**.

7.1 Environmental Considerations

As noted in Chapter 1, this section discusses those resources that could influence the selection of a preferred alternative for this project location. The Act 120 document will analyze impacts of the preferred alternative on these and the remaining of the 23 resource categories.

7.1.1 Hazardous or Residual Waste Sites

The potential for contaminated materials was identified during the Phase I ESA conducted for the Columbus Avenue Bridge Project and are as follows:

- It is anticipated that the bridge paint contains lead because of the age of the bridge. All work will comply with applicable lead material handling, safety, and disposal requirements.
- Shallow soil under the Columbus Avenue Bridge may have been impacted by flaking lead-based paint as observed during the field view and during previous bridge inspections.
- Black surface staining is present on the railroad ties and ballast.
- Historic Fill (e.g., slag, cinders and fly ash) may be present beneath the railroad ballast, since these materials have been commonly used as fill in Allegheny County. These materials sometimes contain elevated concentrations of metals and/or polynuclear aromatic hydrocarbons (PAHs).
- The Thomas & Betts Act 2 site (Former American Electric Facility) is located at 1207 Columbus Avenue near the southern retaining walls along Sedgwick Street. The site soils and groundwater have been impacted by solvents, metals, cyanide, and PAHs.
- A former gasoline filling station (M&F Amoco) is located at 1198 California Avenue near the intersection of Kirkbride Street and California Avenue on the northeast side of the Columbus Avenue Bridge approach.
- It should be noted that groundwater contamination sources may be present upgradient of the site. Most of the planned construction alternatives are not expected to encounter the uppermost aquifer. However, alternatives that require deep foundations and dewatering may encounter contamination within the uppermost aquifer. Furthermore, isolated lenses of contaminated perched groundwater may be present within the railroad ballast that could impact construction costs related to track-lowering alternatives.

7.1.2 Historic Properties

The APE for the proposed undertaking contains one historic property, the Pennsylvania Railroad: Main Line (Pittsburgh to Ohio State Line) Railroad Corridor Historic District, which was determined eligible for the National Register of Historic Places (NRHP) on September 14, 1993. As part of the current study, contributing elements of the railroad corridor historic district were identified within the approximately 1,700-foot segment of the corridor contained within the APE. Project historians identified two contributing elements of the railroad corridor historic district being functional and/or decorative components that were constructed during the corridor’s period of significance and that retain historic integrity. These include the concrete retaining walls with stone coping along the outer edges of the depressed section of rail corridor and decorative wrought-iron fencing, both of which are attributable to an early-twentieth-century grade separation project. In addition, the 1907 concrete Columbus Avenue approach ramp contains concrete walls with a gunite finish (this finish is original), and a brick sidewalk with sandstone curbing on the south side of the ramp (the north sidewalk was replaced with concrete). Because this ramp was built as part of a significant grade separation project, it also contributes to the railroad corridor historic district. The related Columbus Avenue Bridge was determined not to contribute to the district in 2007 as part of the statewide historic bridge survey because of loss of integrity of design caused by bolted member repairs and strengthening.

7.1.3 Section 2002 Resources

There are two Section 2002 resources located in the project vicinity, the NRHP-eligible Pennsylvania Railroad: Main Line (Harrisburg to Pittsburgh) Railroad Corridor Historic District and Manchester Park, which is located to the northwest of the Columbus Avenue Bridge. Since the Columbus Avenue Bridge is a non-contributing element of the historic district, there will not be a Section 2002 impact to this resource regardless of which alternative is selected.

7.1.4 Air Quality

The current National Ambient Air Quality Standard designations for the Pittsburgh area pollutants are:

- Marginal nonattainment for the 2008 ozone standard
- Maintenance for the 1971 carbon monoxide standard
- Maintenance for the 2006 PM2.5 standard
- Moderate nonattainment for the 2012 PM2.5 standard
- Nonattainment for the 2010 SO2 standard
- Attainment for lead
- Attainment for NO2

The proposed project will not have a direct effect on air quality with the exception of minor construction related emissions for Alternatives 2, 3, and 4, which would consist of construction equipment regulated under EPA emission standards. NSR has conducted a project-level air quality analysis for the Pittsburgh Vertical Clearance Projects corridor to evaluate secondary or indirect effects on air quality (see **Appendix E**). A general conformity determination is not required since there is no federal action or federal money being used for the project. The No Build Alternative would not result in any impacts to air quality. However, due to the inability to utilize more efficient double-stack containers and the need for additional train trips to accommodate future forecasted freight needs, with a commensurate increase in locomotive emissions for single-stack trains, future emissions would increase slightly under the No Build Alternative as compared to Alternatives 2, 3, and 4, where the more efficient double-stack trains would allow for fewer trains and lower locomotive emissions for the same freight needs. It is anticipated that Alternatives 2, 3, and 4 would have similar impacts on emissions levels. Therefore, from an emissions perspective, any of the approaches to achieving the needed vertical clearance at these locations are considered the same. With the Build alternatives, there would be a slight net reduction in annual regional locomotive operational emissions in comparison to both existing and future 2045 No Build emission levels, and therefore no significant adverse impacts would result with implementation of the project.

7.1.5 Noise

Direct noise effects will be limited to temporary construction related impacts. The No Build Alternative would have no noise effects. Any noise effects of the Build alternatives would be temporary and the difference between Build alternatives would not be significant.

Regarding indirect or secondary effects, NSR has conducted a noise impact assessment to evaluate the potential impacts associated with the Pittsburgh Vertical Clearance Projects corridor (see **Appendix F**). Noise levels would be slightly higher under the No Build Alternative than Alternatives 2, 3, and 4 due to the greater number of single-stack trains that would be required to accommodate future rail traffic demand as compared to the fewer double-stack trains capable of carrying the same amount of rail freight. Under both the low-growth and high-growth scenarios, there were 13 Category 2 and no Category 3 sensitive land use sites above the Surface Transportation Board noise impact threshold identified near the Columbus Avenue Bridge under both the No Build and all of the Build alternatives. It is anticipated that Alternatives 2, 3, and 4 would have a similar impact on noise levels. The variation in vertical alignments of the Build alternatives is small, anticipated to be less than five feet. Changes in the vertical bridge alignment associated with the Build alternatives would result in generally imperceptible differences in noise levels that are within tenths of a decibel of one another. The dominant consideration for noise in these circumstances is the number of trains per day, and that would not be different for any of the Build alternatives for these projects. Therefore, from a noise perspective, any of the approaches to achieving the needed vertical clearance at these locations are considered the same.

7.1.5 Vibration

NSR conducted a vibration analysis for the Pittsburgh Vertical Clearance Projects corridor in consideration of guidance provided by the Pennsylvania History Code (see **Appendix F**). It is anticipated that there will be no impacts as a result of any alternative. Currently, the study corridor is defined as “heavily used” (i.e., more than 12 freight trains per day). Under future conditions there is no change to the train speeds or track locations, other than small reductions in vertical alignment in areas that would result in a negligible change in vibration. Therefore, both the No Build Alternative and Alternatives 2, 3, and 4 would only result in an increase in the number of trains per day. However, because the number of trains is not predicted to result in an increase of 3 VdB or greater at any vibration-sensitive land uses, there would be no vibration impacts under any of the alternatives.

7.2 Engineering Considerations

7.2.1 Roadway

The existing horizontal geometry along the Columbus Avenue Bridge consists of two tangents across the bridge connected by a short, sharp horizontal curve. The Columbus Avenue Bridge ties directly into California Avenue at a T intersection on the east end. The vertical grade along the existing Columbus Avenue roadway approach is approximately 5% to the west of the bridge, tying into the Columbus Avenue Bridge, which is generally flat. The eastern end of the bridge ties into a crest curve along California Avenue with slight grade approaching from the north and south directions.

The existing typical section along Columbus Avenue on the west side of the bridge consists of a curbed section that is approximately 30' wide and includes an eastbound and westbound travel lane with a variable shoulder width adjacent to the curb. Sidewalks are located on both sides of the western approach to the Columbus Avenue Bridge but continue only along the north side (westbound lane) across the bridge. The existing typical section along California Avenue to the east side of the bridge consists of a curbed section that is approximately 39' wide and includes two northbound travel lanes and one southbound travel lane. The curb is adjacent to the travel lanes. A sidewalk is located on both sides of California Avenue to the south of the intersection with Columbus Avenue and only on the eastern side of California Avenue to the north of the bridge. The proposed typical sections along Columbus Avenue and California Avenue would match the existing. Typical sections of Columbus Avenue and California Avenue are included in **Appendix B**.

7.2.2 Structure

The superstructures in spans 1 and 2 are steel pony trusses; span 3 is a skewed steel through girder. The width (out-to-out) is 50'-0" and the width (curb-to-curb) is 30'-0" for span 1 and is 28'-0" for spans 2 and 3. There are two lanes, one in each direction. The parapets and railings are the thru-girders and trusses, and the sidewalk is 5'-6" wide on the north side.

Approach concrete curbs and sidewalks are present on all four corners. The curbs are spalled on the west approach, north and south, and at the east on the south. The east approach south curb has been previously patched with asphalt. The south sidewalk on the west approach ends at the bridge. At the west approach slab there are moderate hairline cracks, and edges are chipped with loose and missing sealant.

Spans 1 through 3 have an 8" reinforced concrete deck with 1/2" integral wearing surface. The wearing surface is in satisfactory condition with hairline transverse and map cracks with minor wheel wear throughout. A patched spall is present in span 3. The south concrete curb has spalling throughout in spans 1 and 2. The concrete sidewalk on the north is in good condition with hairline transverse and map cracks. The stay-in-place (SIP) forms are in good condition with isolated areas of minor corrosion, mostly along the outside edges along the sidewalk. At pier 1, in span 2 there is loose concrete present in the SIP form near the corner of the deck. For the armored neoprene compression seals, the west neoprene seal is completely missing and allows leakage below. The east seal is in fair condition with bulging of the joint material and a few tears.

The superstructure is fair, meaning that all primary structural elements are sound but may have minor section loss. Truss members in spans 1 and 2 consist of pony through trusses in fair condition and have fracture critical members. The web plats of the diagonal members exhibit paint peel and minor loss at the lower connection points near the curb level. The bottom chords are filled with concrete at each panel point. The bottom chord flange angles have gouges and deformations. The diagonals and verticals have repair/retrofit plates welded and bolted to their webs. Intersecting welds are present at some retrofit plates. The lower chord has several areas of rust pack and section loss to the bottom flange angles, lacing bars, and tie plates. The bearings have steel plates at the west abutment. Some bearings have rust pack with a gap between the sliding plate and masonry plate. Span 3 has riveted built-up through girders, which are fracture critical members in satisfactory condition. Areas of isolated surface rust are present. The top flange and top of the web are visible above the sidewalk with surface rusting present. Some vertical stiffeners have welded repair plates, which exhibit minor rust packing between the plates. The floor beams are riveted built-up members with partial length bottom flange cover plates and are in fair condition. Isolated areas of surface rust exist. Several floor beams have repair plates welded or bolted to webs. The welded repair plates on the floor beams have intersecting welds, but no cracks. Some floor beams have up to 100% section loss to the rivet heads, which have been painted over. Sidewalk support brackets have isolated areas with 100% section loss to bottom flange angles and diagonals and one support has a missing horizontal member. This structure does not have a drainage system but drains along the curbs to the end of structure. Paint on girders, floor beams, and steel pier caps are in poor to fair condition with areas of paint peeling and surface rust. The condition of the splash zone is similar to the rest of the structure. Areas of flaking, peeling paint, and surface rust exist on the trusses. Paint condition at the bearings ranges from fair to poor with areas of heavy surface rust, laminar corrosion, and pack rust. According to the latest information available, the safe load capacity rating for the bridge is 31 tons except for 33 tons in combinations.

The substructure consists of reinforced concrete abutments on bedrock for the east and west abutments and steel pier bents on spread footings at piers 1 and 2. The substructure is fair, and all primary structural elements are sound but may have minor section loss, cracking, and spalling. At the west abutment, the reinforced concrete backwall exhibits vertical hairline cracks and moderate to heavy efflorescence. On the bridge seats, one pedestal is spalled and the remaining concrete is delaminated and soft and at another there is undermining of the masonry plate with an exposed anchor bolt. There is a deep spall on the bridge seat due to a leaking joint above. The concrete stem is in satisfactory condition with vertical, horizontal, and diagonal hairline cracks throughout. Several cracks extend full height with efflorescence and water seepage. The concrete wings are in in poor condition. Vertical, horizontal, and map cracking with heavy efflorescence, extensive delamination, and spalls with exposed rebar are present throughout both wings. The north wingwall is delaminated for its full height and width. The south wingwall has evidence of outward movement at mid-height. For the east abutment the concrete backwall exhibits full height vertical hairline cracks and light efflorescence. The concrete seats exhibit minor scaling along the edges. A deep spall exists at the top edge adjacent to the right bearing. Another spall is at the construction joint in the bridge seat. The concrete stem is in fair condition. Hairline map cracking with moderate efflorescence exists below the left and right bearings. Minor scaling and random vertical hairline cracks are present throughout. A large delamination exists on the far-left stem. The concrete wings are continuous with the stem and are in fair condition with random areas of map cracking and efflorescence. The footing is not visible.

Piers 1 and 2 are in satisfactory condition with minor surface rust. Pier 1 is a riveted built-up steel cross girder that is a fracture-critical member in satisfactory condition with isolated areas of peeled paint and moderate surface rust. On the top flange, the horizontal leg is torn in two locations. Footings are not visible. Pier columns are encased in a concrete crash wall adjacent to the railroad. The wall is in poor condition. Heavy map cracking, delamination, and spalls exist throughout, particularly under columns 1 and 2. The four concrete-encased steel columns are in satisfactory condition. Full height vertical hairline cracks are present throughout. The top of the north column exhibits a vertical crack in the concrete encasement. The three northern columns support the Columbus Avenue Bridge, while the last column and the bent cap previously supported an adjacent structure, which has been removed. Pier 2 is also a riveted built-up steel cross girder that is a fracture-critical member in good condition. Moderate surface rust is present throughout. The steel cross girder has gaps between the bolt nuts and the top flange above column 3 (the southernmost column). Above column 2 (the middle column) there are bolts with nuts not drawn tight, one is missing, and others are loose at the top angle. Footings are not visible. Pier columns are founded on top of a concrete crash wall adjacent to the railroad. The column pedestals have minor spalling. Column 1 (the northernmost column) has an anchor bolt nut with a gap at the base plate. Spalls exist at the top of the wall under columns 1 and 2. The wall has random cracking with efflorescence. The three riveted steel columns are in good condition with painted over areas of pitting with minor section loss. Isolated areas of peeled paint with moderate surface rust exist on all columns especially at the bearings. Trees and vegetation exist at the column bases.

7.2.3 Right-Of-Way

Temporary easements for construction and small sliver takes are anticipated for Alternatives 2 and 4 for work along the sidewalks in the northwest, northeast, and southeast quadrants of the bridge, along with the eastern side of California Avenue.

7.2.4 Utilities

Utilities in the area include a fiber optic line owned by Windstream running parallel to the rail line along the eastern side under the access road, two existing PWSA combination sewers that run along and under the railroad corridor (a 48” combination sewer that crosses under the rail line about 80’ south of the bridge and a 90”x72” combination sewer that crosses under the rail line 350’ north of the bridge), an abandoned water line running partially along and under the railroad corridor, and a Duquesne Light 345-kV electric bank running under the railroad corridor approximately 50’ south of the 48” PWSA sewer. There are existing utility poles and roadway lighting poles along Columbus Avenue and California Avenue. A ten-conduit utility bridge runs alongside the Columbus Avenue Bridge on the south, utilizing the same substructure elements for support.

7.3 Alternatives Description and Evaluation

7.3.1 Alternative 1—No Build Alternative

This alternative would consist of doing nothing to the existing Columbus Avenue Bridge. However, this alternative would not meet the project need.

7.3.2 Alternative 2—Repair and raise bridge to achieve 22’ vertical clearance

Alternative 2 would raise the bridge approximately 1'-11" to achieve 22' of vertical clearance over the railroad tracks. Roadway approach work along Columbus Avenue would extend approximately 250' to the west of the 240’-long bridge. The eastern side of the bridge is at a T intersection with California Avenue. The work required along California Avenue, centered at the east end of the bridge, would involve raising the profile grade along the roadway approximately 275’ to meet the bridge at the required elevation. Approach work would include roadway pavement and sidewalk reconstruction, including the construction of two ADA accessible curb ramps at the intersection with California Avenue and resetting the fence along the adjacent property. In addition, raising the grade of Columbus Avenue west of the bridge and at the intersection with California Avenue would result in additional height, approximately 1'-11" maximum, to the retaining walls, including approximately 150' of length of wall adjacent to the rail corridor on the east side of the bridge and approximately 275' length of wall along the southern side and 175' length of wall along the northern side of Columbus Avenue to the west of the bridge. There would be no effect to any business entrances or driveways, but temporary construction easements and sliver property takes of 10' wide or less along a length of 250' would be required. The construction of the concrete barrier moment slab sidewalk along the westbound lane of Columbus Avenue would require a temporary construction easement within the Manchester Park property. The reconstruction of the sidewalk and resetting the fence along the eastern edge of California Avenue would require a temporary construction easement and minimal property acquisition.

Columbus Avenue Bridge would be closed, and a detour using the bridge carrying Pennsylvania Avenue over the railroad tracks and located approximately 0.6 miles south of the Columbus Avenue Bridge would be used during construction. The vehicular detour would be 1.7 miles and take approximately 7 minutes while the pedestrian detour would be 1.4 miles and take approximately 28 minutes.

Utilities that would be impacted with Alternative 2 include utility poles and light poles along Columbus Avenue and California Avenue. These impacts would be temporary and would require either upgrade in place or to be removed and reinstalled. A ten-conduit utility bridge runs alongside the south side of the Columbus Avenue Bridge, utilizing the same substructure elements for support. With the raising of the Columbus Avenue Bridge, these conduits would require raising as well.

This alternative would require structural repairs to the Columbus Avenue bridge sufficient to allow jacking operations to take place on the structure to raise it to the new required elevation. These could be temporary or permanent stiffening members based on construction methods. For the superstructure, the floor beams, through girders, and steel truss members would be strengthened at the jacking locations and some spall repair would be necessary.

For the substructure, the abutment backfill would be replaced with a modified backfill to meet the additional loading requirements. On the western approach the wingwalls would be reconstructed with additional height for the increase in the roadway profile along Columbus Avenue. The steel pier bent would require modifications to the bearing locations to provide the additional height required for the new vertical clearance.

Alternative 2 is anticipated to have a low potential for waste management impacts. Special provisions should be developed to properly manage painted steel during repairs, removal, and/or repainting. Additionally, the bridge would be inspected to determine if any special precautions would be needed with respect to asbestos containing materials (ACM). Soil/fill within the area to be predrilled for the soldier pile walls and soil fill removed during the backwall replacement excavation should be tested for metals and PAHs and managed as appropriate during construction.

Alternative 2 would require repairs to the bridge superstructure and substructure to raise the bridge. The bridge superstructure does not contribute to the railroad corridor historic district, and repairs to the substructure would be minor and have a low potential to affect character-defining features of the railroad corridor historic district. Alternative 2 would not require modifications to any buildings or driveway entrances on Columbus Avenue or California Avenue. However, Alternative 2 would require modification of the bridge ramp grade (western approach), from a 4.2% vertical grade to a 6.2% vertical grade for approximately 250’ length. This has the potential to affect the historic integrity of the brick sidewalk, stone curbing, and concrete walls of the contributing Columbus Avenue Bridge approach ramp. The raising of the grade of Columbus Avenue at its intersection will require adding additional height to the railroad corridor retaining walls, which are contributing elements of the historic district. Therefore, Alternative 2 is anticipated to have a moderate potential to impact historic properties.

In addition to the impacts to the NRHP-eligible Pennsylvania Railroad: Main Line (Harrisburg to Pittsburgh) Railroad Corridor Historic District, this alternative would result in a temporary impact to Manchester Park.

7.3.3 Alternative 3A – Repair substructure and lower eastern tracks to achieve 22’ vertical clearance

Alternative 3A would lower the eastern railroad tracks approximately 1'-11" to achieve 22' of vertical clearance. Work along the railroad corridor would extend approximately 900' to the southeast of the bridge and approximately 1,250' to the northwest of the bridge to lower the railroad tracks to the required elevation based on the necessary track design requirements. The track lowering would affect the adjacent yard tracks due to their proximity to the mainline tracks and would include existing turnouts. This alternative would also require some minor work to the Columbus Avenue Bridge substructures but would not require work along Columbus Avenue or California Avenue.

Utilities that would be impacted with Alternative 3A would include a fiber optic line owned by Windstream that would need to be relocated and two existing PWSA combination sewers that run under the railroad corridor. The 48” combination sewer nearest the bridge would require extensive reconstruction and even possible replacement to support the load of the lowered tracks overtop the sewer. The 90”x72” combination sewer on the north end of the track lowering would require some strengthening to support the increased load due to lowering.

This alternative would not require repairs to the superstructure of the Columbus Avenue Bridge. For the substructure, the abutment backfill would be replaced with a modified backfill to meet the additional loading requirements. Walls along the railroad corridor would need to be investigated to check the additional backfill height that the new track profile would create when the face of the wall is exposed.

Alternative 3A would require minor repairs to the bridge’s substructure; the associated track lowering would entail the removal of ballast and possibly other fill materials. Special provisions should be developed to properly manage painted steel during repairs, removal, and/or repainting, if required, but impacts to steel should be minimal. Additionally, the bridge should be inspected to determine if any special precautions would be needed with respect to ACM. The maximum depth of excavation is about two feet, so it is likely that only ballast will be encountered with small amounts of sub-ballast or other soils. All materials will be properly managed and disposed of if necessary.

Alternative 3A is anticipated to have a moderate impact relative to the other alternatives for waste management due to the increased potential for management of soil and groundwater. The depth to groundwater should be determined prior to excavation to determine if construction dewatering will be required. If groundwater is present, it will be properly managed and disposed of if necessary.

The bridge’s northeast abutment is integral with the retaining walls that contribute to the NRHP-eligible Pennsylvania Railroad: Main Line (Harrisburg to Pittsburgh) Railroad Corridor Historic District. Alternative

3A would require minor repairs to the bridge's substructure, but these repairs would be made in-kind and would not alter character-defining features of the railroad corridor historic district. The associated track lowering would entail the removal of ballast and would potentially expose more of the contributing retaining walls. Any required repairs to the wall would be made in-kind and would not affect the characteristics of the railroad corridor historic district that qualify it for NRHP eligibility. No building entrances or driveways would be impacted. Therefore, Alternative 3A is anticipated to have a low potential to impact historic properties.

No property impacts are anticipated for this alternative including any impacts to Manchester Park.

7.3.4 Alternative 3B—Repair substructure and lower western tracks to achieve 22' vertical clearance

Alternative 3B would lower the western railroad tracks approximately 3'-2" to achieve 22' of vertical clearance. Work along the railroad corridor would extend approximately 1,300' to the southeast of the bridge and approximately 1,600' to the northwest of the bridge to lower the railroad tracks to the required elevation based on the necessary track design requirements. Track reconfiguration will be required for the adjacent yard tracks due to their proximity to the mainline tracks and would include existing turnouts. Four tracks currently run under the western span of the Columbus Avenue Bridge and with Alternative 3B only two tracks will continue to run under this span. This alternative would also require some minor work to the Columbus Avenue Bridge substructures but would not require work along Columbus Avenue or California Avenue. Alternative 3B would provide Norfolk Southern with operational advantages. Because of how the mainline interfaces with the Island Avenue interlocking north of Columbus, trains are often blocked, and this alternative allows for the clear running of trains on Main 1 and Main 2.

Utilities that would be impacted with Alternative 3B include two existing PWSA combination sewers that run under the railroad corridor. The 48" combination sewer nearest the bridge and the 90"x72" combination sewer on the north end of the project limits would both require some strengthening to support the increased loading due to lowering the tracks.

This alternative would not require repairs to the superstructure.

Alternative 3B would require minor repairs to the bridge's substructure; the associated track lowering would entail the removal of ballast and possibly other fill materials. Special provisions should be developed to properly manage painted steel during repairs, removal, and/or repainting, if required, but impacts to steel should be minimal. Additionally, the bridge should be inspected to determine if any special precautions would be needed with respect to ACM. The maximum depth of excavation is about three feet so it is likely that a mixture of ballast and historic fill will be encountered. Approximately six and a half feet of additional material will need to be excavated for the proposed drainage ditch. Special provisions would be prepared for the testing and management of historic fill encountered during construction. All materials will be properly managed and disposed of if necessary. Alternative 3B is anticipated to have a moderate to high impact relative to the other alternatives for waste management due to the increased potential for management of soil and groundwater. The depth to groundwater should be determined prior to excavation to determine if construction dewatering will be required. If groundwater is present, it will be properly managed and disposed of if necessary.

The bridge's west pier rests atop the retaining walls that contribute to the NRHP-eligible Pennsylvania Railroad: Main Line (Harrisburg to Pittsburgh) Railroad Corridor Historic District. Alternative 3B would require minor repairs to the bridge's substructure, but these repairs would be made in-kind and would not alter character-defining features of the railroad corridor historic district. The associated track lowering would entail the removal of ballast and the construction of a drainage ditch that would run parallel to the retaining wall. The existing wall would not be impacted, but the lowering could potentially expose more of the wall surface. Any required repairs to the wall would be made in-kind and would not affect the characteristics of the railroad corridor historic district that qualify it for NRHP eligibility. No building entrances or driveways would be impacted. Therefore, Alternative 3B is anticipated to have a low potential to impact historic properties.

No property impacts are anticipated for this alternative including any impacts to Manchester Park.

7.3.5 Alternative 4—Combination repair and raise bridge and lower tracks to achieve 22' vertical clearance

Alternative 4 would raise the bridge approximately 9" and would lower the railroad tracks approximately 1'-2" to achieve 22' of vertical clearance over the railroad tracks. Roadway approach work along Columbus Avenue would extend approximately 150' to the west of the 240'-long bridge, and work along California Avenue, east of the bridge, would extend approximately 150' north/south of the bridge in order to raise the profile grade along the roadway to meet the bridge at the required elevation. Approach work would include roadway pavement and sidewalk reconstruction, including construction of two ADA accessible curb ramps at the intersection with California Avenue and resetting the fence along the adjacent property.

There would be no impact to building entrances or driveways along Columbus Avenue or California Avenue. However, temporary construction easements and a minimal property acquisition would be required. The construction of the concrete barrier moment slab sidewalk along the westbound lane of Columbus Avenue would require a temporary construction easement within the Manchester Park property. The reconstruction of the sidewalk and resetting the fence along the eastern edge of California Avenue would require a temporary construction easement and a minimal property acquisition.

Work along the railroad corridor would extend approximately 300' to the south of the bridge and approximately 600' to the north of the bridge to lower the railroad tracks to the required elevation based on the necessary track design requirements. The work limits of the track lowering would not affect any of the adjacent yard railroad tracks.

The detour as described in Alternative 2 would be used during construction of the street-level portion of this alternative.

Utilities that would be impacted with Alternative 4 include utility poles and lighting poles along Columbus and California avenues. A ten-conduit utility bridge runs alongside the south side of the Columbus Avenue Bridge, utilizing the same substructure elements for support. With the raising of the Columbus Avenue Bridge, these conduits would require raising as well. The utilities in the railroad corridor would not be assumed to be impacted by the minimal track lowering in this alternative.

This alternative would require structural repairs sufficient to allow jacking operations to take place on the structure to raise it to the new elevation required. For the superstructure, the floor beams, through girders, and steel truss members would be strengthened at the jacking locations, and the deck would be replaced.

For the substructure, the abutment backfill would be replaced with a modified backfill to reduce the greater backfill loading due to increased exposed height. On the western approach, the wingwalls would be reconstructed with additional height for the increase in roadway profile along Columbus Avenue. The steel pier bent would require modifications to the bearing locations to provide the additional height required for the new vertical clearance.

Special provisions would be developed to properly manage painted steel during repairs, removal, and/or repainting, if required, but impacts to steel should be minimal. Additionally, the bridge would be inspected to determine if any special precautions are needed with respect to ACM. Soil/fill within the area to be predrilled for the soldier pile walls and soil fill removed during the backwall replacement excavation, should be tested for metals and PAHs and managed as appropriate during construction. Soils under the tracks (if present) would be tested for metals and PAHs to determine if any special handling would be required. However, due to the shallow excavation, it is likely that only ballast will be encountered to the maximum depths of 1’-2” and therefore soil testing will likely not be required.

Alternative 4 is anticipated to have a low to moderate impact for waste management and is less likely to intercept shallow groundwater than Alternative 3. The depth to groundwater should be determined prior to excavation to determine if construction dewatering would be required. If groundwater is present, it should be tested for parameters required by the local sanitary sewer authority for its discharge permit.

Similar to Alternatives 2 and 3, Alternative 4 would require minor repairs to the bridge superstructure and substructure in order to raise the bridge and lower the tracks; however, the degree of bridge raising and track lowering would be less. Like Alternative 2, Alternative 4 would require modification of the bridge ramp grade (west approach). This has the potential to affect the historic integrity of the brick sidewalk, stone curbing, and concrete walls of the contributing Columbus Avenue Bridge approach ramp, but such features would be affected to a lesser degree than under Alternative 2. Alternative 4 would not require modifications to any buildings or driveway entrances on Columbus or California avenues. Therefore, Alternative 4 is anticipated to have a low to moderate potential to impact historic properties.

In addition to the impacts to the NRHP-eligible Pennsylvania Railroad: Main Line (Harrisburg to Pittsburgh) Railroad Corridor Historic District, this alternative would result in a temporary impact to Manchester Park.

7.3.6 Alternatives Comparison Summary

Alternative 1 would not meet the needs of the project and therefore can be eliminated from consideration. Alternative 2 would meet the project need and would result in the lowest total construction length but would require a detour during construction and would have a moderate potential to impact historic properties within the project limits. This alternative would also require minor property acquisitions, both temporary and permanent, including a temporary impact to Manchester Park. Alternatives 3A and 3B would meet the project need, would avoid a detour during construction, and would have the lowest potential to impact historic and Section 2002 properties; however, Alternative 3A would have a moderate potential and Alternative 3B would have a moderate to high potential for encountering hazardous waste material. Alternative 3B would result in the greatest total construction length, along with the most impact to public utilities, and the greatest overall cost. However, it would allow for operational advantages for Norfolk Southern when compared to Alternative 3A, as operations have changed over the last few years since the inception of the project. Alternative 4 would meet the project need but would require a detour during construction. This alternative would also require some minor property acquisition, both temporary and permanent, including a temporary impact to Manchester Park, similar to Alternative 2. When accounting for impacts to the surrounding community, project complexity, and potential historic and Section 2002 property impacts, either Alternative 3A or Alternative 3B is recommended to be advanced for further consideration. A comparison matrix of the five identified alternatives is included in **Appendix D.**

7.3.7 Design Modification Options

Several design modification options were considered that involve adjustments to the vertical clearance that can be applied to any of the alternatives considered.

Design Modification 3A – Eastern Tracks

Applying a design modification to Alternative 3A would lower the railroad tracks approximately 1'-0" in order to achieve 21'-1" of vertical clearance. (Note: vertical clearance at Fort Wayne #4 [east] would be increased by 1'-0" for 21'-1" clearance, and vertical clearance at Fort Wayne #3 [west] would be increased by approximately 6" to 21'-1".) Work along the railroad corridor would extend approximately 600' to the south of the bridge and approximately 1,100' to the north of the bridge in order to lower the railroad tracks to the required elevation based on the necessary track design requirements. The work limits of the track lowering would not affect any of the adjacent railyard tracks. This design modification would not require any significant work to the Columbus Avenue Bridge substructure; however, minor spall repairs and concrete repairs are anticipated. Work along Columbus Avenue or California Avenue would not be required.

There would be no additional impact to utilities with this design modification as compared to Alternative 3A.

The design modification is anticipated to reduce the likelihood of encountering contaminated soils or groundwater and minimize impacts associated with management of painted steel and/or ACM. Soils under the tracks (if present) would be tested for metals and PAHs to determine if any special handling would be required. However, due to the shallow excavation, it is likely that only ballast will be encountered to the maximum depths of 1' and soil testing will likely not be required. Therefore, impacts with respect to waste management would result in a low impact.

The design modification is anticipated to have a low potential to impact historic properties. Additionally, the impacts to the Columbus Avenue Bridge abutment and the eastern railroad corridor retaining walls would be further minimized.

No impacts to Manchester Park would be required for this alternative.

Design Modification 3B – Western Tracks

Applying a design modification to Alternative 3B would lower the railroad tracks on the southwest side of the corridor approximately 2'-8" in order to achieve 21'-6" of vertical clearance. (Note: vertical clearance would be increased by 2'-6" for 21'-6" clearance.) Work along the railroad corridor would extend approximately 1,200’ to the southeast of the bridge and approximately 1,600’ to the northwest of the bridge in order to lower the railroad tracks to the required elevation based on the necessary track design requirements. Track reconfiguration will be required for the adjacent yard tracks due to their proximity to the mainline tracks and would include existing turnouts. Four tracks currently run under the western span of the Columbus Avenue Bridge; with this alternative, only two tracks will continue to run under the span. This design modification would not require any significant work to the Columbus Avenue Bridge substructure; however, minor spall repairs and concrete repairs are anticipated. Work along Columbus Avenue or California Avenue would not be required.

Utilities that would be impacted with this design modification include two existing PWSA combination sewers that run under the railroad corridor. Both the 48” combination sewer nearest the bridge and the 90”x72” combination sewer on the north end of the track lowering would require some possible strengthening due to the increased loading from the track lowering.

The design modification is anticipated to reduce the likelihood of encountering contaminated soils or groundwater and minimize impacts associated with management of painted steel and/or ACM compared to Alternative 3B. Special provisions would be prepared for the testing and management of historic fill encountered during construction. Soils under the tracks (if present) would be tested for metals and PAHs to determine if any special handling would be required. However, due to the shallow excavation, it is likely that ballast and subballast will be encountered to the maximum depth of 2’-6” for the track lowering while ballast and historic fill may be encountered to a depth of 4’-6” over the sewer for possible strengthening. Therefore, impacts with respect to waste management would result in a moderate impact, but less of an impact than the unmodified Alternative 3B.

The design modification is anticipated to have a low potential to impact historic properties. Additionally, the impacts to the Columbus Avenue Bridge abutment and the southwest railroad corridor retaining walls would be further minimized.

No impacts to Manchester Park would be required for this alternative.

7.4 Selection of Preferred Alternative

Based on these considerations, Alternative 3A or 3B–Repair substructure and lower tracks, with the Design Modification A or B of lowering the tracks to 21’-1” and 21’-6” vertical clearance, are the preferred alternatives for the Columbus Avenue Bridge Project.

Michael Baker INTERNATIONAL

APPENDIX A

Purpose and Need Statement

Norfolk Southern Railway Company
Pittsburgh Vertical Clearance Projects

Project Purpose and Need Statement

June 2019
Revised November 2022

INTRODUCTION:

These proposed projects are railway improvement projects on the Pittsburgh and Fort Wayne Lines, owned and operated by Norfolk Southern Railway Company (NSR). The proposed projects consist of addressing freight capacity and delay constraints through the City of Pittsburgh, Allegheny County, Pennsylvania. The Pittsburgh and Fort Wayne Lines serve rail freight traffic in interstate commerce and operates as a primary link through Pittsburgh between Chicago and the New York/New Jersey commercial markets. NSR is a common carrier and the Pittsburgh and Fort Wayne Lines form a critical component of NSR's route between Chicago and the east coast, carrying a variety of commodities, both hazardous material such as chlorine, anhydrous ammonia, hydrogen fluoride, crude oil, and ethanol, as well as nonhazardous materials like coal, auto parts and finished vehicles, lumber, agricultural products, and intermodal containers and trailers.

The five overhead clearance projects [W. North Avenue Bridge, Pittsburgh (PC-1.60); Pennsylvania Avenue Bridge, Pittsburgh (PC-1.82); Columbus Avenue Bridge, Pittsburgh (PC-2.17); Washington Avenue Bridge, Swissvale (PT-344.91); and Amtrak Station Canopy (PT-353.20), Pittsburgh] have vertical obstructions along the Pittsburgh and Fort Wayne Lines and prevent efficient movement of freight, especially time-sensitive intermodal freight, by rail between Chicago and New York/New Jersey, and specifically through Pennsylvania. Unused capacity exists on the Pittsburgh and Fort Wayne Lines and these clearance projects will allow the line to accommodate anticipated freight growth while allowing for double-stack intermodal freight to use the Pittsburgh and Fort Wayne Lines in lieu of the Mon Line. The ability to move this double-stack traffic on the Pittsburgh and Fort Wayne Lines will eliminate exposure to hazardous conditions and delay to time-sensitive freight relating to the unpredictable landslides from adjacent property that occur along the Monongahela Line (Mon Line). In addition to clearance for double-stack trains, the W. North Avenue Bridge also has corrosion and other conditions that are considered safety concerns that may pose a safety hazard to the railroad and the traveling public and a potential liability to other transportation entities (e.g., City of Pittsburgh, Allegheny County).

Maps of the individual projects, along with photographs of the existing conditions, are included in Appendix 1, along with additional purpose and/or need statements relating to the individual overhead clearance projects, as applicable. The five clearance projects represent the final double-stack clearance limitations on the Pittsburgh and Fort Wayne Lines.

This Purpose and Need Statement has been developed in accordance with Pennsylvania Act 120 of 1970. It follows guidance from several sources, including the Pennsylvania Department of Transportation (PennDOT) Publication No. 319: Needs Study Handbook. Appendices, figures, and photographs referenced herein provide supporting documentation.

PURPOSE:

The purpose of the Pittsburgh vertical clearance projects is to promote the efficient transportation of goods between Chicago and the New York/New Jersey commercial markets and to improve mobility and safety for freight traffic through Pittsburgh. The projects will remove the final remaining vertical clearance restrictions creating chokepoints and other hindrances to efficient flow of intermodal rail traffic and will support truck/rail intermodal facilities along this important rail corridor by allowing for double-stack intermodal traffic, which is a PennDOT goal under the Commonwealth's State Rail Plan, developed in compliance with Federal Railroad Administration requirement and with the Rail Freight Preservation and Improvement Act of 1984, as amended, Public Law 587-119. See US DOT, The Strategic Multimodal Analysis, Task 3: Chicago-New York City Corridor Analysis, Final Report (Apr. 2006) (https://www.fhwa.dot.gov/policy/otps/sma/index.cfm).

The Pittsburgh and Fort Wayne Lines comprise one of two NSR mainline routes through Pittsburgh. The second mainline on the south side of the city is referred to as the Mon Line. The Mon Line is not being considered as a viable railway improvement project due to several major physical constraints and engineering factors. These factors include the fact that the Mon Line is prone to unpredictable landslides from adjacent properties, which cause hazardous conditions and substantial transportation interruption and reliability concerns for freight movement. In addition, although the Mon Line is cleared for double-stack freight movement, it has substantial capacity constraints due to a single-track line through a tunnel and a major river crossing, thus causing further delay and capacity issues for freight transit between Chicago and the east coast on that line.

Because of the constraints of the Mon Line, the Pittsburgh and Fort Wayne Lines currently are the primary route through the City of Pittsburgh for sensitive freight such as hazardous materials and would be the preferred route for time-dependent freight such as intermodal traffic, in large part because it avoids the hazardous conditions and delay experienced on the Mon Line. Furthermore, the Pittsburgh and Fort Wayne Lines are a shorter route between Chicago and the east coast and use of that route increases network fluidity while reducing transit time.

Although the double-track Pittsburgh and Fort Wayne Lines are the preferred freight route through the City of Pittsburgh, several bridges on that line limit the clearance for rail freight such that double-stack intermodal and automobile multilevel freight cannot move on that line. Rail capacity exists on the double-track Pittsburgh and Fort Wayne Lines and these proposed projects will allow the line to accommodate anticipated freight growth and double-stack intermodal traffic. In addition, the condition of the bridge over the railroad at W. North Avenue, Pittsburgh, has safety deficiencies that pose risks to current rail traffic and forecasted rail traffic increases throughout the United States and within Pennsylvania in particular.

NEED

The project need for the railway improvement projects along the Pittsburgh and Fort Wayne Lines is to address:

A. Forecasted traffic demands;
B. Vertical clearance constraints;
C. Operational safety and reliability;
D. Public safety; and
E. Facility deficiencies.

A. Forecasted traffic demands:

Anticipated increases in freight capacity projections, especially in the intermodal market, indicate that double-stack utilization will increase over the next 30 years. Pennsylvania state and national rail plans have identified clearances restricting freight rail transportation as a major impediment to freight capacity, recommending reducing choke points restricting double-stack intermodal traffic [2015 Pennsylvania State Rail Plan (Dec. 2016); The Strategic Multimodal Analysis, Task 3: Chicago-New York City Corridor Analysis, Final Report (U.S. DOT, Apr. 2006); Pennsylvania Intercity Passenger and Freight Rail Plan (PennDOT 2010); 2003 Pennsylvania State Rail Plan (PennDOT 2003).] Intermodal shipment is a method of moving freight from origin to final destination using two or more transportation modes, without handling the freight itself when changing modes. This method improves efficiency by allowing for use of the most efficient transportation mode for each segment of a shipment of goods in a trailer or container (Congressional Research Service, 2003). In an intermodal transportation network, trains, trucks, ships, and aircraft are connected seamlessly to provide an efficient and flexible transportation system meeting the needs of the nation's consumers, carriers, and shippers (FHWA, 2009a).

The intermodal business is one way to achieve a long-term sustainable balance between business needs and the impact of railroad operations on the environment. In intermodal operations, containers often are loaded two high, called "double-stack," to allow twice as many shipments to be moved on one intermodal train. Double-stack intermodal traffic increases capacity using the existing infrastructure, with appropriate clearance and without requiring new rail lines for additional trains. Double-stack rail traffic also reduces shipping costs and improves service, while at the same time providing new competitive rail alternatives and new economic development opportunities for customers and communities.

The need for improving freight transportation throughout the United States is driven by factors such as:

- Growing congestion on U.S. highways used for long-haul freight movement;
- Volatile or high fuel prices and the quest for energy-efficiency;
- The strain on the truck driver labor pool;
- Need for improvements in shipping services;
- The national policy toward the reduction of greenhouse gas (GHG) emissions.

The Federal Highway Administration (FHWA) Freight Analysis Framework (FAF) forecasts that the tons of freight transported within the U.S. by rail will increase by more than 20% between 2015 and 2045, with a more than 80% increase in value of freight by rail over that same time frame. (https://www.bts.gov/newsroom/dot-releases-30-year-freight-projections ; https://www.bts.gov/sites/bts.dot.gov/files/docs/FFF_2017_Full_June2018revision.pdf). FHWA's FAF, which compares relevant statistics from 2012 to 2045, also predicts that, with current infrastructure, highway congestion would increase dramatically because of the increase in freight and intermodal demand. See Appendix 2. It is infeasible to accommodate these anticipated increases in freight requirements by merely maintaining the current national rail infrastructure, and commensurate congestion would result. Projects are needed to address the national need to enhance rail infrastructure as evidenced by the forecasted increase in demand and congestion.

Pennsylvania ranks first in the country in the number of operating railroads (approximately 65) and ranks near the top in total track mileage (more than 5,600 miles). Each year, around 200 million tons of freight originate in, terminate in, or pass through Pennsylvania by rail, including more than 50 million tons of coal, steel, food, and other products mined or grown throughout the Commonwealth. The Commonwealth of Pennsylvania is expected to face substantial highway-truck traffic congestion as a result of the increase in demand and freight transportation, as shown in the FAF graphics in Appendix 2. PennDOT predicts that within the Commonwealth of Pennsylvania, intermodal freight rail traffic will increase by 86.4%. The primary east-west Class I freight rail corridor in Pennsylvania is through Pittsburgh. The Pittsburgh-Allegheny County region in particular is expected to be highly congested in the absence of additional freight transportation planning. See Appendix 2.

To accommodate the expected increases in rail demand, as well as to support national goals relating to greenhouse gas emissions and fuel efficiency, the national freight rail system has been substantially modernized over the past decades to raise clearances, upgrade tunnels, and modify rail lines throughout much of America's 140,000-mile freight rail network to accommodate double-stack intermodal trains. (See https://www.aar.org/article/6-milestones-intermodal-growth/) Limitations for double-stack intermodal trains still impact freight transportation through Pennsylvania, however. The clearance projects represent the final obstacles for double-stack and automobile multilevel traffic along the Pittsburgh and Fort Wayne Lines and complement the clearance of 163 previously existing obstructions to double-stack container traffic in the 1990s through a Conrail/PennDOT partnership.

B. Vertical clearance constraints:

The Pittsburgh and Fort Wayne Lines serve as an alternate route for the Mon Line but currently have limited vertical clearance at various locations that prevents the passage of double-stack trains or automobile multilevel traffic. Five structures limit the height of freight railroad cars travelling along the Pittsburgh and Fort Wayne Lines. The structures do not provide sufficient vertical clearance between the bridge and the tracks, and Amtrak Station's shed canopy over the freight line is not tall enough, to allow double-stack intermodal trains to travel underneath.

The current vertical clearance at the project locations varies along the corridor from 18'-3" to 20'-6". The PUC requirement for vertical clearance in Pennsylvania is 22'-0", absent a waiver.

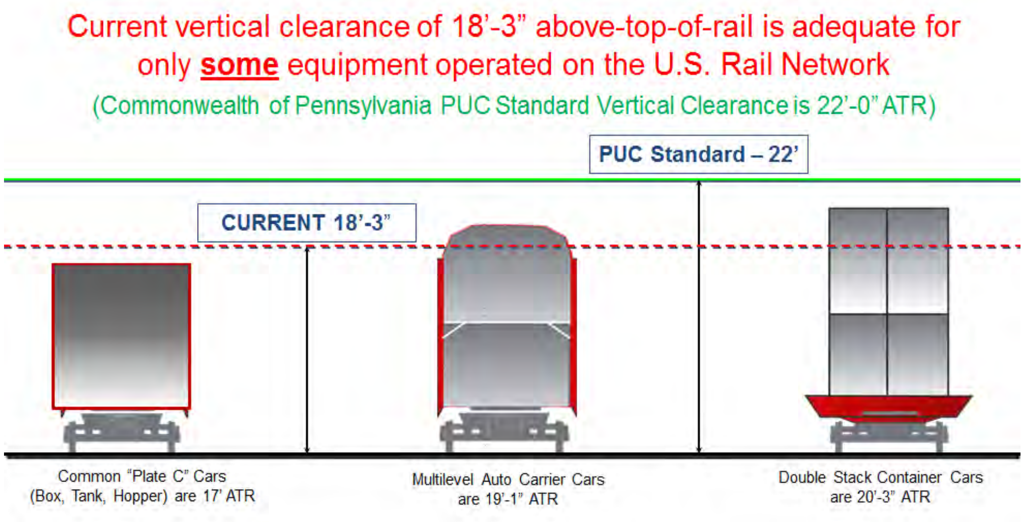


Figure 2. Vertical Clearance Standards

C. Operational safety and reliability:

The NSR line between Chicago and metropolitan New York City via Cleveland, Pittsburgh and Harrisburg is referred to as the Premier Corridor and is the most critical freight artery on Norfolk Southern's 22-state network. NSR has two east-west freight routes through Pittsburgh, one of which is cleared for double-stacked intermodal trains and automobile multilevel trains. However, that double-stack route, known as the Port Perry Branch and the Mon Line (together, the Mon Line) is currently at or near capacity and, as a result, frequently faces congestion issues and service delays. In addition, the infrastructure and geography of the Mon Line create challenges for timely delivery of the service-sensitive intermodal freight that uses it today. The Mon Line has a 3-mile single-tracked segment that includes a tunnel and an adjacent bridge over the Monongahela River. This 3-mile segment is the largest chokepoint on NSR's route between Chicago and the New York metropolitan area. In addition to the choke point, and more importantly, the topography adjacent to the railroad right of way is susceptible to landslides from the adjacent Mount Washington. The slope of Mount Washington continues to shift, and each time it does, the potential exists for soil and rock to be deposited on the railroad tracks, making them unable to be traversed until the debris is removed and the slide area stabilized. Besides the substantial costs incurred for cleanup, the unpredictable slides create hazardous conditions and cause hours of delay annually. These landslides range from moderate to severe in nature and the timing and severity of the incidents are unpredictable. Further, the landslides originate on property not owned or controlled by NSR, and as such NSR can merely react to landslides as they may occur. (See Appendix 3.) Each year, delay times resulting from these events, averaging approximately 32.9 hours, create substantial cost for the railroad, customers, and businesses. Delays on the Mon Line relating to landslides are projected to cause almost 4.3 million hours of closures over the next 30 years. Service-sensitive freight on this line and the additional capacity through southwest Pennsylvania anticipated in the future will need to be accommodated.

NSR's second mainline through Pittsburgh is the Pittsburgh and Fort Wayne Lines, which has double track throughout for more efficient operations. However, the current vertical clearance on this line is inadequate for double-stack trains in several locations, and consequently the line constrains the capability to accommodate the projected increases in freight tons, and the anticipated increase in intermodal capacity, expected to be moving on the nation's transportation network. These limitations result in freight rail congestion and lead to less efficient intermodal transportation. An increase in intermodal traffic in order to keep trucks off highways needs to be accommodated for this major east-west artery. Under the current circumstances, adding more traffic to the Mon Line route to accommodate the forecasted increases in intermodal and other freight over the next many years would result in additional delays to train schedules and worsened congestion. In addition, NSR's dependence on the capacity- and geography-constrained Mon Line through Pittsburgh for its double-stack intermodal traffic, most of which has interstate commerce related time sensitivities, affects its ability to deliver quality service to customers and, ultimately, to compete with trucks. The structural risks adjacent to the current Mon Line route pose a threat to its long-term vitality, especially for this service-sensitive traffic. Considering that intermodal traffic through this part of Pennsylvania is expected to substantially increase in the coming years, it is crucial that investment be made in infrastructure improvement on the Pittsburgh and Fort Wayne Lines in the near-term for operational safety and reliability.

D. Public safety:

Public safety is the primary operational focus of NSR, PennDOT, the City of Pittsburgh, Allegheny County, and Amtrak. The safety of citizens, employees, and operations are central to the goals of the Pittsburgh Vertical Clearance projects. Additional rail capacity is beneficial to the safety of the motoring public by removing long-haul trucks from the highways of multiple states.

The Pittsburgh and Fort Wayne Lines (in the project area) have only three at-grade crossings, of which just one is a public at-grade crossing. Adding freight to the Pittsburgh and Fort Wayne Lines presents less risk of automobile/rail conflict for high-volume freight transportation. While at-grade crossing accidents have been greatly reduced through public education initiatives nationwide, projects like the Pittsburgh Vertical Clearance projects boost these efforts by routing trains on heavily gated lines with pedestrian and motor vehicle crossing options.

E. Facility Deficiencies:

Structurally deficient structures become less effective and more expensive to maintain or repair as their conditions worsen. Facility deficiencies must be addressed for this key component of the rail network in order to help to minimize future maintenance and address existing structural deficiencies and traffic demands (e.g., rail, vehicular, pedestrian and bicycle). The W. North Avenue Bridge, at the intersection of W. North Avenue and Brighton Road in Pittsburgh, is in poor condition. The current poor condition of the W. North Avenue Bridge has led to increased maintenance actions, with additional substantial maintenance necessary if the structure remains active and in service. These maintenance activities eventually will require more frequent interruptions on the Pittsburgh and Fort Wayne Lines to allow for more extensive maintenance repairs, thus causing significant disruption to interstate commerce on the busiest corridor between the Midwest and the East Coast. If the structural conditions are not addressed, the poor condition of this bridge may pose a threat to public transportation connectivity. In accordance with maintenance obligations, modification or replacement of this bridge will ensure the continued safe and efficient transportation of goods by rail. The condition of this bridge would need to be addressed to ensure the continued safe and efficient transportation of goods by rail in accordance with maintenance obligations to address facility deficiencies.

APPENDIX 1

PROJECT LOCATIONS

The locations of the five individual proposed projects is shown below in Figure 1.1.

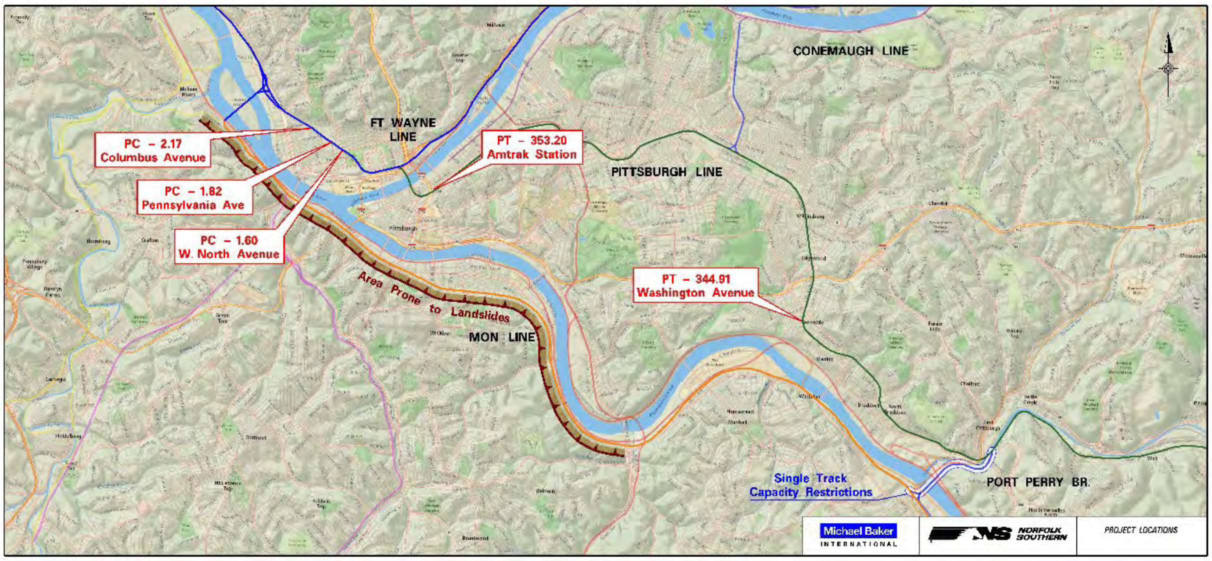
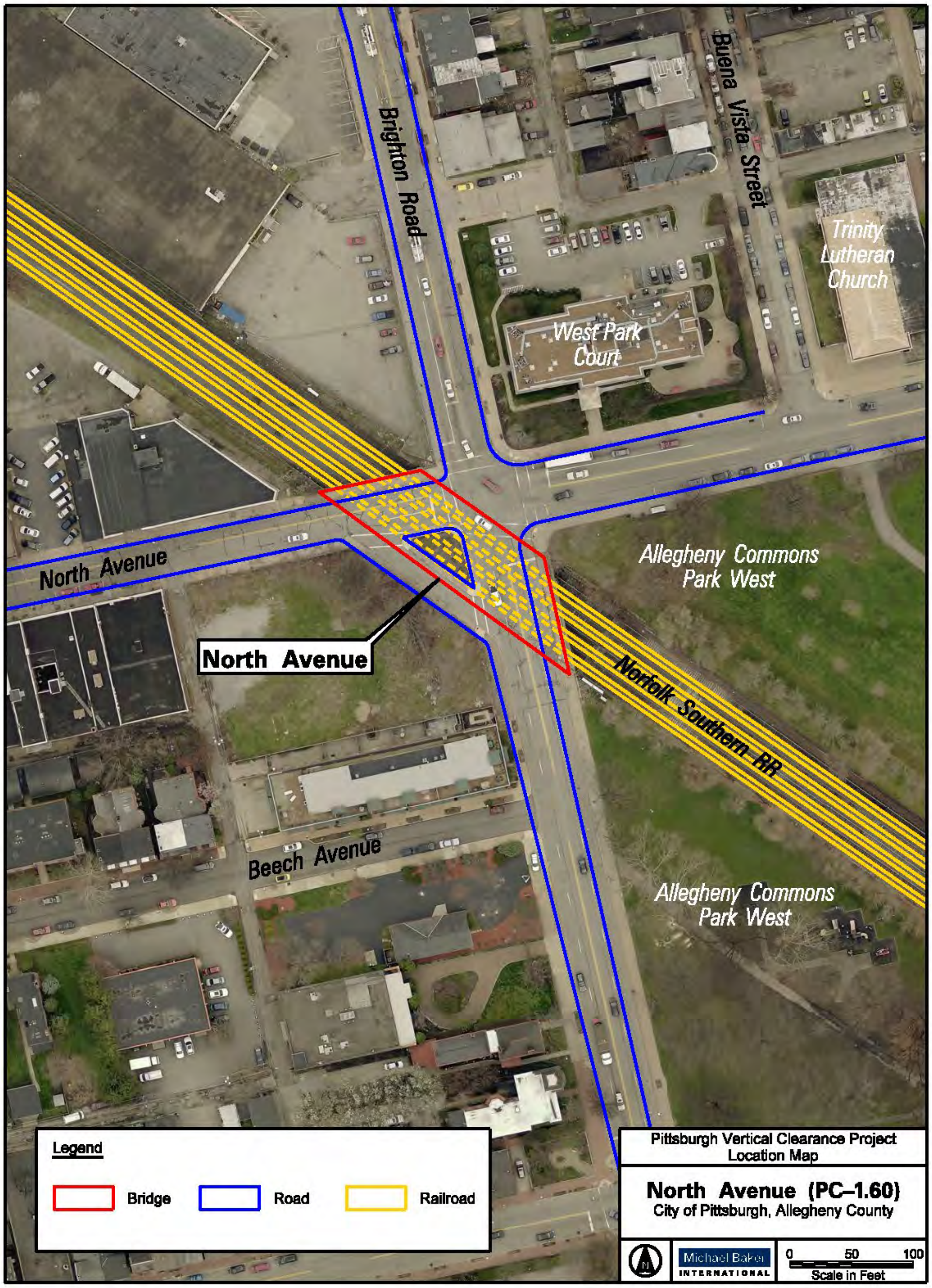


Figure 1.1. Map of Project Locations showing Port Perry Bridge, Mon Line, Pittsburgh Line and Fort Wayne Line

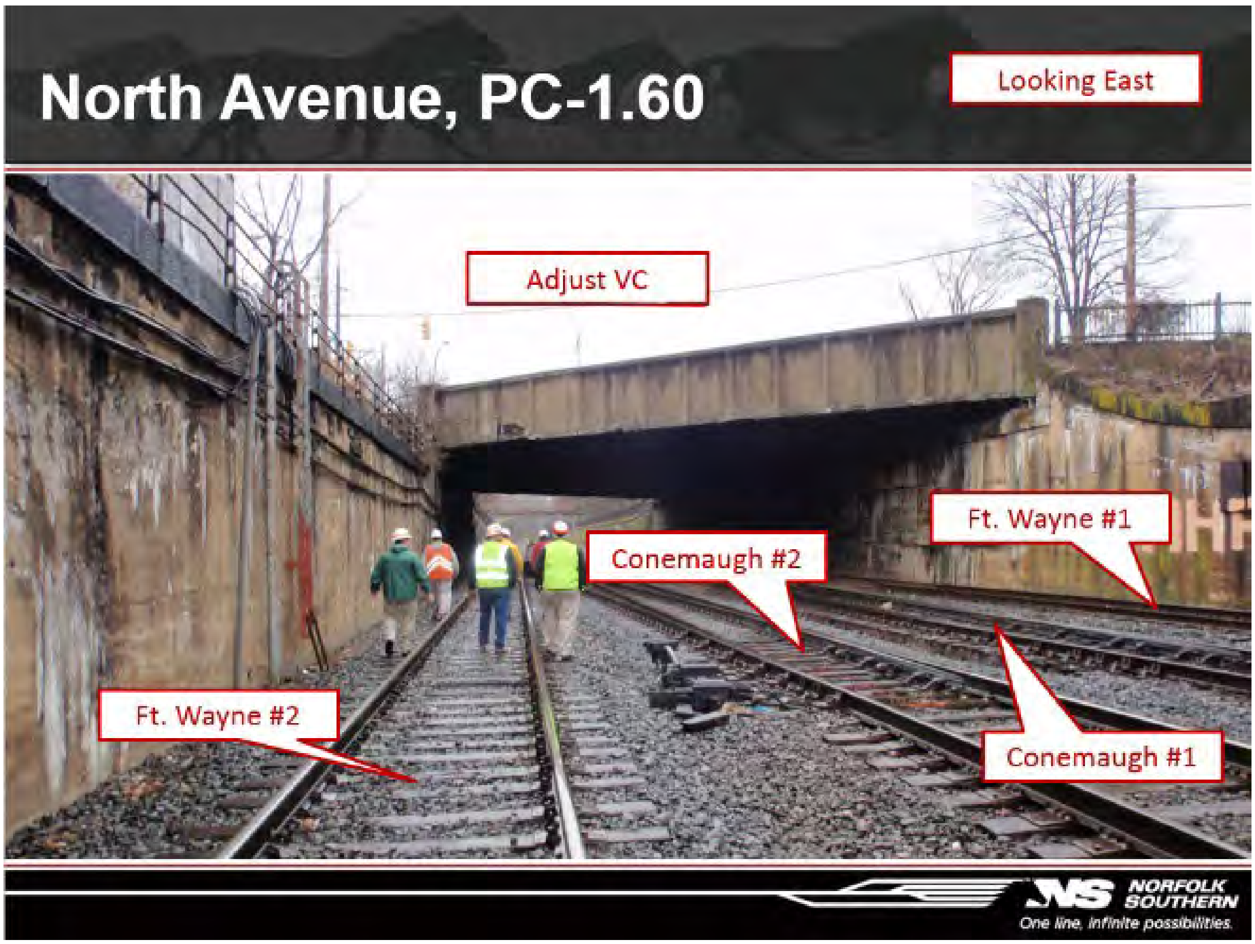
Maps of the individual projects, along with photographs of the existing conditions, are presented in this Appendix, along with descriptions relating to the individual overhead clearance projects, as applicable.

1. Project Location Map:
W. North Avenue Bridge over NS (PC-1.60), City of Pittsburgh, Allegheny County

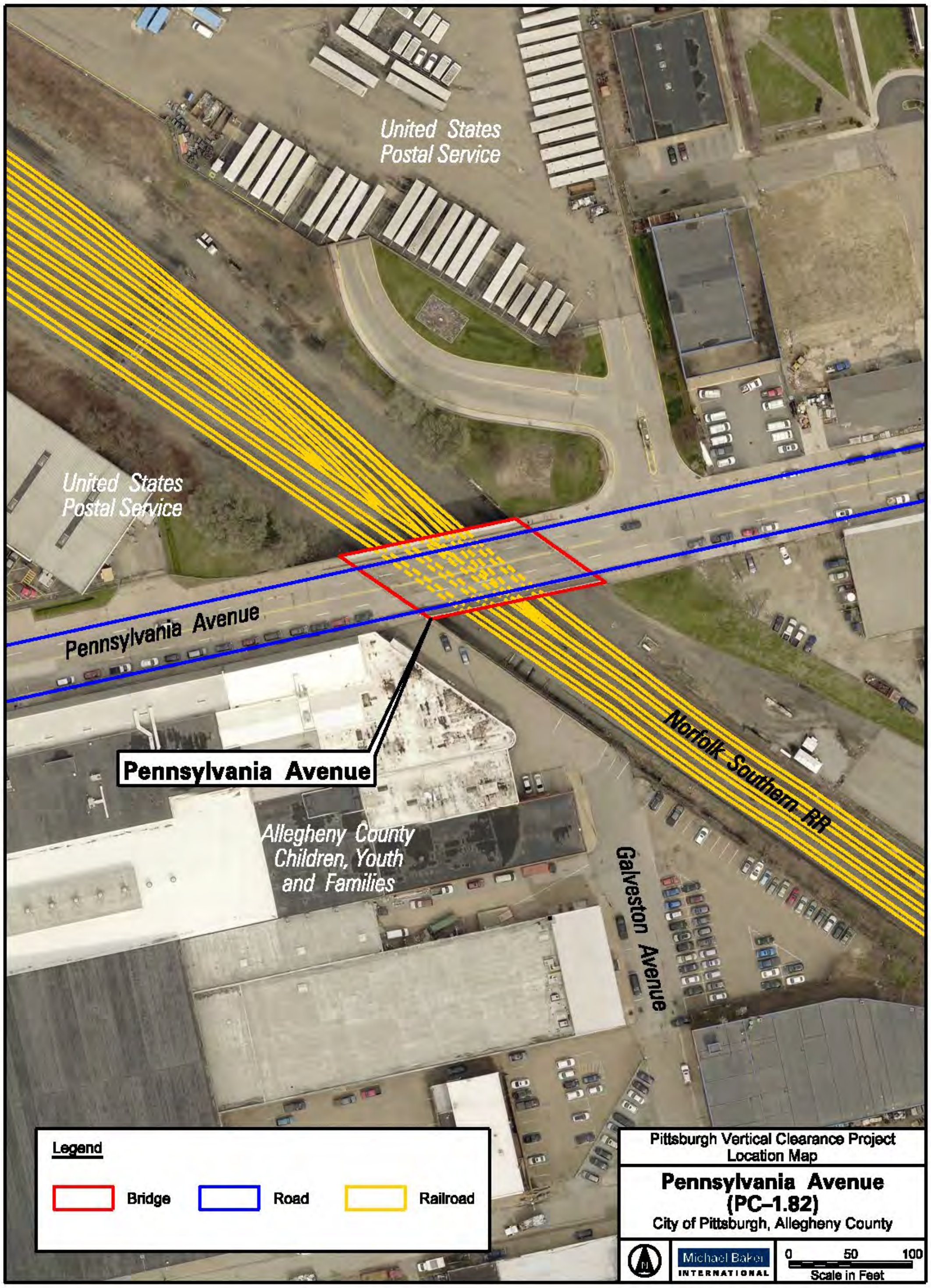


Description:
W. North Avenue Bridge over NS (PC-1.60), City of Pittsburgh, Allegheny County

To increase vertical clearance between the Fort Wayne Line tracks and the bridge to accommodate double-stack railroad traffic and to address structural deficiencies of the bridge in order to provide for safe and efficient rail transportation. The bridge needs attention and is structurally deficient according to a 2018 inspection report. The bridge has an existing vertical clearance of 18’-2”, which does not provide adequate clearance for the passage of double-stack intermodal trains. The bridge has spalling concrete, and the back wall is falling onto a bearing on the left side of the bridge.



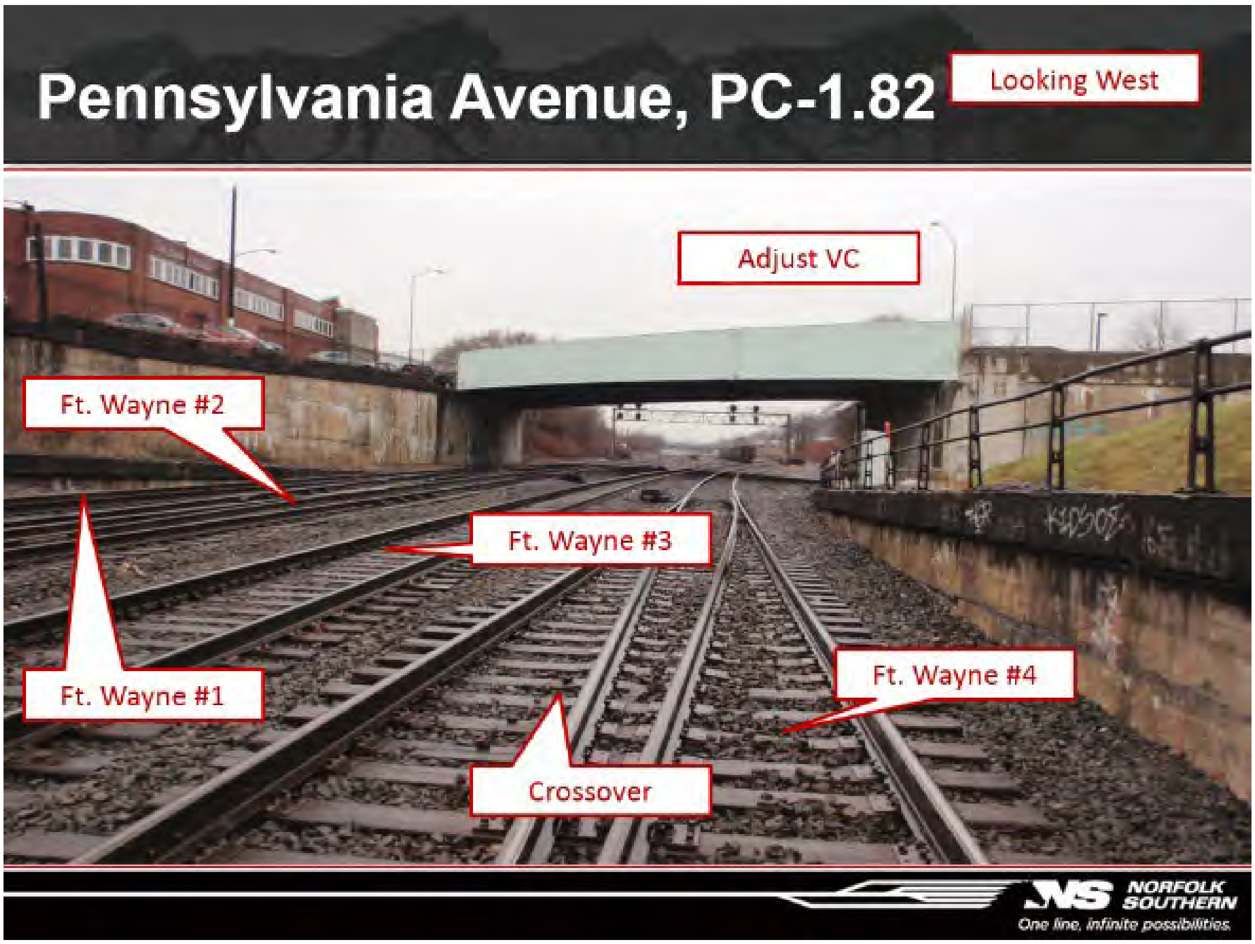
2. Project Location Map:
Pennsylvania Avenue Bridge over NS (PC-1.82), City of Pittsburgh, Allegheny County



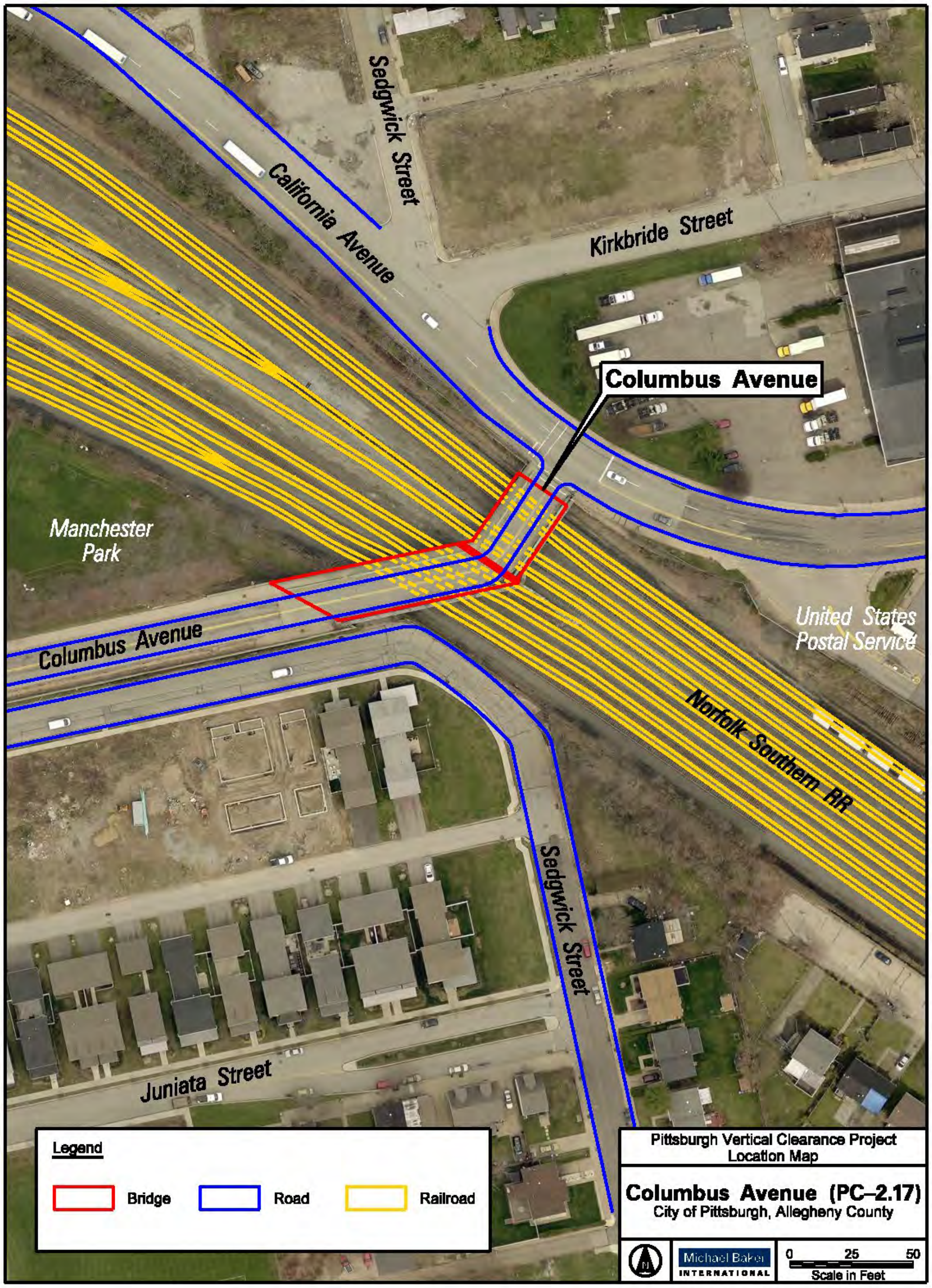
Description:

Pennsylvania Avenue Bridge over NS (PC-1.82), City of Pittsburgh, Allegheny County

To increase vertical clearance between the Fort Wayne Line tracks and the bridge to accommodate double-stack railroad traffic. The bridge has an existing vertical clearance of 19’-7”, which does not provide adequate clearance for the passage of double-stack intermodal trains.



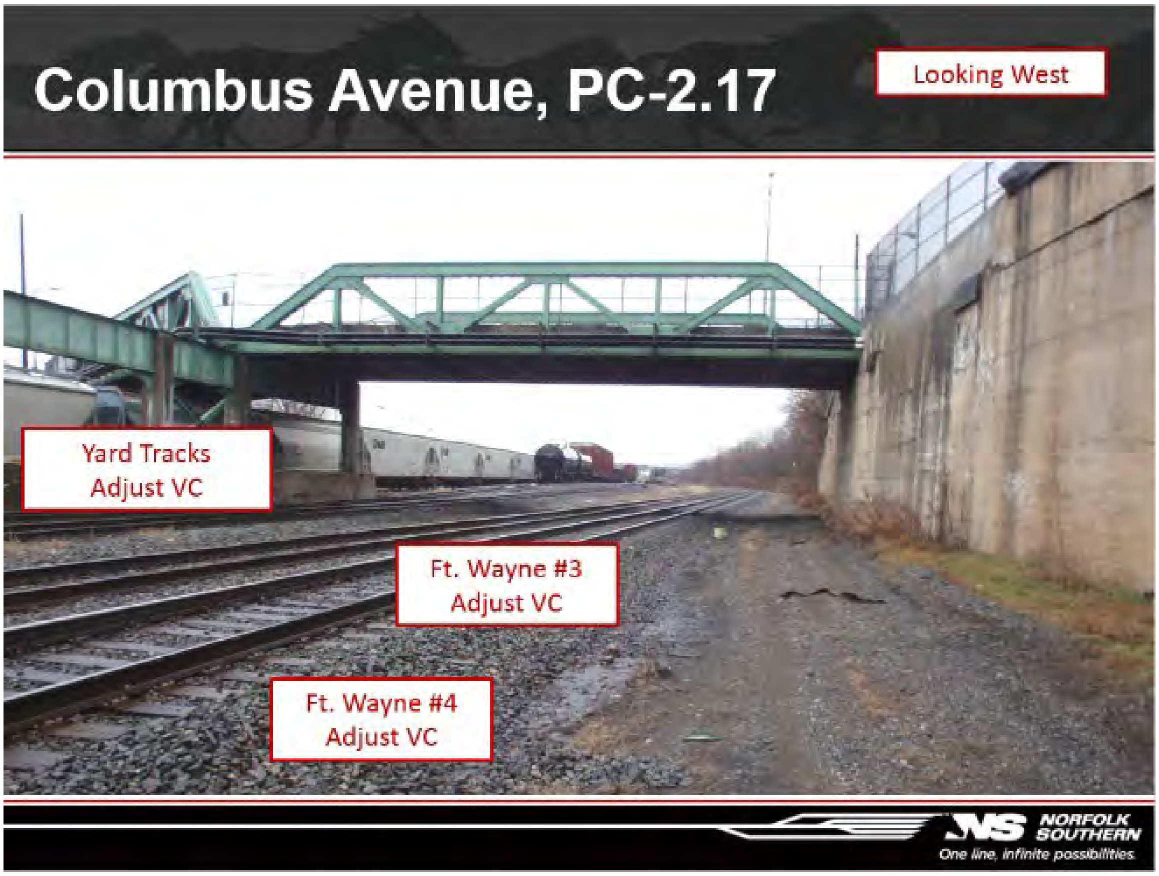
3. Project Location Map:
Columbus Avenue Bridge over NS (PC-2.17), City of Pittsburgh, Allegheny County



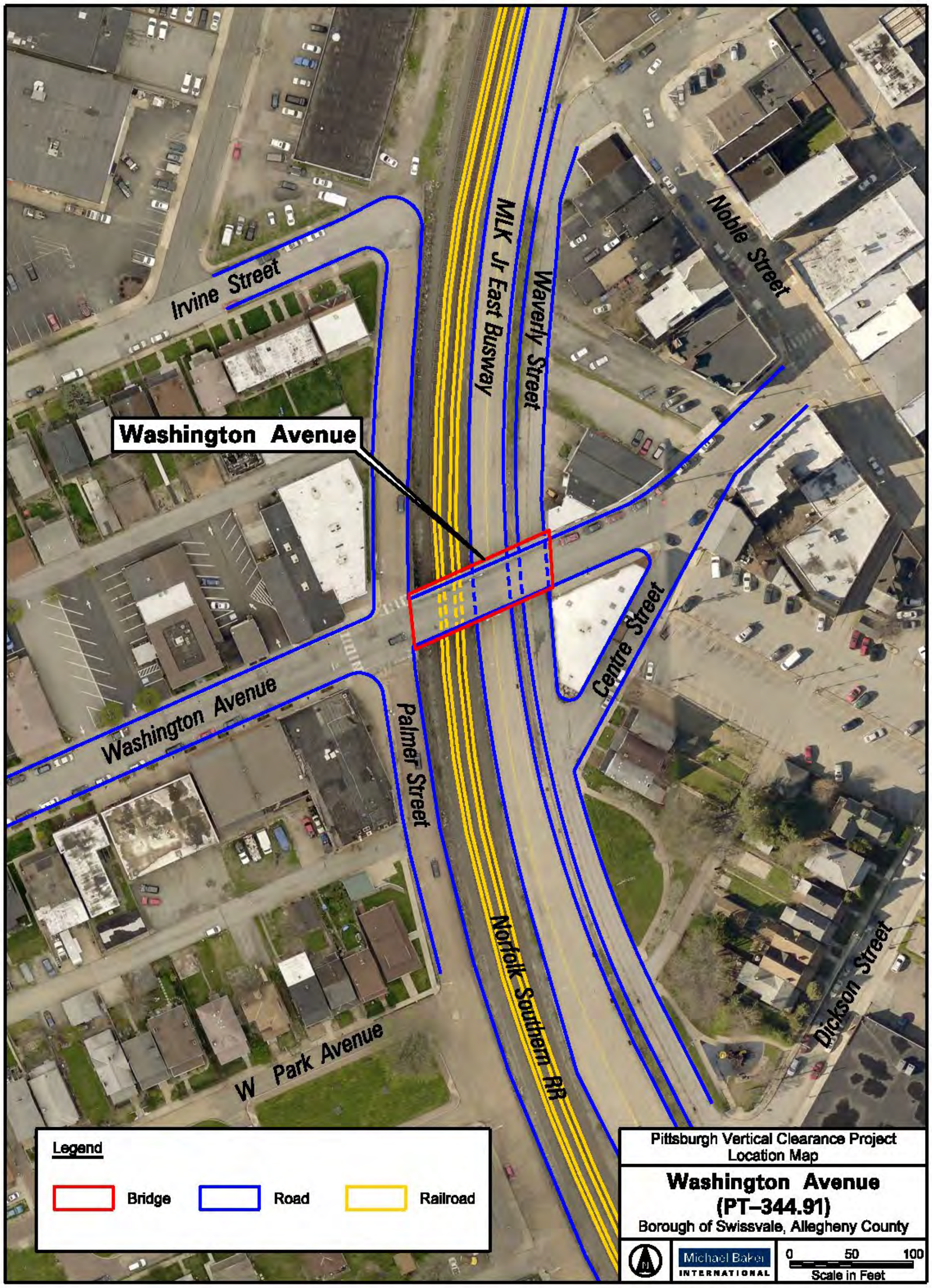
Description:

Columbus Avenue Bridge over NS (PC-2.17), City of Pittsburgh, Allegheny County

To increase vertical clearance between the Fort Wayne Line tracks and the bridge to accommodate double-stack railroad traffic. The bridge has an existing vertical clearance of 20’-6”, which does not provide adequate clearance for the passage of double-stack intermodal trains.



4. Project Location Map:
Washington Avenue Bridge (PT-344.91), Borough of Swissvale, Allegheny County

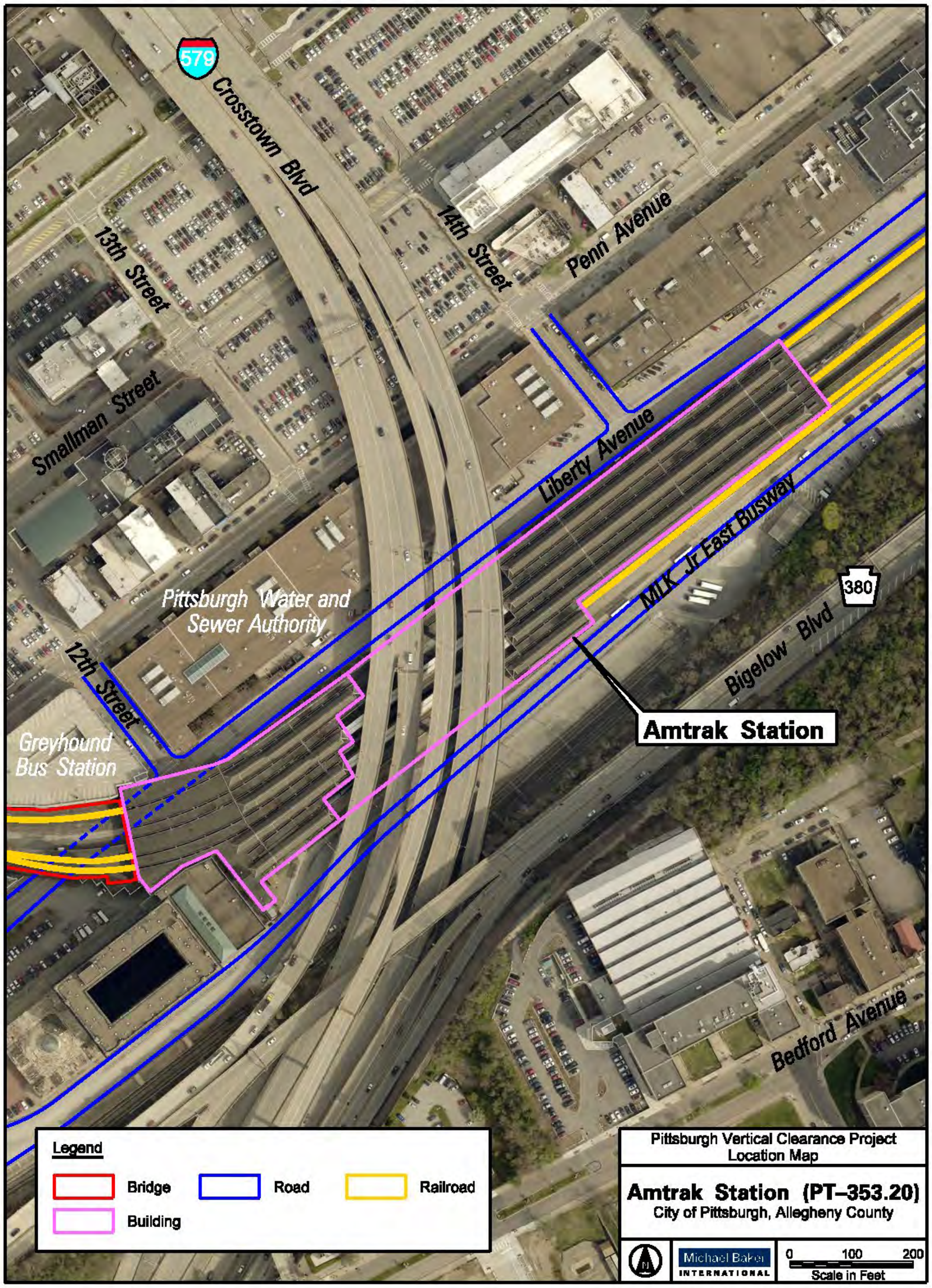


Description:

Washington Avenue Bridge (PT-344.91), Borough of Swissvale, Allegheny County

To increase vertical clearance between the Pittsburgh Line tracks and the bridge to accommodate double-stack railroad traffic. The bridge has an existing vertical clearance of 19'-9", which does not provide adequate clearance for the passage of double-stack intermodal trains.

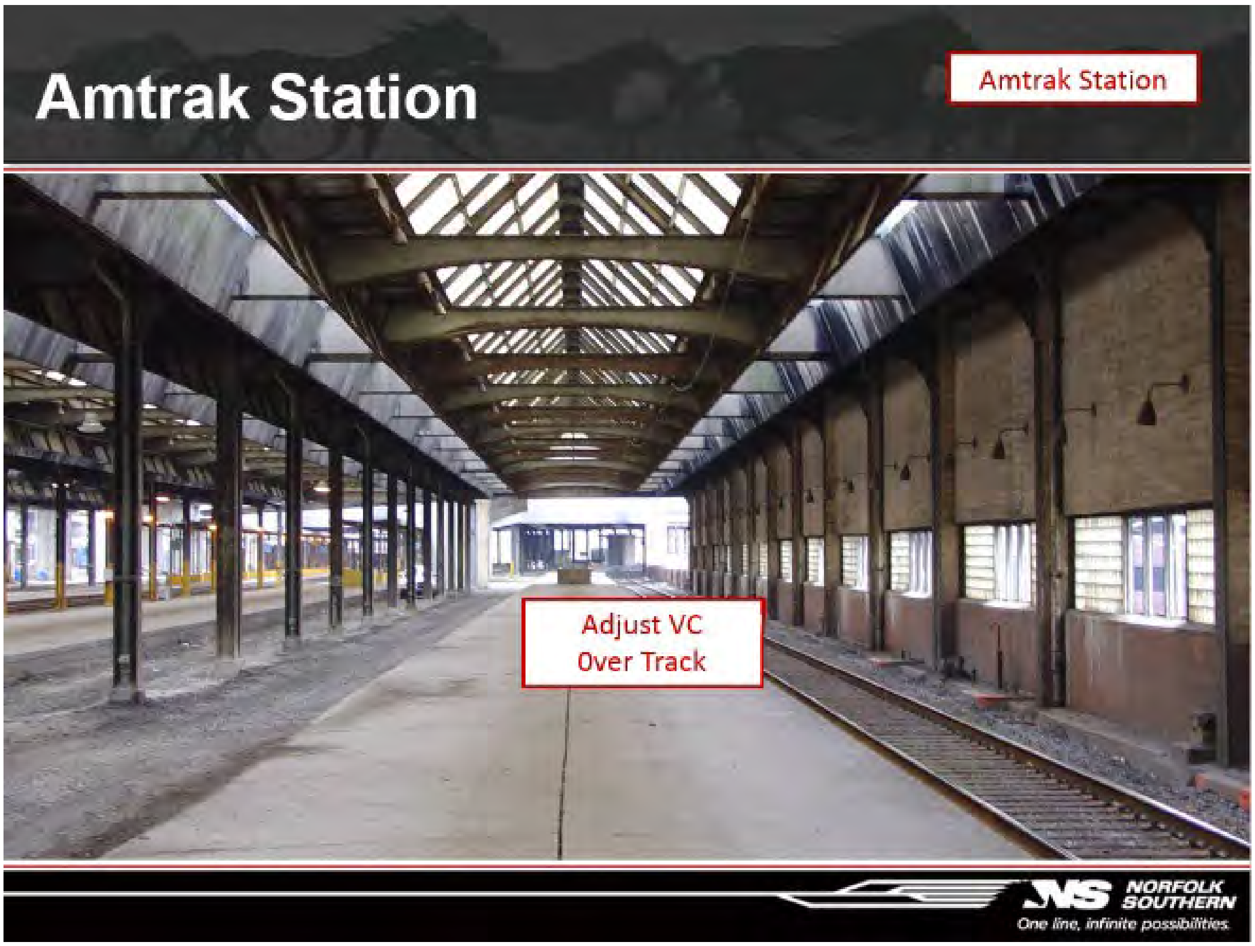
5. Project Location Map:
Amtrak Station Canopy (PT-353.20), City of Pittsburgh, Allegheny County



Description:

Amtrak Station Canopy (PT-353.20), City of Pittsburgh, Allegheny County

To increase vertical clearance between the Pittsburgh Line track and station overhanging roof to accommodate double-stack railroad traffic. The station has an existing vertical clearance of 19', which does not provide adequate clearance for the passage of double-stack intermodal trains.



APPENDIX 2

FHWA FREIGHT ANALYSIS FRAMEWORK

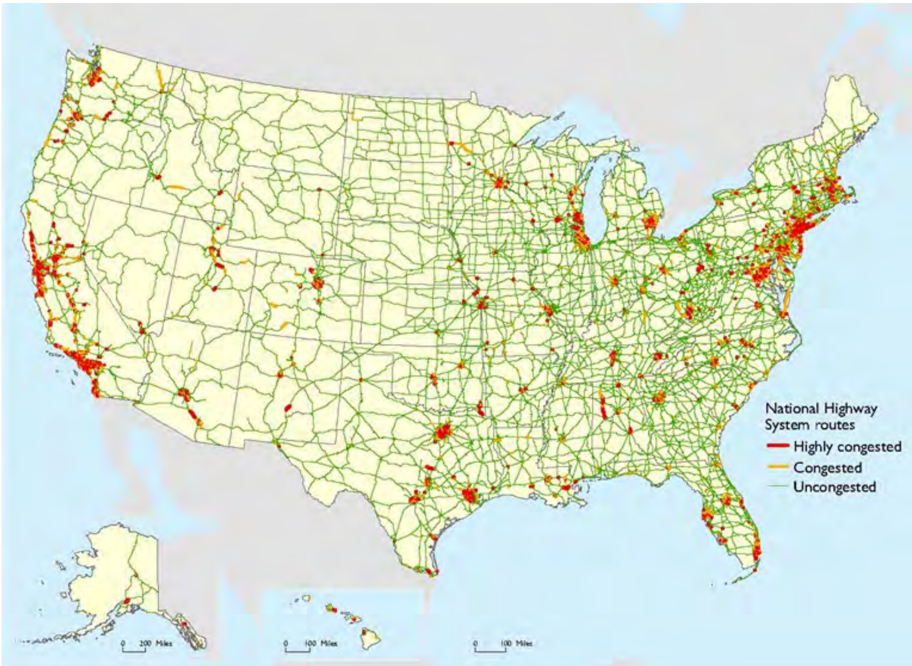


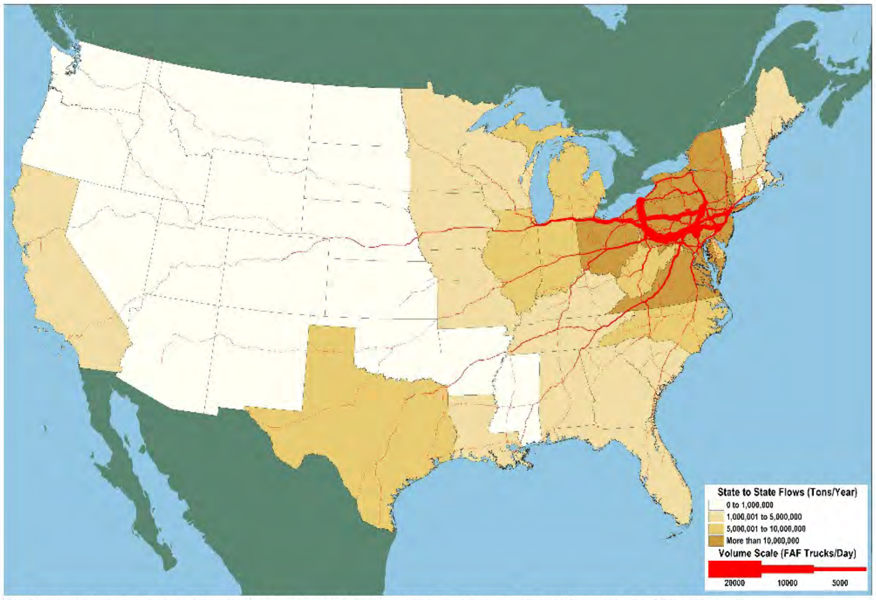
Figure 2.1: Freight Facts & Figures 2017 - Chapter 4: Freight Transportation System Performance. 2012 National Highway System (NHS) routes. (https://www.bts.gov/sites/bts.dot.gov/files/docs/FFF_2017_Full_June2018revision.pdf)

Figure 2.2: Freight Facts & Figures 2017 - Chapter 4: Freight Transportation System Performance. 2045 NHS routes. (https://www.bts.gov/sites/bts.dot.gov/files/docs/FFF_2017_Full_June2018revision.pdf)

Figure 2.3: Freight Facts & Figures 2017 - Chapter 4: Freight Transportation System Performance. Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2012 Map. (https://www.bts.gov/sites/bts.dot.gov/files/docs/FFF_2017_Full_June2018revision.pdf)

Figure 2.4: Freight Facts & Figures 2017 - Chapter 4: Freight Transportation System Performance. Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2045 Map. (https://www.bts.gov/sites/bts.dot.gov/files/docs/FFF_2017_Full_June2018revision.pdf)

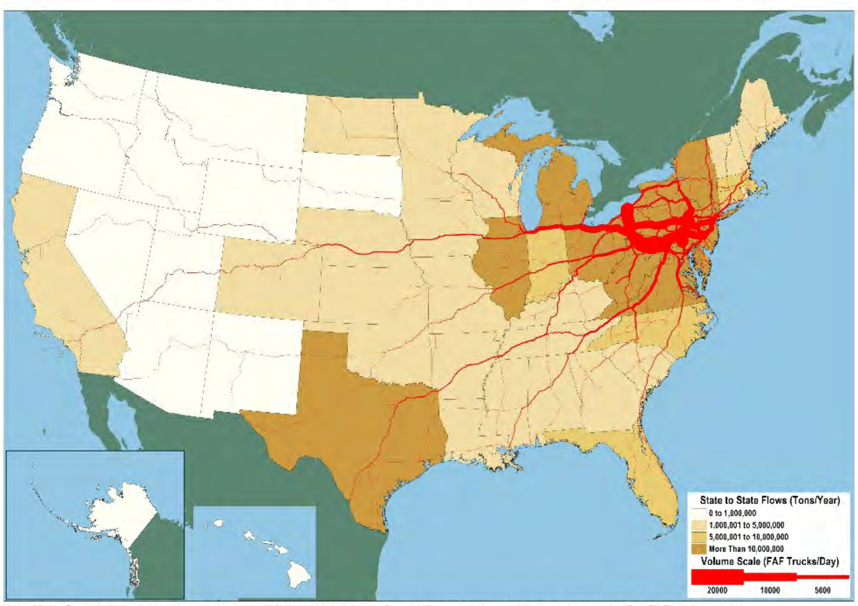
Major Flows by Truck To, From, and Within Pennsylvania: 2012



Note: Major flows include domestic and international freight moving by truck on highway segments with more than twenty five FAF trucks per day and between places typically more than fifty miles apart.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 4.3, 2017.

Figure 2.5: Source US DOT, FHWA, Office of Freight Management and Operations, Freight Analysis Framework, 2017. Major Flows by Truck to, From, and Within Pennsylvania: 2012.
https://ops.fhwa.dot.gov/freight/freight_analysis/state_info/pennsylvania/truckflow.htm

Major Flows by Truck To, From, and Within Pennsylvania: 2045



Note: Major flows include domestic and international freight moving by truck on highway segments with more than twenty five FAF trucks per day and between places typically more than fifty miles apart.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 4.3, 2017.

Figure 2.6: Source US DOT, FHWA, Office of Freight Management and Operations, Freight Analysis Framework, 2017. Major Flows by Truck to, From, and Within Pennsylvania: 2045.
https://ops.fhwa.dot.gov/freight/freight_analysis/state_info/pennsylvania/truckflow.htm

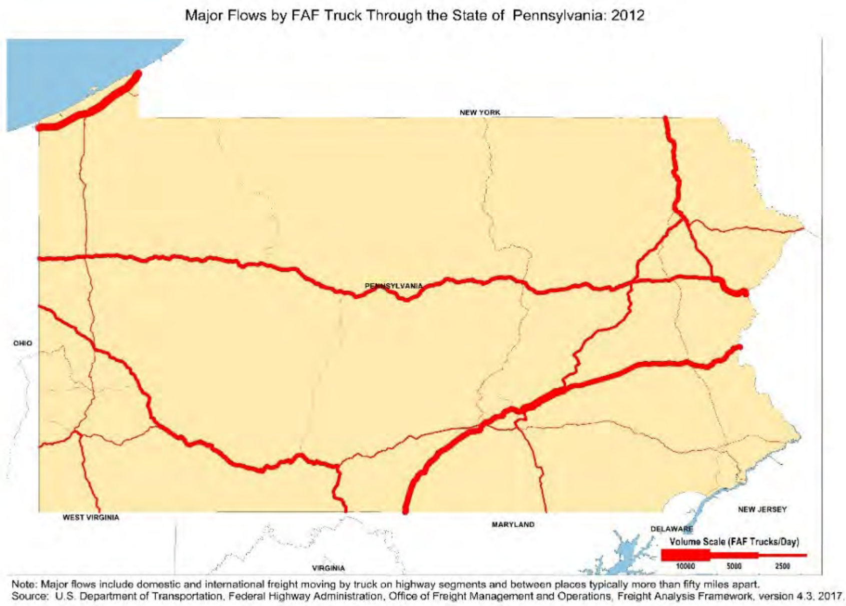


Figure 2.7: Source US DOT, FHWA, Office of Freight Management and Operations, Freight Analysis Framework, 2017. Major Flows by FAF Truck Through the State of Pennsylvania: 2012.
https://ops.fhwa.dot.gov/Freight/freight_analysis/state_info/pennsylvania/statetruckflow.htm

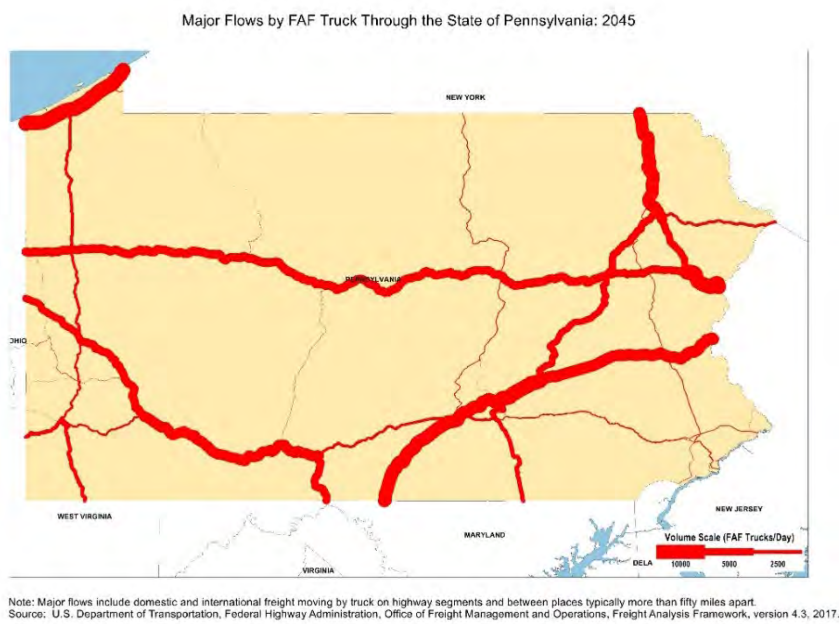


Figure 2.8: Source US DOT, FHWA, Office of Freight Management and Operations, Freight Analysis Framework, 2017. Major Flows by FAF Truck Through the State of Pennsylvania: 2045.
https://ops.fhwa.dot.gov/Freight/freight_analysis/state_info/pennsylvania/statetruckflow.htm

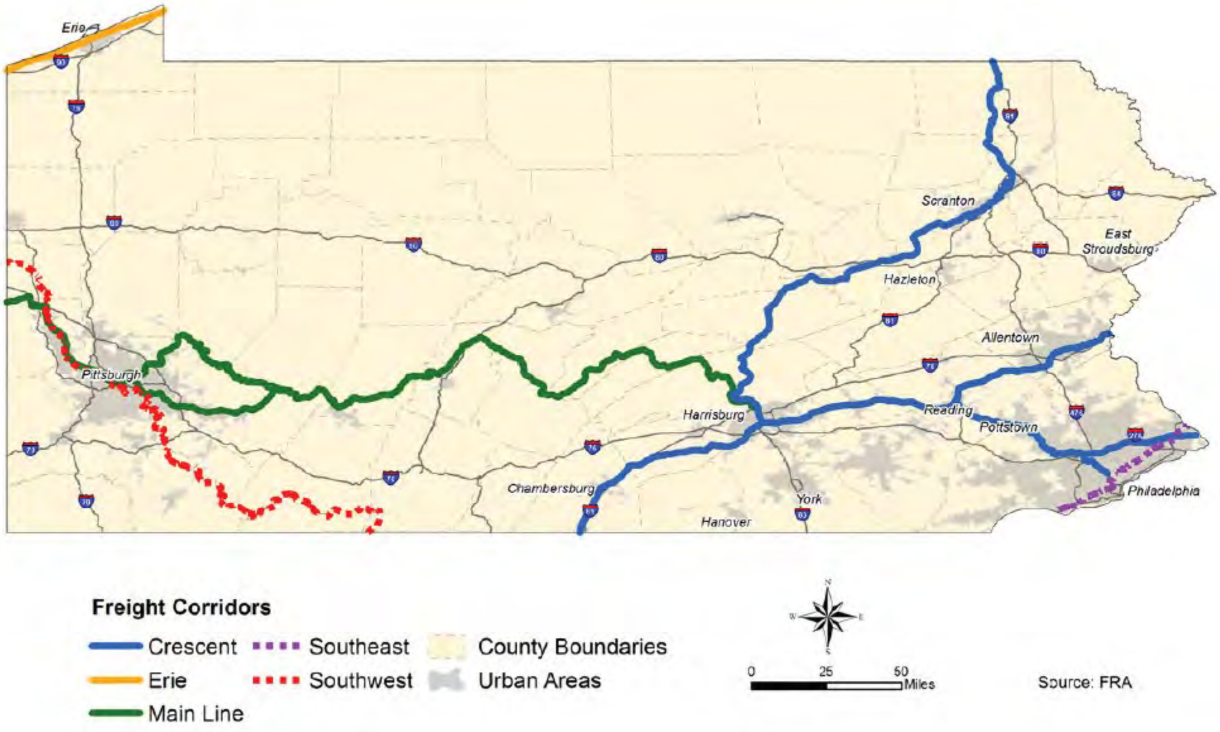


Figure 2.9: Major Class I Freight Corridors in Pennsylvania. Source: PennDOT 2015 Pennsylvania State Rail Plan (Dec. 2016) (adapted from Federal Railroad Administration)
https://www.penndot.gov/Doing-Business/Transit/InformationandReports/Documents/2015%20Pennsylvania%20State%20Rail%20Plan%20(low).pdf

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APPENDIX 3

LANDSLIDES FROM MOUNT WASHINGTON

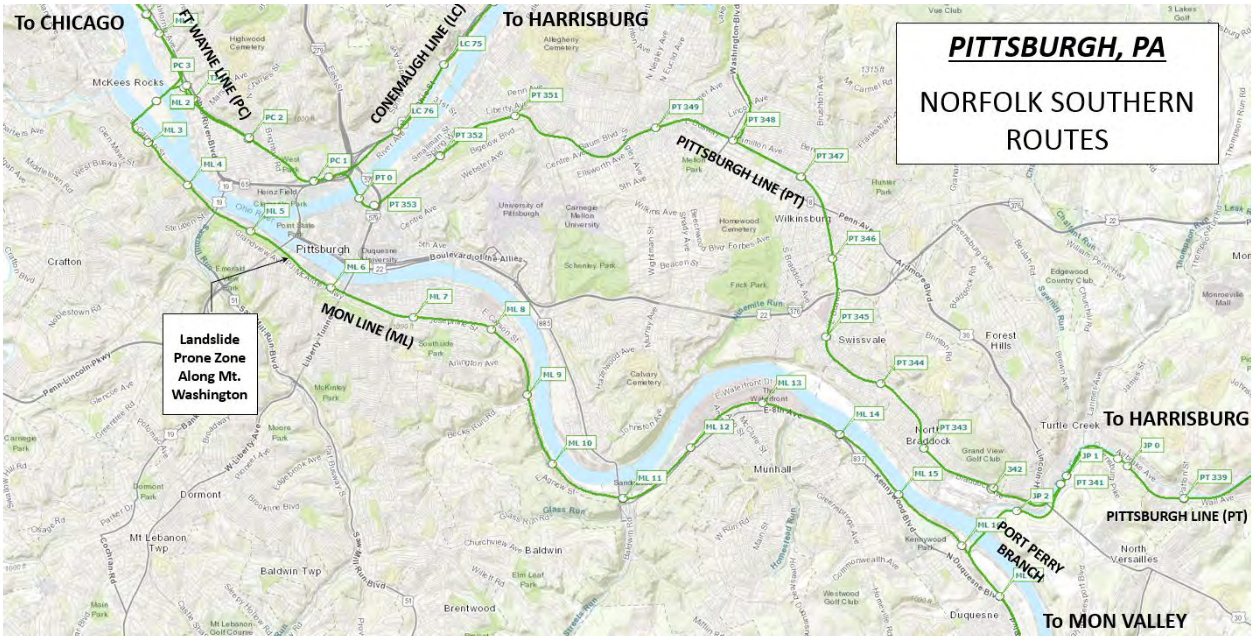


Figure 3.1: Overview Map of Project Locations showing Port Perry Bridge, Mon Line, Pittsburgh Line and Fort Wayne Line

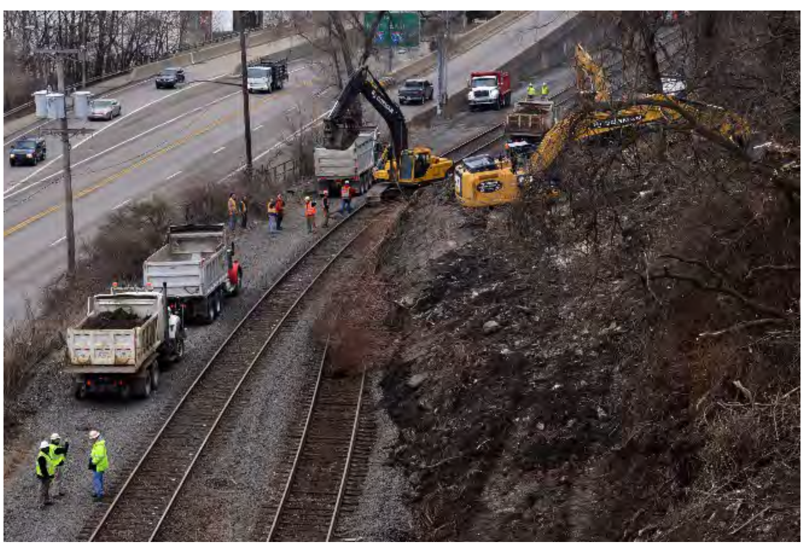
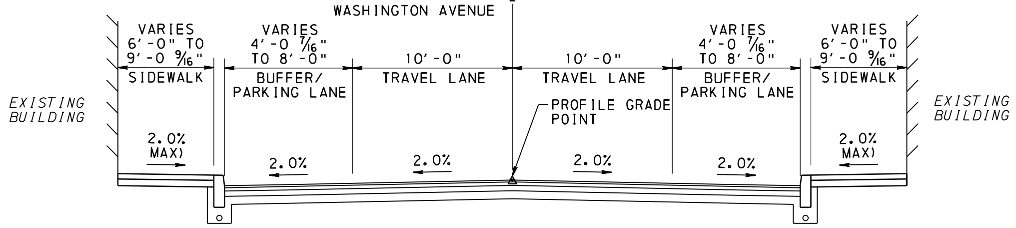


Figure 3.2: Image courtesy of Pittsburgh Post-Gazette, 2014.

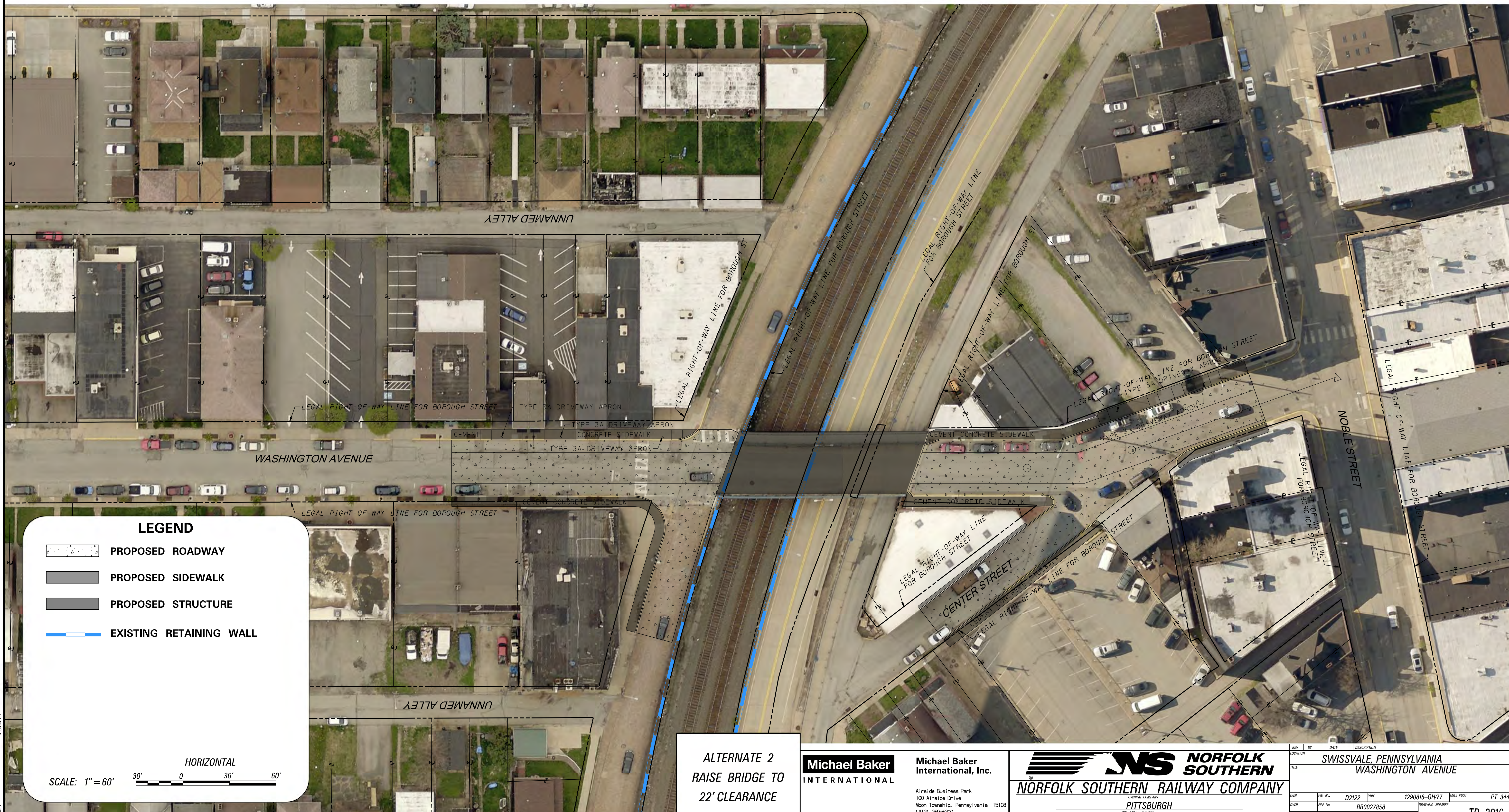
Michael Baker
INTERNATIONAL

APPENDIX B

Conceptual Plans and Profiles



TYPICAL SECTION – WASHINGTON AVENUE



LEGEND

PROPOSED ROADWAY

PROPOSED SIDEWALK

PROPOSED STRUCTURE

EXISTING RETAINING WALL

HORIZONTAL

SCALE: 1" = 60' 30' 0 30' 60'

ALTERNATE 2
RAISE BRIDGE TO
22' CLEARANCE

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SWISSVALE, PENNSYLVANIA
WASHINGTON AVENUE

D2122	1290818-OH77		PT 344.91
BR0027858			
10/11/2019			TD-2016-79

SHEET NO. 1 OF 2

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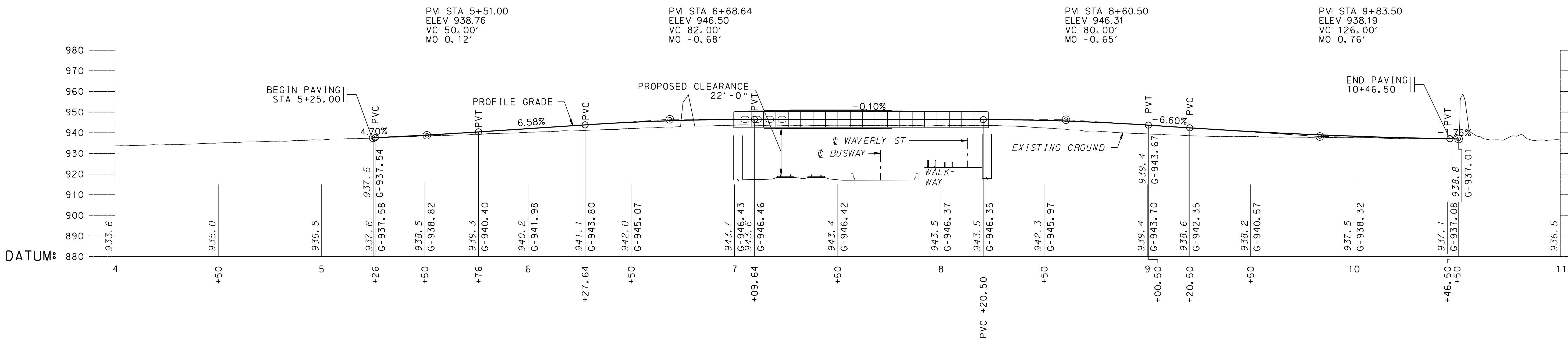

PROFILE – WASHINGTON AVENUE

HORIZONTAL

SCALE: 1"=50'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL

SCALE: 1"=10'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

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22' CLEARANCE

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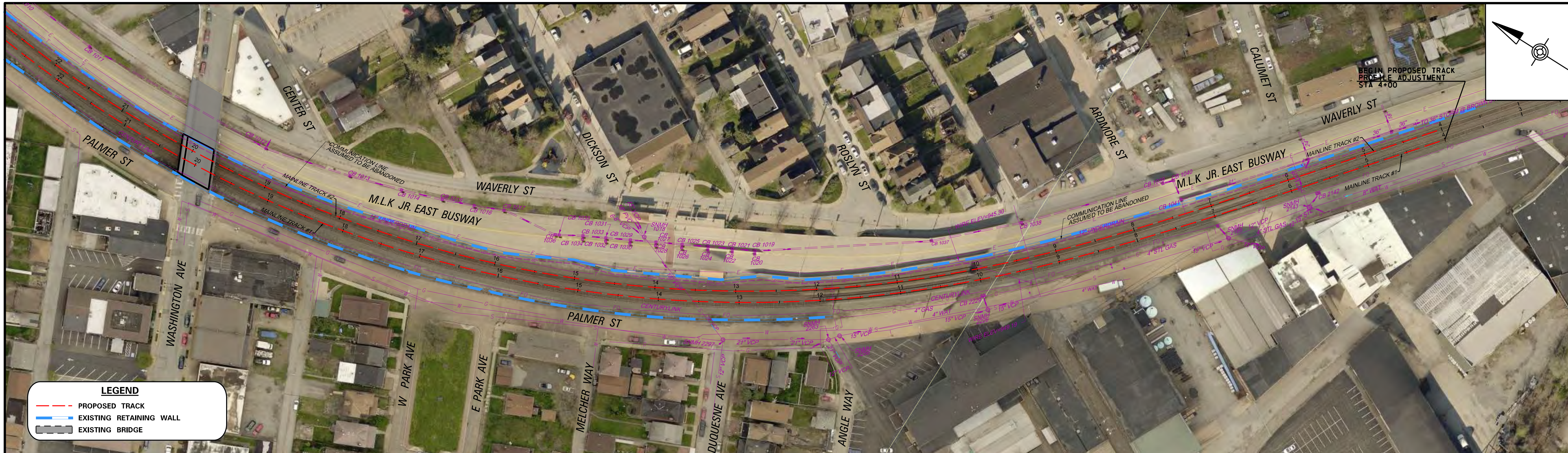

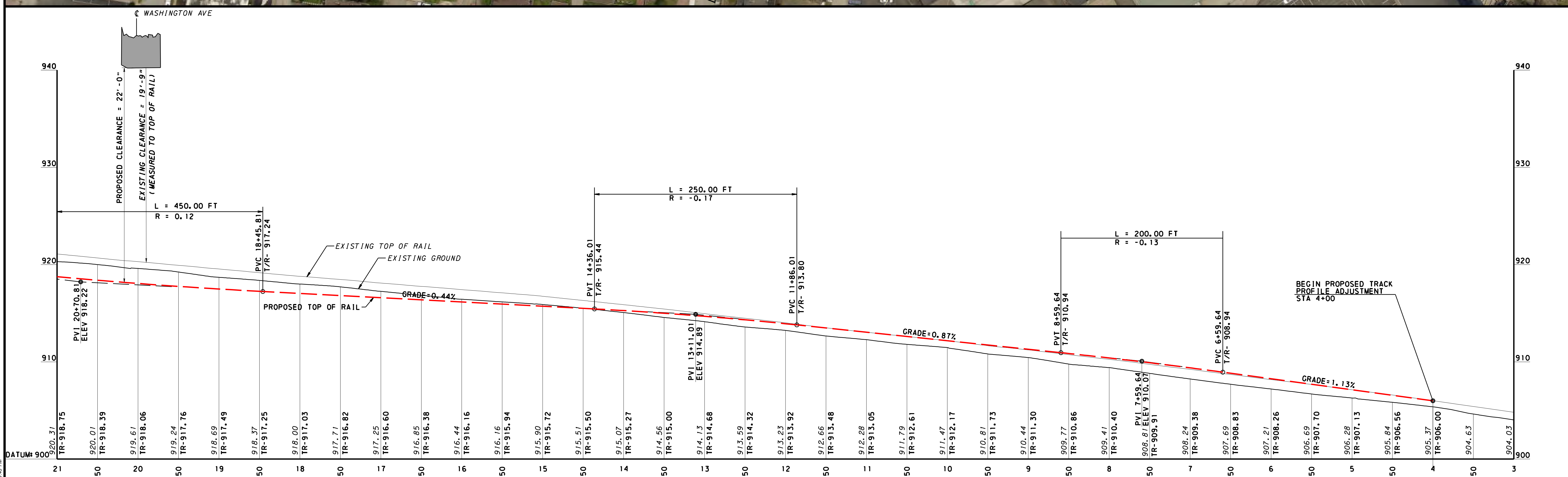

PROFILE – MAINLINE TRACK 1

HORIZONTAL SCALE: 1" = 120'
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DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10'
5' 0 5' 10'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 3
LOWER TO
22' CLEARANCE

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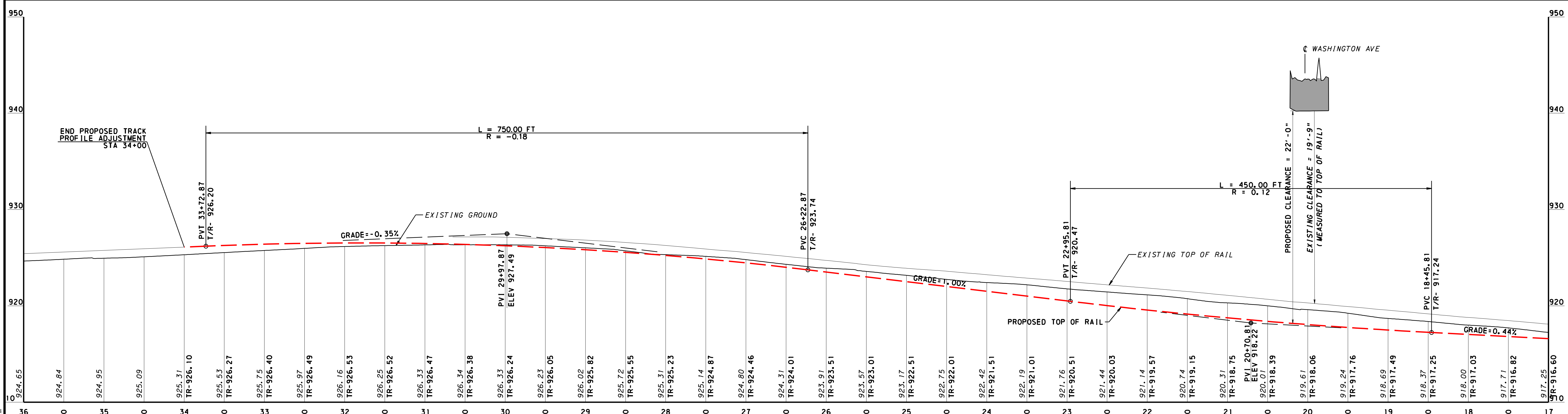

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DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1"=10'
5' 0 5' 10'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

PROFILE – MAINLINE TRACK 1

ALTERNATE 3
LOWER TO
22' CLEARANCE

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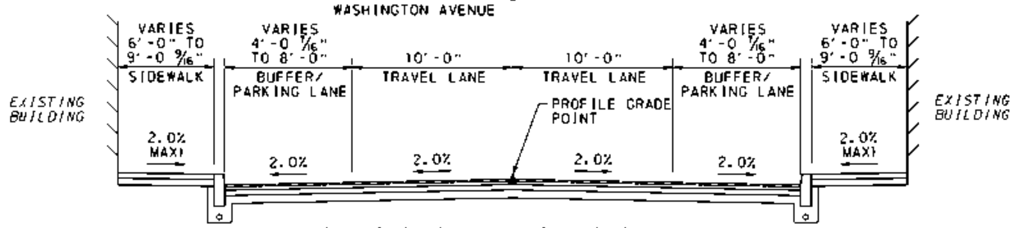

TYPICAL SECTION - WASHINGTON AVENUE

FOR LIMITS OF TRACK LOWERING
SEE RAILROAD PLAN AND PROFILE
ALTERNATE 4

ALTERNATE 4
RAISE BRIDGE
& LOWER TRACKS
TO 22' CLEARANCE

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TITLE: WASHINGTON AVENUE

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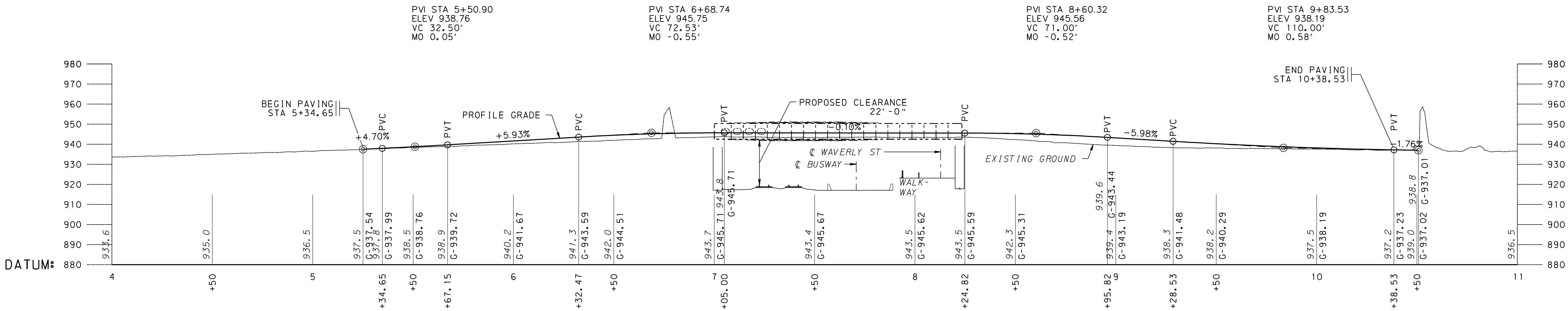
SHEET NO. 1 OF 4



GENERAL NOTE:

THE EXISTING GROUND AT BRIDGE IS RAISED 2.05' DUE TO TRACKS BEING LOWERED 9" AND AN INITIAL RAISING OF 2.80' FROM ALTERNATIVE 2
2.80' - 0.75' = 2.05'

PROFILE – WASHINGTON AVENUE

HORIZONTAL

SCALE: 1" = 50'   50' 0 50' 100'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL

SCALE: 1" = 10'   10' 0 10' 20'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 4
RAISE BRIDGE
& LOWER TRACKS
TO 22' CLEARANCE

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TITLE: WASHINGTON AVENUE

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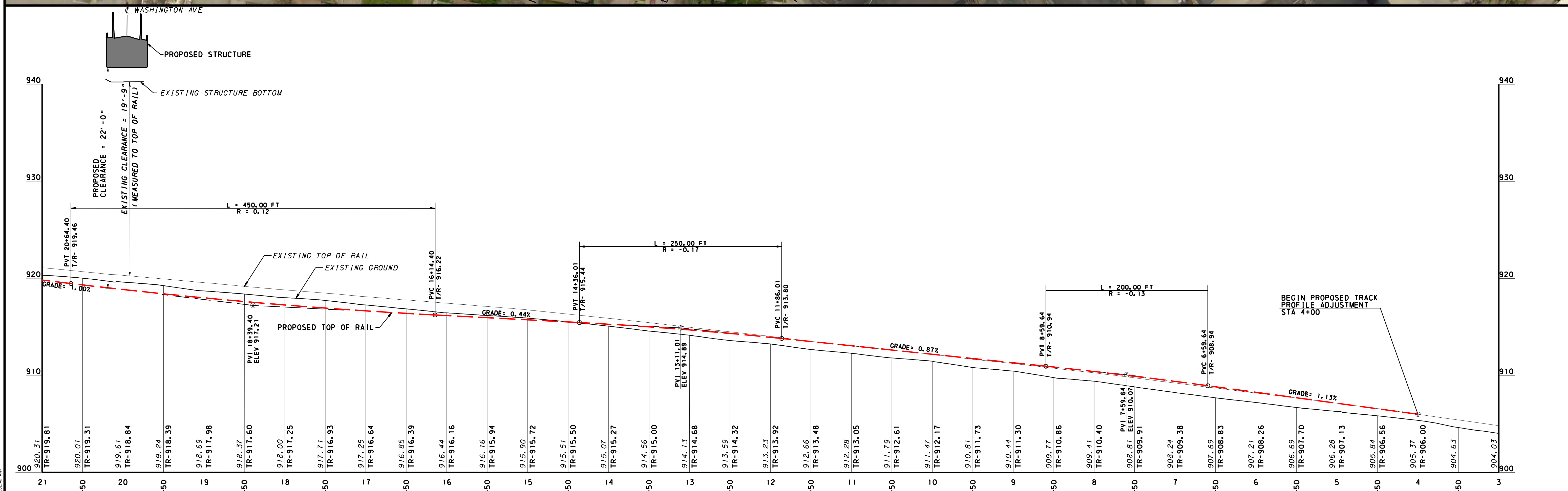

PROFILE – MAINLINE TRACK 1

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DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 12'

6' 0 6' 12'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 4
RAISE BRIDGE & LOWER TRACKS TO 22' CLEARANCE

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WASHINGTON AVENUE

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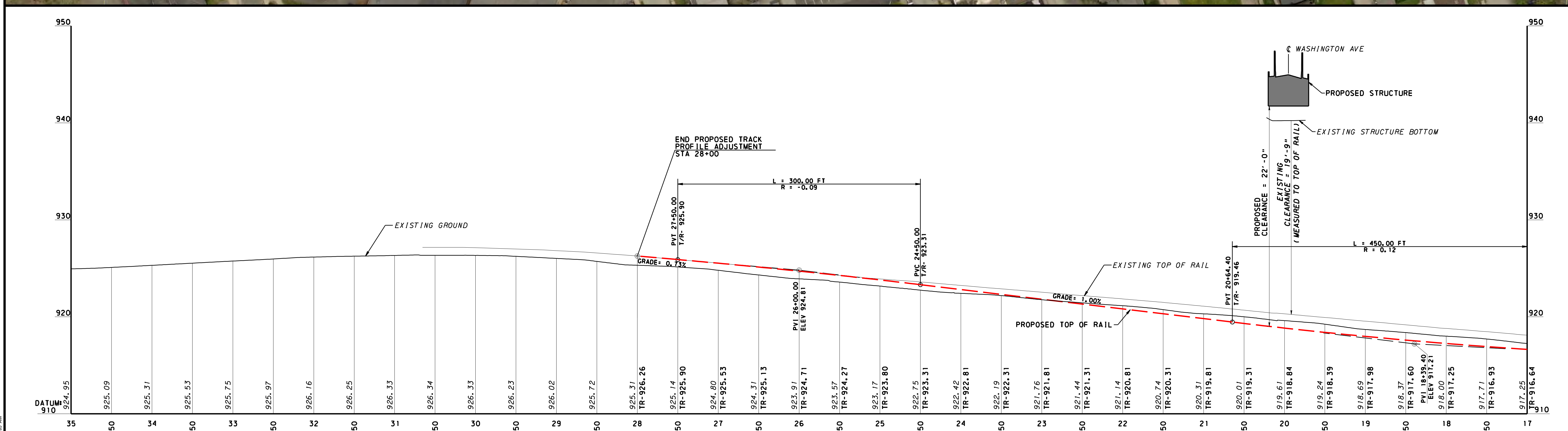

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DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 12'
6' 0 6' 12'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

PROFILE – MAINLINE TRACK 1

ALTERNATE 4
RAISE BRIDGE & LOWER TRACKS TO 22' CLEARANCE

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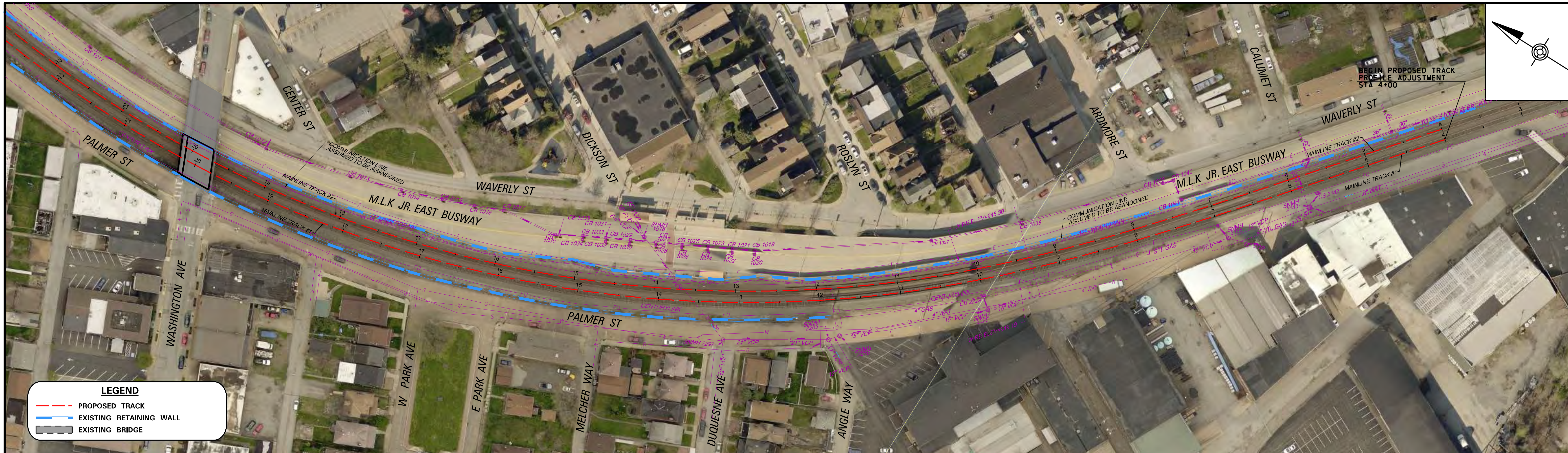

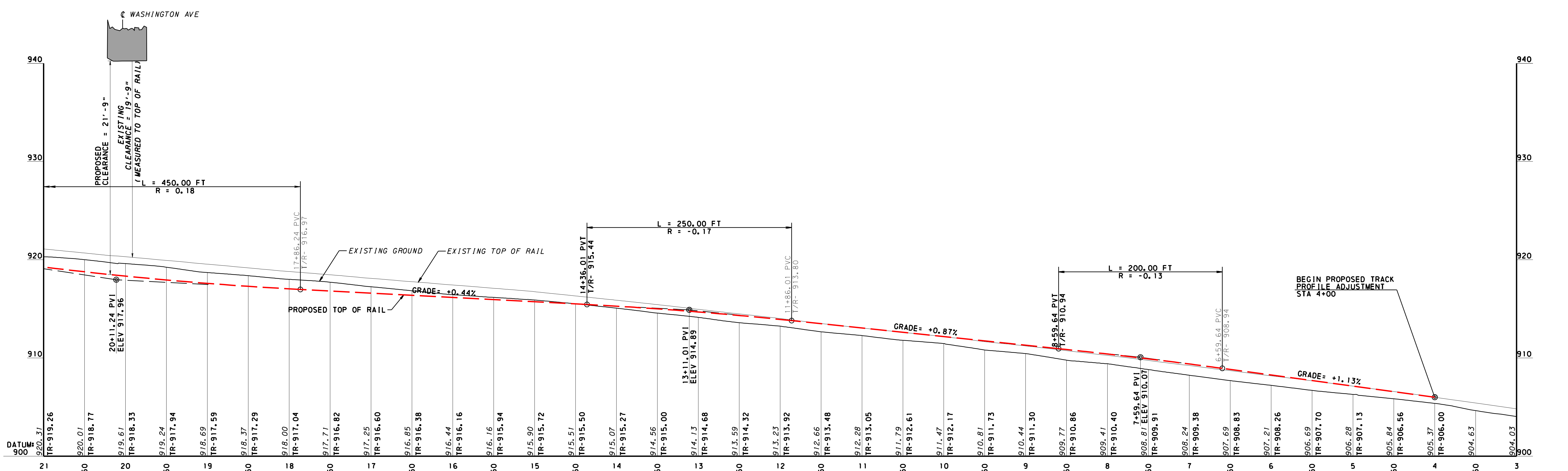

PROFILE – MAINLINE TRACK 1

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VERTICAL
SCALE: 1" = 12'
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DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

DESIGN MODIFICATION
LOWER TO 21' CLEARANCE

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TITLE: WASHINGTON AVENUE

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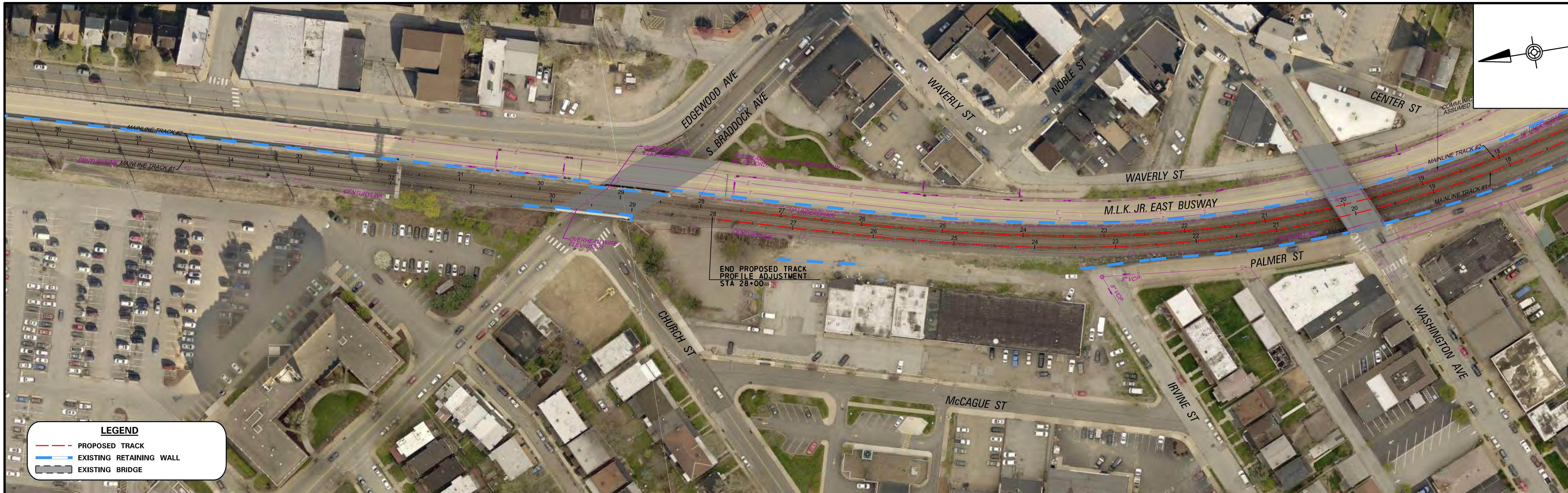

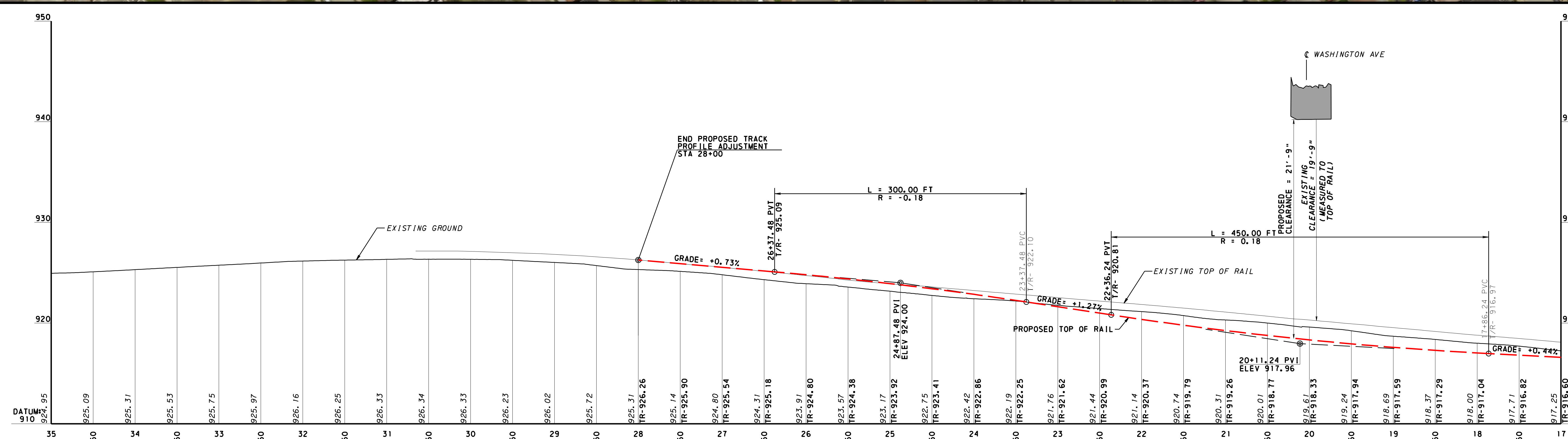

PROFILE – MAINLINE TRACK 1

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DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

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6' 0 6' 12'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

DESIGN MODIFICATION LOWER TO 21' CLEARANCE

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PITTSBURGH

OPERATING DIVISION

OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

REV	BY	DATE	DESCRIPTION

LOCATION: SWISSVALE, PENNSYLVANIA

TITLE: WASHINGTON AVENUE

DGN	JMB	PID No.	D2122	VRN	1290818-OH77
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CHK	WVB	DATE	03/19/2020	MILE POST	PT 344.91

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SHEET NO.	TITLE
C-01	OVERALL SITE PLAN
C-02	OVERALL SITE PLAN
C-03	GENERAL NOTES AND PHASING
C-04	TABULATION OF QUANTITIES
C-05	SITE PLAN
C-06	SITE PLAN
C-07	SITE PLAN
C-08	SITE PLAN
C-09	SITE PLAN
C-10	SITE ELEVATION
C-11	CIVIL DETAILS
C-12	CIVIL DETAILS
C-13	CIVIL DETAILS
C-14	CIVIL DETAILS
C-15	CIVIL DETAILS
D-01	DEMOLITION NOTES AND PHASING
D-02	DEMOLITION PLAN
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D-05	DEMOLITION ELEVATION
D-06	DEMOLITION DETAILS
T-01	GENERAL NOTES AND CONSTRUCTION PHASING
T-02	TABULATION OF QUANTITIES AND DETAILS
T-03	TRAFFIC CONTROL PLAN
T-04	TRAFFIC CONTROL PLAN
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T-06	TRAFFIC CONTROL PLAN
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S-07	EXISTING STRUCTURAL ROOF FRAMING PLAN - AREA 1
S-08	EXISTING STRUCTURAL ROOF FRAMING PLAN - AREA 2
S-09	EXISTING STRUCTURAL ROOF FRAMING PLAN - AREA 3
S-10	EXISTING STRUCTURAL ROOF FRAMING PLAN - AREA 4
S-11	STRUCTURAL ROOF FRAMING PLAN - AREA 1
S-12	STRUCTURAL ROOF FRAMING PLAN - AREA 2
S-13	STRUCTURAL ROOF FRAMING PLAN - AREA 3
S-14	STRUCTURAL ROOF FRAMING PLAN - AREA 4
S-15	POST DEMOLITION FRAMING PLAN - AREA 1
S-16	POST DEMOLITION FRAMING PLAN - AREA 2
S-17	POST DEMOLITION FRAMING PLAN - AREA 3
S-18	POST DEMOLITION FRAMING PLAN - AREA 4
S-19	TRACK LEVEL STRUCTURAL DETAILS
S-20	TRACK LEVEL STRUCTURAL DETAILS 2
S-21	ROOF LEVEL STRUCTURAL DETAILS
U-01	GENERAL NOTES
U-02	UTILITY MEP PLAN - AREA 1
U-03	UTILITY MEP PLAN - AREA 2
U-04	UTILITY MEP PLAN - AREA 3
U-05	UTILITY MEP PLAN - AREA 4

ALTERNATIVE 2 and 3 contained in this section
- Alt 2 is 1st 60 pages
- Alt 3 is 54 pages

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

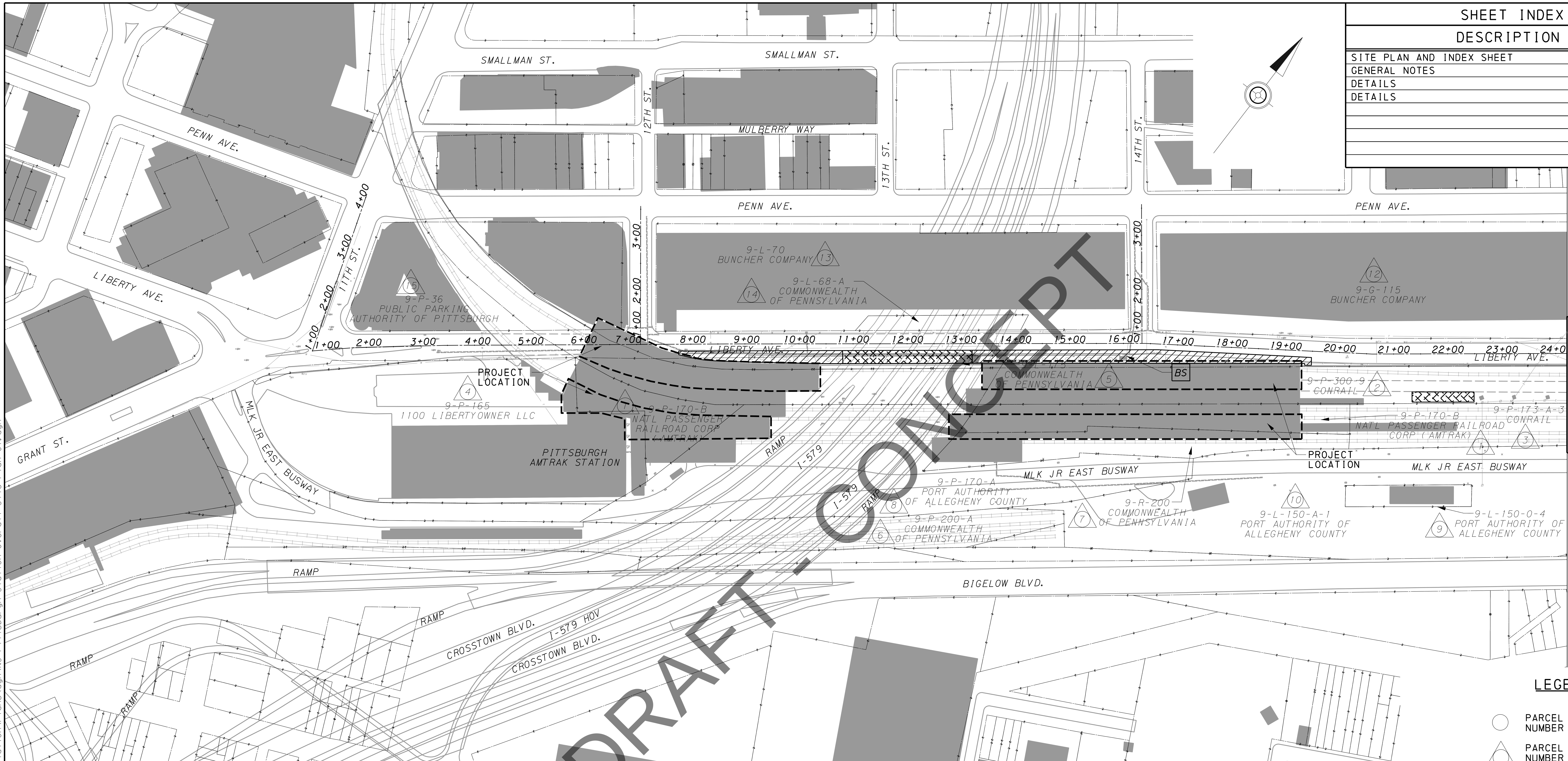
PITTSBURGH STATION

TRAINSHED IMPROVEMENTS
COVER SHEET

DGN ZRS	VAL SEC 17.2 MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864	DATE 6/14/2018
SHEET NUMBER	OF	DRAWING NUMBER PT-353 18 01

ALTERNATIVE 2

SHEET INDEX BLOCK	
DESCRIPTION	SHEET
SITE PLAN AND INDEX SHEET	X
GENERAL NOTES	X
DETAILS	X
DETAILS	X

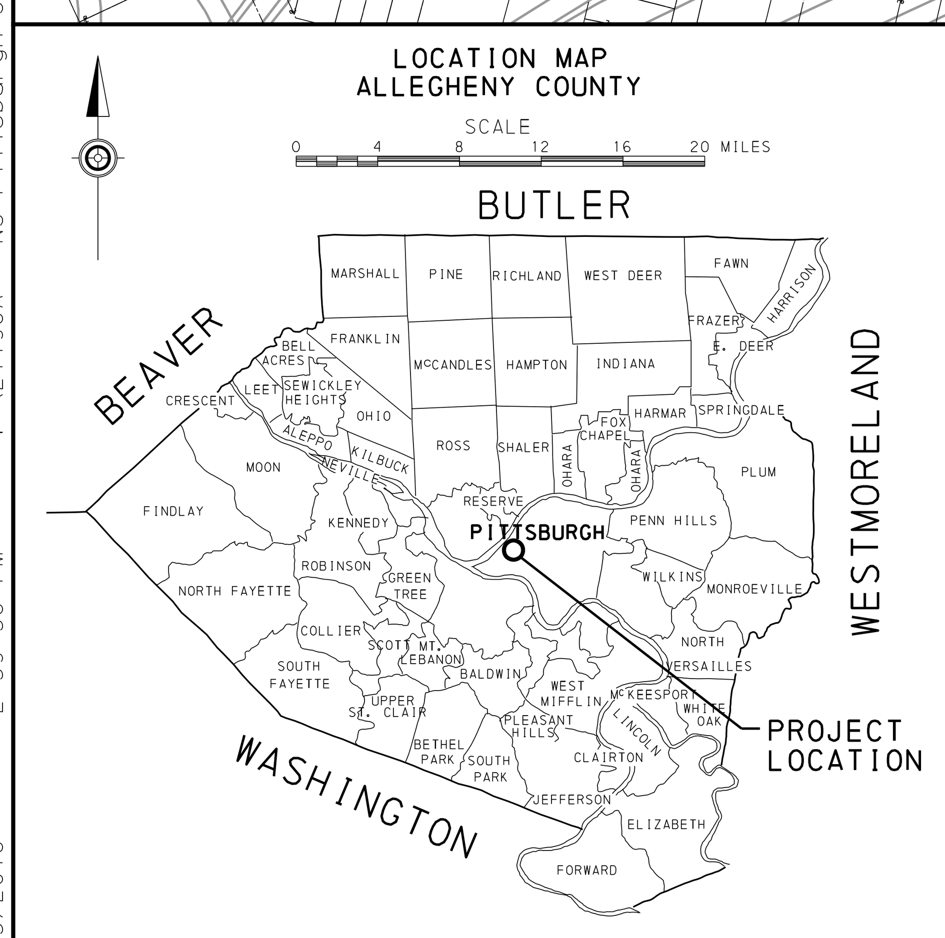


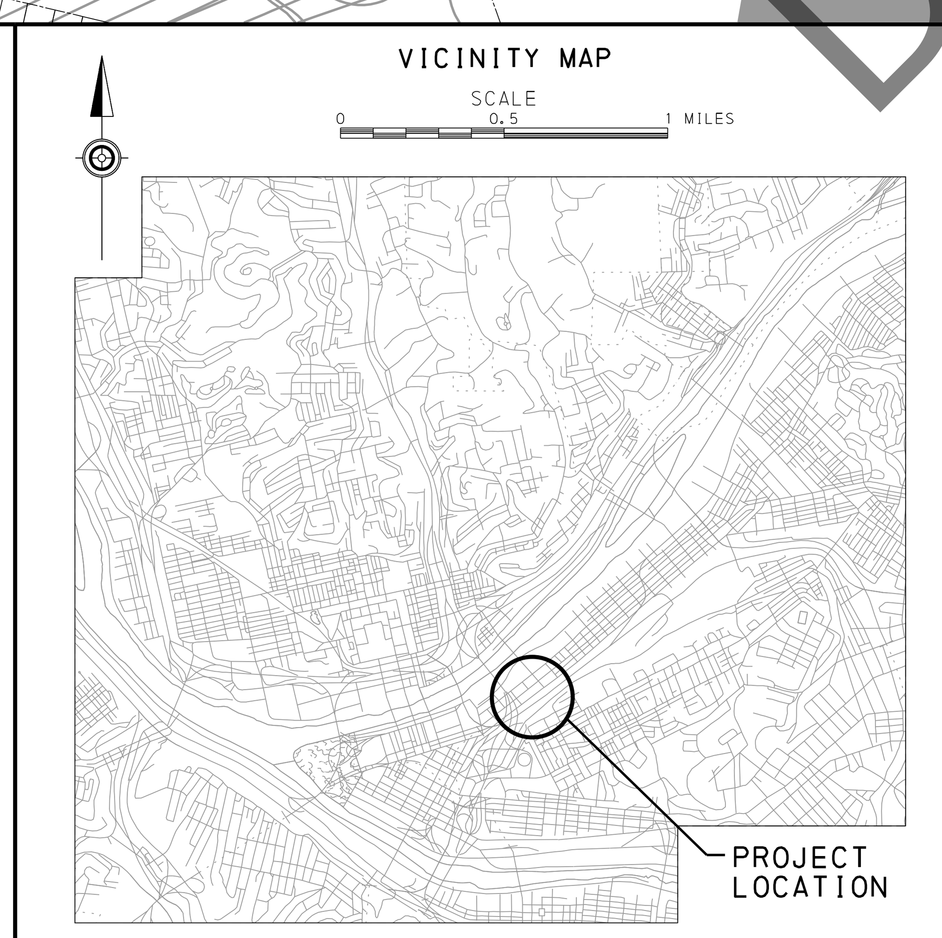
DRAFT - CONCEPT

LEGEND

○ PARCEL IDENTIFICATION NUMBER

△ PARCEL IDENTIFICATION NUMBER - NO TAKE





SITE PLAN

SCALE

0 100 200 FEET

PENNSYLVANIA ONE CALL SYSTEM, INC
1-800-242-1776
SERIAL NO. 20181224123

CALL BEFORE YOU DIG!
PENNSYLVANIA LAW REQUIRES
3 WORKING DAYS NOTICE FOR
CONSTRUCTION PHASE AND 10 WORKING
DAYS IN DESIGN STAGE - STOP CALL
Pennsylvania One Call System, Inc

1-800-242-1776

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

Norfolk Southern Corp

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OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
SITE PLAN AND SHEET INDEX

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK VPA	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 1 OF 1		DRAWING NUMBER PT-353 18 01	

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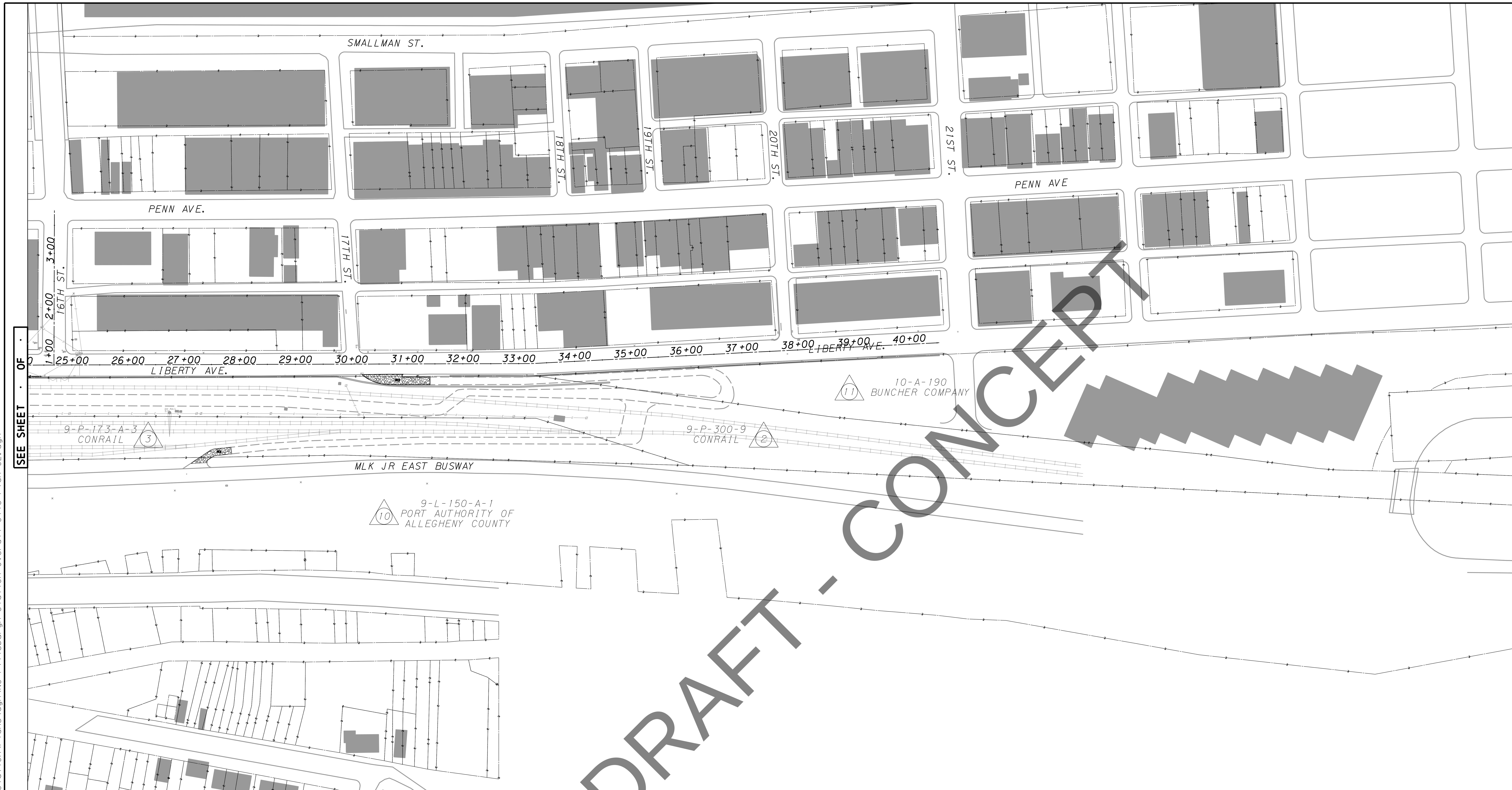

LEGEND

○ PARCEL IDENTIFICATION NUMBER

△ PARCEL IDENTIFICATION NUMBER - NO TAKE

SITE PLAN

SCALE

0 100 200 FEET

LIST OF PROPERTY OWNERS

1. 9-P-170-B NATL PASSENGER RAILROAD CORP (AMTRAK)
2. 9-P-300-9 CONRAIL
3. 9-P-173-A-3 CONRAIL
4. 9-P-165 1100 LIBERTYOWNER LLC
5. 9-L-175 COMMONWEALTH OF PENNSYLVANIA
6. 9-P-200-A COMMONWEALTH OF PENNSYLVANIA
7. 9-R-200 COMMONWEALTH OF PENNSYLVANIA
8. 9-P-170-A PORT AUTHORITY OF ALLEGHENY COUNTY
9. 9-L-150-0-4 PORT AUTHORITY OF ALLEGHENY COUNTY
10. 9-L-150-A-1 PORT AUTHORITY OF ALLEGHENY COUNTY
11. 10-A-190 BUNCHER COMPANY
12. 9-G-115 BUNCHER COMPANY
13. 9-L-70 BUNCHER COMPANY
14. 9-L-68-A COMMONWEALTH OF PENNSYLVANIA
15. 9-P-36 PUBLIC PARKING AUTHORITY OF PITTSBURGH

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

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OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
SITE PLAN AND SHEET INDEX

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
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SHEET NUMBER 1 OF 1		DRAWING NUMBER PT-353 18 01	

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D-9012 CADD (02-90) REVISED (05-97)

REVISION NUMBER	REVISIONS	DATE	BY	DISTRICT	COUNTY	ROUTE	SECTION	SHEET
				-				OF

TABULATION OF QUANTITIES

⊕ SEE SUMMARY SHEET FOR COMPLETE ITEM NUMBERS.

																														ITEM NUMBER / UNIT	REMARKS	SIDE	STATIONS
001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	901		929	957
031	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	050	051	052	053	054	055	056	057	058	059	060	902		930	958
061	062	063	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079	080	081	082	083	084	085	086	087	088	089	090	903		931	959
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PITTSBURGH STATION
TRAINSHED IMPROVEMENTS

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK VPA	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 1 OF 1		DRAWING NUMBER PT-353 18 01	

LEGEND

- WORK ZONE
- TREE
- GRASS
- STREET LIGHT AND POLE (BY OTHERS)
- ROOF REMOVAL WORK LIMITS
- IP INLET PROTECTION
- CONTRACTOR STAGING AREA
- RCE ROCK CONSTRUCTION ENTRANCE (RCE)
- DIRECTION OF TRAFFIC FLOW
- CONTRACTOR ACCESS ROUTE
- CONTRACTOR FLAGPERSON

SCALE
0 25 50

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

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PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
SITE UTILITIES PLAN

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK VPA	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 1 OF 1		DRAWING NUMBER PT-353 18 01	

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LEGEND

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- RCE ROCK CONSTRUCTION ENTRANCE (RCE)
- DIRECTION OF TRAFFIC FLOW
- CONTRACTOR ACCESS ROUTE
- CONTRACTOR FLAGPERSON

SCALE
0 25 50

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

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PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
SITE UTILITIES PLAN

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK VPA	FILE BR0028864		DATE 6/13/2018
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LEGEND

- WORK ZONE
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- DIRECTION OF TRAFFIC FLOW
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SCALE
0 25 50

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
SITE UTILITIES PLAN

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK VPA	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 1 OF 1		DRAWING NUMBER PT-353 18 01	

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LEGEND

- WORK ZONE
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- DIRECTION OF TRAFFIC FLOW
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- CONTRACTOR FLAGPERSON

SCALE
0 25 50

PRELIMINARY PLANS

WSP
WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

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PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
SITE UTILITIES PLAN

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK VPA	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 1 OF 1			DRAWING NUMBER PT-353 18 01

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LEGEND

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- GRASS
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- ROOF REMOVAL WORK LIMITS
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- RCE ROCK CONSTRUCTION ENTRANCE (RCE)
- DIRECTION OF TRAFFIC FLOW
- CONTRACTOR ACCESS ROUTE
- CONTRACTOR FLAGPERSON

SCALE
0 25 50

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

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PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
SITE UTILITIES PLAN

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK VPA	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 1 OF 1			DRAWING NUMBER PT-353 18 01

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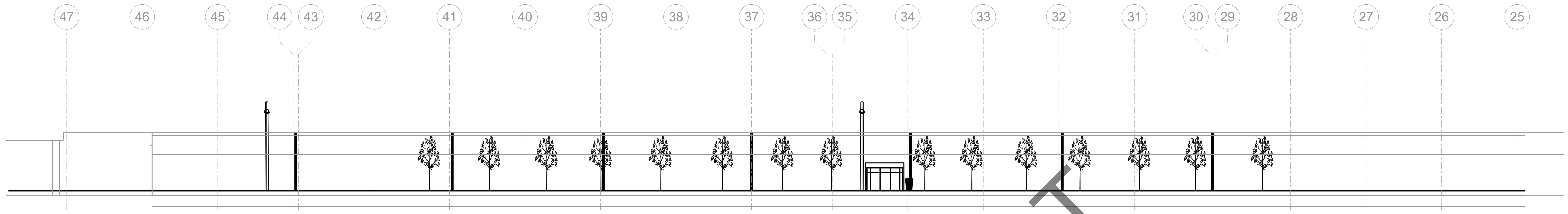

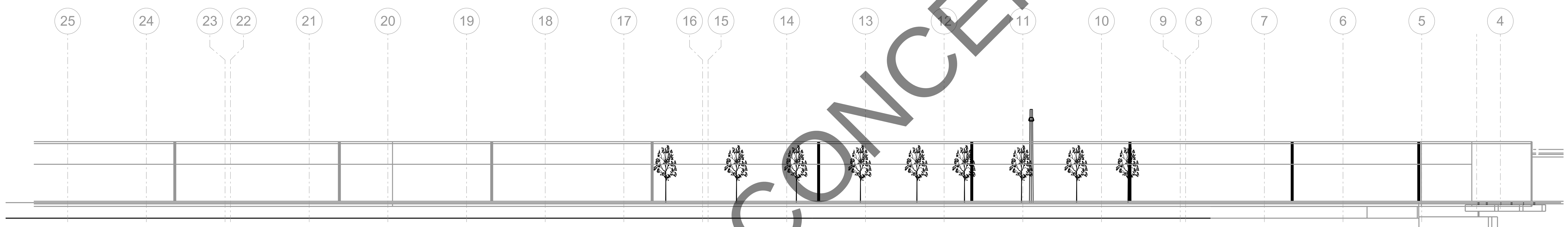

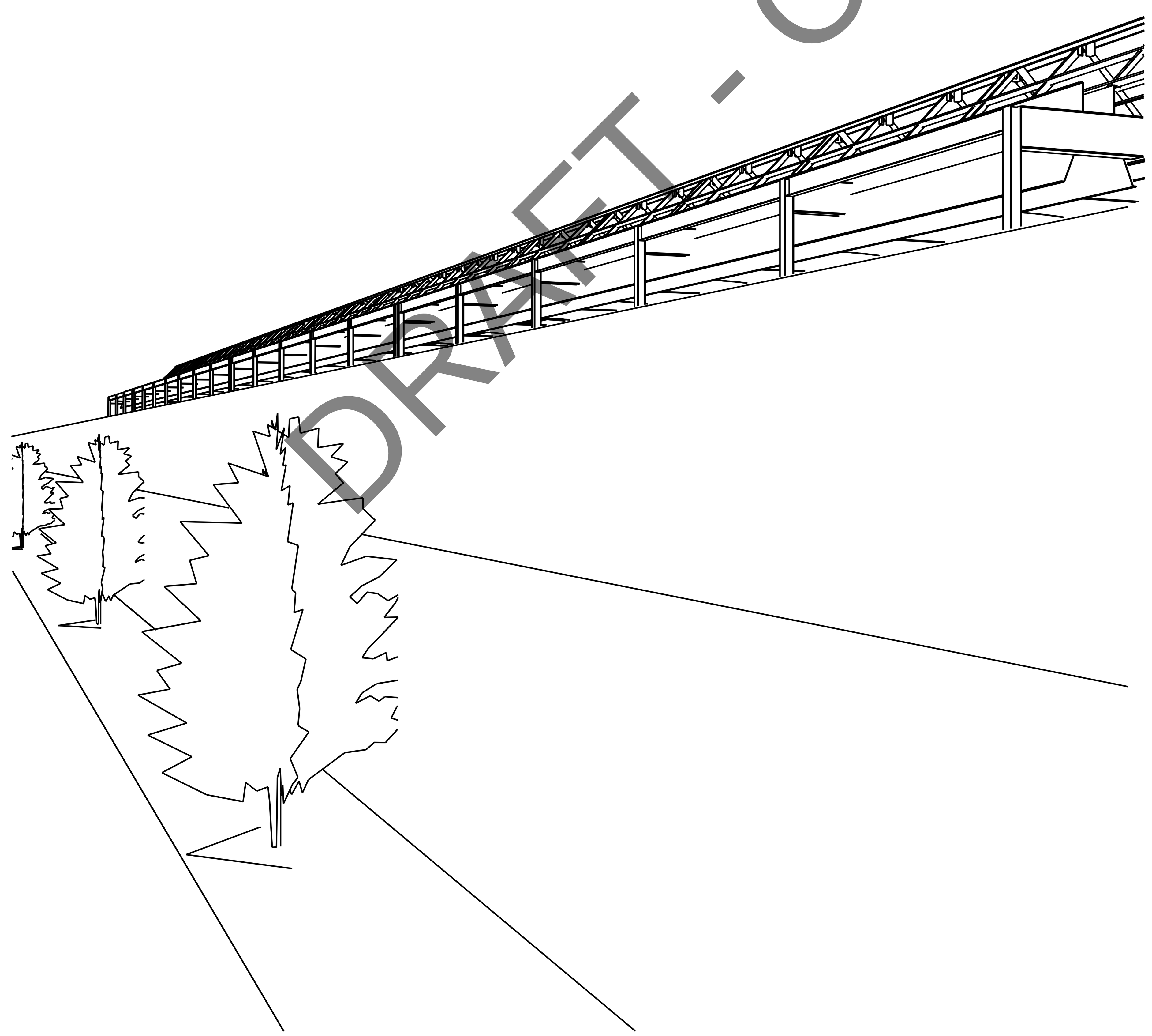

SEE SHEET - OF -

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

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OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA.

PITTSBURGH STATION

TRAINSHED IMPROVEMENTS
SITE UTILITIES PLAN

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK VPA	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 1 OF 1			DRAWING NUMBER PT-353 18 01

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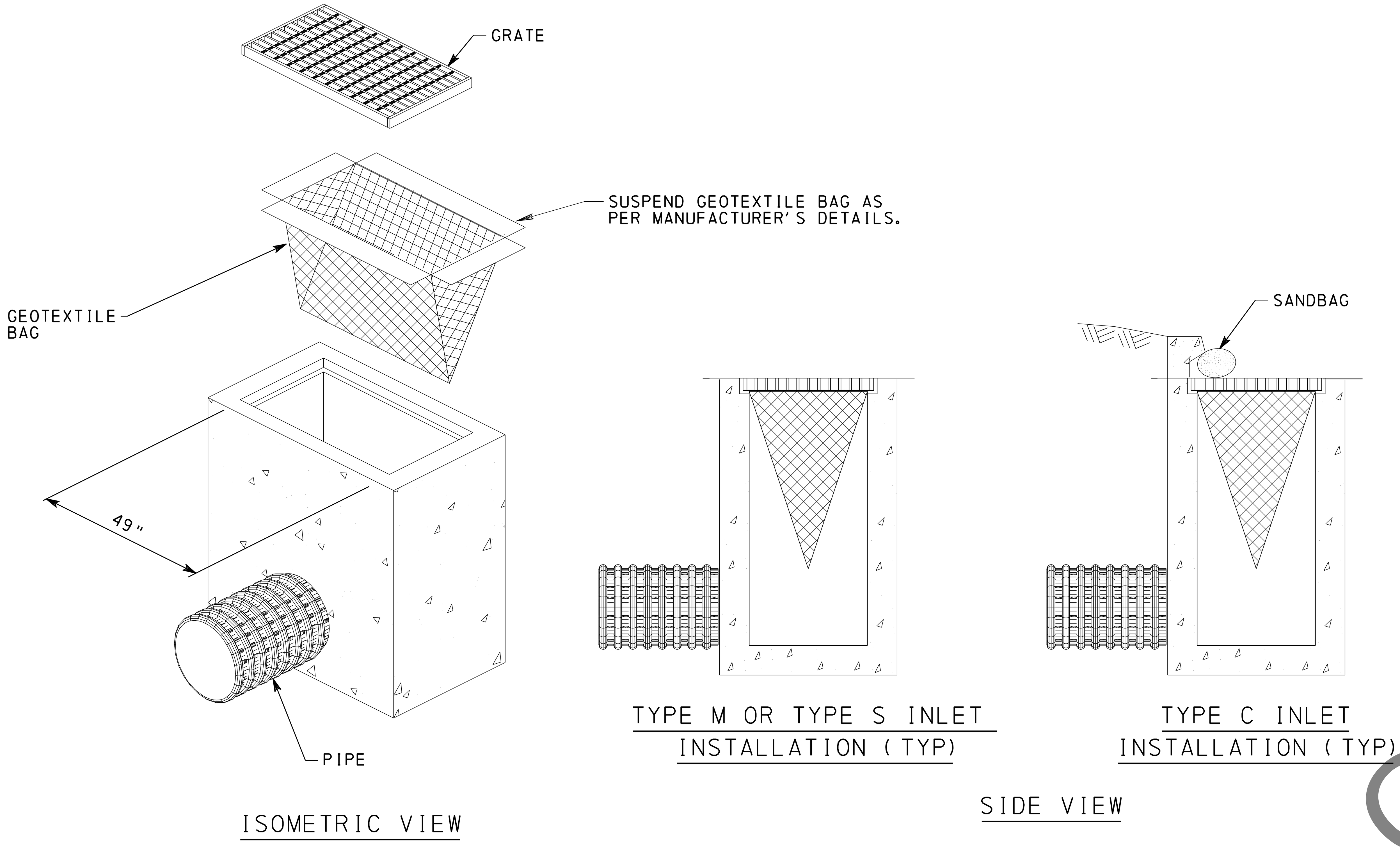
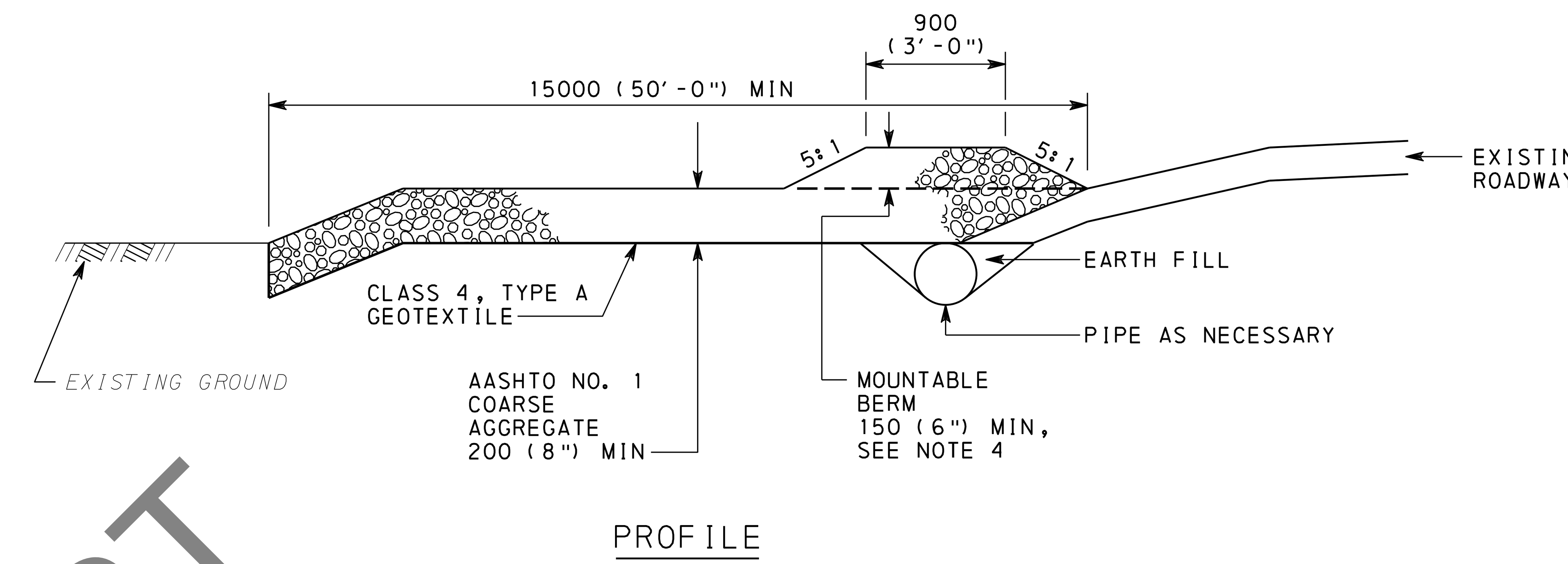
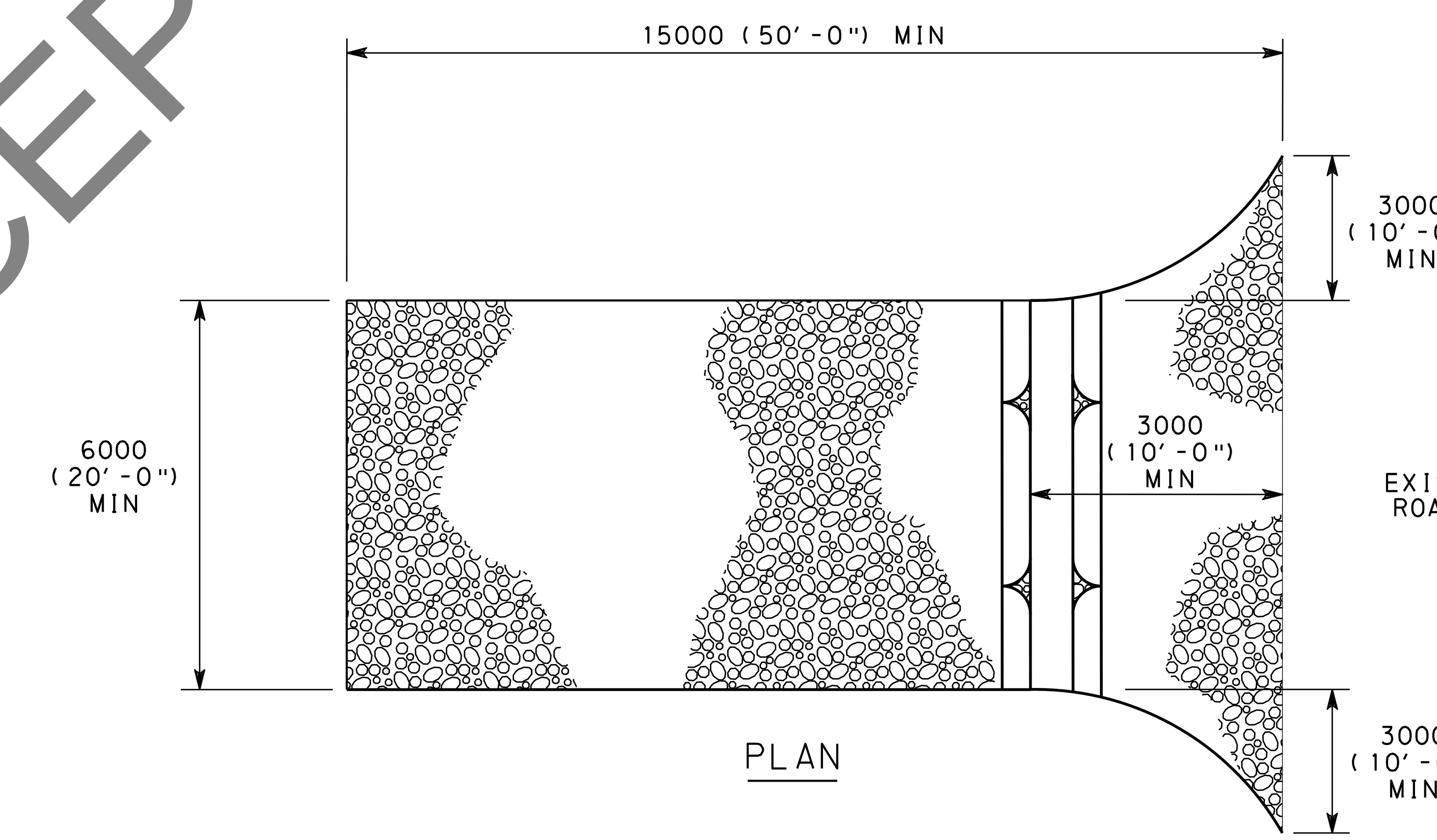


INLET FILTER BAG

NOTES

1. INSPECT INLET FILTER BAG AFTER EACH RUNOFF EVENT. MAINTAIN AS REQUIRED TO ENSURE PROPER FUNCTIONING OF THE BAG.
2. REMOVE ACCUMULATED SEDIMENT/DEBRIS WHEN THE INLET FILTER REACHES ONE-HALF MAXIMUM CAPACITY.
3. REPLACE FILTER BAG IF RIPPED OR TORN.
4. PROVIDE DOWN GRADIENT BERM AS INDICATED ON SHEET 1. DO NOT USE IN SAG/SUMP CONDITIONS.
5. USE SANDBAGS AT TYPE C INLET CURB OPENINGS TO TO PREVENT BYPASS FLOW.
6. REMOVE AND PROPERLY DISPOSE OF INLET FILTER BAG WHEN NO LONGER NEEDED.





ROCK CONSTRUCTION ENTRANCE

NOTES

1. INSPECT THE ENTRANCE DAILY. REMOVE ALL SEDIMENT DEPOSITED ON THE PUBLIC ROADWAYS AND RETURN TO THE CONSTRUCTION SITE. WASHING OF THE ROADWAY WILL NOT BE PERMITTED.
2. MAINTAIN THE SPECIFIED ROCK CONSTRUCTION ENTRANCE THICKNESS. PLACE ADDITIONAL ROCK WHENEVER ROCK BECOMES CLOGGED WITH SEDIMENT.
3. MAINTAIN STOCKPILE OF AASHTO NO. 1 COARSE AGGREGATE.
4. CONSTRUCT A MOUNTABLE BERM ONLY WHEN 150 (6") MIN COVER CANNOT BE PROVIDED OVER THE PIPE.
5. SATISFACTORILY REMOVE MATERIALS AS PER SPECIFICATION IN PUBLICATION 408, SECTION 849 WHEN ROCK CONSTRUCTION ENTRANCE IS NO LONGER NEEDED.
6. PROVIDE GEOTEXTILE MATERIAL MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTION 735. FURNISH AND INSTALL IN ACCORDANCE WITH PUBLICATION 408, SECTION 212. PROVIDE GEOTEXTILE ALONG ALL INTERFACE AREAS WITH GROUND CONTACT.
7. CONSTRUCT ROCK CONSTRUCTION ENTRANCE WITHIN THE RIGHT-OF-WAY OR EASEMENT AREAS. ENTRANCE MAY BE CONSTRUCTED ON A SKEW IF ADEQUATE PULL OUT SIGHT DISTANCE IS AVAILABLE.
8. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS IN () PARENTHESES.

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

Norfolk Southern Corp
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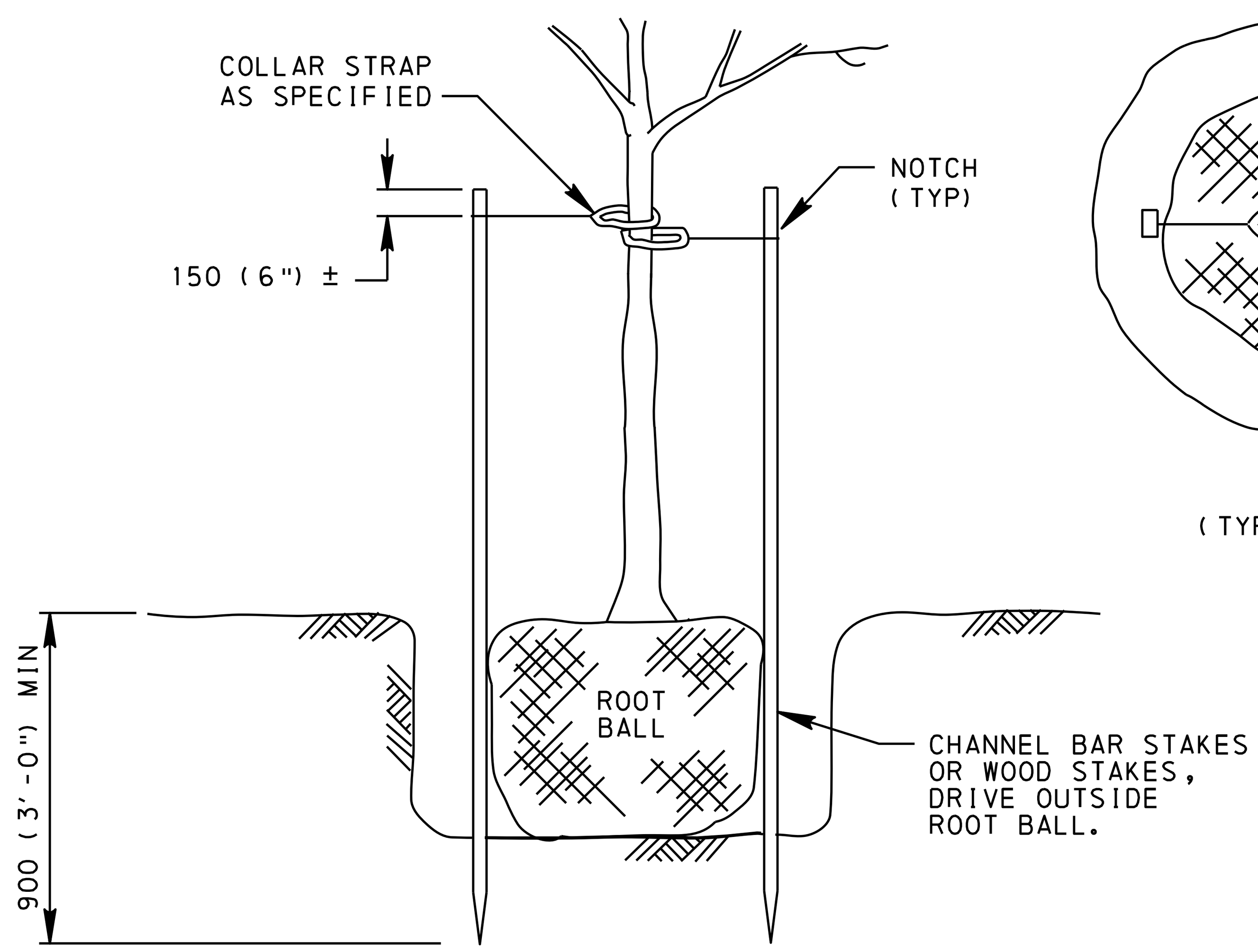
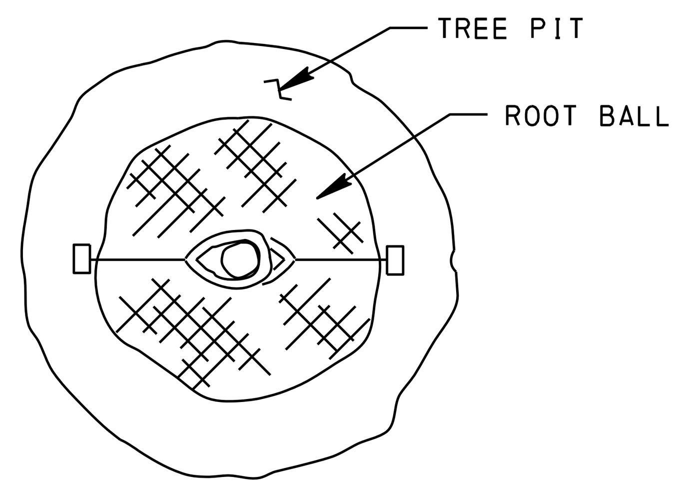
OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
SITE PLAN DETAILS

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK VPA	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 1 OF 1		DRAWING NUMBER PT-353 18 01	



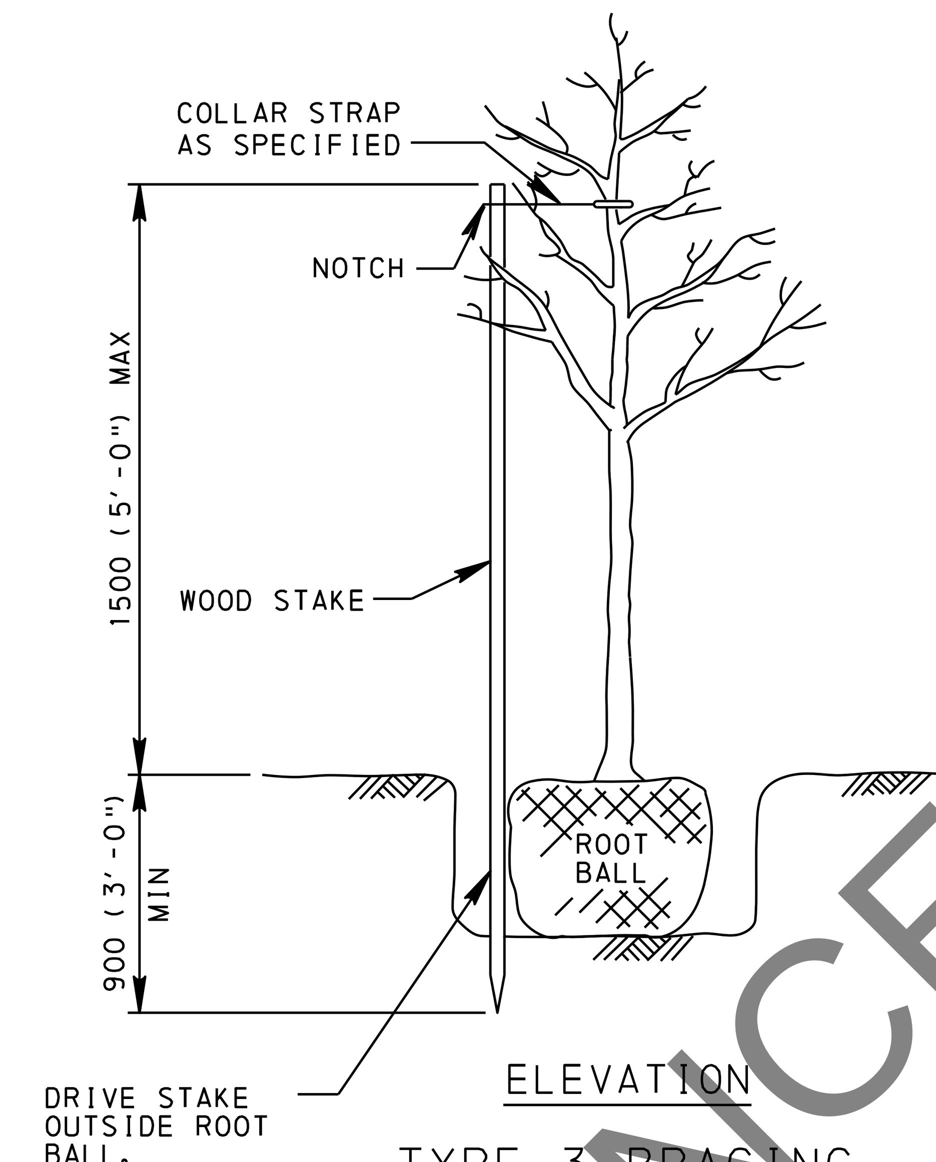
ELEVATION



PLAN
(TYPE 2 BRACING)

TYPE 2 BRACING

FOR DECIDUOUS TREES OVER 40 (1½") CALIPER AND ALL EVERGREEN TREES 1.2 m (4'-0") TO 2.4 m (8'-0") HEIGHT.



ELEVATION

TYPE 3 BRACING

FOR DECIDUOUS TREES 1.5 m (5'-0") TO 40 (1½") CALIPER

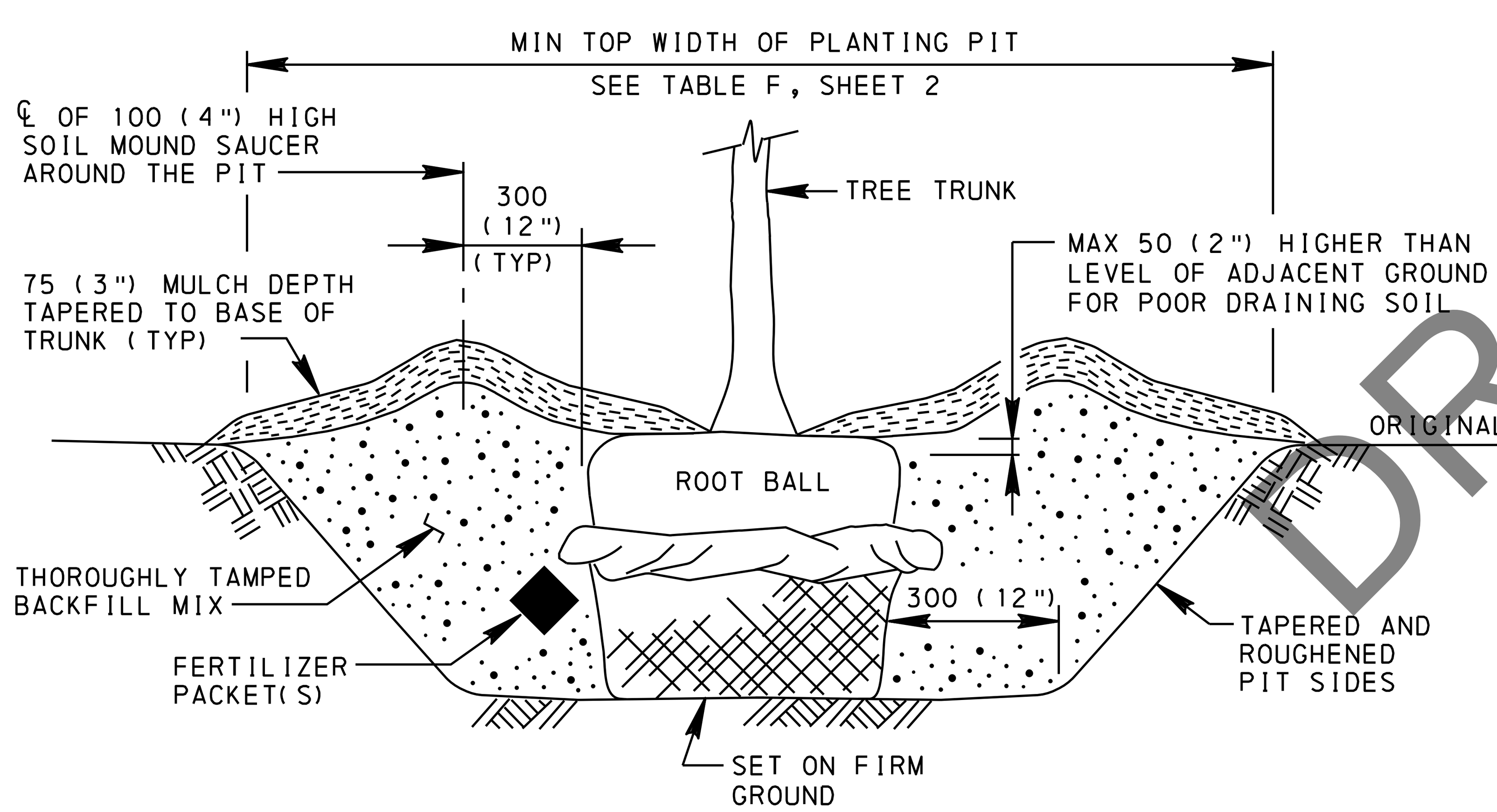
BRACING DETAILS

FOR BRACING REQUIREMENTS
SEE TABLES A AND D ON SHEET 2.

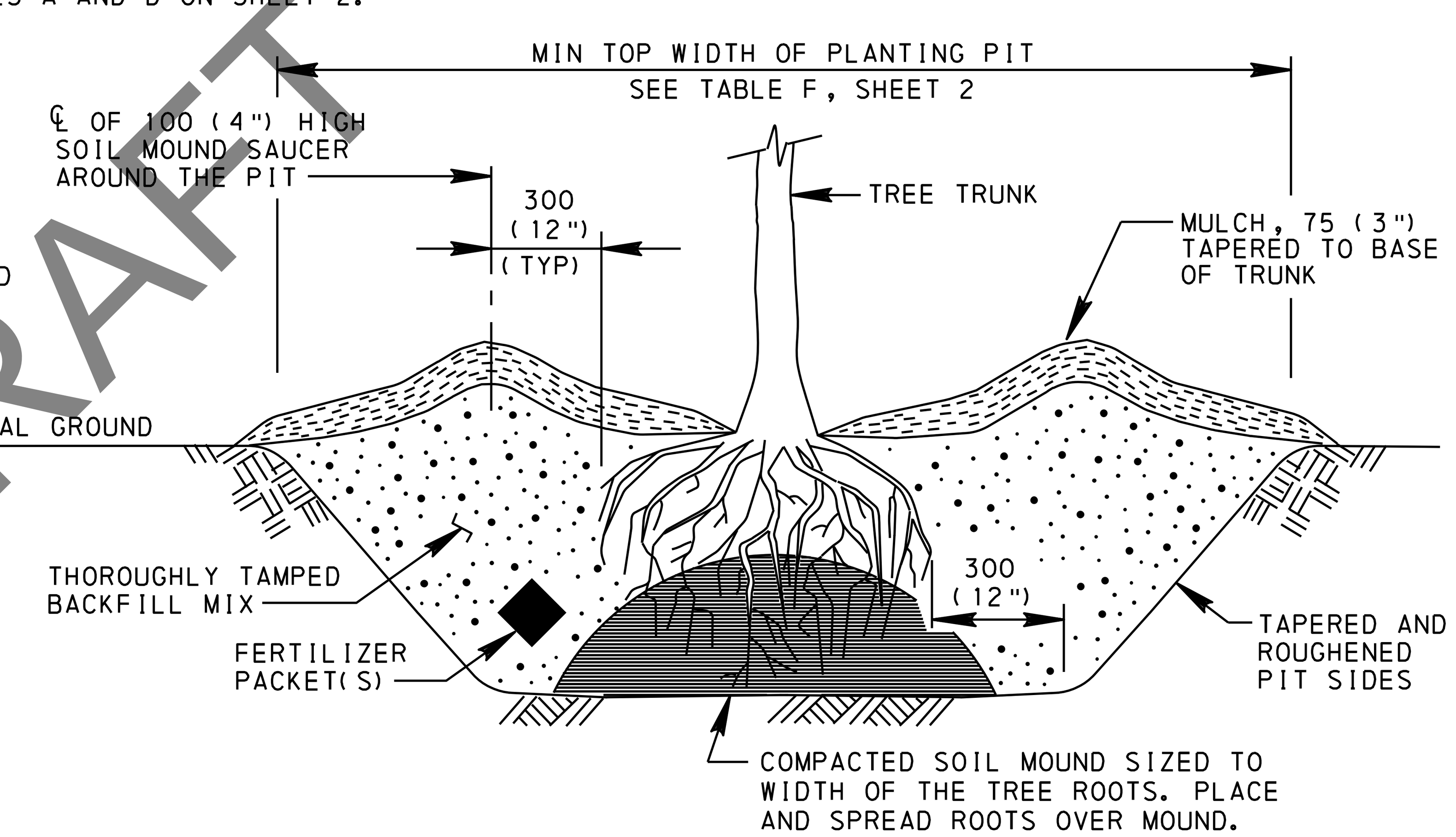
NOTES

1. ALL MOUNDS CREATED IN THE PLANTING PIT SHALL CONSIST OF SOIL MATERIAL FROM THE PIT EXCAVATION FREE OF ALL STONES AND FOREIGN MATERIAL 50 (2") OR LARGER IN ANY DIMENSION.
2. SET TOP OF ROOT BALL 25 TO 50 (1" TO 2") HIGHER THAN SURROUNDING GROUND.
3. ATTACH COLLAR STRAPS TO THE TREE AT A POINT NOT LESS THAN 50% OF THE HEIGHT OF THE TREE.
4. SPACE ROOT CONTACT FERTILIZER PACKETS EQUALLY AROUND THE BALL OR ROOTS AND SET 150 TO 200 (6" TO 8") DEEP. PLACE FERTILIZER TABLETS AT THE ROOT ZONE APPROXIMATELY 75 TO 100 (3" TO 4") DEEP.
5. PROVIDE MATERIALS AND CONSTRUCT AS SPECIFIED IN PUBLICATION 408, SECTIONS 805 AND 808.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS IN () PARENTHESES.

FOR BRACING REQUIREMENTS
SEE TABLES A AND D ON SHEET 2.



BALLED AND BURLAPPED
OR CONTAINER



BARE ROOT

TREE PLANTING DETAILS

FOR FERTILIZER PACKET SCHEDULE
SEE TABLE B ON SHEET 2.

PRELIMINARY PLANS

wsp
WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

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PITTSBURGH DIVISION

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PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
SITE PLAN DETAILS

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK VPA	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 1 OF 1		DRAWING NUMBER PT-353 18 01	

FORMULA D MIXTURE (CONSERVATION MIX)

FORMULA AND SPECIES	% BY WEIGHT	MIN % PURITY	MIN % GERMINATION	MAX % WEED	SEEDING RATE Lb PER 1000 SY
					50.0 TOTAL
TALL FESCUE (FESTUCA ARUNDINACEA VAR. KENTUCKY 31)	60	96	85	0.10	30.0
CREEPING RED FESCUE OR CHEWINGS FESCUE (FESCUE RUBRA OR SSP COMMUTATE)(IMPROVED AND CERTIFIED)	30	97	85	0.10	15.0
ANNUAL RYEGRASS (LOLIUM MULTIFLORUM)	10	95	90	0.10	5.0

SEEDING SCHEDULE

SOIL SUPPLEMENTS AND SEEDING WILL BE IN ACCORDANCE WITH SECTION 804 AND THE CHARTS, TABLES AND FORMULAS SPECIFYING THE RATES OF APPLICATION.

ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 4 DAYS UPON REACHING FINISHED GRADE. CUT SLOPES IN COMPETENT BEDROCK AND ROCK FILLS NEED NOT BE VEGETATED. SEEDED AREAS WITHIN 50 FEET OF A SURFACE WATER, OR AS OTHERWISE SHOWN ON THE PLAN DRAWINGS, SHALL BE BLANKETED ACCORDING TO THE STANDARDS OF THIS PLAN.

WITHIN 4 DAYS AFTER EARTH DISTURBANCE ACTIVITIES CEASE IN ANY AREA OR SUBAREA OF THE PROJECT, THE OPERATOR SHALL STABILIZE ALL DISTURBED AREAS. DURING NON-GERMINATING MONTHS, MULCH OR PROTECTIVE BLANKETING SHALL BE APPLIED AS DESCRIBED IN THE PLAN. AREAS NOT AT FINISHED GRADE, WHICH WILL BE REACTIVATED WITHIN 1 YEAR, MAY BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY STABILIZATION SPECIFICATIONS. THOSE AREAS WHICH WILL NOT BE REACTIVATED WITHIN 1 YEAR SHALL BE STABILIZED IN ACCORDANCE WITH THE PERMANENT STABILIZATION SPECIFICATIONS.

SPREAD SEEDS WHERE INDICATED AND AT THE RATES SPECIFIED AS INDICATED. SPREAD SEEDS WITHIN THE FOLLOWING DATES, OR AS OTHERWISE INDICATED OR DIRECETED.

SCHEDULE OF SEEDING AND SOIL SUPPLEMENTS

FORMULA D	ROADWAY SLOPES AND DRAINAGE CHANNELS	MARCH 15 TO MAY 15 SEPTEMBER 1 TO OCTOBER 15

EXTEND SEEDING DATES WHERE PROJECT CONDITIONS WARRANT. APPLY FULL TREATMENT OR APPLY ONLY 50% OF THE PERMANENT SEEDING AND SOIL SUPPLEMENTS AND APPLY THE REMAINING 50% WITHIN THE NEXT SEEDIND DATES, AS DIRECTED IN WRITING.

USE TILLAGE AND SOIL SUPPLEMENTS BEFORE PERMANENT SEEDING ON TOPSOILED AREAS, WHERE TEMPORARY SEEDING OR MULCHING HAS BEEN APPLIED.

THE CONTRACTOR MAY APPLY PERMANENT SEED AND/OR SOIL SUPPLEMENTS WITHOUT TILLING ON NON-TOPSOILED AREAS, WHERE TEMPORARY SEEDING OR MULCHING HAS BEEN APPLIED.

PENNSYLVANIA ONE CALL SYSTEM, INC
1-800-242-1776
SERIAL NO. 20181224123

CALL BEFORE YOU DIG!
PENNSYLVANIA LAW REQUIRES 3 WORKING DAYS NOTICE FOR CONSTRUCTION PHASE AND 10 WORKING DAYS IN DESIGN STAGE - STOP CALL
Pennsylvania One Call System, Inc
1-800-242-1776

PUBLIC UTILITIES

PENNSYLVANIA ONE CALL SYSTEM, INC
1-800-242-1776
SERIAL NO. 20181224123

E	PENN POWER COMPANY Att: Mr. DAVID A NICKEL 2939 N. HERMITAGE ROAD P.O. BOX 361 CLARK, PA 16113 BUS: 724 962-1083 nickeld@firstenergycorp.com	W	PA AMERICAN WATER 907 LUNDYS LANE ELLWOOD CITY, PA 16117 724 758-3382
		T	VERIZON 15 E. MONTGOMERY AVENUE PITTSBURGH, PA 15212

DRAFT - CONCEPT

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

Norfolk Southern Corp
PITTSBURGH LINE
PITTSBURGH DIVISION
OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
SITE PLAN DETAILS

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK VPA	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 1 OF 1		DRAWING NUMBER PT-353 18 01	

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LEGEND

- WORK ZONE
- TO BE DEMOLISHED
- ROOF REMOVAL WORK LIMITS
- IP — INLET PROTECTION
- TEMPORARY LIGHTING
- CONTRACTOR STAGING AREA
- RCE — ROCK CONSTRUCTION ENTRANCE (RCE)
- DIRECTION OF TRAFFIC FLOW
- CONTRACTOR ACCESS ROUTE
- CONTRACTOR FLAGPERSON

SCALE 0 25 50

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

Norfolk Southern Corp
PITTSBURGH LINE
PITTSBURGH DIVISION
OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
SITE DEMOLITION PLAN

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK VPA	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 1 OF 1		DRAWING NUMBER PT-353 18 01	

LEGEND

- WORK ZONE
- TO BE DEMOLISHED
- ROOF REMOVAL WORK LIMITS
- IP INLET PROTECTION
- TEMPORARY LIGHTING
- CONTRACTOR STAGING AREA
- RCE ROCK CONSTRUCTION ENTRANCE (RCE)
- DIRECTION OF TRAFFIC FLOW
- CONTRACTOR ACCESS ROUTE
- CONTRACTOR FLAGPERSON

SCALE
0 25 50

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

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PITTSBURGH LINE
PITTSBURGH DIVISION
OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
SITE DEMOLITION PLAN

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK VPA	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 1 OF 1			DRAWING NUMBER PT-353 18 01

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LEGEND

- WORK ZONE
- TO BE DEMOLISHED
- ROOF REMOVAL WORK LIMITS
- IP INLET PROTECTION
- TEMPORARY LIGHTING
- CONTRACTOR STAGING AREA
- RCE ROCK CONSTRUCTION ENTRANCE (RCE)
- DIRECTION OF TRAFFIC FLOW
- CONTRACTOR ACCESS ROUTE
- CONTRACTOR FLAGPERSON

SCALE
0 25 50

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
SITE DEMOLITION PLAN

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
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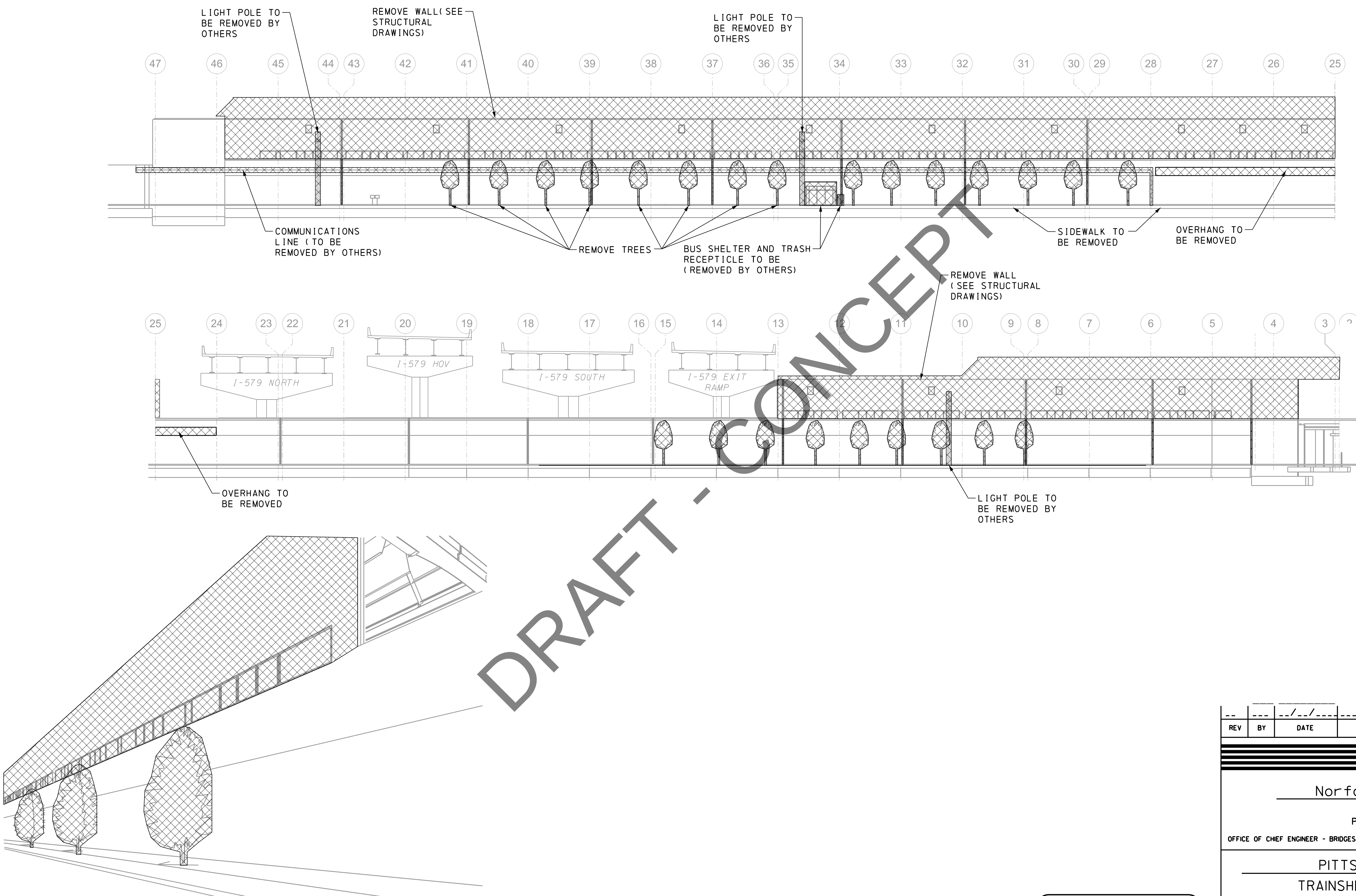

SEE SHEET - OF -

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

Norfolk Southern Corp
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PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
SITE UTILITIES PLAN

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK VPA	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 1 OF 1		DRAWING NUMBER PT-353 18 01	

CONSTRUCTION PHASING

SET UP TRAFFIC CONTROL IN ACCORDANCE WITH PADOT PUBLICATION 213 AND AS SHOWN ON THESE TRAFFIC CONTROL PLANS.

MAINTAIN ACCESS TO DRIVEWAYS AND SIDE ROADS AT ALL TIMES.

PHASE 1

WORK TO BE PERFORMED:

REQUIREMENTS:

MAINTENANCE AND PROTECTION OF TRAFFIC:

PHASE 2

WORK TO BE PERFORMED:

REQUIREMENTS:

MAINTENANCE AND PROTECTION OF TRAFFIC:

SHEET INDEX

GENERAL NOTES

THIS WORK CONSISTS OF THE MAINTENANCE OF TRAFFIC AND THE PROTECTION OF THE TRAVELING PUBLIC APPROACHING THE CONSTRUCTION AREA AND WITHIN THE LIMITS OF CONSTRUCTION.

FURNISH, ERECT, PLACE AND MAINTAIN TRAFFIC CONTROL SIGNS AND DEVICES AND MAINTAIN TRAFFIC DURING HOURS OF CONSTRUCTION AND AT ALL OTHER TIMES IN ACCORDANCE WITH THE METHODS INDICATED ON THESE DRAWINGS AND,

1. THE SPECIAL PROVISIONS OF THE CONTRACT.
2. PA CODE, TITLE 67, CHAPTER 212, OFFICIAL TRAFFIC CONTROL DEVICES, (MARCH 2006).
3. PADOT PUBLICATION 213, TEMPORARY TRAFFIC CONTROL GUIDELINES, (JUNE 2014).
4. PADOT PUBLICATION 35, APPROVED CONSTRUCTION MATERIALS (BULLETIN 15), CURRENT EDITION.
5. PADOT PUBLICATION 408, SPECIFICATIONS, DATED 2016.
6. PADOT PUBLICATION 236, HANDBOOK OF APPROVED SIGNS, (NOVEMBER 2013).
7. PADOT PUBLICATION 111, TRAFFIC CONTROL-PAVEMENT MARKINGS AND SIGNING STANDARDS, TC-8600 AND TC-8700 SERIES.
8. MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), (2009 EDITION).

IMMEDIATELY UPON COMPLETION OF THE WORK, REMOVE SIGNS AND DEVICES. FOR TYPE "B" AND TYPE "C" MOUNTED SIGNS, REMOVE POSTS COMPLETELY. THE DEPARTMENT WILL REMOVE ANY TRAFFIC CONTROL DEVICES ERECTED BY DEPARTMENT FORCES.

THE TRAFFIC CONTROL PLAN DOES NOT RELIEVE THE CONTRACTOR OF ITS RESPONSIBILITY AS SPECIFIED IN SECTION 901.3(a) OF PADOT PUBLICATION 408.

SIGN LOCATIONS MAY BE ADJUSTED SLIGHTLY TO FIT FIELD CONDITIONS.

ALL SIGNS AND DEVICES SHALL BE NEW AT THE BEGINNING OF THE PROJECT, AND MAINTAINED IN NEW CONDITION AND TO PADOT'S SATISFACTION THROUGHOUT THE DURATION OF THE PROJECT.

THESE PLANS HAVE BEEN REVIEWED AND ARE IN COMPLIANCE WITH STANDARDS PRESCRIBED IN CHAPTER 212 OF THE 67 PA. CODE AS CURRENTLY AMENDED.

NOTE THAT THIS APPROVAL DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR THE PROTECTION OF THE PUBLIC AND THE CONSTRUCTION PERSONNEL. THE STANDARDS PRESCRIBED ARE MINIMUM AND ADDITIONAL PROTECTION MAY BE NECESSARY IF PROBLEMS ARE ENCOUNTERED DURING THE TERM OF THE CONTRACT. CONSTANTLY REVIEW THIS PLAN FOR ADEQUACY AND RECOMMEND CHANGES FOR DEPARTMENT APPROVAL WHEN INADEQUACIES ARE DISCOVERED.

THE CONTRACTOR HAS THE OPTION TO SUBMIT ALTERNATE TRAFFIC CONTROL PLANS FOR CONSIDERATION. THESE PLANS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF PENNSYLVANIA, AND SHALL BE CONSISTENT WITH STANDARD DESIGN PRACTICES. THE DEPARTMENT WILL ALLOW NO CONSTRUCTION ACTIVITY UNTIL THE CONTRACTOR'S ALTERNATE PLANS ARE APPROVED IN WRITING BY THE DISTRICT TRAFFIC ENGINEER. MODIFICATIONS TO THE APPROVED MPT PLAN SHALL BE APPROVED BY THE DISTRICT TRAFFIC ENGINEER OR AUTHORIZED REPRESENTATIVE.

THE CONTRACTOR SHALL HAVE A SUFFICIENT AMOUNT OF THE FOLLOWING SIGNS AVAILABLE IN CASE THEIR USE BECOMES NECESSARY: W3-4 "BE PREPARED TO STOP" AND W20-7 "FLAGGER SYMBOL". THESE SIGNS ARE NOT INTENDED TO BE PART OF THE REQUIRED NORMAL TRAFFIC CONTROL OR A SUPPLEMENT THERETO.

REPORT ALL TRAFFIC INCIDENTS WITHIN THE PROJECT LIMITS TO THE DISTRICT TRAFFIC ENGINEER BY COPY OF THE TRAFFIC ACCIDENT REPORT FROM THE PA STATE POLICE AND LOCAL POLICE.

THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE PA ONE-CALL SYSTEM, INC. AT 1-800-242-1776 AT LEAST THREE (3) WORKING DAYS PRIOR TO DIGGING. PA ONE-CALL SHOULD BE CONTACTED BEFORE ANY SIGN POST ANCHOR IS DRIVEN INTO THE GROUND FOR ANY TEMPORARY AND/OR PERMANENT SIGNING.

PROVIDE A SUFFICIENT AMOUNT OF TYPE III BARRICADES TO CLOSE ENTIRE ROADWAY.

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION

TRAINSHED IMPROVEMENTS
GENERAL NOTES

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK MJO	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 1 OF 10			DRAWING NUMBER PT-353 18 01

MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION

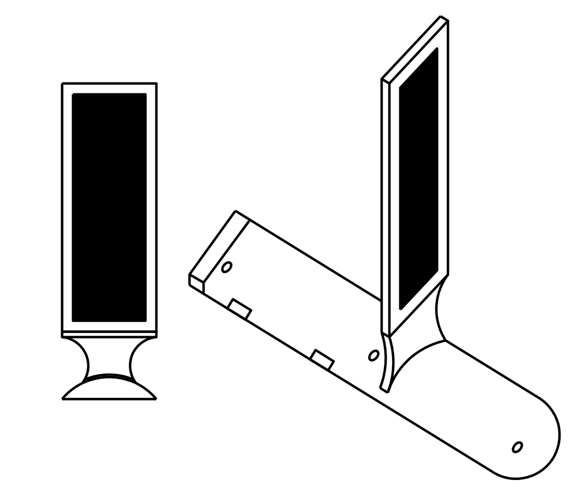
ITEM NO 0901-0001

TABULATION OF TRAFFIC CONTROL DEVICES
(FOR INFORMATION ONLY)

TRAFFIC CONTROL DEVICE	UNIT	DESCRIPTION	MINIMUM REQUIRED
G20-2	36"x18"	END ROAD WORK	
M4-8A	24"x18"	END DETOUR	
M4-9B	30"x24"	PEDESTRIAN DETOUR	
M4-10L	48"x18"	DETOUR ARROW, LEFT	
M4-10R	48"x18"	DETOUR ARROW, RIGHT	
M4-9L	30"x24"	DETOUR SIGN, LEFT	
M4-9R	30"x24"	DETOUR SIGN, RIGHT	
M4-9S	30"x24"	DETOUR SIGN, STRAIGHT	
M4-9SL	30"x24"	LEFT ADVANCE DETOUR	
M4-9SR	30"x24"	RIGHT ADVANCE DETOUR	
R9-9	24"x12"	SIDEWALK CLOSED	
R11-3A	60"x30"	ROAD CLOSED 500 FT LOCAL TRAFFIC ONLY	
R11-3A	60"x30"	ROAD CLOSED 250 FT LOCAL TRAFFIC ONLY	
W1-4BL	36"x36"	TWO-LANE LEFT REVERSE CURVE	
W1-4R	36"x36"	RIGHT REVERSE CURVE	
W4-2L	36"x36"	PAVEMENT WIDTH TRANSITION - LEFT LANE ENDS	
W5-5	36"x36"	LANES SHIFT	
W20-1	36"x36"	ROAD WORK	
W20-1	30"x30"	ROAD WORK	
W20-2	36"x36"	ADVANCE DETOUR	
W20-3	36"x36"	ROAD CLOSED	
W20-5L	36"x36"	LEFT LANE CLOSED	
W30-1-6	20"x6"	DISTANCE (AHEAD) PANEL	
W30-1-6	15"x5"	DISTANCE (AHEAD) PANEL	
W30-1-6	15"x5"	DISTANCE (AHEAD) PANEL	
SS-1	30"x24"	SPECIAL SIGN - LIBERTY AVE	
SS-2	60"x30"	SPECIAL SIGN - LIBERTY AVE CLOSED AFTER 16TH ST	
SS-3	60"x30"	SPECIAL SIGN - LIBERTY AVE CLOSED AFTER 11TH ST	
	EACH	SIGN POSTS	
	EACH	TYPE III BARRICADE	
	EACH	TYPE B LIGHTS	

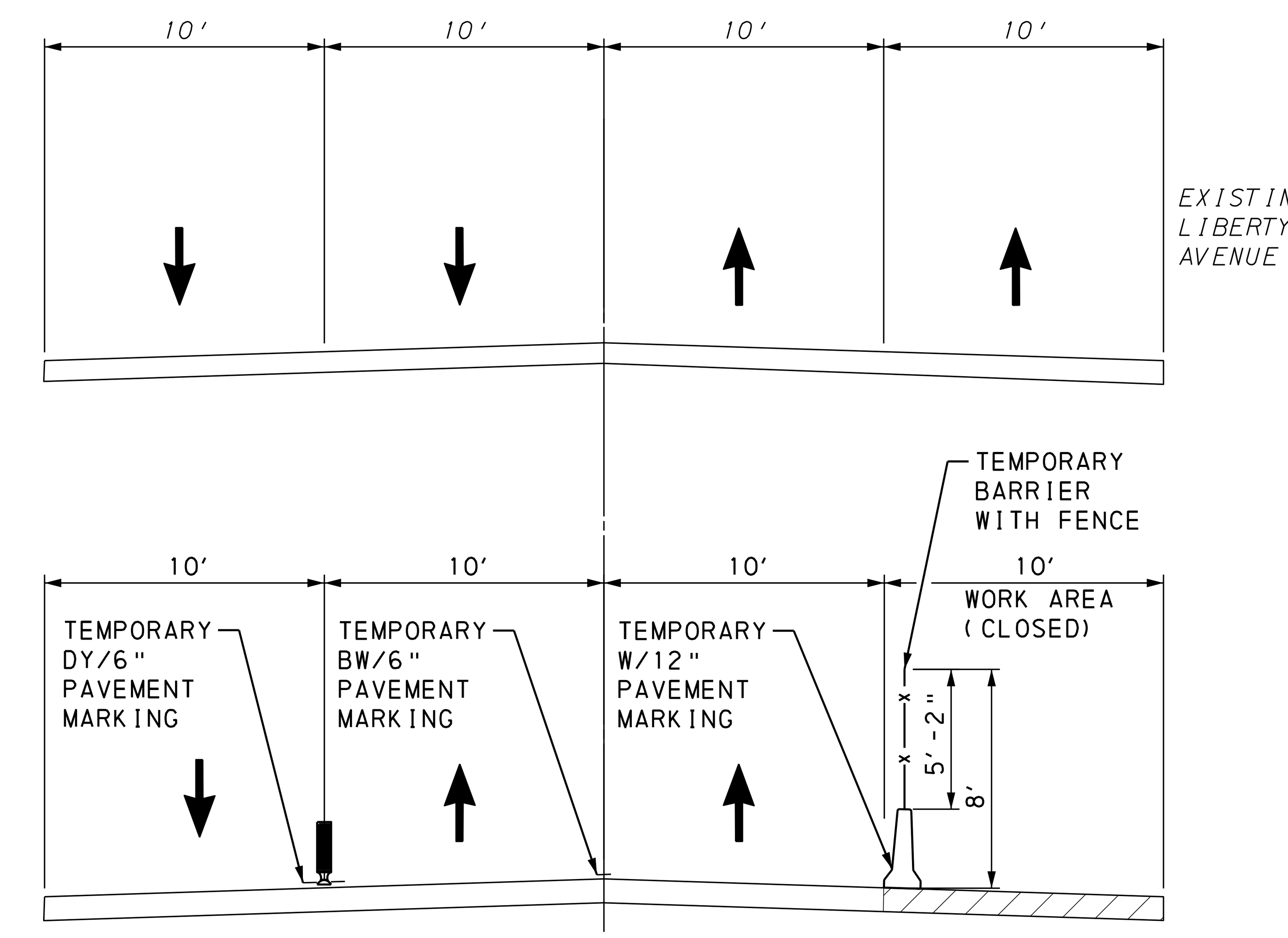
PAY ITEMS

ITEM NO	DESCRIPTION	UNITS	QUANTITY
0901-0231	ADDITIONAL WARNING LIGHTS, TYPE B	DAY	
0901-0240	ADDITIONAL TRAFFIC CONTROL SIGNS	SF	
0901-0450	3-LINE CHANGEABLE MESSAGE SIGN WITH TELECOMMUNICATIONS	EACH	
9000-xxxx	TEMPORARY BARRIER WITH FENCE	EACH	
9000-xxxx	TEMPORARY TIMING MODIFICATIONS	EACH	
9000-xxxx	OFF-DUTY UNIFORMED POLICE OFFICER	DOLLAR	



TEMPORARY LANE SEPARATOR CURB

NTS



TYPICAL SECTION FOR MPT - LIBERTY AVENUE

SCALE=1"=5'

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
DETAILS

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK MJO	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 2 OF 9		DRAWING NUMBER PT-353 18 01	

LEGEND

- CHANNELIZING DEVICE
- TEMPORARY LANE SEPARATOR
- DIRECTION OF TRAFFIC FLOW
- CONTRACTOR ACCESS ROUTE
- CONTRACTOR FLAGPERSON
- WORK ZONE
- TEMPORARY BARRIER WITH FENCE
- TEMPORARY IMPACT ATTENUATOR
- TYPE B LIGHT
- TYPE III BARRICADE
- TW/6" TEMPORARY WHITE / WIDTH
- TY/4" TEMPORARY YELLOW / WIDTH
- TBW/6" TEMPORARY BROKEN WHITE / WIDTH
- TDY/4" TEMPORARY DOUBLE YELLOW / WIDTH
- EDY EXISTING DOUBLE YELLOW PAVEMENT MARKING
- EBW EXISTING BROKEN WHITE PAVEMENT MARKING
- TYPE "H" OR "X" BASE SIGN
- ARROW PANEL

SCALE 0 25 50

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

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PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
TRAFFIC CONTROL PLAN

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK MJO	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 3 OF 9		DRAWING NUMBER PT-353 18 01	

LEGEND

- CHANNELIZING DEVICE
- TEMPORARY LANE SEPARATOR
- DIRECTION OF TRAFFIC FLOW
- CONTRACTOR ACCESS ROUTE
- CONTRACTOR FLAGPERSON
- WORK ZONE
- TEMPORARY BARRIER WITH FENCE
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- TYPE "H" OR "X" BASE SIGN
- ARROW PANEL

SCALE 0 25 50

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

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NORFOLK SOUTHERN

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PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
TRAFFIC CONTROL PLAN

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LEGEND

	CHANNELIZING DEVICE
	TEMPORARY LANE SEPARATOR
	DIRECTION OF TRAFFIC FLOW
	CONTRACTOR ACCESS ROUTE
	CONTRACTOR FLAGPERSON
	WORK ZONE
	TEMPORARY BARRIER WITH FENCE
	TEMPORARY IMPACT ATTENUATOR
	TYPE B LIGHT
	TYPE III BARRICADE
TW/6"	TEMPORARY WHITE / WIDTH
TY/4"	TEMPORARY YELLOW / WIDTH
TBW/6"	TEMPORARY BROKEN WHITE / WIDTH
TDY/4"	TEMPORARY DOUBLE YELLOW / WIDTH
EDY	EXISTING DOUBLE YELLOW PAVEMENT MARKING
EBW	EXISTING BROKEN WHITE PAVEMENT MARKING
	TYPE "H" OR "X" BASE SIGN
	ARROW PANEL

SCALE
0 25 50

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

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NORFOLK SOUTHERN

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PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION

TRAINSHED IMPROVEMENTS
TRAFFIC CONTROL PLAN

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK MJO	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 5 OF 9		DRAWING NUMBER PT-353 18 01	

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LEGEND

- CHANNELIZING DEVICE
- TEMPORARY LANE SEPARATOR
- DIRECTION OF TRAFFIC FLOW
- CONTRACTOR ACCESS ROUTE
- CONTRACTOR FLAGPERSON
- WORK ZONE
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- TYPE B LIGHT
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- TBW/6" TEMPORARY BROKEN WHITE / WIDTH
- TDY/4" TEMPORARY DOUBLE YELLOW / WIDTH
- *EDY EXISTING DOUBLE YELLOW PAVEMENT MARKING*
- *EBW EXISTING BROKEN WHITE PAVEMENT MARKING*
- TYPE "H" OR "X" BASE SIGN
- ARROW PANEL

SCALE
0 25 50

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

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PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
TRAFFIC CONTROL PLAN

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SHEET NUMBER 6 OF 9		DRAWING NUMBER PT-353 18 01	

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ALTERNATIVE 2

LEGEND

•	CHANNELIZING DEVICE
	TEMPORARY LANE SEPARATOR
	DIRECTION OF TRAFFIC FLOW
	CONTRACTOR ACCESS ROUTE
	CONTRACTOR FLAGPERSON
	WORK ZONE
	TEMPORARY BARRIER WITH FENCE
	TEMPORARY IMPACT ATTENUATOR
	TYPE B LIGHT
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TW/6"	TEMPORARY WHITE / WIDTH
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EDY	EXISTING DOUBLE YELLOW PAVEMENT MARKING
EBW	EXISTING BROKEN WHITE PAVEMENT MARKING
	TYPE "H" OR "X" BASE SIGN
	ARROW PANEL

SCALE
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PRELIMINARY PLANS

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PITTSBURGH STATION
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SHEET NUMBER 7 OF 9			DRAWING NUMBER PT-353 18 01

ALTERNATIVE 2

LEGEND

- CHANNELIZING DEVICE
- TEMPORARY LANE SEPARATOR
- DIRECTION OF TRAFFIC FLOW
- CONTRACTOR ACCESS ROUTE
- CONTRACTOR FLAGPERSON
- WORK ZONE
- TEMPORARY BARRIER WITH FENCE
- TEMPORARY IMPACT ATTENUATOR
- TYPE B LIGHT
- TYPE III BARRICADE
- TW/6" TEMPORARY WHITE / WIDTH
- TY/4" TEMPORARY YELLOW / WIDTH
- TBW/6" TEMPORARY BROKEN WHITE / WIDTH
- TDY/4" TEMPORARY DOUBLE YELLOW / WIDTH
- EDY EXISTING DOUBLE YELLOW PAVEMENT MARKING
- EBW EXISTING BROKEN WHITE PAVEMENT MARKING
- TYPE "H" OR "X" BASE SIGN
- ARROW PANEL

SCALE
0 25 50

PRELIMINARY PLANS

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

REV	BY	DATE	DESCRIPTION
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NORFOLK SOUTHERN

Norfolk Southern Corp
PITTSBURGH LINE
PITTSBURGH DIVISION
OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
TRAFFIC CONTROL PLAN

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK MJO	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 8 OF 9			DRAWING NUMBER PT-353 18 01

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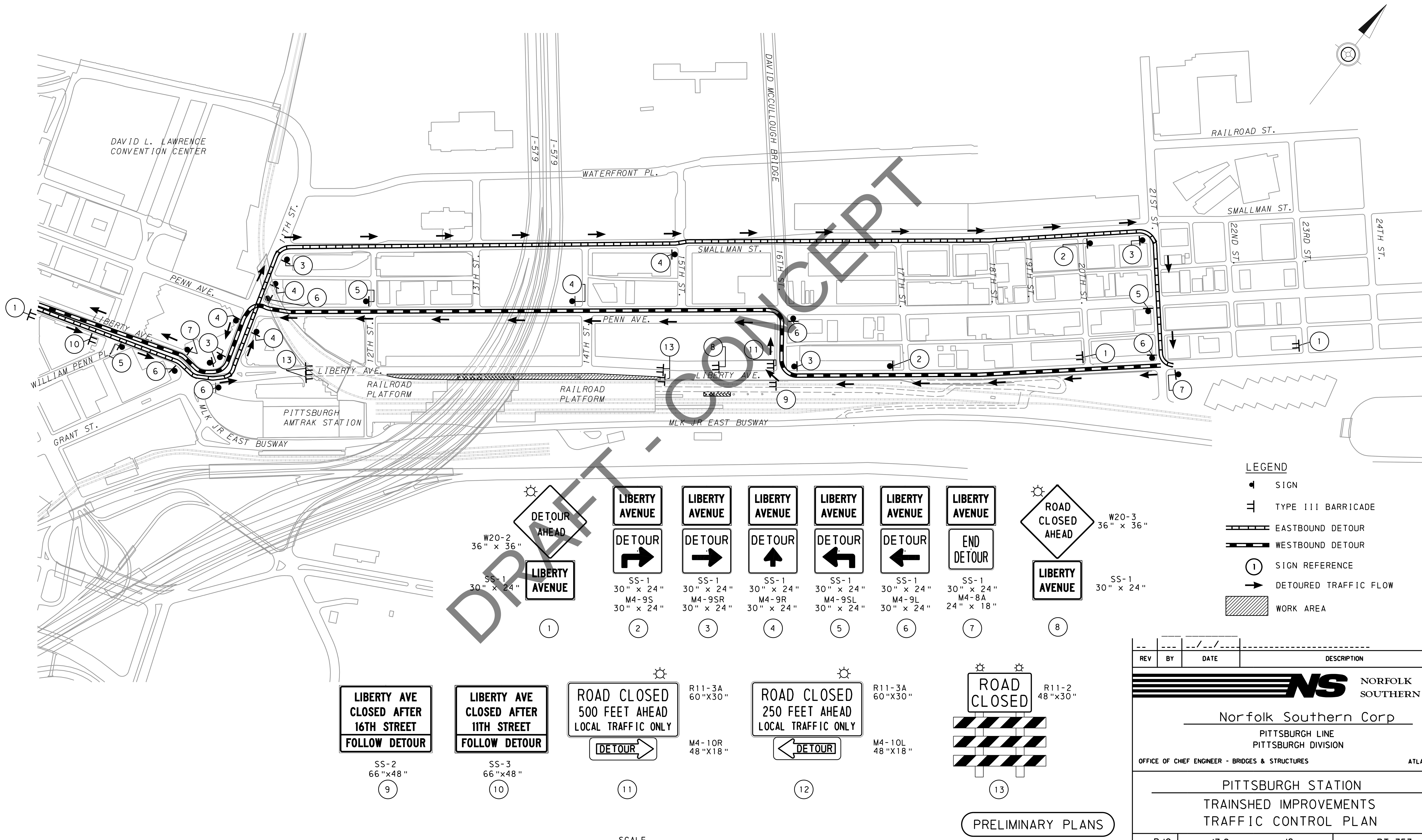
6/13/2018



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NORFOLK SOUTHERN

Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
TRAFFIC CONTROL PLAN

DGN BJG	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK MJO	FILE BR0028864		DATE 6/13/2018
SHEET NUMBER 9 OF 9		DRAWING NUMBER PT-353 18 01	

WSP USA
11 STANWIX STREET
SUITE 950
PITTSBURGH, PA 15222

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GENERAL NOTES:

1. OWNER AND HIS DESIGNEE HAVE OVERALL AUTHORITY AND THE CONTRACTOR SHALL FOLLOW ALL DIRECTIVES.

2. GENERAL NOTES, PLANS, AND SPECIFICATIONS APPLY TO ALL WORK AREAS AND CONSTRUCTION PHASES. ALL ARE COMPLEMENTARY TO EACH OTHER. ANY WORK PORTRAYED IN EITHER IS CONSIDERED PART OF THE CONTRACT. ALL PLANNING, SCHEDULING, PHASING, AND SAFETY IS CONSIDERED INCIDENTAL TO THE CONTRACT AND NO ADDITIONAL PAYMENT WILL BE MADE FOR THESE.

3. IN ADVANCE OF HIS OPERATIONS, THE CONTRACTOR SHALL EXPOSE BY WHATEVER MEANS NECESSARY, INCLUDING HAND DIGGING, ANY EXISTING UTILITY THAT MAY BE IN CONFLICT WITH THE PROPOSED WORK PRIOR TO ADVANCING OPERATIONS TO THAT POINT AT NO ADDITIONAL COST TO THE OWNER.

4. THE LOCATION OF ALL UTILITIES SHOWN ON THESE PLANS IS TAKEN FROM THE BEST AVAILABLE RECORDS. THE OWNER, DESIGNER AND/OR ENGINEER WILL NOT BE RESPONSIBLE FOR ANY OMISSION OR VARIATION FROM THE LOCATION SHOWN. THE CONTRACTOR SHALL CONTACT UTILITY LOCATORS REQUIRED TO LOCATE EXISTING UTILITIES AT THE CONTRACTOR'S EXPENSE. UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN PLOTTED FROM THE BEST AVAILABLE SURVEYS AND RECORDS, AND THEREFORE, THEIR LOCATIONS MUST BE CONSIDERED AS APPROXIMATE ONLY. THERE MAY BE OTHER UTILITIES OR CONSTRUCTION, THE EXISTENCE OF WHICH IS AT PRESENT NOT KNOWN. VERIFICATION OF THE LOCATIONS OF UNDERGROUND UTILITIES AND EXISTING CONSTRUCTION, SHOWN OR NOT SHOWN, WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

5. PROTECTION OF EXISTING FEATURES: ALL LIGHTS, ELECTRICAL SERVICE, COMMUNICATIONS, AND EQUIPMENT WITHIN, AND ADJACENT TO, THE WORK AREAS SHALL BE PROTECTED AT ALL TIMES. THE CONTRACTOR SHALL PROTECT THESE EXISTING CONSTRUCTION AND EQUIPMENT NOT INTENDED TO BE REMOVED FROM DAMAGE WHILE WORKING AT THE WORK SITE. IN ADDITION TO THE BARRICADES INDICATED ON THE PLANS, THE CONTRACTOR SHALL PLACE BARRICADES AROUND ANY ELEVATED LIGHTS AND EQUIPMENT THAT MAY BE IN THE WORK AREA TO DELINEATE AND PROTECT THEM. ANY DAMAGE SHALL BE REPAIRED IMMEDIATELY TO ITS ORIGINAL CONDITION AT THE EXPENSE OF THE CONTRACTOR AS ACCEPTED BY THE OWNER OR ENGINEER.

6. THE CONTRACTOR SHALL IMMEDIATELY REPAIR TO ITS ORIGINAL CONDITION ANY AREA DAMAGED DUE TO THE CONTRACTOR'S OPERATIONS. THIS REPAIR SHALL BE AT THE CONTRACTOR'S OWN EXPENSE AND AS ACCEPTED BY THE OWNER OR THE ENGINEER.

GENERAL SAFETY NOTES:

1. THIS PROJECT IS FOR THE IMPROVEMENT OF OVERHEAD CLEARANCE ABOVE NORFOLK SOUTHERN MAIN LINE TRACKS THROUGH THE PITTSBURGH STATION BY PARTIAL REMOVAL OF THE EXISTING STATION ROOF STRUCTURE. ADDITIONALLY, THE PROJECT INVOLVES SPECIFIC REPAIRS TO EXISTING ROOF STRUCTURE AND ROOFING CONSTRUCTION, AS INDICATED.

2. THE CONTRACTOR SHALL PROVIDE A WRITTEN SAFETY PLAN COMPLIANCE DOCUMENT (SPCD) TO THE OWNER AND THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO THE PRE-CONSTRUCTION MEETING. WORK CANNOT PROCEED UNTIL THIS SPCD HAS BEEN ACCEPTED BY THE OWNER AND THE ENGINEER. THE SPCD WILL DEMONSTRATE HOW THE CONTRACTOR WILL MEET THE SAFETY REQUIREMENTS OF THE CONTRACT, INCLUDING DETAILS ON TOOL BOX SAFETY MEETINGS, TYPES, LOCATIONS, AND MAINTENANCE OF BARRICADES, WORK ACCESS ROUTES, AND PROPOSED PROCEDURES USED BY THE CONTRACTOR TO MONITOR AND PROTECT TRAFFIC ON ADJACENT STREET(S).

3. THE CONTRACTOR SHALL DEVELOP AND SUBMIT A CONSTRUCTION SCHEDULE PRIOR TO THE PRE-CONSTRUCTION MEETING FOR REVIEW AND APPROVAL BY THE OWNER. THE SCHEDULE WILL BE UPDATED BY THE CONTRACTOR AT LEAST MONTHLY PER ACTUAL PROGRESS. SCHEDULE COORDINATION WITH THE OWNER IS REQUIRED TO POTENTIAL CONFLICTS.

4. NO ROADS OR SIDEWALKS SHALL BE CLOSED WITHOUT PRIOR WRITTEN APPROVAL BY THE OWNER AND THE CITY OF PITTSBURGH. THE CONTRACTOR SHALL COMPLY WITH ALL THE REQUIREMENTS SET FORTH IN THE CONTRACT DOCUMENTS REGARDING CLOSURES.

5. AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS ARE TO BE COMPLETELY RESTORED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER AND THE ENGINEER.

6. THE CONTRACTOR SHALL PROVIDE THE OWNER WITH THE NAME OF HIS SAFETY OFFICER AND HIS FIELD FOREMEN WHO WILL BE IN CHARGE DURING WORKING HOURS. ADDITIONALLY, THE CONTRACTOR SHALL IDENTIFY THE 24-HOUR EMERGENCY RESPONSE TELEPHONE NUMBERS FOR HIS SUPERVISOR(S) IN CHARGE.

7. THE CONTRACTOR SHALL BE FULLY AWARE AND CONTINUOUSLY MONITOR ALL REQUIREMENTS AND ACTIVITIES FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS.

CONTRACTOR ACCESS NOTES:

1. THE CONTRACTOR SHALL ONLY ACCESS THE WORK AREAS VIA THE GATES DENOTED ON THE PLANS, UNLESS OTHERWISE DIRECTED BY THE OWNER OR ENGINEER. THE CONTRACTOR SHALL COORDINATE THE SCHEDULE FOR ACCESS TO THE SITE WITH THE OWNER.

2. THE CONTRACTOR SHALL MAINTAIN SITE SECURITY, AND GATE SECURITY FOR ENTRY POINTS.

3. INTEGRITY OF THE PERIMETER FENCE SHALL BE MAINTAINED AT ALL TIMES.

HAZARDOUS MATERIAL MANAGEMENT NOTES:

1. REMOVE ALL DEMOLITION MATERIALS FROM SITE AND LEGALLY DISPOSE OF OFF OWNER'S PROPERTY.

2. IDENTIFY, DOCUMENT LOCATIONS, AND TYPES OF MATERIALS TO BE REMOVED/DEMOLISHED THAT CONSIST OF, OR CONTAIN, HAZARDOUS MATERIALS WHETHER OR NOT THEY ARE IDENTIFIED IN THE DOCUMENTS. REFER TO PLANS AND SECTIONS FOR REFERENCES TO ANTICIPATED TYPES AND LOCATIONS OF HAZARDOUS MATERIALS.

3. IDENTIFY AND MAINTAIN SEGREGATED STORAGE AND LOADING AREAS FOR MATERIALS IDENTIFIED AS POTENTIALLY CONTAINING HAZARDOUS MATERIALS INCLUDING, BUT NOT LIMITED TO, ASBESTOS.

4. IF HAZARDOUS MATERIALS ARE ENCOUNTERED ON SITE WHICH ARE IMPACTED BY THE WORK, THE CONTRACTOR MUST NOTIFY THE OWNER AND THE ENGINEER IMMEDIATELY.

5. CONFORM WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS FOR CONTAINMENT, REMOVAL, HANDLING, TEMPORARY STORAGE, TRANSPORTATION AND DISPOSAL OF HAZARDOUS MATERIALS FOUND ON SITE INCLUDING ASBESTOS CONTAINING MATERIALS.

6. CONFORM WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS FOR PROTECTION OF THE PUBLIC AND PROTECTION OF WORKERS FROM ALL HAZARDOUS MATERIALS ENCOUNTERED.

NOTIFICATION OF CONSTRUCTION ACTIVITIES NOTES:

1. THE NOTICE TO PROCEED WILL NOT BE ISSUED UNTIL THE CONTRACTOR HAS SUBMITTED TO THE OWNER FOR APPROVAL, AND WHICH HAS BEEN APPROVED IN WRITING, THE FOLLOWING ITEMS: A SPCD, A SCHEDULE WITH CRITICAL PATH IDENTIFIED, EMERGENCY CONTACT INFORMATION (SUPERVISOR, FOREMAN, PROJECT MANAGER), AND SCHEDULE OF VALUES FOR LUMP SUM WORK ITEMS.

2. IN THE EVENT OF AN EMERGENCY, THE CONTRACTOR SHALL CALL EMERGENCY RESPONDERS (911) AND THE OWNER IMMEDIATELY. THE OWNER WILL COORDINATE PUBLIC COMMUNICATIONS REGARDING ANY EMERGENCY.

INSPECTION REQUIREMENTS NOTES:

1. CONTRACTOR SHALL PROVIDE UNENCUMBERED ACCESS TO THE WORK AREAS FOR THE OWNER AND ENGINEER AT ALL TIMES. CONTRACTOR SHALL INCLUDE SUFFICIENT TIME TO ACCOMMODATE INSPECTIONS AND ACCEPTANCE OF WORK BY THE OWNER AND THE ENGINEER.

UNDERGROUND UTILITIES AND EXISTING PAVEMENT NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF EXISTING PAVEMENTS, SIDEWALKS, PLATFORMS, UNDERGROUND PIPES AND UTILITIES, AND ALL OTHER EXISTING FEATURES UNLESS OTHERWISE NOTED ON THESE PLANS. THE CONTRACTOR WILL REPAIR TO ORIGINAL CONDITIONS ALL FEATURES INCLUDING EXISTING PAVEMENTS, PLATFORMS, AND SIDEWALKS DISTURBED BY HIS ACTIVITIES TO THE SATISFACTION OF THE OWNER AND THE ENGINEER. THIS REPAIR WILL BE CONSIDERED INCIDENTAL TO THE WORK AND NO ADDITIONAL COMPENSATION SHALL BE MADE FOR IT.

FOUNDATION NOTES:

1. BACKFILLING AGAINST WALLS SHALL NOT BE DONE UNTIL CONCRETE HAS BEEN CURED TO ATTAIN SUFFICIENT STRENGTH (7 DAYS MINIMUM).

2. THE CONTRACTOR SHALL SAFEGUARD AND PROTECT ALL EXCAVATIONS AND ALL EXCAVATIONS SHALL BE KEPT FREE OF WATER.

3. NO HORIZONTAL JOINTS SHALL BE PLACED IN WALLS AND/OR GRADE BEAMS EXCEPT AS SHOWN ON THE DRAWINGS WITHOUT APPROVAL OF THE OWNERS REPRESENTATIVE.

FOUNDATION CONCRETE:

1. ALL THE CONCRETE SHALL BE NORMAL WEIGHT CONCRETE HAVING A DESIGN COMPRESSIVE STRENGTH AT 28 DAYS AS FOLLOWS:
   - A. FOOTINGS 4,000 PSI
   - B. WALLS AND PIERS 4,000 PSI

2. NO CONCRETE SHALL BE PLACED UNTIL CONCRETE DESIGN MIXES HAVE BEEN SUBMITTED FOR EACH CLASS OF CONCRETE NOTED ABOVE AND HAVE BEEN APPROVED BY THE OWNERS REPRESENTATIVE.

3. REINFORCING STEEL SHALL BE DEFORMED BARS OF INTERMEDIATE GRADE NEW BILLET STEEL CONFORMING TO CURRENT REQUIREMENTS OF ASTM A 615, GRADE 60. LAP BARS 40 DIAMETER UNLESS OTHERWISE ALL HOOKS SHALL BE STANDARD HOOKS, UNLESS OTHERWISE NOTED.

4. PROVIDE ASTM A775 EPOXY COATED BARS FOR EXTERIOR/PERIMETER FOUNDATION WALLS.

5. MINIMUM STEEL REINFORCING CLEAR CONCRETE COVER (PROTECTION), UNLESS OTHERWISE SHOWN, SHALL BE 3 INCHES FOR FOOTINGS AND OTHER STRUCTURAL CONCRETE DEPOSITED AGAINST GROUND, AND 2 INCHES FOR CONCRETE PERMANENTLY EXPOSED TO EARTH OR WEATHER.

6. ALL STRUCTURAL MEMBERS SHALL BE POURED FOR THEIR FULL DEPTHS IN ONE OPERATION. CONSTRUCTION JOINTS, SUCH AS DAY'S POUR JOINTS, SUCH AS THE SPAN, MAIN REINFORCING TO RUN THROUGH THE JOINT, KEY AND ROUGHEN JOINTS TO EXPOSE AGGREGATE. CONTRACTOR SHALL SUBMIT DRAWING INDICATING CONSTRUCTION JOINT LOCATIONS FOR APPROVAL.

7. NO CONCRETE SHALL BE PLACED IN WATER.

8. PROVIDE WATER STOPS IN JOINTS BETWEEN WALLS AND FOOTINGS AND IN WALL JOINTS.

EXISTING CONSTRUCTION:

1. ALL DIMENSIONS AND ELEVATIONS OF EXISTING STRUCTURES SHOWN ON THE DRAWINGS ARE OBTAINED FROM AVAILABLE SOURCES AND ARE NOT GUARANTEED TO BE TRUE AND EXACT. THE CONTRACTOR SHALL VERIFY THESE DIMENSIONS AND ELEVATIONS BY ACTUAL FIELD MEASUREMENTS PRIOR TO FABRICATION OF ANY MATERIALS AND START OF WORK AND REPORT ANY DISCREPANCIES TO THE OWNERS REPRESENTATIVE.

2. PRIOR TO EXCAVATION, VERIFY LOCATIONS OF UNDERGROUND UTILITIES AND EXCAVATE OR SURVEY TO ESTABLISH EXACT UTILITY LOCATIONS. THE UTILITY LOCATIONS ON THE CONTRACT DRAWINGS ARE ONLY APPROXIMATE AND CANNOT BE USED TO ASSURE THE CONTRACTOR OF ADEQUATE CLEARANCE IN, CASES OF CLOSE PROXIMITY. COORDINATE ALL WORK WITH THE UTILITIES TO ASSURE THEIR UNINTERRUPTED FUNCTION.

3. ACTIVE UTILITIES SHOWN ON DRAWINGS SHALL BE ADEQUATELY PROTECTED FROM DAMAGE. SHOULD ACTIVE UTILITIES BE ENCOUNTERED BUT NOT SHOWN ON DRAWINGS, NOTIFY THE OWNER'S REPRESENTATIVE, ENGINEER AND UTILITY OWNER. WORK SHALL BE PROTECTED, SUPPORTED, OR RELOCATED AS DIRECTED.

4. INACTIVE AND ABANDONED UTILITIES ENCOUNTERED SHALL BE REPORTED TO THE OWNER'S REPRESENTATIVE AND ENGINEER; UTILITIES SHALL BE REMOVED, PLUGGED, OR CAPPED AS DIRECTED.

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

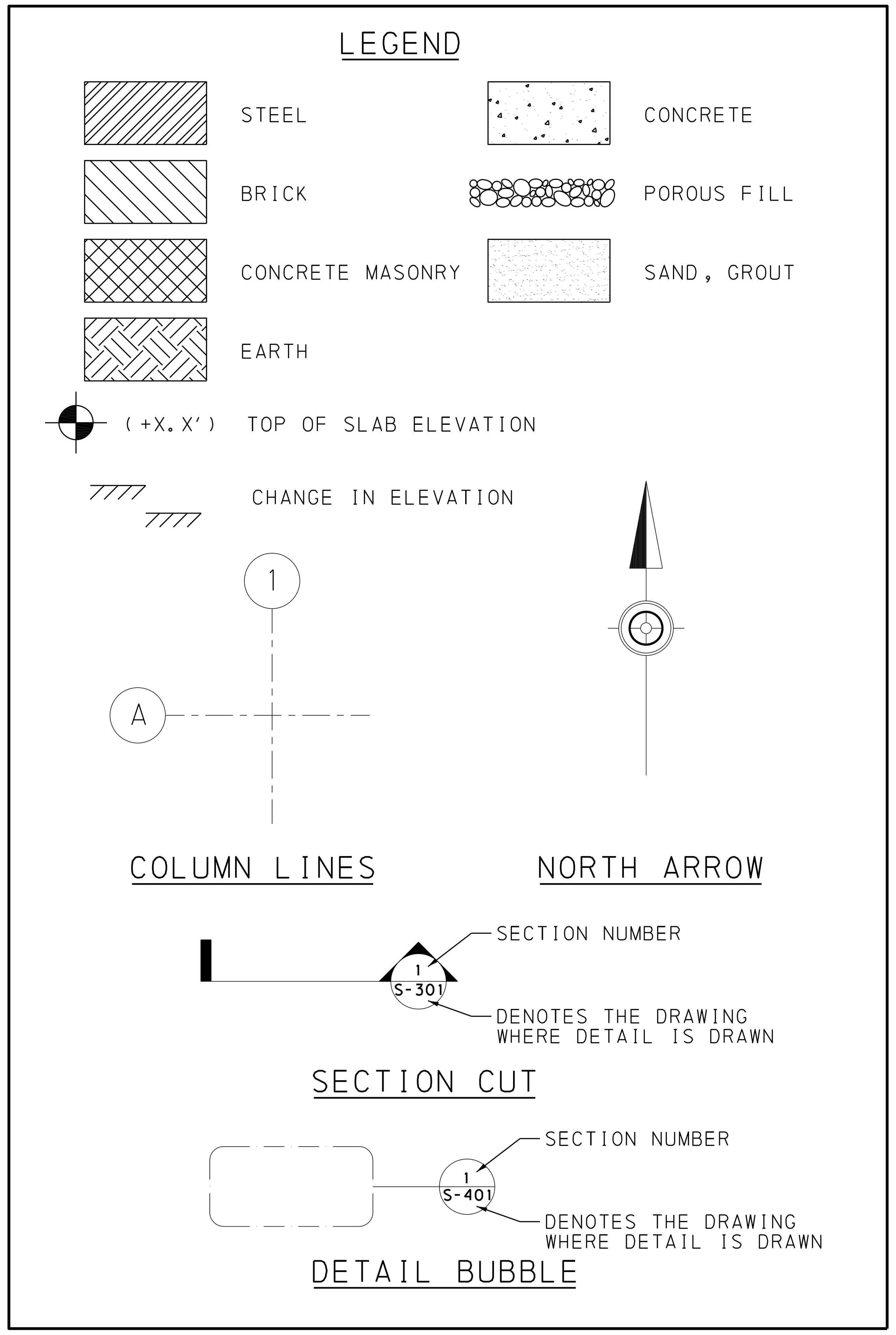
OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
GENERAL NOTES

DGN ZRS	VAL SEC 17.2 MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864	DATE 6/14/2018
SHEET NUMBER S-01 OF S-21		DRAWING NUMBER PT-353 18 01

ABBREVIATIONS

(A)	ABOVE
ALT	ALTERNATE
AB	ANCHOR BOLT
(B)	BELOW
B	BOTTOM
BO	BOTTOM OF
℄	CENTERLINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
CJ	CONSTRUCTION JOINT
DIA	DIAMETER
DN	DOWN
EF	EACH FACE
EW	EACH WAY
EOS	EDGE OF SLAB
EL	ELEVATION
EMB	EMBEDMENT
EJ	EXPANSION JOINT
F	FOOTING
FD	FLOOR DRAIN
FDN	FOUNDATION
FS	FAR SIDE
FTG	FOOTING
GA	GAGE
GALV	GALVANIZED
(H)	HIGH
HP	HIGH POINT
HS	HIGH STRENGTH
HOR	HORIZONTAL
ID	INSIDE DIAMETER
IJ	ISOLATION JOINT
JT	JOINT
K	KIPS (KILOPOUNDS)
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
(L)	LOW
LP	LOW POINT
LT	LIGHT
MAX	MAXIMUM
MIN	MINIMUM
MISC	MISCELLANEOUS
MW	MOVING WALKWAY
NS	NEAR SIDE
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
NO (#)	NUMBER
OC	ON CENTER
OD	OUTSIDE DIAMETER
PL	PLATE
PT	POINT
R	RADIUS
REINF	REINFORCEMENT
REQ'D	REQUIRED
RO	ROUGH OPENING
RW	RETAINING WALL
SB	SLIDE BEARING
S.O.G.	SLAB ON GRADE
SPEC	SPECIFICATION
SST	STAINLESS STEEL
STAG	STAGGERED
STA	STATION
SYM	SYMMETRICAL
T.O.	TOP OF
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
WF	WALL FOOTING
WT	WEIGHT
WWF	WELDED WIRE FABRIC
WD	WIDTH
W/	WITH
W/O	WITHOUT
WP	WORKING POINT



REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

Norfolk Southern Corp

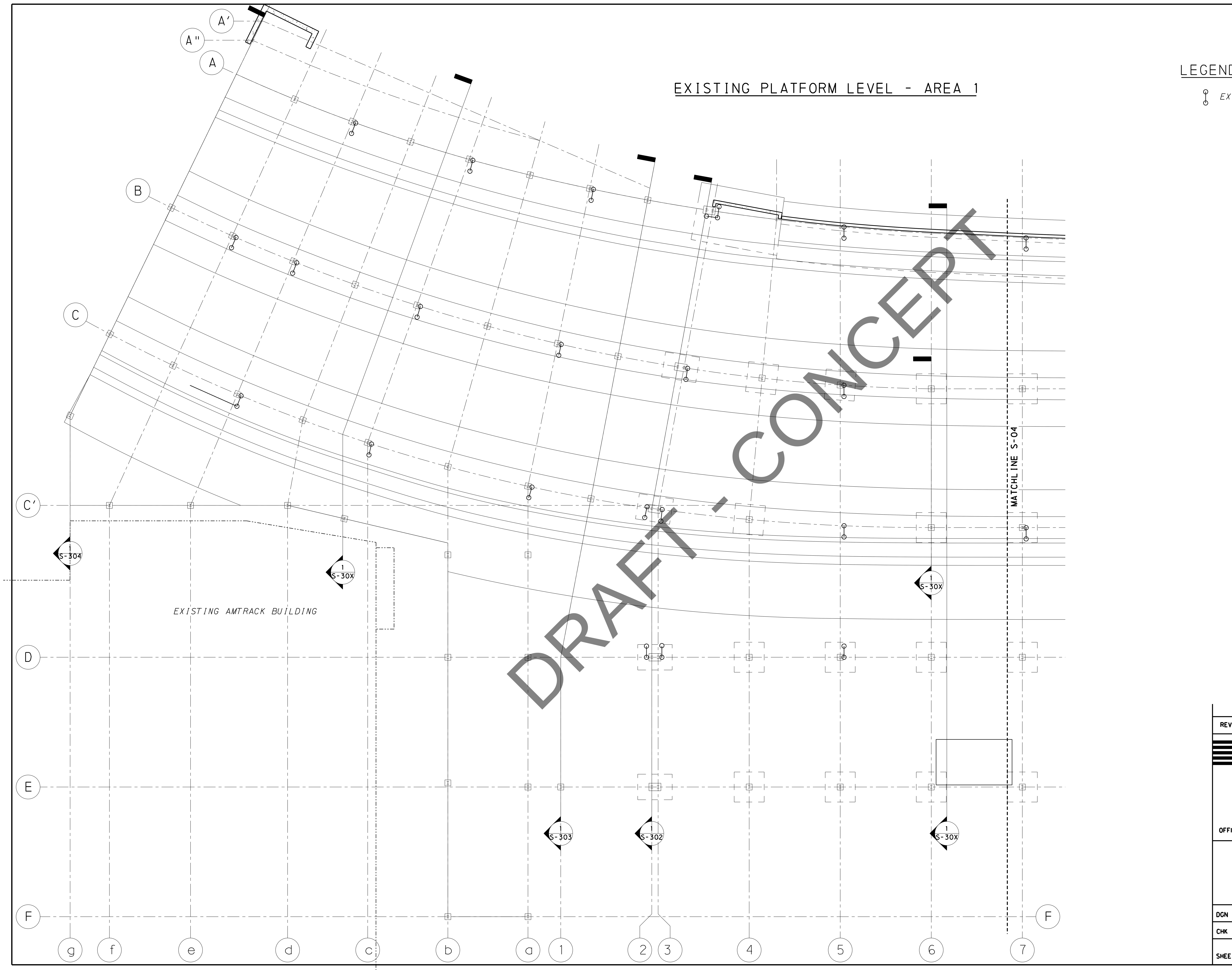
PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA.

PITTSBURGH STATION

TRAINSHED IMPROVEMENTS
LEGEND AND ABBREVIATIONS

DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 6/14/2018
SHEET NUMBER S-02 OF S-21		DRAWING NUMBER PT-353 18 01	



REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

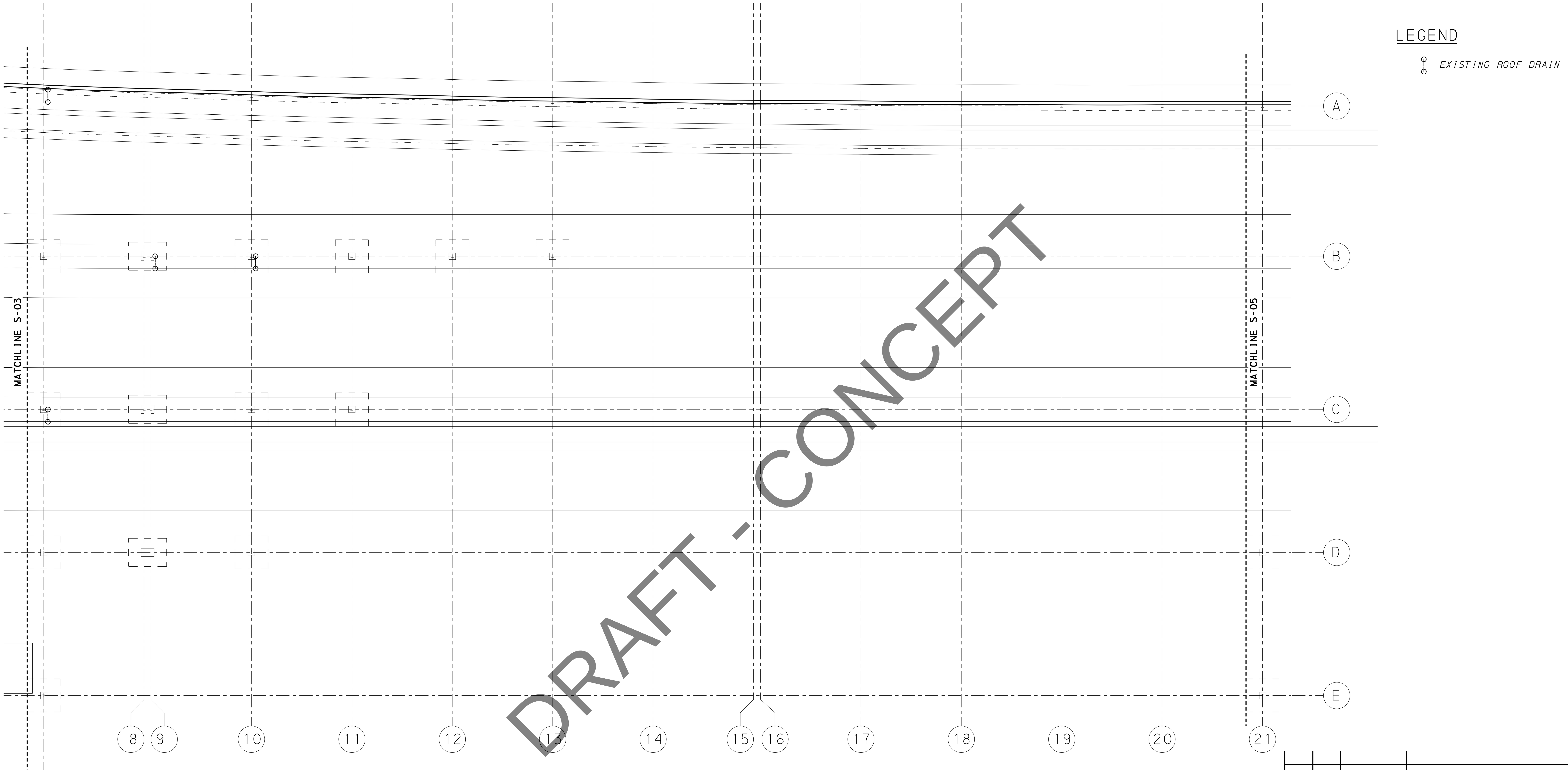
Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
EXISTING PLATFORM LEVEL - AREA 1

DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 6/14/2018
SHEET NUMBER S-03 OF S-21	DRAWING NUMBER PT-353 18 01		



EXISTING PLATFORM LEVEL - AREA 2

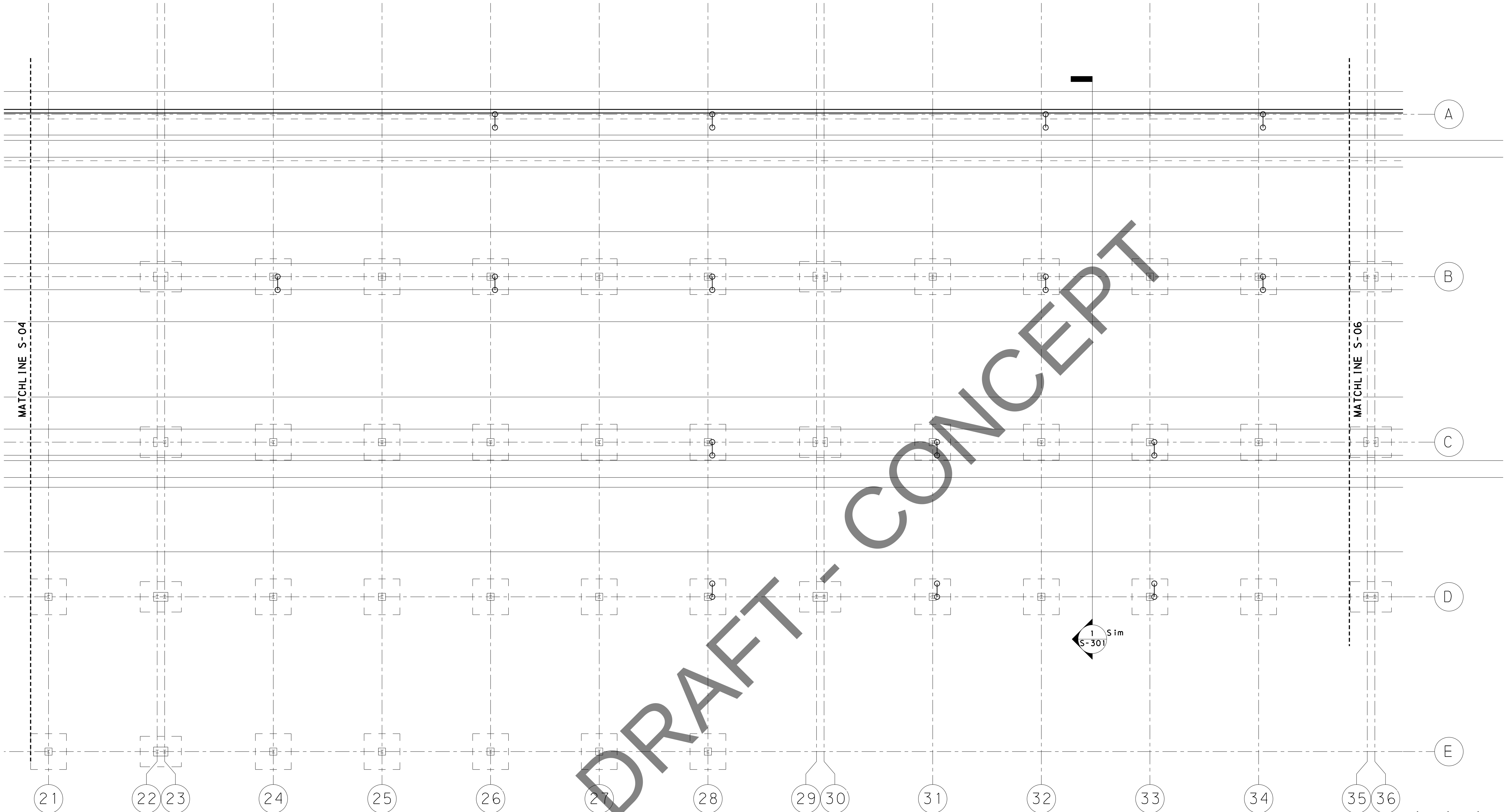
REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

Norfolk Southern Corp
PITTSBURGH LINE
PITTSBURGH DIVISION
OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
EXISTING PLATFORM LEVEL - AREA 2

DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 6/14/2018
SHEET NUMBER S-04 OF S-21		DRAWING NUMBER PT-353 18 01	



LEGEND

EXISTING ROOF DRAIN

EXISTING PLATFORM LEVEL - AREA 3

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION

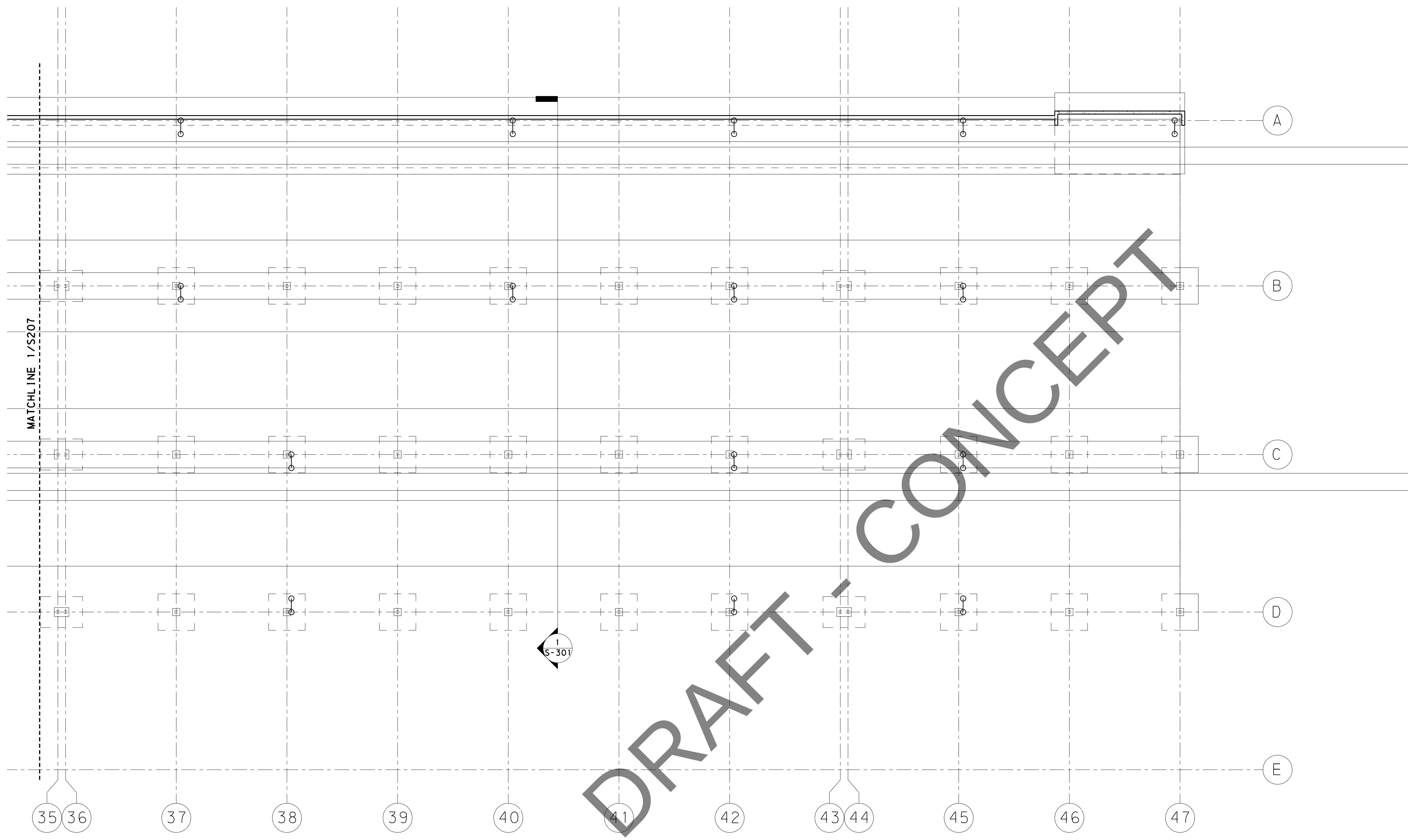
TRAINSHED IMPROVEMENTS
EXISTING PLATFORM LEVEL - AREA 3

DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 6/14/2018
SHEET NUMBER S-05 OF S-21		DRAWING NUMBER PT-353 18 01	

ALTERNATIVE 2

LEGEND

EXISTING ROOF DRAIN



EXISTING PLATFORM LEVEL - AREA 4

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

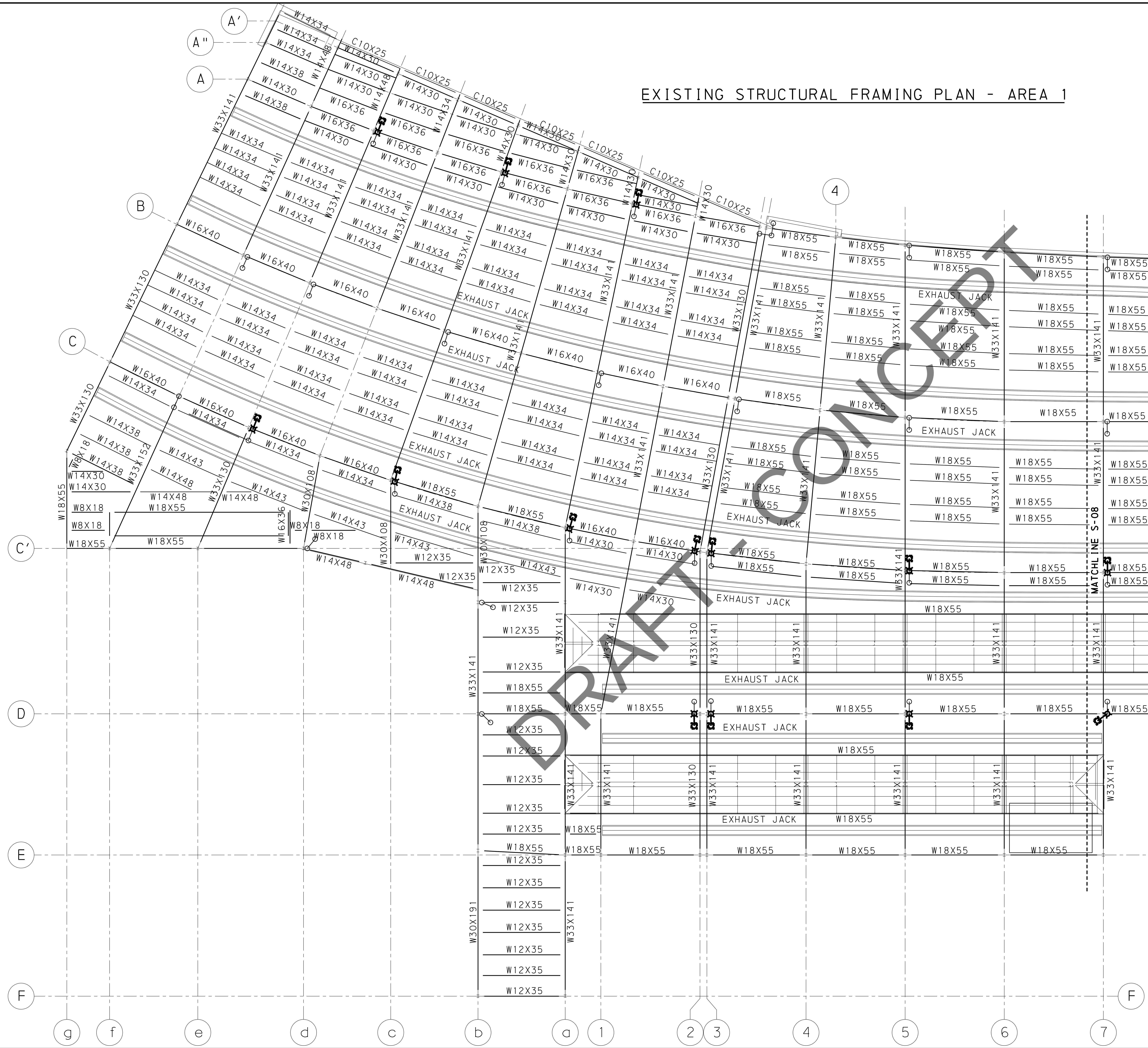
OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION

TRAINSHED IMPROVEMENTS
EXISTING PLATFORM LEVEL - AREA 4

DGN ZRS	VAL SEC 17.2 MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864	DATE 6/14/2018
SHEET NUMBER S-06 OF S-21		DRAWING NUMBER PT-353 18 01

EXISTING STRUCTURAL FRAMING PLAN - AREA 1



LEGEND

EXISTING ROOF DRAIN

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

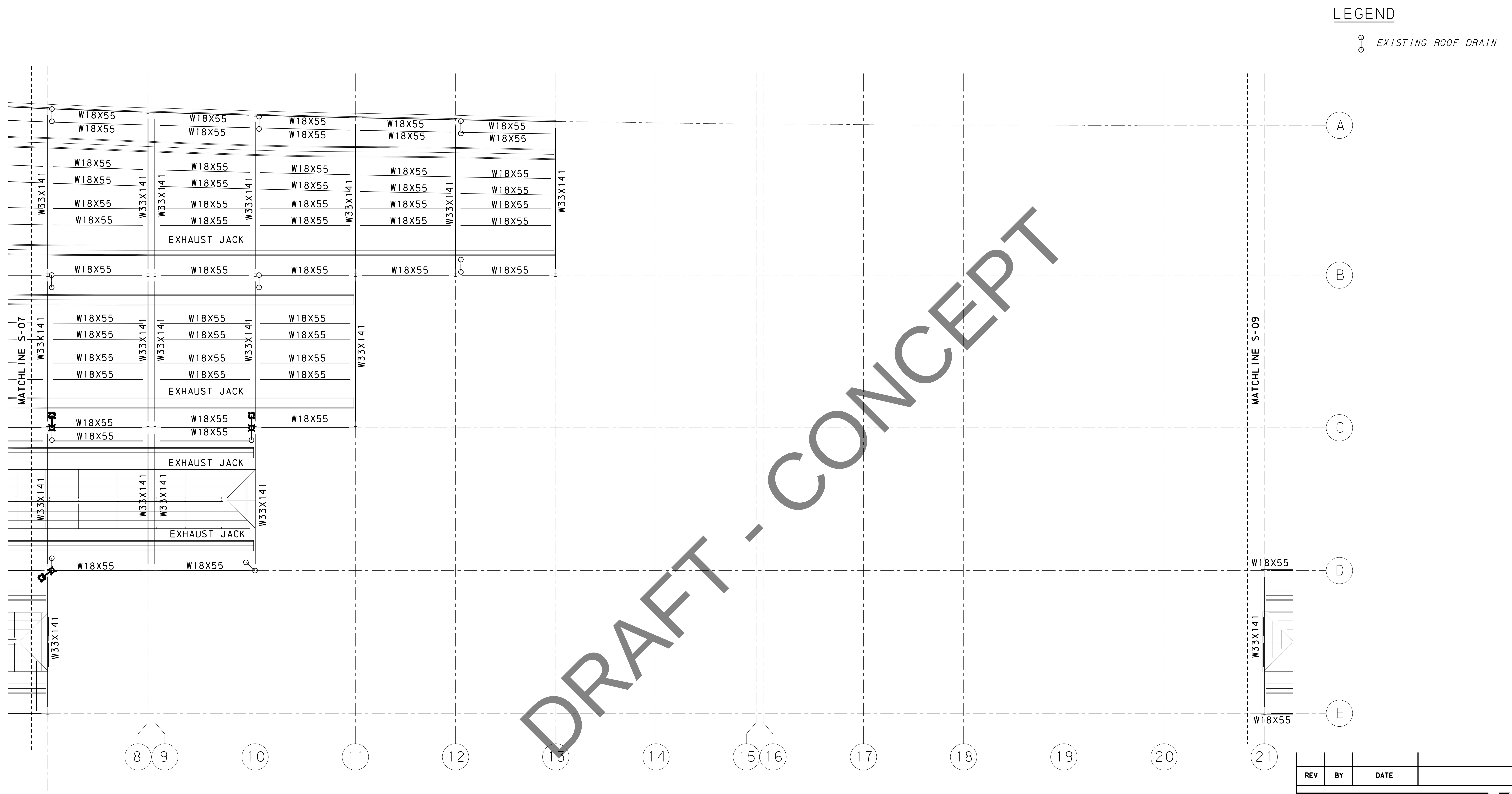
Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
EXISTING STRUCTURAL FRAMING PLAN - AREA I

DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 6/14/2018
SHEET NUMBER S-07 OF S-21		DRAWING NUMBER PT-353 18 01	



EXISTING STRUCTURAL FRAMING PLAN - AREA 2

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION

TRAINSHED IMPROVEMENTS
EXISTING STRUCTURAL FRAMING PLAN - AREA 2

DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 6/14/2018
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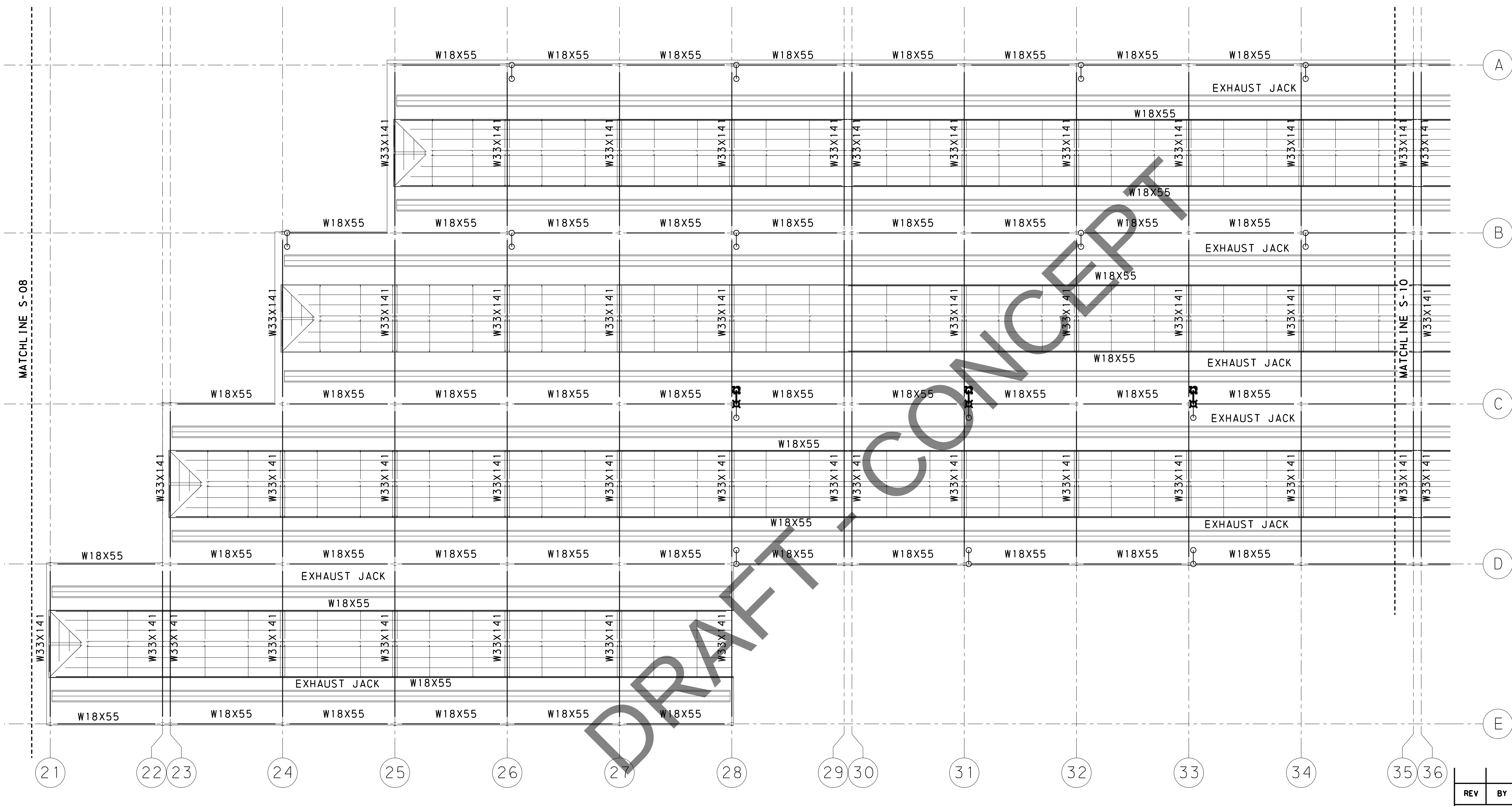
LEGEND

EXISTING ROOF DRAIN



EXISTING STRUCTURAL FRAMING PLAN - AREA 3

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION

TRAINSHED IMPROVEMENTS
EXISTING STRUCTURAL FRAMING PLAN - AREA 3

DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
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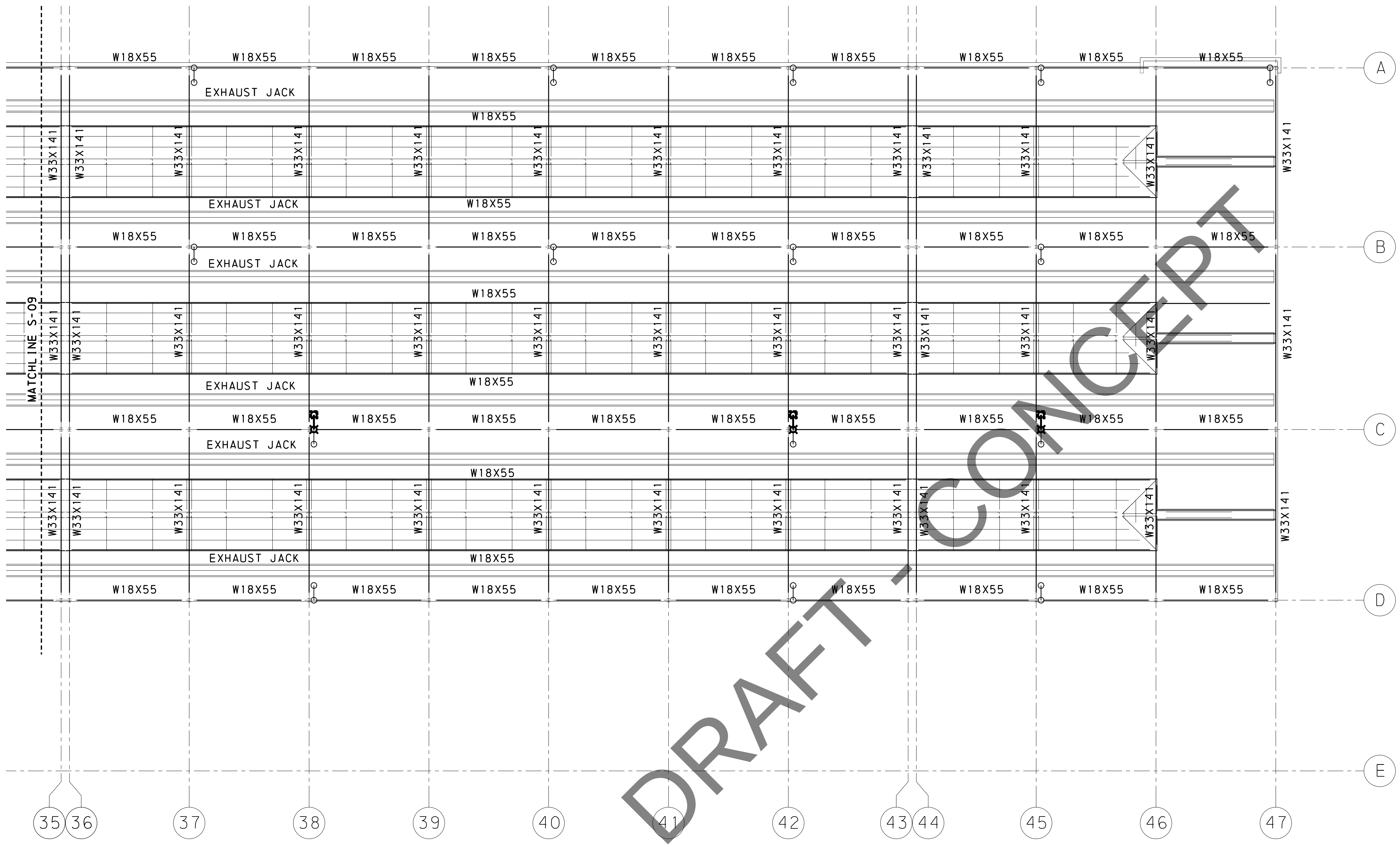
SHEET NUMBER S-09 OF S-21		DRAWING NUMBER PT-353 18 01	

LEGEND

EXISTING ROOF DRAIN



EXISTING STRUCTURAL FRAMING PLAN - AREA 4

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

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PITTSBURGH LINE
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OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION

TRAINSHED IMPROVEMENTS

EXISTING STRUCTURAL FRAMING PLAN - AREA 4

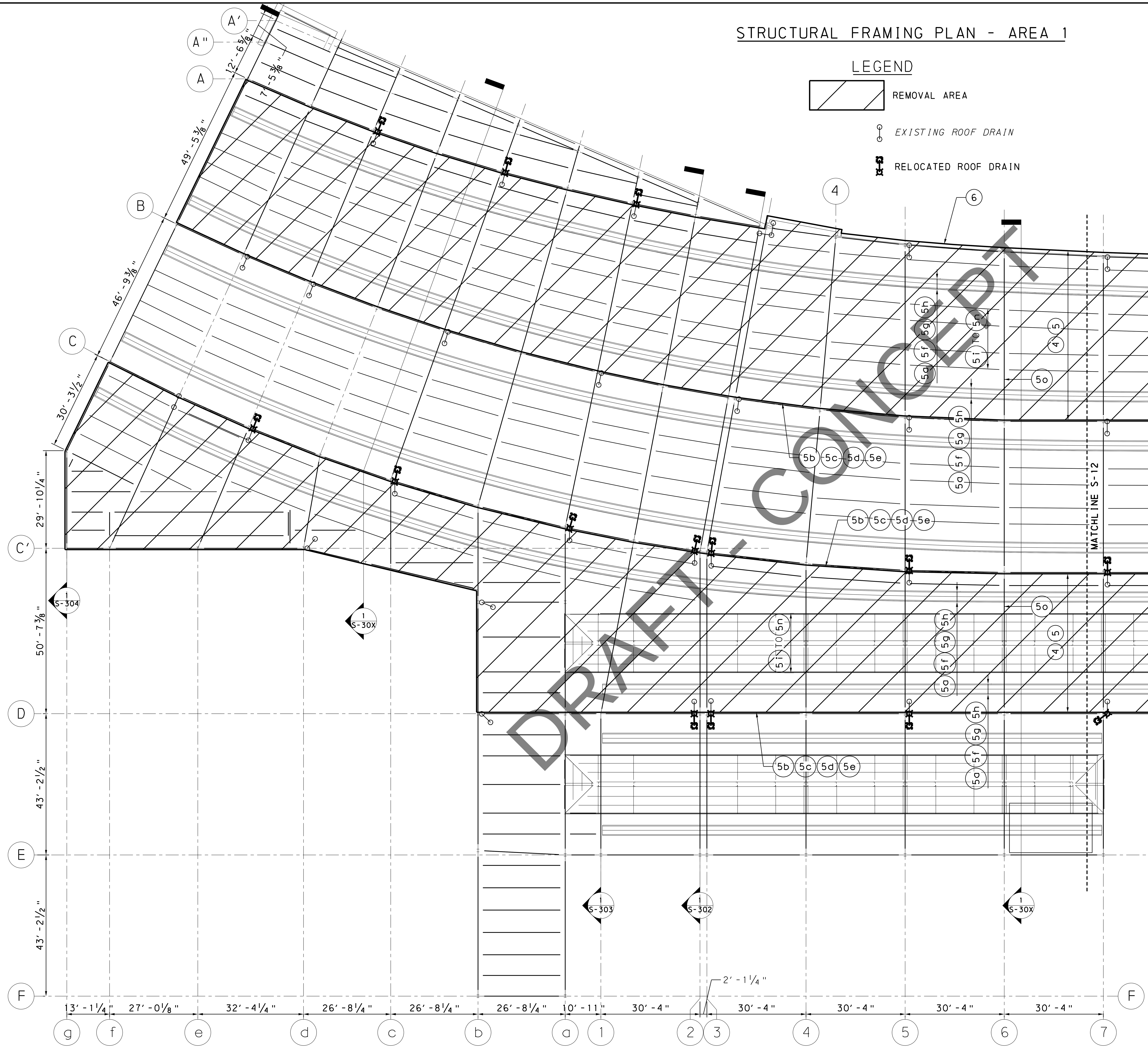
DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 6/14/2018
SHEET NUMBER S-10 OF S-21		DRAWING NUMBER PT-353 18 01	

ALTERNATIVE 2

STRUCTURAL FRAMING PLAN - AREA 1

LEGEND

- REMOVAL AREA
- *EXISTING ROOF DRAIN*
- RELOCATED ROOF DRAIN



ROOF LEVEL PLAN DEMOLITION NOTES:

1. COORDINATE ALL ACTIVITIES WITHIN THE RAILWAY RIGHT-OF-WAY WITH NORFOLK SOUTHERN AND AMTRAK OPERATIONS.
2. IDENTIFY AND DOCUMENT LOCATIONS OF MATERIALS IDENTIFIED AS POTENTIALLY CONTAINING HAZARDOUS MATERIALS INCLUDING BUT NOT LIMITED TO ASBESTOS.
3. CONFORM WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS FOR CONTAINMENT, REMOVAL, HANDLING, TEMPORARY STORAGE, TRANSPORTATION AND DISPOSAL OF HAZARDOUS MATERIALS FOUND ON SITE INCLUDING ASBESTOS CONTAINING MATERIALS.
4. INSTALL APPROVED TEMPORARY BRACING REQUIRED TO MAINTAIN STABILITY OF THE STRUCTURE DURING THE REMOVAL OF ROOF FRAMING INDICATED.
5. COORDINATE ROOF REMOVAL PROCESS TO MAINTAIN SAFE OPERATIONS AND COMPLETE THE REMOVAL OF EACH BAY OF THE ROOF AREA IDENTIFIED ACCORDING TO THE FOLLOWING GENERAL PROCEDURES:

a) CONFIRM LOCATIONS AND CONSTRUCTION WHERE EXISTNG CONSTRUCTION INCLUDES HAZARDOUS MATERIALS DESCRIBED IN NOTES 2 TO 4 ABOVE, SUCH AS THE EXHAUST JACK (ROOF VENT) SURFACE PANELS. THESE PANELS ARE IDENTIFIED AS TRANSITE PANELS IN ORIGINAL STATION CONSTRUCTION DOCUMENTS, BOLTED TO STEEL ANGLE FRAMING.

b) REMOVE THE EXISTING ROOFING MATERIALS TO CENTERLINE OF EDGE BEAM THAT WILL REMAIN IN PLACE AFTER REOVAL OF ADJACENT STRUCTURE.

c) REMOVE THE PRECAST ROOF SLAB PANELS THAT SPAN BETWEEN STEEL BEAM FRAMING OVER TRACK AND PLATFORM.

d) VERIFY CONDITION OF ROOFING MATERIALS ON ROOF AREA THAT WILL REMAIN. DOCUMENT CONDITION OF EXISTING ROOFING MATERIALS AND ADEQUACY FOR REPAIR AT NEW ROOFING EDGES. VERIFY ROOFING CONSTRUCTION AND COORDINATE FINAL DETAILING OF ROOF REPAIRS WITH EXISTING CONDITIONS IDENTIFIED AND SUBMIT TO ENGINEER FOR APPROVAL.

e) VERIFY AND DOCUMENT CONDITION OF EXISTING PRECAST CONCRETE ROOF DECK PANELS. REPORT LOCATIONS OF PRECAST PANELS EXHIBITING EXCESSIVE DETERIORATION TO OWNER AND ENGINEER FOR REVIEW.

f) PROVIDE TEMPORARY SUPPORT TO THE TRANSITE PANELS OR SIMILAR MATERIALS.

g) SHEAR THE BOLTS THAT CONNECT THE PANELS TO STEEL FRAMING AND REMOVE PANELS INTACT.

h) LOWER TRANSITE PANELS INTO A TRUCK OR DUMPSTER THAT WILL BE USED TO TRANSPORT THE TRANSITE PANELS, MAINTAINING THE PANELS INTACT AND UNDAMAGED. i) PROVIDE TEMPORARY SUPPORT FOR SKYLIGHT GLASS PANELS.

j) REMOVE THE CONNECTIONS THAT ATTACH THE SKYLIGHT GLASS TO SLOPED ANGLE FRAMING AND REMOVE THE VENT CONSTRUCTION AT THE APEX OF THE SKYLIGHTS.

k) REMOVE THE SKYLIGHT GLASS PANELS.

l) REMOVE THE TOP CHANNELS AND CONNECTION PLATES THAT FORM THE APEX OF THE SLOPED SKYLIGHT FRAMING AND THE SLOPED ANGLES THAT FORM THE SKYLIGHT FRAMING.

m) REMOVE THE BOTTOM CHANNELS AND MISCELLANEOUS FRAMING THAT FORMS THE BASE FOR SKYLIGHT FRAMING. n) REMOVE STEEL BEAM FRAMING PARALLEL TO THE TRACKS.

o) REMOVE THE MAIN GIRDER THAT SPANS OVER AND ACROSS THE TRACKS, BETWEEN COLUMNS.

6. REMOVE EXISTING MASONRY WALL DOWN TO PARAPET HEIGHT. ADD CONCRETE PARAPET TOPPING TO MATCH HEIGHT OF EXISTING PARAPET BETWEEN GRIDS 15 AND 25.

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
STRCUTURAL FRAMING PLAN - AREA I

DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 6/14/2018
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STRUCTURAL FRAMING PLAN - AREA 2

REV	BY	DATE	DESCRIPTION

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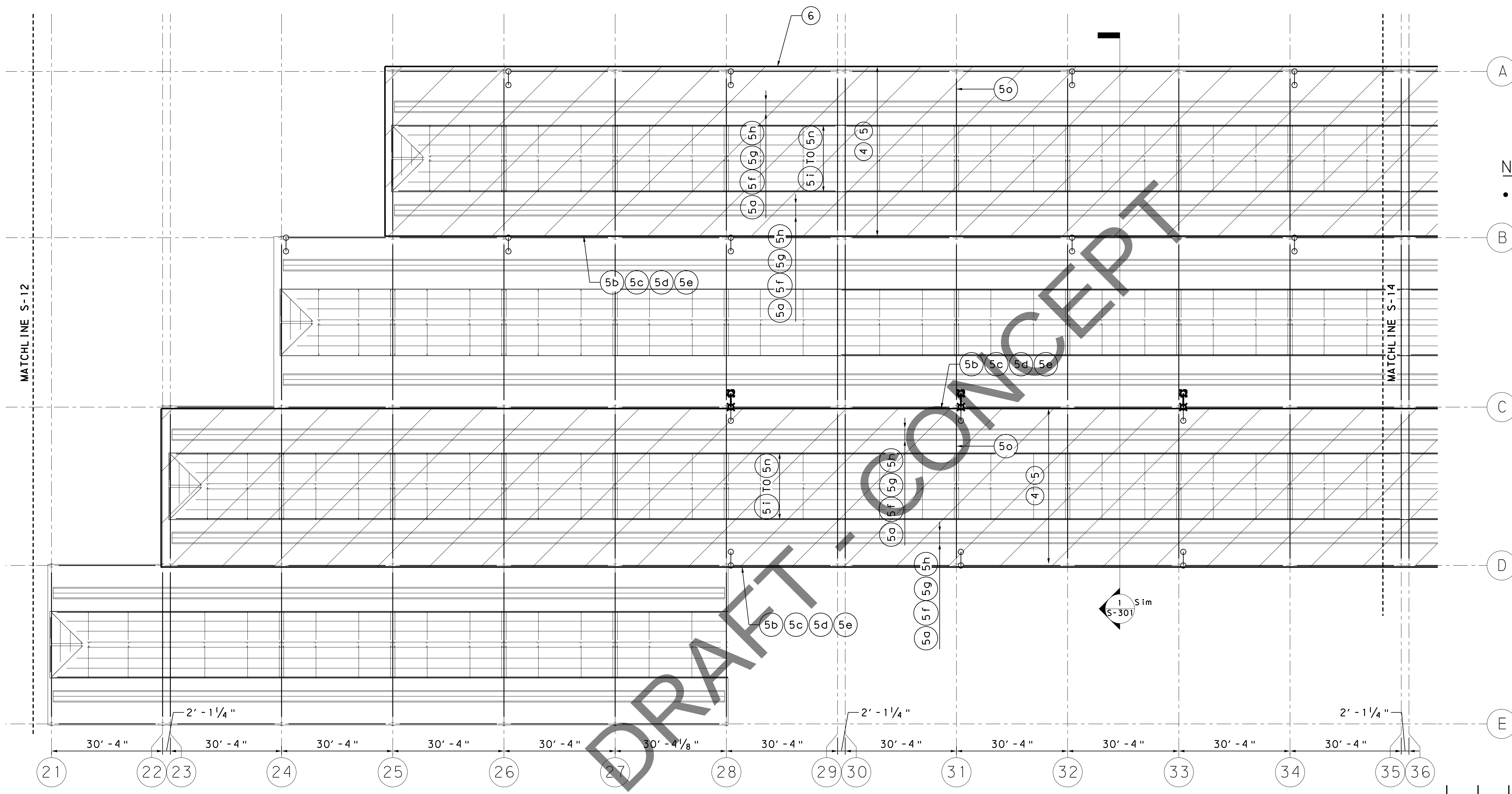
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
STRUCTURAL FRAMING PLAN - AREA 2

DGN ZRS	VAL SEC 17.2 MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864	DATE 6/14/2018
SHEET NUMBER S-12 OF S-21		DRAWING NUMBER PT-353 18 01

ALTERNATIVE 2



LEGEND

REMOVAL AREA

EXISTING ROOF DRAIN

RELOCATED ROOF DRAIN

NOTE

- REFER TO SHEET S-11 FOR DEMOLITION NOTES

STRUCTURAL FRAMING PLAN - AREA 3

REV	BY	DATE	DESCRIPTION

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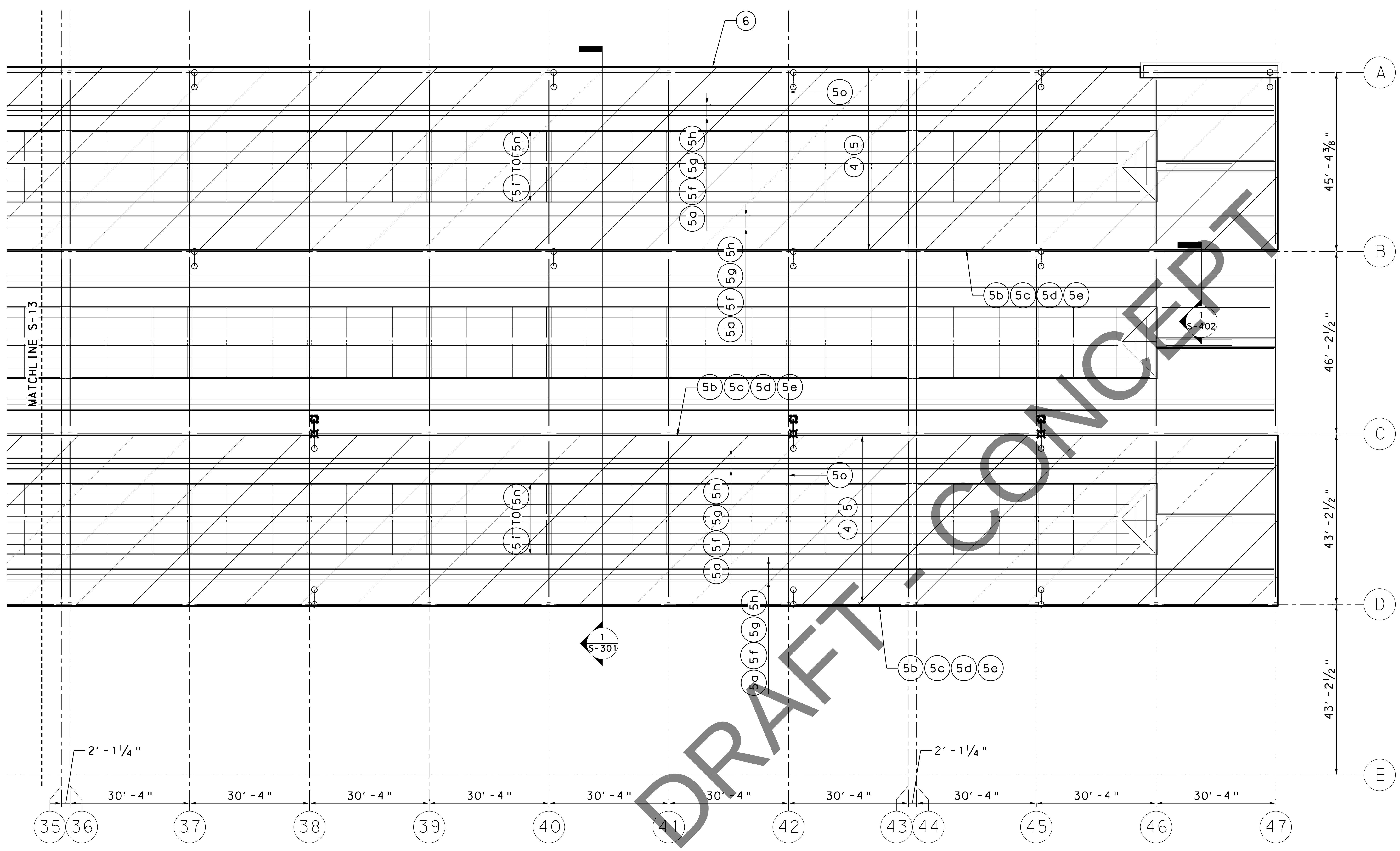
TRAINSHED IMPROVEMENTS
STRUCTURAL FRAMING PLAN - AREA 3

DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 6/14/2018
SHEET NUMBER S-13 OF S-21		DRAWING NUMBER PT-353 18 01	



STRUCTURAL FRAMING PLAN - AREA 4

LEGEND

REMOVAL AREA

EXISTING ROOF DRAIN

RELOCATED ROOF DRAIN

NOTE

- REFER TO SHEET 1 OF 4 FOR DEMOLITION NOTES

REV	BY	DATE	DESCRIPTION

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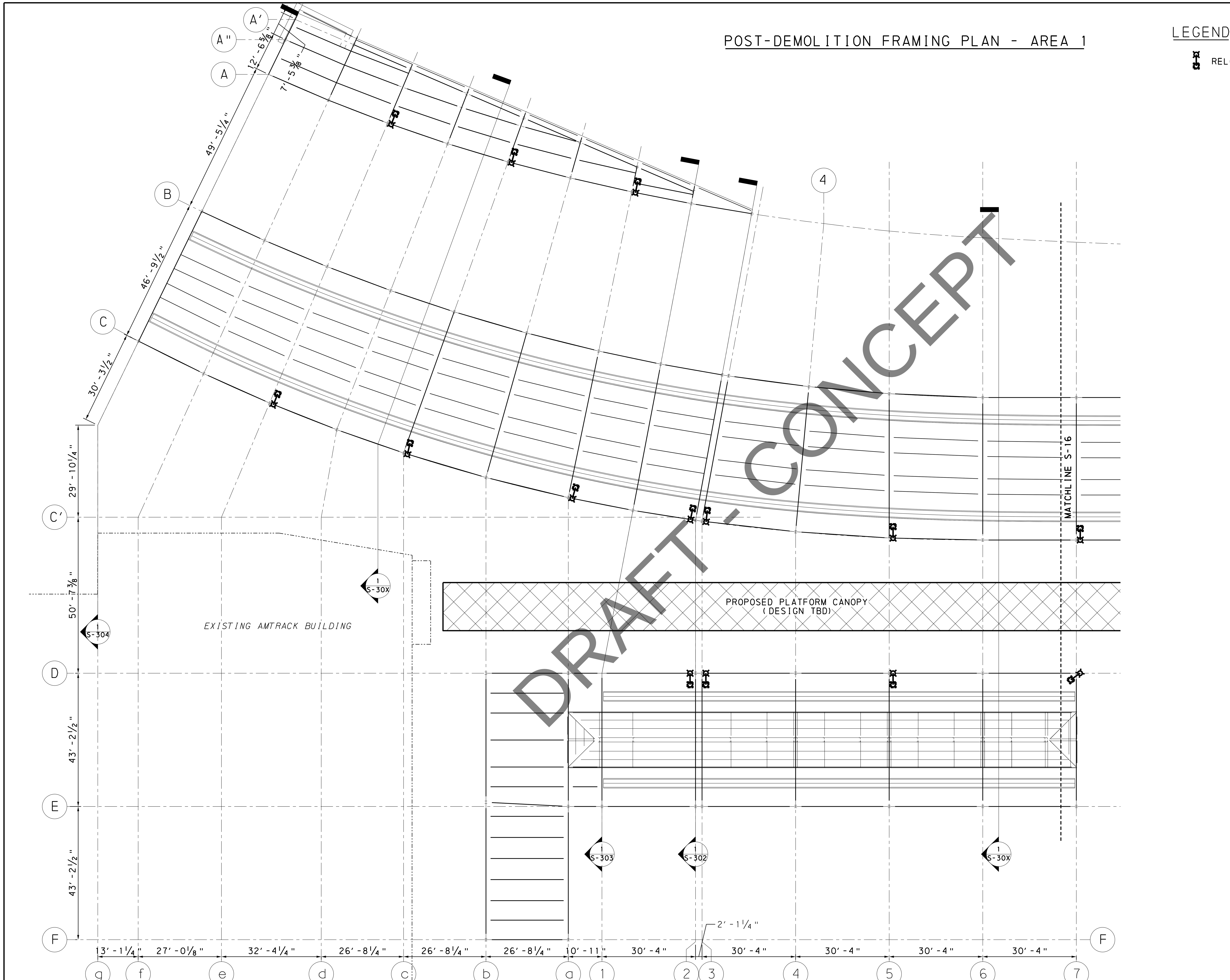
TRAINSHED IMPROVEMENTS
STRUCTURAL FRAMING PLAN - AREA 4

DGN ZRS	VAL SEC 17.2 MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864	DATE 6/14/2018
SHEET NUMBER S-14 OF S-21		DRAWING NUMBER PT-353 18 01



REV	BY	DATE	DESCRIPTION

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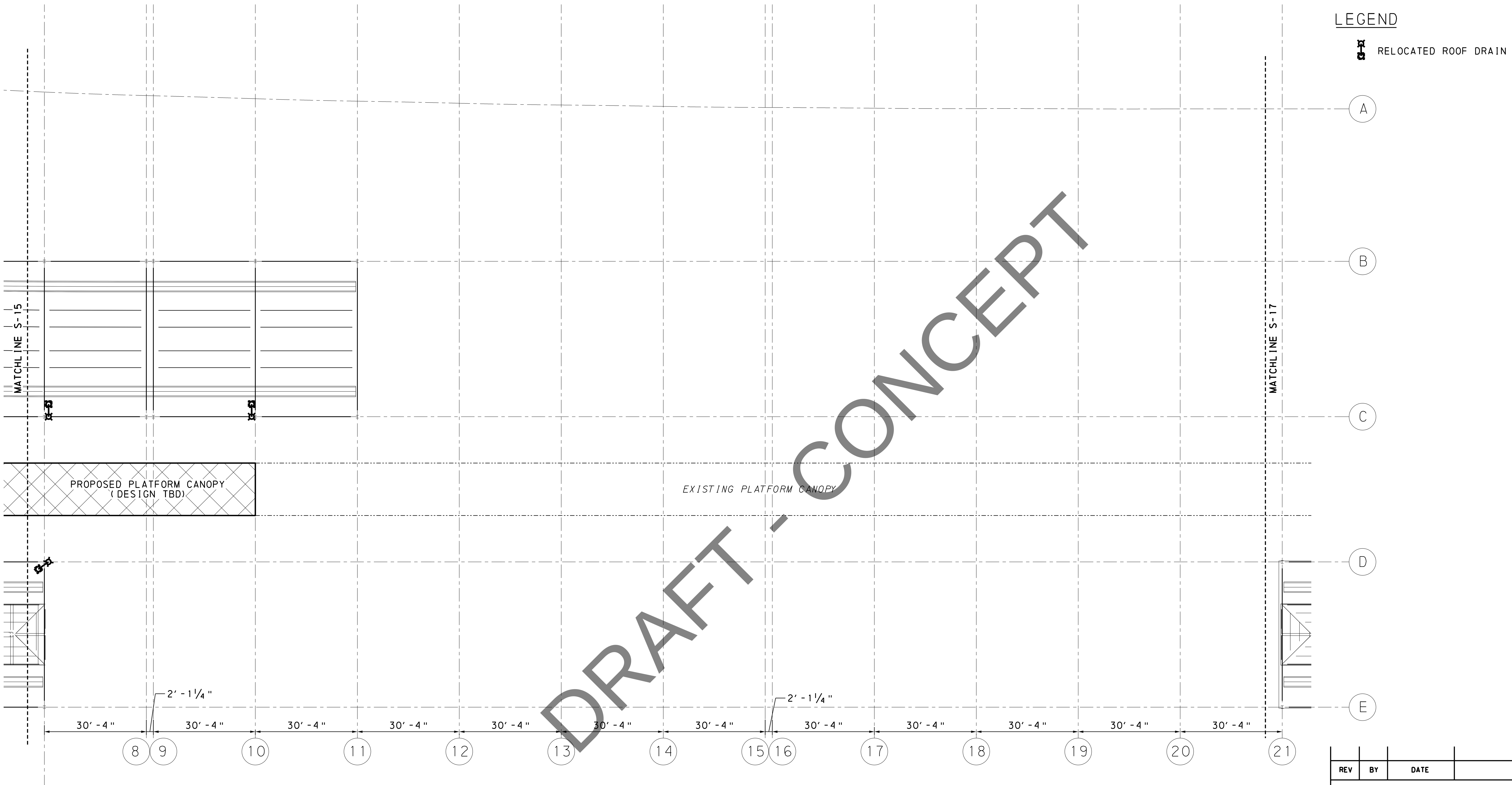
OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
POST-DEMOLITION FRAMING PLAN - AREA I

DGN ZRS	VAL SEC 17.2 MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864	DATE 6/14/2018
SHEET NUMBER S-15 OF S-21		DRAWING NUMBER PT-353 18 01

ALTERNATIVE 2



STRUCTURAL FRAMING PLAN - AREA 2
POST-DEMOLITION

REV	BY	DATE	DESCRIPTION

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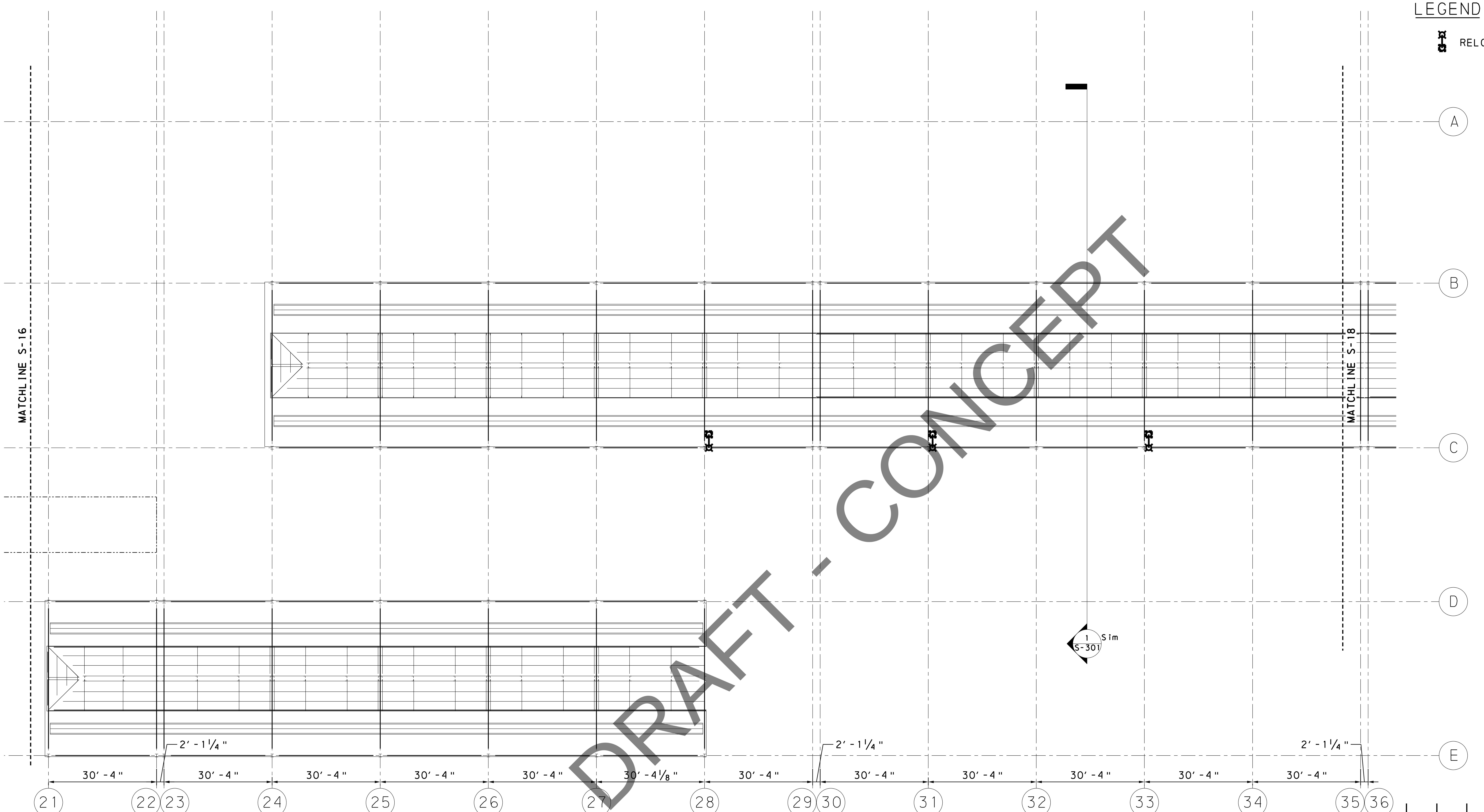
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
POST-DEMOLITION FRAMING PLAN - AREA 2

DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 6/14/2018
SHEET NUMBER S-16 OF S-21		DRAWING NUMBER PT-353 18 01	



STRUCTURAL FRAMING PLAN - AREA 3
POST-DEMOLITION

REV	BY	DATE	DESCRIPTION

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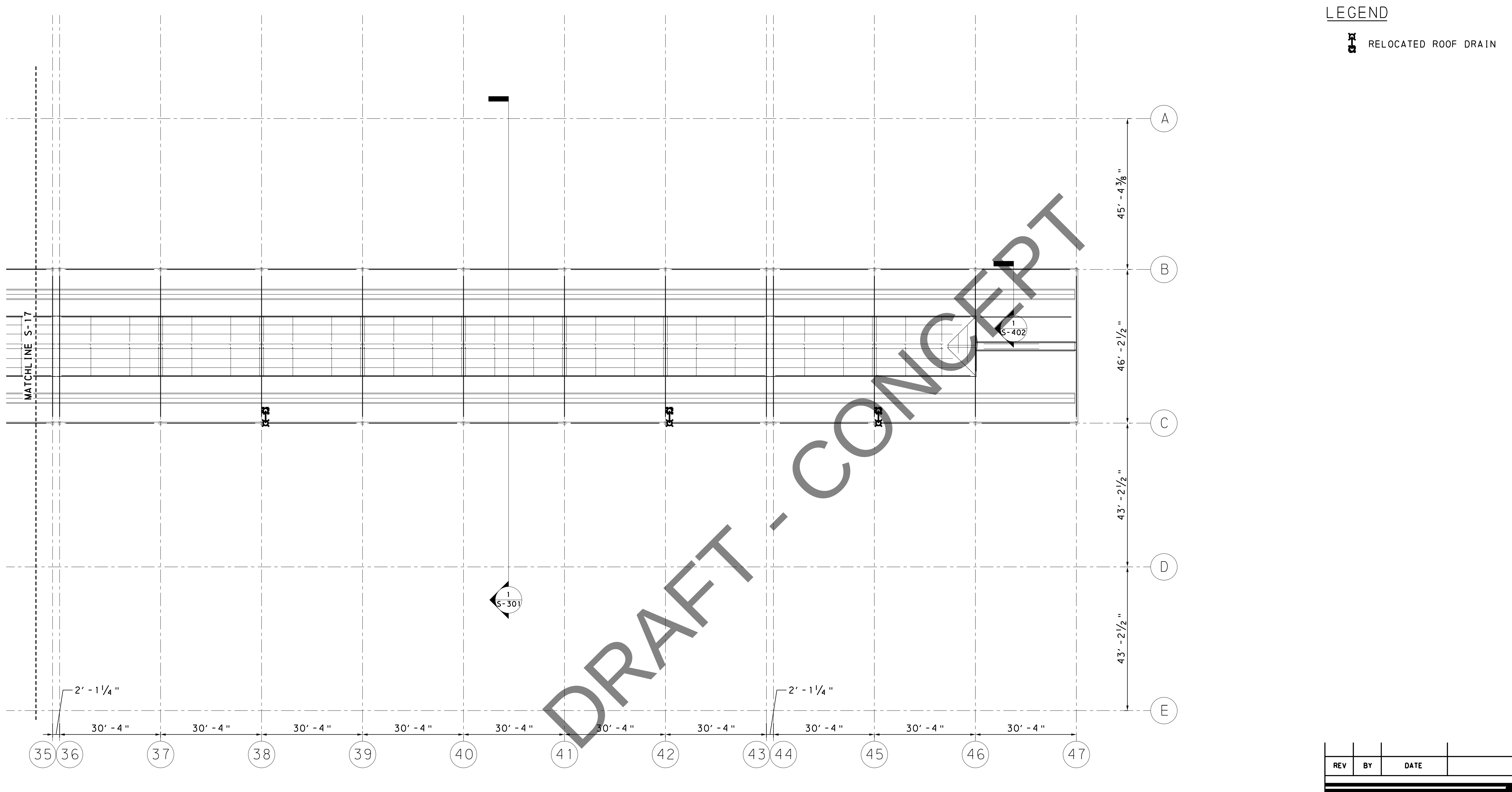
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION

TRAINSHED IMPROVEMENTS
POST-DEMOLITION FRAMING PLAN - AREA 3

DGN ZRS	VAL SEC 17.2 MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864	DATE 6/14/2018
SHEET NUMBER S-17 OF S-21		DRAWING NUMBER PT-353 18 01



STRUCTURAL FRAMING PLAN - AREA 4
POST-DEMOLITION

REV	BY	DATE	DESCRIPTION

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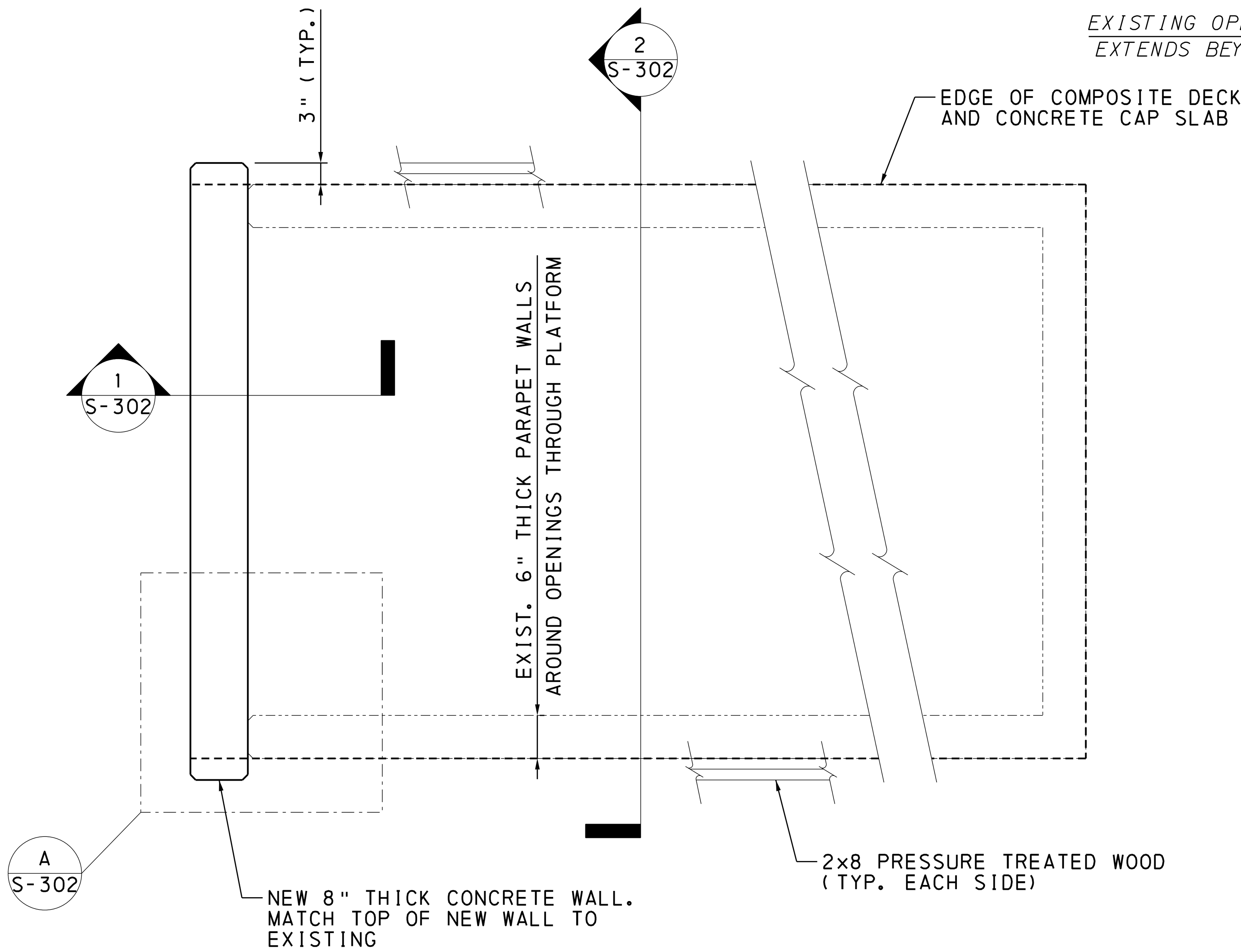
OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION

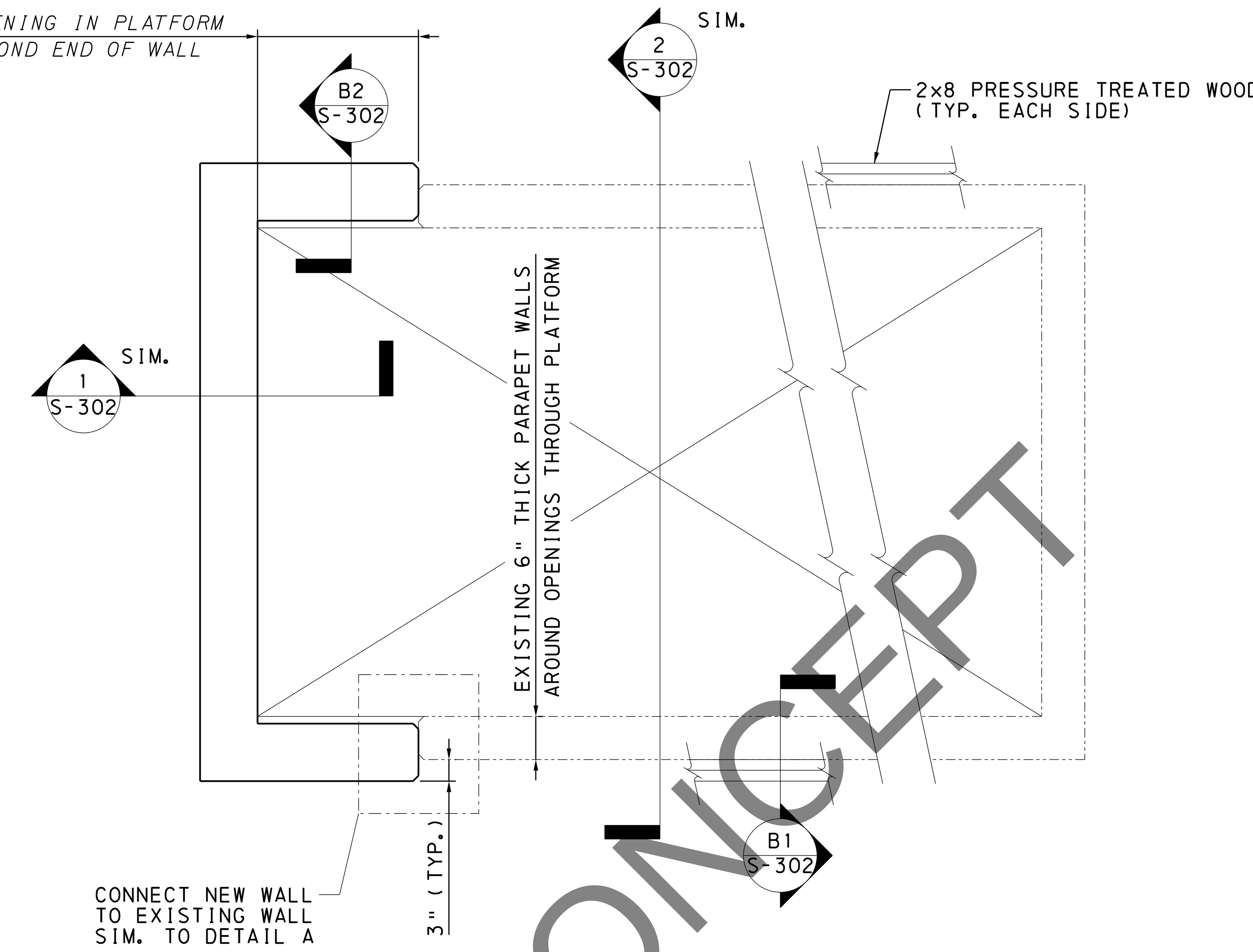
TRAINSHED IMPROVEMENTS
POST-DEMOLITION FRAMING PLAN - AREA 4

DGN ZRS	VAL SEC 17.2 MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864	DATE 6/14/2018
SHEET NUMBER S-18 OF S-21		DRAWING NUMBER PT-353 18 01



TYPICAL PLAN 1 @ EXISTING PLATFORM OPENING

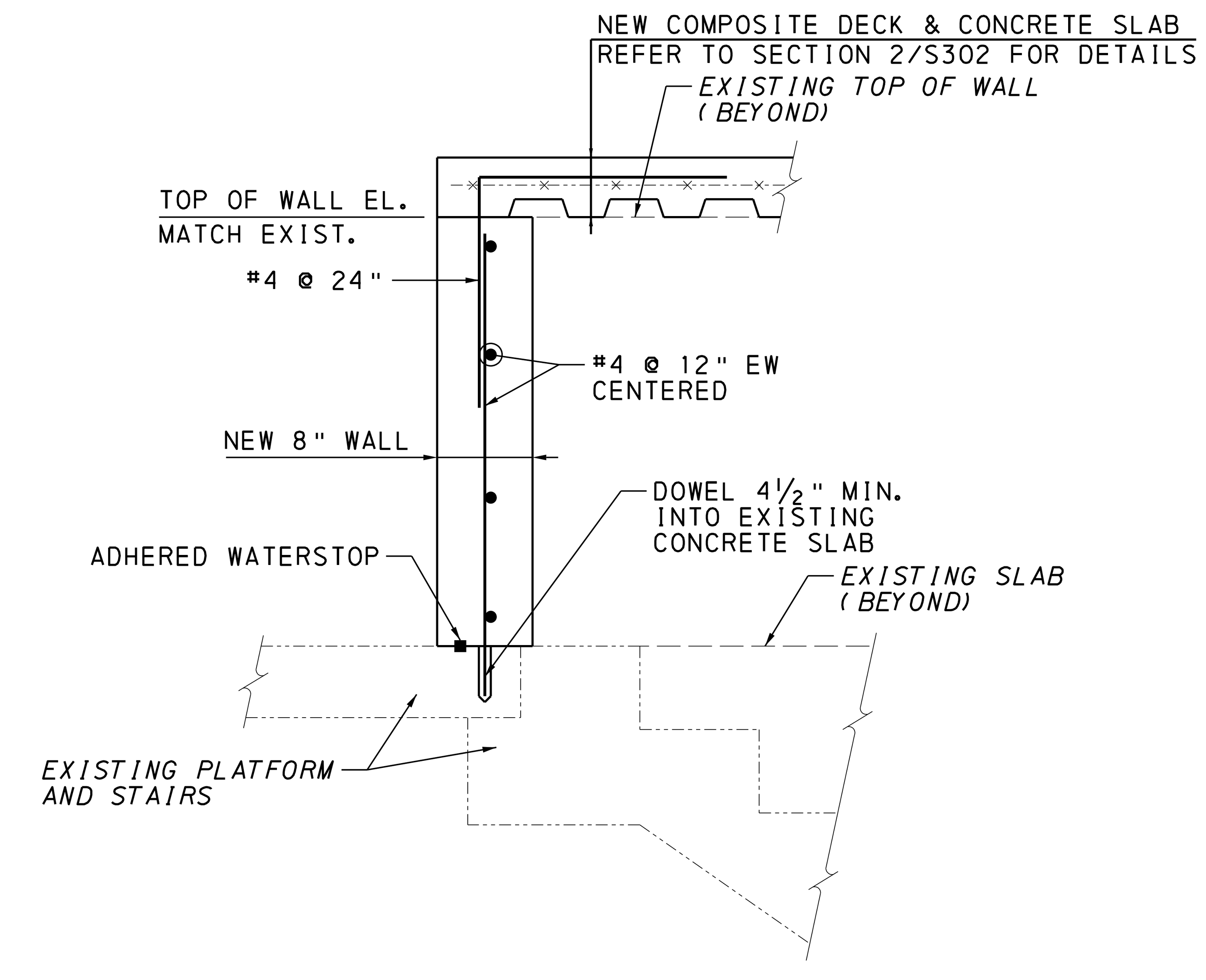
12 0 12 INCHES



TYPICAL PLAN 2 @ EXISTING PLATFORM OPENING

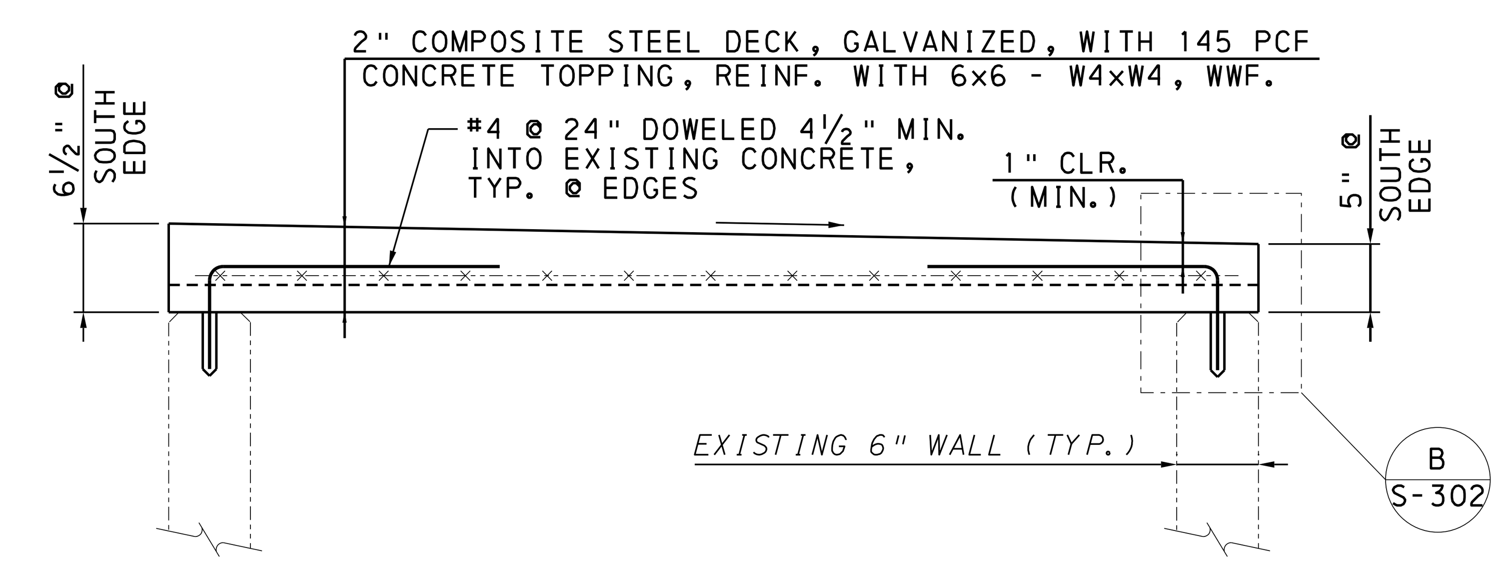
COMPOSITE DECK AND CONCRETE CAP SLAB NOT SHOWN FOR CLARITY

12 0 12 INCHES



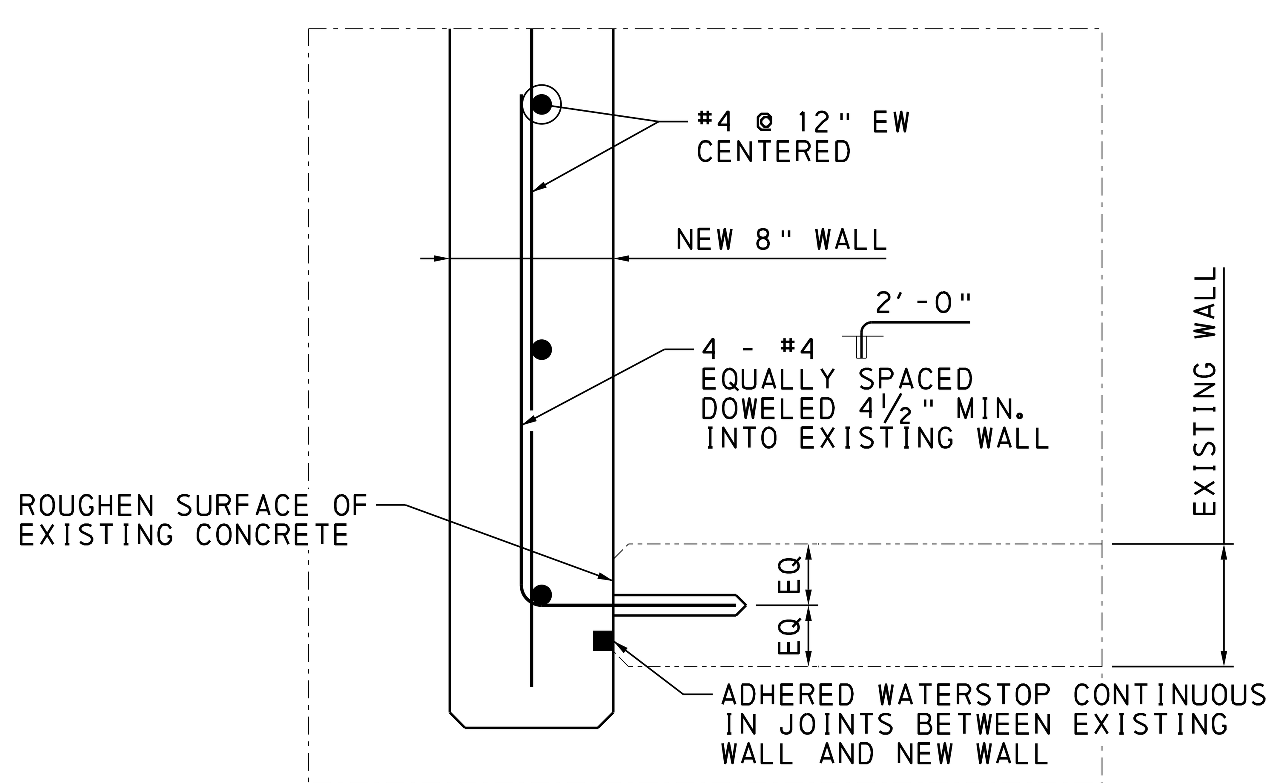
SECTION 1

6 0 6 12 INCHES



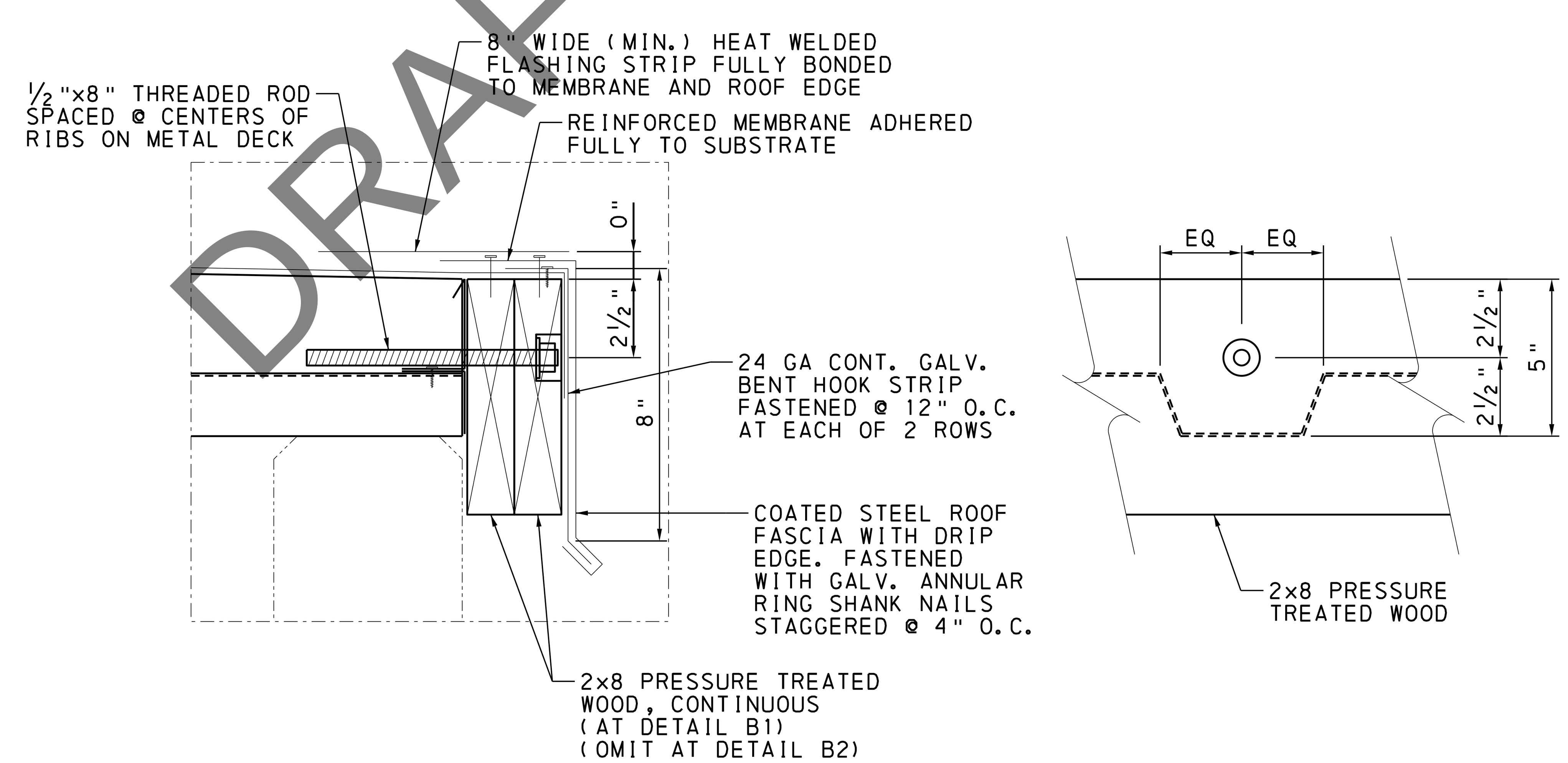
SECTION 2

6 0 6 12 INCHES



DETAIL A

6 0 6 INCHES



DETAIL B

3 0 3 INCHES

REV	BY	DATE	DESCRIPTION

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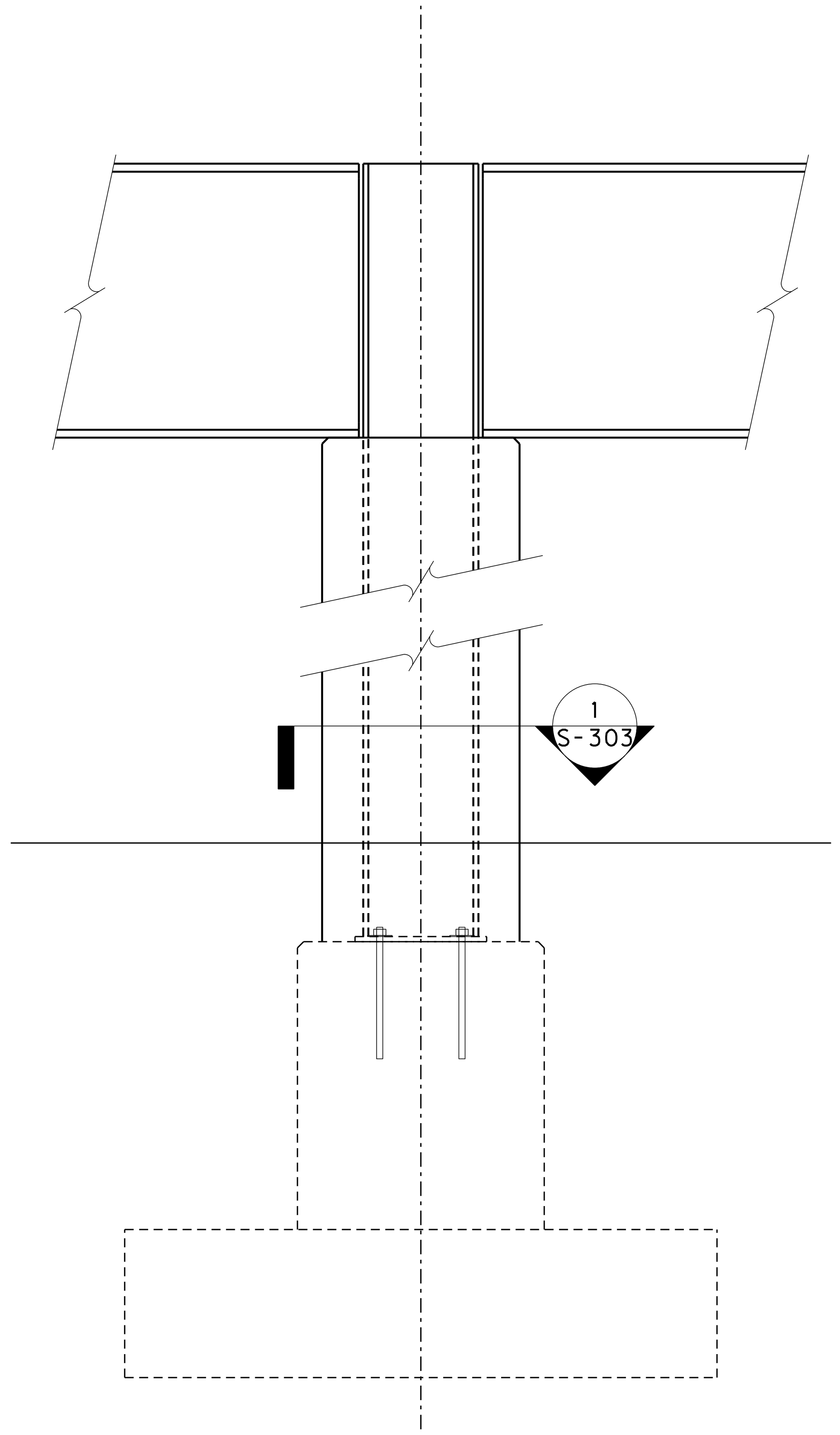
PITTSBURGH STATION

TRAINSHED IMPROVEMENTS

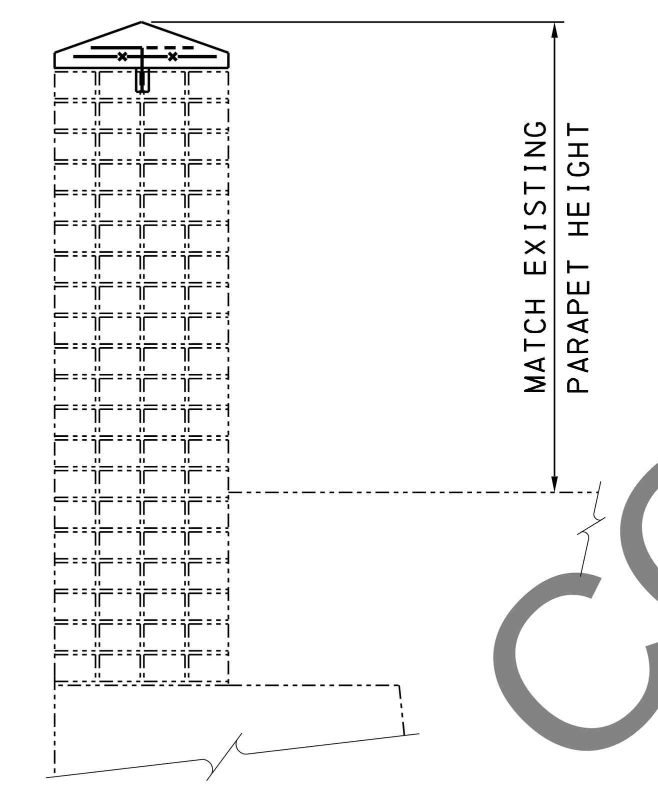
TRACK LEVEL STRUCTURAL DETAILS

DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 6/14/2018
SHEET NUMBER S-19 OF S-21		DRAWING NUMBER PT-353 18 01	

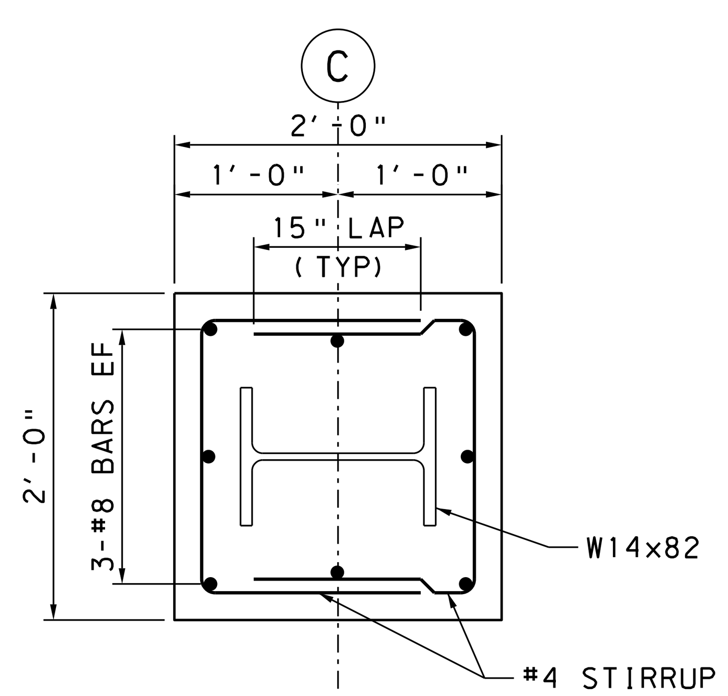


COLUMN ENCASEMENT DETAIL

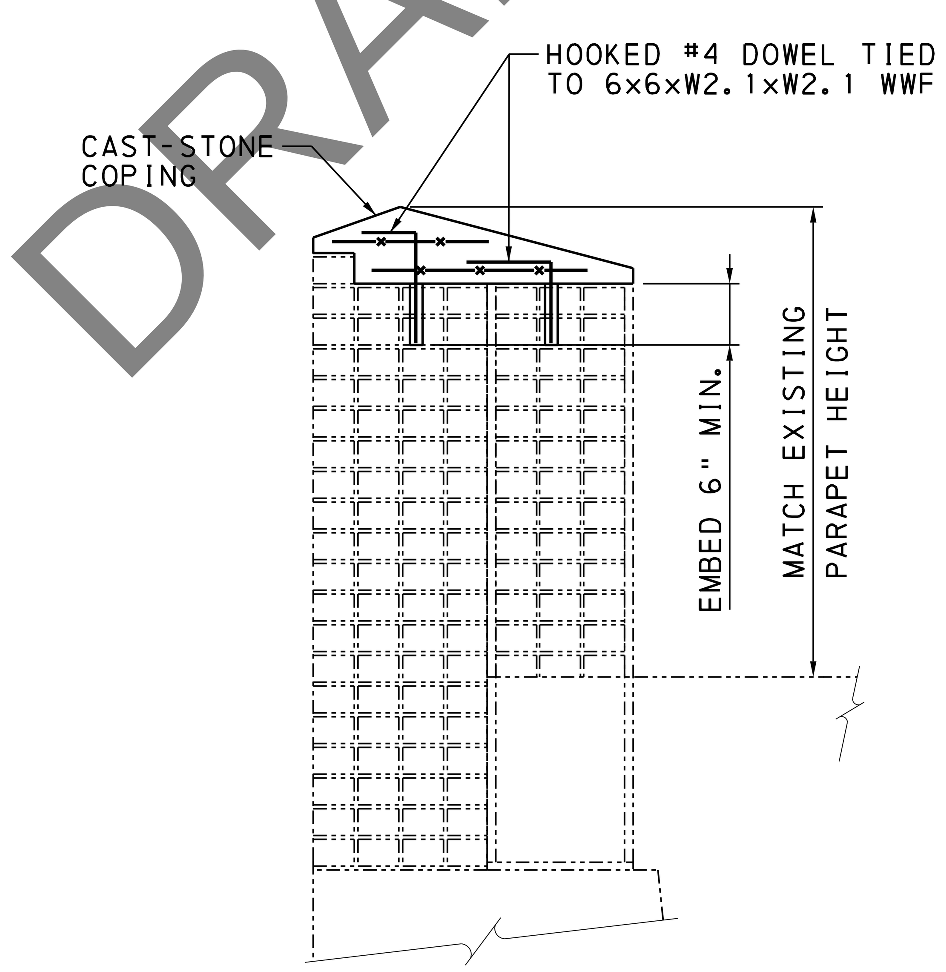
12 0 12 INCHES



TYPICAL PARAPET SECTION



SECTION 1



TYPICAL PARAPET SECTION
AT COLUMN

REV	BY	DATE	DESCRIPTION

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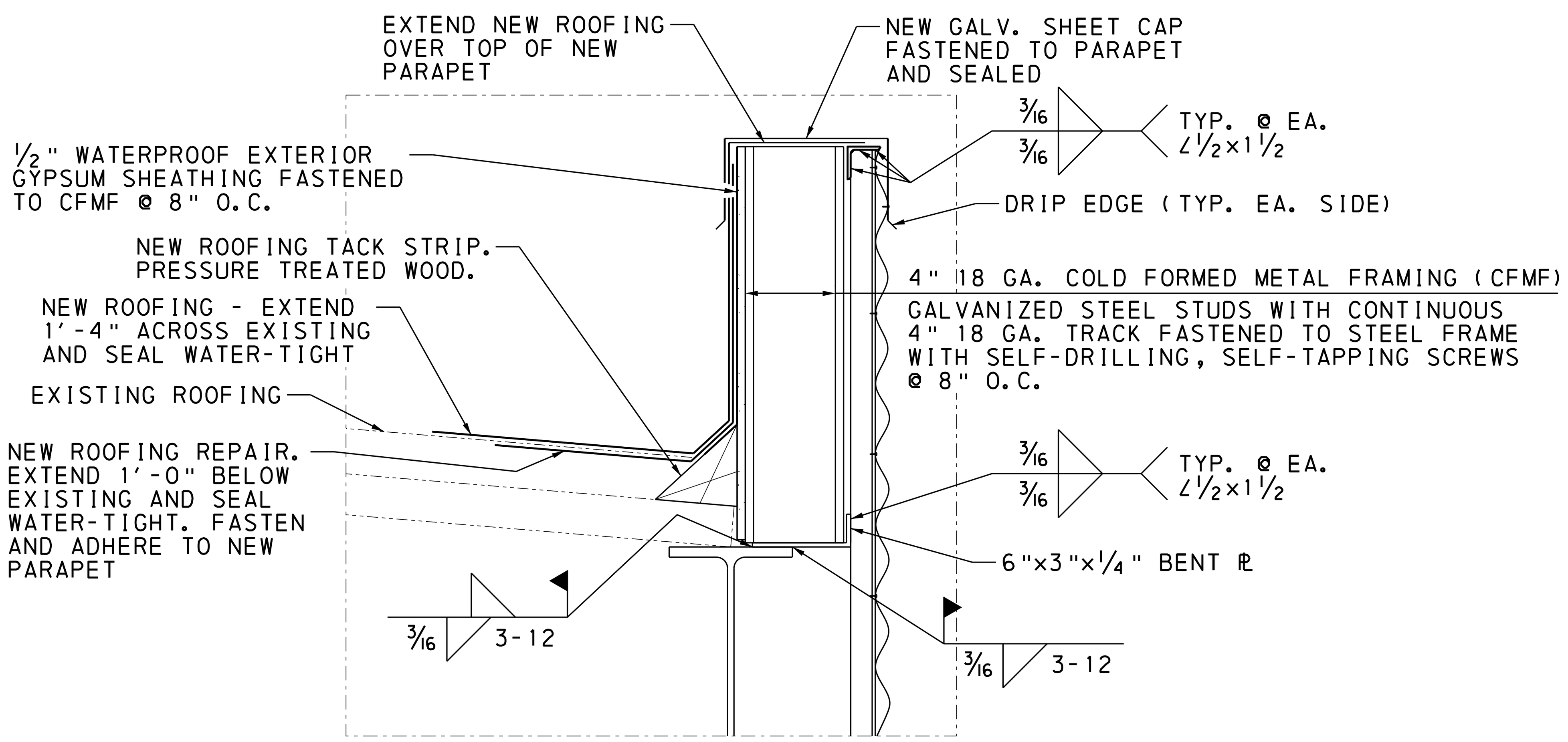
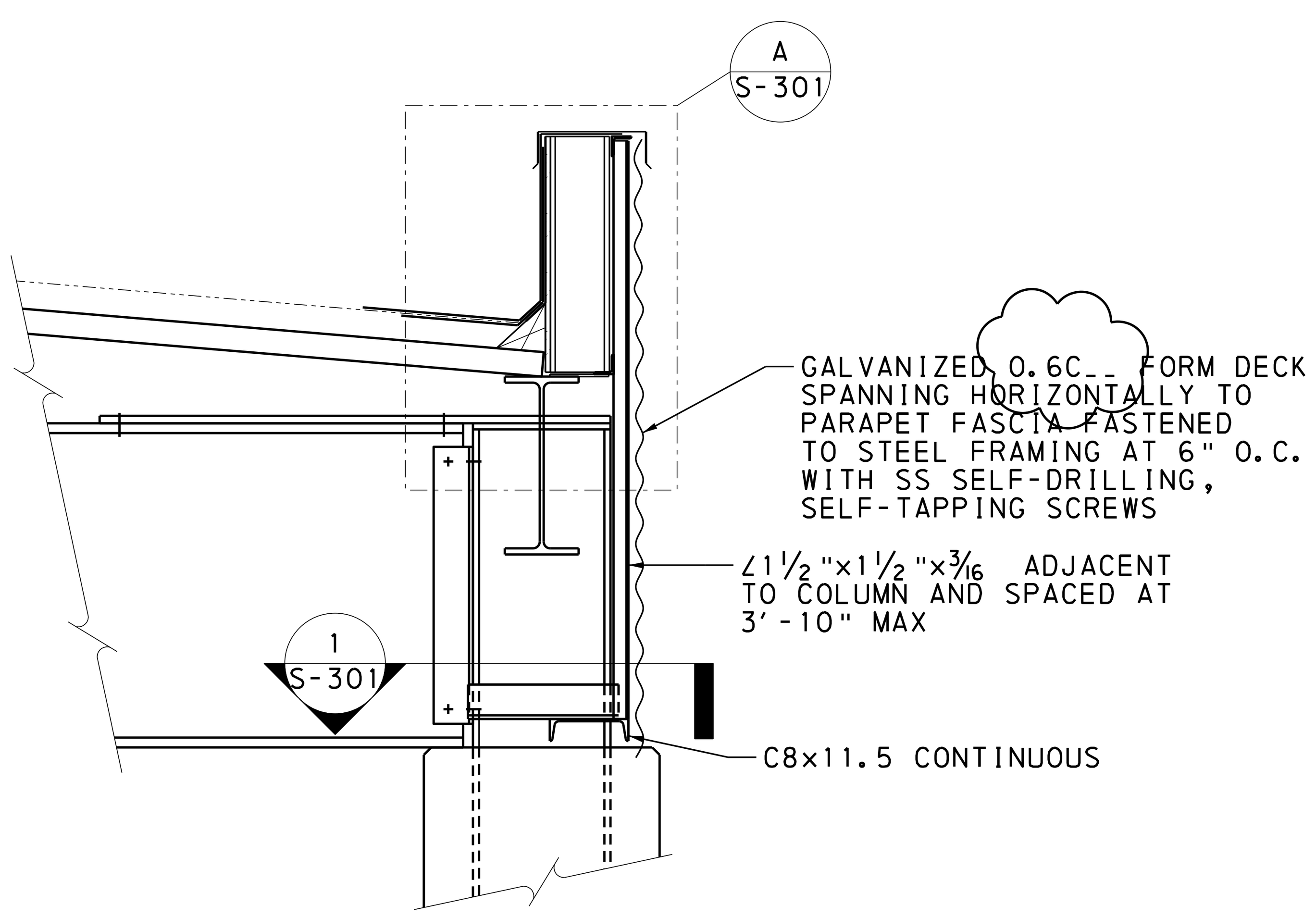
TRAINSHED IMPROVEMENTS
TRACK LEVEL STRUCTURAL DETAILS 2

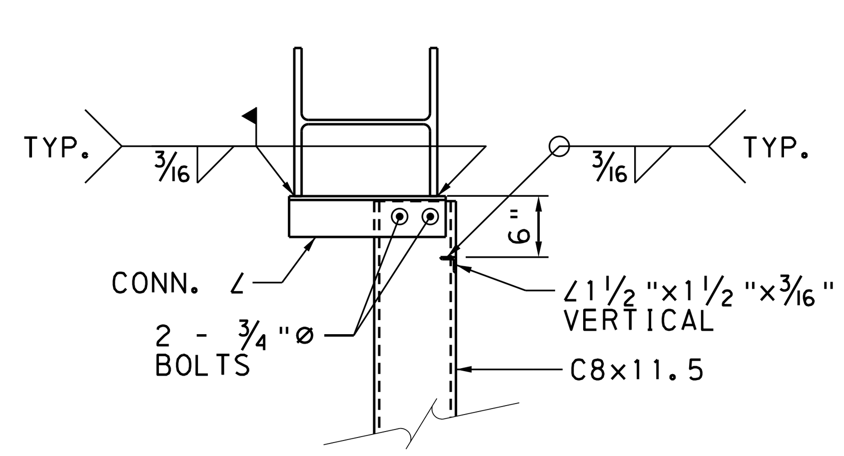
DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 6/14/2018
SHEET NUMBER S-20 OF S-21	DRAWING NUMBER PT-353 18 01		



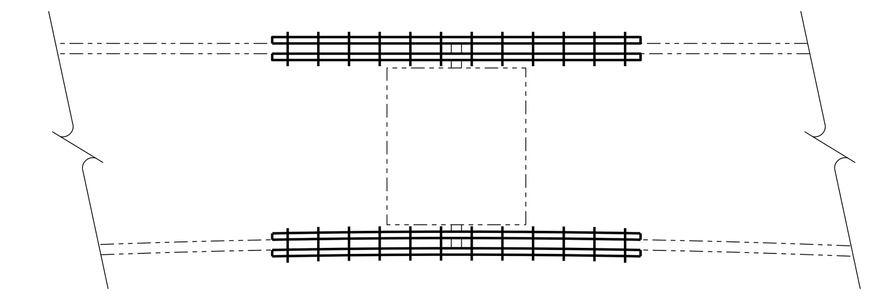
ROOF EDGE REPAIR - DETAIL A
6 0 6 INCHES



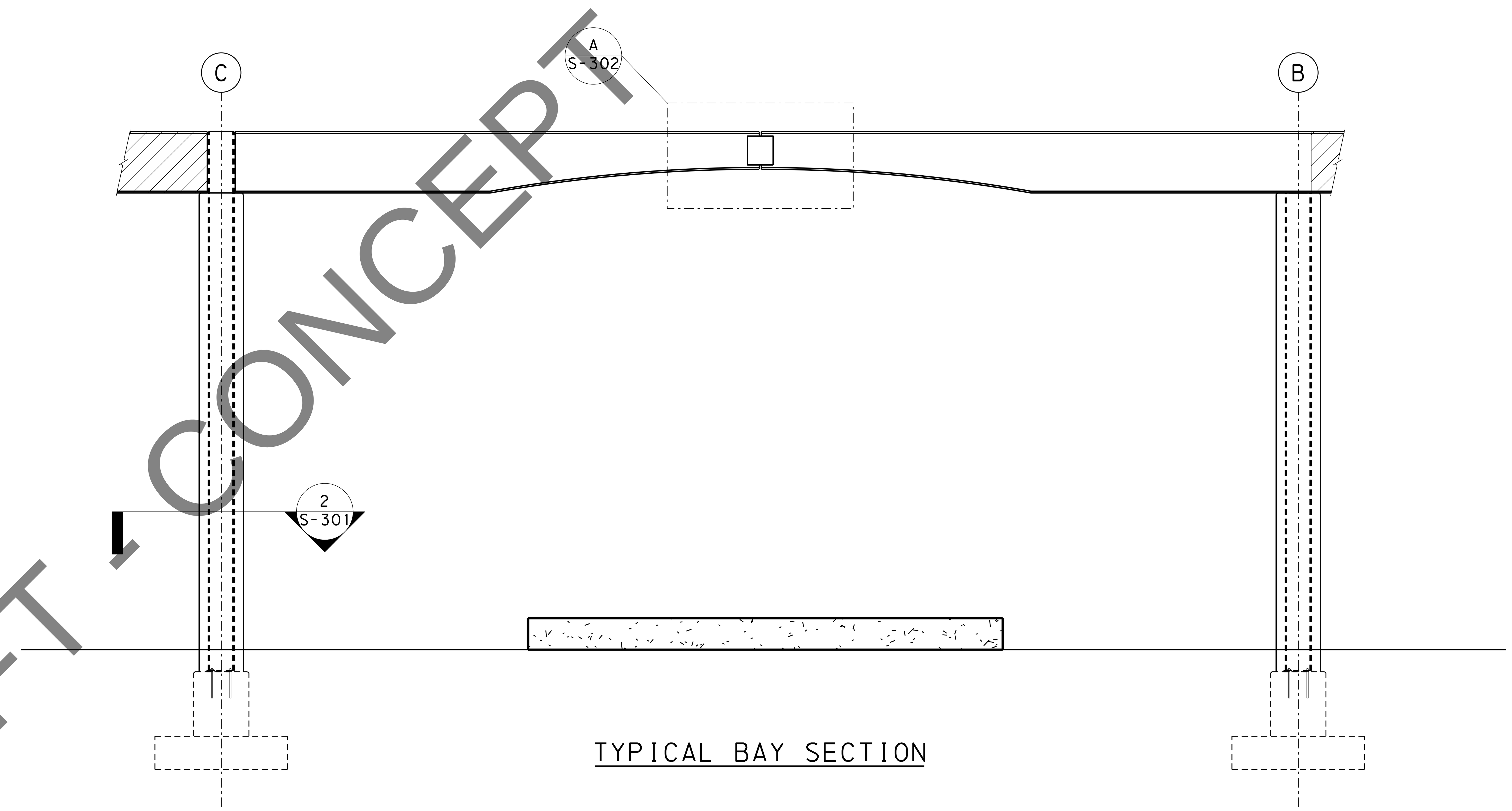
ROOF EDGE REPAIR
12 0 12 INCHES



SECTION 1
12 0 12 INCHES



GIRDER SPLICE DETAIL
12 0 12 INCHES



TYPICAL BAY SECTION

REV	BY	DATE	DESCRIPTION

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PITTSBURGH STATION
TRAINSHED IMPROVEMENTS
ROOF LEVEL STRUCTURAL DETAILS

DGN ZRS	VAL SEC 17.2 MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864	DATE 6/14/2018
SHEET NUMBER S-21 OF S-21		DRAWING NUMBER PT-353 18 01

GENERAL ELECTRICAL NOTES:

1. COMPLY WITH THE LATEST APPROVED EDITION OF THE NATIONAL ELECTRICAL CODE (NEC), THE NATIONAL ELECTRICAL SAFETY CODE (NESC), OSHA, DRAWINGS, AND SPECIFICATIONS.
2. COMPLY WITH NORFOLK SOUTHERN AND AMTRAK REQUIREMENTS.
3. PERFORM WORK IN ACCORDANCE WITH NECA 1 2000, STANDARD PRACTICE FOR GOOD WORKMANSHIP IN ELECTRICAL CONTRACTING.
4. STUDY PLANS AND SPECIFICATIONS CLOSELY AND VISIT JOB SITE PRIOR TO SUBMITTING BID; VERIFY DETAILS RELATING TO ELECTRICAL WORK. PROVIDE A COMPLETE AND OPERABLE ELECTRICAL INSTALLATION THAT IS COMPLIANT WITH APPLICABLE CODES.
5. FOR WIRE IN CONDUIT AT 120/208 VOLT, THREE PHASE, FOUR WIRE CIRCUITS, CONFORM TO THE COLORS: PHASE A = BLACK, PHASE B=RED, PHASE C=BLUE, NEUTRAL=WHITE.
6. FOR WIRE IN CONDUIT AT 277/480 VOLT, THREE PHASE, FOUR WIRE CIRCUITS, CONFORM TO THE COLORS: PHASE A = BROWN, PHASE B=ORANGE, PHASE C=YELLOW, NEUTRAL=GRAY.
7. FOR WIRE IN CONDUIT CONFORM TO THE FOLLOWING INSULATION COLORS: EQUIPMENT GROUNDING CONDUCTOR=GREEN.
8. FOR INDOOR WIRING USE #12 AWG MINIMUM THHN FOR BRANCH CIRCUIT AND FEEDER WIRING, INCLUDING GROUND WIRES, UNLESS NOTED. RUN GROUND WIRE IN EVERY CONDUIT THAT CONTAINS FEEDER OR BRANCH CIRCUIT WIRING.
9. FOR OUTDOOR WIRING IN CONDUIT USE #12 AWG MINIMUM THWN-2 FOR BRANCH CIRCUIT AND FEEDER WIRING, INCLUDING GROUND WIRES, UNLESS NOTED. RUN GROUND WIRE IN EVERY CONDUIT THAT CONTAINS FEEDER OR BRANCH CIRCUIT WIRING.
10. ALUMINUM WIRE NOT PERMITTED.
11. DO NOT SPLICE IN CONDULETS OR POWER PULL-BOXES UNLESS NOTED.
12. CLEAN AND RELAMP NEW AND RE-INSTALLED LUMINAIRES BEFORE FINAL ACCEPTANCE.
13. MANUFACTURER'S PART NUMBERS ARE SUBJECT TO VERIFICATION. DRAWING AND SPECIFICATION DESCRIPTIONS SHALL GOVERN.
14. ITEMIZE DEVIATIONS FROM THE PLANS AND SPECIFICATIONS AND BID SEPARATELY AS A VOLUNTARY ALTERNATE. INCLUDE ADD OR DEDUCT PRICE FROM THE BASE BID.
15. CONTRACT DOCUMENTS SHOW MAJOR ITEMS ONLY; PROVIDE INCIDENTAL ITEMS REQUIRED FOR A COMPLETE AND FULLY OPERATIONAL SYSTEM.
16. COMPLY WITH CONDUIT BENDING LIMITS OF THE NATIONAL ELECTRIC CODE. CONDUIT RUNS LONGER THAN 100 FEET WITHOUT PULL BOX OR OTHER LEGAL MEANS TO PULL WIRE ARE NOT PERMITTED.
17. UNDERGROUND CONDUIT SHALL BE NONMETALLIC RIGID SCHEDULE 80 PVC. ALL UNDERGROUND 90 DEGREE CONDUIT BENDS AND CONDUIT STUB UPS ABOVE GRADE SHALL BE RIGID GALVANIZED STEEL WITH 40 MIL BONDED PVC COATING UNLESS OTHERWISE NOTED.
18. FOR INTERIOR WORK, WALL AND FLOOR PENETRATIONS SHALL BE CLOSED AND SEALED IN AN APPROVED MANNER TO MAINTAIN THE FIRE INTEGRITY OF THE STRUCTURE AND BE AIR AND WATER TIGHT.
19. FOR CONDUCTORS IN CONDUIT, RUN CONTINUOUS AND SAME COLOR FROM SOURCE OF SUPPLY TO TERMINATION POINT.
20. ALL FIXTURE LAMPS SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
21. NEW OVERHEAD WIRING:
    a. COMPLY WITH WIRING METHODS IN NATIONAL ELECTRICAL SAFETY CODE.
    b. RUN MESSENGER WIRE WITH ALL NEW OVERHEAD WIRE.
    c. GROUND NEW MESSENGER WIRES TO STEEL COLUMNS THAT ARE ELECTRICALLY CONTINUOUS TO GROUND.
    d. UNLESS OTHERWISE REQUIRED BY AMTRAK OR NORFOLK SOUTHERN, MAINTAIN 27 FEET FROM TOP OF RAIL TO LOW-POINT OF SAG. PROVIDE CLEARANCES FROM OTHER WIRING PER NESC.
    e. PROVIDE TRIPLEX OR QUADPLEX CABLE TO MATCH EXISTING SYSTEMS TO BE REROUTED.
    a. OVERHEAD WIRING PRODUCT SPECIFICATIONS:
        i. TRIPLEX OR QUADPLEX SERVICE ENTRANCE CABLE TYPE SE PER NEC ARTICLE 338
        ii. CONDUCTOR INSULATION: XHHW-2
        iii. CONDUCTOR SIZE TO MATCH EXISTING
        iv. WET LOCATION SPLICES
        v. MESSENGER WIRE SHALL NOT SERVE AS NEUTRAL OR GROUND CONDUCTOR
22. NEW CANOPY EXTENSION (TBD)

ELECTRICAL SUBMITTALS/SHOP DRAWINGS:

SUBMITTALS SHALL BE PREPARED SPECIFICALLY FOR THIS PROJECT AND SHALL INCLUDE PRODUCT DATA SHEETS, PHYSICAL LAYOUT DRAWINGS, WIRING DIAGRAMS, UL LISTING AND ALL RATINGS TO DEMONSTRATE COMPLIANCE WITH DRAWINGS AND SPECIFICATIONS. MARK ON THE SUBMITTAL THE PART NUMBERS AND SELECTION OF OPTIONS. SUBMIT SHOP DRAWINGS FOR REVIEW BEFORE RELEASING ANY EQUIPMENT FOR MANUFACTURE OR SHIPMENT. A SINGLE ELECTRONIC COPY IS ACCEPTABLE BASED ON CONTRACT REQUIREMENTS.

SUBMIT PRODUCTS:
- OVERHEAD WIRING SYSTEM: EACH TYPE OF TRIPLEX, QUADPLEX, MESSENGER WIRE, AND ATTACHMENT HARDWARE TO STRUCTURE.
- LIGHT FIXTURES
- SPEAKERS
- CAMERAS

ELECTRICAL SUBMITTALS/SHOP DRAWINGS CONT'D:

SUBMIT CALCULATIONS:
- PROVIDE OVERHEAD WIRING CALCULATIONS FOR HORIZONTAL AND VERTICAL CLEARANCES:
    - ABOVE RAIL
    - BETWEEN CROSSING WIRES
    - BETWEEN PARALLEL WIRES
    - BETWEEN SUPPLY AND COMMUNICATION WIRES.
    - MESSENGER WIRE TENSIONS FOR EACH SPAN.
- CALCULATIONS SHALL BE BASED ON THE NESC REQUIREMENTS FOR OVERHEAD WIRING.
- CALCULATIONS SHALL INCLUDE, SAG, WIND AND ICE LOAD BASED ON LOCAL WEATHER
- INCLUDE PARAGRAPH NUMBERS CITED FROM THE NESC.
- PRESENT CALCULATIONS IN ORGANIZED FORMAT CLEARLY INDICATING WHICH CALCULATION RELATES TO WHICH OVERHEAD WIRE SPAN.

GENERAL ELECTRICAL DEMOLITION NOTES:

1. DISCONNECT ELECTRICAL SYSTEMS IN WORK AREAS SCHEDULED FOR DEMOLITION; COORDINATE ELECTRICAL OUTAGES WITH OWNER IN ADVANCE.
2. EXISTING CONDITIONS SHOWN ARE BASED UPON REASONABLE REVIEW OF AVAILABLE RECORDS AND FIELD OBSERVATIONS. IT IS POSSIBLE THAT REPORTED CONDITIONS DO NOT REFLECT NEW OR PREVIOUSLY DEMOLISHED EQUIPMENT OR WIRING. IN SOME CASES, THESE DRAWINGS OMIT EQUIPMENT AND WIRING NOT EXPECTED TO IMPACT IN-CONTRACT WORK. VERIFY THAT EXISTING CONDITIONS AND DIMENSIONS THAT MAY BE SHOWN ON DRAWINGS AND REPORT DISCREPANCIES TO THE ENGINEER BEFORE DEMOLITION.
3. WITHOUT ADDITIONAL COST TO THE OWNER, REPLACE EQUIPMENT, FACILITIES, AND MATERIALS DAMAGED DUE TO DEMOLITION WORK.
4. COORDINATE WITH OWNER AND TEST CIRCUITS TO VERIFY WHETHER WIRING ON STRUCTURES TO BE DEMOLISHED NEEDS TO BE MAINTAINED FOR AREAS OUTSIDE OF THE LIMITS OF DEMOLITION.
5. DISCONNECT AND REMOVE LIGHT FIXTURES, SPEAKERS AND OTHER EQUIPMENT INDICATED AND NOT INDICATED WHICH ARE ATTACHED TO STRUCTURES TO BE DEMOLISHED. REMOVE THE ASSOCIATED WIRING BACK TO SOURCE OF SUPPLY OR NEAREST JUNCTION BOX OR SPLICE THAT WILL REMAIN ENERGIZED. REMOVE THE ASSOCIATED CONDUIT BACK TO STRUCTURES TO REMAIN.
6. REROUTE CIRCUITS TO MAINTAIN CONNECTION TO AREAS OUTSIDE LIMITS OF DEMOLITION. MAKE WRITTEN RECORD OF EXISTING WIRING SYSTEMS, IE, WIRE TYPE, SIZE, CONDUIT, OVERHEAD TRIPLEX, QUADPLEX, ETC. USE SAME FOR INSTALLATION OF NEW RE-ROUTE.
7. UNINTENDED INTERRUPTION OF CIRCUITS FEEDING LIGHTING OR OTHER EQUIPMENT MAY BE INCIDENTAL TO IN-CONTRACT DEMOLITION. INTERCEPT, REWORK, AND RECONNECT THESE CIRCUITS TO THEIR POWER SOURCE.
8. PROVIDE TEMPORARY LIGHTING AND POWER DURING DEMOLITION AND CONSTRUCTION.

GENERAL MECHANICAL NOTES:

1. COMPLY WITH THE LATEST APPROVED EDITION OF THE INTERNATIONAL PLUMBING CODE AND ALL LOCAL ORDINANCES AND AMENDMENTS.
2. COMPLY WITH NORFOLK SOUTHERN AND AMTRAK REQUIREMENTS.
3. EXISTING CONDITIONS SHOWN ON DRAWINGS ARE BASED ON FIELD SURVEYS, RECORD DRAWINGS, AND OTHER AVAILABLE DOCUMENTS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY EXISTING CONDITIONS PRIOR TO THE START OF WORK.
4. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER AND IN ACCORDANCE WITH CURRENT ACCEPTABLE INDUSTRY STANDARDS AND ALL APPLICABLE CODES, ORDINANCES, AND REGULATIONS.
5. COORDINATE LOCATION OF PLUMBING DEVICES WITH LIGHT FIXTURES, AND ALL OTHER ROOF MOUNTED DEVICES.
6. COORDINATE WITH OTHER TRADES THE LOCATION OF ALL PIPING AND EQUIPMENT TO AVOID INTERFERENCES.
7. DO NOT INTERFERE WITH THE USE OF ADJACENT BUILDINGS. MAINTAIN FREE AND SAFE PASSAGE AROUND ADJACENT BUILDINGS.
8. NO MATERIALS SHALL BE SOLD ON SITE. NO SIGNS SHALL BE PLACED ON THE SITE ADVERTISING SALE OF MATERIALS. DISPLAY FOR SALE MATERIALS ON THE SITE OR REMOVAL BY BUYERS IS STRICTLY PROHIBITED.
9. TAKE PRECAUTIONS TO MAINTAIN CLEANLINESS ON ROADWAYS AND OTHER PUBLIC AREAS USED BY EQUIPMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR IMMEDIATE REMOVAL OF ALL SPILLAGE ON THESE PAVINGS.
10. PROVIDE ALL NECESSARY OFFSETS IN PIPING TO AVOID STRUCTURE.
11. STORM PIPE MATERIAL: CAST IRON, HUBLESS, ASTM A888 WITH ASTM C 1277 COUPLINGS.
12. NEW CANOPY EXTENSION (TBD)

GENERAL MECHANICAL DEMOLITION NOTES:

1. CONFORM TO APPLICABLE CODES FOR DEMOLITION WORK, SAFETY OF STRUCTURE, DUST CONTROL, AND ENVIRONMENTAL COMPLIANCE.
2. DEMOLISH IN AN ORDERLY AND CAREFUL MANNER AS REQUIRED TO ACCOMMODATE NEW WORK. PROTECT EXISTING ELEMENTS AND FINISHES WHICH ARE TO REMAIN.
3. REPAIR ALL DEMOLITION PERFORMED IN EXCESS OF THAT REQUIRED AT NO EXTRA COST TO THE OWNER.

ELECTRICAL KEY NOTES (E):

- E1 PROTECT IN PLACE (LIGHT FIXTURE, SPEAKER, CIRCUIT BREAKER BOX) AND INTERCONNECTING WIRING THAT IS ATTACHED TO STRUCTURES TO REMAIN.
- E2 REMOVE WITH BRICK WALL DEMOLITION.
- E3 REMOVE WITH CANOPY/STRUCTURE DEMOLITION.
- E4 COLUMN TO REMAIN FOR REROUTE OF OVERHEAD WIRING. COORDINATE WITH STRUCTURAL.
- E5 REROUTE OVERHEAD ELECTRIC BETWEEN COLUMNS TO MAINTAIN CONNECTION TO SYSTEMS THAT ARE TO REMAIN IN SERVICE.
- E6 FIELD VERIFY EXISTING JUNCTION BOX AND CABLE ON CANOPY (ABOVE, TO BE DEMOLISHED) SERVES PASSENGER CANOPY LIGHTING AND CAMERAS (BELOW, TO REMAIN). REMOVE CONDUIT AND WIRING FROM PASSENGER CANOPY BACK TO SOURCE. RESUPPLY EXISTING PASSENGER CANOPY LIGHTING AND CAMERAS WITH NEW WIRING RUN ALONG PASSENGER CANOPY EXTENSION FROM AMTRAK STATION BUILDING. SEE NEW CANOPY PLANS FOR MORE INFORMATION.
- E7 FIELD VERIFY EXISTING CIRCUIT BREAKER BOXES WITH UNDERGROUND ELECTRIC AND CIRCUITS FEEDING OVERHEAD. REMOVE IF NOT IN SERVICE.

MECHANICAL KEY NOTES (M):

- M1 REMOVE EXISTING ROOF DRAIN AND CAP EXISTING STORM PIPING AT GRADE.
- M2 REMOVE EXISTING ROOF DRAIN AND HORIZONTAL STORM PIPING, SHOWN HATCHED. RELOCATE ROOF DRAIN TO EXISTING ROOF TO REMAIN. PROVIDE NEW HORIZONTAL STORM PIPING FROM RELOCATED ROOF DRAIN TO EXISTING VERTICAL STORM PIPING. MATCH PIPE SIZE TO EXISTING.
- M3 ROOF DRAIN AND STORM PIPING TO REMAIN.
- M4 REMOVE EXISTING ROOF DRAIN. CUT AND CAP STORM PIPING BELOW ROOF DRAIN. EXISTING STORM PIPING WITHIN COLUMN TO REMAIN.
- M5 FIELD VERIFY EXISTING 2" PIPING IS USED FOR WATER SERVICE, NOTIFY ENGINEER OTHERWISE. FIELD LOCATE SOURCE CONNECTION AND SHUT-OFF FROM USE. REMOVE EXISTING PIPING TO ROOF AND CAP AT GRADE.
- M6 REMOVE EXISTING ROOF DRAIN AND HORIZONTAL STORM PIPING, SHOWN HATCHED. RELOCATE ROOF DRAIN TO EXISTING ROOF TO REMAIN. PROVIDE NEW ELBOW AND HORIZONTAL STORM PIPING FROM ROOF DRAIN AT COLUMN Cf AND CONNECT HORIZONTAL PIPING TO EXISTING VERTICAL STORM DRAINAGE PIPING AT COLUMN Ce. MATCH PIPE SIZE TO EXISTING.

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

Norfolk Southern Corp

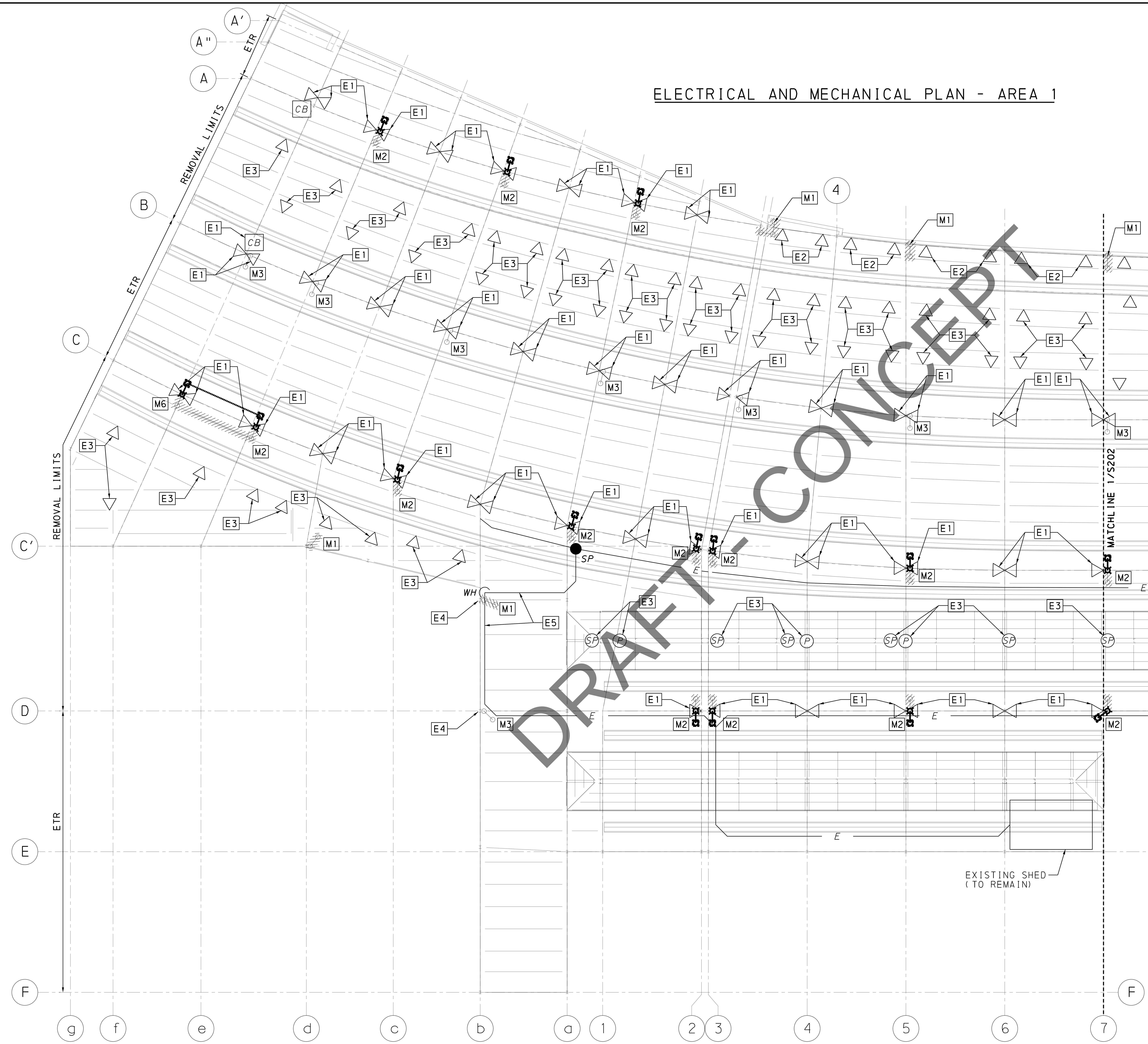
PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS

DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 5/15/2018
SHEET NUMBER	OF		DRAWING NUMBER PT-353 18 01

ELECTRICAL AND MECHANICAL PLAN - AREA 1



LEGEND

- CB — EXISTING CIRCUIT BREAKER BOX
- J — EXISTING JUNCTION BOX
- SP — EXISTING WIRE SPLICE
- —E— EXISTING OVERHEAD ELECTRIC CABLE
- —EU— EXISTING UNDERGROUND ELECTRIC CABLE
- —T— EXISTING OVERHEAD TELECOM CABLE
- —TU— EXISTING UNDERGROUND TELECOM CABLE
- EXISTING DOWN LIGHT
- (P) EXISTING PENDANT LIGHT
- (SP) EXISTING LOUD SPEAKER
- WH EXISTING WEATHERHEAD
- EXISTING ROOF DRAIN
- NEW TO EXISTING STORM PIPE CONNECTION
- RELOCATED ROOF DRAIN
- ETR EXISTING TO REMAIN (COORDINATE WITH STRUCTURAL DEMOLITION PLAN)

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

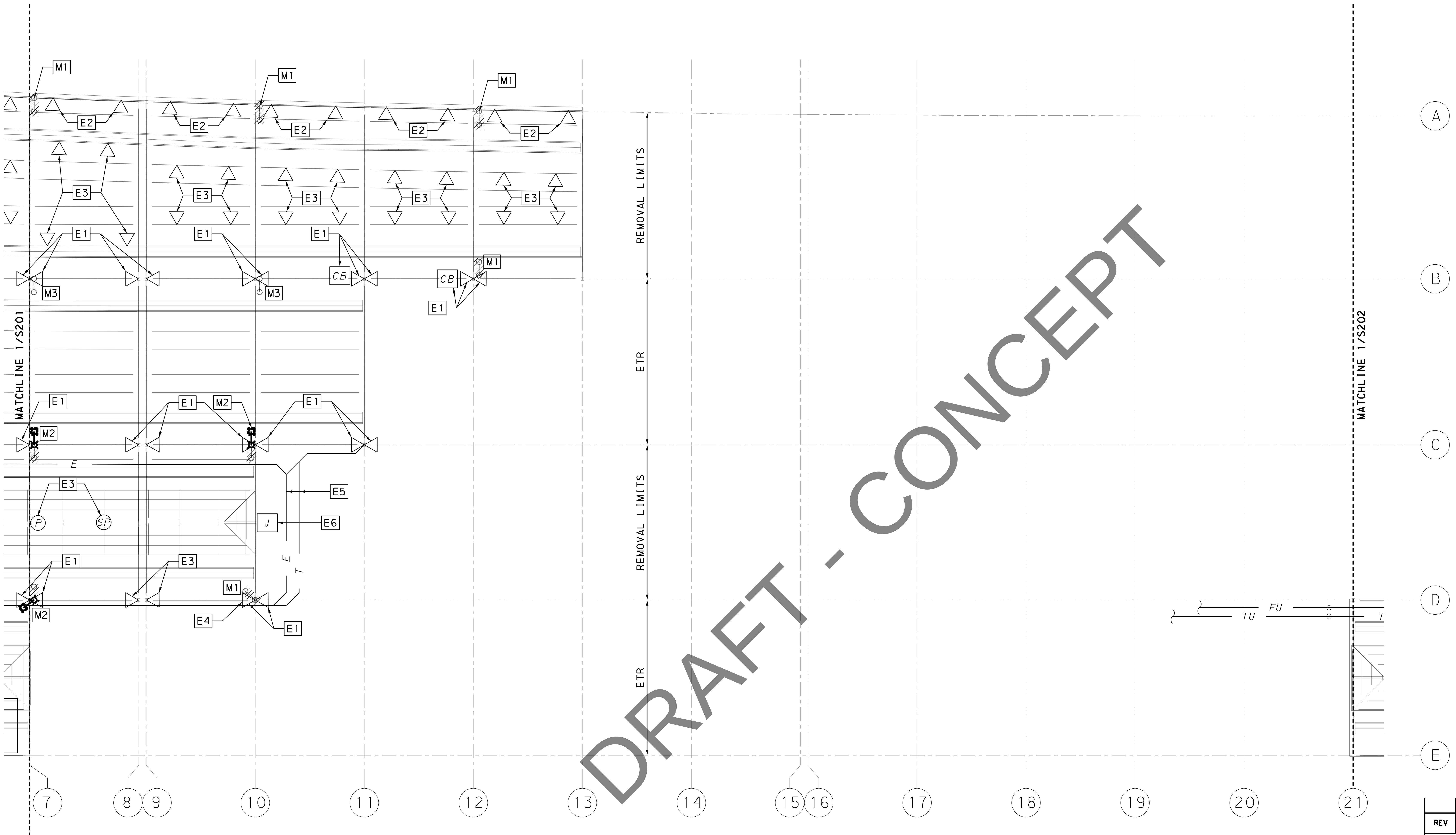
Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS

DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 5/15/2018
SHEET NUMBER	OF		DRAWING NUMBER PT-353 18 01



ELECTRICAL AND MECHANICAL PLAN - AREA 2

LEGEND

- CB EXISTING CIRCUIT BREAKER BOX
- J EXISTING JUNCTION BOX
- SP EXISTING WIRE SPLICE
- —E— EXISTING OVERHEAD ELECTRIC CABLE
- —EU— EXISTING UNDERGROUND ELECTRIC CABLE
- —T— EXISTING OVERHEAD TELECOM CABLE
- —TU— EXISTING UNDERGROUND TELECOM CABLE
- EXISTING DOWN LIGHT
- P EXISTING PENDANT LIGHT
- SP EXISTING LOUD SPEAKER
- WH EXISTING WEATHERHEAD
- EXISTING ROOF DRAIN
- NEW TO EXISTING STORM PIPE CONNECTION
- RELOCATED ROOF DRAIN
- ETR EXISTING TO REMAIN (COORDINATE WITH STRUCTURAL DEMOLITION PLAN)

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

Norfolk Southern Corp

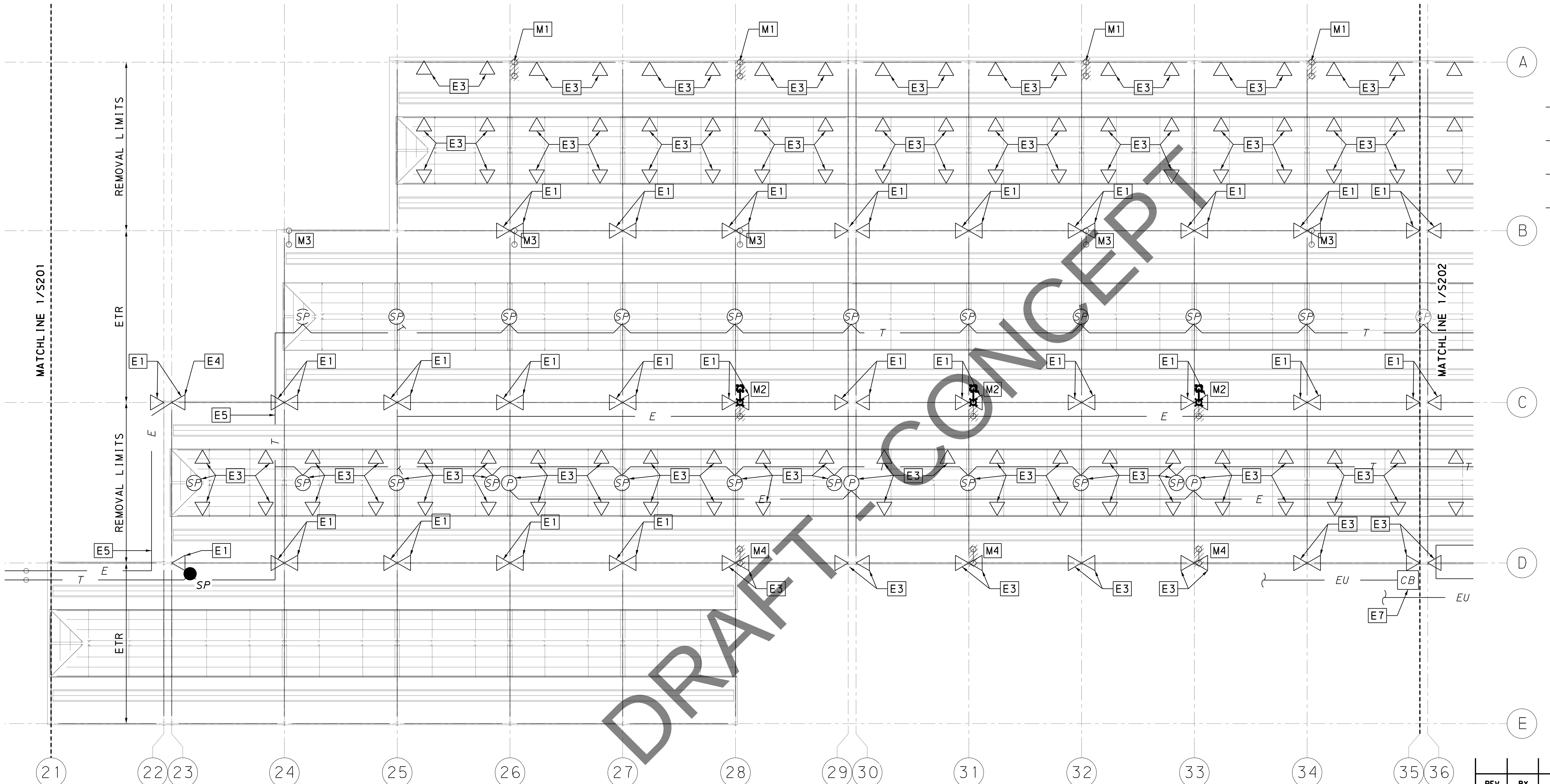
PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION

TRAINSHED IMPROVEMENTS

DGN ZRS	VAL SEC 17.2 MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864	DATE 5/15/2018
SHEET NUMBER OF		DRAWING NUMBER PT-353 18 01



LEGEND

CB	EXISTING CIRCUIT BREAKER BOX
J	EXISTING JUNCTION BOX
SP	EXISTING WIRE SPLICE
—E—	EXISTING OVERHEAD ELECTRIC CABLE
—EU—	EXISTING UNDERGROUND ELECTRIC CABLE
—T—	EXISTING OVERHEAD TELECOM CABLE
—TU—	EXISTING UNDERGROUND TELECOM CABLE
▽	EXISTING DOWN LIGHT
P	EXISTING PENDANT LIGHT
SP	EXISTING LOUD SPEAKER
WH	EXISTING WEATHERHEAD
	EXISTING ROOF DRAIN
	NEW TO EXISTING STORM PIPE CONNECTION
	RELOCATED ROOF DRAIN
ETR	EXISTING TO REMAIN (COORDINATE WITH STRUCTURAL DEMOLITION PLAN)

ELECTRICAL AND MECHANICAL PLAN - AREA 3

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

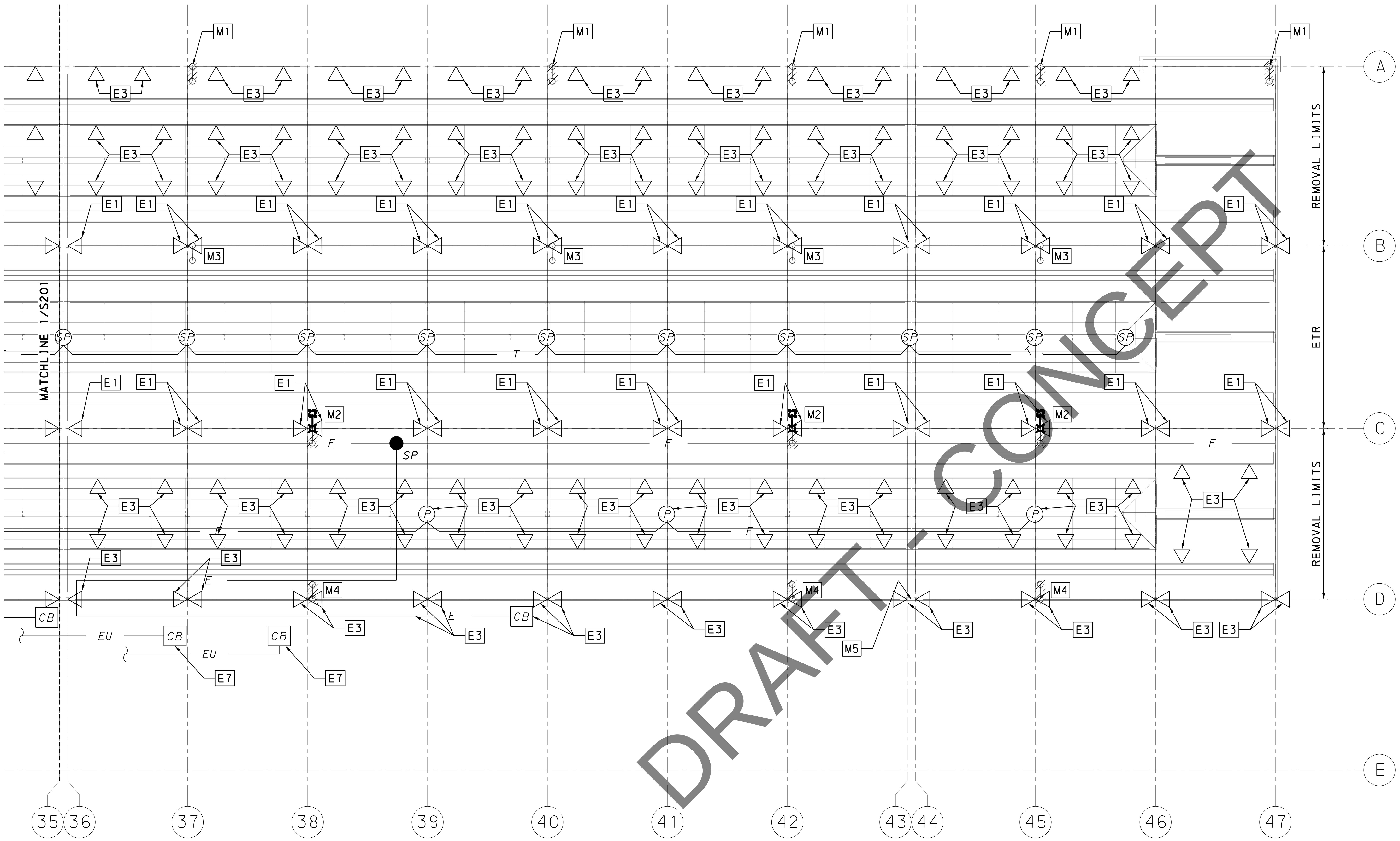
Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA.

PITTSBURGH STATION
TRAINSHED IMPROVEMENTS

DGN ZRS	VAL SEC 17.2 MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864	DATE 5/15/2018
SHEET NUMBER OF		DRAWING NUMBER PT-353 18 01



ELECTRICAL AND MECHANICAL PLAN - AREA 4

LEGEND

- CB EXISTING CIRCUIT BREAKER BOX
- J EXISTING JUNCTION BOX
- SP EXISTING WIRE SPLICE
- —E— EXISTING OVERHEAD ELECTRIC CABLE
- —EU— EXISTING UNDERGROUND ELECTRIC CABLE
- —T— EXISTING OVERHEAD TELECOM CABLE
- —TU— EXISTING UNDERGROUND TELECOM CABLE
- EXISTING DOWN LIGHT
- P EXISTING PENDANT LIGHT
- SP EXISTING LOUD SPEAKER
- WH EXISTING WEATHERHEAD
- EXISTING ROOF DRAIN
- NEW TO EXISTING STORM PIPE CONNECTION
- RELOCATED ROOF DRAIN
- ETR EXISTING TO REMAIN (COORDINATE WITH STRUCTURAL DEMOLITION PLAN)

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

Norfolk Southern Corp

PITTSBURGH LINE
PITTSBURGH DIVISION

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA.

PITTSBURGH STATION

TRAINSHED IMPROVEMENTS

DGN ZRS	VAL SEC 17.2	MAP 18	MILE POST PT-353
CHK DAL	FILE BR0028864		DATE 5/15/2018
SHEET NUMBER	OF		DRAWING NUMBER PT-353 18 01

1 PEDESTRIAN CANOPY FOUNDATION PLAN - AREA 1
3/32" = 1'-0"

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
REVISIONS		

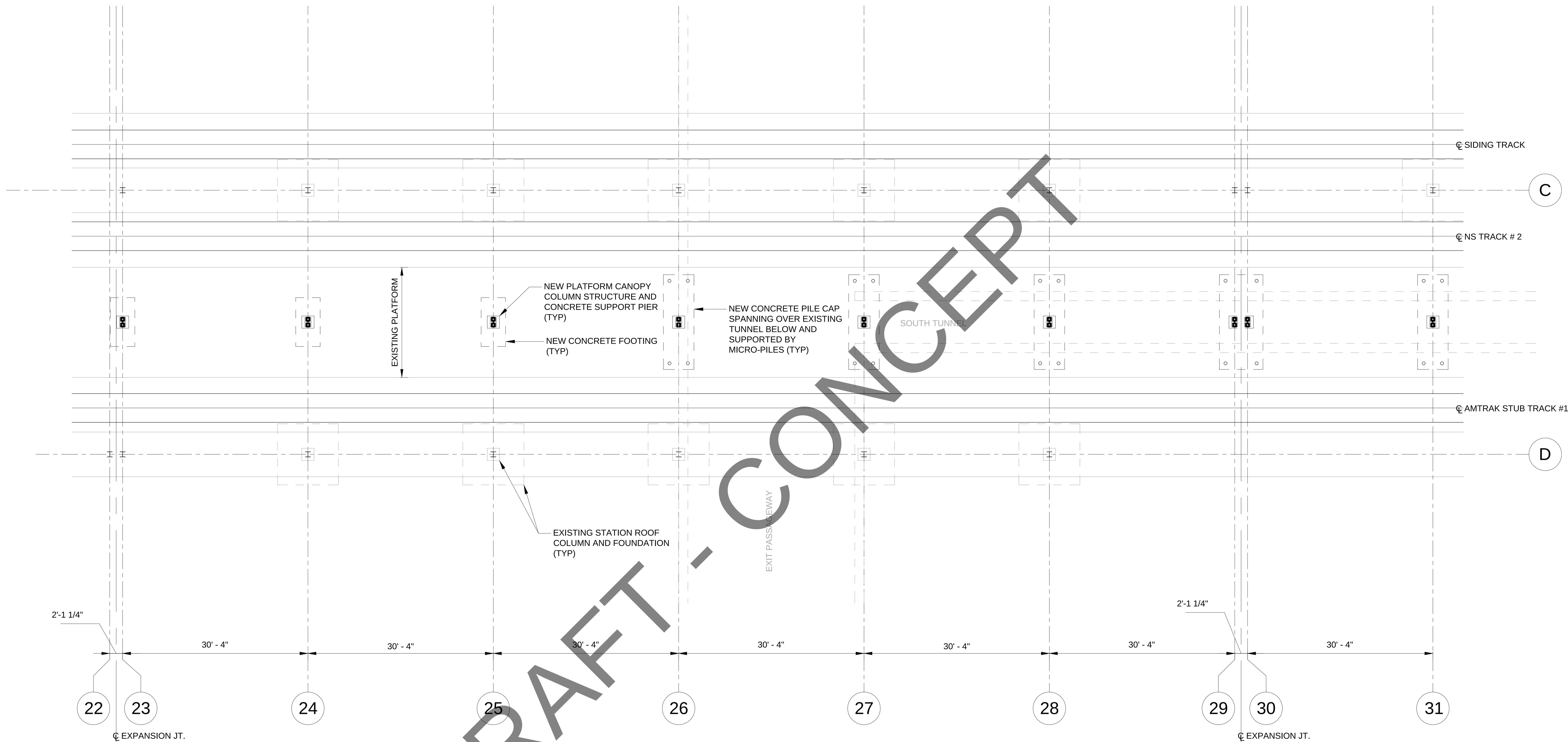
PREPARED FOR: NORFOLK SOUTHERN

PREPARED BY: wsp

PLATFORM PEDESTRIAN CANOPY CONCEPT
FOUNDATION PLAN - AREA 1

SHEET: SC-101

DESIGNED BY	DRAWN BY	CHECKED BY	DATE
ZRS	ZRS	DAL	10/03/2018



1 PEDESTRIAN CANOPY FOUNDATION PLAN - AREA 2
3/32" = 1'-0"

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION

REVISIONS

PREPARED FOR: NORFOLK SOUTHERN

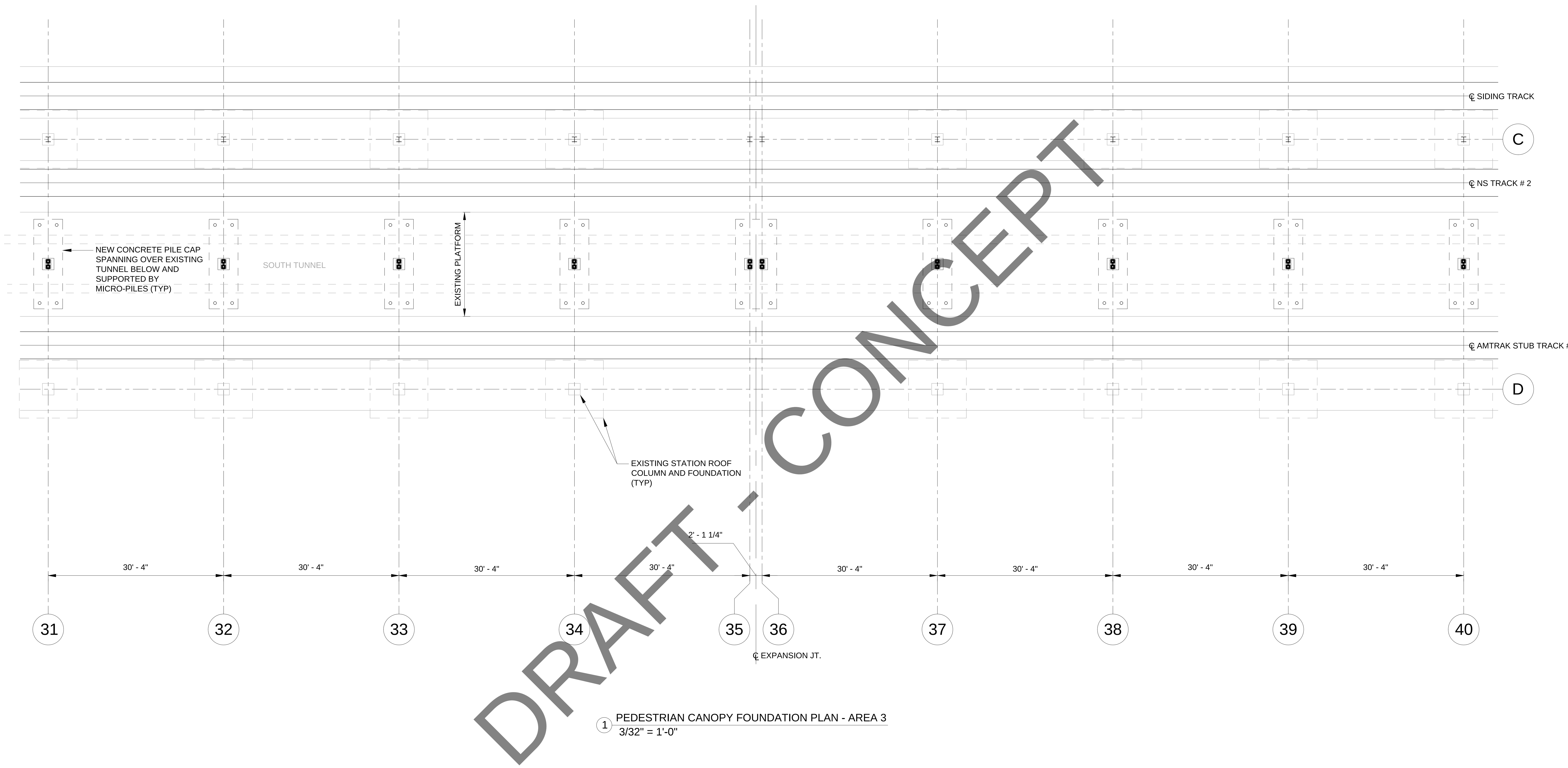
PREPARED BY: wsp

PLATFORM PEDESTRIAN CANOPY CONCEPT
FOUNDATION PLAN - AREA 2

SHEET: SC-102

DESIGNED BY	DRAWN BY	CHECKED BY	DATE
ZRS	ZRS	DAL	10/03/2018

ALTERNATIVE 2



1 PEDESTRIAN CANOPY FOUNDATION PLAN - AREA 3
3/32" = 1'-0"

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION

REVISIONS

PREPARED FOR: NORFOLK SOUTHERN

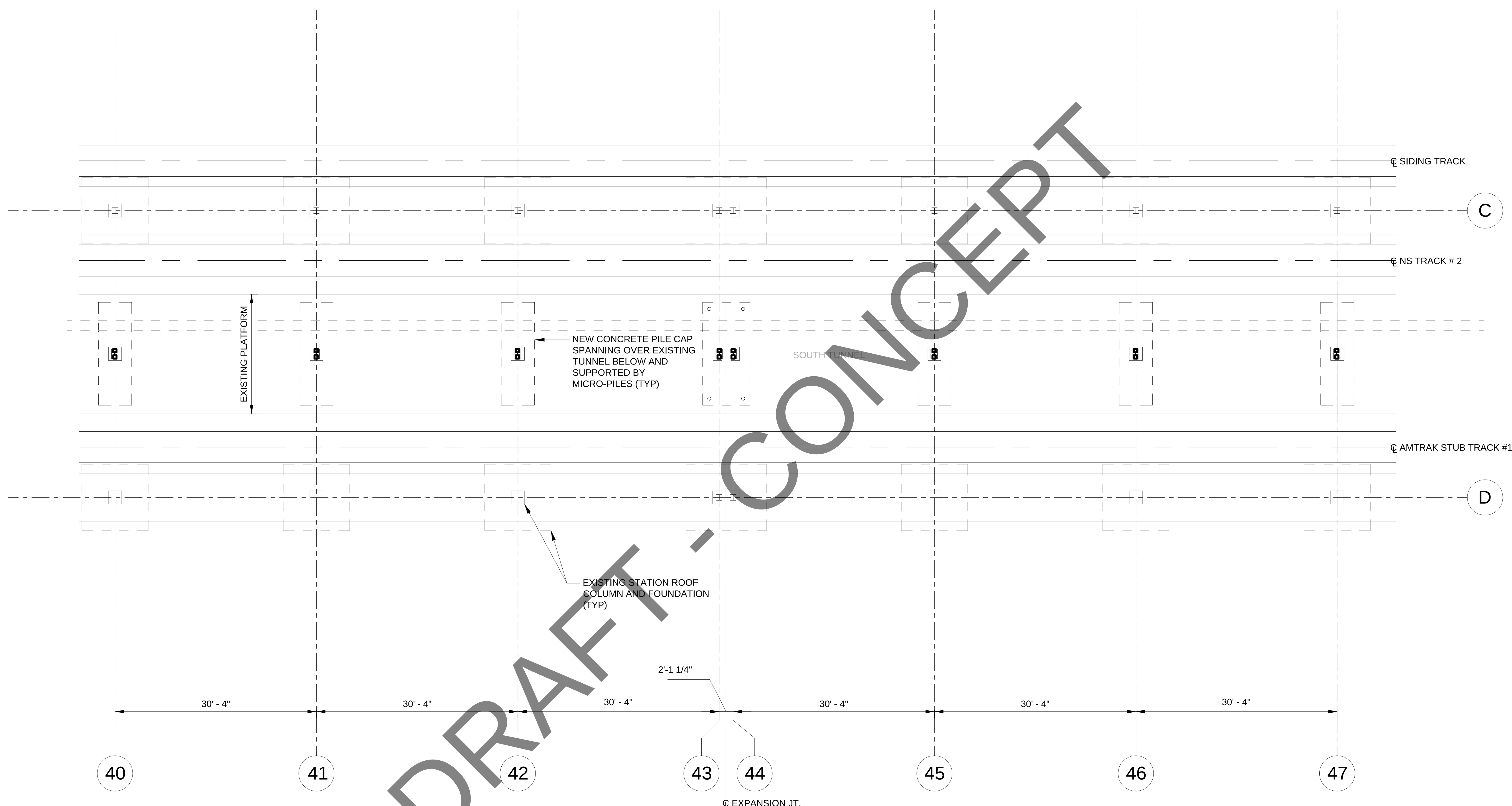
PREPARED BY: WSP

PLATFORM PEDESTRIAN CANOPY CONCEPT
FOUNDATION PLAN - AREA 3

SHEET: SC-103

DESIGNED BY	DRAWN BY	CHECKED BY	DATE
ZRS	ZRS	DAL	10/03/2018

ALTERNATIVE 2



DRAFT - CONCEPT

1 PEDESTRIAN CANOPY FOUNDATION PLAN - AREA 4
3/32" = 1'-0"

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION

REVISIONS

PREPARED FOR: NORFOLK SOUTHERN

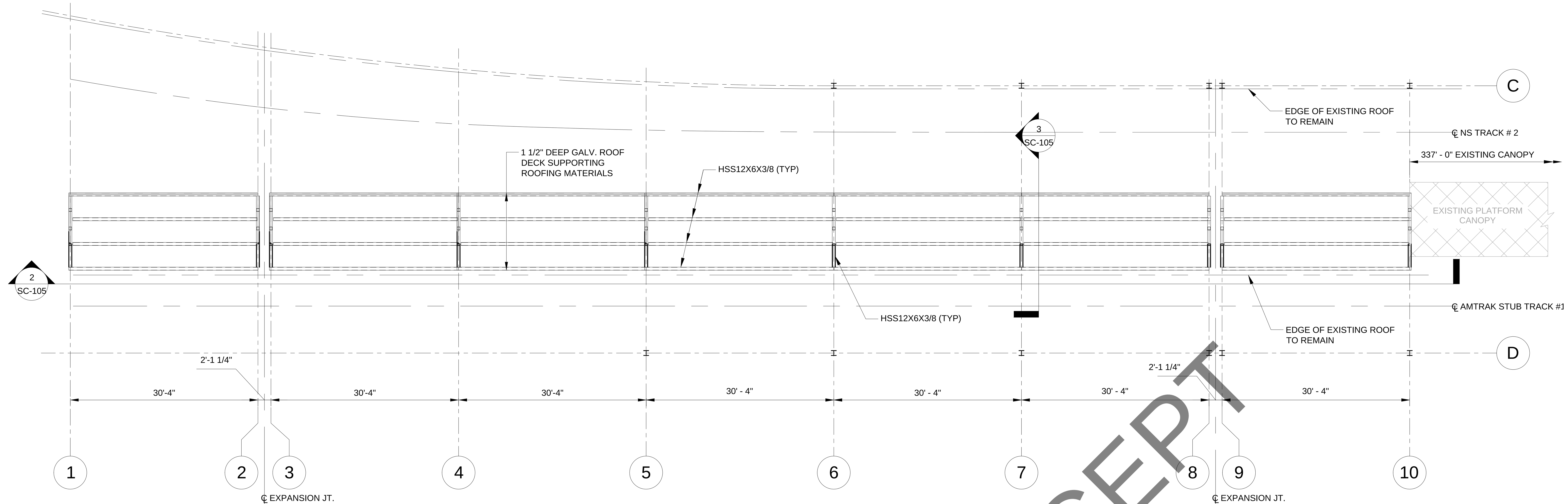
PREPARED BY: wsp

PLATFORM PEDESTRIAN CANOPY CONCEPT
FOUNDATION PLAN - AREA 4

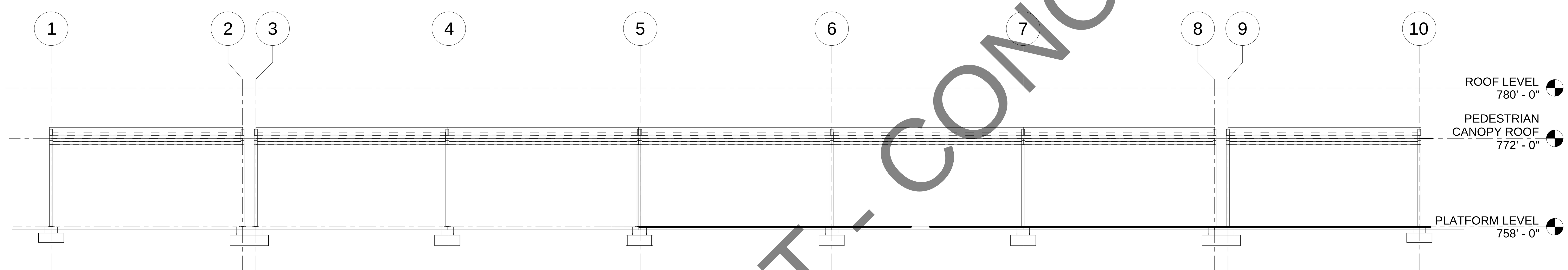
SHEET SC-104

DESIGNED BY	DRAWN BY	CHECKED BY	DATE
ZRS	ZRS	DAL	10/03/2018

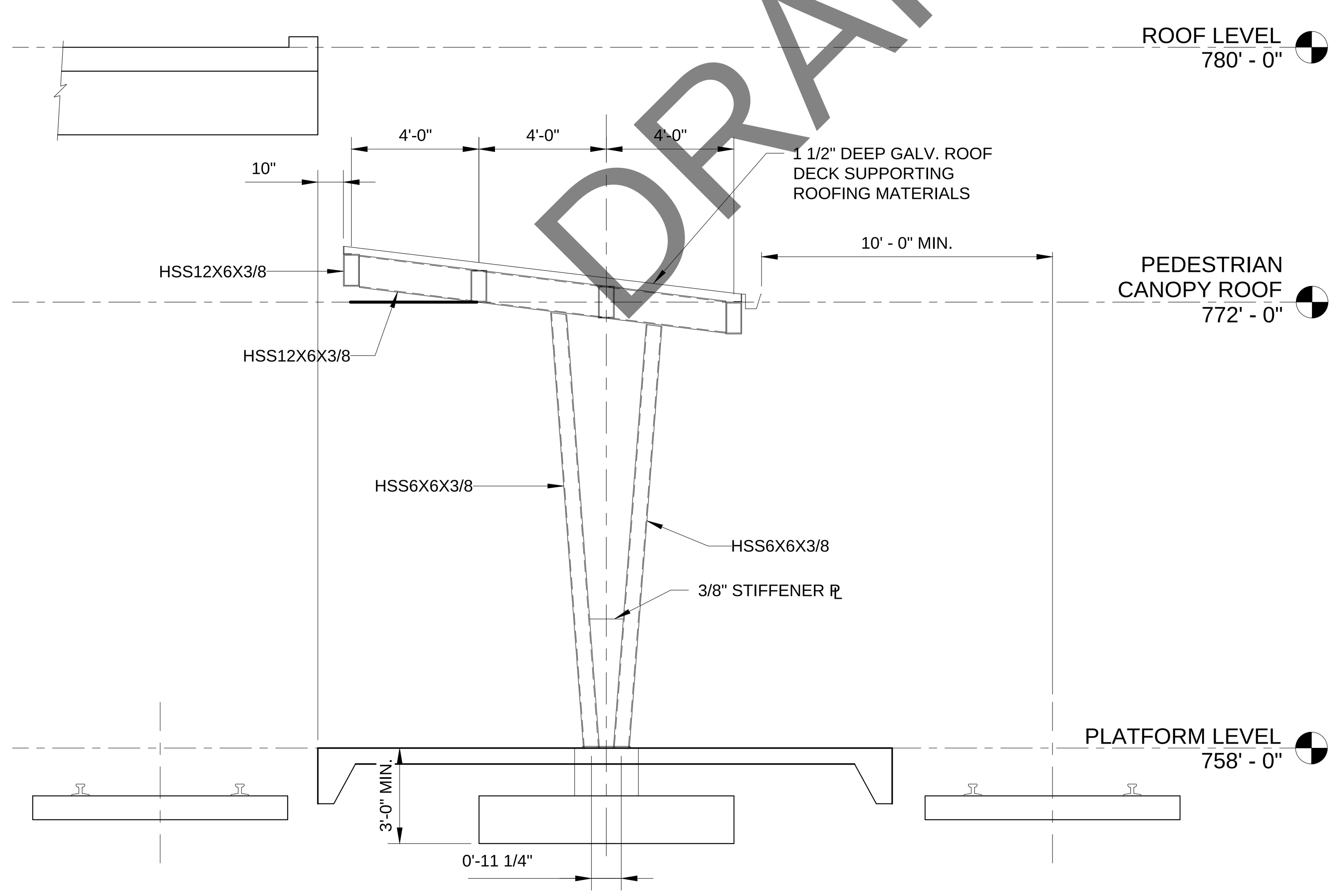
ALTERNATIVE 2



1 PEDESTRIAN CANOPY ROOF - AREA 1
3/32" = 1'-0"



2 TYPICAL CANOPY ELEVATION
3/32" = 1'-0"



3 TYPICAL CANOPY SECTION
1/4" = 1'-0"

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
REVISIONS		

PREPARED FOR: NORFOLK SOUTHERN

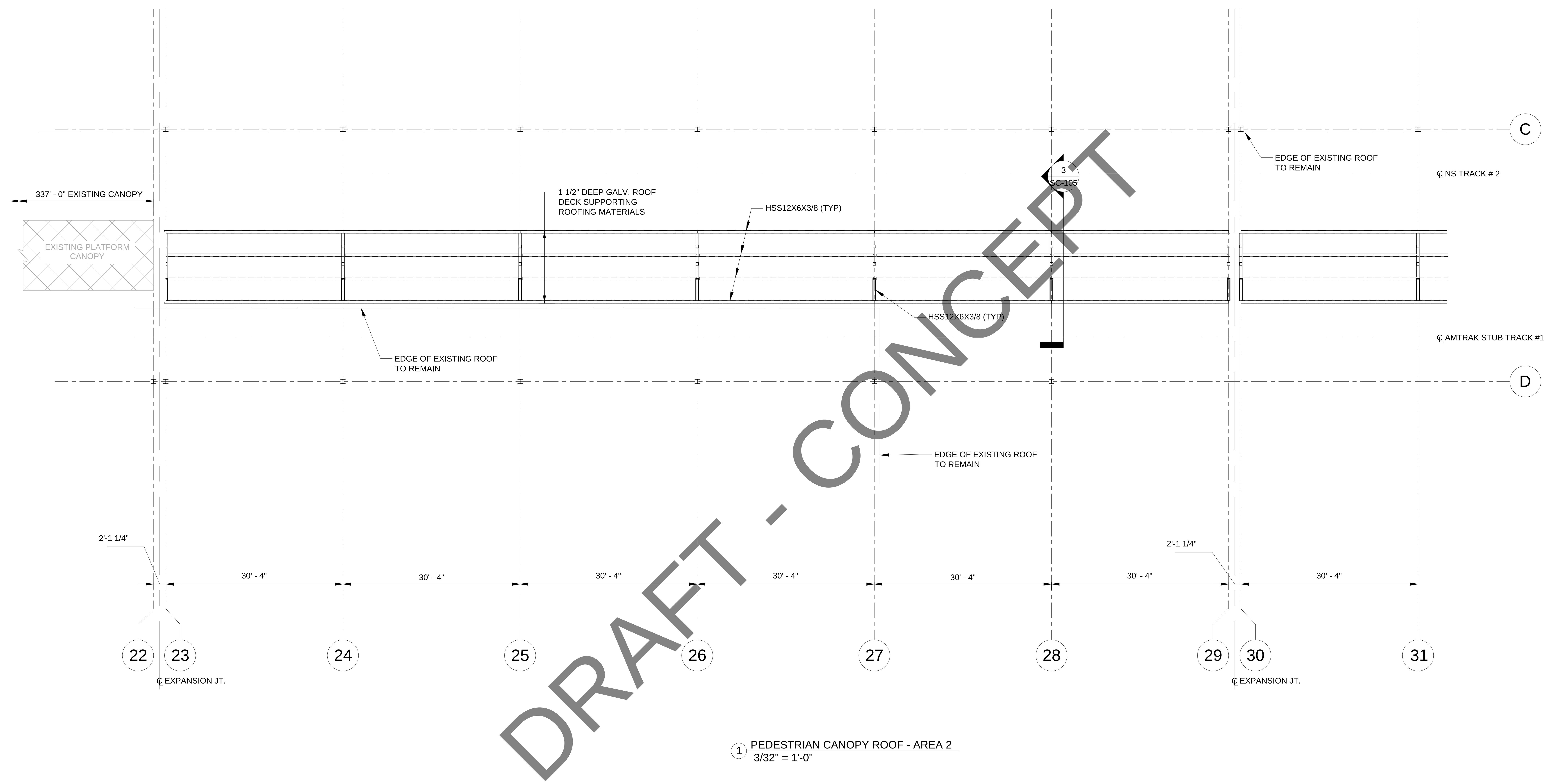
PREPARED BY: WSP

PLATFORM PEDESTRIAN CANOPY CONCEPT
ROOF PLAN - AREA 1

SHEET SC-105

DESIGNED BY	DRAWN BY	CHECKED BY	DATE
ZRS	ZRS	DAL	10/03/2018

ALTERNATIVE 2



1 PEDESTRIAN CANOPY ROOF - AREA 2
3/32" = 1'-0"

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION

REVISIONS

PREPARED FOR: NORFOLK SOUTHERN

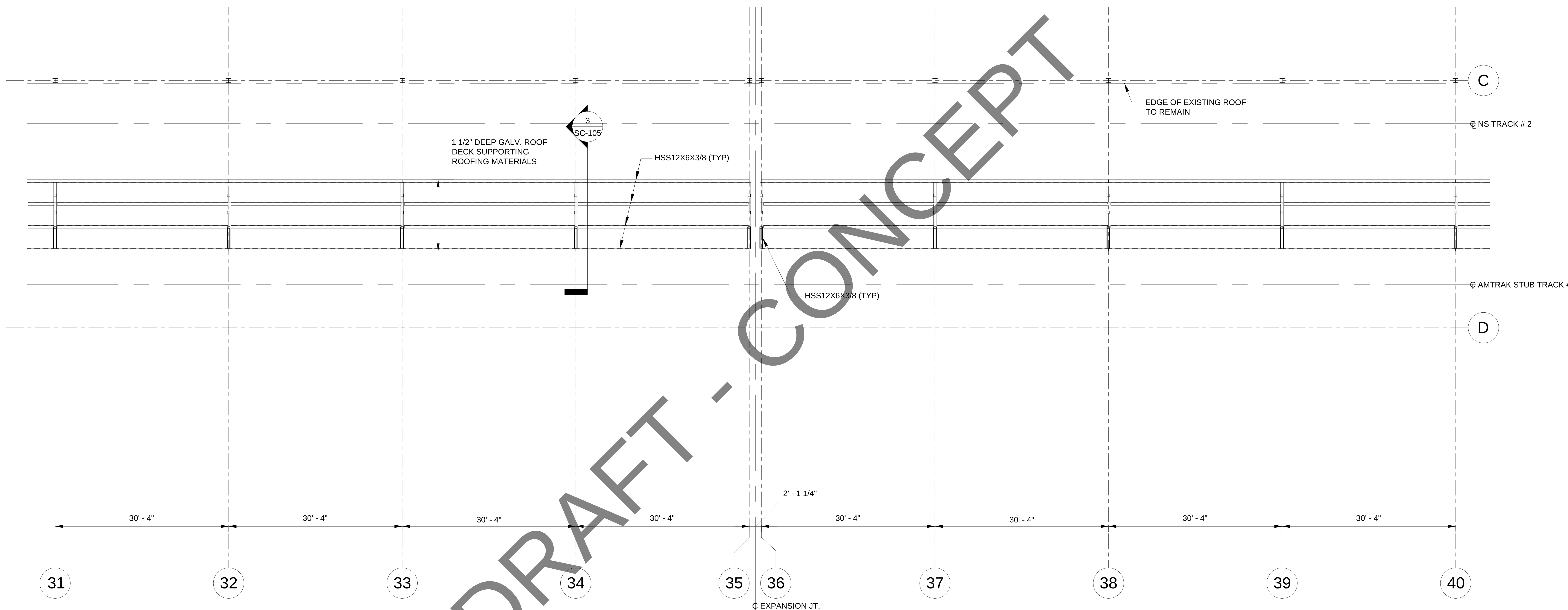
PREPARED BY: wsp

PLATFORM PEDESTRIAN CANOPY CONCEPT
ROOF PLAN - AREA 2

SHEET SC-106

DESIGNED BY	DRAWN BY	CHECKED BY	DATE
ZRS	ZRS	DAL	10/03/2018

ALTERNATIVE 2



1 PEDESTRIAN CANOPY ROOF - AREA 3
3/32" = 1'-0"

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION
REVISIONS		

PREPARED FOR: NORFOLK SOUTHERN

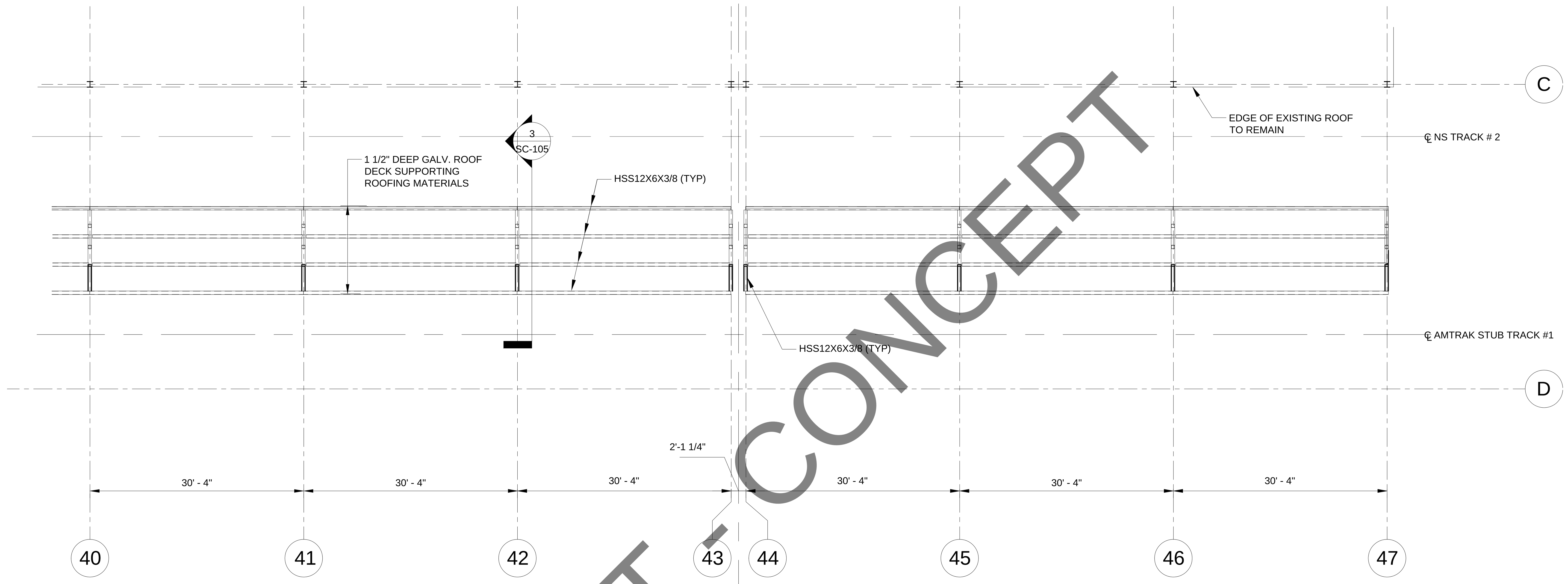
PREPARED BY: wsp

PLATFORM PEDESTRIAN CANOPY CONCEPT
ROOF PLAN - AREA 3

SHEET: SC-107

DESIGNED BY	DRAWN BY	CHECKED BY	DATE
ZRS	ZRS	DAL	10/03/2018

ALTERNATIVE 2



1 PEDESTRIAN CANOPY ROOF - AREA 4
3/32" = 1'-0"

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION

REVISIONS

PREPARED FOR: NORFOLK SOUTHERN

PREPARED BY: WSP

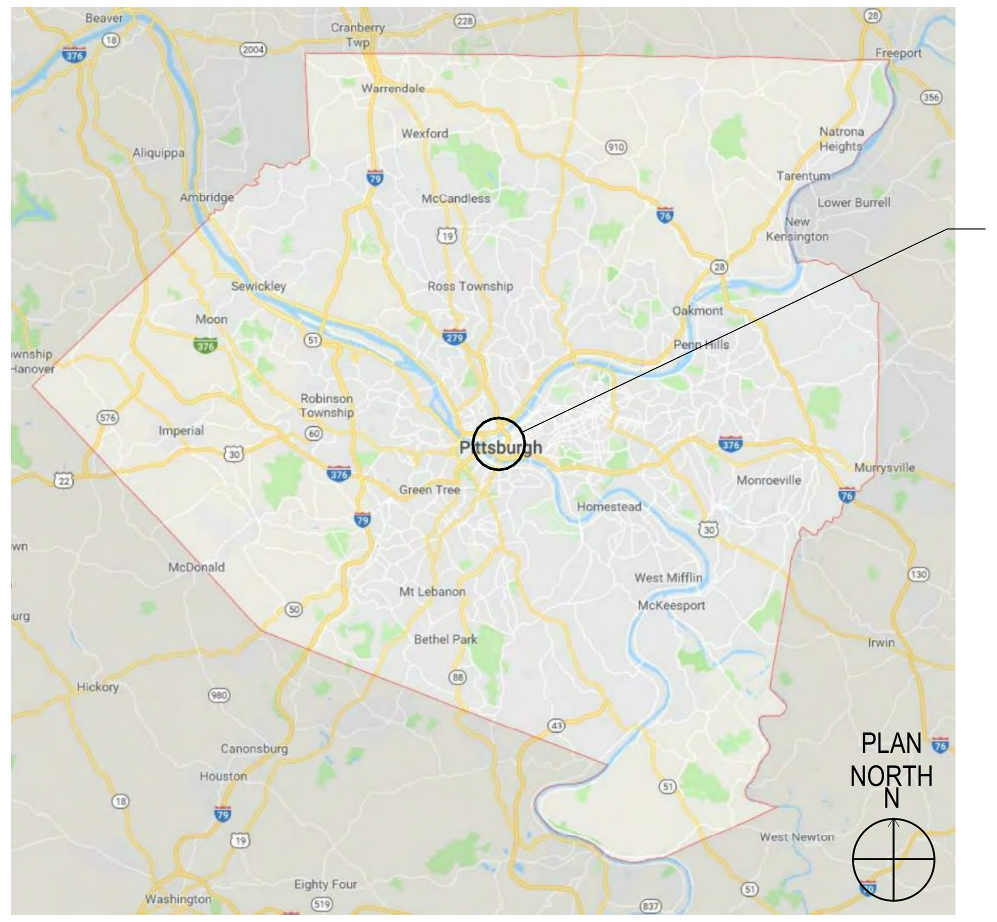
PLATFORM PEDESTRIAN CANOPY CONCEPT
ROOF PLAN - AREA 4

SHEET SC-108

DESIGNED BY	DRAWN BY	CHECKED BY	DATE
ZRS	ZRS	DAL	10/03/2018

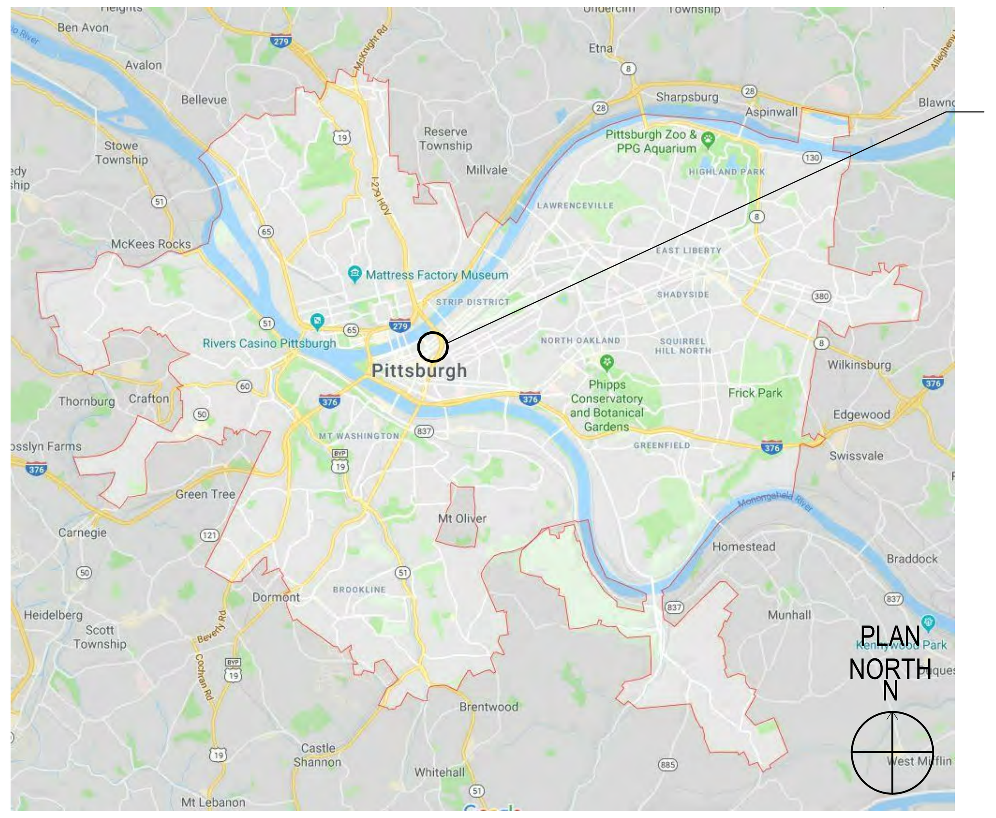
NORFOLK SOUTHERN

NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH VERTICAL CLEARANCE
AMTRAK STATION
100% SUBMISSION



PROJECT LOCATION

VICINITY MAP - ALLEGHENY COUNTY, PA



PROJECT LOCATION: 1100 LIBERTY AVENUE

LOCATION MAP - PITTSBURGH, PA 15222

SCHEDULE - SHEET INDEX

SHEET INFORMATION

NUMBER	NAME
GENERAL	
G-001	COVER SHEET
G-002	GENERAL NOTES
SITE	
AS001	PARTIAL SITE PLAN (1 OF 2)
AS002	PARTIAL SITE PLAN (2 OF 2)
AS003	DETAIL SITE PLAN (1 OF 5)
AS004	DETAIL SITE PLAN (2 OF 5)
AS005	DETAIL SITE PLAN (3 OF 5)
AS006	DETAIL SITE PLAN (4 OF 5)
AS007	DETAIL SITE PLAN (5 OF 5)
STRUCTURAL	
S-001	STRUCTURAL DESIGN CRITERIA, & GENERAL NOTES
S-002	STRUCTURAL GENERAL NOTES, ABBREVIATIONS & SYMBOLS
S-100	COMPREHENSIVE PLAN
S-101	FRAMING PLAN - AREA A
S-102	FRAMING PLAN - AREA B
S-103	FRAMING PLAN - AREA C
S-104	FRAMING PLAN - AREA D
S-201	STRUCTURAL ELEVATION BENT ag & af
S-202	STRUCTURAL ELEVATION BENT ae & ad
S-203	STRUCTURAL ELEVATION BENT ac & ab
S-204	STRUCTURAL ELEVATION BENT aa & 1a
S-205	STRUCTURAL ELEVATION BENT 2/2a, 3/3a, 4/4A & 5
S-206	STRUCTURAL ELEVATION BENT 6 & 7, 8 & 9
S-207	STRUCTURAL ELEVATION BENT 10 & 11, 12 & 13
S-208	STRUCTURAL ELEVATION BENT 23 & 24
S-209	STRUCTURAL ELEVATION BENT 25, 26, 27 & 28-38, 40-45
S-210	STRUCTURAL ELEVATION BENT 39 & 46
S-211	STRUCTURAL ELEVATION BENT 47
S-311	FRAMING SECTIONS
S-312	FRAMING SECTIONS
S-313	FRAMING SECTIONS
S-314	FRAMING SECTIONS
S-601	PROPOSED CUT HEIGHT SCHEDULE

SCHEDULE - SHEET INDEX

SHEET INFORMATION

NUMBER	NAME
ARCHITECTURE	
A-001	ARCHITECTURAL ABBREVIATIONS & SYMBOLS
A-130	COMPREHENSIVE ROOF PLAN
A-131	PARTIAL ROOF PLAN - AREA A
A-132	PARTIAL ROOF PLAN - AREA B
A-133	PARTIAL ROOF PLAN - AREA C
A-134	PARTIAL ROOF PLAN - AREA D
AD501	DEMOLITION DETAILS
A-501	NEW WORK DETAILS
ELECTRICAL	
E-111	ELECTRICAL - 1ST FLOOR PLAN - AREA A
E-112	ELECTRICAL - 1ST FLOOR PLAN - AREA B
E-113	ELECTRICAL - 1ST FLOOR PLAN - AREA C
E-114	ELECTRICAL - 1ST FLOOR PLAN - AREA D

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL

1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY

PITTSBURGH DIVISION PITTSBURGH LINE

DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE
AMTRAK STATION
COVER SHEET

VALUATION PLAN: MILE POST: PT-353.20

AUTHORITY NO.: FILE NO.:

MADE BY: JD DATE: 05-21-2021 CHECKED BY: MK

SCALE: AS NOTED DRAWING NO.: G-001

100% SUBMISSION - NOT FOR CONSTRUCTION

ALTERNATIVE 3

GENERAL NOTES:

1. SITE ENTRANCE SAFETY - ENTRY TO THE SITE WILL BE REVIEWED PRIOR TO SITE ACCESS FOR ENTRANCE LOCATION, TRACK GRADE CROSSING APPROACH, TRACK GRADE CROSSING AND EXIT OF GRADE CROSSING.
TRACK GRADE CROSSING IS NON-SIGNALED AND REQUIRES RAILROAD CROSSING TRAINING PRIOR TO ACCESS. ALL VEHICLE AND PERSONNEL UTILIZING THE GRADE CROSSING ARE TO BE TRAINED AND FOLLOW PROCEDURES.
NO VEHICLES OR PERSONNEL ARE TO REMAIN ON CROSSING AT ANY TIME.
2. CONSTRUCTION COMPOUND SAFETY - COMPOUND IS TO BE FENCED AND CONTRACTOR AND CM SUPPORT STAFF ARE TO FOLLOW RWP TRAINING AND ALL APPLICABLE SAFETY TRAINING IN ALL WORK PREPARATION WITHIN THE COMPOUND.
3. JOB SITE SAFETY - ENTIRE SITE IS IN CLOSE PROXIMITY TO ACTIVE RAIL LINES. ALL MOVEMENT THROUGHOUT THE JOB SITE IS TO FOCUS ON REMAINING AT THE RWP REQUIRED DISTANCE FROM THE FOULING ENVELOP FOR PERSONNEL AND VEHICLES.
4. EMPLOYEE IN CHARGE (EMPLOYED BY NS) WILL PROVIDE WORK SITE SAFETY AND ANY ON TRACK PROTECTION. NO WORK WITHIN THE JOB SITE CAN START UNTIL THE JOB SITE SAFETY BRIEFING MEETING IS HELD AND ALL EMPLOYEES SIGN THE SIGN IN SHEET. THE MEETING WILL ADDRESS ALL CONSTRUCTION AND ON TRACK PROTECTION METHODS AND DURATIONS.
5. FOULING A TRACK: FOULING A TRACK MEANS THE PLACEMENT OF AN INDIVIDUAL OR EQUIPMENT IN SUCH PROXIMITY TO A TRACK THAT THE INDIVIDUAL OR EQUIPMENT COULD BE STRUCK BY A TRAIN, LOCOMOTIVE, OR OTHER RAILROAD EQUIPMENT.
   A. ALL PLANNED ACTIVITY REQUIRING FOULING TRACKS WILL BE REVIEWED PRIOR TO THE EXECUTION OF THE WORK. THE WORK TASKS AND DURATION WILL BE REVIEWED AND APPROVED BY NS SUPERVISION.
   B. THE TYPE OF FOUL WILL BE IDENTIFIED AND FOLLOWED TO PROVIDE THE APPROVED ON TRACK PROTECTION FOR SPECIFIED TASK.
   C. EMPLOYEES MUST REMAIN OUT OF THE FOULING ENVELOP AT ALL TIMES UNLESS ON-TRACK PROTECTION IS PROVIDED. EXPECT THE MOVEMENT OF TRAINS, ENGINES, OR CARS AT ANY TIME, ON ANY TRACK, IN EITHER DIRECTION.
   D. PROPER SAFEGUARDS MUST BE IN PLACE BEFORE A TRACK IS FOULED AND INCLUDE PROTECTION BY THE FOLLOWING:
      I. ROADWAY WORKER PROTECTION RULES.
      II. TRACK OCCUPATION PERMISSION AND TIME LIMITS.
      III. APPLICATION OF SAFETY AND OPERATING RULES CONCERNING CROSSING, WALKING ADJACENT TO, MOUNTING AND DISMOUNTING, AND GOING AROUND AND BETWEEN EQUIPMENT.
      IV. COMMUNICATION AND UNDERSTANDING WITH THE EMPLOYEE IN CHARGE CONTROLLING THE TRACK OCCUPATION AND ANY MOVEMENTS.
6. ALL DIMENSIONS ARE IN FEET/INCHES UNLESS NOTED OTHERWISE.
7. THESE GENERAL NOTES ARE NOT INTENDED TO REPLACE SPECIFICATIONS - REFER TO SPECIFICATIONS FOR REQUIREMENTS IN ADDITION TO GENERAL NOTES.
8. DETAILS SHOWN ON DRAWINGS ARE TYPICAL FOR ALL SIMILAR CONDITIONS.
9. DRAWING NOTES AND SPECIFICATIONS ARE INSTRUCTIONS TO THE CONTRACTOR AND APPLY TO ALL THE WORK UNLESS MORE SPECIFIC INFORMATION IS SHOWN ELSEWHERE ON THE DRAWINGS OR WRITTEN IN THE SPECIFICATIONS - IN THE EVENT OF CONFLICTING INSTRUCTIONS, THE ARCHITECT SHALL DETERMINE WHAT CONTROLS.
10. VERIFY ALL DIMENSIONS IN THE FIELD AND COORDINATE DIMENSIONS SHOWN ON THE CONTRACT DRAWINGS WITH FABRICATION AND FIELD CONDITIONS AND REPORT ANY INCONSISTENCIES TO THE OWNER BEFORE PROCEEDING WITH WORK.
11. STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE, AND, EXCEPT WHERE SPECIFICALLY SHOWN, DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION THE CONTRACTOR SHALL SUPERVISE CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES, SEQUENCE, AND APPLICABLE SAFETY REGULATIONS TO BE FOLLOWED.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING AND COORDINATING THE WORK OF THE SUB-CONTRACTORS - THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH THE BUILDING OWNER, TENANT OR HIS REPRESENTATIVES THE DELIVERY AND INSTALLATION OF ITEMS BEING PROVIDED AND INSTALLED BY OTHERS.
13. PLUMBING AND ELECTRICAL WORK RELATED TO DEMOLITION AND NEW INSTALLATION OF COMPONENTS SHALL COMPLY WITH ALL APPLICABLE CODES.
14. ALL MATERIALS, FABRICATION AND INSTALLATION SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS AND SPECIFICATIONS FOR EACH DIVISION OF WORK.
15. CONSTRUCTION MUST COMPLY WITH APPLICABLE CODES AND ORDINANCES, LAWS AND SAFETY ORDERS AS DIRECTED BY LOCAL JURISDICTION.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIMELY ORDERING OF MATERIALS INCLUDED IN THESE CONTRACT DOCUMENTS - SOME ITEMS IN THESE DOCUMENTS MAY REQUIRE LONG LEAD TIMES OR SPECIAL COORDINATION SUBSTITUTIONS WILL NOT BE ALLOWED FOR MATERIAL NOT ORDERED IN A TIMELY FASHION.
17. CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND GRADE CONDITIONS, (BOTH NEW AND EXISTING) REPORTING ANY DISCREPANCIES TO THE OWNER PRIOR TO ORDERING MATERIALS OR PROCEEDING WITH ANY PHASE OF THE WORK.
18. CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS PRIOR TO COMMENCING CONSTRUCTION ALL DISCREPANCIES SHALL BE NOTED AND SENT TO THE ARCHITECT WITH ADEQUATE TIME TO REVIEW PRIOR TO STARTING THAT PORTION OF THE WORK IN ORDER TO AVOID PROJECT DELAYS.
19. CONTRACTOR SHALL CLEAN, PATCH AND REPAIR ALL SURFACES DAMAGED BY DEMOLITION, ALTERATION OR INSTALLATION OF THE WORK.
20. CONTRACTOR SHALL VISIT THE SITE AND VERIFY ALL EXISTING CONDITIONS PRIOR TO COMMENCING CONSTRUCTION - ALL DISCREPANCIES SHALL BE NOTED AND SENT TO THE ARCHITECT WITH ADEQUATE TIME TO REVIEW PRIOR TO STARTING THAT PORTION OF THE WORK IN ORDER TO AVOID PROJECT DELAYS.
21. ALL REQUESTS FROM INFORMATION PROMPTED BY THE BUILDING OFFICIALS SHALL INCLUDE A COPY OF THE BUILDING OFFICIALS COMMENTS AND THE BUILDING INSPECTORS FIELD REPORT TO ENSURE AN ACCURATE AND TIMELY RESPONSE.
22. CONTRACTOR AND SUBCONTRACTOR SHALL ALL BE LICENSED TO PERFORM THEIR REQUESTED DUTIES AS REQUIRED IN ACCORDANCE WITH LOCAL STANDARDS CONTRACTOR SHALL COMPARE STRUCTURAL SECTIONS WITH ARCHITECTURAL SECTIONS AND REPORT ANY DISCREPANCY TO THE ARCHITECT PRIOR TO FABRICATION OR INSTALLATION OF STRUCTURAL MEMBERS.
23. CONTRACTOR SHALL COMPARE STRUCTURAL SECTIONS WITH ARCHITECTURAL SECTIONS AND REPORT ANY DISCREPANCY TO THE ARCHITECT PRIOR TO FABRICATION OR INSTALLATION OF STRUCTURAL MEMBERS.

ELECTRICAL SYSTEM TASKS WITHIN CONSTRUCTION ZONE:

LIGHTING FIXTURES, TELECOMMUNICATIONS EQUIPMENT AND RELATED CONDUIT

THERE ARE LIGHTING APPURTENANCES WITHIN THE CONSTRUCTION ZONE AT SELECT LOCATIONS THROUGHOUT THE DEMOLITION AREA. FUNCTIONING LIGHTS REQUIRED FOR STATION MANAGEMENT WILL BE REPLACED.
NON-FUNCTIONING/DECOMMISSIONED LIGHTS WITHIN THE CONSTRUCTION ZONE WILL BE VERIFIED TO BE DE-ENERGIZED AND DEMOLISHED. UPON AGREEMENT WITH AMTRAK, NO REPLACEMENT WILL BE REQUIRED AT THESE LOCATIONS.

THE PLAN TO ADDRESS THE PROJECT LIGHTING AND COMMUNICATIONS SYSTEMS WILL BE ADDRESSED IN THE FOLLOWING PHASES:

1. CM & CONTRACTOR IDENTIFY THE PHASES OF CONSTRUCTION AND REQUIRED DECOMMISSIONING OF LIGHTING AND COMMUNICATION SYSTEMS
2. CONTRACTOR DEMOLISH CONDUIT, LIGHTING AND FIXTURES
3. AT COMPLETION OF CONSTRUCTION, CONTRACTOR TO INSTALL SPECIFIED LIGHTING FIXTURES, CONDUIT AND LIGHTING CIRCUIT WIRING
4. AMTRAK B&B PERSONNEL TO MAKE LIVE CONNECTIONS TO LIGHTING AND COMMUNICATION POWER FEEDS AND TEST.

CONDUIT:

AT LOCATIONS THROUGHOUT THE STATION THERE IS CONDUIT INSTALLED BOTH LONGITUDINALLY AND ACROSS THE TRACKS AT THE BENT LINES. IT IS ASSUMED THAT THIS CONDUIT MANAGES LIGHTS AND STATION COMMUNICATION WIRES. MBI (CRS) IS TO COMMUNICATE WITH STATION MASTER TO REVIEW FUNCTIONALITY OF ORIGINAL UNDER CANOPY LIGHTING, PA SYSTEM IN UPPER CANOPY AND REQUIREMENT FOR LIGHTING AT TRACK 2 AREA.
WHERE REQUIRED TO BE REMOVED, ELECTRICAL CONTRACTOR TO DETERMINE IF WIRING WITHIN CONDUIT IS POWERED PRIOR TO DECOMMISSIONING LOCAL WIRING AND CONDUIT.

LIGHTING:

STATION LIGHT FIXTURES WITHIN THE CONSTRUCTION ZONE ARE TO BE DECOMMISSIONED AT JUNCTION BOXES AND DEMOLISHED FOR CONSTRUCTION ACCESS. REINSTALLATION OF CONDUIT AND NEW (IN KIND) EQUIVALENT LIGHTING FIXTURE TO OCCUR AFTER STRUCTURAL AND ARCHITECTURAL MODIFICATIONS ARE COMPLETE.
LIGHTING FIXTURES IN THE CONSTRUCTION ZONE ARE ESTIMATED TO BE PRESENT AT 10 LOCATIONS THROUGHOUT THE PROJECT ON TRACK NO. 1 AND 12 LOCATIONS THROUGHOUT THE PROJECT ON TRACK NO. 2.

COMMUNICATION EQUIPMENT:

SPEAKERS AND CONDUIT AT THE BENT LOCATIONS WITHIN THE CONSTRUCTION ZONE ARE TO BE DECOMMISSIONED AND REMOVED FOR CONSTRUCTION. IF FUNCTION IS VERIFIED, EQUIPMENT IS TO BE REINSTALLED AFTER ALL OTHER CONSTRUCTION.
THE COMMUNICATION EQUIPMENT IN THE CONSTRUCTION ZONE IS ESTIMATED TO BE PRESENT AT 12 LOCATIONS THROUGHOUT THE PROJECT ON TRACK NO. 2.

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN
OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION
GENERAL NOTES
VALUATION PLAN: ---------- MILE POST: PT-353.20
AUTHORITY NO.: ---------- FILE NO.: ----------
MADE BY: EAR DATE: 08-30-2021 CHECKED BY: ----------
SCALE: AS NOTED DRAWING NO.: G-002

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30-AUG-2021

1 PARTIAL SITE PLAN - SHEET 1 OF 2
SCALE: 1" = 100'-0"

CALL BEFORE YOU DIG !

PENNSYLVANIA LAW REQUIRES
3 WORKING DAYS NOTICE FOR CONSTRUCTION PHASE
AND 10 WORKING DAYS IN DESIGN STAGE
BEFORE YOU DIG CALL
THE PA ONE CALL SYSTEM TELEPHONE NUMBER.

1-800-242-1776

PA ONE CALL SERIAL NUMBER

KEYPLAN

1 2 3 4

0 8'-0" 16'-0" 32'-0"
SCALE:1/16" = 1'-0"

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION
PARTIAL SITE PLAN
VALUATION PLAN: ----------- MILE POST: PT-353.20
AUTHORITY NO.: ----------- FILE NO.: -----------
MADE BY: EAR DATE: 08-30-2021 CHECKED BY: -----------
SCALE: AS NOTED DRAWING NO.: AS-001

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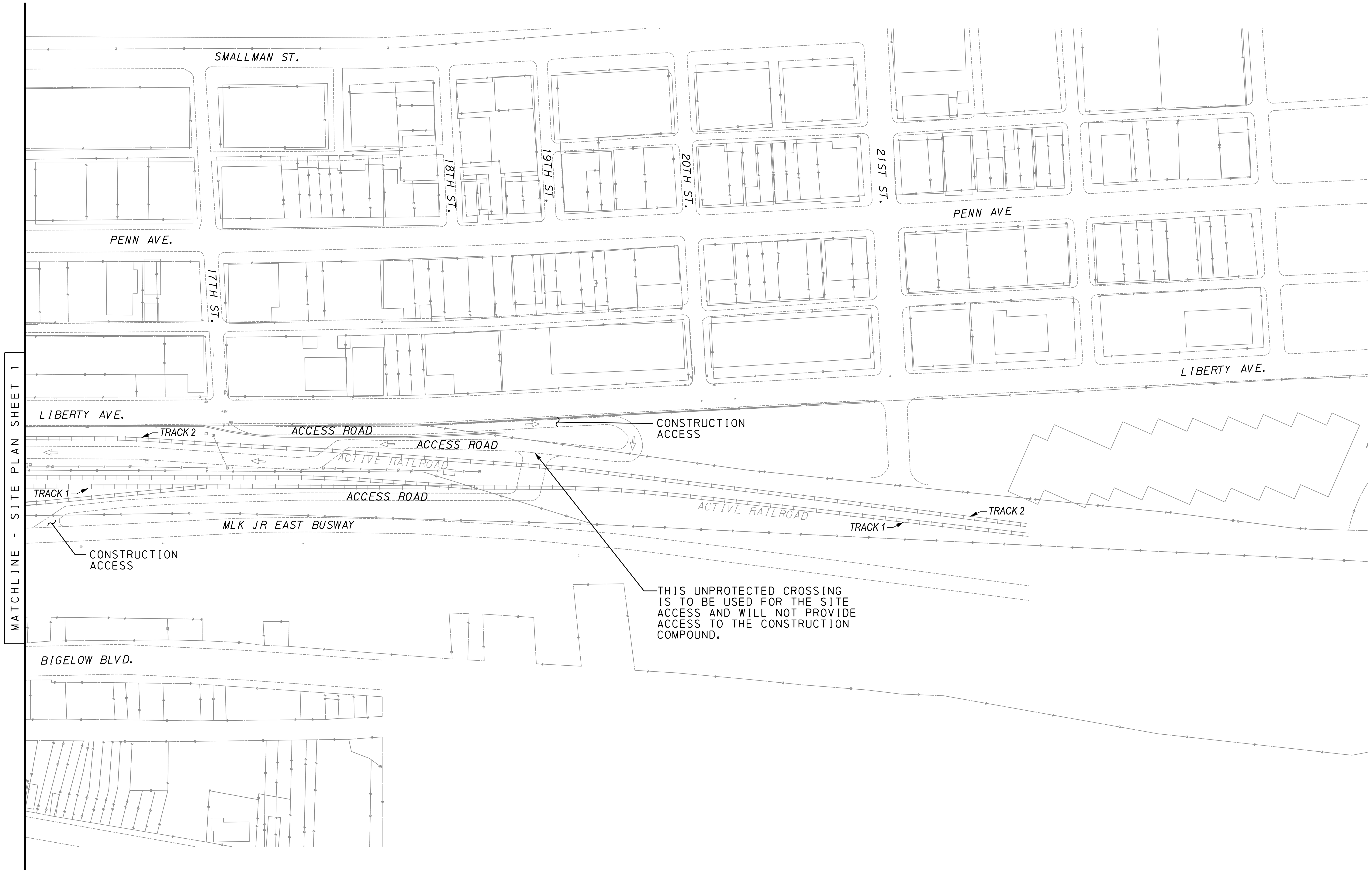
30-AUG-2021

PLAN NORTH



2 PARTIAL SITE PLAN - SHEET 2 OF 2

SCALE: 1" = 100'-0"

6'-0"

4'-0"

NORFOLK SOUTHERN
RAILWAY COMPANY

PITTSBURGH
VERTICAL CLEARANCE
PROJECT

AMTRAK STATION 2021

NORFOLK SOUTHERN PROJECT SIGN

NOT TO SCALE

NOTE:

1. SIGN INFORMATION FOR SIGN POSTED AT ENTRANCE TO RAIL YARD. SIGN TO BE LOCATED BY NORFOLK SOUTHERN MANAGER ON SITE.

KEYPLAN

			4	5

0 8'-0" 16'-0" 32'-0"

SCALE: 1/16" = 1'-0"

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL

1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY

PITTSBURGH DIVISION PITTSBURGH LINE

DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

PARTIAL SITE PLAN

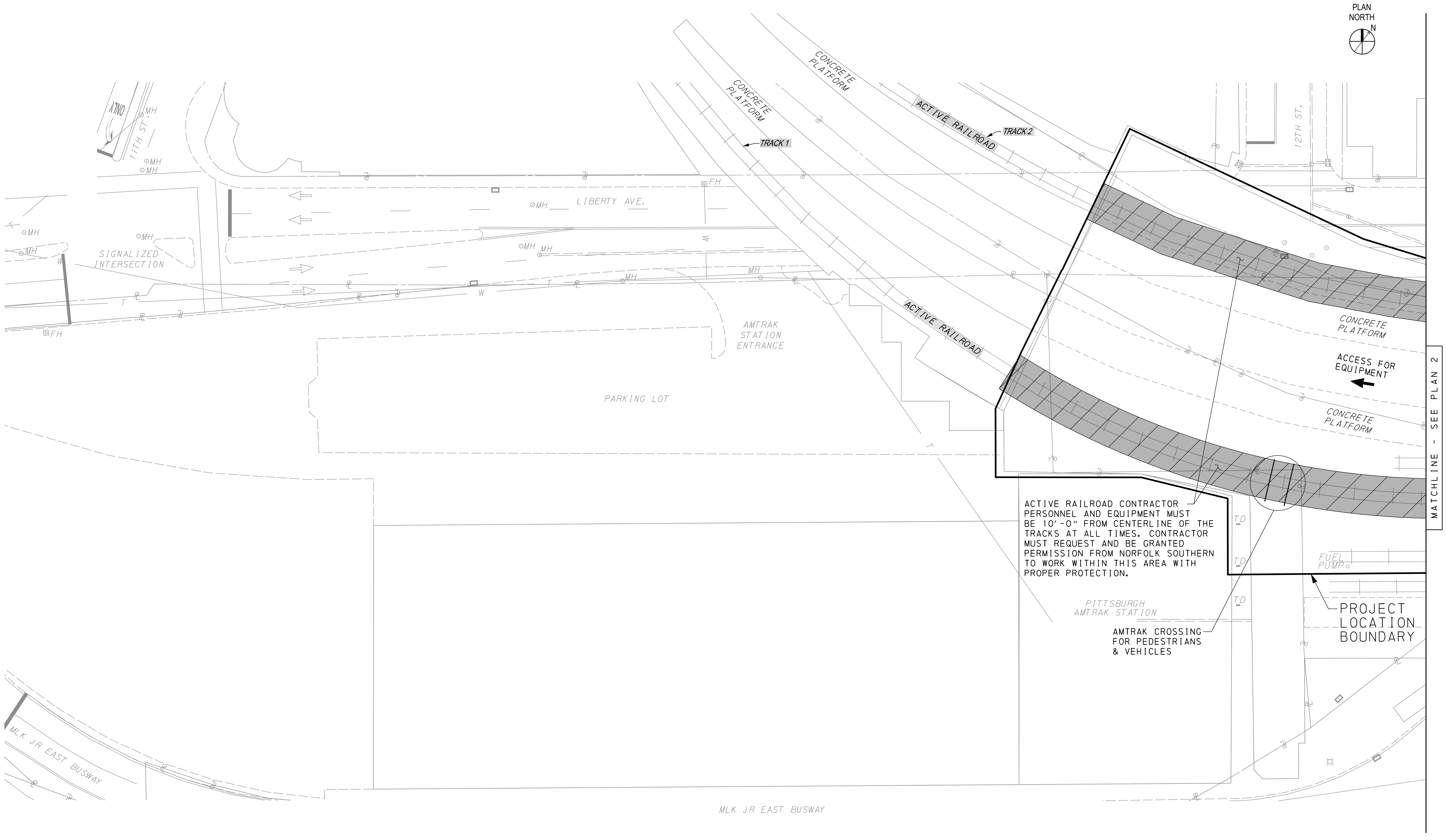
VALUATION PLAN: ---------- MILE POST: PT-353.20

AUTHORITY NO.: ---------- FILE NO.: ----------

MADE BY: EAR DATE: 08-30-2021 CHECKED BY: ----------

SCALE: AS NOTED DRAWING NO.: AS-002

ALTERNATIVE 3



1 DETAIL SITE PLAN - 1
SCALE: 1" = 25'-0"

KEYPLAN

1				

0 8'-0" 16'-0" 32'-0"
SCALE:1/16" = 1' - 0"

NO.	DATE	REVISIONS

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PHILADELPHIA, PA 19103
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NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION
DETAIL SITE PLAN

VALUATION PLAN: ----------- MILE POST: PT-353.20
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MADE BY: EAR DATE: 08-30-2021 CHECKED BY: -----------
SCALE: AS NOTED DRAWING NO.: AS-003

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30-AUG-2021

ALTERNATIVE 3

2 DETAIL SITE PLAN - 2

SCALE: 1" = 25'-0"

KEYPLAN

2

0 8'-0" 16'-0" 32'-0"

SCALE: 1/16" = 1'-0"

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL

1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY

PITTSBURGH DIVISION PITTSBURGH LINE

DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

DETAIL SITE PLAN

VALUATION PLAN: ---------- MILE POST: PT-353.20

AUTHORITY NO.: ---------- FILE NO.: ----------

MADE BY: EAR DATE: 08-30-2021 CHECKED BY: ----------

SCALE: AS NOTED DRAWING NO.: AS-004

ALTERNATIVE 3

3 DETAIL SITE PLAN - 3
SCALE: 1" = 25'-0"

KEYPLAN

3

0 8' - 0" 16' - 0" 32' - 0"
SCALE:1/16" = 1' - 0"

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE
AMTRAK STATION
DETAIL SITE PLAN

VALUATION PLAN: ----------- MILE POST: PT-353.20
AUTHORITY NO.: ----------- FILE NO.: -----------
MADE BY: EAR DATE: 08-30-2021 CHECKED BY: -----------
SCALE: AS NOTED DRAWING NO.: AS-005

ALTERNATIVE 3

4 DETAIL SITE PLAN - 4

SCALE: 1" = 25'-0"

KEYPLAN

4

0 8' - 0" 16' - 0" 32' - 0"

SCALE:1/16" = 1' - 0"

NO.	DATE	REVISIONS

Michael Baker
INTERNATIONAL

1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NS NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY

PITTSBURGH DIVISION PITTSBURGH LINE

DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE
AMTRAK STATION
DETAIL SITE PLAN

VALUATION PLAN: ----------- MILE POST: PT-353.20

AUTHORITY NO.: ----------- FILE NO.: -----------

MADE BY: EAR DATE: 08-30-2021 CHECKED BY: -----------

SCALE: AS NOTED DRAWING NO.: AS-006

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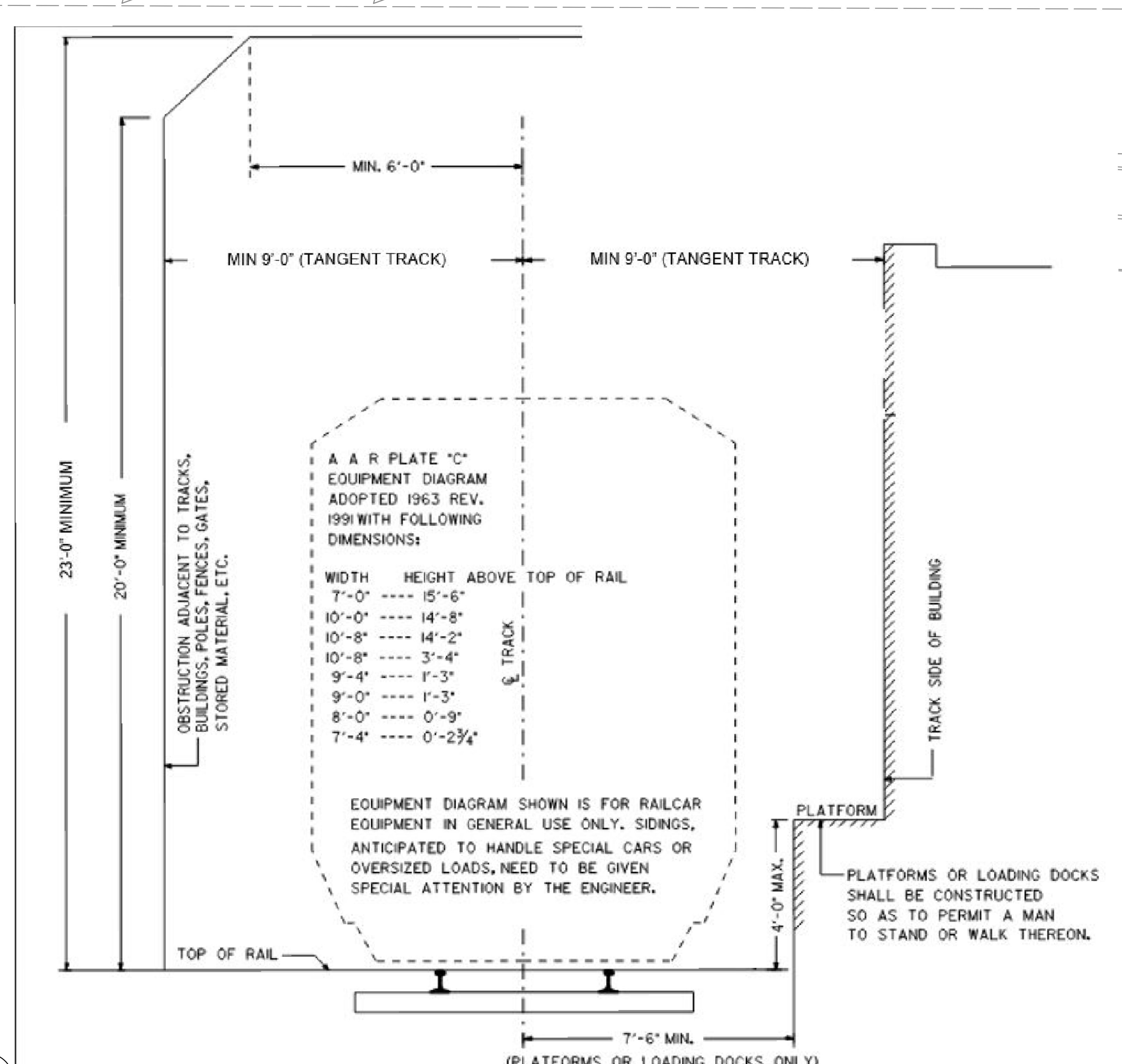
5 DETAIL SITE PLAN - 5
SCALE: 1" = 25'-0"



5A SCALE: 1" = 25'-0"

NOTE:

CONSTRUCTION COMPOUND AND EQUIPMENT ARE TO BE PLACED TO FOLLOW SPECIFICATION DIRECTION. COMPOUND FENCE AND ALL COMPOUND ACTIVITIES ARE TO BE PLACED TO REMAIN OUTSIDE OF CLEARANCE ELEMENT LIMITS IN DIAGRAM.

KEYPLAN

5

0 8'-0" 16'-0" 32'-0"
SCALE:1/16" = 1'-0"

NO.	DATE	REVISIONS

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1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION
DETAIL SITE PLAN

VALUATION PLAN: ----------- MILE POST: PT-353.20
AUTHORITY NO.: ----------- FILE NO.: -----------
MADE BY: EAR DATE: 08-30-2021 CHECKED BY: -----------
SCALE: AS NOTED DRAWING NO.: AS-007

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DESIGN CRITERIA

DC-1 BUILDING CODE: IBC 2015, ASCE7-10

DC-2 LATERAL LOAD DESIGN CRITERIA
- A. RISK CATEGORY — II
- B. WIND DESIGN CRITERIA
  1. ULTIMATE WIND SPEED (Vult) — 115 MPH
  2. NOMINAL WIND SPEED (Vasd) — 89 MPH
  3. EXPOSURE CATEGORY — B
  4. INTERNAL PRESSURE COEFFICIENT — +/- 0.55
- C. SEISMIC DESIGN CRITERIA
  1. SEISMIC IMPORTANCE FACTOR (Ie) — 1.0
  2. SITE CLASS — D (ASSUMED)
  3. SEISMIC DESIGN CATEGORY — B
  4. SHORT PERIOD SPECTRAL ACCELERATION (Ss) = 0.105g
  5. ONE SECOND SPECTRAL ACCELERATION (S1) = 0.053g
  6. SHORT PERIOD RESPONSE ACCELERATION (Sds) = 0.112
  7. ONE SECOND RESPONSE ACCELERATION (Sd1) = 0.085
  8. SEISMIC RESPONSE COEFFICIENT (Cs) = 0.037
  9. SEISMIC RESISTING SYSTEM: STRUCTURAL STEEL SYSTEMS NOT SPECIFICALLY DETAILED FOR SEISMIC RESISTANCE
     A. R = 3

DC-3 GRAVITY LOADS
- A. DEAD LOADS
  1. ROOF — 40 PSF
- B. LIVE LOADS
  1. ROOF — 20 PSF MINIMUM
- C. SNOW LOADS
  1. GROUND SNOW LOAD (Pg) — 25 PSF
  2. FLAT-ROOF SNOW LOAD(Pf) — 20 PSF
  3. SNOW IMPORTANCE FACTOR (Is) — 1.0
  4. SNOW EXPOSURE FACTOR (Ce) — 1.0
  5. THERMAL FACTOR (Ct) — 1.2
  6. ADDITIONAL SNOW DRIFT AND SLIDING SNOW AS PER APPLICABLE BUILDING CODES

GENERAL

G-1 METHODS, PROCEDURES AND SEQUENCES OF CONSTRUCTION ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND IMPLEMENTING THE NECESSARY PRECAUTIONS TO MAINTAIN AND ENSURE THE INTEGRITY OF THE STRUCTURE AT ALL STAGES OF CONSTRUCTION.

G-2 TEMPORARY BRACING, SHEETING, SHORING, ETC, REQUIRED TO ENSURE THE STRUCTURAL INTEGRITY/STABILITY OF THE EXISTING BUILDINGS, UTILITIES, ETC, DURING CONSTRUCTION IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER EMPLOYED BY THE CONTRACTOR.

G-3 IMPLEMENTATION OF JOB SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

G-4 WHEN NOT SPECIFICALLY INDICATED ON THE STRUCTURAL DRAWINGS, THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING REQUIREMENTS FOR PENETRATIONS PRIOR TO FABRICATION OR ERECTION OF THE STRUCTURE.

G-5 PENETRATIONS OF NEW AND EXISTING STRUCTURAL MEMBERS ARE SUBJECT TO APPROVAL BY THE ENGINEER.

G-6 THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING ANCHORAGE AND HANGER REQUIREMENTS REQUIRED FOR SUPPORTING EQUIPMENT, FINISHES, UTILITIES ETCETERA NOT INDICATED ON THE STRUCTURAL DRAWINGS.

G-7 THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING AND COORDINATING DIMENSIONS AND INSTALLATION DETAILS OF PURCHASED EQUIPMENT WITH THE SUPPORTING STRUCTURE. ANY CONFLICTS BETWEEN THESE ITEMS AND THE BUILDING STRUCTURE IS TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION.

G-8 THE STRUCTURAL DRAWINGS GOVERN THE WORK FOR STRUCTURAL FEATURES, UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ON PLANS AND DETAILS ARE TO GOVERN THE STRUCTURAL WORK. THE CONTRACTOR IS TO REFER TO THE ARCHITECTURAL DRAWINGS FOR DIMENSIONS AND DETAILS NOT PROVIDED. DIMENSIONAL CONFLICTS IN THE DOCUMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

G-9 FOR ADDITIONAL INFORMATION NOT COVERED IN THESE GENERAL NOTES, REFER TO THE PROJECT SPECIFICATIONS. IN CASE OF CONFLICT BETWEEN THE GENERAL NOTES, SPECIFICATIONS, AND DRAWINGS, THE MOST STRINGENT REQUIREMENTS AS DETERMINED BY THE ENGINEER WILL GOVERN.

G-10 WORK NOT INDICATED ON A PART OF THE DRAWINGS, BUT REASONABLY IMPLIED TO BE SIMILAR TO THAT SHOWN AT CORRESPONDING LOCATIONS, IS TO BE REPEATED.

G-11 EXISTING BUILDING INFORMATION SHOWN IS BASED UPON EXISTING BUILDING DOCUMENTS AND/OR FROM FIELD OBSERVATION. THE INFORMATION CONTAINED HEREIN MAY REQUIRE ADJUSTMENTS AND/OR MODIFICATIONS TO CONFORM TO EXISTING CONDITIONS. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING BUILDING INFORMATION SHOWN (DIMENSIONS, ELEVATIONS, ETC) AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO FABRICATION OF ANY STRUCTURAL COMPONENT.

G-12 DETAILS DESIGNATED AS "TYPICAL DETAILS," APPLY GENERALLY TO THE DRAWINGS IN AREAS WHERE CONDITIONS ARE SIMILAR TO THOSE DESCRIBED IN THE DETAILS.

G-13 SHOP DRAWINGS:
- A. SHOP DRAWINGS FOR ALL MATERIALS ARE TO BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO THE START OF FABRICATION OR COMMENCEMENT OF WORK.
- B. SHOP DRAWINGS MUST BE CHECKED AND STAMPED BY THE CONTRACTOR PRIOR TO SUBMISSION. THE CONTRACTOR'S STAMP OF APPROVAL WILL CONSTITUTE CERTIFICATION THAT HE HAS VERIFIED ALL FIELD MEASUREMENTS, CONSTRUCTION CRITERIA, MATERIALS AND SIMILAR DATA AND HAS CHECKED EACH DRAWING FOR COMPLETENESS, COORDINATION, AND COMPLIANCE WITH THE CONTRACT DOCUMENTS.
- C. REPRODUCTION OF ANY PORTION OF THE STRUCTURAL CONTRACT DRAWINGS FOR SUBMITTAL AS SHOP DRAWINGS IS PROHIBITED.
- D. CHANGES TO SHOP DRAWINGS THAT ARE RE-SUBMITTED MUST BE CLOUDED OR SOMEHOW INDICATE THAT A CHANGE HAS BEEN MADE TO PREVIOUSLY ISSUED AND REVIEWED DRAWING.
- E. THE CONTRACTOR IS TO PROVIDE THE ENGINEER WITH WRITTEN NOTICE OF DEVIATIONS OF ANY TYPE FROM THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS. THE NOTICE MUST BE RECEIVED PRIOR TO SHOP DRAWING SUBMITTAL. THE CONTRACTOR REMAINS LIABLE FOR ANY DEVIATION UNLESS REVIEWED BY THE ENGINEER AND ACKNOWLEDGED IN WRITING, PRIOR TO THE RECEIPT OF THE SHOP DRAWINGS.

FOUNDATION / CONCRETE

FOUNDATIONS

F-1 FOUNDATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE INFORMATION SHOWN ON EXISTING BUILDING DRAWINGS. NO NEW GEOTECHNICAL REPORT AND RECOMMENDATIONS HAVE BEEN PROVIDED FOR THIS PROJECT.

F-2 FOUNDATIONS ARE TO BE PLACED ON UNDISTURBED SOIL OR COMPACTED FILL CONFORMING TO 95% STANDARD DENSITY PER ASTM D 698 (MAXIMUM FILL LIFT = 8".

F-3 THE CONTRACTOR IS TO RETAIN THE SERVICES OF A PROFESSIONAL GEOTECHNICAL ENGINEER, SUBJECT TO THE APPROVAL OF THE OWNER, TO VERIFY THAT THE MATERIAL ON WHICH FOUNDATIONS BEAR HAS AT LEAST THE CAPACITY AS NOTED IN THE DESIGN CRITERIA. THE GEOTECHNICAL ENGINEER IS TO MAKE RECOMMENDATIONS FOR IMPROVING AREAS THAT DO NOT MEET THE DESIGN CRITERIA.

F-4 ALL EXTERIOR FOOTINGS ARE TO BEAR A MINIMUM OF 42" BELOW FINISHED GRADE. ELEVATIONS SHOWN ON THE DRAWINGS AT WHICH FOUNDATIONS BEAR ARE APPROXIMATE AND MAY VARY TO SUIT SUBSURFACE SOIL CONDITIONS. FOOTING ELEVATIONS SHOWN ON THE DRAWINGS ARE TO BE FIELD VERIFIED AND ADJUSTED AS REQUIRED SO THAT FOUNDATIONS BEAR ON MATERIAL OF AT LEAST THE CAPACITY NOTED ABOVE.

F-5 PRIOR TO PLACING CONCRETE, ANY WATER PRESENT IS TO BE PUMPED OUT FROM THE BOTTOM OF EXCAVATIONS.

REINFORCED CONCRETE

C-1 REINFORCED CONCRETE WORK IS TO BE IN ACCORDANCE WITH THE AMERICAN CONCRETE INSTITUTE (ACI) "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE - ACI 318" (LATEST EDITION) AND THE "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS- ACI 301" (LATEST EDITION).

C-2 MIXING, TRANSPORTING, PLACING AND TESTING OF CONCRETE IS TO BE DONE IN ACCORDANCE WITH ACI 301.

C-3 PRIOR TO CONCRETE PLACEMENT, THE CONTRACTOR MUST SUBMIT CONCRETE MIX DESIGNS FOR EACH TYPE OF CONCRETE TO BE USED, PREPARED IN ACCORDANCE WITH THE SPECIFICATIONS TO THE ENGINEER FOR REVIEW.

C-4 THE SLUMP AT POINT OF PLACEMENT IS NOT TO EXCEED 4"+/-1" AND THE WATER/CEMENT RATIO IS NOT TO EXCEED 0.45. IF ADDITIONAL SLUMP (UP TO 8") IS DESIRED FOR PUMPING, A SUPER-PLASTICIZER ADMIXTURE MAY BE ADDED.

C-5 CONCRETE EXPOSED TO WEATHER AND FREEZE/THAW SHALL BE AIR ENTRAINED IN ACCORDANCE WITH ACI RECOMMENDATIONS. AIR ENTRAINING ADMIXTURE SHALL CONFORM TO ASTM C260.

C-6 CONCRETE TO BE NORMAL WEIGHT CONCRETE (145 PCF) WITH MINIMUM 28 DAY COMPRESSIVE STRENGTH (f'c) = 4,000 PSI AND CEMENT CONFORMING TO ASTM C 150, TYPE I, II OR III.

C-7 REINFORCEMENT:
- A. DEFORMED BARS: ASTM A 615/A 615M, GRADE 60

C-8 REINFORCEMENT IS TO BE DETAILED, FABRICATED, AND PLACED IN ACCORDANCE WITH THE ACI "DETAILING MANUAL NO. SP-66" (LATEST EDITION).

C-9 SPLICES (LAPS) OF REINFORCING BARS SHALL BE CLASS 'B' TENSION LAPS PER ACI 318 (LATEST EDITION) UNLESS NOTED OTHERWISE.

C-10 PROVIDE ADEQUATE CONCRETE COVER IN ACCORDANCE WITH THE REQUIREMENTS AS SET FORTH BY ACI 318.

C-11 REINFORCEMENT IS TO BE SECURELY HELD IN PLACE WHILE PLACING CONCRETE. IF REQUIRED, ADDITIONAL BARS, STIRRUPS, OR CHAIRS WILL BE PROVIDED BY THE CONTRACTOR TO FURNISH SUPPORT FOR ALL BARS WHERE NECESSARY DURING CONSTRUCTION.

C-12 LEVELING GROUT TO BE NON-SHRINK, NON-METALLIC TYPE, FACTORY PREMIXED GROUT IN ACCORDANCE WITH ASTM C 1107, HAVING A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 5000 PSI.

C-13 ANCHOR RODS TO BE ASTM F 1554 Fy=36 KSI MINIMUM, GALVANIZED, UNLESS NOTED OTHERWISE.

STRUCTURAL STEEL

S-1 STRUCTURAL STEEL WORK IS TO BE DETAILED AND CONSTRUCTED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS" (FOURTEENTH EDITION) AND THE "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES".

S-2 STRUCTURAL STEEL, UNLESS NOTED OTHERWISE, TO CONFORM TO THE REQUIREMENTS OF ASTM STANDARDS AS INDICATED ON THE STEEL MATERIAL SCHEDULE ON DRAWING S-002.

S-3 PRIOR TO FABRICATION, THE STEEL FABRICATOR IS TO SUBMIT TO THE ENGINEER FOR REVIEW THE FOLLOWING:
- A. DESIGN CALCULATIONS OF STRUCTURAL STEEL CONNECTIONS, PREPARED BY OR UNDER THE SUPERVISION OF, A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF PENNSYLVANIA, AND BEARING THE SEAL OF THE PROFESSIONAL ENGINEER.
- B. SHOP DRAWINGS SHOWING ERECTION PLANS, PIECE DRAWINGS, AND CONNECTION DETAILS.

S-4 THE STRUCTURAL STEEL FABRICATOR, AND/OR GENERAL CONTRACTOR, MUST VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS AT THE SITE. ALL DISCREPANCIES FOUND ARE TO BE REPORTED TO THE ENGINEER PRIOR TO PREPARATION OF SHOP DRAWINGS. SHOP DRAWINGS ARE TO INCLUDE ALL FIELD MEASUREMENTS AND CONDITIONS.

S-5 STRUCTURAL STEEL FABRICATOR IS TO PROVIDE FOR VERTICAL AND HORIZONTAL FIELD ADJUSTMENT OF ALL SUPPORT ASSEMBLIES.

S-6 CUTS, HOLES, COPING, ETC REQUIRED FOR OTHER TRADES MUST BE SHOWN ON THE SHOP DRAWINGS AND MADE IN THE SHOP. CUTS OR BURNING OF HOLES IN THE FIELD WILL NOT BE PERMITTED.

S-7 UNLESS OTHERWISE NOTED, STRUCTURAL STEEL CONNECTIONS TO BE SHOP WELDED AND FIELD BOLTED.
- A. BOLTS: 3/4" DIAMETER ASTM A 325 UNO WITH MATCHING WASHERS AND HEAVY HEX NUTS. USE TENSION CONTROL BOLT ASSEMBLIES CONFORMING TO ASTM F 1852 UNO.
- B. ALL WELDS SHALL BE ¼" FILLET WELDS UNLESS NOTED OTHERWISE.

S-8 WELDING TO BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY (AWS) "STRUCTURAL WELDING CODE-ANSI/AWS D1.1/D1.1M" (LATEST EDITION). USE E70XX ELECTRODES UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

S-9 PAINT AND PROTECTION:
- A. NEW STRUCTURAL STEEL SHALL HAVE SURFACES PREPARED IN ACCORDANCE WITH SSPC-SP6/NACE NO. 3 COMMERCIAL BLAST CLEANING. EXISTING STRUCTURAL STEEL INDICATED TO BE PAINTED SHALL HAVE SURFACES PREPARED IN ACCORDANCE WITH SSPC-SP3 POWER TOOL CLEANING.
- B. NEW STRUCTURAL STEEL SHALL BE SHOP PRIMED. REFER TO SPECIFICATION 0 99113 - EXTERIOR PAINTING FOR PRIMER AND FINISH PAINT SYSTEM.
- C. REFER TO STRUCTURAL ELEVATION DRAWINGS FOR LIMITS OF STRUCTURAL STEEL PAINTING. LIMITS PERTAIN TO NEW AND EXISTING BEAMS AND ASSOCIATED REINFORCING MEMBERS ALONG BENTS.
- D. NEW AND SALVAGED STEEL FRAMING ASSOCIATED WITH THE EXHAUST JACKS S HALL BE PREPARED AND PAINTED IN ACCORDANCE WITH REQUIRMENTS ABOVE.
- E. DO NOT PAINT STEEL WHERE IT WILL BE ENCASED WITH CONCRETE OR WHERE FIELD WELDS ARE ANTICIPATED.

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION — PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

STRUCTURAL DESIGN CRITERIA, & GENERAL NOTES

VALUATION PLAN: — MILE POST: PT-353.20
AUTHORITY NO.: — FILE NO.:
MADE BY: WCA — DATE: 05-21-2021 — CHECKED BY: NLB
SCALE: AS NOTED — DRAWING NO.: S-001

ABBREVIATIONS

A	
A/E	ARCHITECT/ENGINEER
AB	ANCHOR BOLT
ABV	ABOVE
ACI	AMERICAN CONCRETE INSTITUTE
ADDL	ADDITIONAL
ADJ	ADJACENT, ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALT	ALTERNATE
APPROX	APPROXIMATE(LY)
ARCH	ARCHITECT OR ARCHITECTURAL
ASTM	AMERICAN SOCIETY FOR TESTING MATERIAL
AVG	AVERAGE
B	
B PL	BASE PLATE OR BEARING PLATE
B/	BOTTOM OF
B/C	BOTTOM OF CURB
BD	BOARD
BF	BOTH FACES
BFF	BELOW FINISHED FLOOR
BIT	BITUMINOUS
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BENCH MARK
BM	BEAM
BOT	BOTTOM
BR	BRICK
BRG	BEARING
BRKT	BRACKET
BS	BOTH SIDES
BSMT	BASEMENT
BT	BENT
BTWN	BETWEEN
C	
CB	CATCH BASIN
CC	CENTER TO CENTER
CEM PL	CEMENT PLASTER
CF	CUBIC FOOT OR CUBIC FEET
CHAM	CHAMFER
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CL	CENTER LINE
CLR	CLEAR
CMU	COMCRETE MASONRY UNIT
CO	CLEAN OUT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
COOR	COORDINATE
CORR	CORRIDOR
CRSE	COURSE
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
CY	CUBIC YARD
D	
db	BAR DIAMETER
DBL	DOUBLE
DET	DETAIL
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DL	DEAD LOAD
DN	DOWN
DTL	DETAIL
DWG	DRAWING
DWL	DOWEL

E	
E	EAST
EA	EACH
EF	EACH FACE
EIFS	EXTERIOR INSULATION FINISH SYSTEM
EJ	EXPANSION JOINT
ELE	ELEVATOR
ELEC	ELECTRICAL
ELEV	ELEVATION
EMBED	EMBED(ED)(MENT)
ENCL	ENCLOSE(URE)
ENGR	ENGINEER
EOS	EDGE OF SLAB
EQ	EQUAL
EQUIP	EQUIPMENT
EST	ESTIMATE(D)
EW	EACH WAY
EXC	EXCAVATE OR EXCAVATION
EXCL	EXCLUDE(ING)
EXIST	EXISTING
EXP	EXPANSION
EXP BLT	EXPANSION BOLT
EXT	EXTERIOR
F	
F/F	FACE TO FACE
FD	FLOOR DRAIN
FDN	FOUNDATION
FF	FAR FACE
FIN	FINISH(ED)
FL	FLOOR
FPRF	FIREPROOF(ING)
FS	FAR SIDE
FT	FOOT/FEET
FTG	FOOTING
G	
GA	GAUGE
GALV	GALVANIZED
GB	GRADE BEAM
GC	GENERAL CONTRACTOR
GD	GRADE(ING)
GRAV	GRAVEL
GRD	GROUND
GRT	GROUT
H	
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HP	HIGH POINT
HT	HEIGHT
I	
ID	INSIDE DIAMETER
IN	INCH(ES)
INCL	INCLUDE
INFO	INFORMATION
INT	INTERIOR
ISO JT	ISOLATION JOINT
J	
JB	JAMB
JST	JOIST
JT	JOINT
K	
K	KIP(S)
KB	KNEE BRACE
KCF	KIPS PER CUBIC FEET
KLF	KIPS PER LINEAR FOOT
KSF	KIPS PER SQAURE FEET
KSI	KIPS PER SQAURE INCH
L	
L	LENGTH
LB	POUND
ld	DEVELOPMENT LENGTH
LF	LINEAL FOOT
LG	LONG
LGT	LENGTH
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL
LP	LOW POINT
LTL	LINTEL

M	
M/E/P	MECHANICAL, ELECTRICAL, & PLUMBING
MANUF	MANUFACTURE
MAS	MASONARY
MATL	MATERIAL
MAX	MAXIMUM
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MEMB	MEMBRANE
MEZZ	MEZZANINE
MFR	MANUFACTURE
MH	MANHOLE
MID	MIDDLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLTP	MULTIPLE
MO	MASONRY OPENING
MP	MASONRY PIER
MTL	METAL
N	
N	NORTH
NF	NEAR FACE
NIC	NOT IN CONTRACT
NM	NORMAL
NO	NUMBER
NOM	NOMINAL
NS	NEAR SIDE
NTS	NOT TO SCALE
O	
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPNG	OPENING
OPP HAND	OPPOSITE HAND
OZ	OUNCE
P	
PART	PARTITION
PCF	POUNDS PER CUBIC FEET
PCI	POUNDS PER CUBIC INCH
PEMB	PRE-ENGINEERED METAL BUILDING
PERF	PERFORATED
PERM	PERIMETER
PL	PLATE
PLF	POUNDS PER LINEAR FOOT
PLYWD	PLYWOOD
PRCST	PRECAST
PREFAB	PREFABRICATED
PREMLD	PREMOLDED
PROP	PROPERTY
PROT	PROTECT, PROTECTED, OR PROTECTION
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GUAGE
PT	POINT
PVMT	PAVEMENT
Q	
QTY	QUANTITY
R	
RAD	RADIUS OR RADII
RD	ROOF DRAIN
RE:	REFER TO
REC	RECESSED
REINF	REINFORCE(ING)(MENT)
REQ'D	REQUIRED
REV	REVISION OR REIVSE
RF	ROOF
RO	ROUGH OPENING
RTU	ROOF TOP UNIT

S	
S	SOUTH
SC	SLIP CRITICAL
SCHED	SCHEDULE
SDI	STEEL DECK INSTITUTE
SECT	SECTION
SF	SQUARE FOOT
SHT	SHEET
SIM	SIMILAR
SL	SLOPE(D) OR SLOPING
SLV	SLEEVE
SOG	SLAB ON GRADE
SP	SPACE(S) OR SPACING
SPEC	SPECIFY, SPECIFIED OR SPECIFICATIONS
SQ	SQUARE
SQ FT	SQUARE FOOT
SS	STAINLESS STEEL
STD	STANDARD
STIFF	STIFFENER
STL	STEEL
STRUCT	STRUCTURAL
SUSP	SUSPEND, SUSPENED, OR SUSPENSION
T	
T	THICKNESS
T&B	TOP & BOTTOM
T/	TOP OF
T/C	TOP OF CURB
TEMP	TEMPORARY
TERM	TERMINATE / TERMINAL
THD	THREAD(ED)
THK	THICKNESS
THRESH	THRESHOLD
TRANS	TRANSVERSE
TRTD	TREATED
TSF	TONS PER SQUARE FEET
TYP	TYPICAL
U	
UNO	UNLESS NOTED OTHERWISE
V	
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	
W	WEST
W	WIDTH
W/	WITH
W/O	WITHOUT
WL	WIND LOAD
WP	WORKING POINT
WT	WEIGHT
WWF	WELDED WIRE REINFOREMENT

SYMBOLS

∠	ANGLE	⊥ ( )	PERPENDICULAR
@	AT	PL	PLATE
℄	CENTERLINE	S( )	AMERICAN STANDARD SHAPE
()°	DEGREE	L( )	ANGLE
ø	DIAMETER	C( )	CHANNEL
	ELEVATION	LL( )	DOUBLE ANGLE
=	EQUAL	HSS( )	HOLLOW STRUCTURAL SECTION
()'	FOOT OR FEET	MC( )	MISCELLANEOUS CHANNEL
()"	INCH OR INCHES	WT( )	STRUCTURAL TEE
#	NUMBER	W( )	WIDE FLANGE
// ( )	PARALLEL	K( )	OPEN WEB STEEL JOIST
%	PERCENT		

STEEL MATERIALS SCHEDULE

STRUCTURAL ELEMENT	Fy YIELD STRENGTH (KSI)	REMARKS
WIDE FLANGE SHAPES	50	ASTM A992/A992M
ANGLE & CHANNEL SHAPES	36	ASTM A36/A36M
CONNECTIONS, PLATES & ALL OTHERS	36	ASTM A36/A36M
ANCHOR RODS	36	ASTM F 1554
HSS RECTANGULAR TUBE	46	ASTM A500 GRADE B
HSS ROUND TUBE	42	ASTM A500 GRADE B

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(215) 568-0539

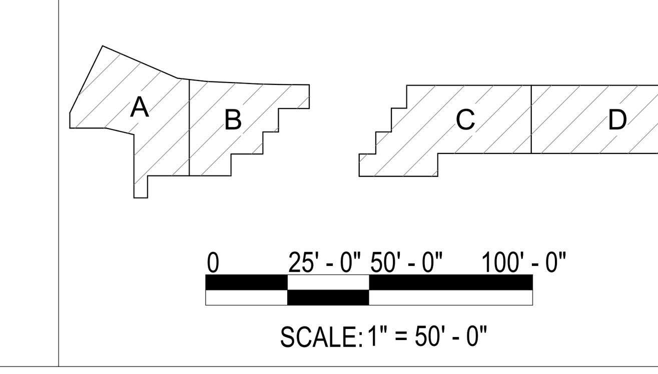
NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION
STRUCTURAL GENERAL NOTES, ABBREVIATIONS & SYMBOLS
VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-002

1 COMPREHENSIVE PLAN
1" = 50'-0"

N

KEYPLAN



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NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY

PITTSBURGH DIVISION PITTSBURGH LINE

DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

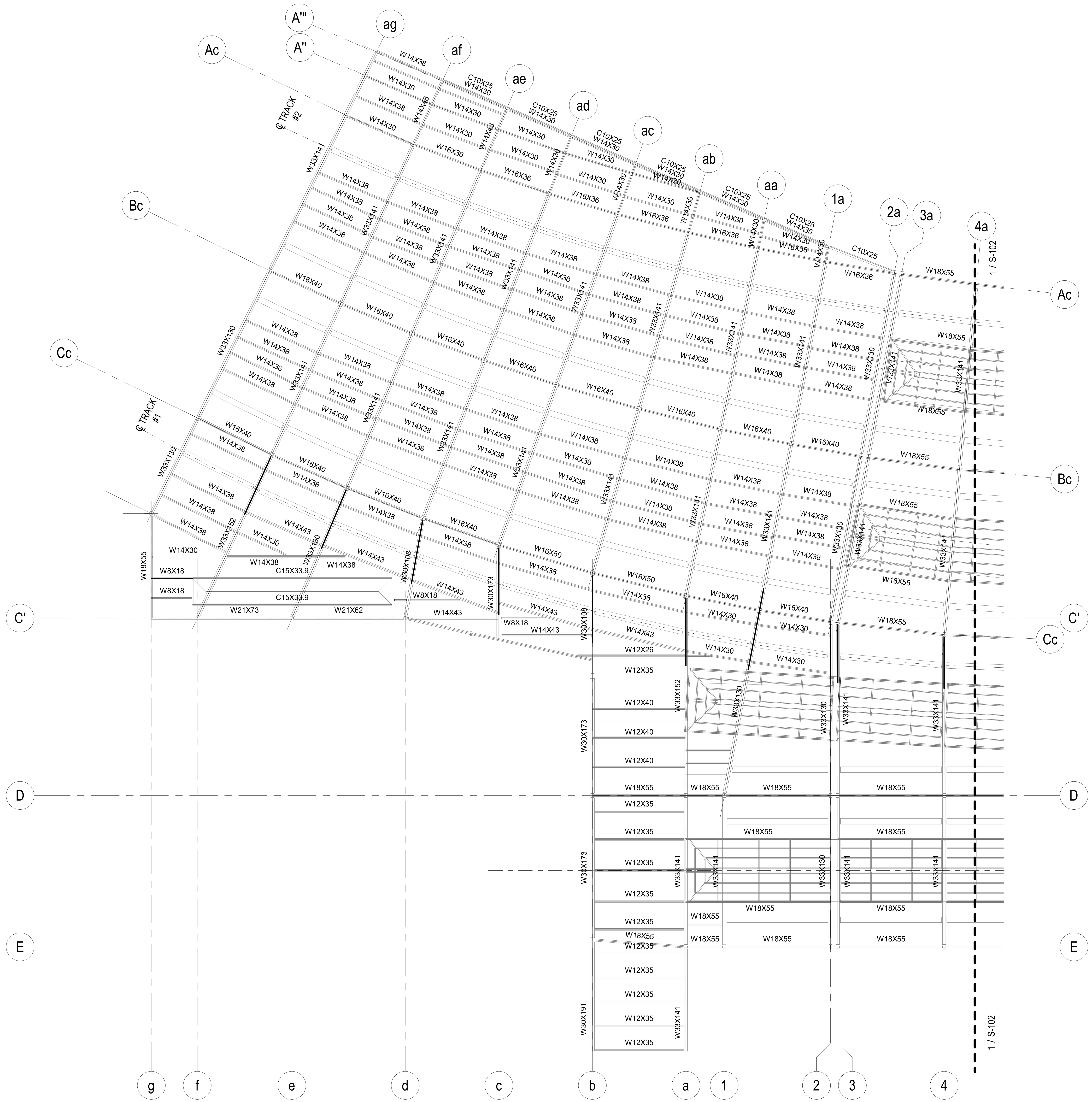
COMPREHENSIVE PLAN

VALUATION PLAN: MILE POST: PT-353.20

AUTHORITY NO.: FILE NO.:

MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB

SCALE: AS NOTED DRAWING NO.: S-100

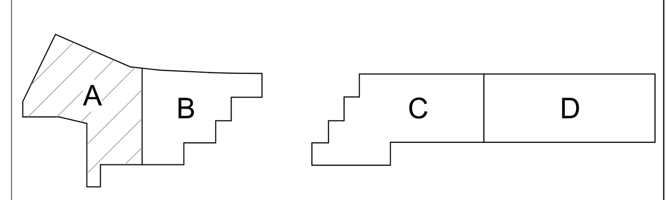


1 FRAMING PLAN - AREA A
1/16" = 1'-0"

PLAN NOTES

1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS, MEMBER SIZES AND ELEVATIONS FOR COORDINATION WITH NEW WORK.
3. COORDINATE DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.
4. REFER TO S-200 SERIES DRAWINGS FOR FRAMING BENT ELEVATIONS CORRESPONDING TO GRID LINE DESIGNATIONS.

KEYPLAN



0 8' - 0" 16' - 0" 32' - 0"
SCALE: 1/16" = 1' - 0"

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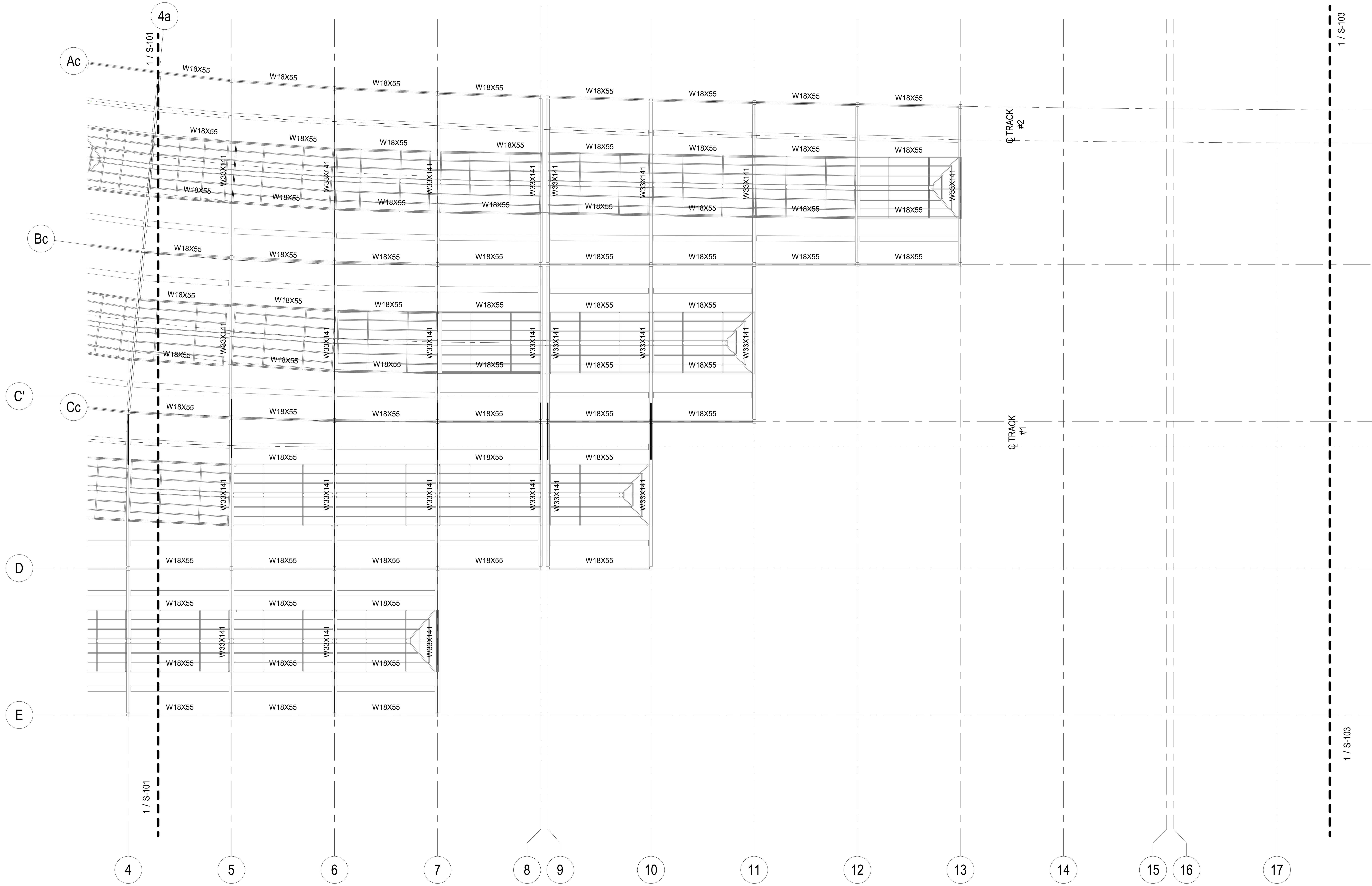
NORFOLK SOUTHERN
OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION
FRAMING PLAN - AREA A
VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-101

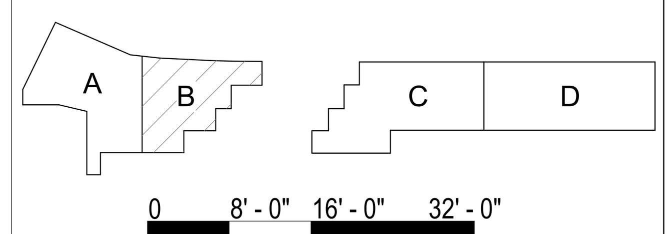


1 FRAMING PLAN - AREA B
1/16" = 1'-0"

PLAN NOTES

1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS, MEMBER SIZES AND ELEVATIONS FOR COORDINATION WITH NEW WORK.
3. COORDINATE DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.
4. REFER TO S-200 SERIES DRAWINGS FOR FRAMING BENT ELEVATIONS CORRESPONDING TO GRID LINE DESIGNATIONS.

KEYPLAN



SCALE: 1/16" = 1' - 0"

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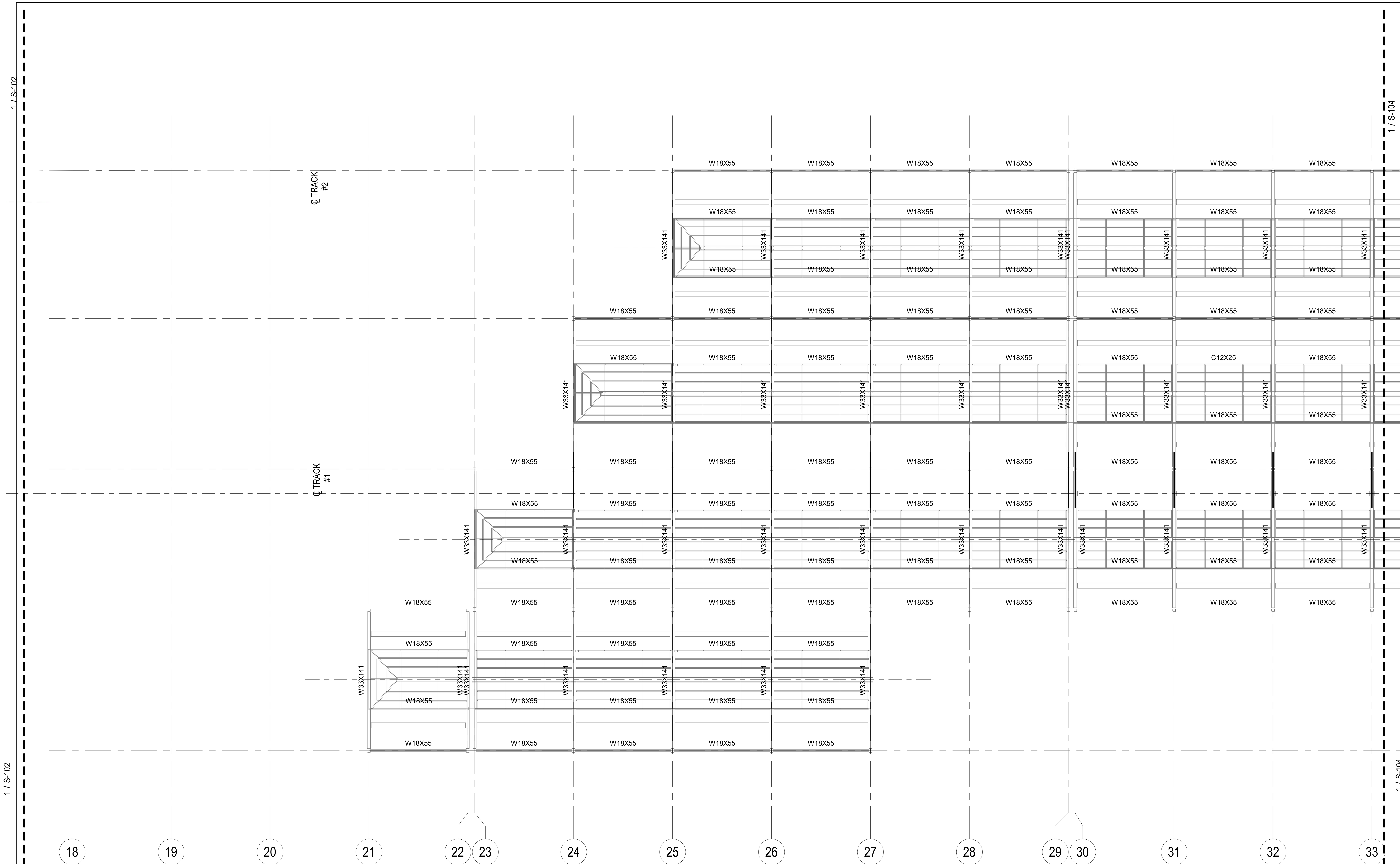
NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE
AMTRAK STATION
FRAMING PLAN - AREA B

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-102



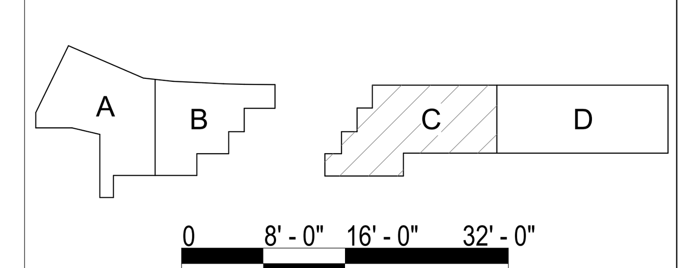
1 FRAMING PLAN - AREA C

1/16" = 1'-0"

PLAN NOTES

1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS, MEMBER SIZES AND ELEVATIONS FOR COORDINATION WITH NEW WORK.
3. COORDINATE DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.
4. REFER TO S-200 SERIES DRAWINGS FOR FRAMING BENT ELEVATIONS CORRESPONDING TO GRID LINE DESIGNATIONS.

KEYPLAN



SCALE: 1/16" = 1' - 0"

NO.	DATE	REVISIONS

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NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY

PITTSBURGH DIVISION PITTSBURGH LINE

DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

FRAMING PLAN - AREA C

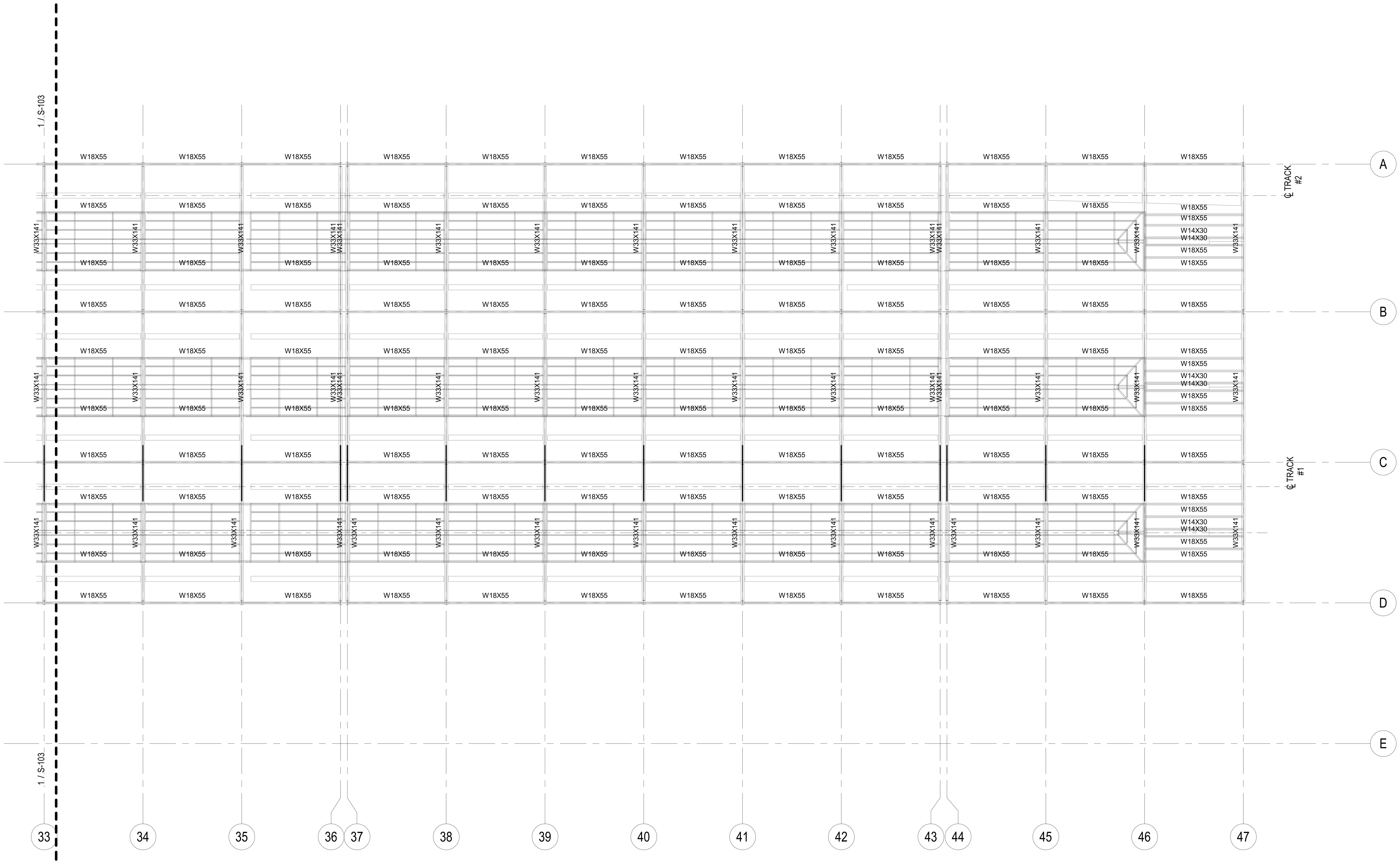
VALUATION PLAN: MILE POST: PT-353.20

AUTHORITY NO.: FILE NO.:

MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB

SCALE: AS NOTED DRAWING NO.: S-103

ALTERNATIVE 3

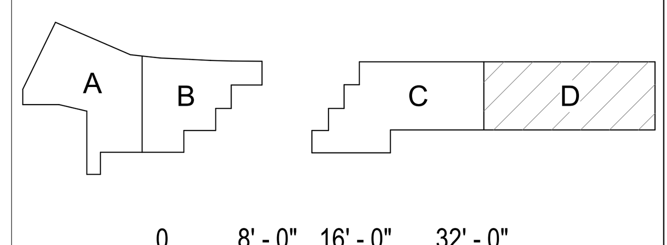


1 FRAMING PLAN - AREA D
1/16" = 1'-0"

PLAN NOTES

1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENTIONS AND ELEVATIONS AND COORDINATE WITH NEW WORK.
3. COORDINATE DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.

KEYPLAN



SCALE: 1/16" = 1' - 0"

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NORFOLK SOUTHERN

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DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

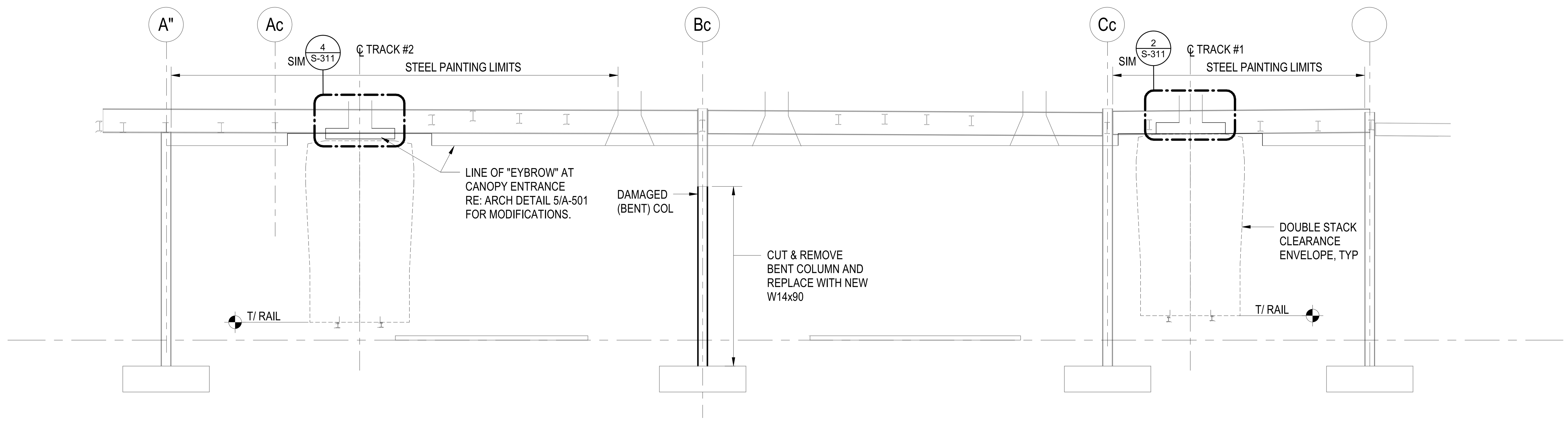
FRAMING PLAN - AREA D

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-104

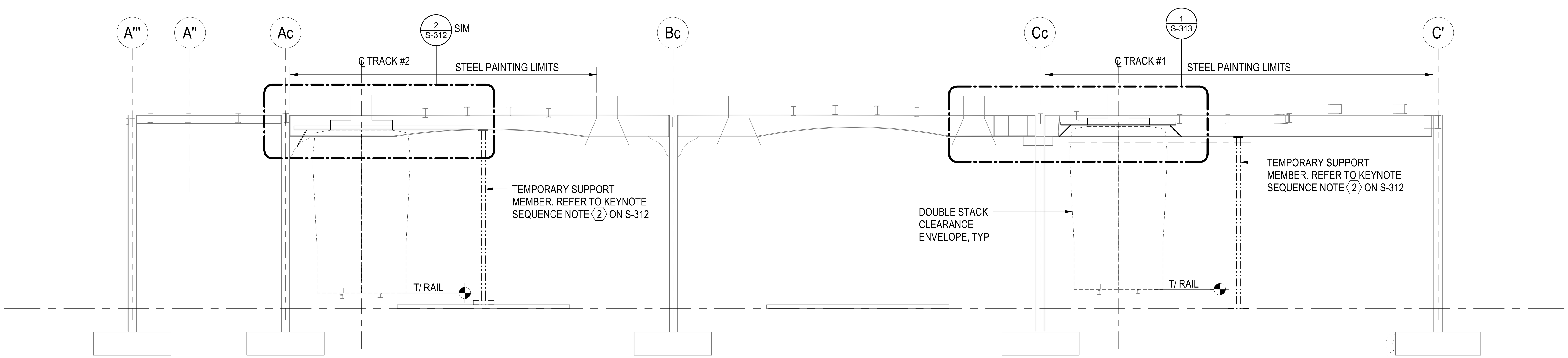
ALTERNATIVE 3

ELEVATION NOTES

1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS, MEMBER SIZES AND ELEVATIONS FOR COORDINATION WITH NEW WORK.
3. COORDINATE DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.
4. REFER TO S-100 SERIES DRAWINGS FOR FRAMING BENT LOCATIONS CORRESPONDING TO GRID LINE DESIGNATIONS.



1 BENT ag
1/8" = 1'-0"



2 BENT af
1/8" = 1'-0"

0 4' - 0" 8' - 0" 16' - 0"
SCALE: 1/8" = 1' - 0"

NO.	DATE	REVISIONS

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NORFOLK SOUTHERN
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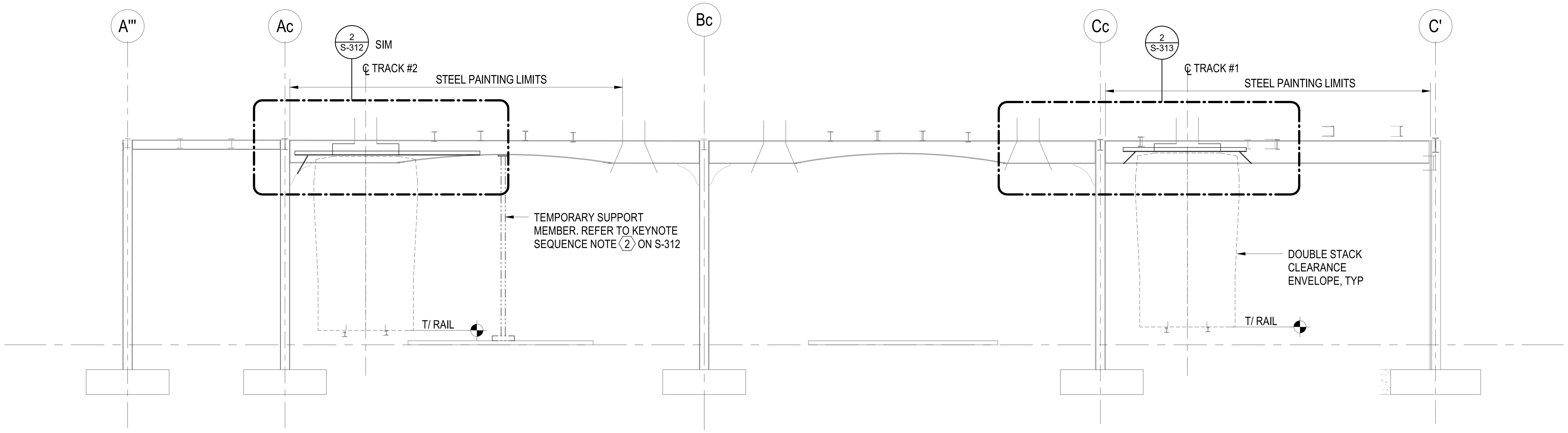
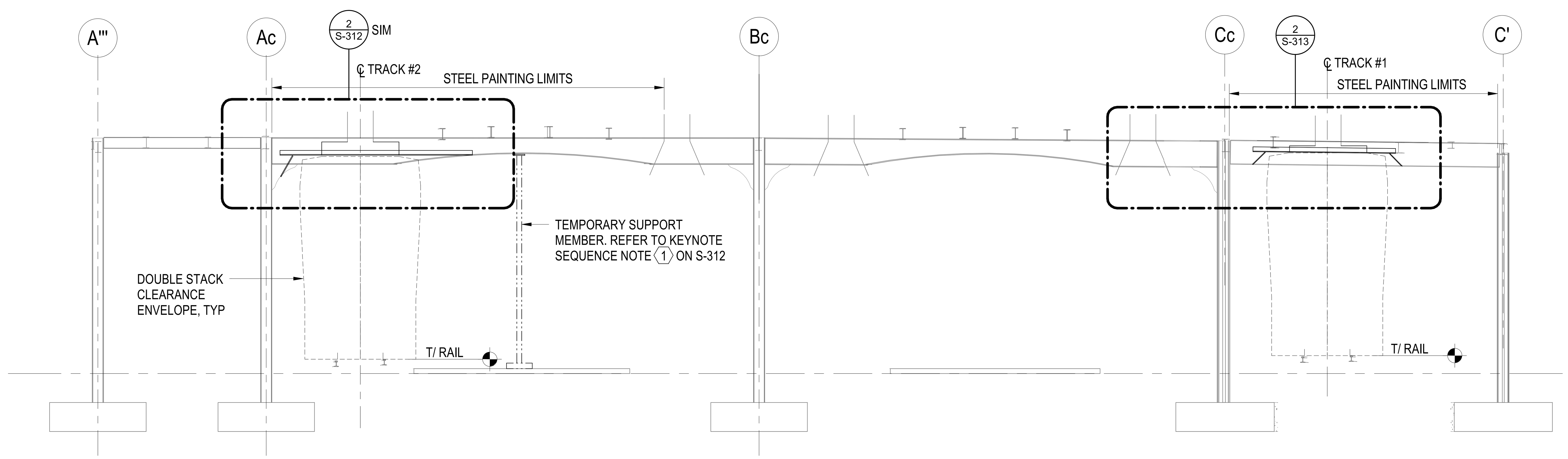
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

STRUCTURAL ELEVATION BENT ag & af

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-201



1 BENT ae
1/8" = 1'-0"



2 BENT ad
1/8" = 1'-0"

ELEVATION NOTES

1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS, MEMBER SIZES AND ELEVATIONS FOR COORDINATION WITH NEW WORK.
3. COORDINATE DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.
4. REFER TO S-100 SERIES DRAWINGS FOR FRAMING BENT LOCATIONS CORRESPONDING TO GRID LINE DESIGNATIONS.

0 4' - 0" 8' - 0" 16' - 0"
SCALE: 1/8" = 1' - 0"

NO.	DATE	REVISIONS

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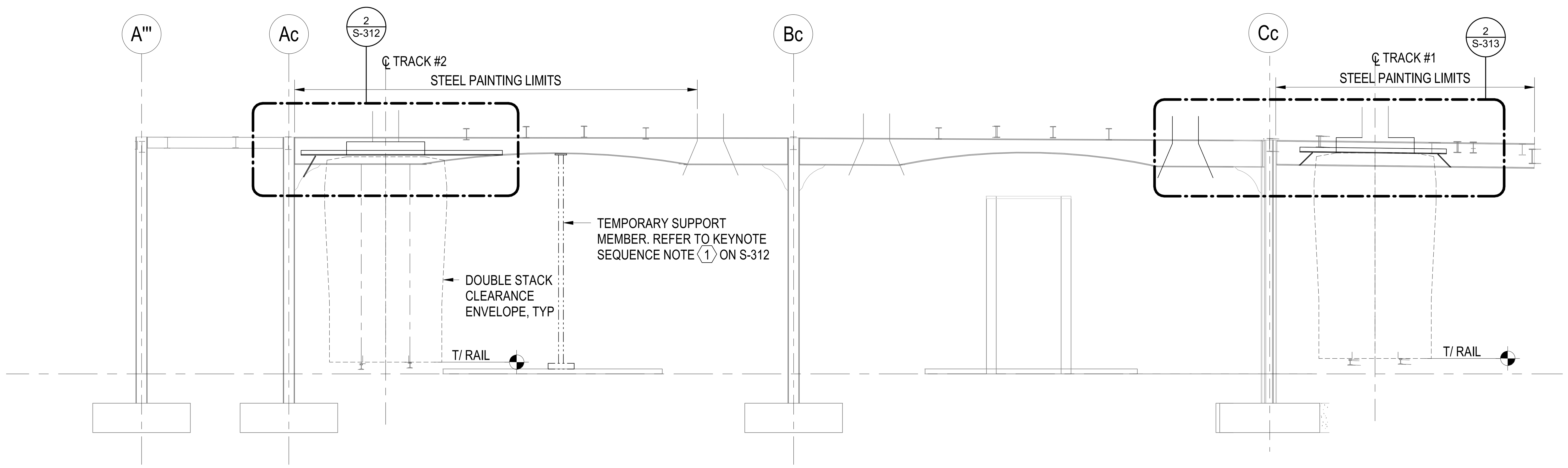
AMTRAK STATION

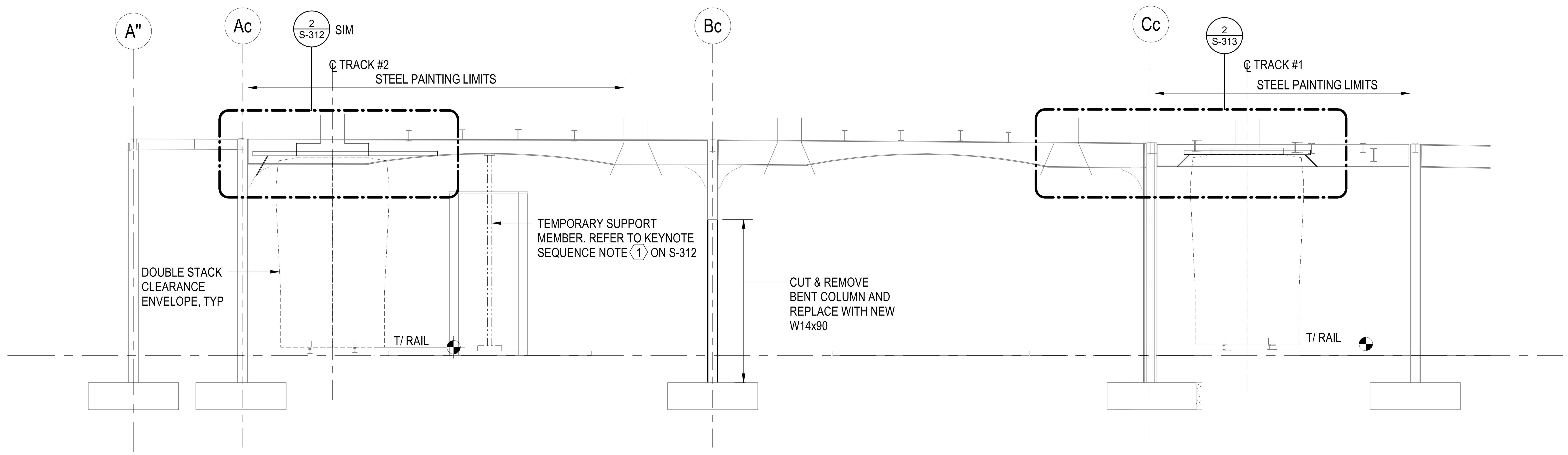
STRUCTURAL ELEVATION BENT ae & ad

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-202

ALTERNATIVE 3



1 BENT ac
1/8" = 1'-0"



2 BENT ab
1/8" = 1'-0"

ELEVATION NOTES

1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS, MEMBER SIZES AND ELEVATIONS FOR COORDINATION WITH NEW WORK.
3. COORDINATE DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.
4. REFER TO S-100 SERIES DRAWINGS FOR FRAMING BENT LOCATIONS CORRESPONDING TO GRID LINE DESIGNATIONS.

0 4' - 0" 8' - 0" 16' - 0"
SCALE: 1/8" = 1' - 0"

NO.	DATE	REVISIONS

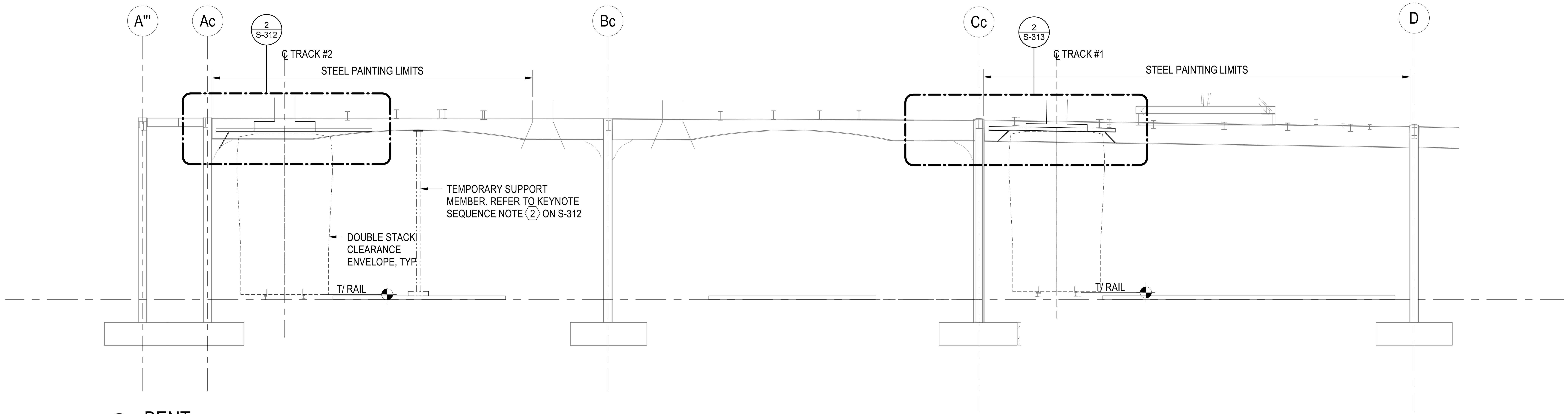
Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

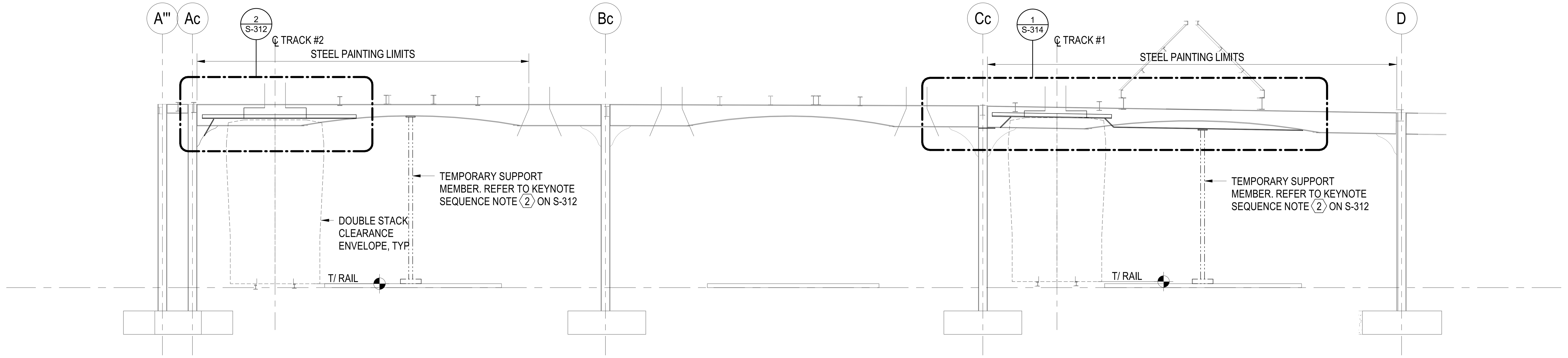
OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION
STRUCTURAL ELEVATION BENT ac & ab
VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-203

ELEVATION NOTES

1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS, MEMBER SIZES AND ELEVATIONS FOR COORDINATION WITH NEW WORK.
3. COORDINATE DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.
4. REFER TO S-100 SERIES DRAWINGS FOR FRAMING BENT LOCATIONS CORRESPONDING TO GRID LINE DESIGNATIONS.



1 BENT aa
1/8" = 1'-0"



2 BENT 1a
1/8" = 1'-0"

0 4' - 0" 8' - 0" 16' - 0"
SCALE: 1/8" = 1' - 0"

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
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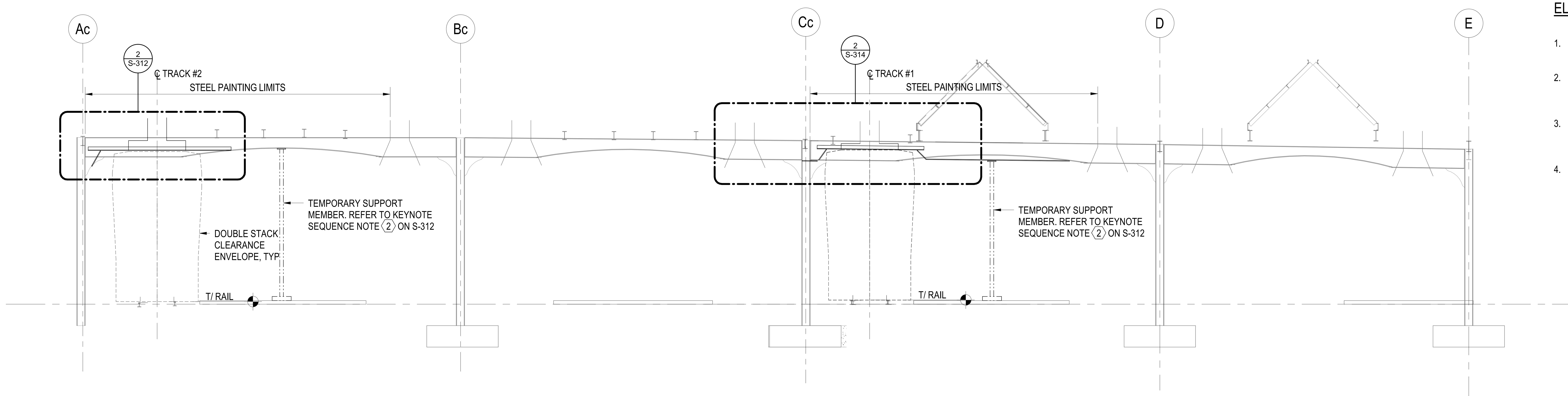
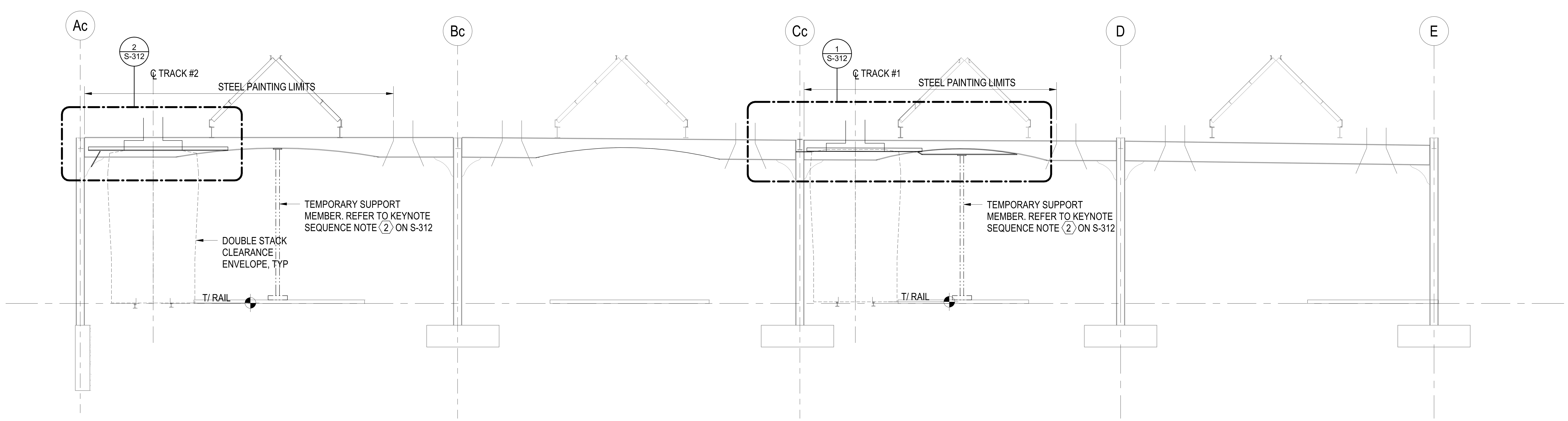
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN
OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION
STRUCTURAL ELEVATION BENT aa & 1a
VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-204



1 BENTS 2/2a, 3/3a & 4/4a
1/8" = 1'-0"



2 BENT 5
1/8" = 1'-0"

ELEVATION NOTES

1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS, MEMBER SIZES AND ELEVATIONS FOR COORDINATION WITH NEW WORK.
3. COORDINATE DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.
4. REFER TO S-100 SERIES DRAWINGS FOR FRAMING BENT LOCATIONS CORRESPONDING TO GRID LINE DESIGNATIONS.

0 4' - 0" 8' - 0" 16' - 0"
SCALE: 1/8" = 1' - 0"

NO.	DATE	REVISIONS

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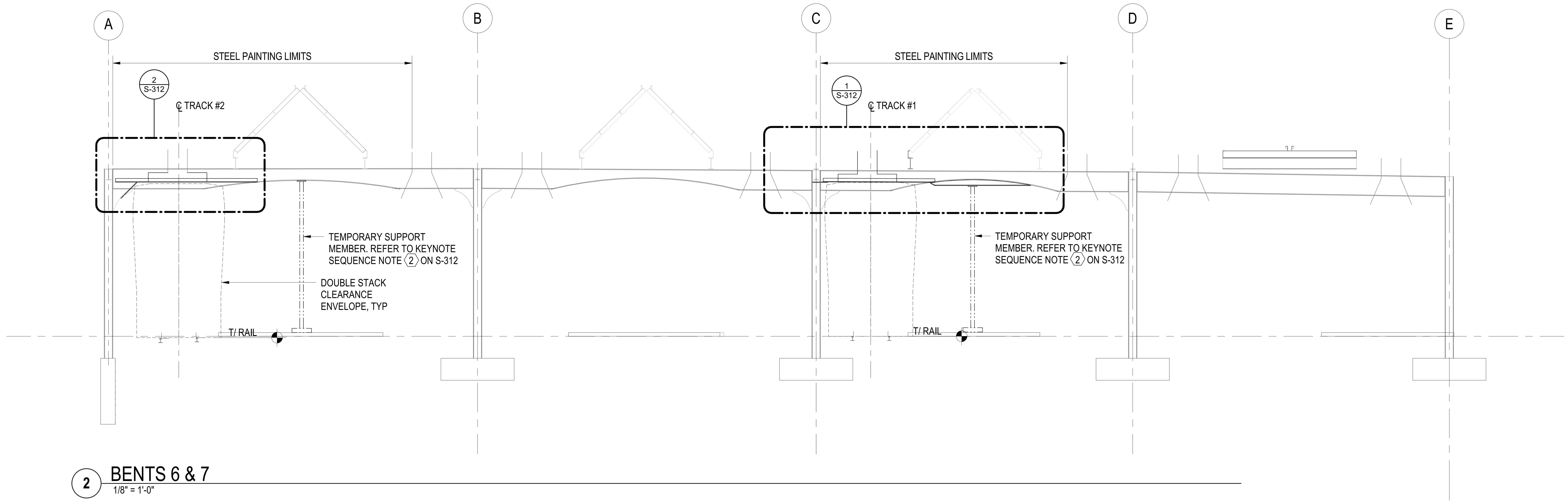
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

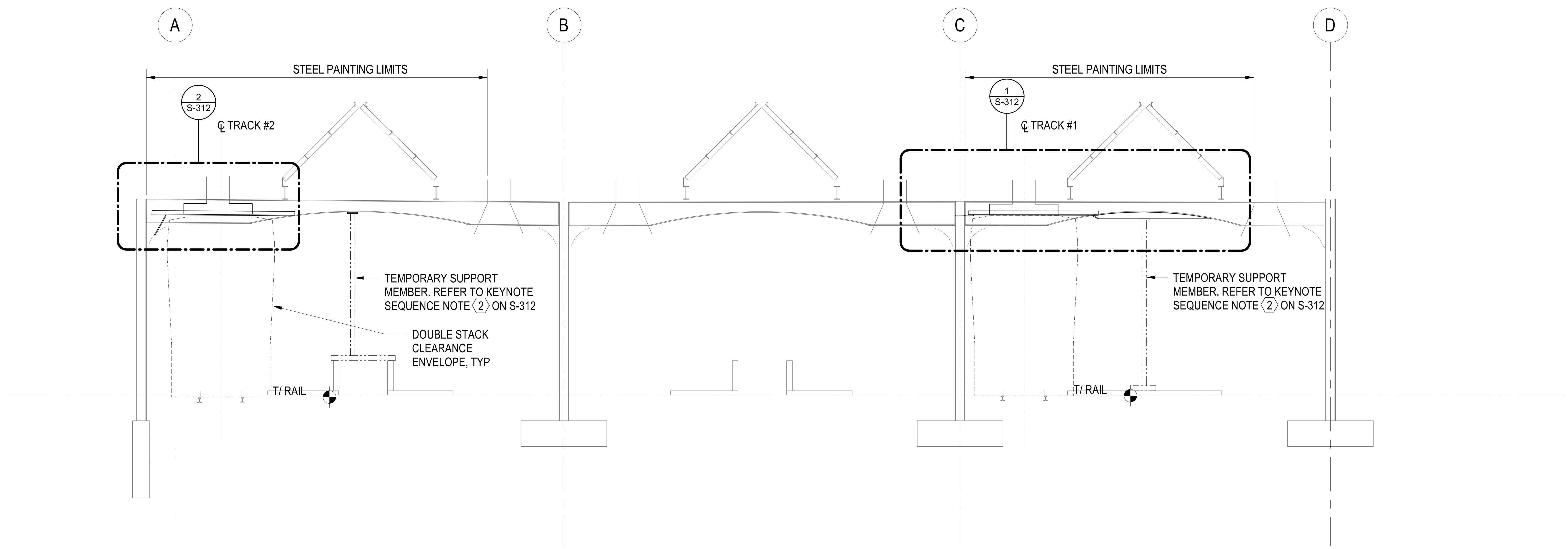
OPERATING COMPANY: **NORFOLK SOUTHERN RAILWAY COMPANY**
PITTSBURGH DIVISION **PITTSBURGH** LINE
DESCRIPTION: **PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION**

STRUCTURAL ELEVATION BENT 2/2a, 3/3a, 4/4A & 5

VALUATION PLAN:
MILE POST: **PT-353.20**
AUTHORITY NO.:
FILE NO.:
MADE BY: **WCA** DATE: **05-21-2021** CHECKED BY: **NLB**
SCALE: **AS NOTED** DRAWING NO.: **S-205**



2 BENTS 6 & 7
1/8" = 1'-0"



1 BENTS 8 & 9
1/8" = 1'-0"

ELEVATION NOTES

1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS, MEMBER SIZES AND ELEVATIONS FOR COORDINATION WITH NEW WORK.
3. COORDINATE DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.
4. REFER TO S-100 SERIES DRAWINGS FOR FRAMING BENT LOCATIONS CORRESPONDING TO GRID LINE DESIGNATIONS.

0 4' - 0" 8' - 0" 16' - 0"
SCALE: 1/8" = 1' - 0"

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

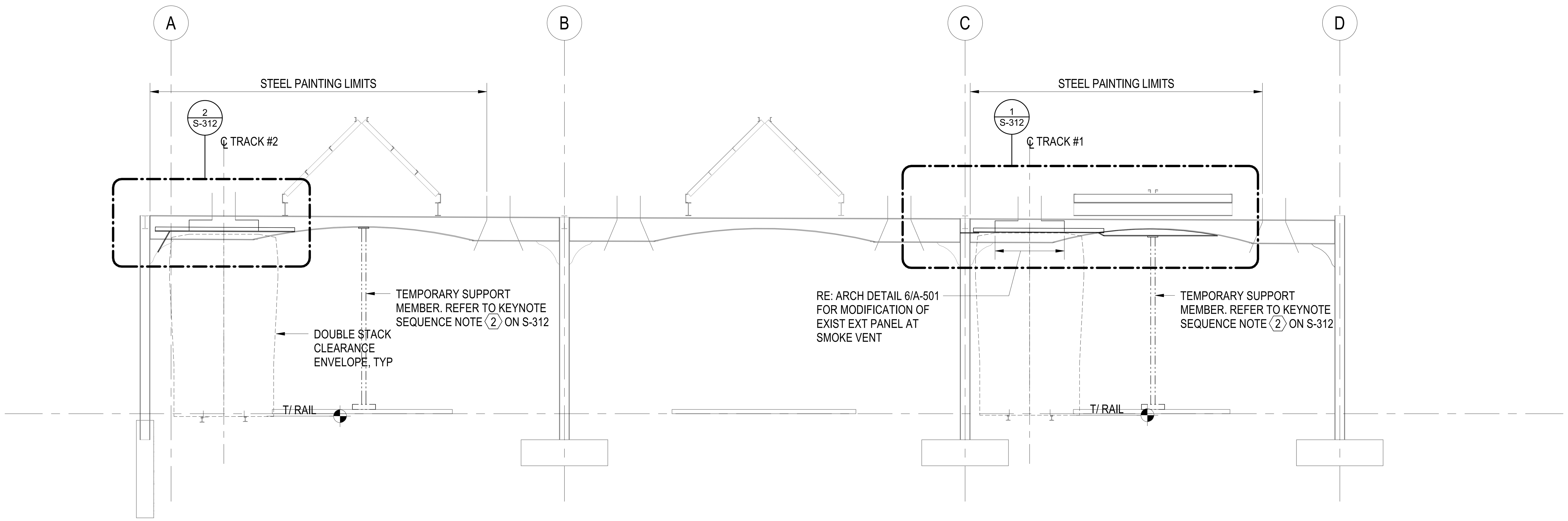
OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

STRUCTURAL ELEVATION BENT 6 & 7, 8 & 9

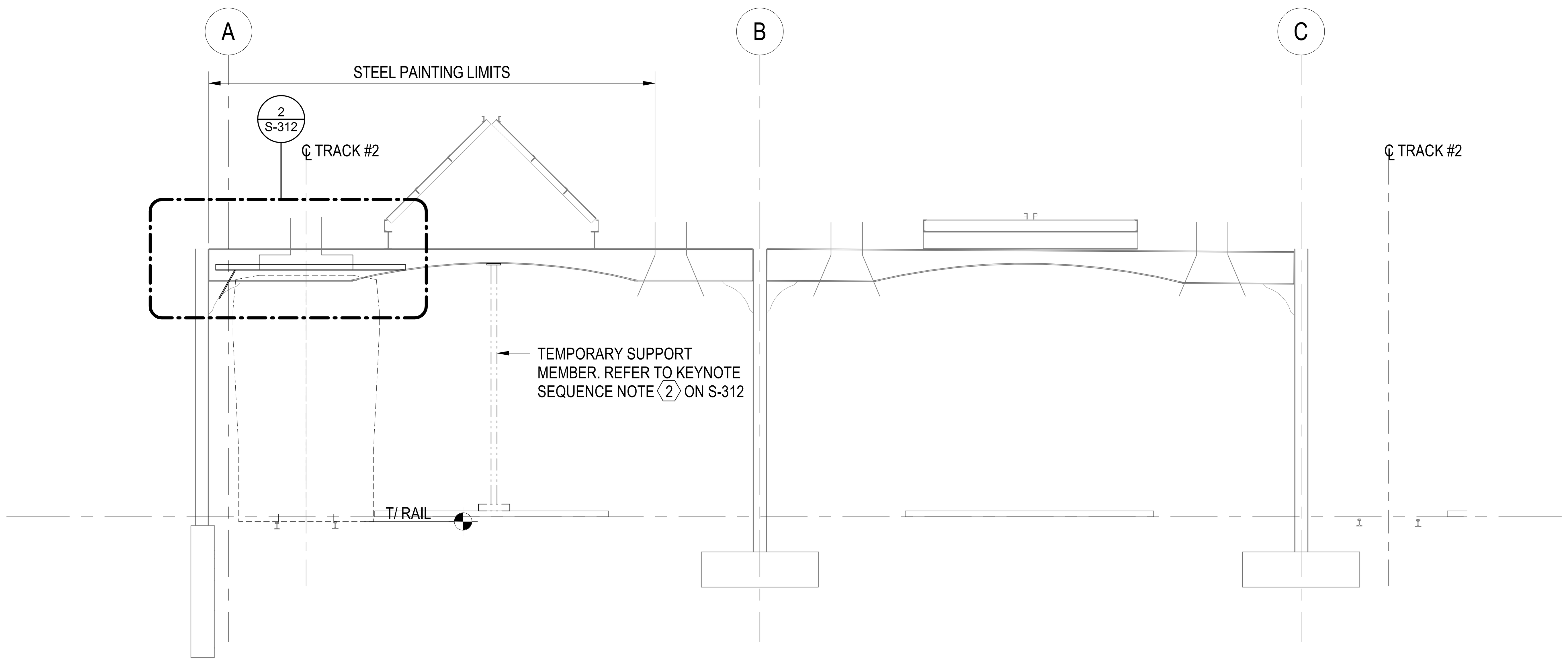
VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-206

ELEVATION NOTES

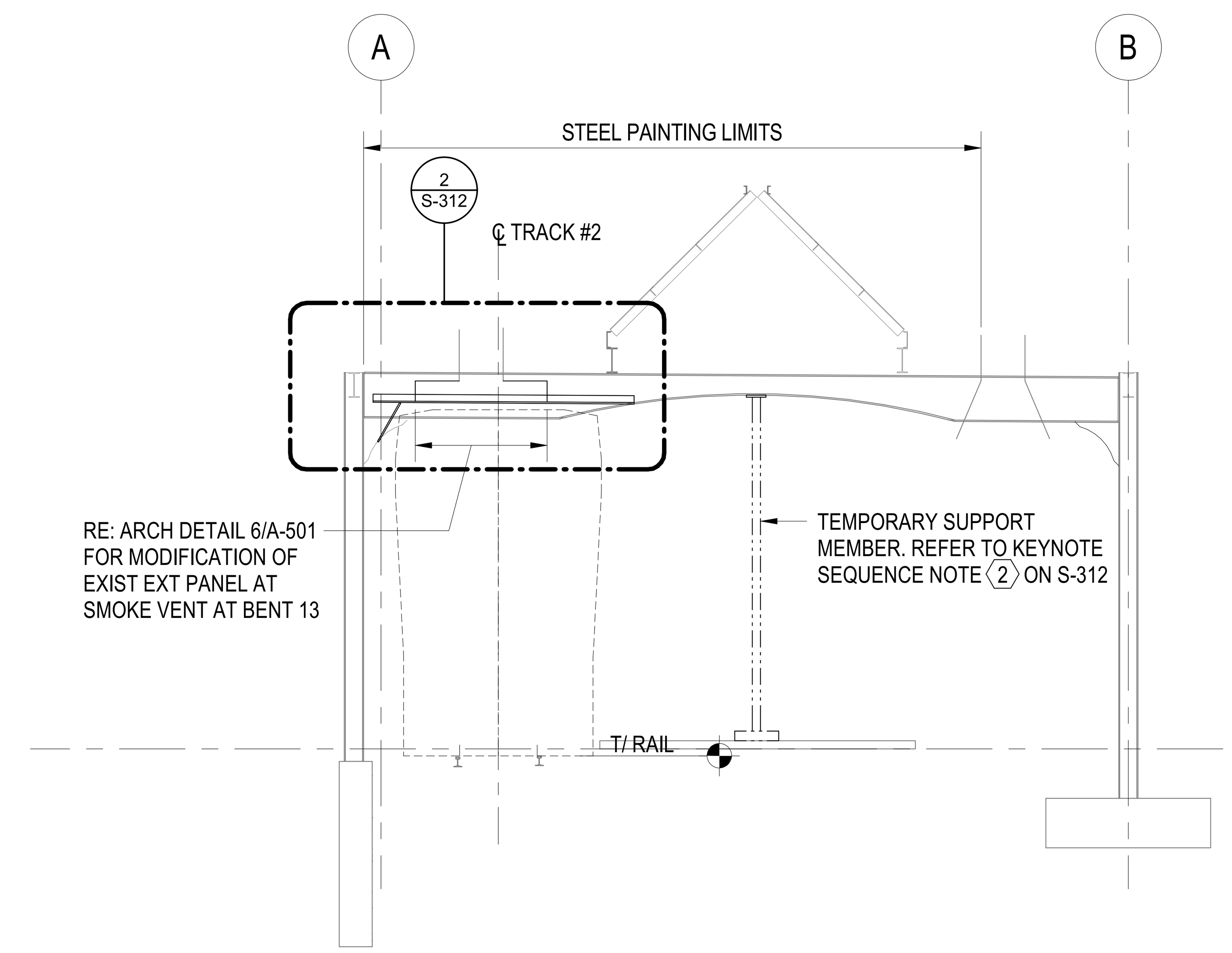
1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS, MEMBER SIZES AND ELEVATIONS FOR COORDINATION WITH NEW WORK.
3. COORDINATE DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.
4. REFER TO S-100 SERIES DRAWINGS FOR FRAMING BENT LOCATIONS CORRESPONDING TO GRID LINE DESIGNATIONS.



1 BENT 10
1/8" = 1'-0"



2 BENT 11
1/8" = 1'-0"



3 BENTS 12 & 13
1/8" = 1'-0"

0 4' - 0" 8' - 0" 16' - 0"
SCALE: 1/8" = 1' - 0"

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
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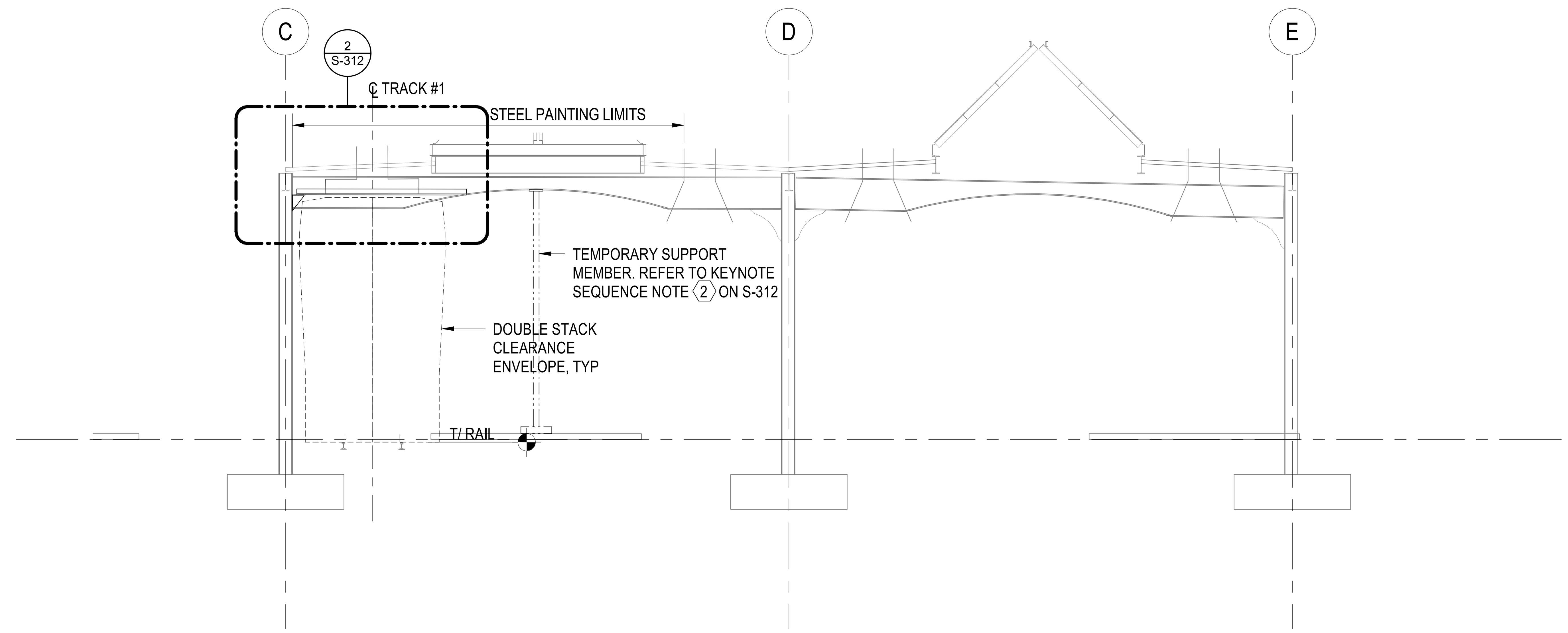
NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

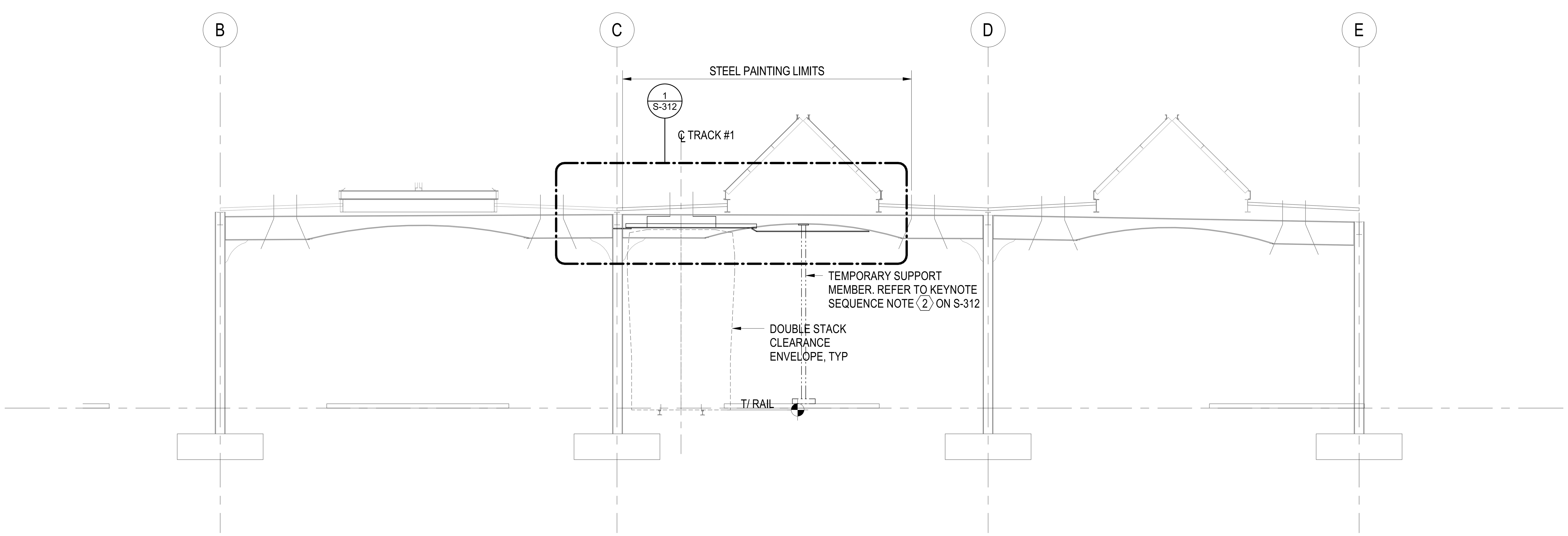
STRUCTURAL ELEVATION BENT 10 & 11, 12 & 13

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-207

ALTERNATIVE 3



1 BENT 23
1/8" = 1'-0"



2 BENT 24
1/8" = 1'-0"

ELEVATION NOTES

1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS, MEMBER SIZES AND ELEVATIONS FOR COORDINATION WITH NEW WORK.
3. COORDINATE DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.
4. REFER TO S-100 SERIES DRAWINGS FOR FRAMING BENT LOCATIONS CORRESPONDING TO GRID LINE DESIGNATIONS.

0 4' - 0" 8' - 0" 16' - 0"
SCALE: 1/8" = 1' - 0"

NO.	DATE	REVISIONS

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NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY

PITTSBURGH DIVISION PITTSBURGH LINE

DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE
AMTRAK STATION

STRUCTURAL ELEVATION BENT 23 & 24

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB

SCALE: AS NOTED DRAWING NO.: S-208

ALTERNATIVE 3

ELEVATION NOTES

1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS, MEMBER SIZES AND ELEVATIONS FOR COORDINATION WITH NEW WORK.
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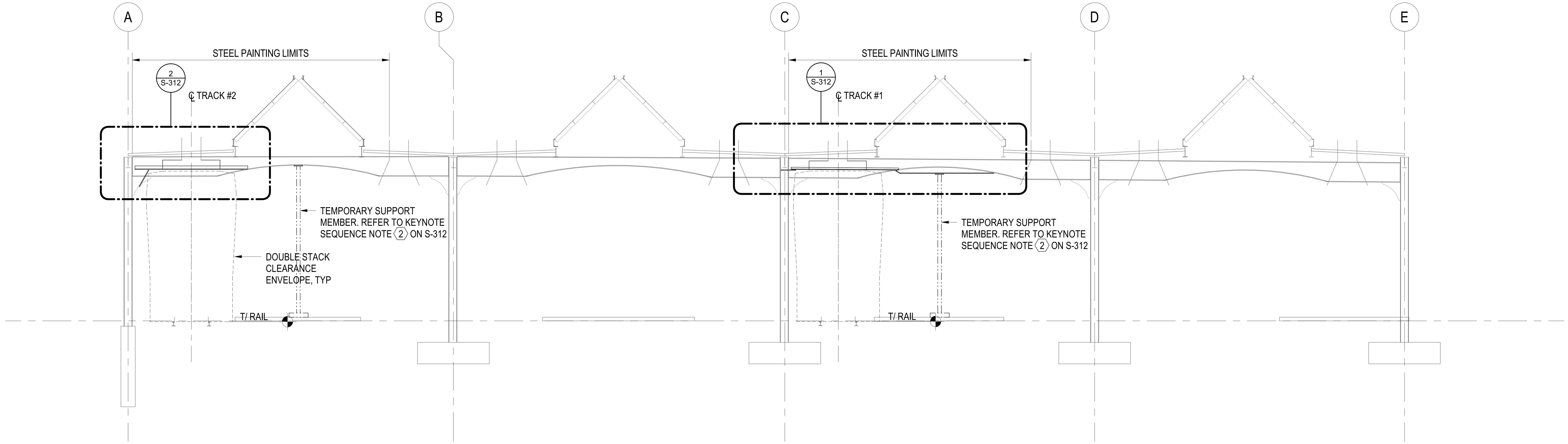
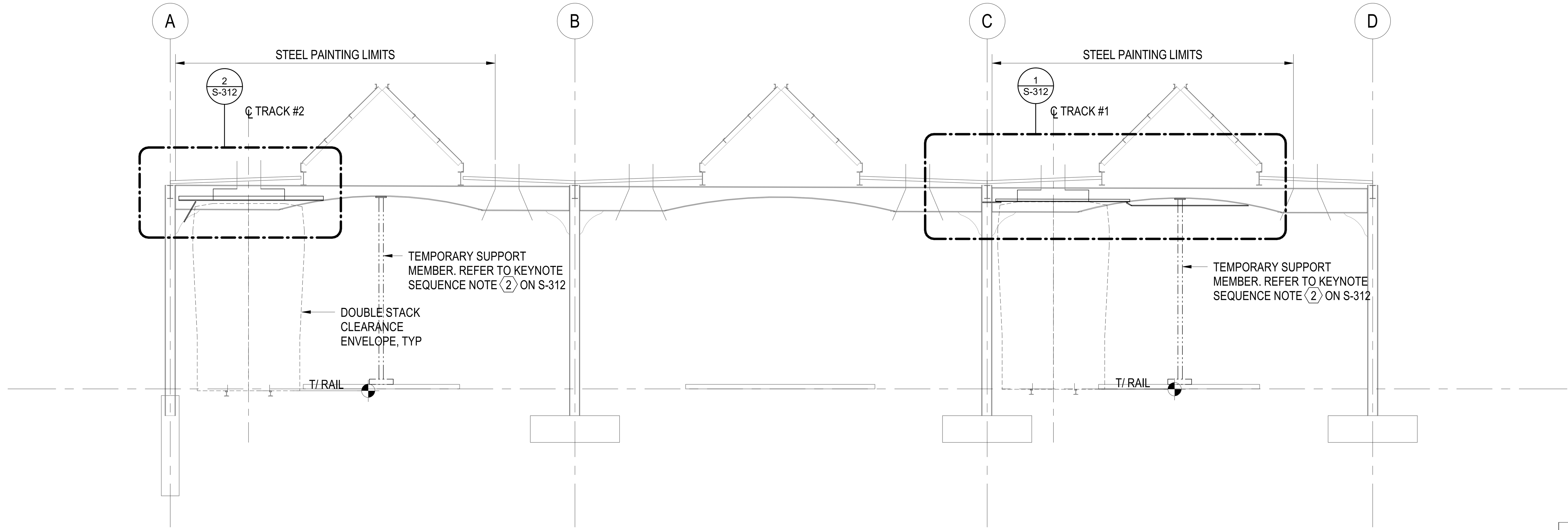
4. REFER TO S-100 SERIES DRAWINGS FOR FRAMING BENT LOCATIONS CORRESPONDING TO GRID LINE DESIGNATIONS.



2 BENTS 25, 26 & 27
1/8" = 1'-0"



1 BENTS 28 - 38, 40 - 45
1/8" = 1'-0"

0 4' - 0" 8' - 0" 16' - 0"
SCALE: 1/8" = 1' - 0"

NO.	DATE	REVISIONS

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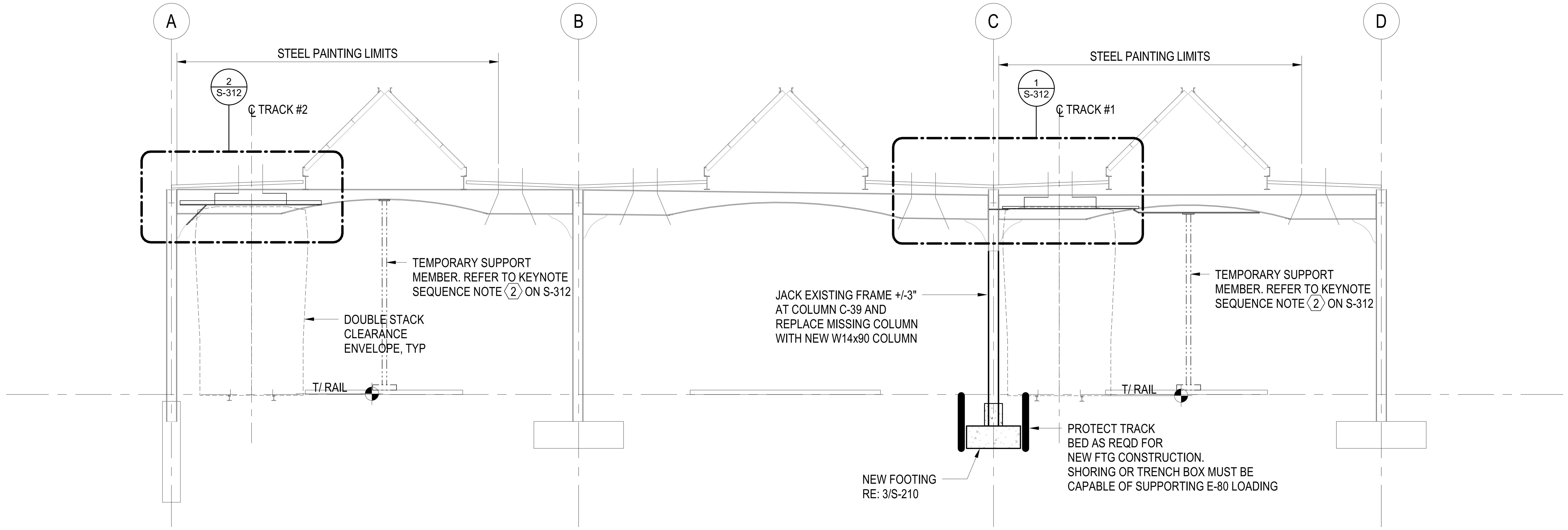
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

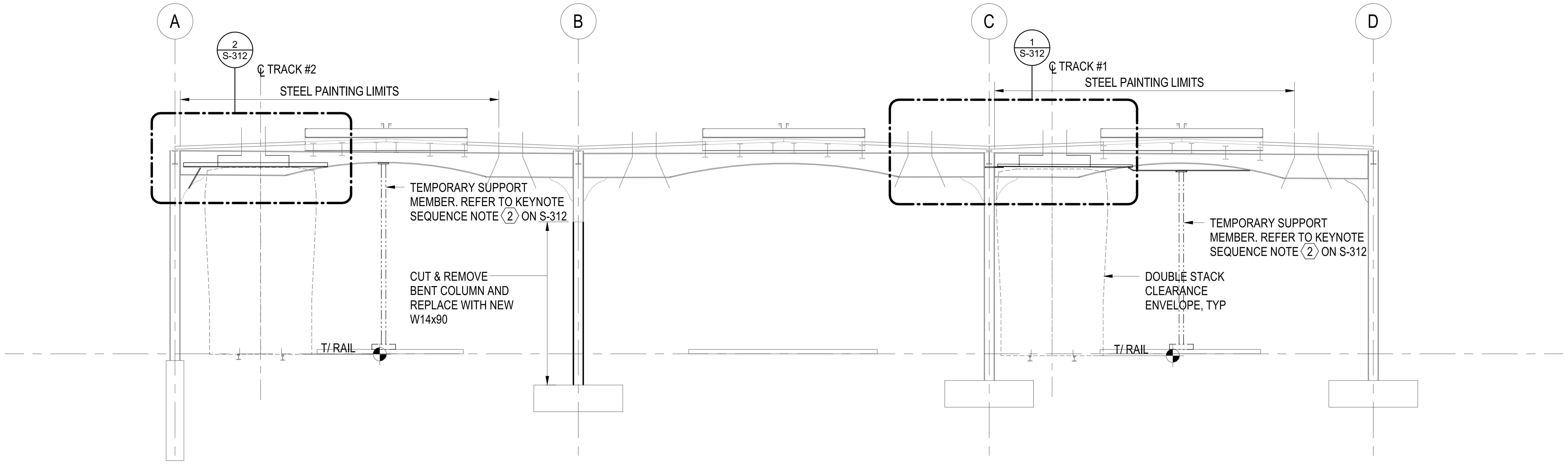
OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

STRUCTURAL ELEVATION BENT 25, 26, 27 & 28-38, 40-45

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-209



1 BENT 39
1/8" = 1'-0"



2 BENT 46
1/8" = 1'-0"

ELEVATION NOTES

1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS, MEMBER SIZES AND ELEVATIONS FOR COORDINATION WITH NEW WORK.
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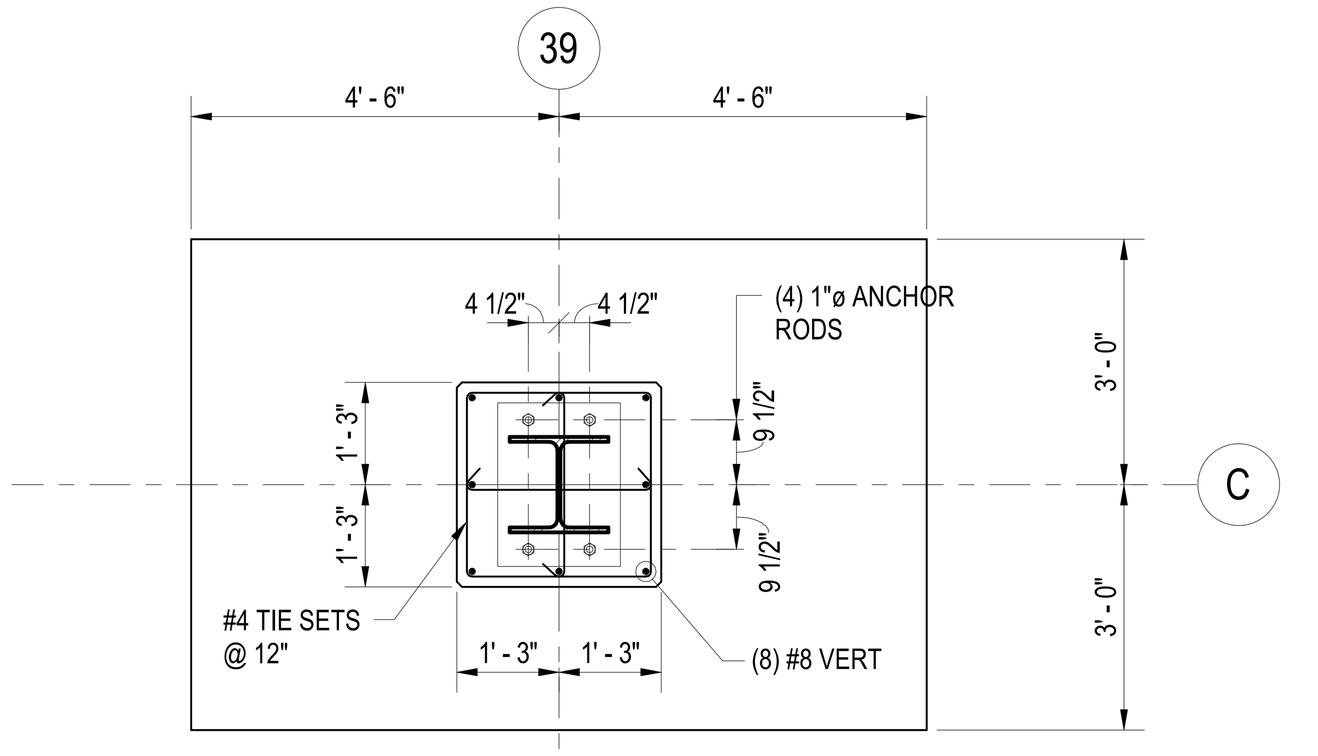
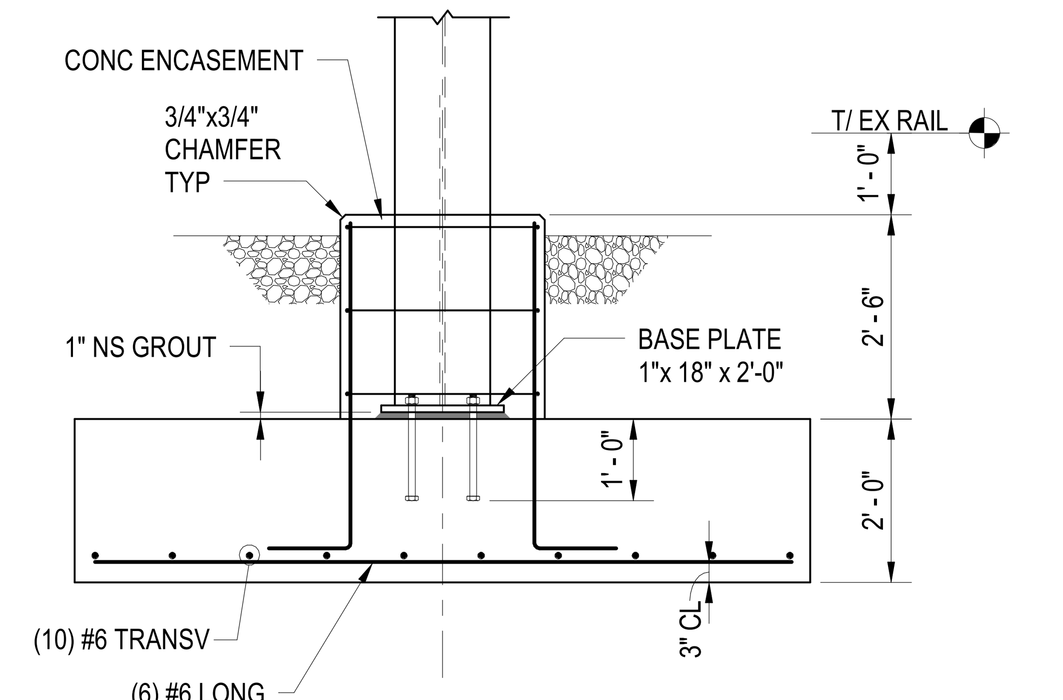
4. REFER TO S-100 SERIES DRAWINGS FOR FRAMING BENT LOCATIONS CORRESPONDING TO GRID LINE DESIGNATIONS.



PLAN VIEW



SECTION

3 NEW COLUMN/FOOTING DETAIL
1/2" = 1'-0"

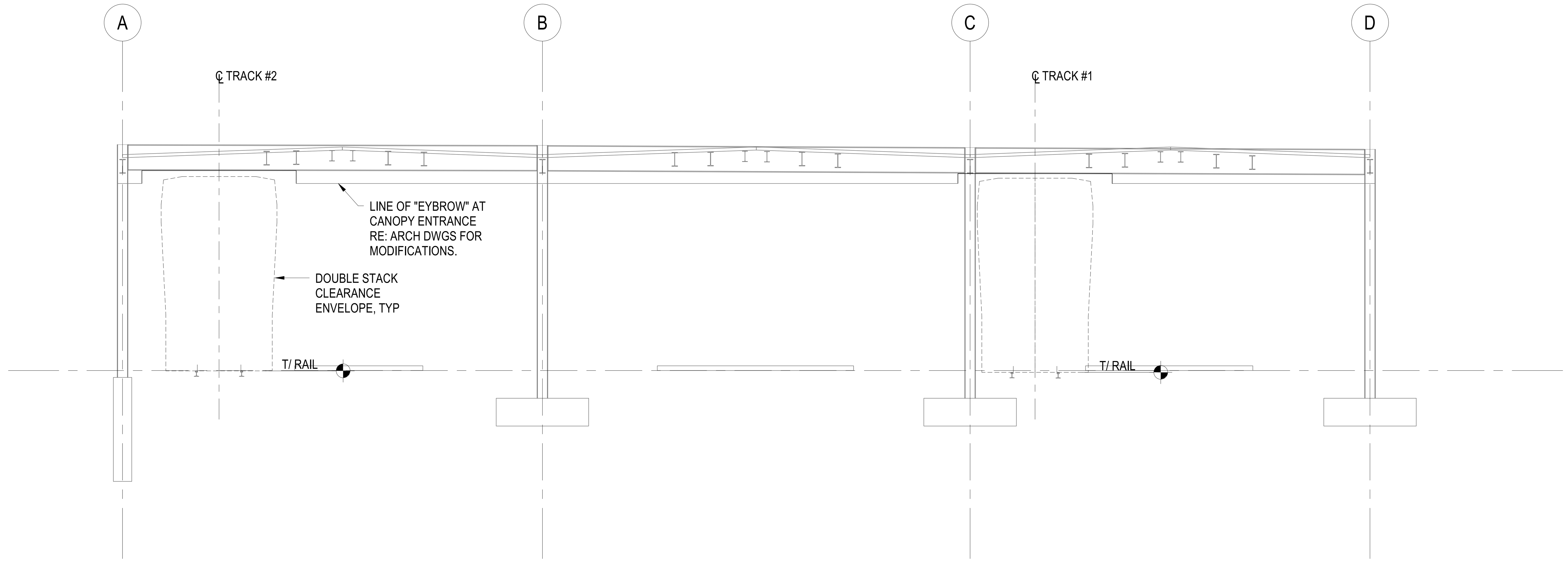
0 4' - 0" 8' - 0" 16' - 0"
SCALE: 1/8" = 1' - 0"

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE
AMTRAK STATION
STRUCTURAL ELEVATION BENT 39 & 46
VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-210



1 BENT 47
1/8" = 1'-0"

ELEVATION NOTES

1. RE: DRAWING S-001 FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS, MEMBER SIZES AND ELEVATIONS FOR COORDINATION WITH NEW WORK.
3. COORDINATE DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.
4. REFER TO S-100 SERIES DRAWINGS FOR FRAMING BENT LOCATIONS CORRESPONDING TO GRID LINE DESIGNATIONS.

0 4' - 0" 8' - 0" 16' - 0"
SCALE: 1/8" = 1' - 0"

NO.	DATE	REVISIONS

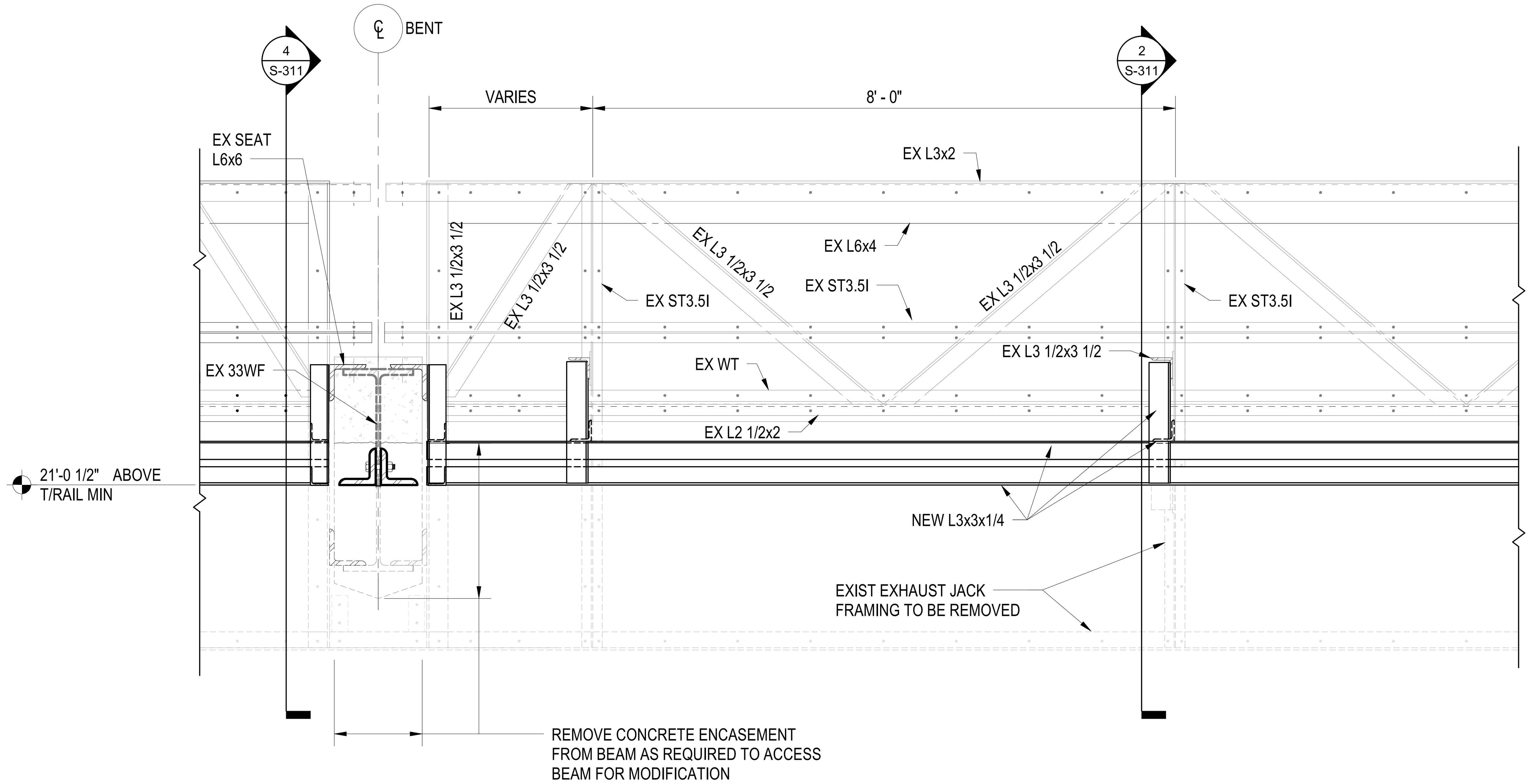
Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

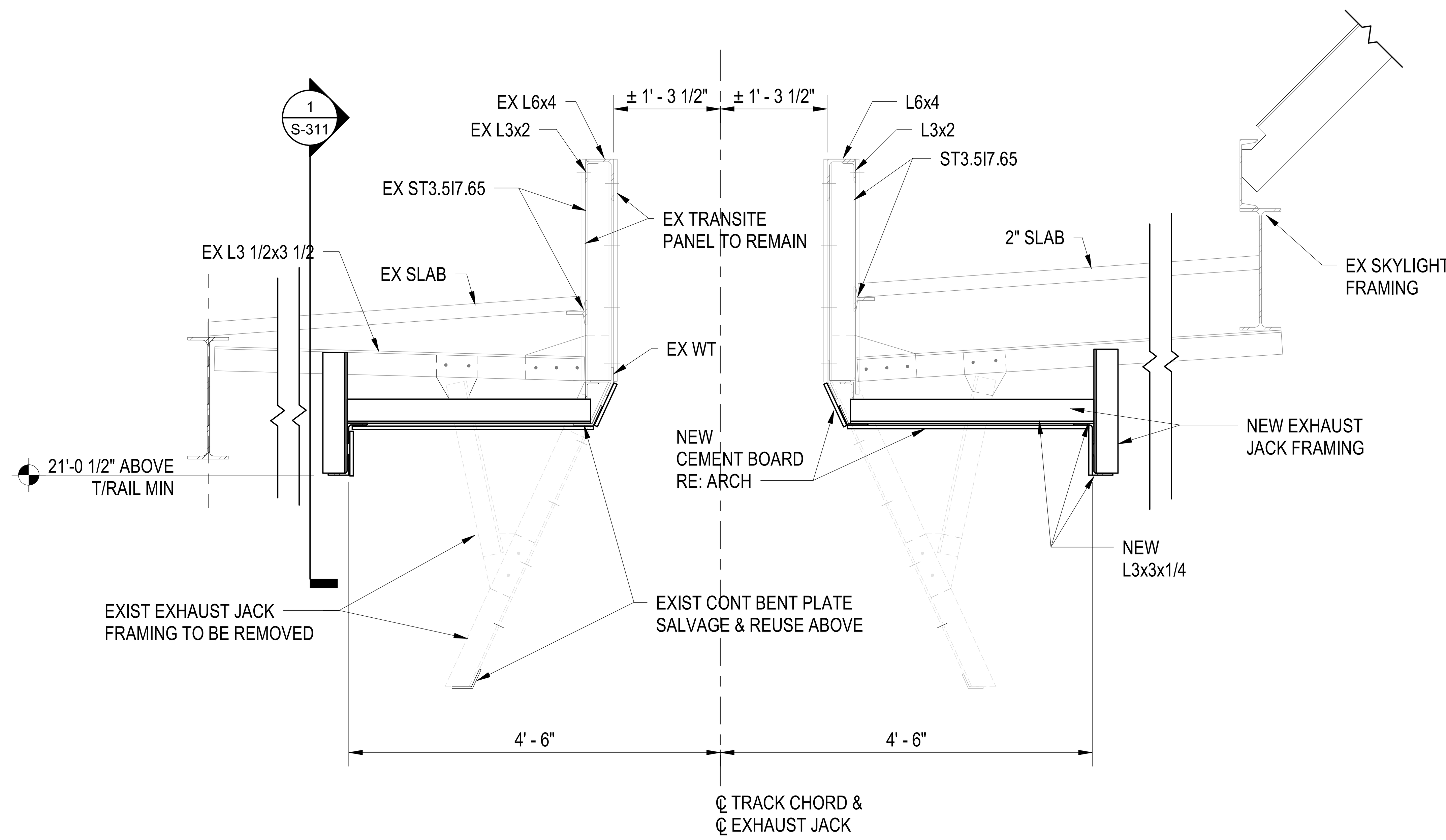
OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

STRUCTURAL ELEVATION BENT 47

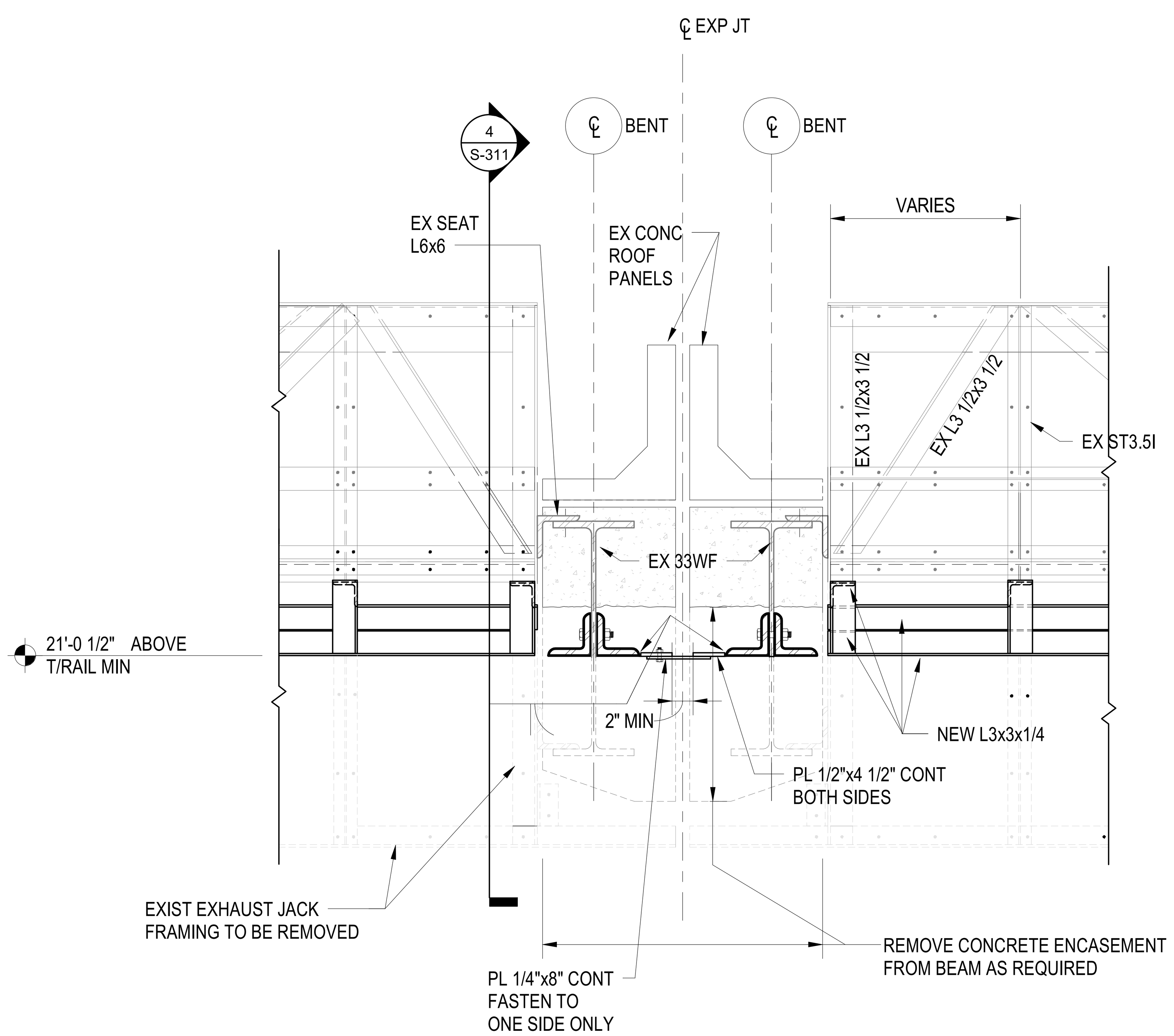
VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-211



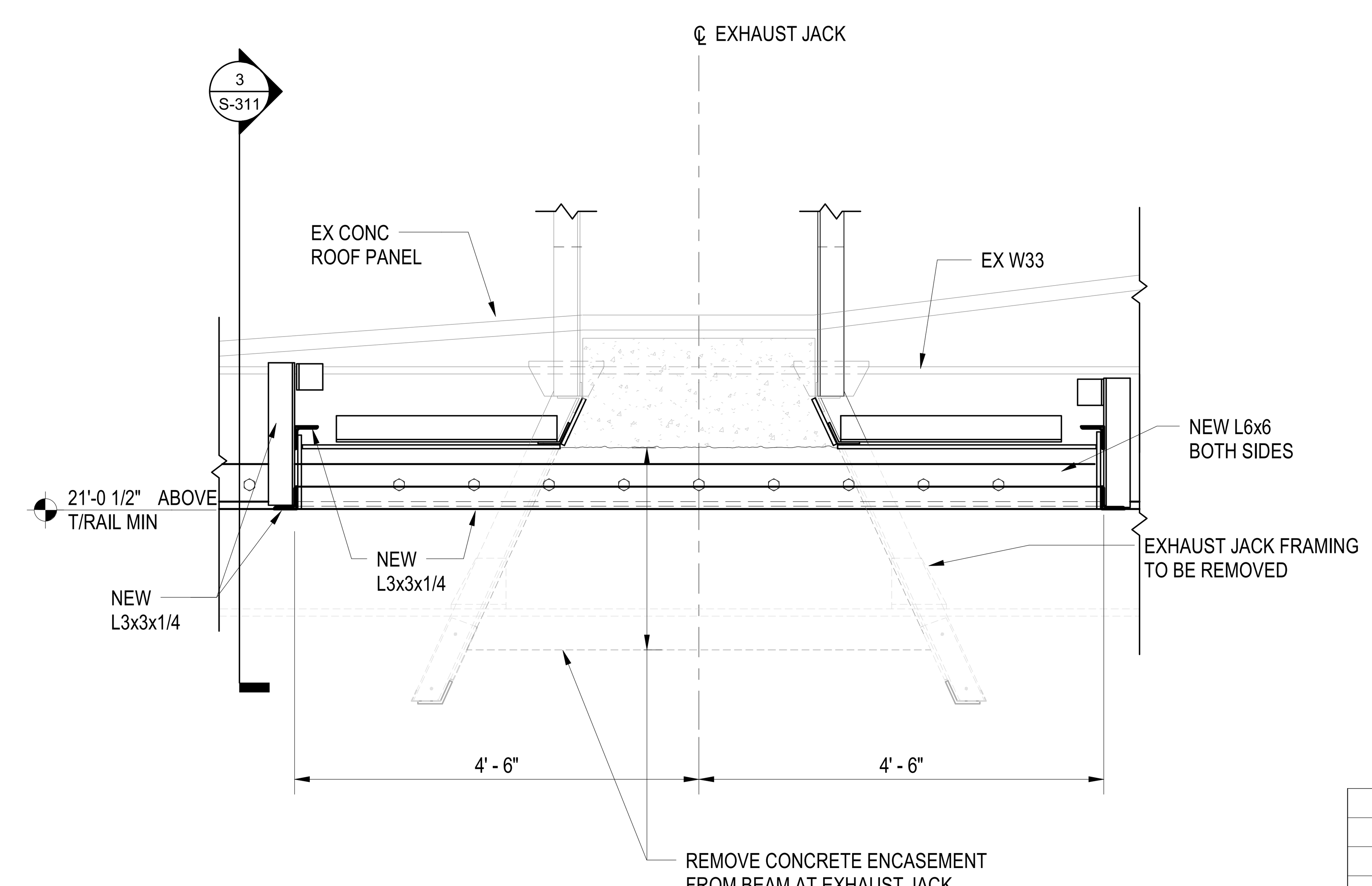
1 EXHAUST JACK FRAMING ELEVATION
3/4" = 1'-0"



2 NEW EXHAUST JACK FRAMING
3/4" = 1'-0"



3 EXHAUST JACK FRAMING ELEVATION AT EXP JT
3/4" = 1'-0" REF: S-311



4 EXHAUST JACK AT BENT
3/4" = 1'-0" REF: S-201

0 1' - 0" 2' - 0" 4' - 0"
SCALE: 3/4" = 1' - 0"

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

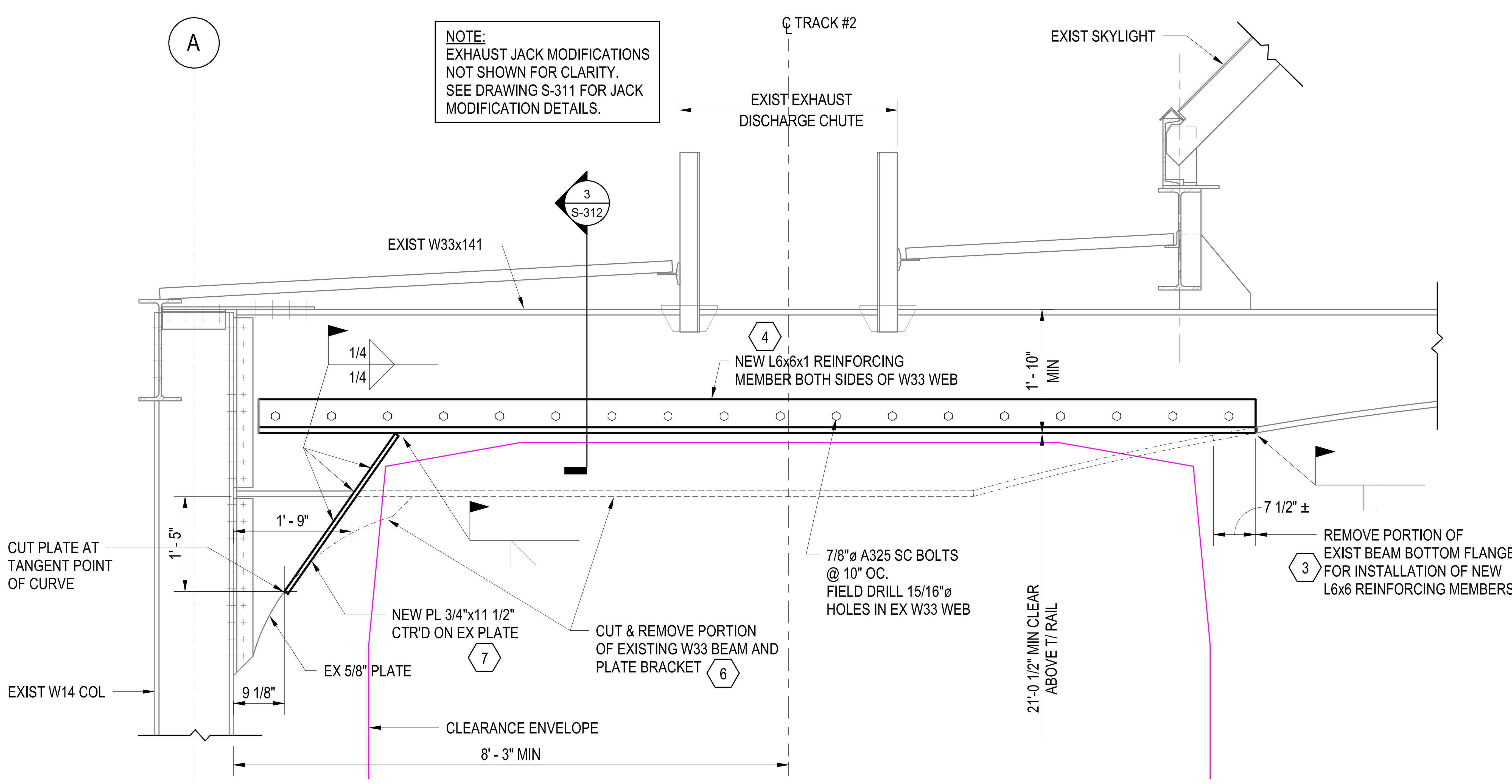
NS NORFOLK SOUTHERN
OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE
AMTRAK STATION
FRAMING SECTIONS
VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: Designer DATE: 05-21-2021 CHECKED BY: Checker
SCALE: AS NOTED DRAWING NO.: S-311

ALTERNATIVE 3

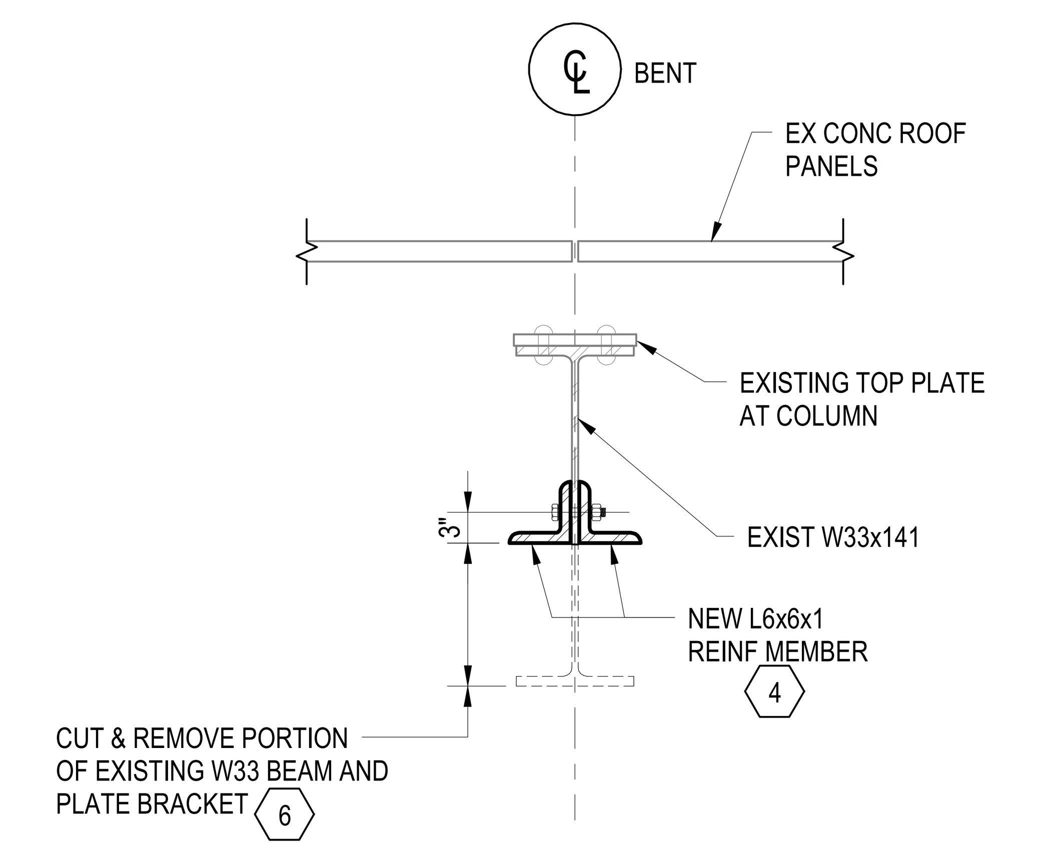
1 EXISTING BEAM MODIFICATION DETAIL
3/4" = 1'-0"

KEYNOTE SEQUENCE OF BEAM MODIFICATION:

1. INSTALL NEW WT REINFORCING AT CENTER SPAN ARCH
2. INSTALL TEMPORARY SUPPORT AT MIDSPAN OF EXISTING W33 GIRDER.
3. CUT AND REMOVE SMALL PORTION OF EXISTING GIRDER BOTTOM FLANGE.
4. INSTALL NEW L6x6 REINFORCMENT MEMBERS.
5. INSTALL NEW BOTTOM FLANGE PLATE AND COLUMN WEB STIFFENERS.
6. CUT & REMOVE PORTION OF EXISTING W33 BEAM AND PLATE BRACKET AFTER INSTALLATION OF NEW L6x6 REINFORCING MEMBERS.
7. INSTALL REINFORCING PLATES OF EXISTING BRACKET
8. REMOVE TEMPORARY MIDSPAN SUPPORT.



2 EXISTING BEAM MODIFICATION DETAIL
3/4" = 1'-0"



3 EXISTING BEAM MODIFICATION SECTION
3/4" = 1'-0"

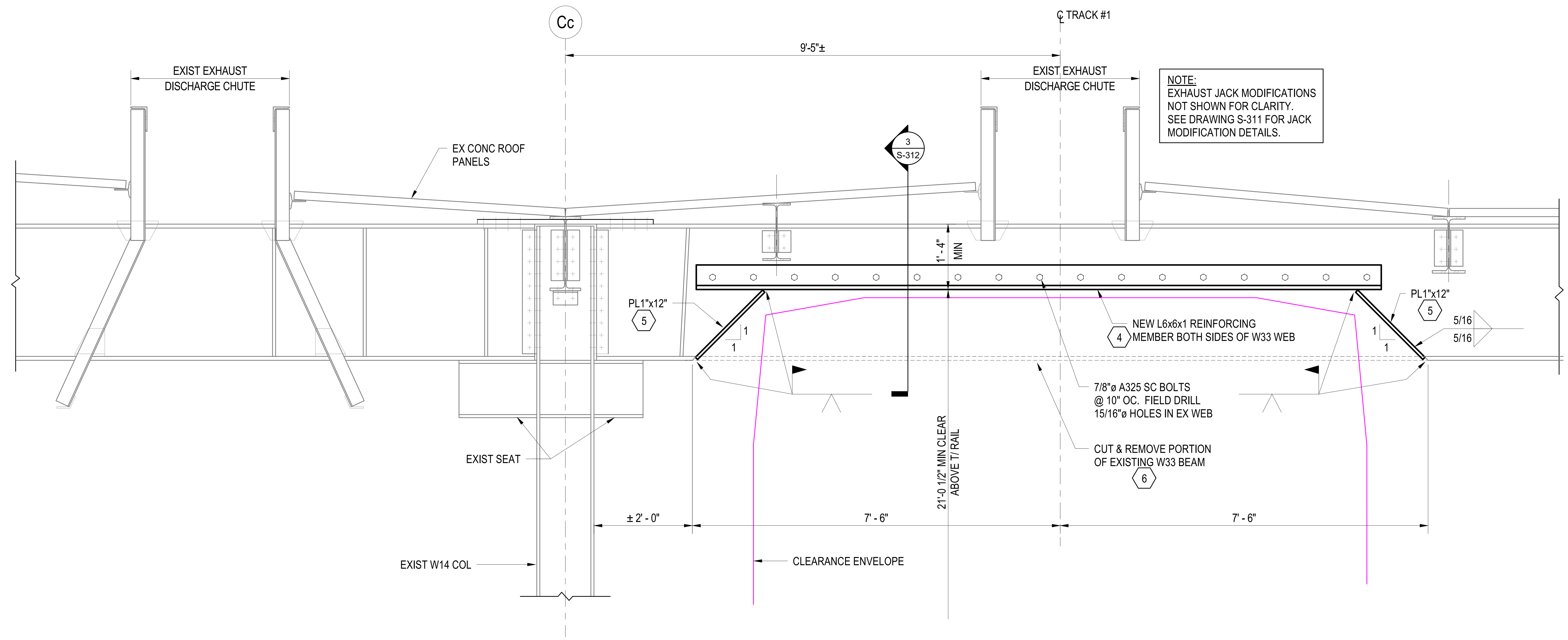
0 1' - 0" 2' - 0" 4' - 0"
SCALE: 3/4" = 1' - 0"

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

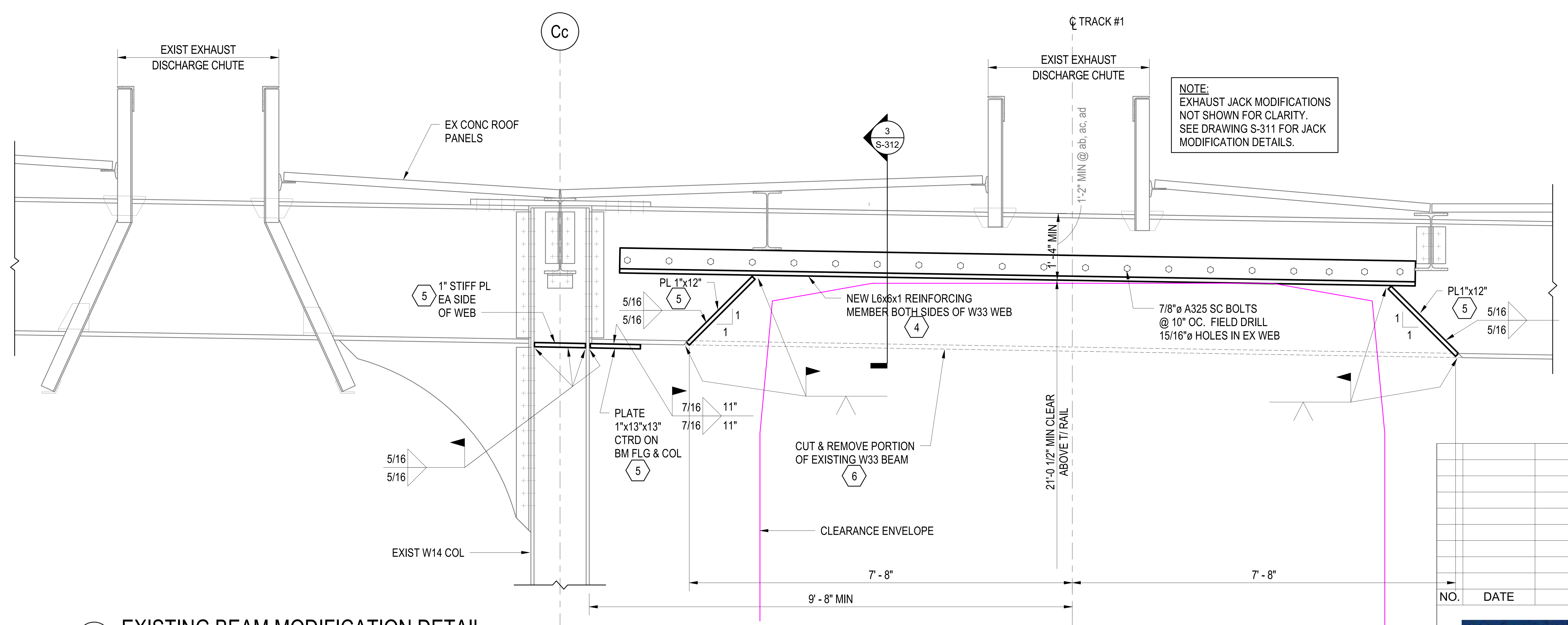
NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE
AMTRAK STATION
FRAMING SECTIONS
VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-312



1 EXISTING BEAM MODIFICATION DETAIL

3/4" = 1'-0"



2 EXISTING BEAM MODIFICATION DETAIL

3/4" = 1'-0"

KEYNOTE SEQUENCE OF BEAM MODIFICATION:

1. INSTALL NEW WT REINFORCING AT CENTER SPAN ARCH
2. INSTALL TEMPORARY SUPPORT AT MIDSPAN OF EXISTING W33 GIRDER.
3. CUT AND REMOVE SMALL PORTION OF EXISTING GIRDER BOTTOM FLANGE.
4. INSTALL NEW L6x6 REINFORCMENT MEMBERS.
5. INSTALL NEW BOTTOM FLANGE PLATE AND COLUMN WEB STIFFENERS.
6. CUT & REMOVE PORTION OF EXISTING W33 BEAM AND PLATE BRACKET AFTER INSTALLATION OF NEW L6x6 REINFORCING MEMBERS.
7. INSTALL REINFORCING PLATES OF EXISTING BRACKET
8. REMOVE TEMPORARY MIDSPAN SUPPORT.

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL

1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY

PITTSBURGH DIVISION PITTSBURGH LINE

DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

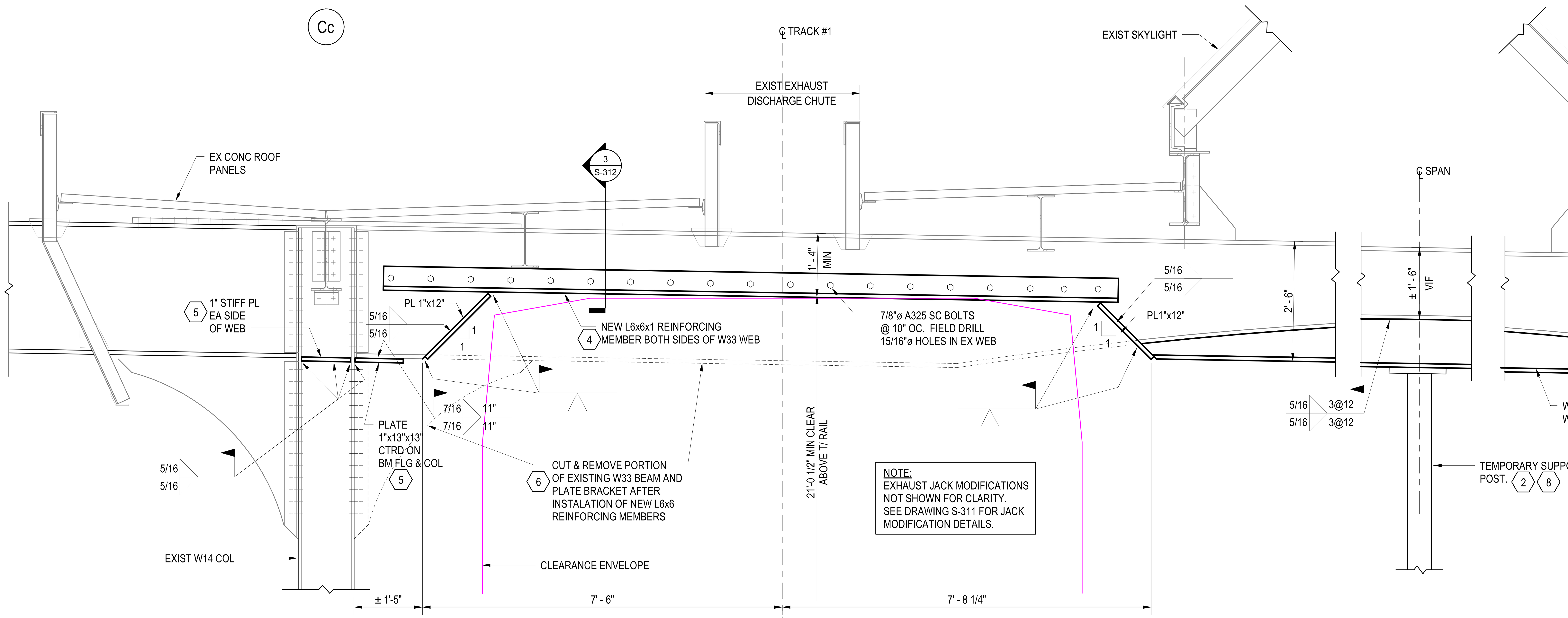
FRAMING SECTIONS

VALUATION PLAN: MILE POST: PT-353.20

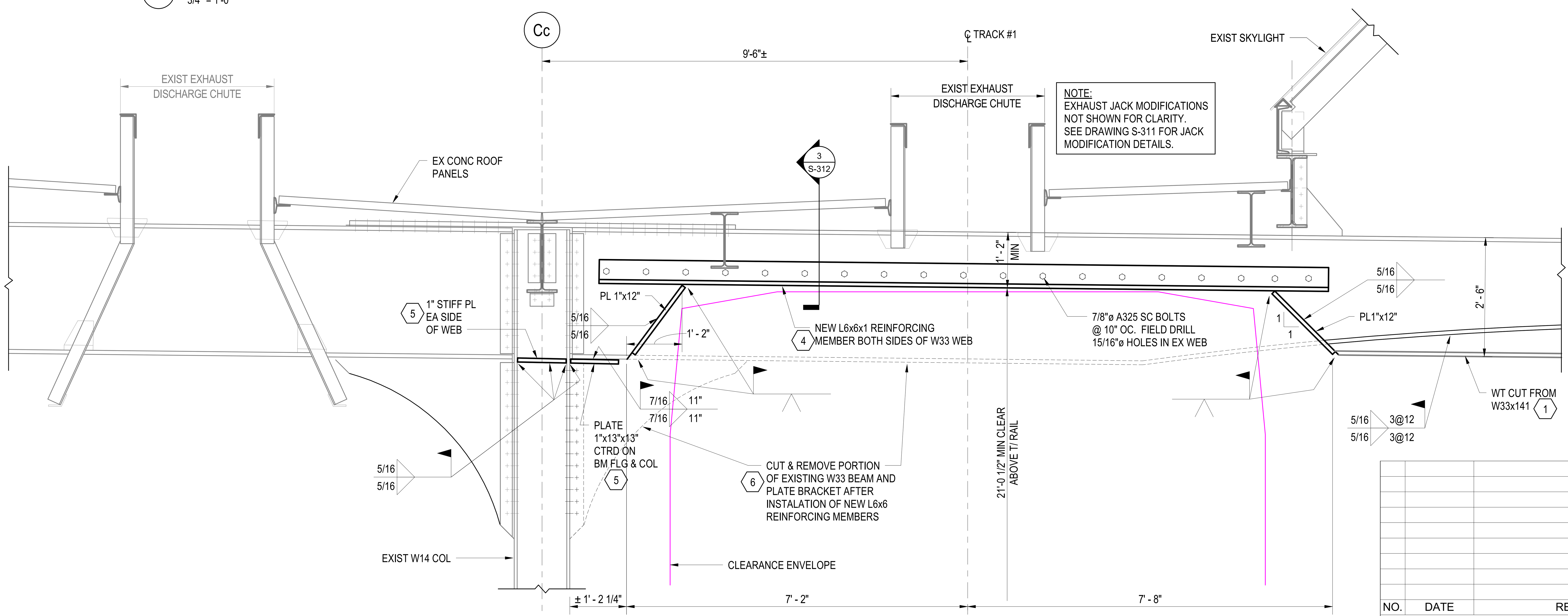
AUTHORITY NO.: FILE NO.:

MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB

SCALE: AS NOTED DRAWING NO.: S-313



1 EXISTING BEAM MODIFICATION DETAIL
3/4" = 1'-0"



FOR CONTINUATION OF BEAM AND REINFORCEMENT RE: SECTION 1/S-314 SIM.

2 EXISTING BEAM MODIFICATION DETAIL
3/4" = 1'-0"

KEYNOTE SEQUENCE OF BEAM MODIFICATION:

1. INSTALL NEW WT REINFORCING AT CENTER SPAN ARCH
2. INSTALL TEMPORARY SUPPORT AT MIDSPAN OF EXISTING W33 GIRDER.
3. CUT AND REMOVE SMALL PORTION OF EXISTING GIRDER BOTTOM FLANGE.
4. INSTALL NEW L6x6 REINFORCMENT MEMBERS.
5. INSTALL NEW BOTTOM FLANGE PLATE AND COLUMN WEB STIFFENERS.
6. CUT & REMOVE PORTION OF EXISTING W33 BEAM AND PLATE BRACKET AFTER INSTALATION OF NEW L6x6 REINFORCING MEMBERS.
7. INSTALL REINFORCING PLATES OF EXISTING BRACKET
8. REMOVE TEMPORARY MIDSPAN SUPPORT.

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE
AMTRAK STATION
FRAMING SECTIONS

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB
SCALE: AS NOTED DRAWING NO.: S-314

COLUMN	TRACK 2 Westbound (EXISTING)		Cut	TRACK 2 Westbound (PROPOSED)	
	LEFT	RIGHT	Height	LEFT	RIGHT
			Minimum		
g	19.5104	19.3542	1.65	21.1604	21.0042
f	20.3229	20.1771	0.83	21.1529	21.0071
e	20.3333	20.1979	0.81	21.1433	21.0079
d	20.3750	20.2292	0.78	21.1550	21.0092
c	20.3229	20.1771	0.83	21.1529	21.0071
b	20.4063	20.3021	0.7	21.1063	21.0021
a	20.3854	20.2708	0.73	21.1154	21.0008
1	20.3542	20.1458	0.86	21.2142	21.0058
2	20.2500	20.0521	0.95	21.2000	21.0021
3	20.2500	20.0521	0.95	21.2000	21.0021
4	20.2292	20.0417	0.96	21.1892	21.0017
5	20.1354	20.0208	0.98	21.1154	21.0008
6	20.3438	20.0729	0.93	21.2738	21.0029
7	20.3438	20.1979	0.81	21.1538	21.0079
8	20.3646	20.1979	0.81	21.1746	21.0079
9	20.3646	20.1979	0.81	21.1746	21.0079
10	20.4375	20.3438	0.66	21.0975	21.0038
11	20.5000	20.3750	0.63	21.1300	21.0050
12	20.5417	20.3750	0.63	21.1717	21.0050
13	20.5313	20.4896	0.52	21.0513	21.0096
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25	20.1771	20.0938	0.91	21.0871	21.0038
26	20.1979	20.1563	0.85	21.0479	21.0063
27	20.2396	20.2813	0.77	21.0096	21.0513
28	20.2813	20.2813	0.72	21.0013	21.0013
29	20.4167	20.3646	0.64	21.0567	21.0046
30	20.4167	20.3646	0.64	21.0567	21.0046
31	20.3646	20.3021	0.7	21.0646	21.0021
32	20.4063	20.3542	0.65	21.0563	21.0042
33	20.3750	20.3750	0.63	21.0050	21.0050
34	20.3021	20.2292	0.78	21.0821	21.0092
35	20.2500	20.2292	0.78	21.0300	21.0092
36	20.2500	20.2292	0.78	21.0300	21.0092
37	20.1667	20.1771	0.84	21.0067	21.0171
38	20.1042	20.1042	0.9	21.0042	21.0042
39	20.1354	20.2396	0.87	21.0054	21.1096
40	20.2396	20.2292	0.78	21.0196	21.0092
41	20.1771	20.1771	0.83	21.0071	21.0071
42	20.2083	20.1667	0.84	21.0483	21.0067
43	20.1875	20.2500	0.82	21.0075	21.0700
44	20.1875	20.2500	0.82	21.0075	21.0700
45	20.1458	20.2083	0.86	21.0058	21.0683
46	20.1458	20.1875	0.86	21.0058	21.0475
47	19.3542	19.4375	1.65	21.0042	21.0875

COLUMN	TRACK 1 Eastbound (EXISTING)		Cut	TRACK 1 Eastbound (PROPOSED)	
	LEFT	RIGHT	Height	LEFT	RIGHT
g	18.6667	18.7292	2.34	21.0067	21.0692
f	19.8542	19.8125	1.19	21.0442	21.0025
e	19.7917	19.7500	1.25	21.0417	21.0000
d	19.7708	19.6667	1.34	21.1108	21.0067
c	19.7188	19.6042	1.4	21.1188	21.0042
b	19.6771	19.5833	1.42	21.0971	21.0033
a	19.6250	19.4167	1.59	21.2150	21.0067
1	19.5938	19.4375	1.57	21.1638	21.0075
2	19.3021	19.3646	1.7	21.0021	21.0646
3	19.3021	19.3646	1.7	21.0021	21.0646
4	19.4479	19.4063	1.6	21.0479	21.0063
5	19.5208	19.5521	1.48	21.0008	21.0321
6	19.7708	19.6771	1.33	21.1008	21.0071
7	19.9167	19.9583	1.09	21.0067	21.0483
8	19.8333	19.8333	1.17	21.0033	21.0033
9	19.8333	19.8333	1.17	21.0033	21.0033
10	19.8646	19.9167	1.14	21.0046	21.0567
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23	20.0104	20.0104	0.99	21.0004	21.0004
24	19.9792	19.9792	1.03	21.0092	21.0092
25	19.9271	19.9688	1.08	21.0071	21.0488
26	19.9896	19.9583	1.04	21.0296	20.9983
27	19.9688	19.9688	1.05	21.0188	21.0188
28	19.8125	19.7396	1.27	21.0825	21.0096
29	19.6563	19.6667	1.35	21.0063	21.0167
30	19.6563	19.6667	1.35	21.0063	21.0167
31	19.7500	19.7813	1.25	21.0000	21.0313
32	19.7917	19.7917	1.21	21.0017	21.0017
33	19.7813	19.8229	1.22	21.0013	21.0429
34	19.7396	19.7396	1.27	21.0096	21.0096
35	19.8438	19.7604	1.24	21.0838	21.0004
36	19.8438	19.7604	1.24	21.0838	21.0004
37	19.8438	19.8854	1.16	21.0038	21.0454
38	19.8646	19.8229	1.18	21.0446	21.0029
39	19.5521	19.5938	1.45	21.0021	21.0438
40	19.9896	19.9375	1.07	21.0596	21.0075
41	20.0208	19.9896	1.02	21.0408	21.0096
42	19.9896	19.9271	1.08	21.0696	21.0071
43	19.9167	19.9792	1.09	21.0067	21.0692
44	19.9167	19.9792	1.09	21.0067	21.0692
45	20.0000	20.0625	1	21.0000	21.0625
46	20.0417	20.0417	0.96	21.0017	21.0017
47	19.5417	19.4792	1.53	21.0717	21.0092

NOTE:

1. ALL DIMENSIONS IN THIS SCHEDULE ARE IN FEET.
2. DIMENSIONS NOTED AS (EXISTING) ARE FROM TOP OF RAILS TO BOTTOM OF EXIST BEAM FLANGE.
3. DIMENSIONS NOTED AS (PROPOSED) ARE FROM TOP OF RAILS TO TOP OF DOUBLE STACK CAR CLEARANCE ENVELOPE.
4. CUT HEIGHT: INDICATES MINIMUM AMOUNT OF STRUCTURAL STEEL TO BE REMOVED FROM BOTTOM OF EXIST BEAM TO PROVIDE MINIMUM CLEARANCE. REFER TO SPECIFIC BEAM MODIFICATION DETAILS.
5. FIELD VERIFY ALL EXISTING STRUCTURE DIMENSIONS AND ELEVATIONS AND COORDINATE WITH NEW WORK. ANY DISCREPENCIES SHALL BE REPORTED TO THE STRUCTURAL ENGINEER PRIOR TO START OF WORK.
6. COORDINATE DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS WITH ARCHITECTURAL DRAWINGS.

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL

1818 MARKET STREET, SUITE 3110
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(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY

PITTSBURGH DIVISION PITTSBURGH LINE

DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE
AMTRAK STATION

PROPOSED CUT HEIGHT SCHEDULE

VALUATION PLAN: MILE POST: PT-353.20

AUTHORITY NO.: FILE NO.:

MADE BY: WCA DATE: 05-21-2021 CHECKED BY: NLB

SCALE: AS NOTED DRAWING NO.: S-601

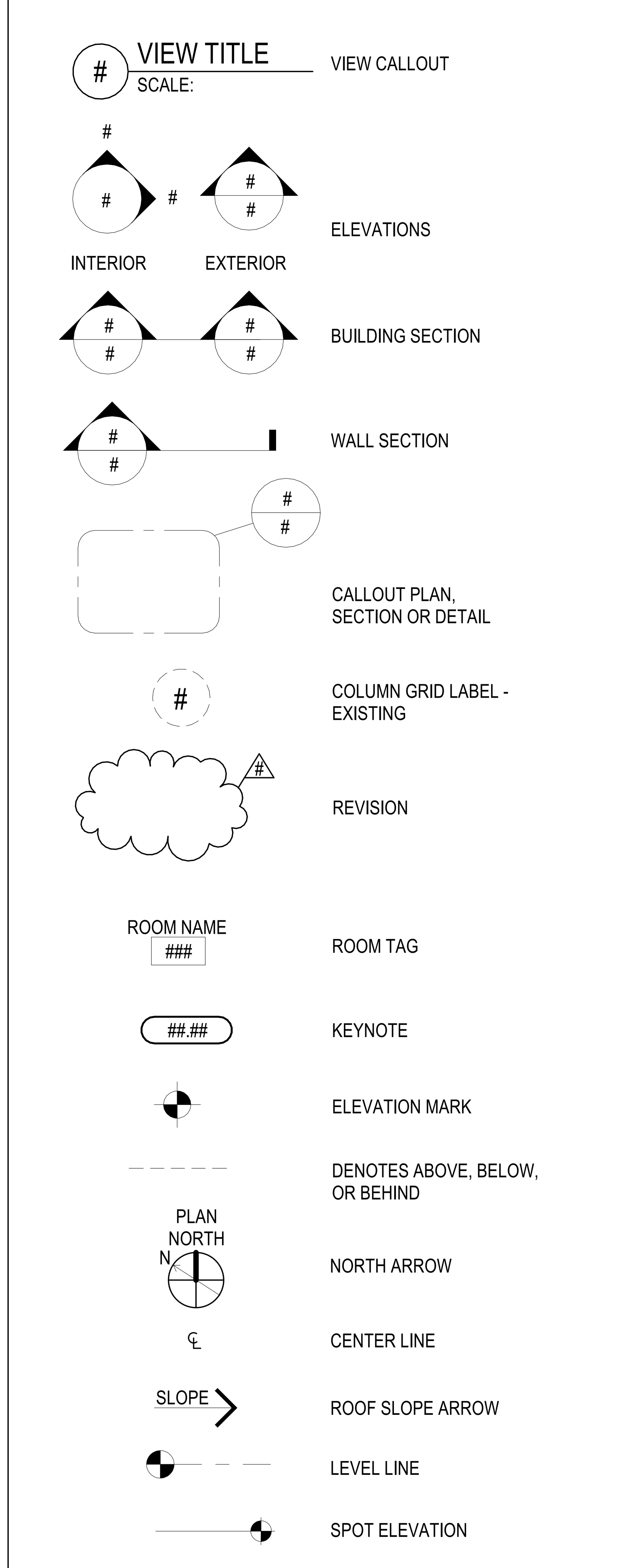
ALTERNATIVE 3

ABB	DESCRIPTION
A	
&	AND
<	ANGLE
@	AT
A/	ABOVE
ACP	ACOUSTIC CEILING PANEL
ADJ	ADJACENT, ADJUSTABLE
AED	AUTOMATED EXTERNAL DEFIBRILLATOR
AFF	ABOVE FINISHED FLOOR
AP	ACCESS PANEL
APPROX	APPROXIMATE(LY)
ARCH	ARCHITECT OR ARCHITECTURAL
ASTM	AMERICAN SOCIETY FOR TESTING MATERIAL
ATTEN	ATTENUATE, ATTENUATION
AVG	AVERAGE
B	
B/	BOTTOM OF
B/C	BOTTOM OF CURB
BC	BASE CABINET
BD	BOARD
BIT	BITUMINOUS
BLDG	BUILDING
BSMT	BASEMENT
C	
[	CHANNEL
C/	CENTER OF
CAB	CABINET
CC	CENTER TO CENTER
CG	CORNER GUARD
CJ	CORNER JOINT
CL	CENTER LINE
CLG	CEILING
CLG HT	CEILING HEIGHT
CLO	CLOSET
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
CORR	CORRIDOR
CP	COPIER
CT	CERAMIC TILE
CY	CUBIC YARD
D	
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DW	DISHWASHER
DWG	DRAWING
E	
E	EAST
EA	EACH
EB	EDGE BANDING
EIFS	EXTERIOR INSULATION FINISH SYSTEM
EJ	EXPANSION JOINT
ELEC	ELECTRICAL
ELEV	ELEVATOR
EMER	EMERGENCY
ENCL	ENCLOSE(URE)
EP	ELECTRICAL PANEL
EQ	EQUAL
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
EXP BLT	EXPANSION BOLT
EXT	EXTERIOR
F	
<	FABRIC
F/F	FACE TO FACE
FAX	FACSIMILE
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FHC	FIRE HOSE CABINET
FL	FLOOR
FL CO	FLOOR CLEANOUT
FP	FIRE PROTECTION
FPRF	FIREPROOF(ING)
FR	FIRE RATED OR FRAME
FT	FOOT/FEET

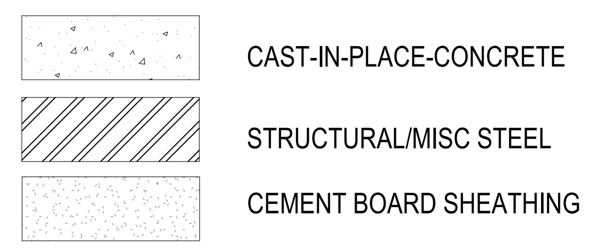
ABB	DESCRIPTION
G	
GA	GAUGE
GL	GLASS OR GLAZING
GRD	GROUND
GWB	GYPSUM WALL BOARD
H	
HB	HOSE BIBB
HC	HANDICAP(PED)
HDW	HARDWARE
HM	HOLLOW METAL
HOR	HORIZONTAL
HP	HIGH POINT
HTR	HEATER
I	
ID	INSIDE DIAMETER
IN	INCH(ES)
INT	INTERIOR
J	
JB	JAMB
JST	JOIST
JT	JOINT
L	
LAM	LAMINATE
LAN	LOCAL AREA NETWORK CONNECTION
LAV	LAVATORY
LB	POUND
LF	LINEAL FOOT
LP	LOW POINT
LTL	LINTEL
M	
m	METERS
MAS	MASONRY
MAX	MAXIMUM
MDF	MEDIUM DENSITY FIBERBOARD
MECH	MECHANICAL
MEZZ	MEZZANINE
MFR	MANUFACTURE
MH	MANHOLE
MICRO	MICROWAVE
MIN	MINIMUM
MISC	MISCELLANEOUS
mm	MILLIMETERS
MO	MASONRY OPENING
MTD	MOUNTED EL
MTL	METAL
N	
N	NORTH
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NOM	NOMINAL
NTS	NOT TO SCALE
O	
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFF	OFFICE
OPNG	OPENING
OPP	OPPOSITE
P	
PART	PARTITION
PL	PLATE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLYWD	PLYWOOD
PNL	PANEL
POS	POINT OF SALE
PR	PAIR
PRCST	PRECAST
PREFAB	PREFABRICATED
PROP	PROPERTY
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PT	POINT
PTD	PAINTED
Q	
QTY	QUANTITY

ABB	DESCRIPTION
R	
R	RISER OR RADIUS
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REF	REFER / REFERENCE
REG	REGISTER
REINF	REINFORCING
REQ'D	REQUIRED
RFG	REFRIGERATOR
RG	RANGE
RM	ROOM
RO	ROUGH OPENING
RTS	RUBBER TRANSITION STRIP
RWC	RAIN WATER CONDUCTOR
S	
S	SOUTH
SAN	SANITARY
SCHD	SCHEDULE
SEC	SECTION
SF	SQUARE FOOT
SIM	SIMILAR
SPKLR	SPRINKLER
SQ	SQUARE
SQ FT	SQUARE FOOT
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STN	STAINED
STOR	STORAGE
SUSP	SUSPEND, SUSPENDED, OR SUSPENSION
SYS	SYSTEM
T	
"T"	TEE (BAR OR W)
T	TREAD
T/	TOP OF
T/C	TOP OF CURB
TB	TACKBOARD
TC	TERRA COTTA
TEL	TELEPHONE
TEMP	TEMPERED OR TEMPERATURE
TERM	TERMINATE / TERMINAL
THRESH	THRESHOLD
TLT	TOILET
TV	TELEVISION
TYP	TYPICAL
U	
UH	UNIT HEATER
UL	UNDERWRITER'S LABORATORY
UMCT	UNGLAZED MOSAIC CERAMIC TILE
UNO	UNLESS NOTED OTHERWISE
V	
VEST	VESTIBULE
VIF	VERIFY IN FIELD
W	
W	WEST
W/	WITH
W/O	WITHOUT
WC	WATER CLOSET
WIN	WINDOW
WP	WATERPROOF(ING)
WSCT	WAINSCOT
WT	WEIGHT
WWF	WELDED WIRE REINFORCEMENT

SYMBOLS



SECTIONS/ SECTIONAL DETAILS



NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL

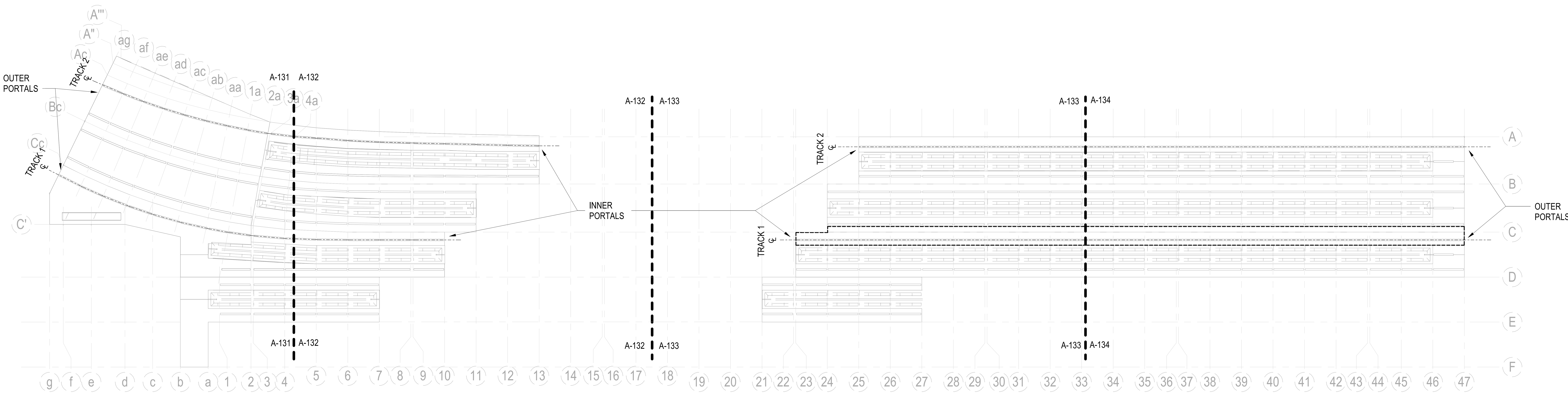
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE
AMTRAK STATION

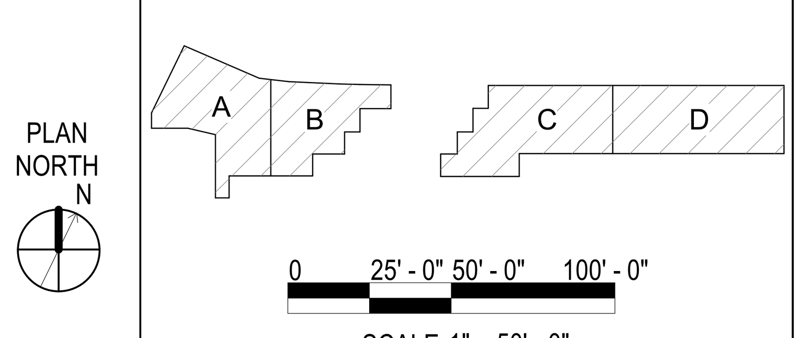
ARCHITECTURAL ABBREVIATIONS & SYMBOLS

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: JD DATE: 05-21-2021 CHECKED BY: MK
SCALE: AS NOTED DRAWING NO.: A-001



1 COMPREHENSIVE ROOF PLAN - DEMOLITION
SCALE: 1" = 50'-0"

KEYPLAN



NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

COMPREHENSIVE ROOF PLAN

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: JD DATE: 05-21-2021 CHECKED BY: MK
SCALE: AS NOTED DRAWING NO.: A-130

ALTERNATIVE 3

KEYNOTES

1 CENTERLINE OF TRACK 1. VERTICAL CLEARANCE WORK OCCURS BELOW THE ROOF LEVEL. REFER TO AD- AND A-SERIES DETAILS. REFER TO S-SERIES AND E-SERIES DRAWINGS FOR ADDITIONAL INFORMATION.

2 CENTERLINE OF TRACK 2. VERTICAL CLEARANCE WORK OCCURS BELOW THE ROOF LEVEL. REFER TO AD- AND A-SERIES DETAILS. REFER TO S-SERIES AND E-SERIES DRAWINGS FOR ADDITIONAL INFORMATION.

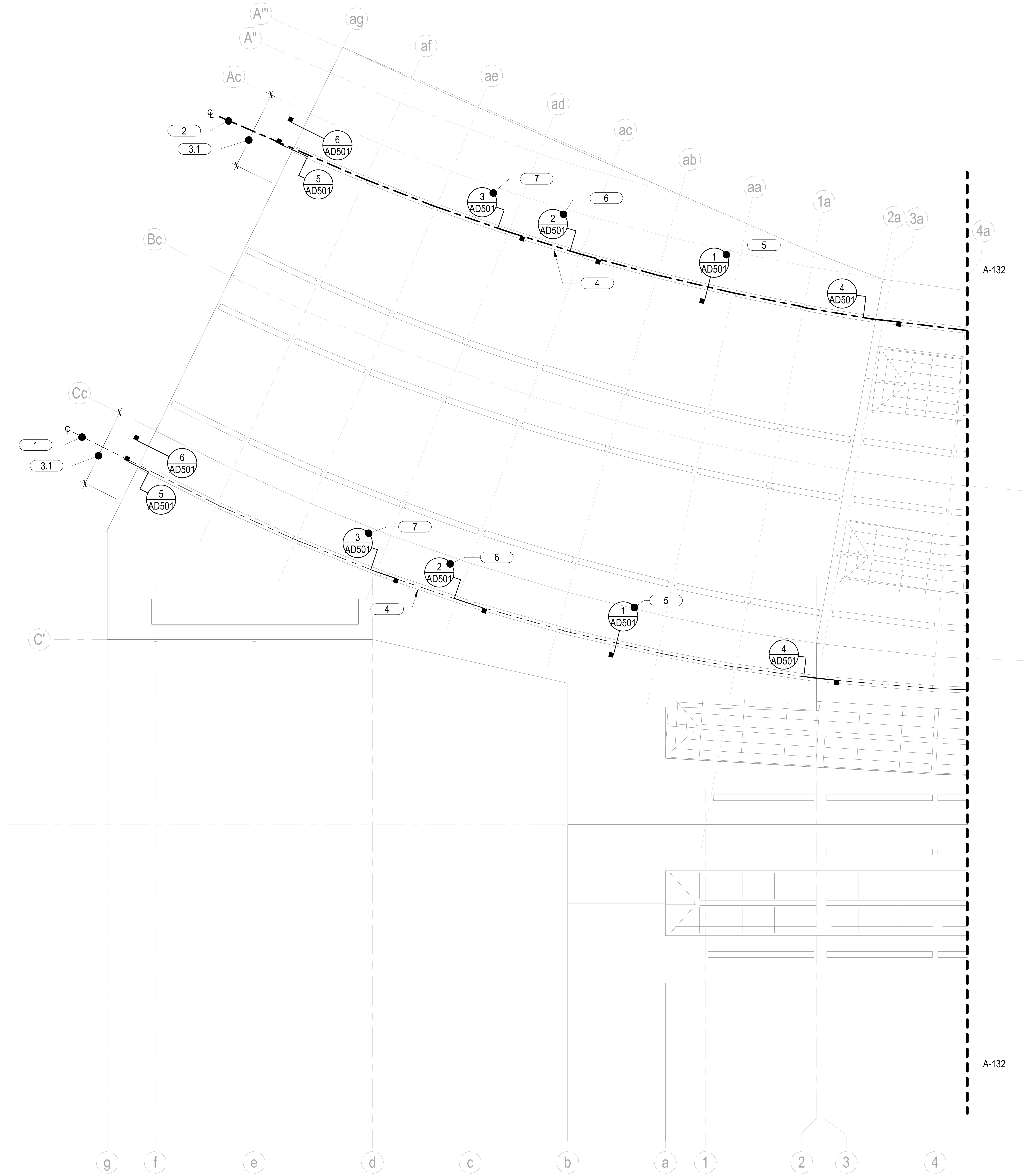
3.1 OUTER PORTAL. REFER TO DETAILS FOR MODIFICATIONS WITHIN AND ADJACENT TO THE TRAIN CAR CLEARANCE ENVELOPE.

4 EXHAUST JACK OPENING, TYPICAL.

5 TYPICAL AT ALL EXHAUST JACKS ALONG TRACKS 1 AND 2.

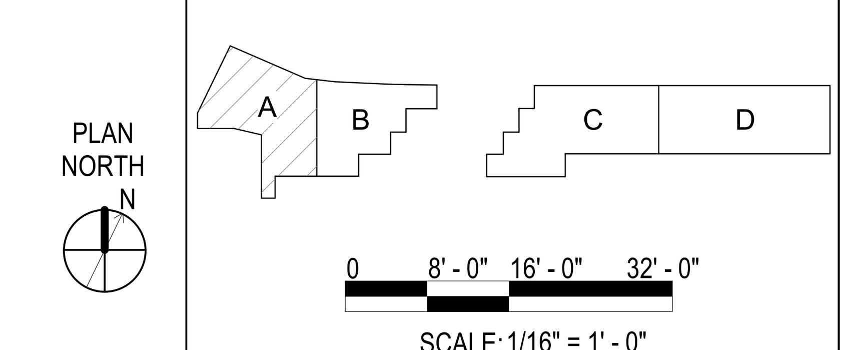
6 TYPICAL BETWEEN JACKS ALONG TRACKS 1 AND 2 UNLESS NOTED OTHERWISE.

7 TYPICAL BETWEEN JACKS ALONG TRACKS 1 AND 2 AT BENTS ad, ab, 1a, 4a, 6, 11 (TRACK 2 ONLY), 25 (TRACK 1 ONLY), 27, 32, 34, 39, 41, AND 46.



1 PARTIAL ROOF PLAN - DEMOLITION - AREA A
SCALE: 1/16" = 1'-0"

KEYPLAN



NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

PARTIAL ROOF PLAN - AREA A

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: JD DATE: 05-21-2021 CHECKED BY: MK
SCALE: AS NOTED DRAWING NO.: A-131

ALTERNATIVE 3

KEYNOTES

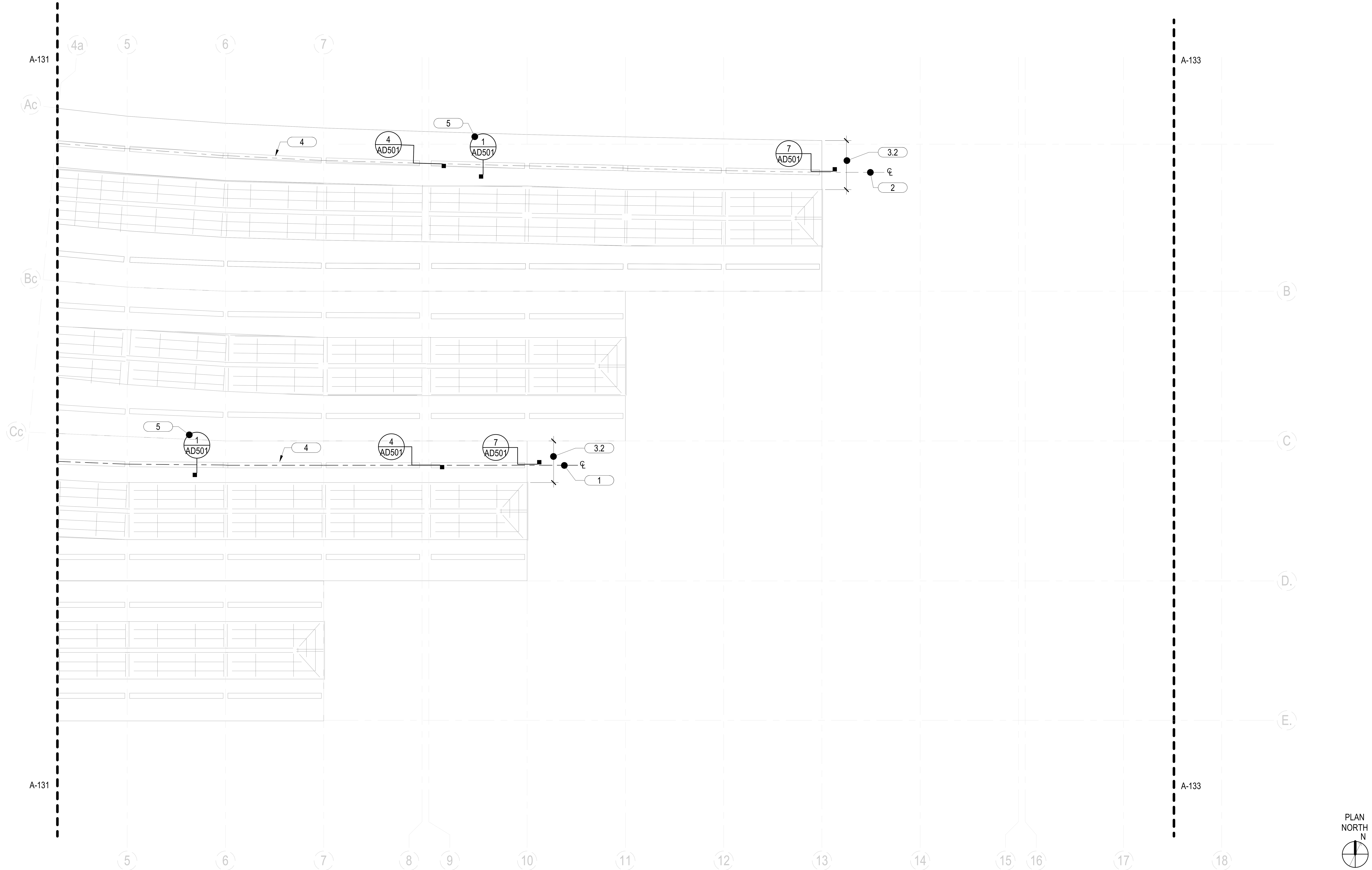
1 CENTERLINE OF TRACK 1. VERTICAL CLEARANCE WORK OCCURS BELOW THE ROOF LEVEL. REFER TO AD- AND A-SERIES DETAILS. REFER TO S-SERIES AND E-SERIES DRAWINGS FOR ADDITIONAL INFORMATION.

2 CENTERLINE OF TRACK 2. VERTICAL CLEARANCE WORK OCCURS BELOW THE ROOF LEVEL. REFER TO AD- AND A-SERIES DETAILS. REFER TO S-SERIES AND E-SERIES DRAWINGS FOR ADDITIONAL INFORMATION.

3.2 INNER PORTAL. REFER TO DETAILS FOR MODIFICATIONS WITHIN AND ADJACENT TO THE TRAIN CAR CLEARANCE ENVELOPE.

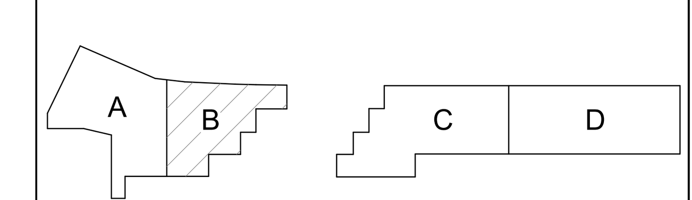
4 EXHAUST JACK OPENING, TYPICAL.

5 TYPICAL AT ALL EXHAUST JACKS ALONG TRACKS 1 AND 2.



1 PARTIAL ROOF PLAN - DEMOLITION - AREA B
SCALE: 1/16" = 1'-0"

KEYPLAN



PLAN NORTH N

0 8' - 0" 16' - 0" 32' - 0"
SCALE: 1/16" = 1' - 0"

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: **NORFOLK SOUTHERN RAILWAY COMPANY**

PITTSBURGH DIVISION **PITTSBURGH** LINE

DESCRIPTION: **PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION**

PARTIAL ROOF PLAN - AREA B

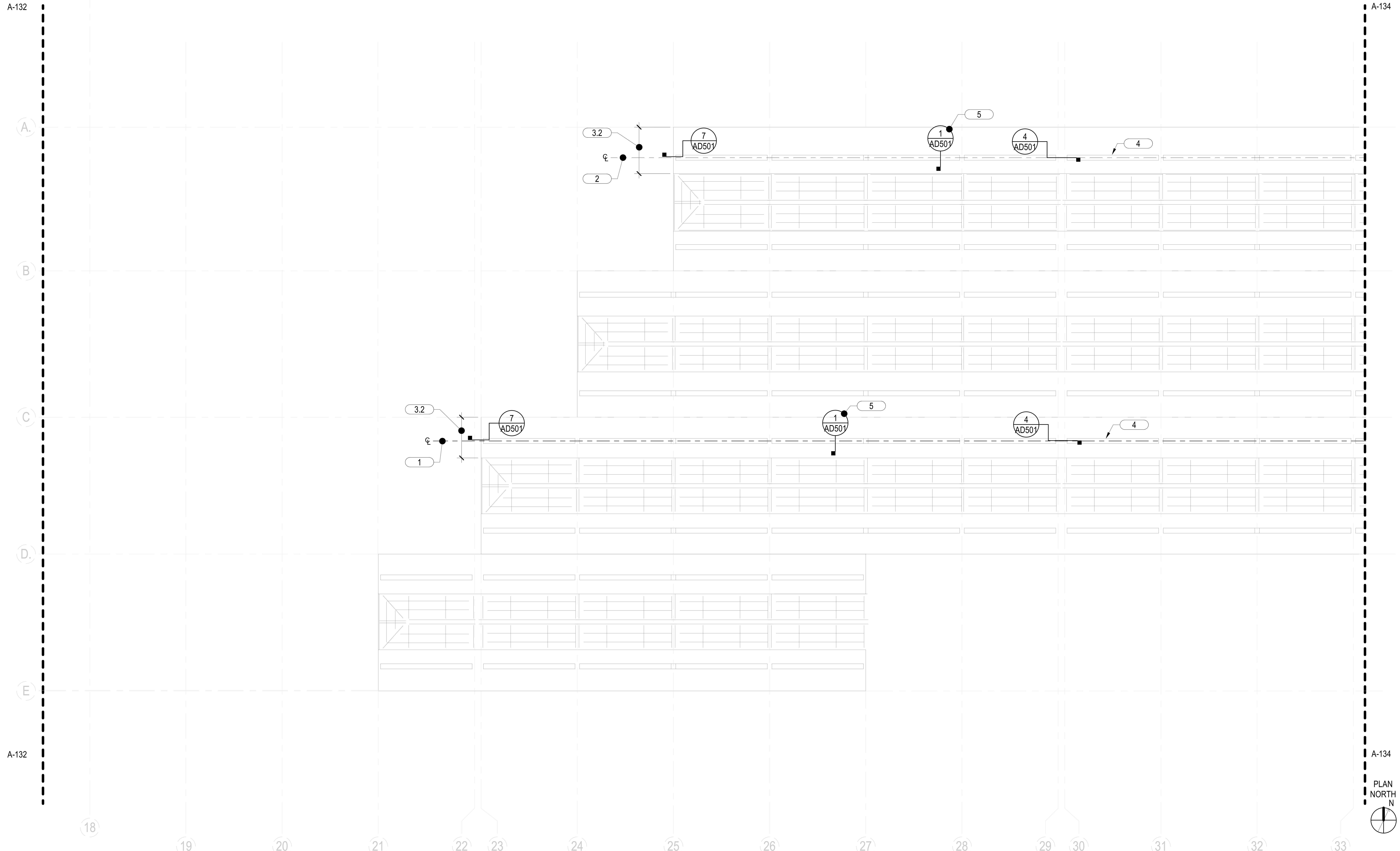
VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: JD DATE: 05-21-2021 CHECKED BY: MK

SCALE: AS NOTED DRAWING NO.: A-132

ALTERNATIVE 3

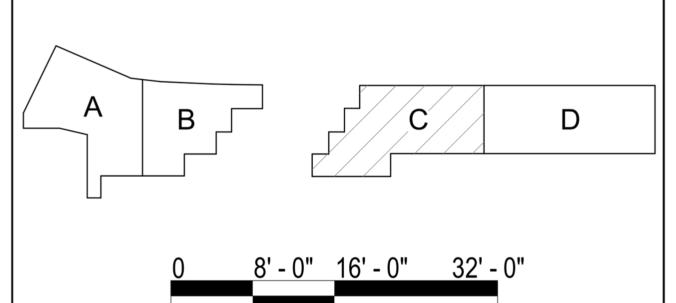
KEYNOTES

1	CENTERLINE OF TRACK 1. VERTICAL CLEARANCE WORK OCCURS BELOW THE ROOF LEVEL. REFER TO AD- AND A-SERIES DETAILS. REFER TO S-SERIES AND E-SERIES DRAWINGS FOR ADDITIONAL INFORMATION.
2	CENTERLINE OF TRACK 2. VERTICAL CLEARANCE WORK OCCURS BELOW THE ROOF LEVEL. REFER TO AD- AND A-SERIES DETAILS. REFER TO S-SERIES AND E-SERIES DRAWINGS FOR ADDITIONAL INFORMATION.
3.2	INNER PORTAL. REFER TO DETAILS FOR MODIFICATIONS WITHIN AND ADJACENT TO THE TRAIN CAR CLEARANCE ENVELOPE.
4	EXHAUST JACK OPENING, TYPICAL.
5	TYPICAL AT ALL EXHAUST JACKS ALONG TRACKS 1 AND 2.



1 PARTIAL ROOF PLAN - DEMOLITION - AREA C
SCALE: 1/16" = 1'-0"

KEYPLAN



SCALE: 1/16" = 1' - 0"

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE
AMTRAK STATION

PARTIAL ROOF PLAN - AREA C

VALUATION PLAN:
MILE POST: PT-353.20
AUTHORITY NO.:
FILE NO.:
MADE BY: JD
DATE: 05-21-2021
CHECKED BY: MK
SCALE: AS NOTED
DRAWING NO.: A-133

ALTERNATIVE 3

KEYNOTES

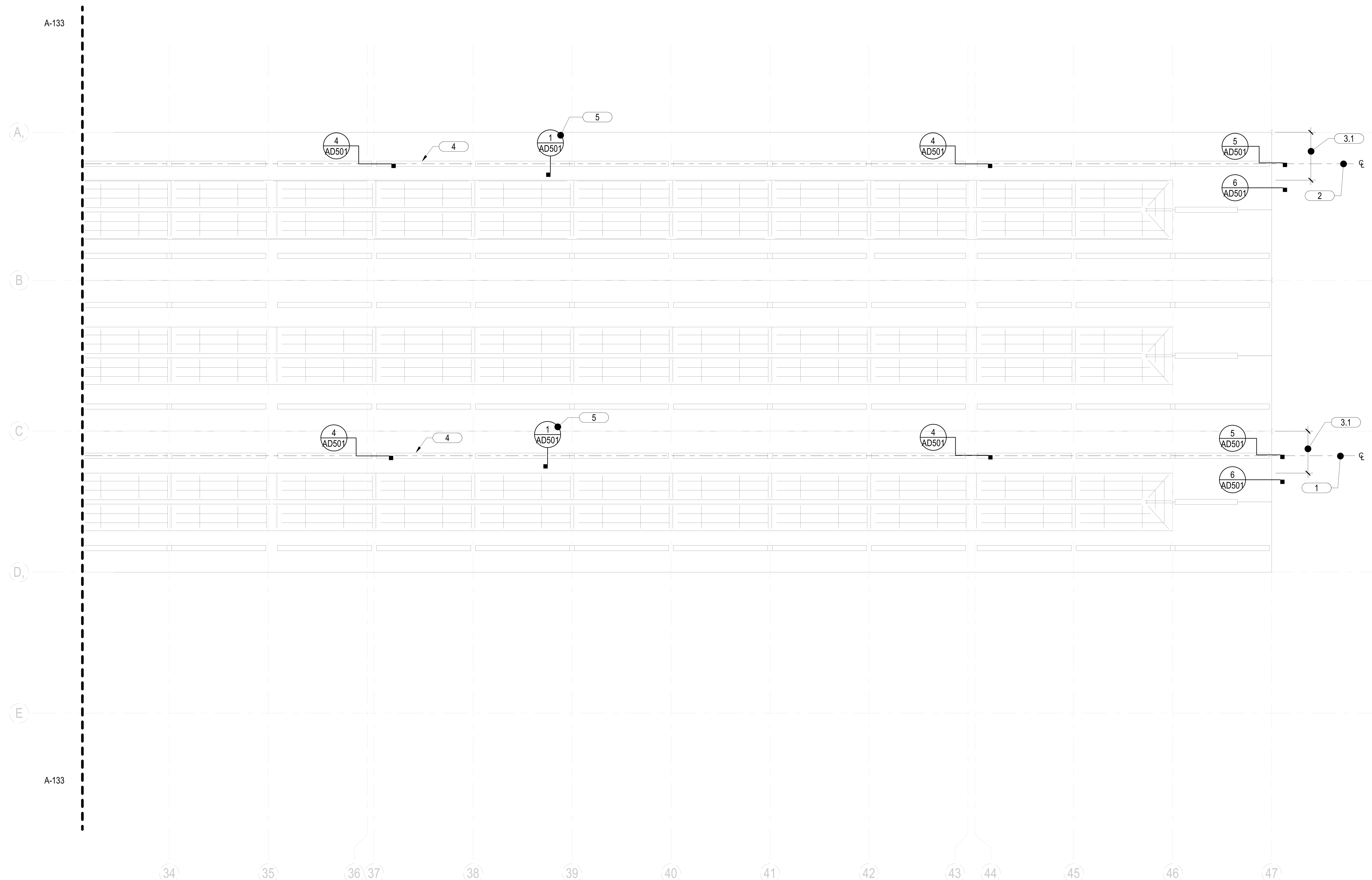
1 CENTERLINE OF TRACK 1. VERTICAL CLEARANCE WORK OCCURS BELOW THE ROOF LEVEL. REFER TO AD- AND A-SERIES DETAILS. REFER TO S-SERIES AND E-SERIES DRAWINGS FOR ADDITIONAL INFORMATION.

2 CENTERLINE OF TRACK 2. VERTICAL CLEARANCE WORK OCCURS BELOW THE ROOF LEVEL. REFER TO AD- AND A-SERIES DETAILS. REFER TO S-SERIES AND E-SERIES DRAWINGS FOR ADDITIONAL INFORMATION.

3.1 OUTER PORTAL. REFER TO DETAILS FOR MODIFICATIONS WITHIN AND ADJACENT TO THE TRAIN CAR CLEARANCE ENVELOPE.

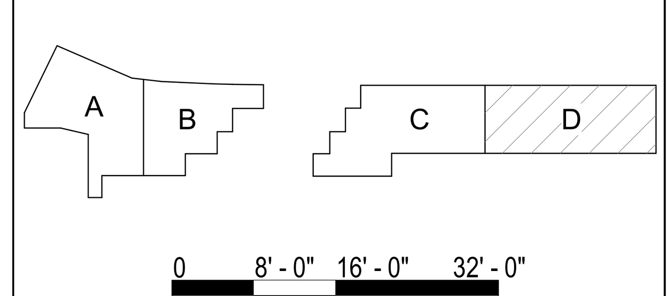
4 EXHAUST JACK OPENING, TYPICAL.

5 TYPICAL AT ALL EXHAUST JACKS ALONG TRACKS 1 AND 2.



1 PARTIAL ROOF PLAN - DEMOLITION - AREA D
SCALE: 1/16" = 1'-0"

KEYPLAN



SCALE: 1/16" = 1' - 0"

NO.	DATE	REVISIONS

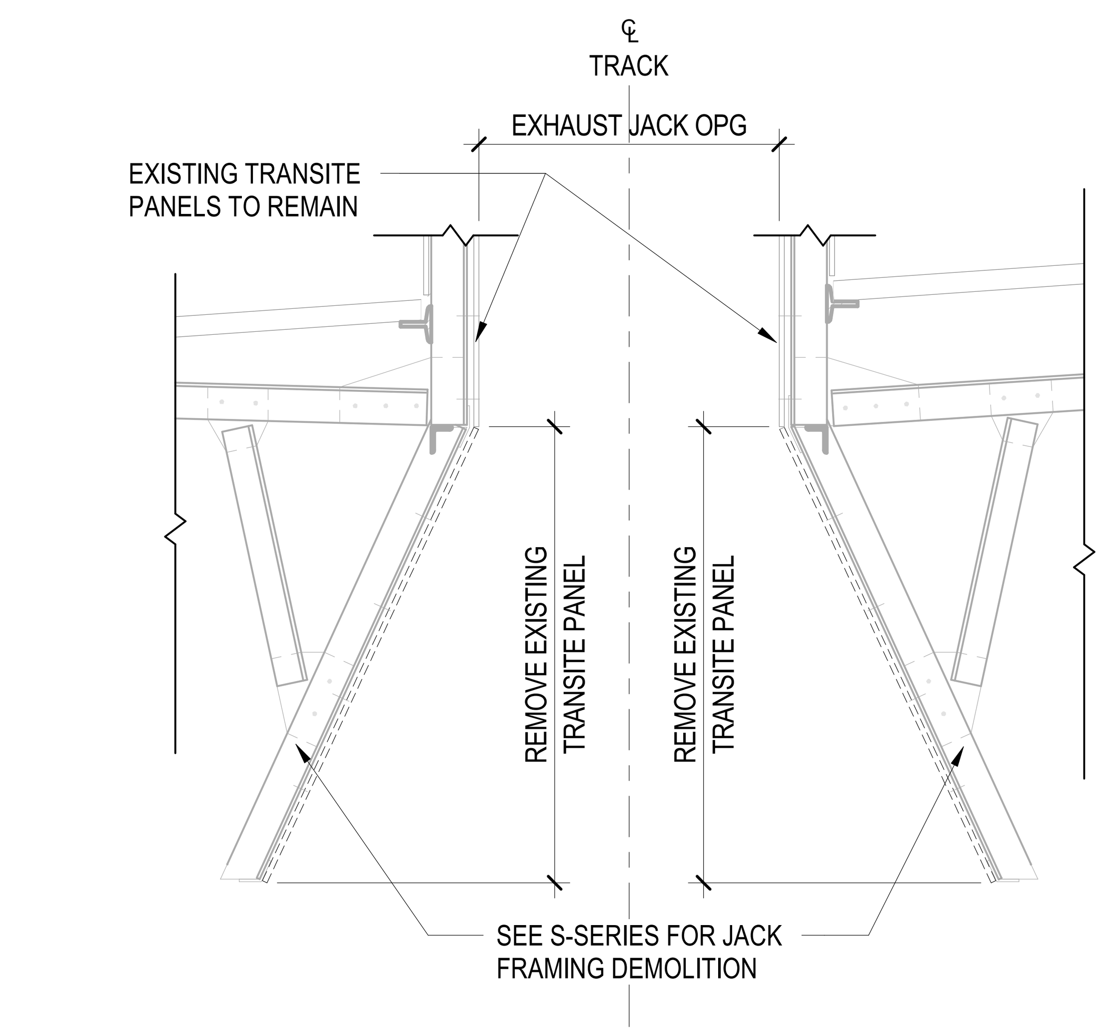
Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

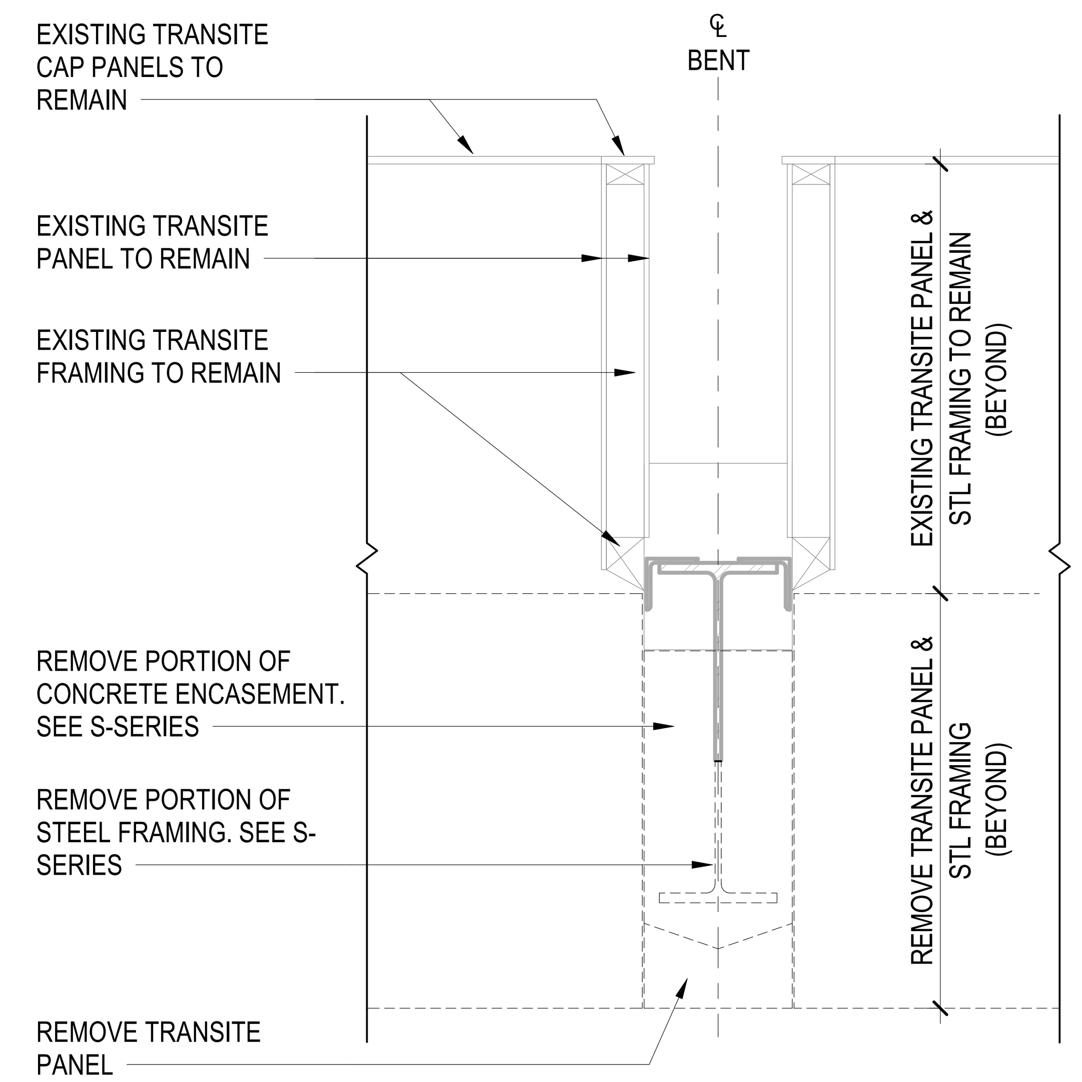
OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

PARTIAL ROOF PLAN - AREA D

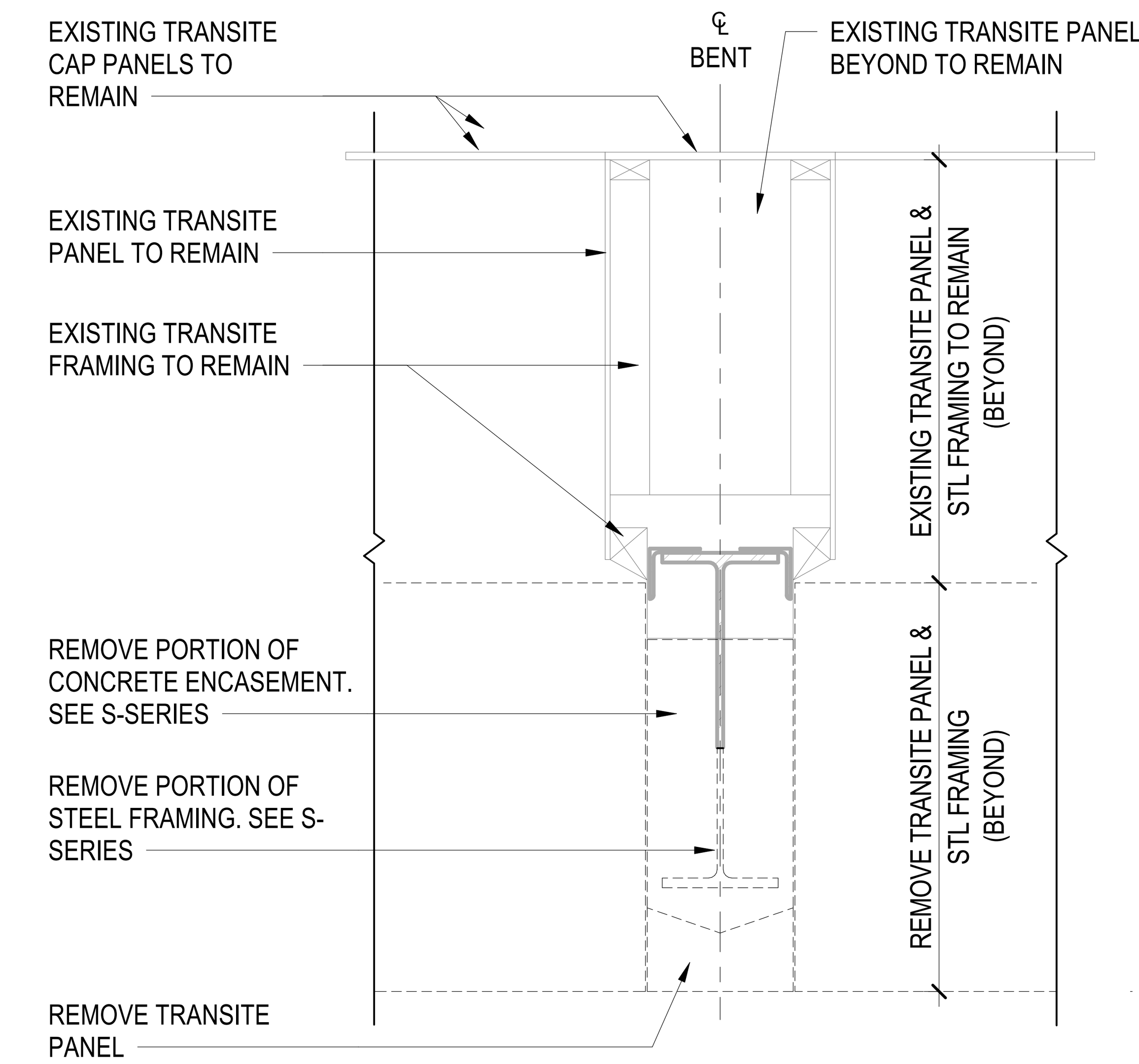
VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: JD DATE: 05-21-2021 CHECKED BY: MK
SCALE: AS NOTED DRAWING NO.: A-134



1 EXHAUST JACK TRANSITE PANEL DEMOLITION, TYPICAL ALONG TRACKS 1 & 2
SCALE: 3/4" = 1'-0"
SEE DETAIL 1/A-501 FOR NEW WORK CONDITION



2 DEMOLITION AT UNCONNECTED EXHAUST JACK ENDS ALONG TRACKS 1 & 2
SCALE: 3/4" = 1'-0"
SEE DETAIL 2/A-501 FOR NEW WORK CONDITION



3 DEMOLITION AT CONNECTED EXHAUST JACK ENDS ALONG TRACKS 1 & 2
SCALE: 3/4" = 1'-0"
SEE DETAIL 3/A-501 FOR NEW WORK CONDITION

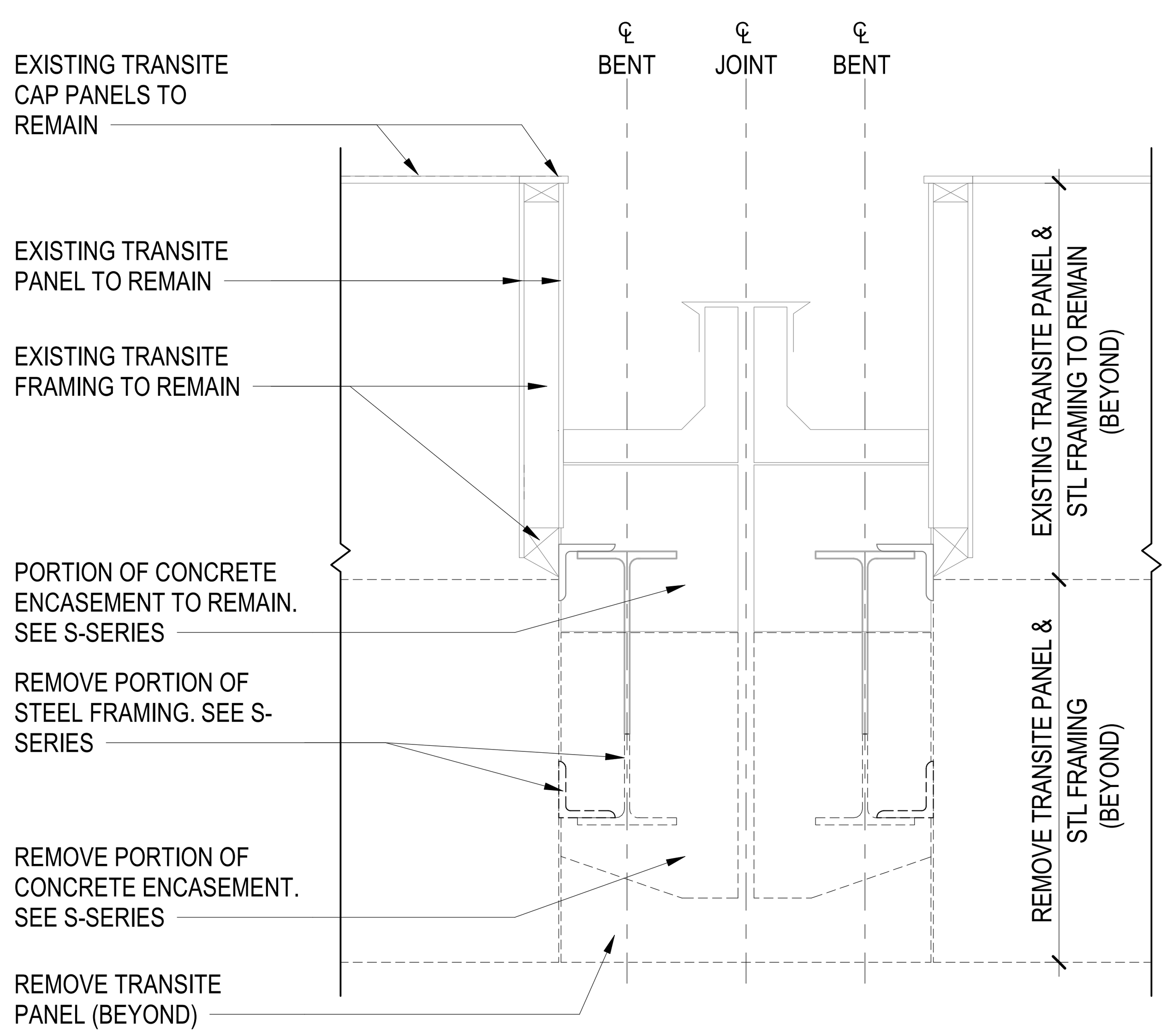
NOTES - DEMOLITION

1 THE TRANSITE PANELS ARE AN ASBESTOS CONTAINING MATERIAL. REFER TO SPECIFICATION 028213 - ASBESTOS ABATEMENT FOR REMOVAL PROCEDURES AND CONTRACTOR RESPONSIBILITIES.

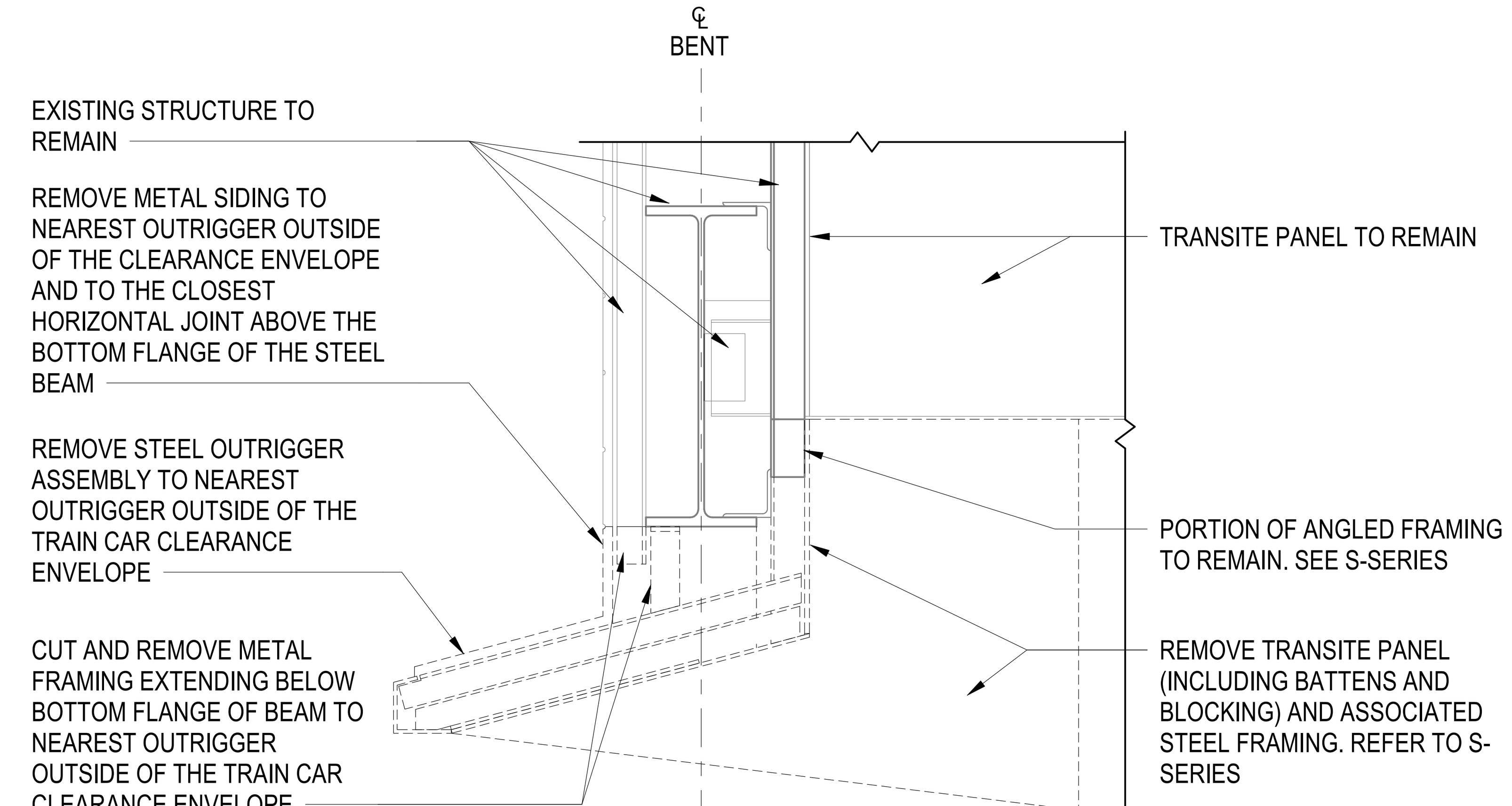
2 ANY MATERIAL SUSPECTED OF BEING ASBESTOS CONTAINING MATERIAL AND NOT IDENTIFIED ON THESE DRAWINGS OR IN THE SPECIFICATIONS SHOULD BE TESTED BEFORE BEING DISTURBED. CONTACT THE OWNER FOR FURTHER INSTRUCTIONS BEFORE TESTING OR REMOVING ANY ADDITIONAL SUSPECT MATERIAL.

3 UPON THE AGE OF THE BUILDING, ALL PAINTED MATERIALS ARE ASSUMED TO HAVE LEAD-CONTAINING PAINT (LCP). WHILE THERE IS NO ABATEMENT OF PAINT PLANNED, THE CONTRACTOR SHOULD BE AWARE OF THE LEAD-CONTAINING PAINT DURING THE RENOVATION ACTIVITIES AND THE REQUIRMENTS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) CONSTRUCTION STANDARDS SHALL BE OBSERVED. REFER ALSO TO SPECIFICATION SECTION 028333 - REMOVAL OF PAINT DURING CONSTRUCTION.

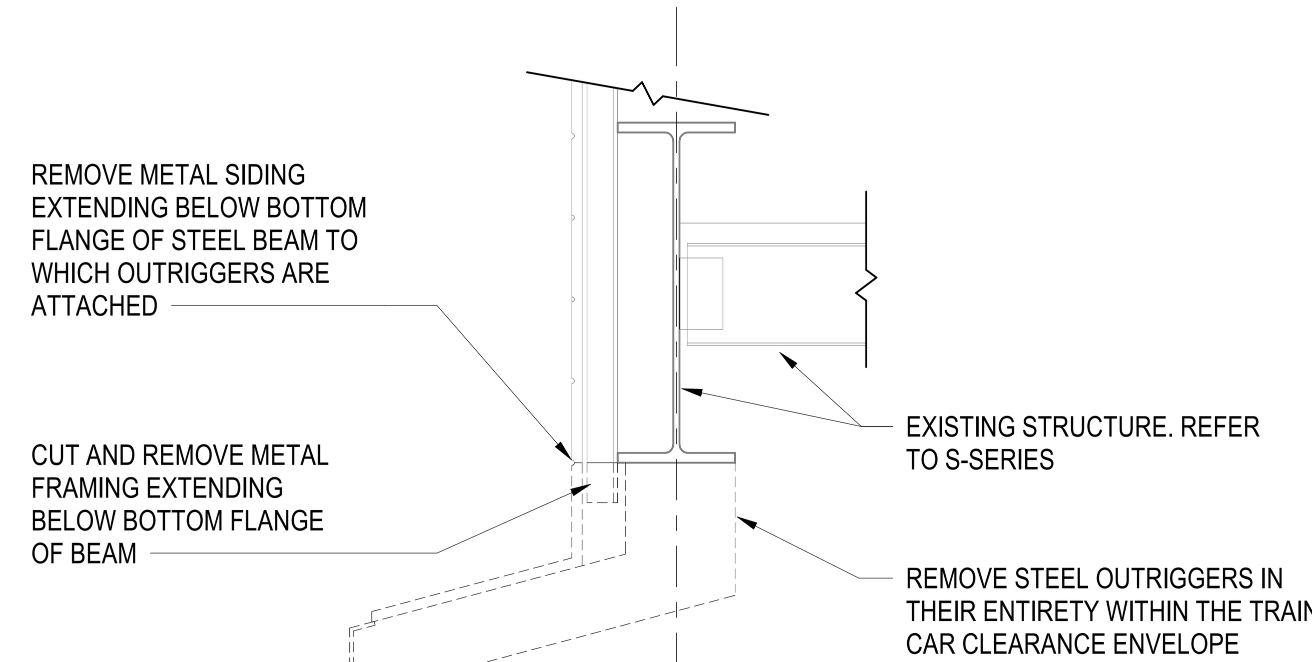
4 THE CONTRACTOR SHALL BE RESPONSIBLE TO PERFORM WORK ACCORDING TO ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.



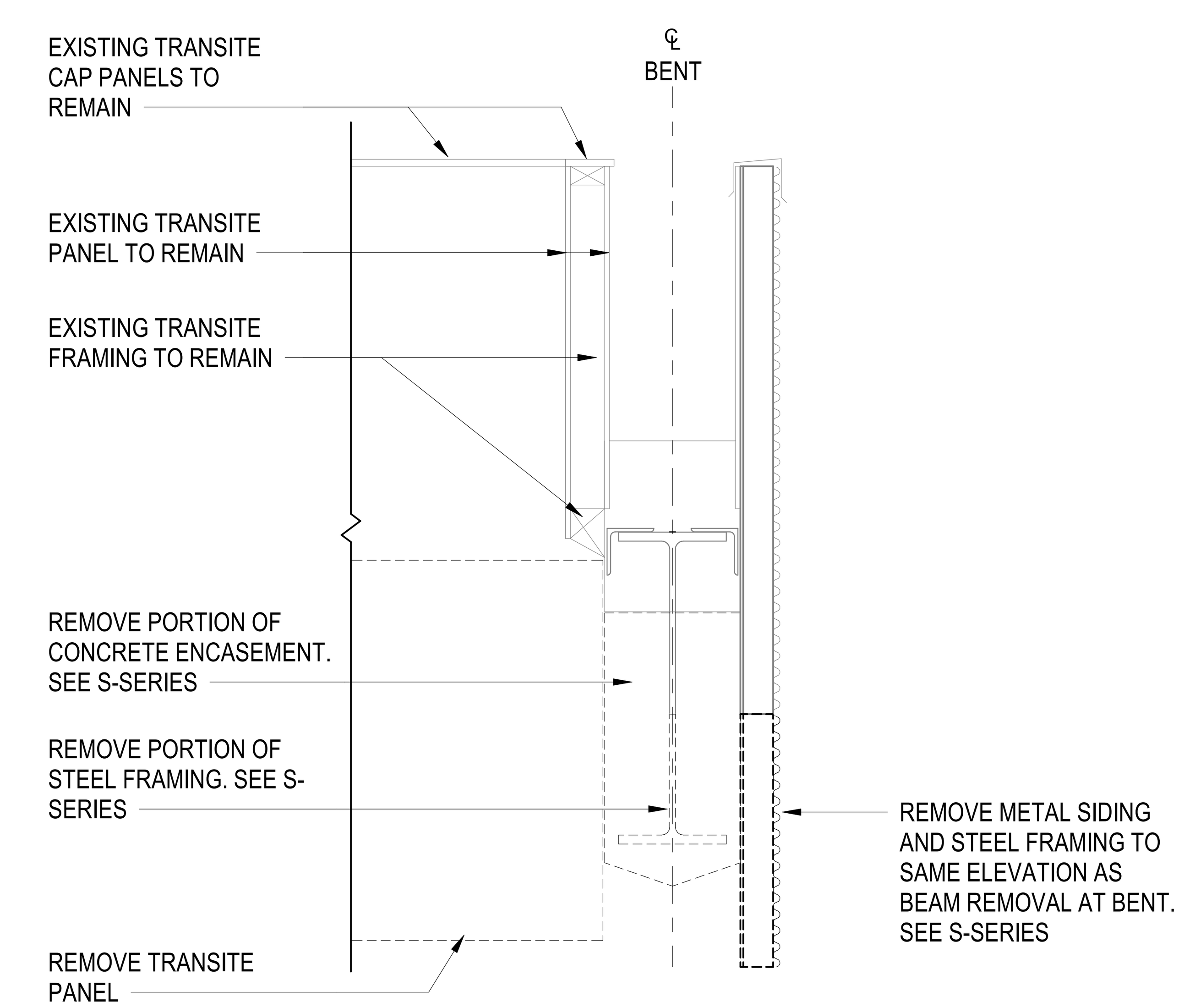
4 EXHAUST JACK DEMOLITION AT EXPANSION JOINT
SCALE: 3/4" = 1'-0"
SEE DETAIL 4/A-501 FOR NEW WORK CONDITION



5 DEMOLITION - OUTER PORTAL AT JACK
SCALE: 3/4" = 1'-0"
SEE DETAIL 5/A-501 FOR NEW WORK CONDITION



6 DEMOLITION - OUTER PORTAL ADJACENT TO JACK
SCALE: 3/4" = 1'-0"



7 DEMOLITION - INNER PORTAL AT JACK
SCALE: 3/4" = 1'-0"
SEE DETAIL 6/A-501 FOR NEW WORK CONDITION

0 1' - 0" 2' - 0" 4' - 0"
SCALE:3/4" = 1' - 0"

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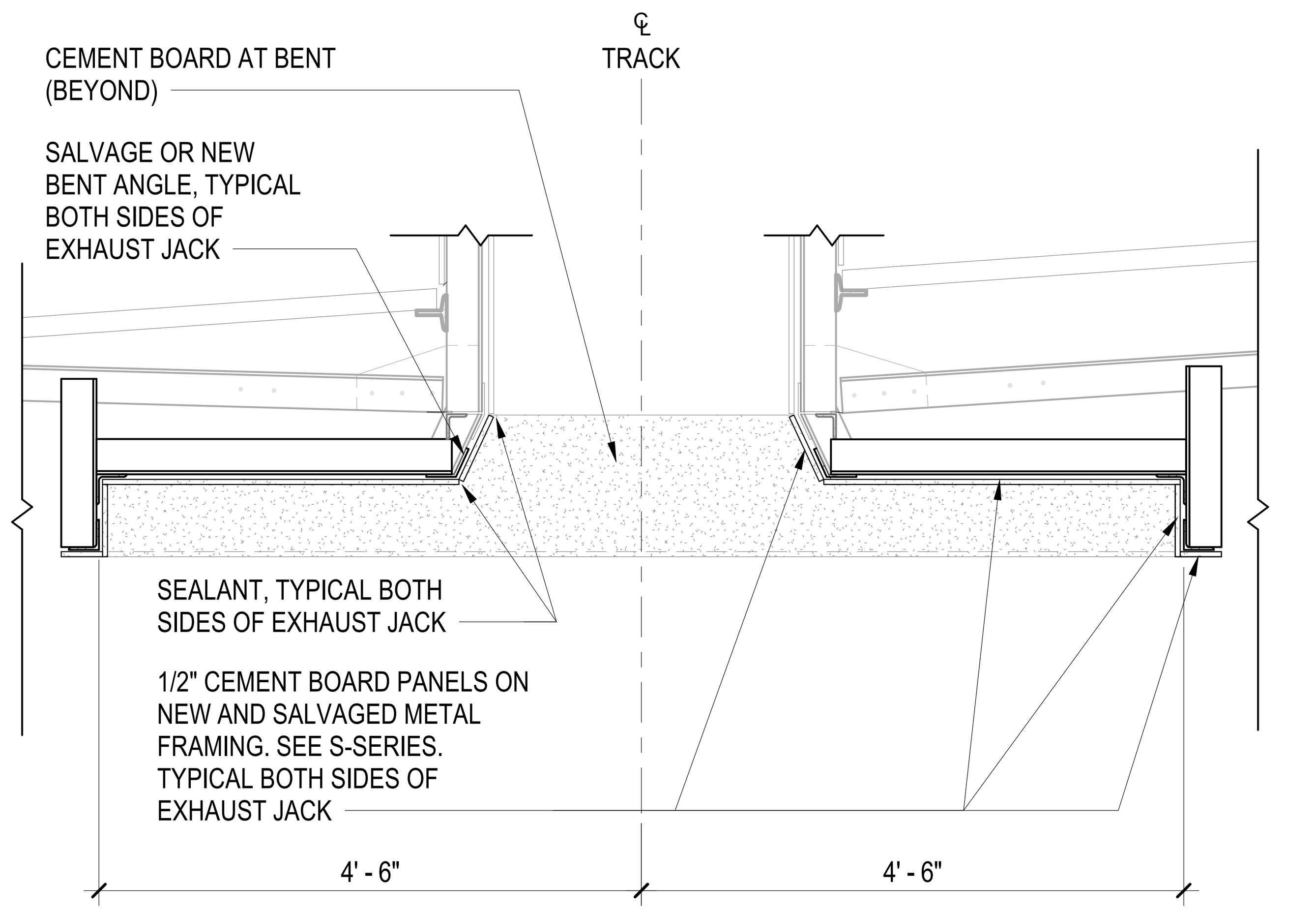
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN
OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE
AMTRAK STATION
DEMOLITION DETAILS
VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: JD DATE: 05-21-2021 CHECKED BY: MK
SCALE: AS NOTED DRAWING NO.: AD501

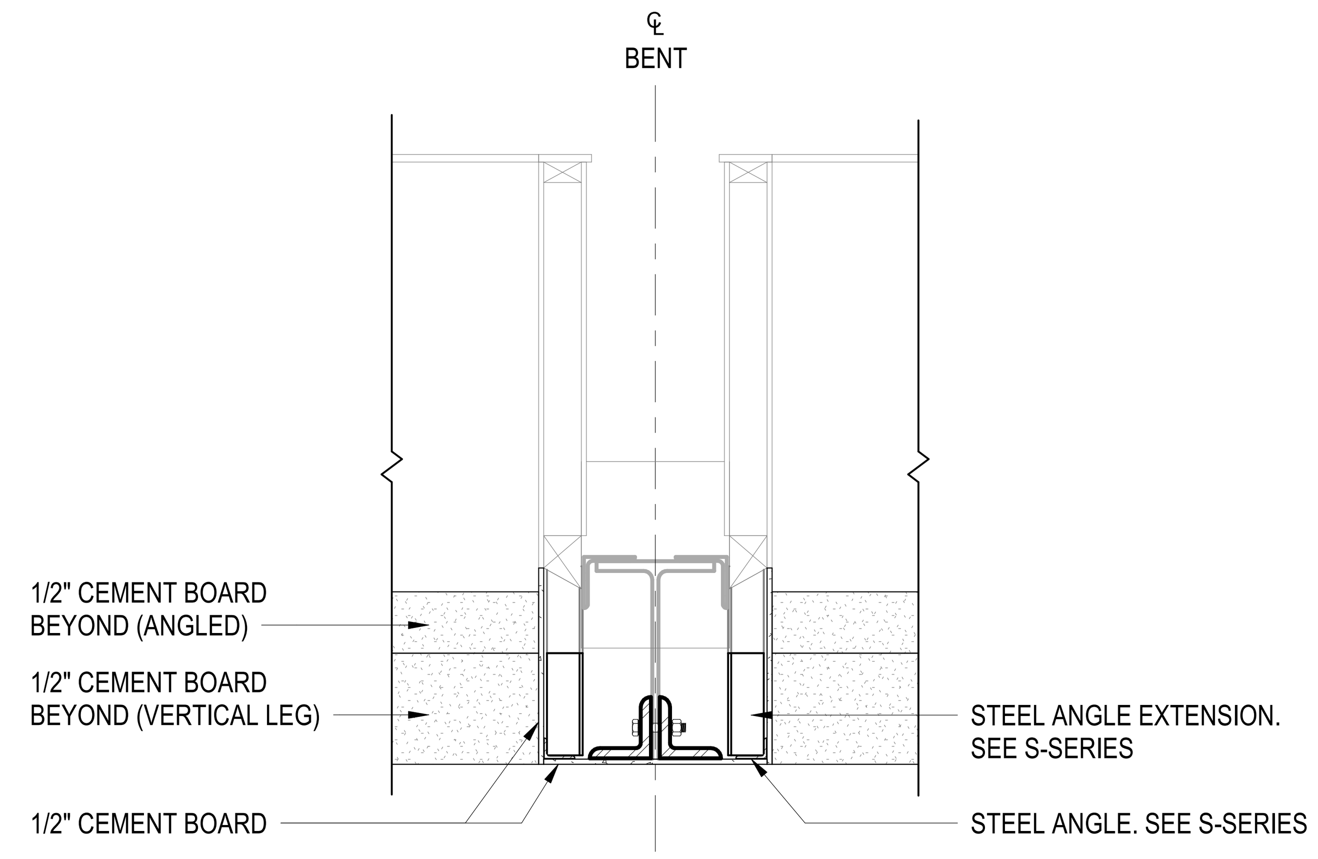
ALTERNATIVE 3

NOTES - NEW WORK

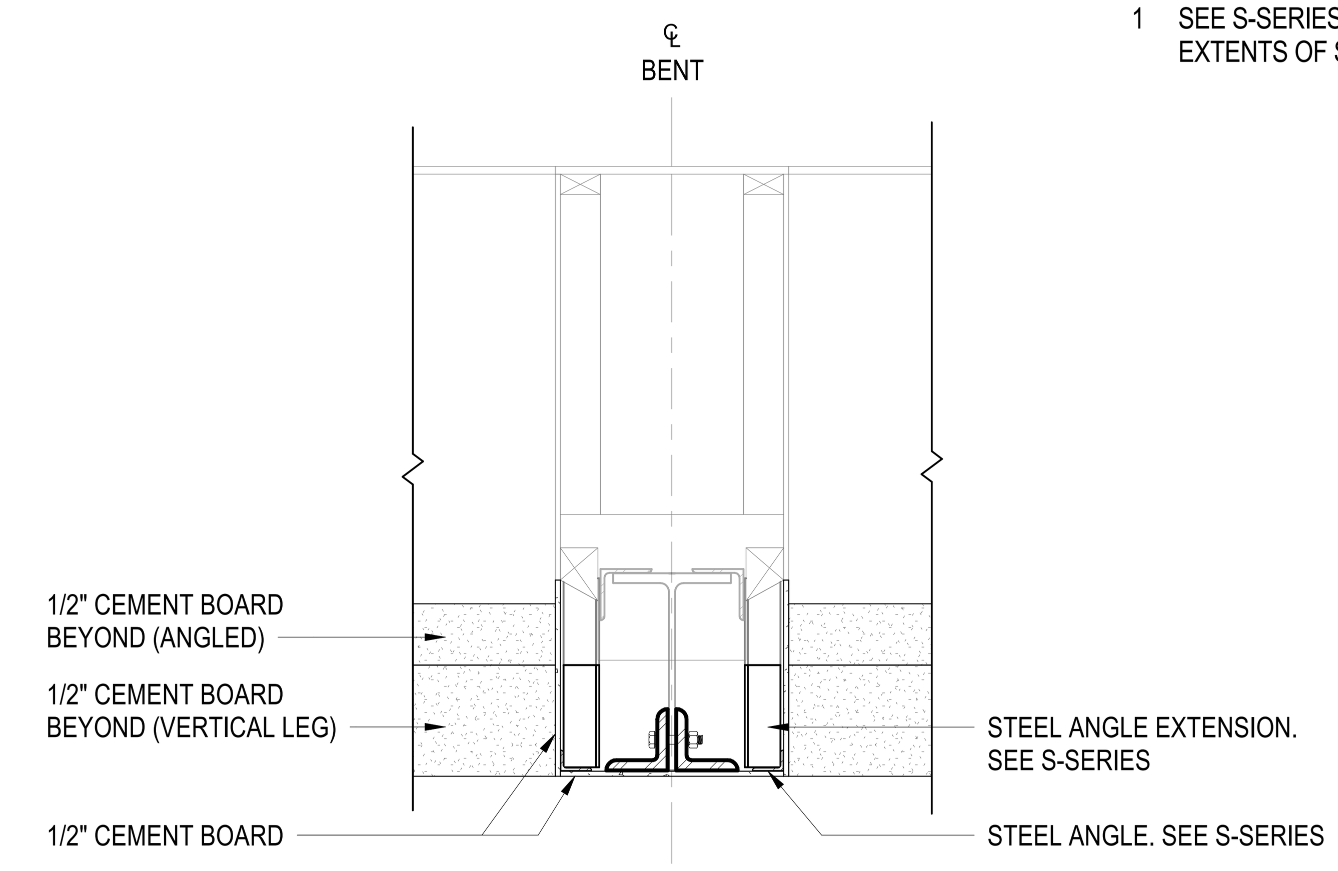
1 SEE S-SERIES STEEL SURFACE PREPARATION REQUIREMENTS AND EXTENTS OF STEEL PAINTING.



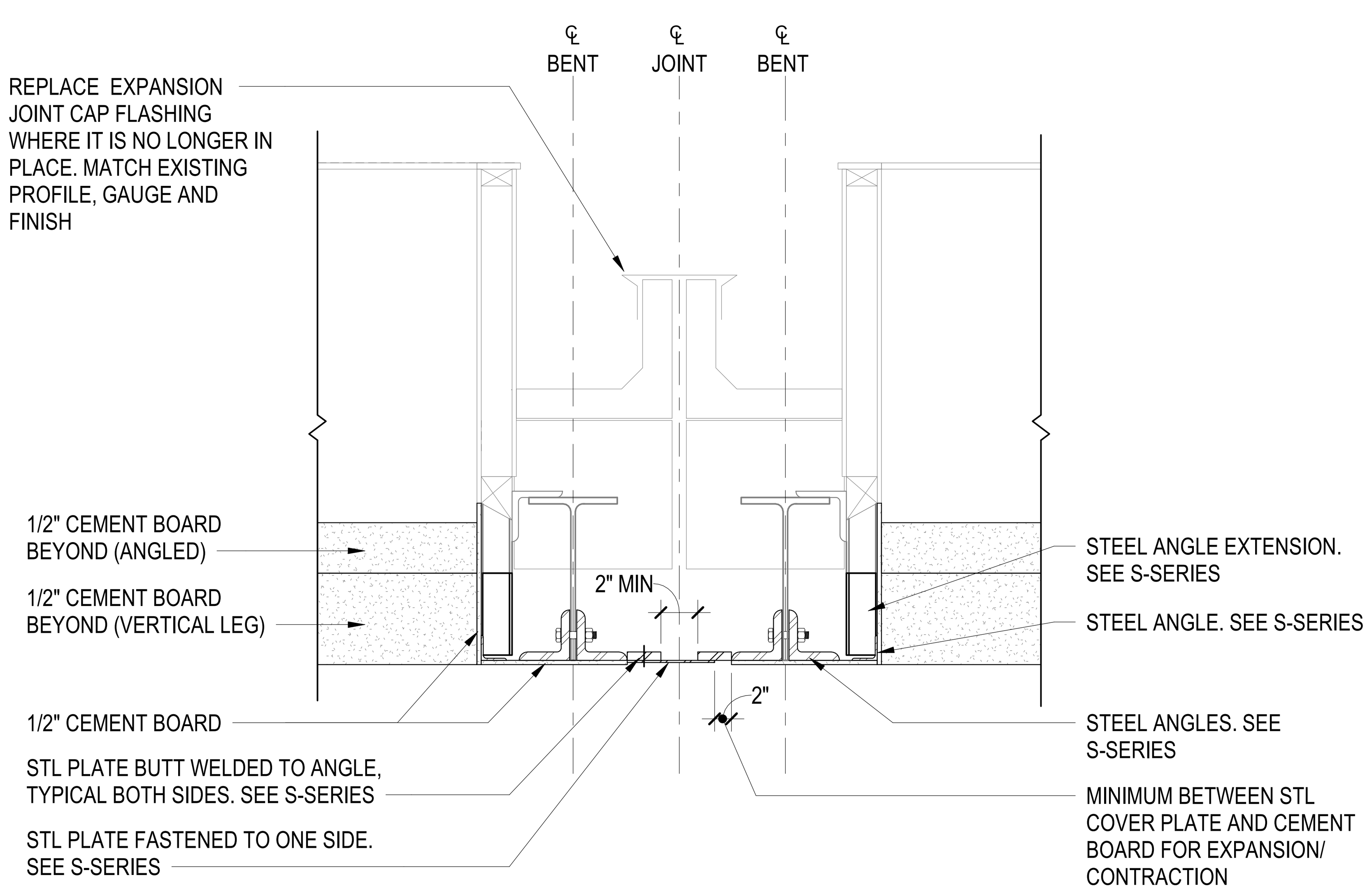
1 TYPICAL EXHAUST JACK PANEL AND FRAMING
SCALE: 3/4" = 1'-0"



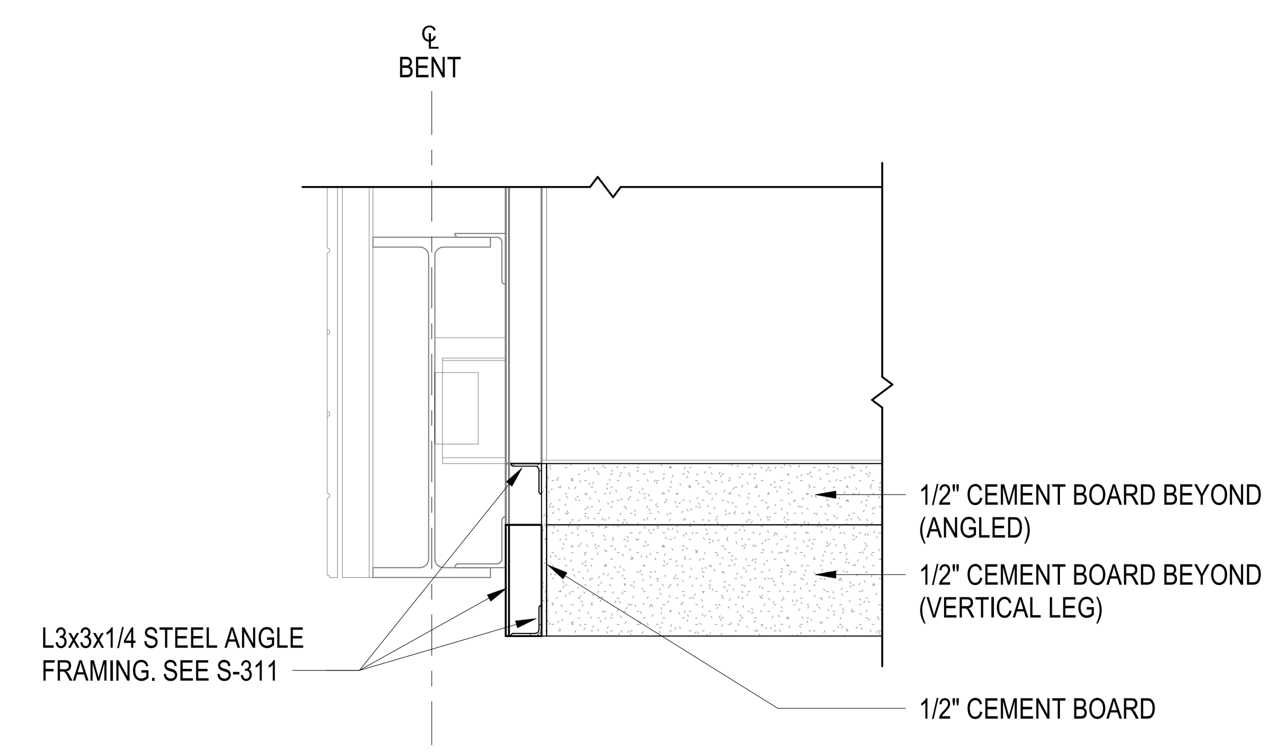
2 TYPICAL UNCONNECTED EXHAUST JACK
SCALE: 3/4" = 1'-0"



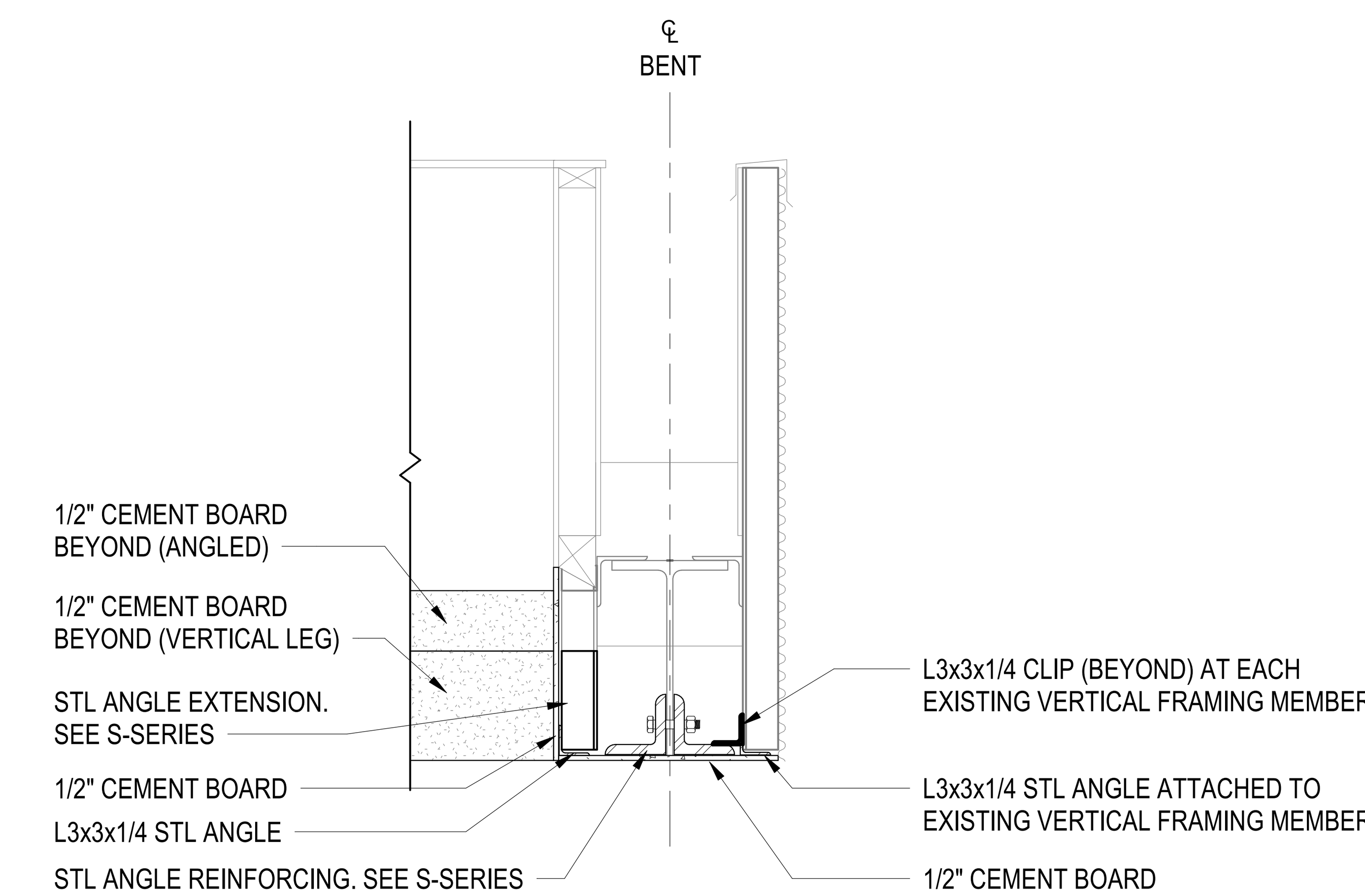
3 TYPICAL CONNECTED EXHAUST JACK
SCALE: 3/4" = 1'-0"



4 TYPICAL EXPANSION JOINT AT EXHAUST JACK DETAIL
SCALE: 3/4" = 1'-0"



5 TYPICAL OUTER PORTAL
SCALE: 3/4" = 1'-0"



6 TYPICAL INNER PORTAL
SCALE: 3/4" = 1'-0"

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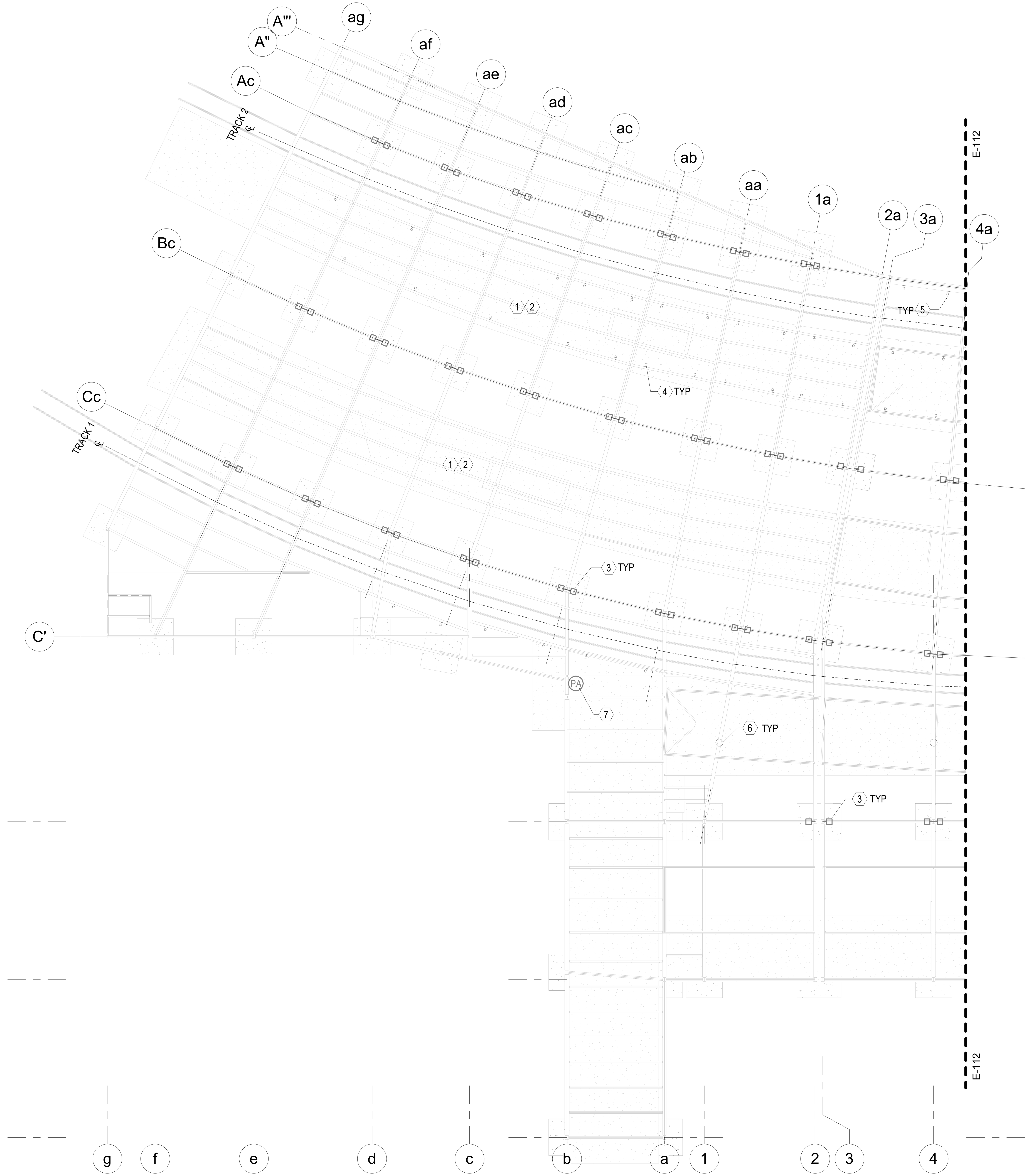
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION
NEW WORK DETAILS

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: JD DATE: 05-21-2021 CHECKED BY: MK
SCALE: AS NOTED DRAWING NO.: A-501

ALTERNATIVE 3



1 ELECTRICAL - 1ST FLOOR PLAN - AREA A
SCALE: 1/16" = 1'-0"

GENERAL NOTES

1. REFER TO OTHER DISCIPLINE DRAWINGS FOR AREAS OF WORK.
2. ALL ELECTRICAL WORK IS TO BE PREFORMED BY A LICENSED ELECTRICIAN.
3. COMPLY WITH ALL AMTRAK AND NORFOLK SOUTHERN SAFETY AND ELECTRICAL REQUIREMENTS.
4. MAINTAIN A WORKING AND OPERABLE SECURITY CAMERA SYSTEM. COORDINATE ANY ANTICIPATED NECESSARY OUTTAGES WITH AMTRAK / NORFOLK SOUTHERN PRIOR TO THE SYSTEM, OR PARTS OF THE SYSTEM, BEING TAKEN OFFLINE.

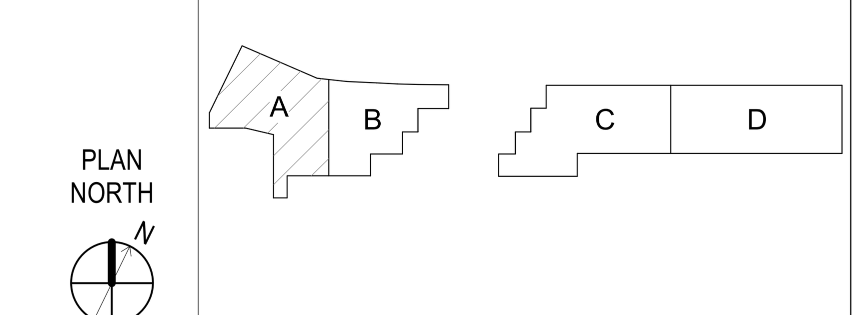
KEYNOTES

1. DE-ENERGIZE ALL CIRCUITS WITHIN THE AREA OF WORK AS NECESSARY TO MAINTAIN A SAFE ENVIRONMENT FOR OTHER DISCIPLINES TO COMPLETE DEMOLITION AND PROPOSED WORK. COORDINATE SHUT DOWN OF ANY ELECTRICAL SYSTEMS WITH OTHER DISCIPLINES AND AMTRAK / NORFOLK SOUTHERN PRIOR TO DISCONNECT. LEAVE ANY LIGHTING OR ELECTRICAL FIXTURES IN PLACE IN THEIR CURRENT CONDITION THAT WILL NOT IMPEDE PROGRESS FOR OTHER DISCIPLINE WORK. REMOVE ANY LIGHTING OR ELECTRICAL FIXTURES THAT WOULD PROHIBIT OTHER DISCIPLINES FROM COMPLETING THEIR WORK. FIXTURES THAT ARE IN PROPER WORKING CONDITION ARE TO BE RE-INSTALLED AT THEIR CURRENT LOCATIONS. DEMOLISH AND REMOVE ANY FIXTURES THAT ARE NO LONGER FUNCTIONAL. REMOVE AND RELOCATE ANY CONDUIT AND CABLING AS REQUIRED TO COMPLETE WORK. RE-INSTALL CONDUIT AND CABLING FOR A PROPER AND FUNCTIONAL SYSTEM ONCE OTHER DISCIPLINE WORK IS COMPLETE.
2. CLEARLY IDENTIFY / LABEL CONDUITS AND CABLE NEAR OR WITHIN THE AREA OF WORK THAT ARE TO REMAIN ENERGIZED DURING CONSTRUCTION.
3. TYPICAL STRUCTURE MOUNTED COBRA HEAD TYPE AREA LIGHTING.
4. TYPICAL STRUCTURE MOUNTED DOWNLIGHT.
5. TYPICAL WALL MOUNTED DOWNLIGHT.
6. TYPICAL STRUCTURE MOUNTED CANOPY LIGHTING.
7. EXISTING PA SYSTEM FIXTURE TO REMAIN.

LEGEND

- EXISTING COBRA HEAD TYPE LIGHT FIXTURE
- EXISTING DOWNLIGHT TYPE FIXTURE
- EXISTING CANOPY TYPE LIGHT FIXTURE
- PA EXISTING PA SYSTEM FIXTURE

KEYPLAN



NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

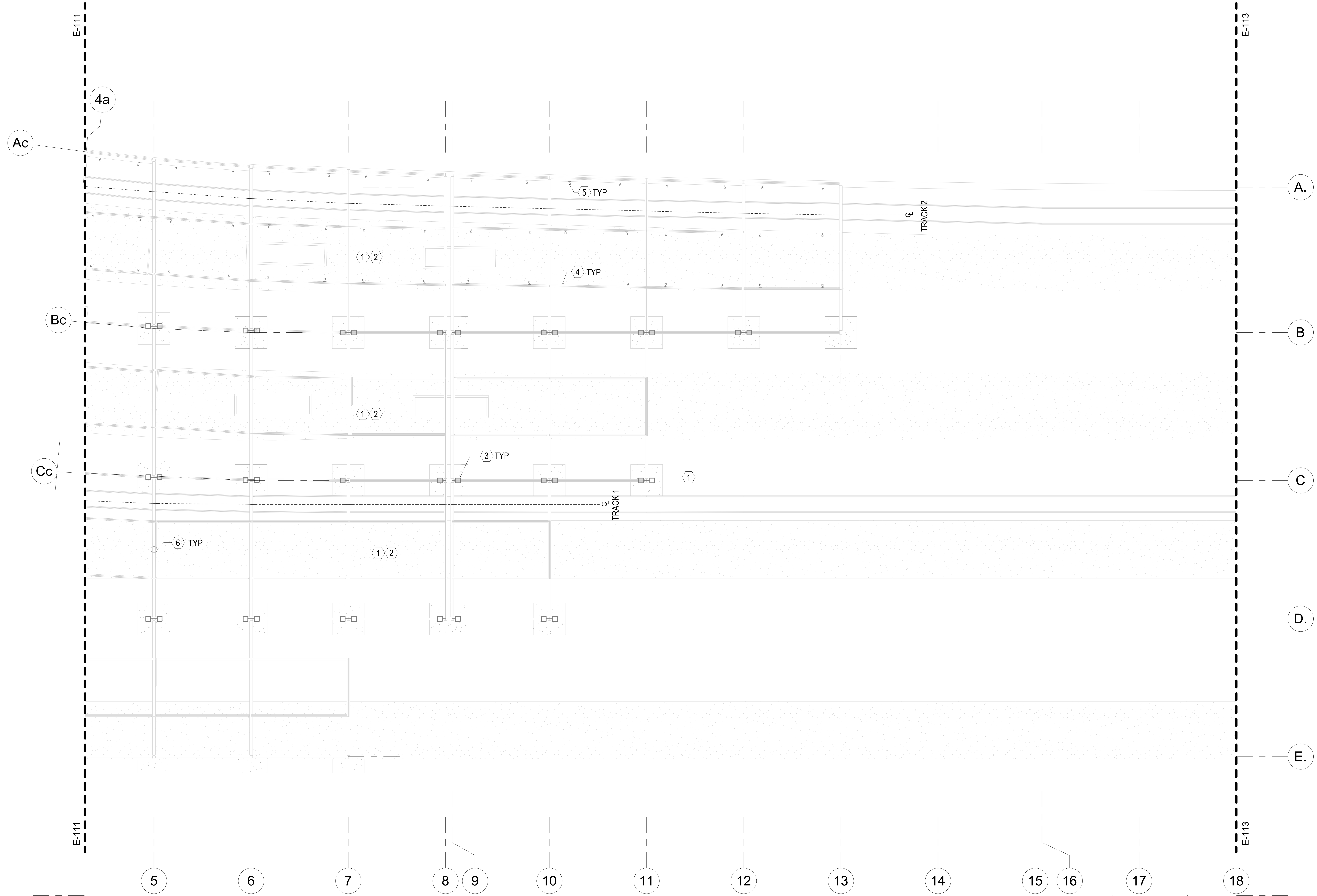
NORFOLK SOUTHERN

OPERATING COMPANY: **NORFOLK SOUTHERN RAILWAY COMPANY**
PITTSBURGH DIVISION **PITTSBURGH** LINE
DESCRIPTION: **PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION**

ELECTRICAL - 1ST FLOOR PLAN - AREA A

VALUATION PLAN: MILE POST: **PT-353.20**
AUTHORITY NO.: FILE NO.:
MADE BY: **SES** DATE: **05/21/2021** CHECKED BY: **DKB**
SCALE: **AS NOTED** DRAWING NO.: **E-111**

ALTERNATIVE 3



1 ELECTRICAL - 1ST FLOOR PLAN - AREA B
SCALE: 1/16" = 1'-0"

GENERAL NOTES

1. REFER TO OTHER DISCIPLINE DRAWINGS FOR AREAS OF WORK.
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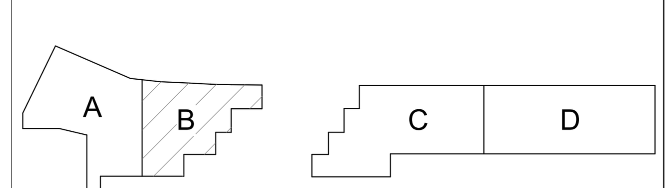
4. TYPICAL STRUCTURE MOUNTED DOWNLIGHT.
5. TYPICAL WALL MOUNTED DOWNLIGHT.
6. TYPICAL STRUCTURE MOUNTED CANOPY LIGHTING.

LEGEND

- EXISTING COBRA HEAD TYPE LIGHT FIXTURE
- EXISTING DOWNLIGHT TYPE FIXTURE
- EXISTING CANOPY TYPE LIGHT FIXTURE
- PA EXISTING PA SYSTEM FIXTURE

KEYPLAN



PLAN NORTH

NO.	DATE	REVISIONS

Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

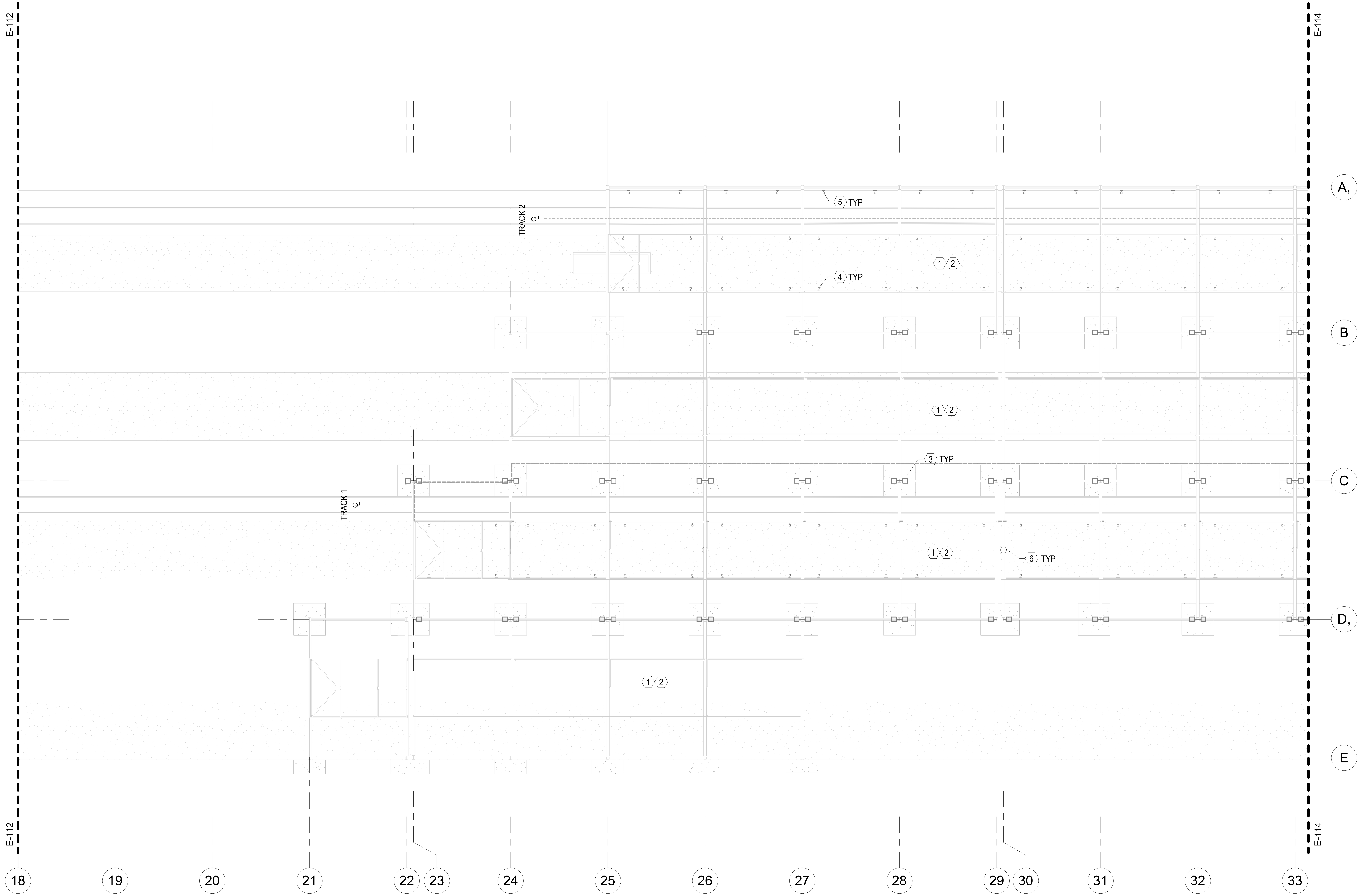
NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

ELECTRICAL - 1ST FLOOR PLAN - AREA B

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: SES DATE: 05/21/2021 CHECKED BY: DKB
SCALE: AS NOTED DRAWING NO.: E-112

ALTERNATIVE 3



GENERAL NOTES

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3. COMPLY WITH ALL AMTRAK AND NORFOLK SOUTHERN SAFETY AND ELECTRICAL REQUIREMENTS.
4. MAINTAIN A WORKING AND OPERABLE SECURITY CAMERA SYSTEM. COORDINATE ANY ANTICIPATED NECESSARY OUTTAGES WITH AMTRAK / NORFOLK SOUTHERN PRIOR TO THE SYSTEM, OR PARTS OF THE SYSTEM, BEING TAKEN OFFLINE.

KEYNOTES

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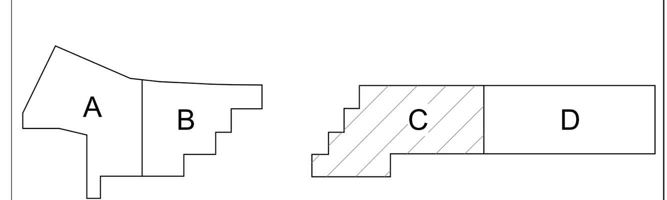
4. TYPICAL STRUCTURE MOUNTED DOWNLIGHT.
5. TYPICAL WALL MOUNTED DOWNLIGHT.
6. TYPICAL STRUCTURE MOUNTED CANOPY LIGHTING.

LEGEND

- EXISTING COBRA HEAD TYPE LIGHT FIXTURE
- EXISTING DOWNLIGHT TYPE FIXTURE
- EXISTING CANOPY TYPE LIGHT FIXTURE
- PA EXISTING PA SYSTEM FIXTURE

KEYPLAN



PLAN NORTH

1 ELECTRICAL - 1ST FLOOR PLAN - AREA C
SCALE: 1/16" = 1'-0"

NO.	DATE	REVISIONS

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1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

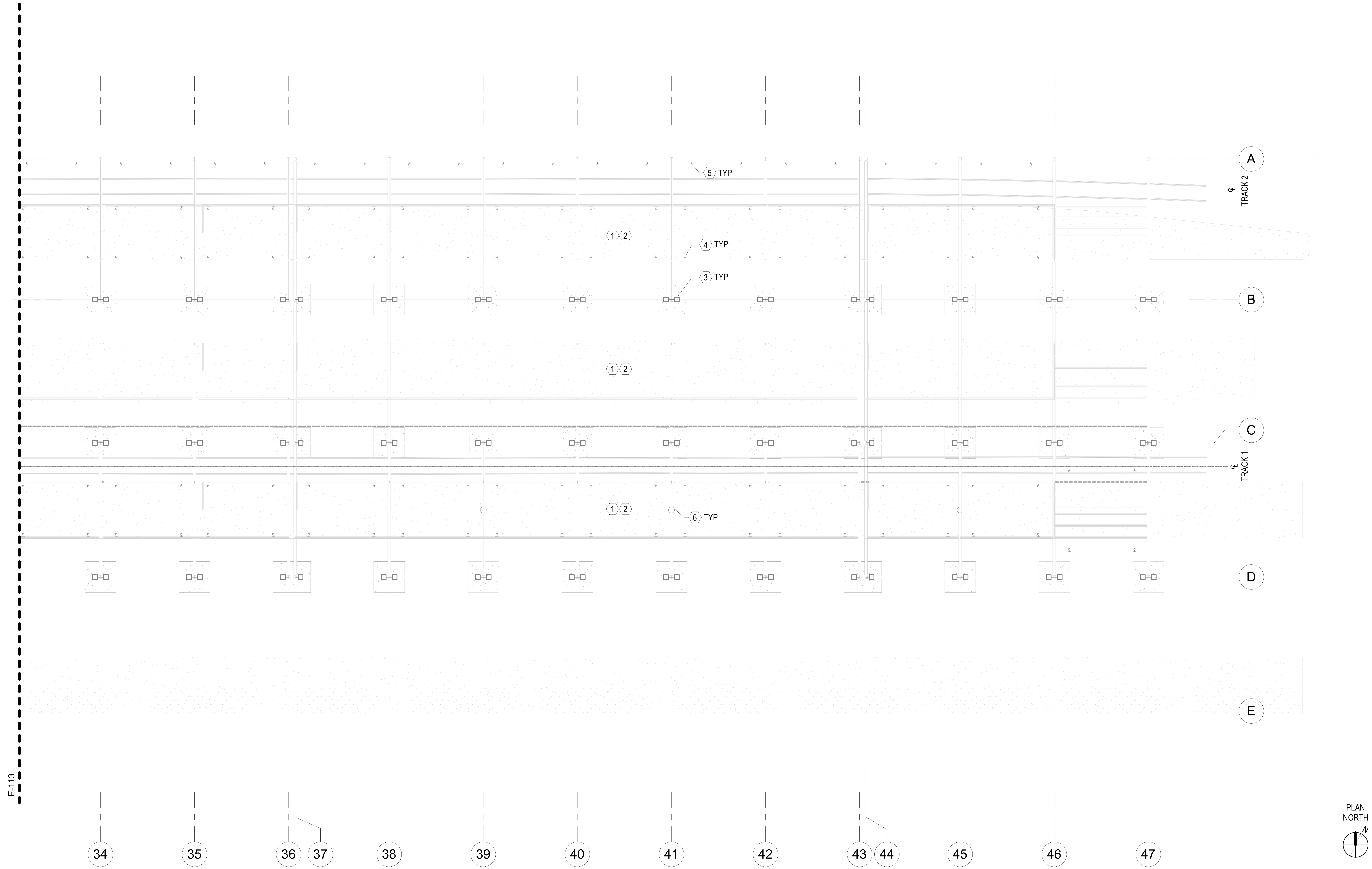
NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

ELECTRICAL - 1ST FLOOR PLAN - AREA C

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: SES DATE: 05/21/2021 CHECKED BY: DKB
SCALE: AS NOTED DRAWING NO.: E-113

ALTERNATIVE 3



1 ELECTRICAL - 1ST FLOOR PLAN - AREA D
SCALE: 1/16" = 1'-0"

GENERAL NOTES

1. REFER TO OTHER DISCIPLINE DRAWINGS FOR AREAS OF WORK.
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KEYNOTES

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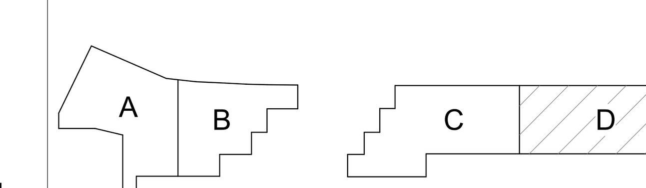
5. TYPICAL WALL MOUNTED DOWNLIGHT.
6. TYPICAL STRUCTURE MOUNTED CANOPY LIGHTING.

LEGEND

- EXISTING COBRA HEAD TYPE LIGHT FIXTURE
- EXISTING DOWNLIGHT TYPE FIXTURE
- EXISTING CANOPY TYPE LIGHT FIXTURE
- PA EXISTING PA SYSTEM FIXTURE

KEYPLAN



PLAN NORTH

NO.	DATE	REVISIONS

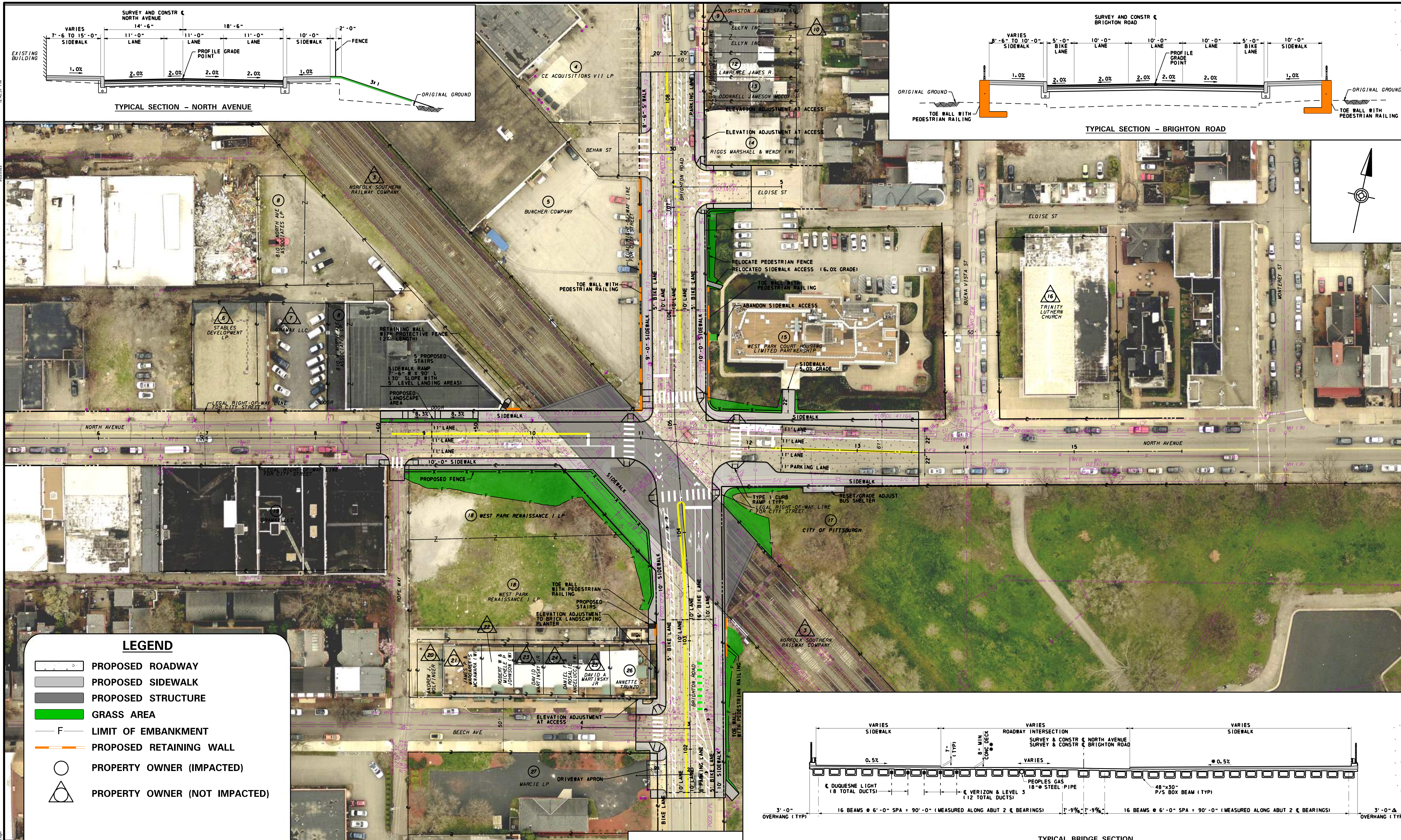
Michael Baker INTERNATIONAL
1818 MARKET STREET, SUITE 3110
PHILADELPHIA, PA 19103
(215) 568-0539

NORFOLK SOUTHERN

OPERATING COMPANY: NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH DIVISION PITTSBURGH LINE
DESCRIPTION: PITTSBURGH VERTICAL CLEARANCE AMTRAK STATION

ELECTRICAL - 1ST FLOOR PLAN - AREA D

VALUATION PLAN: MILE POST: PT-353.20
AUTHORITY NO.: FILE NO.:
MADE BY: SES DATE: 05/21/2021 CHECKED BY: DKB
SCALE: AS NOTED DRAWING NO.: E-114



ALTERNATE 2
REPLACE AND
RAISE BRIDGE
TO 22' CLEARANCE

Michael Baker INTERNATIONAL
AIRSIDE BUSINESS PARK
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108
Phone: (412) 269-6300

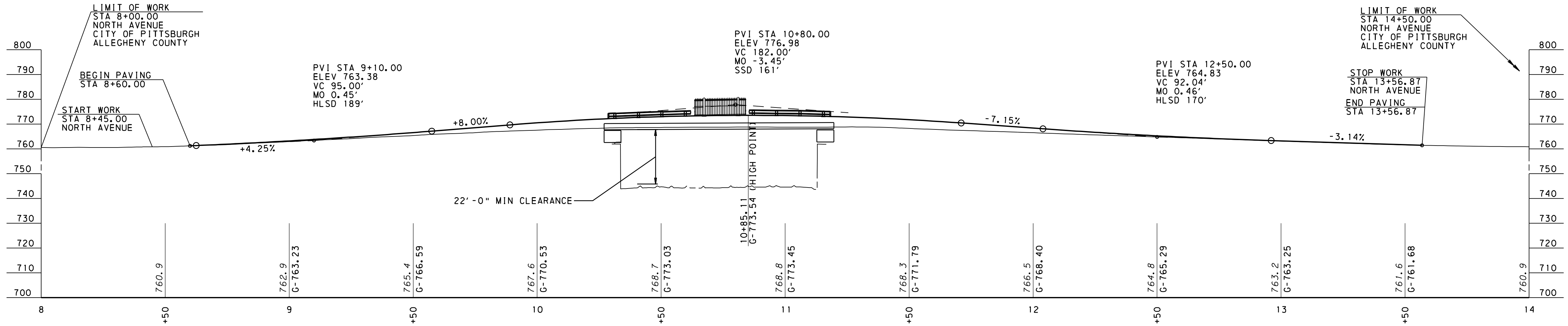
NORFOLK SOUTHERN
NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH

PITTSBURGH, PENNSYLVANIA
NORTH AVENUE

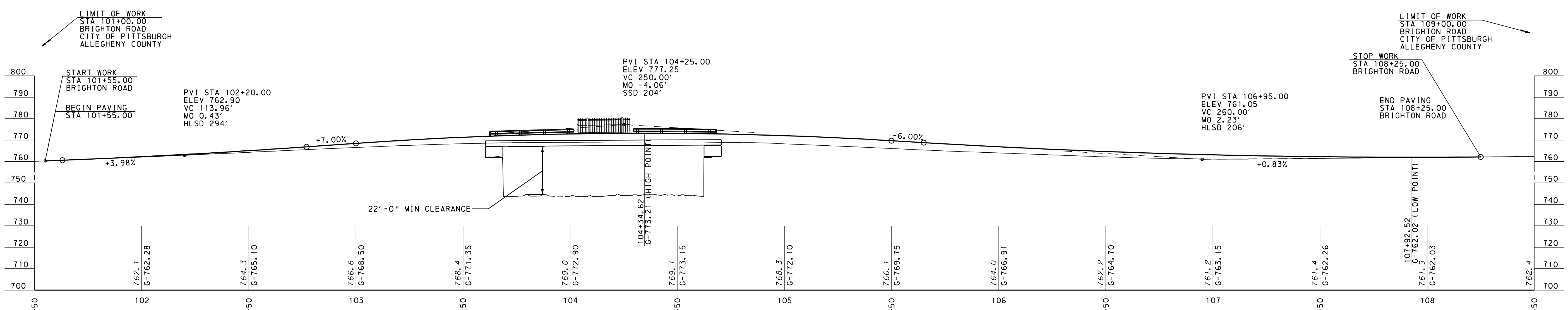
DGN DLJ
DWN DLJ
CHK WVB
FILE No. BR0027858
DATE 2/02/2022
MILE POST PC 1.60

SHEET NO. 1 OF 2

CADD FILE: NS_North_Ave_plan_2 Replace 22ft.dgn



PROFILE – NORTH AVENUE



PROFILE – BRIGHTON ROAD

SCALE: 1" = 50'

25' 0 25' 50'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 2
REPLACE AND
RAISE BRIDGE
TO 22' CLEARANCE

Michael Baker INTERNATIONAL
AIRSIDE BUSINESS PARK
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108
Phone: (412) 269-6300

NORFOLK SOUTHERN
NORFOLK SOUTHERN RAILWAY COMPANY
OWNING COMPANY
PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION	PITTSBURGH, PENNSYLVANIA	
TITLE	NORTH AVENUE	
DGN DLJ	FID No.	MILE POST PC 1.60
DWN DLJ	FILE No. BR0027858	DRAWING NUMBER
CHK WVB	DATE 3/02/2022	SHEET NO. 2 OF 2

CADD FILE: NS North Ave prof_Alt2_replace22ft.dgn

3/9/2022 3:11:27 PM

NS North Ave prof_Alt2_replace22ft.dgn

EXISTING TRACK PROFILE TO REMAIN

HORIZONTAL
SCALE: 1" = 120'
60' 0 60' 120'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL
SCALE: 1" = 10'
5' 0 5' 10'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 3
REPLACE BRIDGE
AND LOWER TO
22' CLEARANCE

Michael Baker INTERNATIONAL
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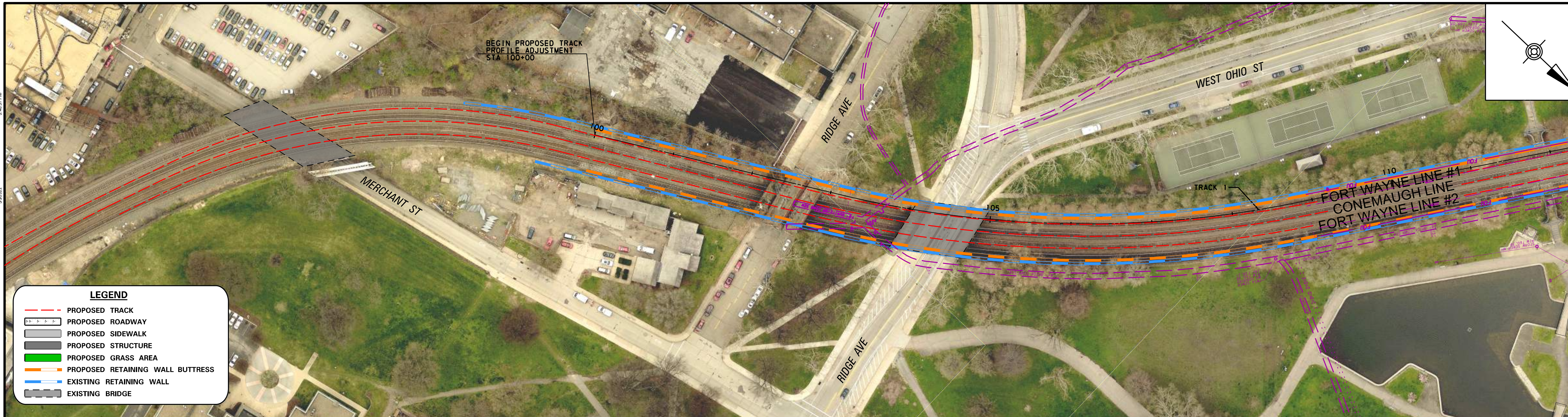
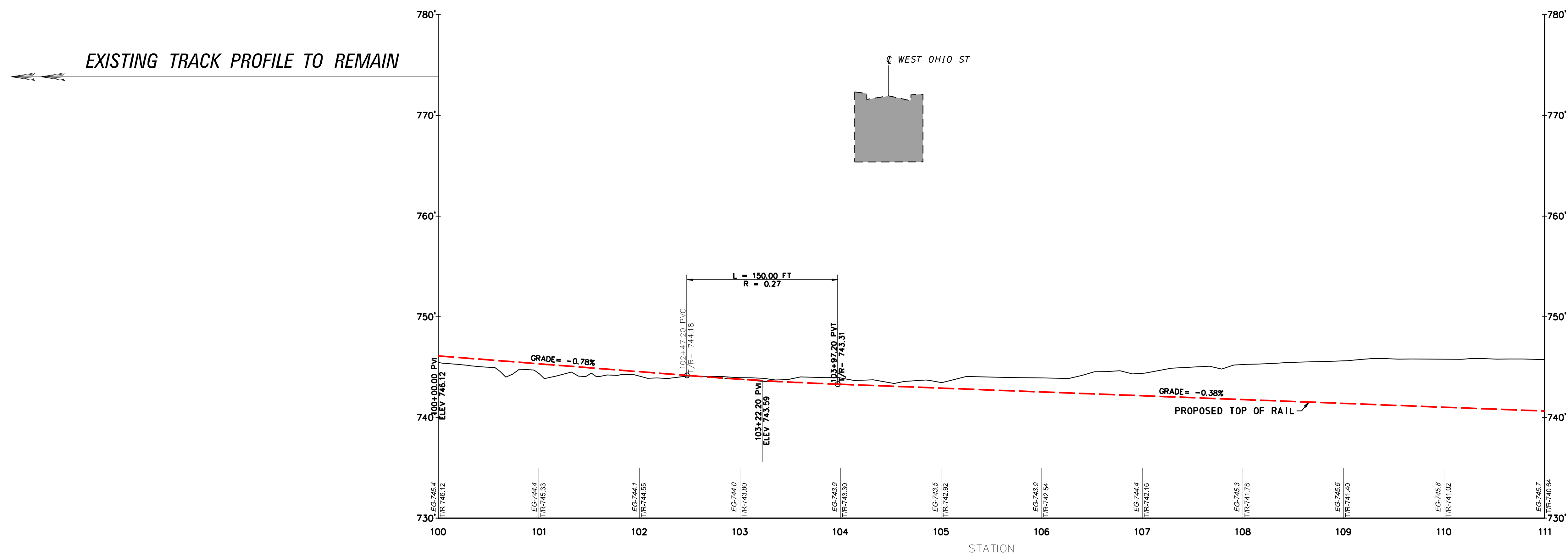
NORFOLK SOUTHERN
NORFOLK SOUTHERN RAILWAY COMPANY
OWNING COMPANY
PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA.

LOCATION	PITTSBURGH, PENNSYLVANIA
TITLE	NORTH AVENUE PENNSYLVANIA AVENUE
DGN	DLJ
PID No.	
VRN	
MILE POST	PC 1.60
DWN	DLJ
FILE No.	BR0027858
DRAWING NUMBER	
CHK	WVB
DATE	2/02/2022

CADD FILE: NS_North_Ave_plan_3 Lower 22ft.dgn

SHEET NO. 1 OF 4





PROFILE – TRACK 1

HORIZONTAL
SCALE: 1" = 120'
60' 0 60' 120'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL
SCALE: 1" = 10'
5' 0 5' 10'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 3
REPLACE BRIDGE
AND LOWER TO
22' CLEARANCE

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OWNING COMPANY
PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

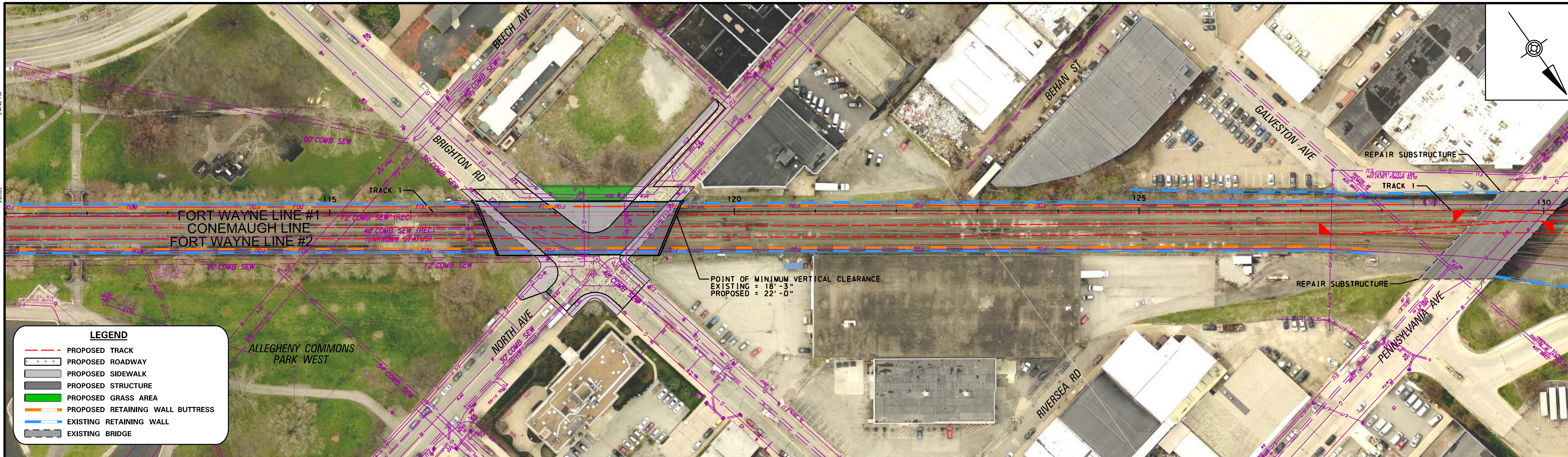
LOCATION PITTSBURGH, PENNSYLVANIA
TITLE NORTH AVENUE
PENNSYLVANIA AVENUE

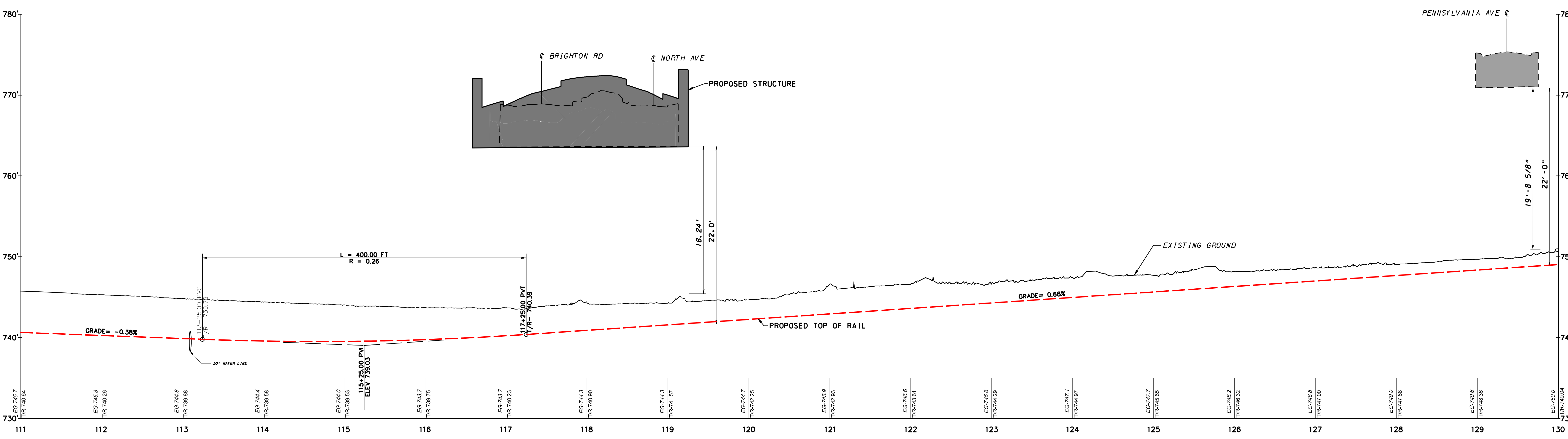
DGN DLJ	PID No.	VRN	MILE POST PC 1.60
DWN DLJ	FILE No. BR0027858		DRAWING NUMBER
CHK WVB	DATE 2/02/2022		

CADD FILE: NS_North_Ave_plan_3 Lower 22ft.dgn

SHEET NO. 2 OF 4

NS_North_Ave_plan_3 Lower 22ft.dgn
3/9/2022 3:40:31 PM





HORIZONTAL SCALE: 1" = 120'
60' 0 60' 120'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10'
5' 0 5' 10'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

PROFILE – TRACK 1

ALTERNATE 3
REPLACE BRIDGE
AND LOWER TO
22' CLEARANCE

Michael Baker INTERNATIONAL
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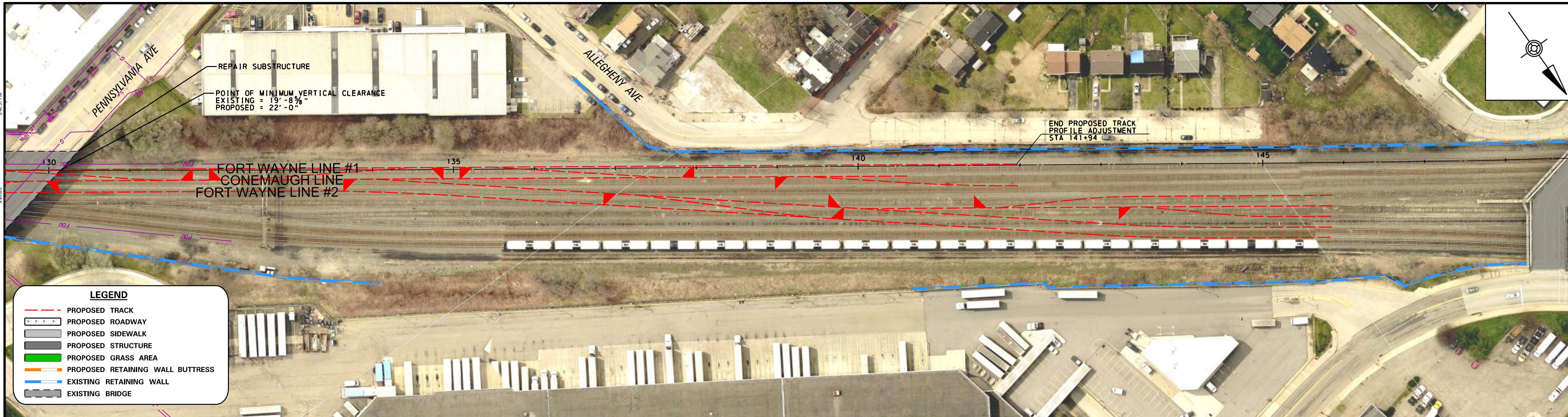
OWNING COMPANY
PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

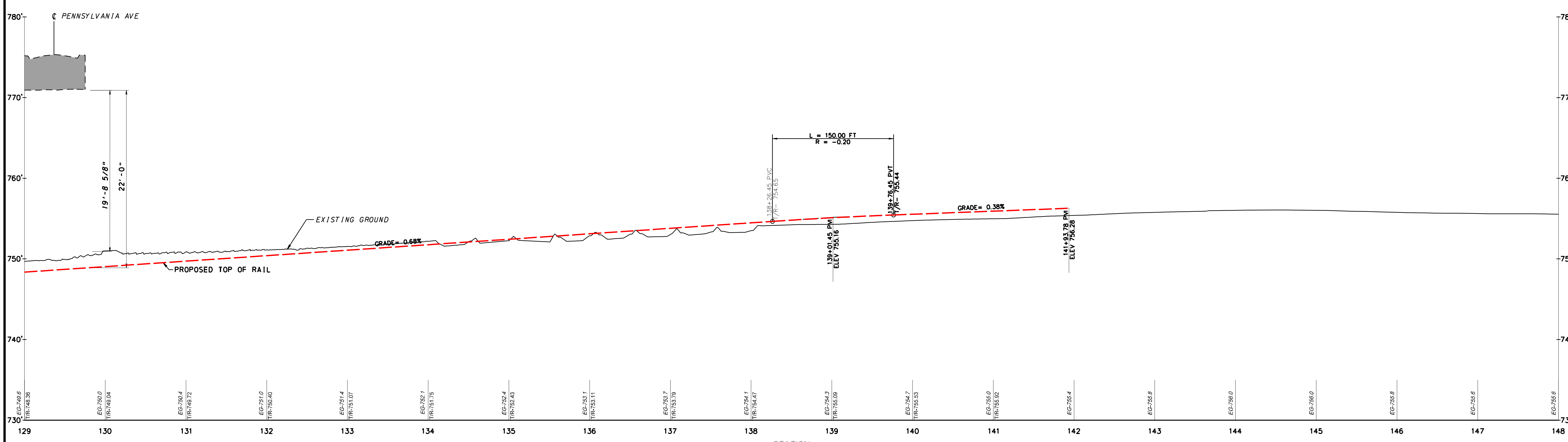
LOCATION: PITTSBURGH, PENNSYLVANIA
TITLE: NORTH AVENUE
PENNSYLVANIA AVENUE

DGN: DLJ
DWN: DLJ
FILE No.: BR0027858
CHK: WVB
DATE: 2/02/2022
PC 1.60

SHEET NO. 3 OF 4

CADD FILE: NS_North_Ave_plan_3 Lower 22ft.dgn





PROFILE – TRACK 1

HORIZONTAL SCALE: 1" = 120'
60' 0 60' 120'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10'
5' 0 5' 10'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 3
REPLACE BRIDGE
AND LOWER TO
22' CLEARANCE

Michael Baker INTERNATIONAL
AIRSIDE BUSINESS PARK
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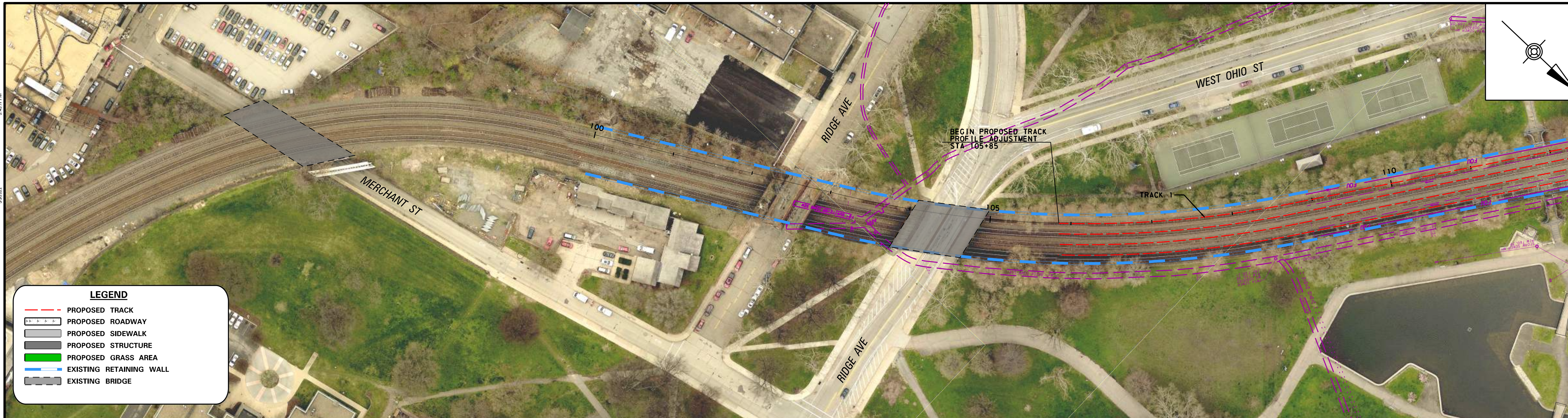
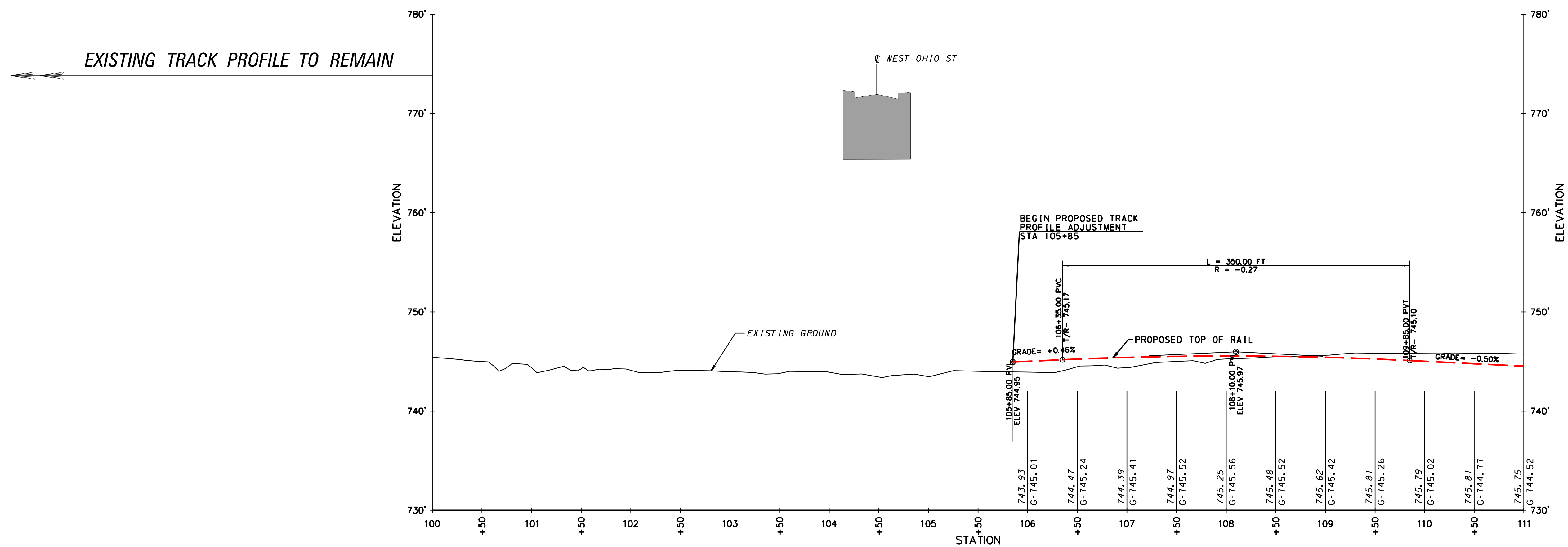
NORFOLK SOUTHERN
NORFOLK SOUTHERN RAILWAY COMPANY
OWNING COMPANY
PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA.

LOCATION	PITTSBURGH, PENNSYLVANIA
TITLE	NORTH AVENUE PENNSYLVANIA AVENUE
DGN	DLJ
DWN	DLJ
CHK	WVB
PID No.	
FILE No.	BR0027858
DATE	2/02/2022
VRN	
MILE POST	PC 1.60
DRAWING NUMBER	

CADD FILE: NS_North_Ave_plan_3 Lower 22ft.dgn

SHEET NO. 4 OF 4





PROFILE – TRACK 1

HORIZONTAL SCALE: 1" = 120'
60' 0 60' 120'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10'
5' 0 5' 10'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 4
REPLACE AND
RAISE BRIDGE
AND LOWER
TO 22' CLEARANCE

Michael Baker INTERNATIONAL
AIRSIDE BUSINESS PARK
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108
Phone: (412) 269-6300

NS NORFOLK SOUTHERN

NORFOLK SOUTHERN RAILWAY COMPANY
OWNING COMPANY
PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION: PITTSBURGH, PENNSYLVANIA
TITLE: NORTH AVENUE
PENNSYLVANIA AVENUE

DGN DLJ	FID No.	VRN	MILE POST PC 1.60	
DWN DLJ	FILE No. BR0027858		DRAWING NUMBER	
CHK WVB	DATE 2/02/2022		SHEET NO. 1 OF 3	

CADD FILE: NS_North_Ave_plan_4 Lower 22ft.dgn

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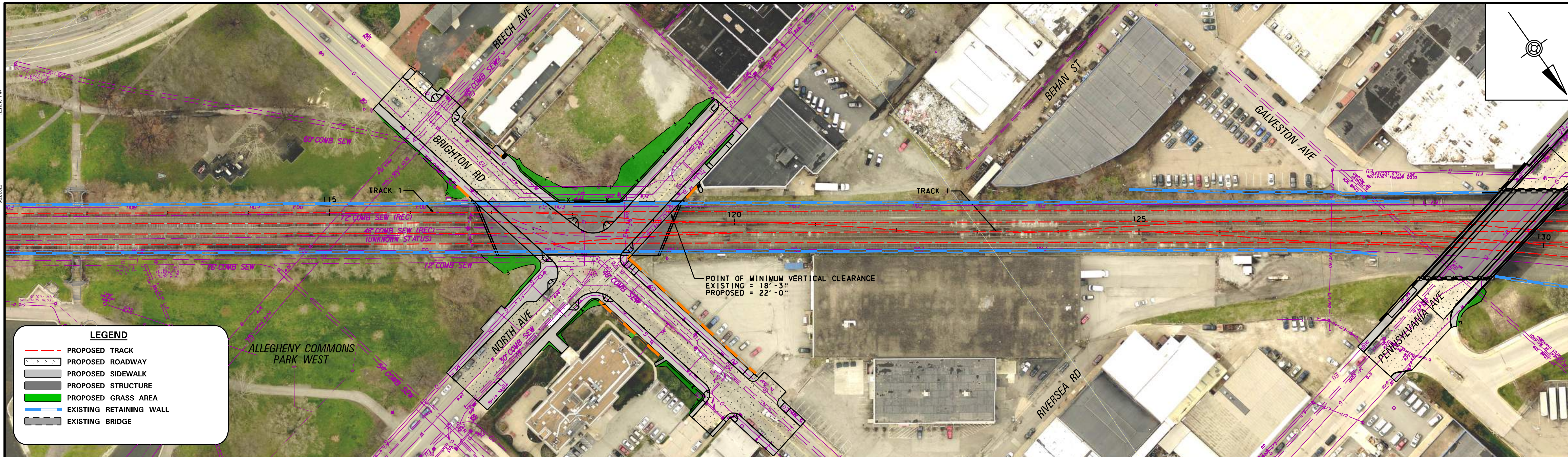
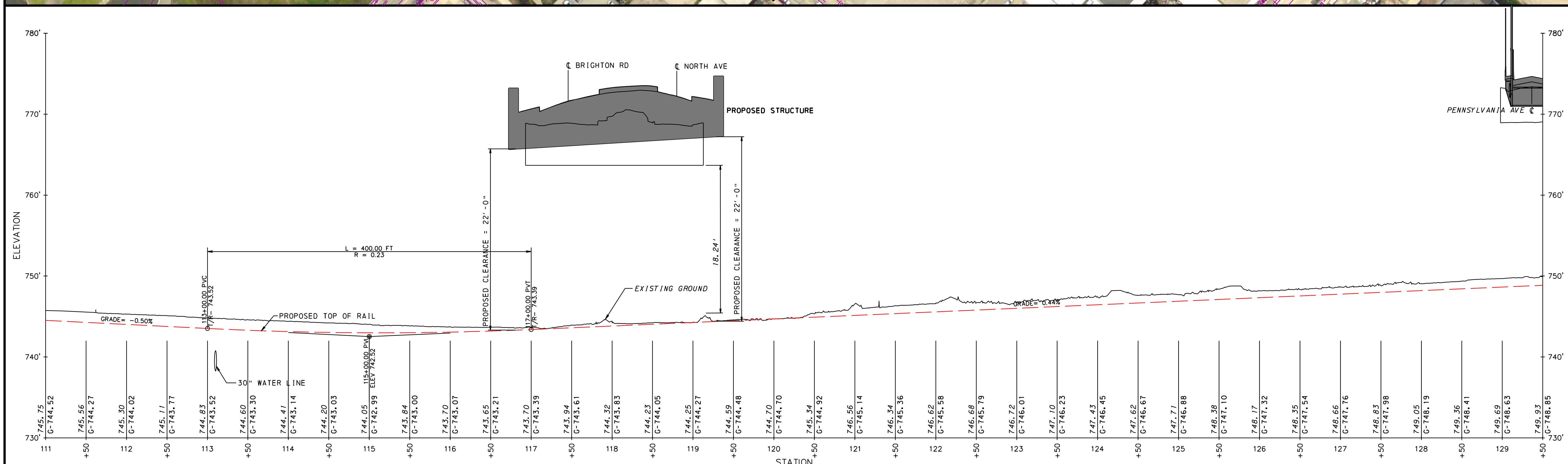
3/9/2022
NS_North_Ave_plan_4 Lower 22ft.dgn





HORIZONTAL SCALE: 1" = 120' (60' 0 60' 120')
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10' (5' 0 5' 10')
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

PROFILE – TRACK 1

ALTERNATE 4
REPLACE AND RAISE BRIDGE AND LOWER TO 22' CLEARANCE

Michael Baker INTERNATIONAL
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100 AIRSIDE DRIVE
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NORFOLK SOUTHERN RAILWAY COMPANY
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PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION: PITTSBURGH, PENNSYLVANIA
TITLE: NORTH AVENUE
PENNSYLVANIA AVENUE

DSN DLJ	PID No.	VAN	MILE POST PC 1.60
DWN DLJ	FILE No. BR0027858		DRAWING NUMBER
CHK WVB	DATE 2/02/2022		SHEET NO. 2 OF 3

CADD FILE: NS_North_Ave_plan_4 Lower 22ft.dgn

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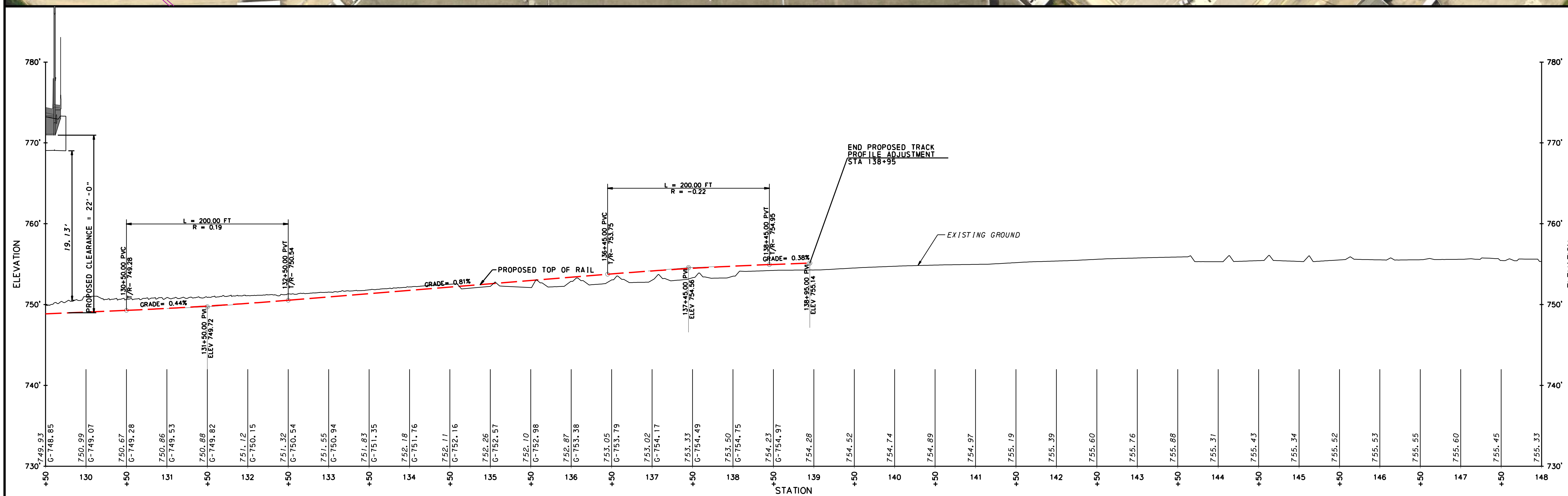
3/2/2022
NS_North_Ave_plan_4 Lower 22ft.dgn

LEGEND

- PROPOSED TRACK
- PROPOSED ROADWAY
- PROPOSED SIDEWALK
- PROPOSED STRUCTURE
- PROPOSED GRASS AREA
- EXISTING RETAINING WALL
- EXISTING BRIDGE



PROFILE – TRACK 1

HORIZONTAL
SCALE: 1" = 120'
60' 0 60' 120'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL
SCALE: 1" = 10'
5' 0 5' 10'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 4
REPLACE AND RAISE BRIDGE AND LOWER TO 22' CLEARANCE

Michael Baker INTERNATIONAL
AIRSIDE BUSINESS PARK
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108
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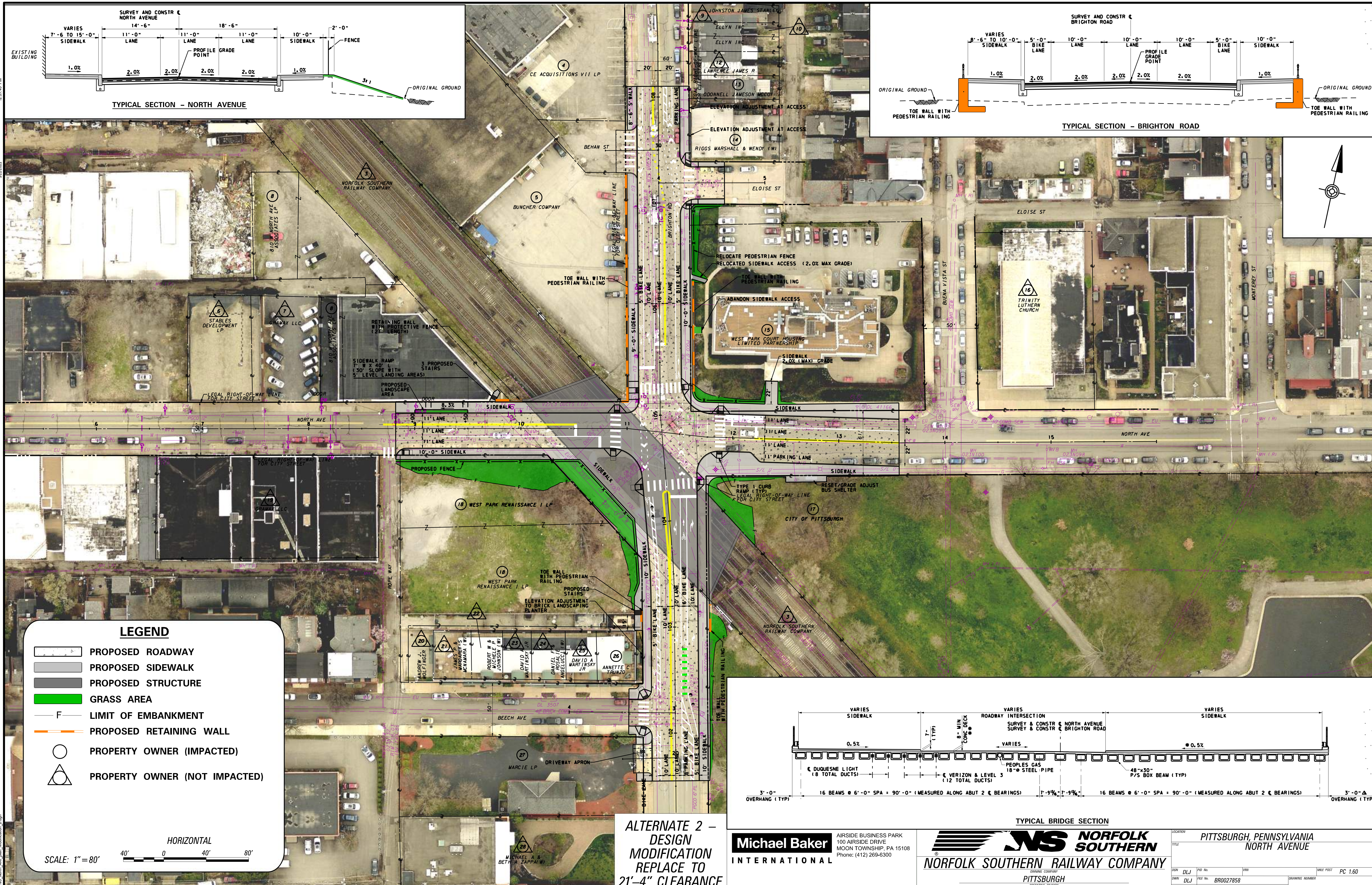
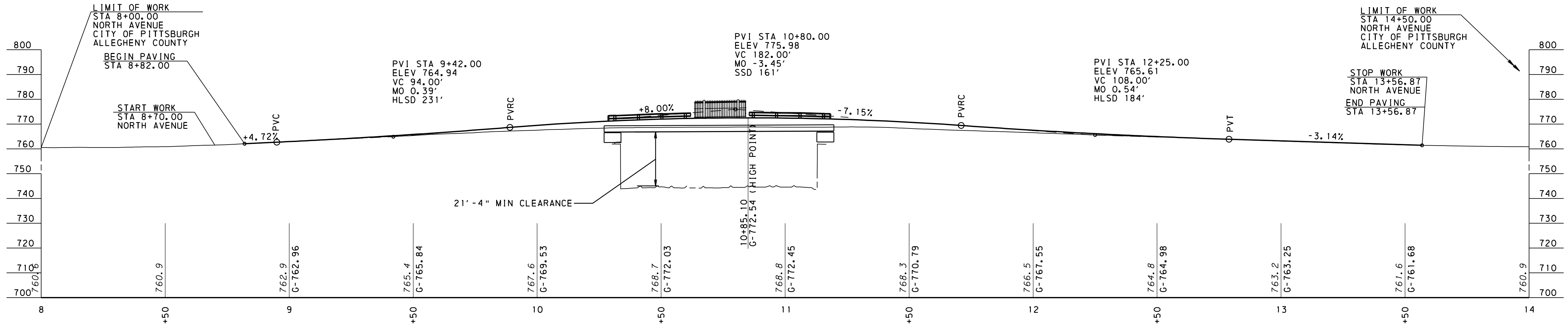
NORFOLK SOUTHERN
NORFOLK SOUTHERN RAILWAY COMPANY
OWNING COMPANY
PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION: PITTSBURGH, PENNSYLVANIA
TITLE: NORTH AVENUE
PENNSYLVANIA AVENUE

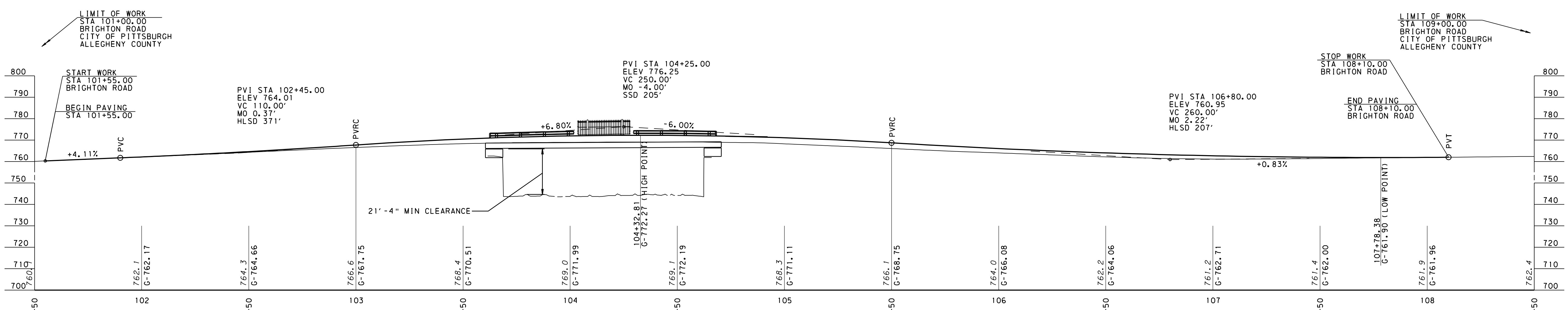
DGN: DLJ
DWN: DLJ FILE No. BR0027858
CHK: WVB DATE 2/02/2022
MILE POST PC 1.60
SHEET NO. 3 OF 3

CADD FILE: NS_North_Ave_plan_4 Lower 22ft.dgn


TYPICAL SECTION - NORTH AVENUE
SURVEY AND CONSTR ℄ NORTH AVENUE
VARIES 7'-6 TO 15'-0" SIDEWALK
14'-6"
18'-6"
11'-0" LANE
11'-0" LANE
11'-0" LANE
10'-0" SIDEWALK
2'-0"
FENCE
EXISTING BUILDING
PROFILE GRADE POINT
ORIGINAL GROUND
TYPICAL SECTION - BRIGHTON ROAD
SURVEY AND CONSTR ℄ BRIGHTON ROAD
VARIES 8'-6" TO 10'-0" SIDEWALK
5'-0" BIKE LANE
10'-0" LANE
10'-0" LANE
10'-0" LANE
5'-0" BIKE LANE
10'-0" SIDEWALK
TOE WALL WITH PEDESTRIAN RAILING
NORTH AVE
BRIGHTON RD
ELOISE ST
BEHAN ST
BUENA VISTA ST
MONTEREY ST
BEECH AVE
ROPE WAY
NORFOLK SOUTHERN RAILWAY COMPANY
CE ACQUISITIONS VII LP
BUNCHER COMPANY
STABLES DEVELOPMENT LP
GRANAX LLC
WEST PARK COURT HOUSING LIMITED PARTNERSHIP
TRINITY LUTHERN CHURCH
WEST PARK RENAISSANCE I LP
CITY OF PITTSBURGH
MARCIE LP
RELOCATE PEDESTRIAN FENCE
RELOCATED SIDEWALK ACCESS (2.0% MAX GRADE)
ABANDON SIDEWALK ACCESS
ELEVATION ADJUSTMENT AT ACCESS
RETAINING WALL WITH PROTECTIVE FENCE
SIDEWALK RAMP
3 PROPOSED STAIRS
PROPOSED LANDSCAPE AREA
PROPOSED FENCE
PROPOSED STAIRS
DRIVEWAY APRON
RESET/GRADE ADJUST BUS SHELTER
LEGAL RIGHT-OF-WAY LINE FOR CITY STREET
TYPICAL BRIDGE SECTION
16 BEAMS @ 6'-0" SPA = 90'-0" (MEASURED ALONG ABUT 2 ℄ BEARINGS)
48"x30" P/S BOX BEAM (TYP)
DUQUESNE LIGHT (8 TOTAL DUCTS)
VERIZON & LEVEL 3 (12 TOTAL DUCTS)
PEOPLES GAS 18"ø STEEL PIPE
LEGEND
PROPOSED ROADWAY
PROPOSED SIDEWALK
PROPOSED STRUCTURE
GRASS AREA
LIMIT OF EMBANKMENT
PROPOSED RETAINING WALL
PROPERTY OWNER (IMPACTED)
PROPERTY OWNER (NOT IMPACTED)
HORIZONTAL
SCALE: 1"=80'
ALTERNATE 2 - DESIGN MODIFICATION REPLACE TO 21'-4" CLEARANCE
Michael Baker INTERNATIONAL
AIRSIDE BUSINESS PARK
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108
Phone: (412) 269-6300
NORFOLK SOUTHERN
NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH
PITTSBURGH, PENNSYLVANIA
NORTH AVENUE
PC 1.60
BR0027858
2/02/2022
SHEET NO. 1 OF 2
CADD FILE: NS_North_Ave_plan_Modification_B.dgn



PROFILE – NORTH AVENUE



PROFILE – BRIGHTON ROAD

SCALE: 1"=50'

25' 0 25' 50'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 2 – DESIGN MODIFICATION REPLACE TO 21'-4" CLEARANCE

Michael Baker INTERNATIONAL

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100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108
Phone: (412) 269-6300

NORFOLK SOUTHERN

NORFOLK SOUTHERN RAILWAY COMPANY

OWNING COMPANY

PITTSBURGH

OPERATING DIVISION

OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION PITTSBURGH, PENNSYLVANIA

TITLE NORTH AVENUE

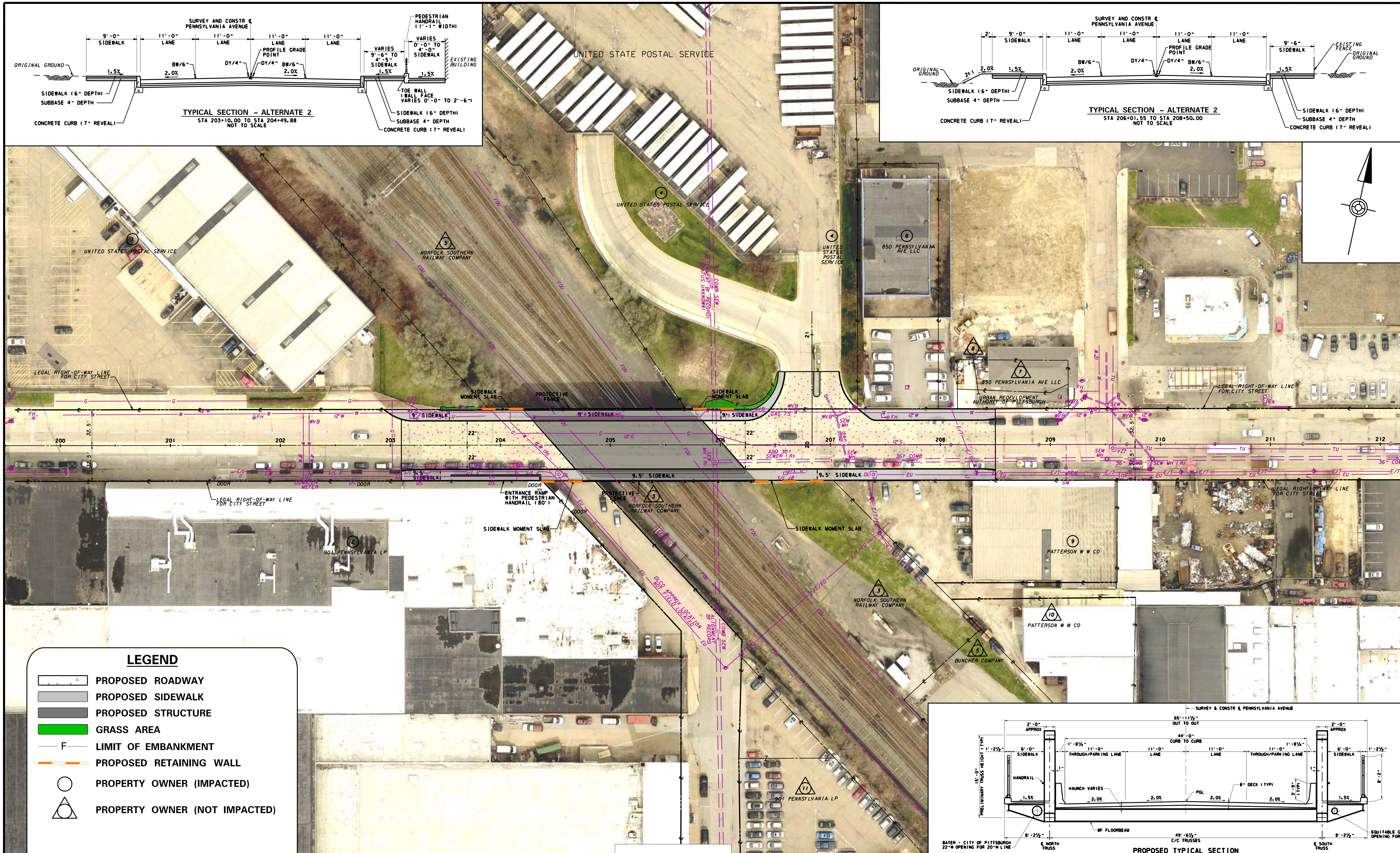
DGN DLJ	PID No.	VAL	MILE POST PC 1.60
DWN DLJ	FILE No. BR0027858		DRAWING NUMBER
CHK WVB	DATE 2/02/2022		

SHEET NO. 2 OF 2

CADD FILE: NS North Ave prof_Modification_B.dgn

3/9/2022 3:11:35 PM

NS North Ave prof_Modification_B.dgn



LEGEND

- PROPOSED ROADWAY
- PROPOSED SIDEWALK
- PROPOSED STRUCTURE
- GRASS AREA
- F LIMIT OF EMBANKMENT
- PROPOSED RETAINING WALL
- PROPERTY OWNER (IMPACTED)
- PROPERTY OWNER (NOT IMPACTED)

SCALE: 1" = 80'

HORIZONTAL

40' 0 40' 80'

ALTERNATE 2
REPLACE TO
22' CLEARANCE

Michael Baker
INTERNATIONAL

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100 AIRSIDE DRIVE
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NORFOLK SOUTHERN

NORFOLK SOUTHERN RAILWAY COMPANY

OWNING COMPANY

PITTSBURGH

OPERATING DIVISION

OFFICE OF THE CHIEF ENGINEER - DESIGN AND CONSTRUCTION - ATLANTA, GA

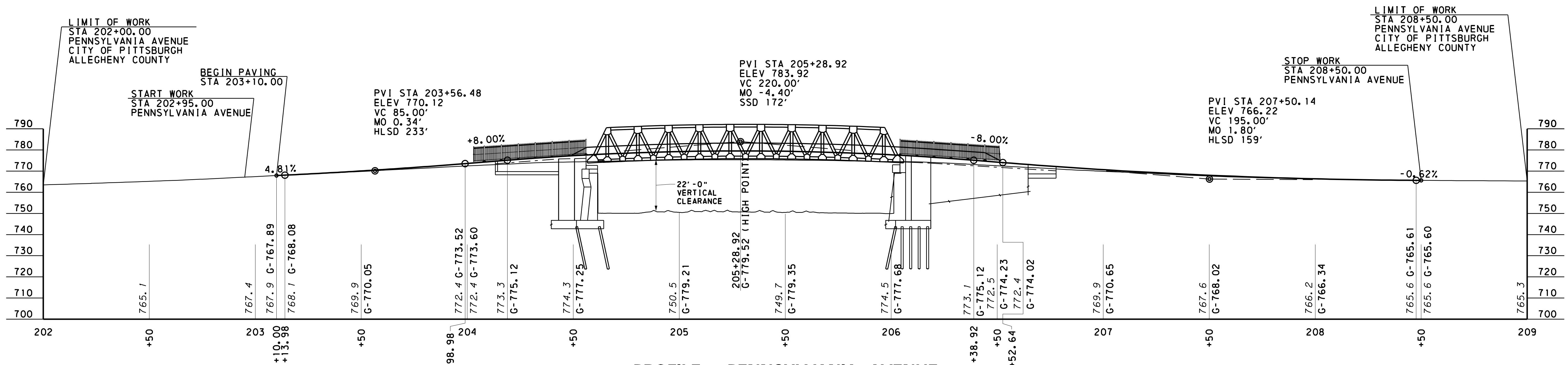
LOCATION: PITTSBURGH, PENNSYLVANIA

TITLE: PENNSYLVANIA AVENUE

DSN	WVB	FID No.		VRN		MILE POST	PC 1.82
DWN	BSP	FILE No.	BR0027859			DRAWING NUMBER	
CHK	DLJ	DATE	2/2/2022				

SHEET NO. 1 OF 2

CADD FILE: NS_Penn_Ave_plan_Alt2 Replace 22ft.dgn



PROFILE – PENNSYLVANIA AVENUE

SCALE: 1" = 50'

25' 0 25' 50'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 2
REPLACE TO
22' CLEARANCE

Michael Baker
INTERNATIONAL

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100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108
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NORFOLK SOUTHERN RAILWAY COMPANY

OWNING COMPANY

PITTSBURGH

OPERATING DIVISION

OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

REV	BY	DATE	DESCRIPTION

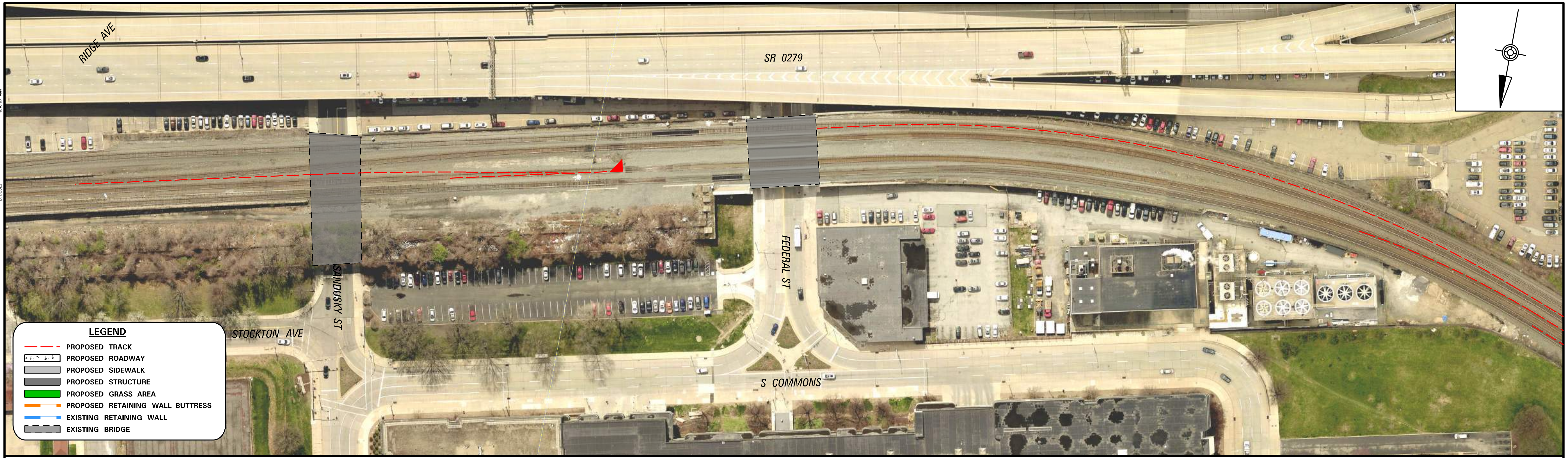
LOCATION: PITTSBURGH, PENNSYLVANIA

TITLE: PENNSYLVANIA AVENUE

DSN WVB	PID No.	VRN	MILE POST PC 1.82
DWN BSP	FILE No. BR0027859		DRAWING NUMBER
CHK DLJ	DATE 3/02/2022		

SHEET NO. 2 OF 2

CADD FILE: NS Pennsyl Ave Prof_Alt 2_Replace at 22ft.dgn



EXISTING TRACK PROFILE TO REMAIN

HORIZONTAL SCALE: 1" = 120'

60' 0 60' 120'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10'

5' 0 5' 10'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 3 REPAIR SUBSTRUCTURE AND LOWER TO 22' CLEARANCE

Michael Baker INTERNATIONAL

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100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108
Phone: (412) 269-6300

NORFOLK SOUTHERN

NORFOLK SOUTHERN RAILWAY COMPANY

OWNING COMPANY

PITTSBURGH

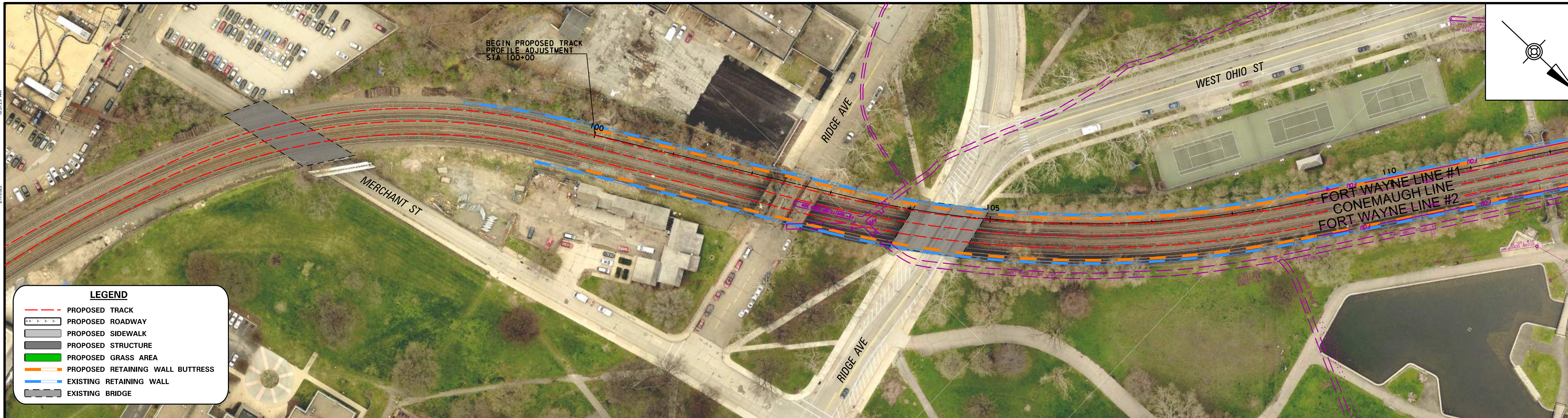
OPERATING DIVISION

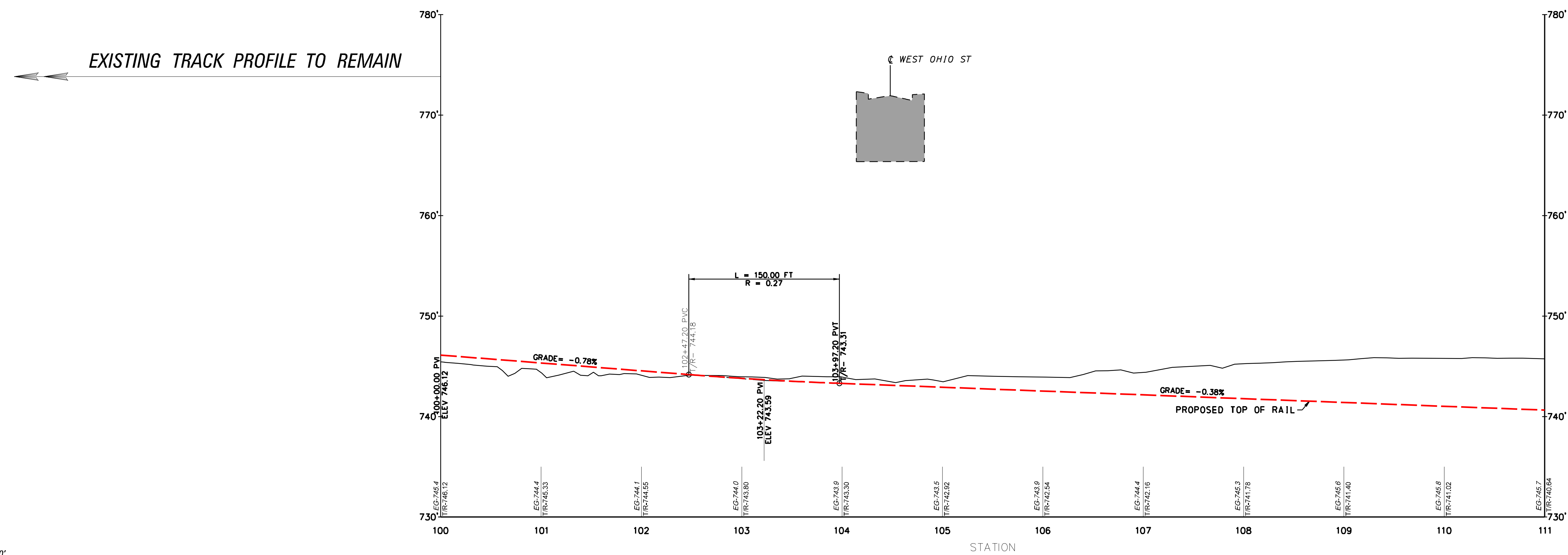
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA.

LOCATION	PITTSBURGH, PENNSYLVANIA		
TITLE	NORTH AVENUE PENNSYLVANIA AVENUE		
DGN DLJ	PID No.	VRN	MILE POST PC 1.60
DWN DLJ	FILE No. BR0027858	DRAWING NUMBER	
CHK WVB	DATE 2/02/2022		

CADD FILE: NS_Pennsylvania_Ave_plan_3 Lower 22ft.dgn

SHEET NO. 1 OF 4





PROFILE – TRACK 1

HORIZONTAL SCALE: 1" = 120'

60' 0 60' 120'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10'

5' 0 5' 10'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 3
REPAIR
SUBSTRUCTURE
AND LOWER TO
22' CLEARANCE

Michael Baker INTERNATIONAL

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MOON TOWNSHIP, PA 15108
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NORFOLK SOUTHERN

NORFOLK SOUTHERN RAILWAY COMPANY

OWNING COMPANY

PITTSBURGH

OPERATING DIVISION

OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION: PITTSBURGH, PENNSYLVANIA

TITLE: NORTH AVENUE
PENNSYLVANIA AVENUE

DGN: DLJ	PID No.		VRN		MILE POST: PC 1.60
DWN: DLJ	FILE No.: BR0027858			DRAWING NUMBER	
CHK: WVB	DATE: 2/02/2022				

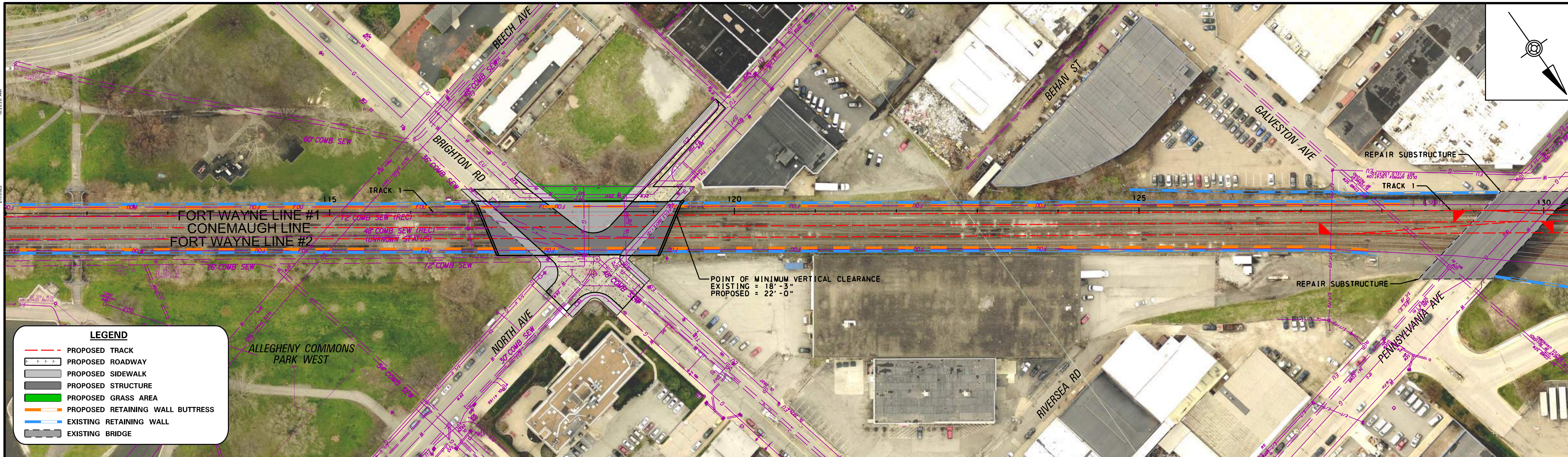
SHEET NO. 2 OF 4

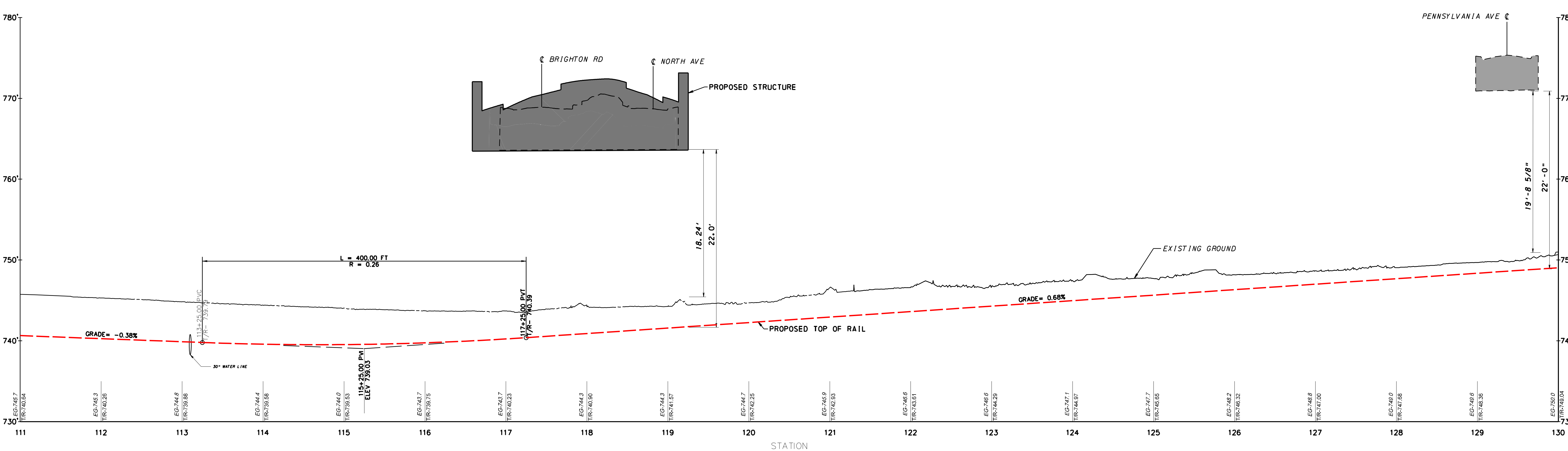
CADD FILE: NS_Pennsylvania_Ave_plan_3 Lower 22ft.dgn

NS_Pennsylvania_Ave_plan_3 Lower 22ft.dgn

2/17/2022

10:31:29 AM





HORIZONTAL SCALE: 1" = 120'

60' 0 60' 120'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10'

5' 0 5' 10'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

PROFILE – TRACK 1

ALTERNATE 3
REPAIR SUBSTRUCTURE AND LOWER TO 22' CLEARANCE

Michael Baker INTERNATIONAL
AIRSIDE BUSINESS PARK
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108
Phone: (412) 269-6300

NORFOLK SOUTHERN
NORFOLK SOUTHERN RAILWAY COMPANY
OWNING COMPANY
PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION: PITTSBURGH, PENNSYLVANIA
TITLE: NORTH AVENUE PENNSYLVANIA AVENUE

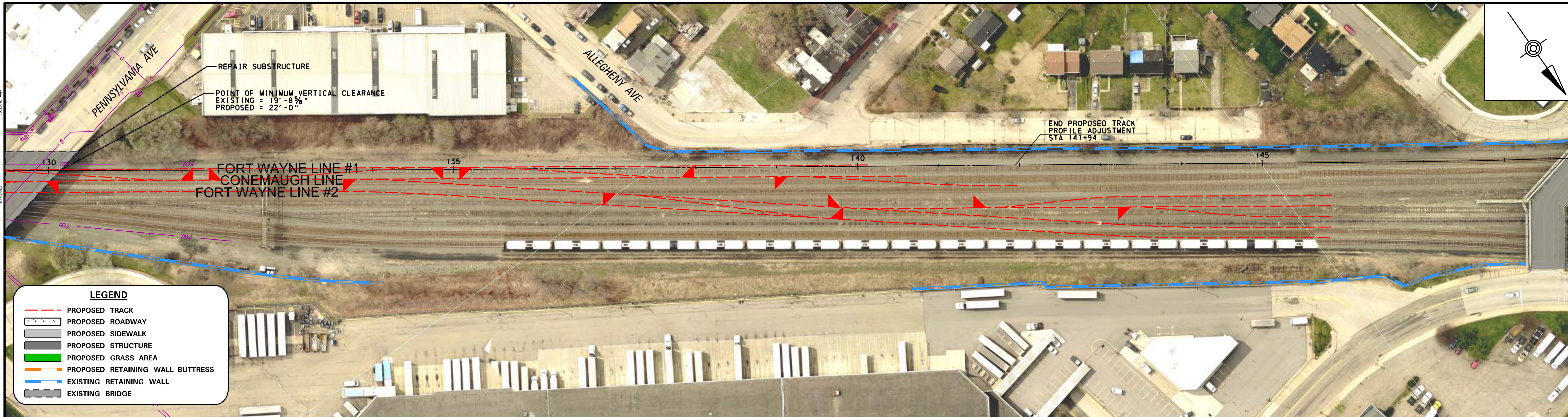
DGN: DLJ | DWN: DLJ | FILE No. BR0027858 | CHK: WVB | DATE 2/02/2022 | FILE POST PC 1.60

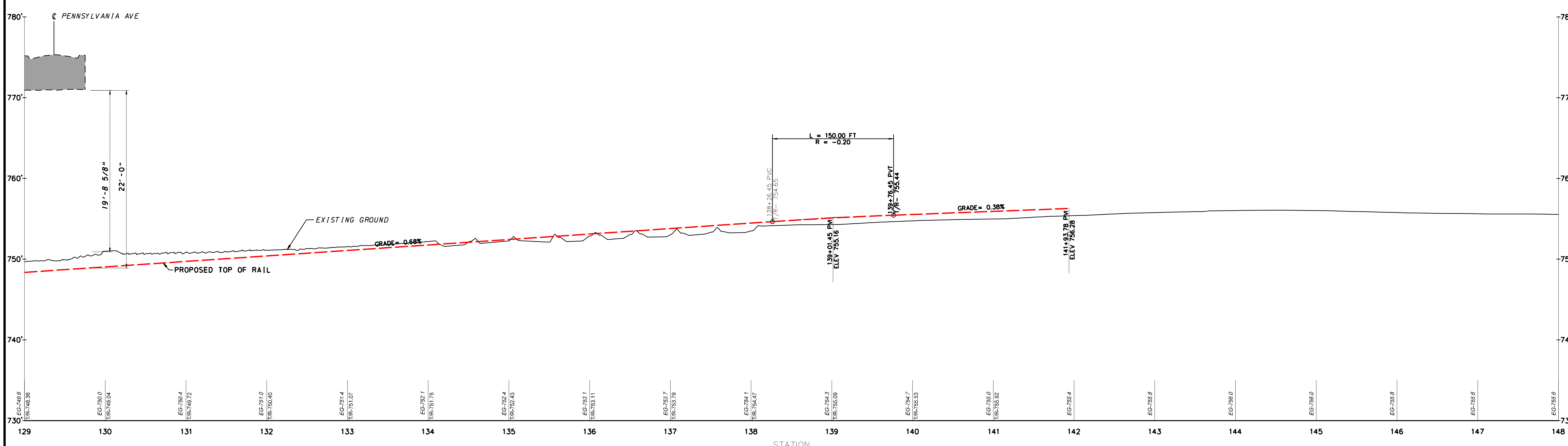
SHEET NO. 3 OF 4

CADD FILE: NS_Pennsylvania_Ave_plan_3 Lower 22ft.dgn

NS_Pennsylvania_Ave_plan_3 Lower 22ft.dgn

2/1/2022 10:20:26 AM





PROFILE – TRACK 1

HORIZONTAL SCALE: 1" = 120'
60' 0 60' 120'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10'
5' 0 5' 10'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 3
REPAIR SUBSTRUCTURE AND LOWER TO 22' CLEARANCE

Michael Baker INTERNATIONAL
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100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108
Phone: (412) 269-6300

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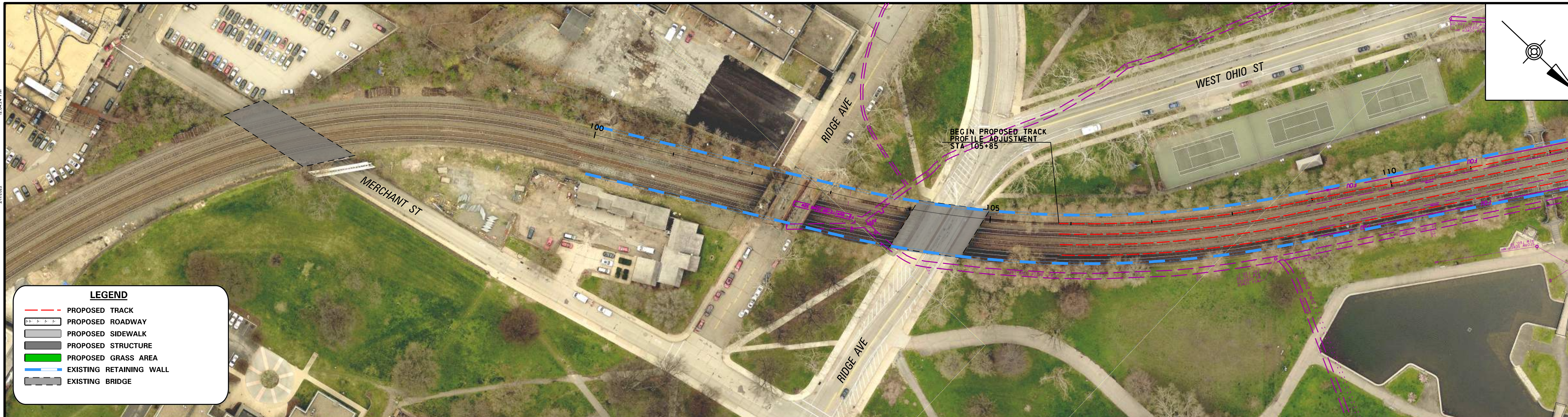
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

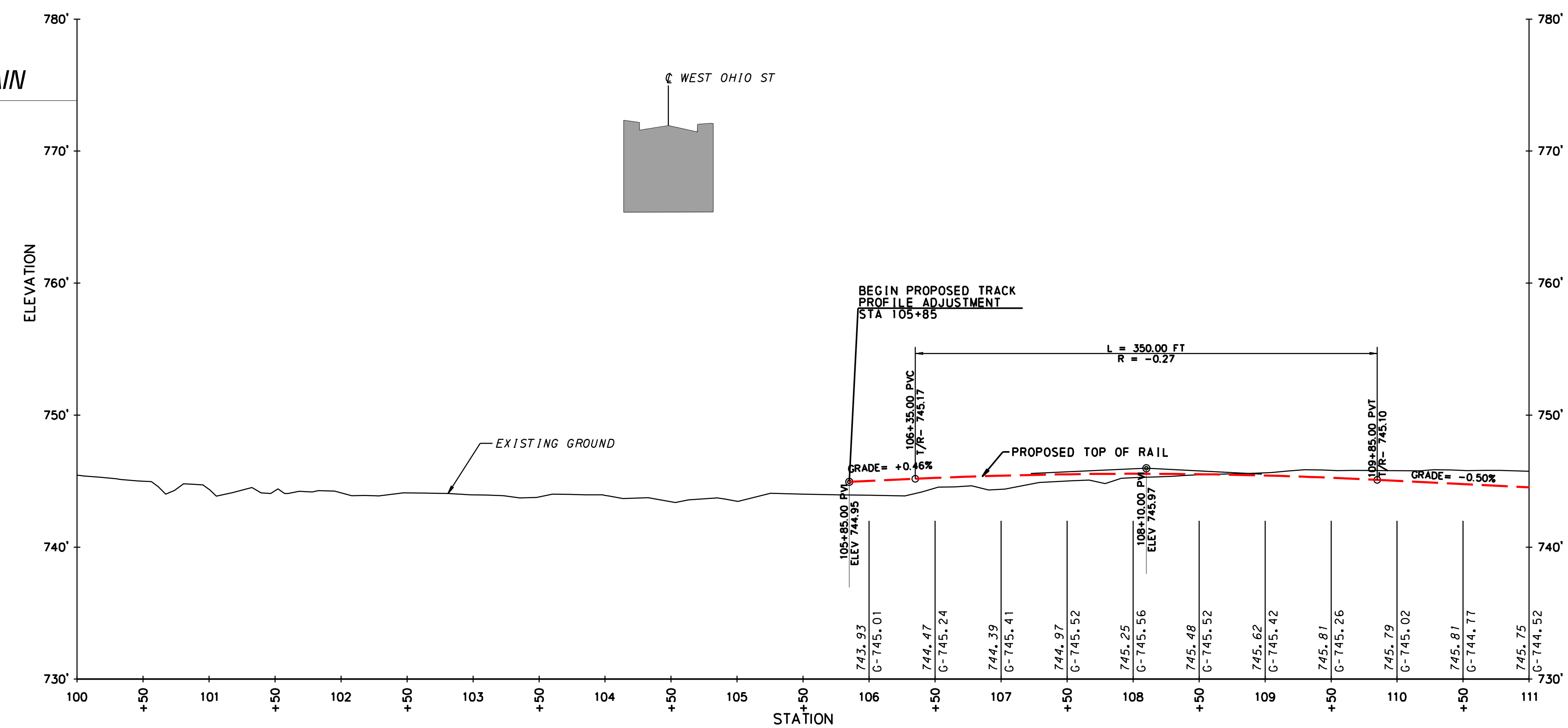
PITTSBURGH, PENNSYLVANIA
NORTH AVENUE
PENNSYLVANIA AVENUE

DGN: DLJ
DWN: DLJ
CHK: WVB
FILE No. BR0027858
DATE 2/02/2022
MILE POST PC 1.60

SHEET NO. 4 OF 4

CADD FILE: NS_Pennsylvania_Ave_plan_3 Lower 22ft.dgn





PROFILE – TRACK 1

HORIZONTAL SCALE: 1" = 120'

VERTICAL SCALE: 1" = 10'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 4
REPLACE AND RAISE BRIDGE AND LOWER TO 22' CLEARANCE

Michael Baker INTERNATIONAL
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100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108
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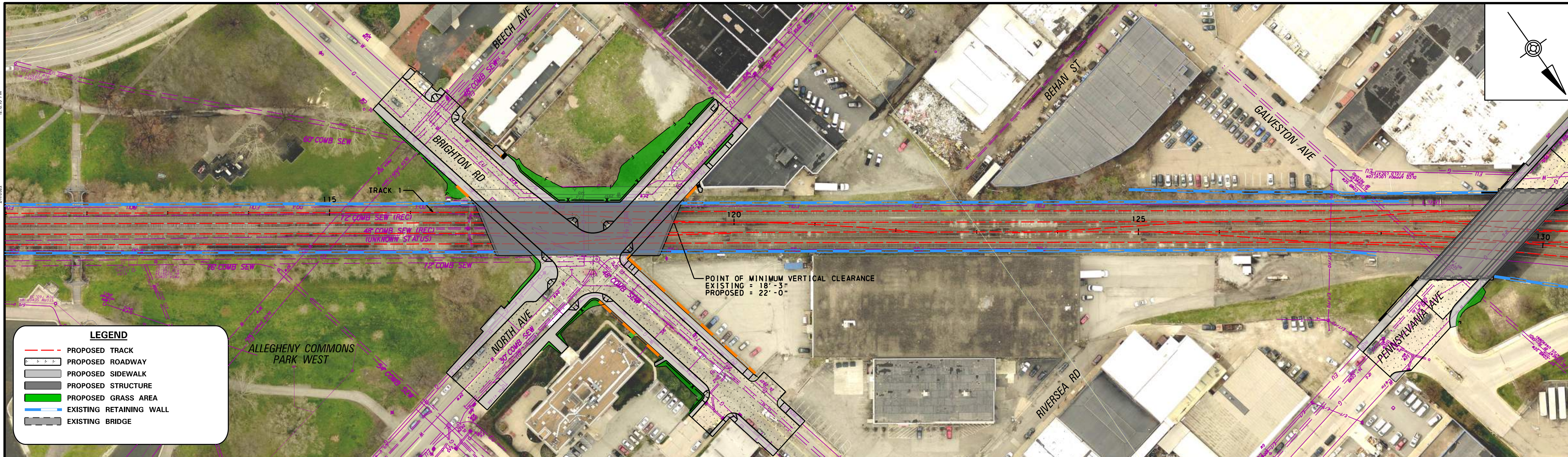
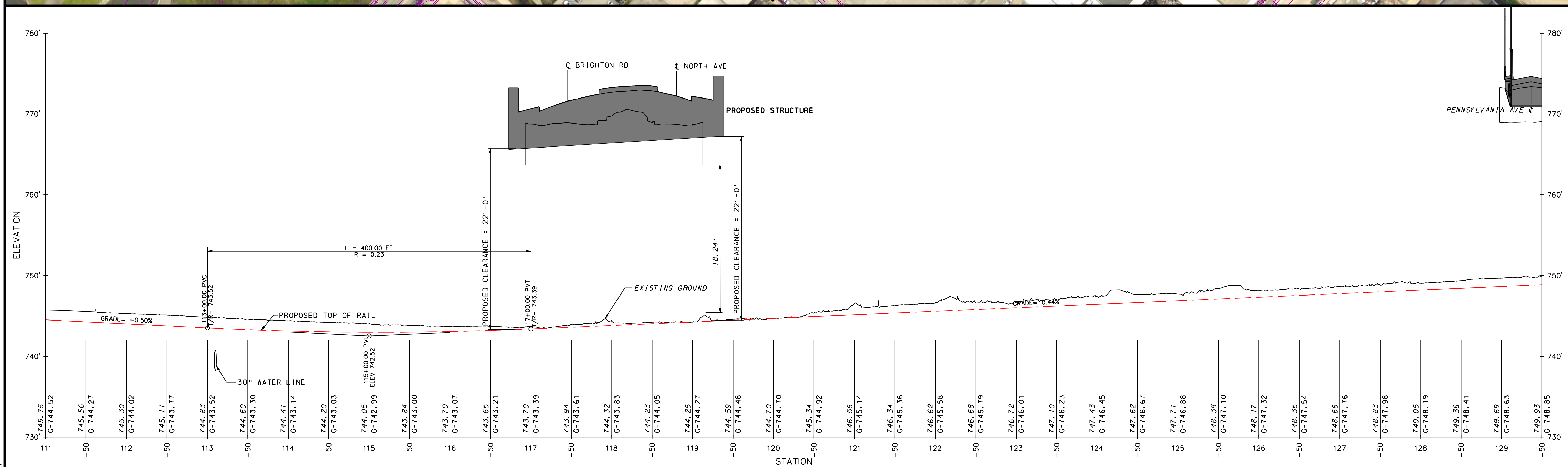
NORFOLK SOUTHERN RAILWAY COMPANY
OWNING COMPANY
PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION: PITTSBURGH, PENNSYLVANIA
TITLE: NORTH AVENUE
PENNSYLVANIA AVENUE

DGN: DLJ
DWN: DLJ
CHK: WVB
FILE No. BR0027858
DATE: 2/02/2022
MILE POST: PC 1.60
SHEET NO. 1 OF 3

CADD FILE: NS_Pennsylvania_Ave_plan_4 Lower 22ft.dgn





HORIZONTAL SCALE: 1" = 120'

60' 0 60' 120'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10'

5' 0 5' 10'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

PROFILE – TRACK 1

ALTERNATE 4
REPLACE AND
RAISE BRIDGE
AND LOWER TO
22' CLEARANCE

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NORFOLK SOUTHERN RAILWAY COMPANY

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PITTSBURGH

OPERATING DIVISION

OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION: PITTSBURGH, PENNSYLVANIA

TITLE: NORTH AVENUE PENNSYLVANIA AVENUE

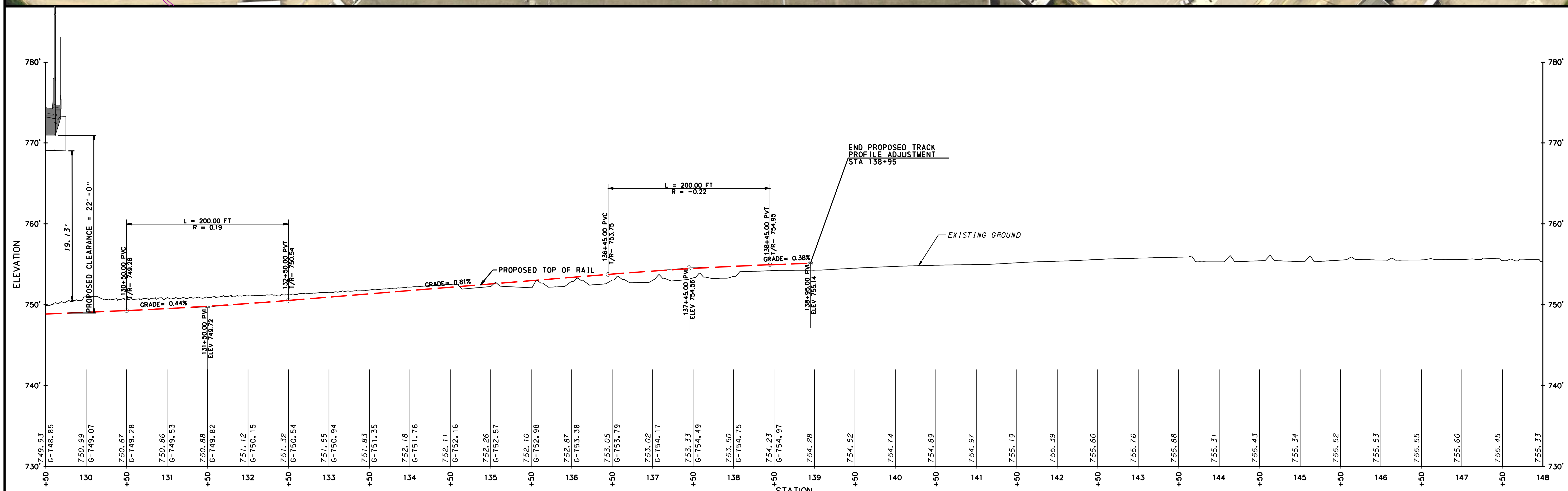
DGN: DLJ · DWN: DLJ · CHK: WVB

FILE No. BR0027858 · DATE 2/02/2022

MILE POST PC 1.60

SHEET NO. 2 OF 3

CADD FILE: NS_Pennsylvania_Ave_plan_4 Lower 22ft.dgn



PROFILE – TRACK 1

HORIZONTAL SCALE: 1" = 120'
60' 0 60' 120'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10'
5' 0 5' 10'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 4
REPLACE AND
RAISE BRIDGE
AND LOWER TO
22' CLEARANCE

Michael Baker INTERNATIONAL
AIRSIDE BUSINESS PARK
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108
Phone: (412) 269-6300

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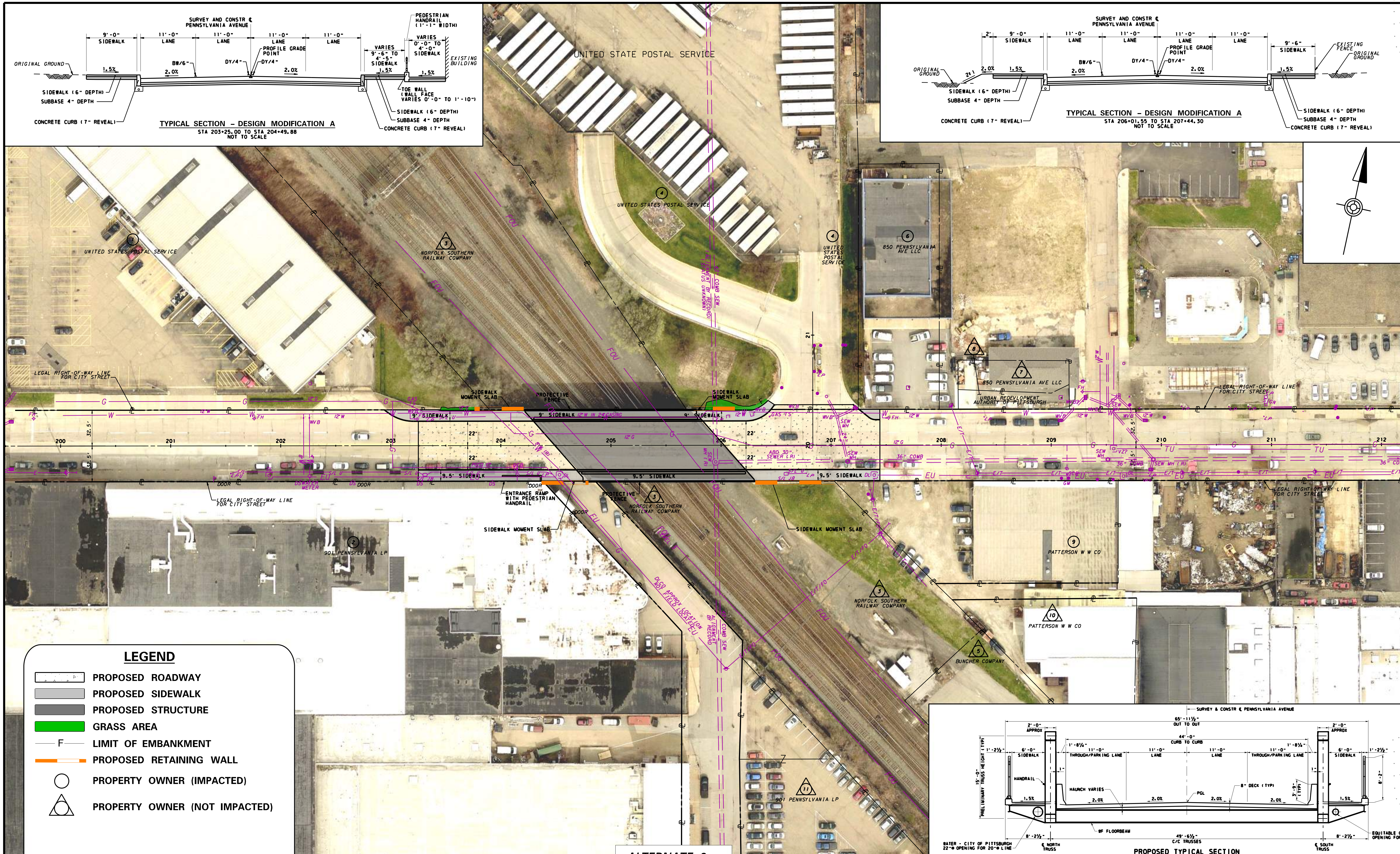
NORFOLK SOUTHERN RAILWAY COMPANY
OWNING COMPANY
PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION: PITTSBURGH, PENNSYLVANIA
TITLE: NORTH AVENUE
PENNSYLVANIA AVENUE

DGN: DLJ | DWN: DLJ | CHK: WVB
FILE No. BR0027858
DATE 2/02/2022
MILE POST PC 1.60
SHEET NO. 3 OF 3

CADD FILE: NS_Pennsylvania_Ave_plan_4 Lower 22ft.dgn



ALTERNATE 2 – DESIGN MODIFICATION REPLACE TO 21' CLEARANCE

Michael Baker INTERNATIONAL
AIRSIDE BUSINESS PARK
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108
Phone: (412) 269-6300

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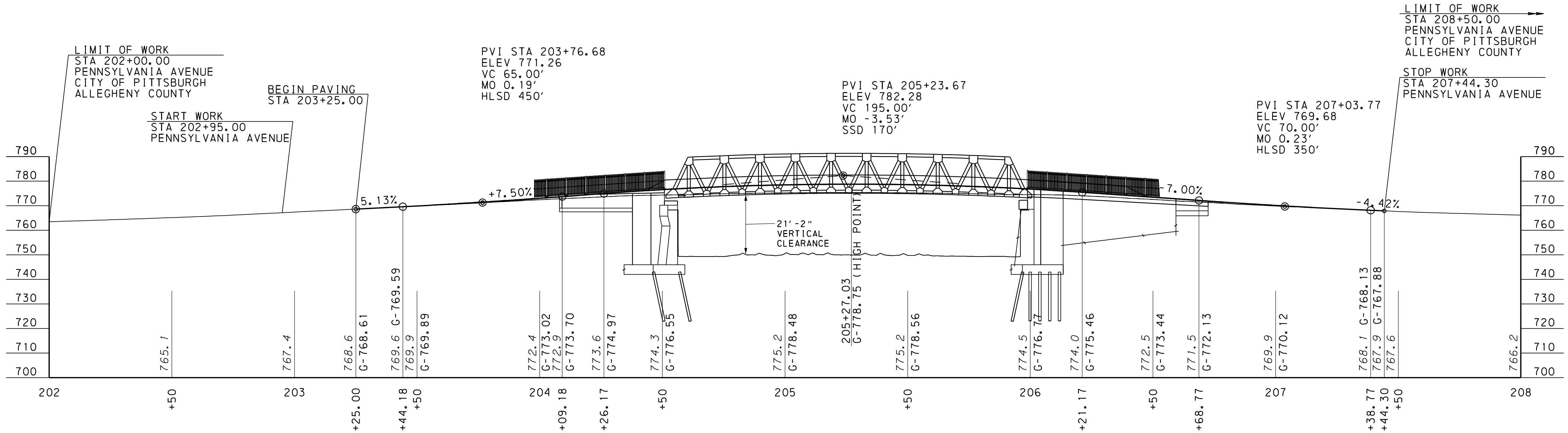
NORFOLK SOUTHERN RAILWAY COMPANY
PITTSBURGH

PITTSBURGH, PENNSYLVANIA
PENNSYLVANIA AVENUE

DGN WVB | DWN BSP | CHK DLJ
FILE No. BR0027859
DATE 2/2/2022
MILE POST PC 1.82

SHEET NO. 1 OF 2

CADD FILE: NS_Penn_Ave_plan_ModA Replace 21ft.dgn



PROFILE – PENNSYLVANIA AVENUE

SCALE: 1" = 50'

25' 0 25' 50'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 2 – DESIGN MODIFICATION REPLACE TO 21' CLEARANCE

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Phone: (412) 269-6300

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OPERATING DIVISION

OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

REV	BY	DATE	DESCRIPTION

LOCATION: PITTSBURGH, PENNSYLVANIA

TITLE: PENNSYLVANIA AVENUE

DGN WVB	PID No.	VRN	MILE POST PC 1.82
DWN BSP	FILE No. BR0027859		DRAWING NUMBER
CHK DLJ	DATE 2/02/2022		

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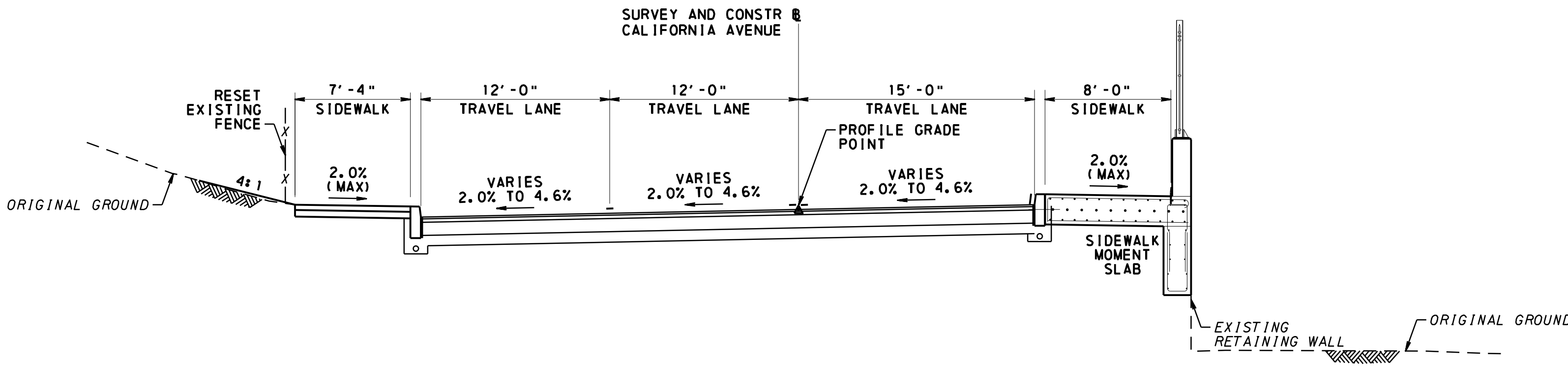
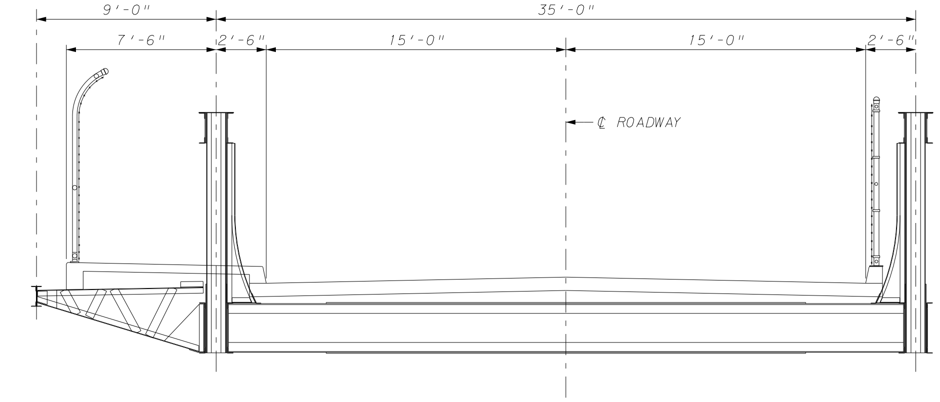
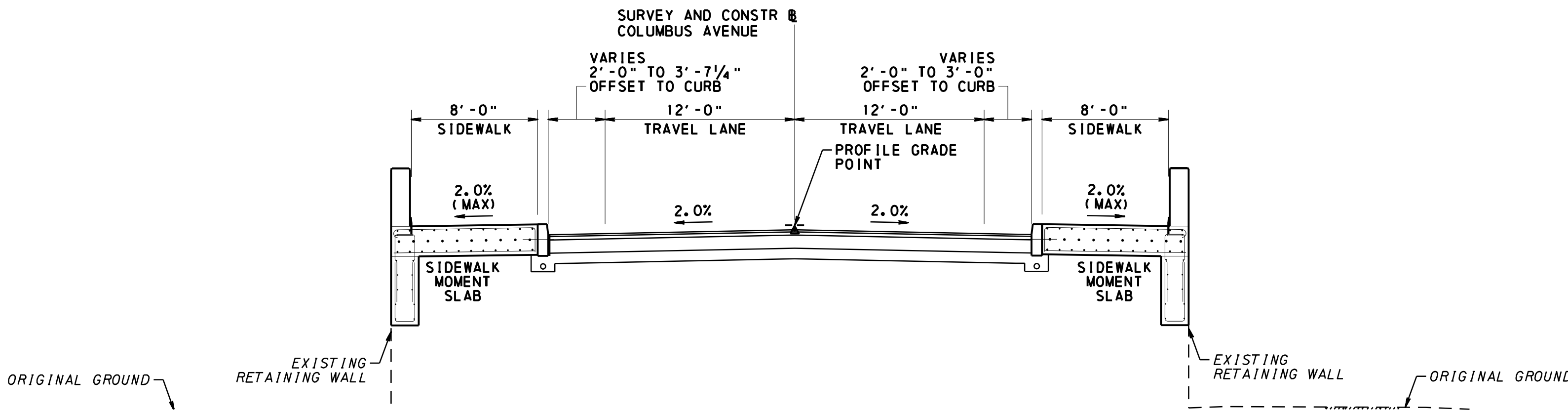


TYPICAL SECTION – CALIFORNIA AVENUE



TYPICAL BRIDGE SECTION



TYPICAL SECTION – COLUMBUS AVENUE

LEGEND

- PROPOSED ROADWAY
- PROPOSED SIDEWALK
- PROPOSED STRUCTURE
- GRASS AREA
- —F— LIMIT OF EMBANKMENT
- —C— LIMIT OF EXCAVATION
- EXISTING RETAINING WALL
- PROPOSED RETAINING WALL

HORIZONTAL

SCALE: 1" = 60' 30' 0 30' 60'

ALTERNATE 2
RAISE TO 22'

Michael Baker INTERNATIONAL
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OPERATING DIVISION

OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION	PITTSBURGH, PENNSYLVANIA
TITLE	COLUMBUS AVENUE

DGN DLJ	PID No. D2122	VRN 1290818-OH77	MILE POST PC 2.17
DWN BSP	FILE No. BLD0004795	DRAWING NUMBER	
CHK WVB	DATE 02/24/2020	TD-2016-79	

SHEET NO. 1 OF 2

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4/5/2020
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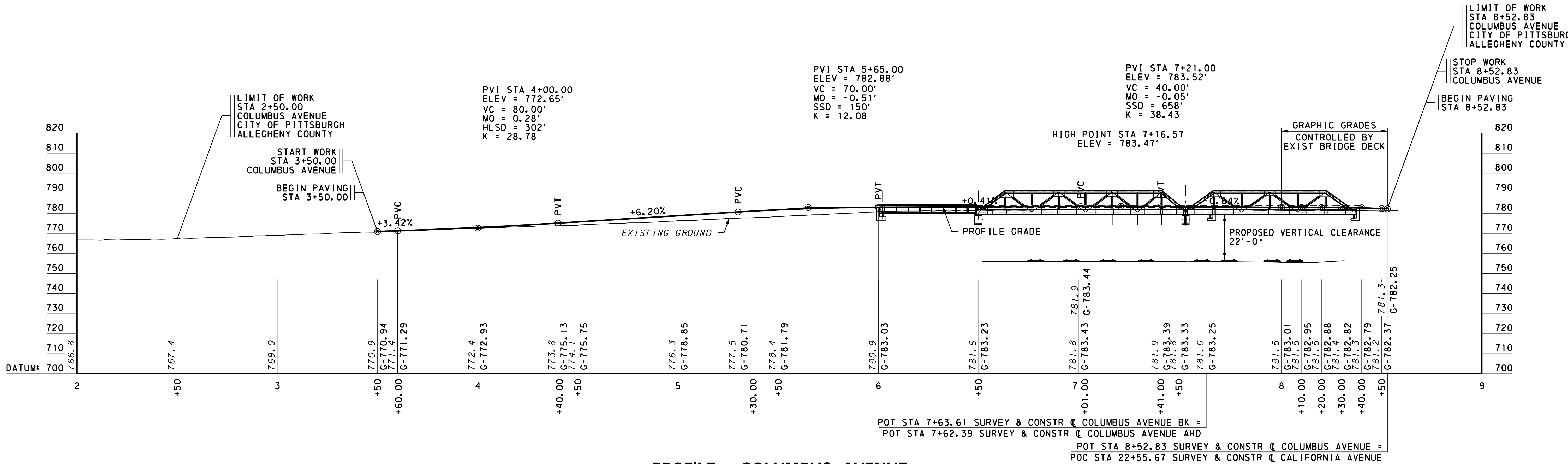
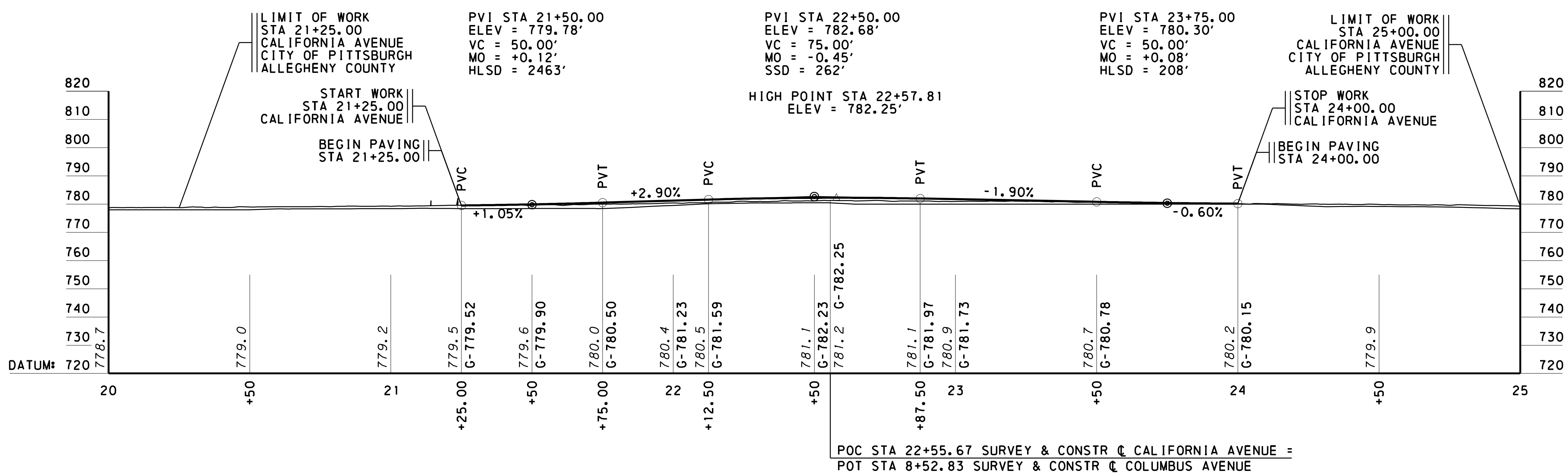


PROFILE – COLUMBUS AVENUE



PROFILE – CALIFORNIA AVENUE

SCALE: 1" = 50'

25' 0 25' 50'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 2
RAISE TO 22'

Michael Baker INTERNATIONAL

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OPERATING DIVISION

OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

REV	BY	DATE	DESCRIPTION

LOCATION: PITTSBURGH, PENNSYLVANIA

TITLE: COLUMBUS AVENUE

DGN DLJ	PID No. D2122	VRN 1290818-OH77	MILE POST	PC 2.17
DWN BSP	FILE No. BLD0004795		DRAWING NUMBER	
CHK WVB	DATE 02/24/2020			TD-2016-79

SHEET NO. 2 OF 2

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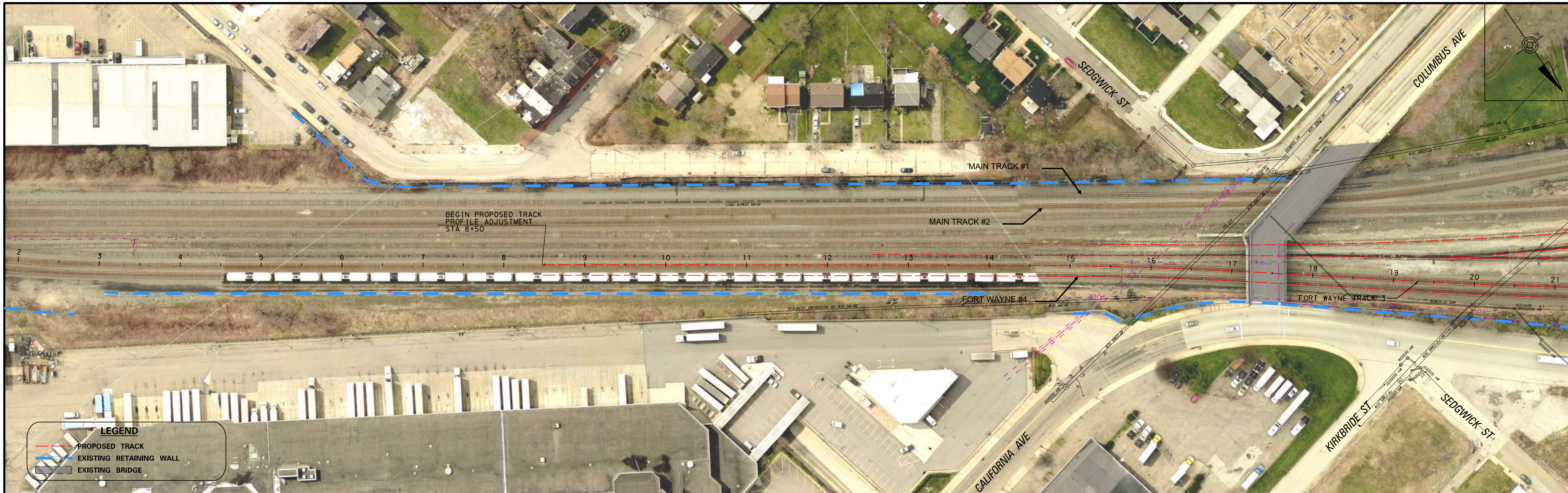

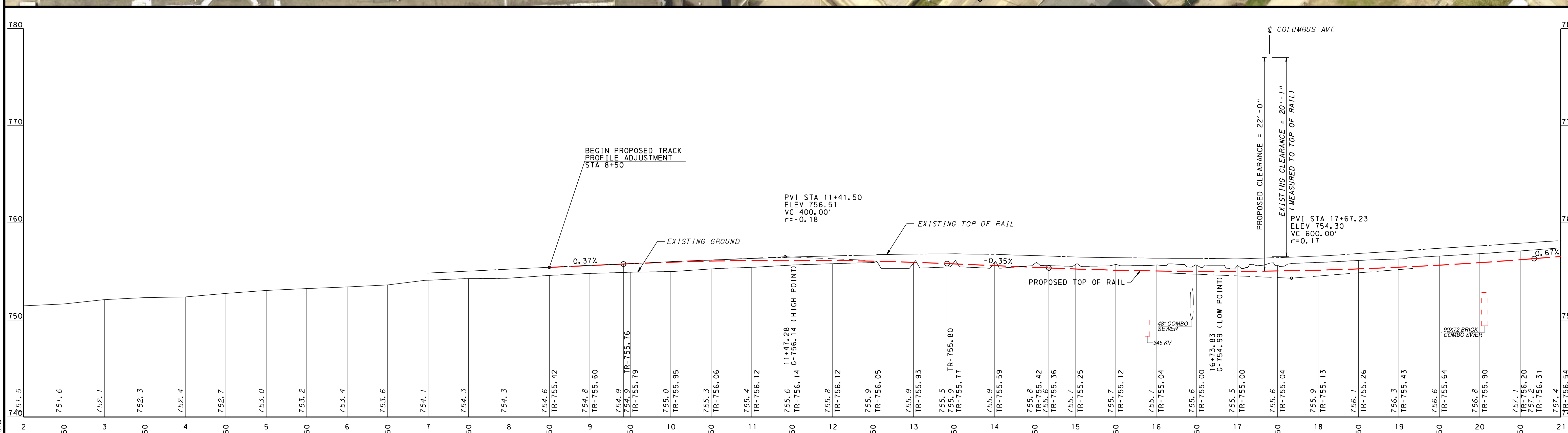

PROFILE – FORT WAYNE TRACK 3

HORIZONTAL SCALE: 1" = 120'

60' 0 60' 120'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10'

5' 0 5' 10'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 3A
LOWER TO
22' CLEARANCE

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Moon Township, Pennsylvania 15108
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OPERATING DIVISION

OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

REV	BY	DATE	DESCRIPTION

LOCATION: PITTSBURGH, PENNSYLVANIA

TITLE: COLUMBUS AVENUE

DGN	DLJ	PID No.	D2122	VRN	1290818-OH77	MILE POST	PC 2.17
DWN	BSP	FILE No.	BLD0004795			DRAWING NUMBER	
CHK	WVB	DATE	02/24/2020				TD-2016-79

SHEET NO. 1 OF 2

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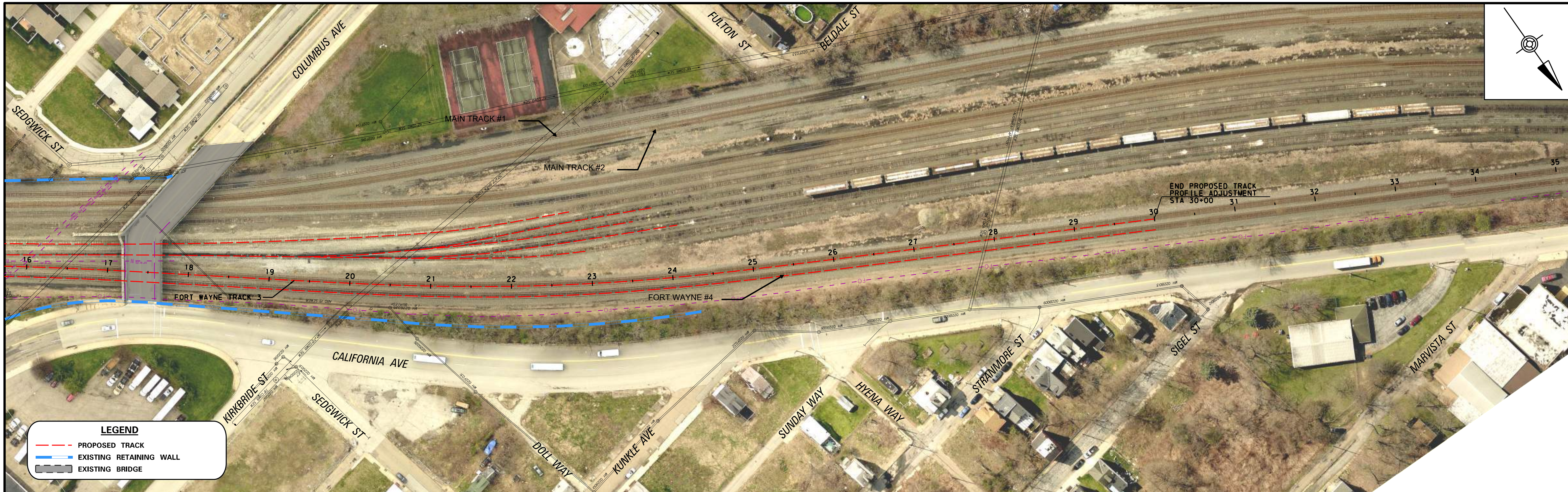
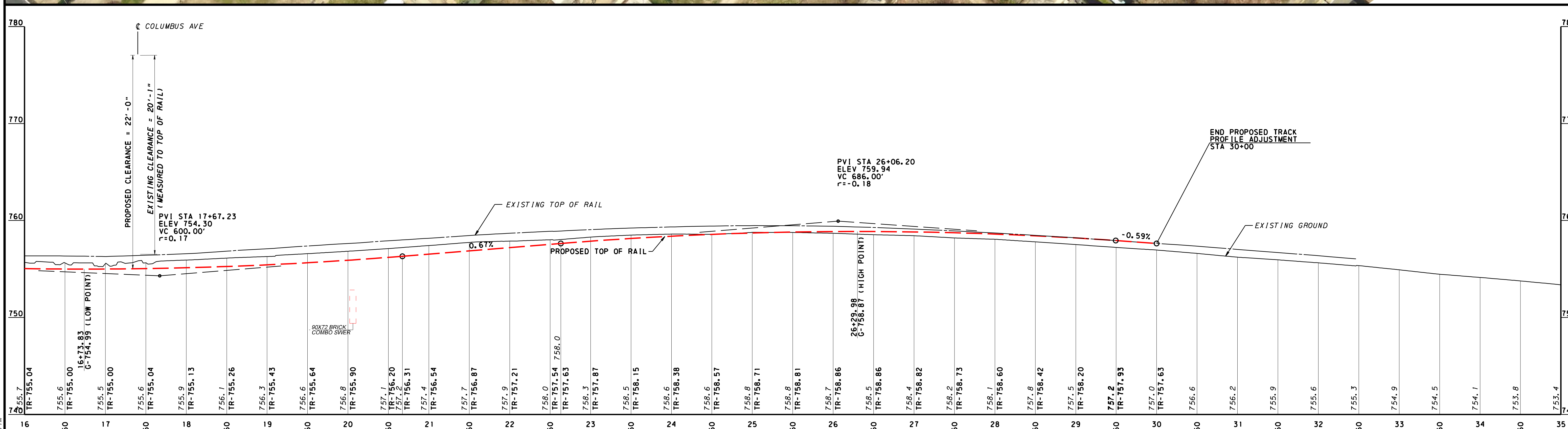
4/6/2020





PROFILE – FORT WAYNE TRACK 3

HORIZONTAL SCALE: 1"=120'

60' 0 60' 120'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1"=10'

5' 0 5' 10'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 3A
LOWER TO
22' CLEARANCE

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OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION	PITTSBURGH, PENNSYLVANIA
TITLE	COLUMBUS AVENUE
DGN	DLJ
PID No.	D2122
VRN	1290818-OH77
MILE POST	PC 2.17
DWN	BSP
FILE No.	BLD0004795
DRAWING NUMBER	TD-2016-79
CHK	WVB
DATE	02/24/2020

SHEET NO. 2 OF 2

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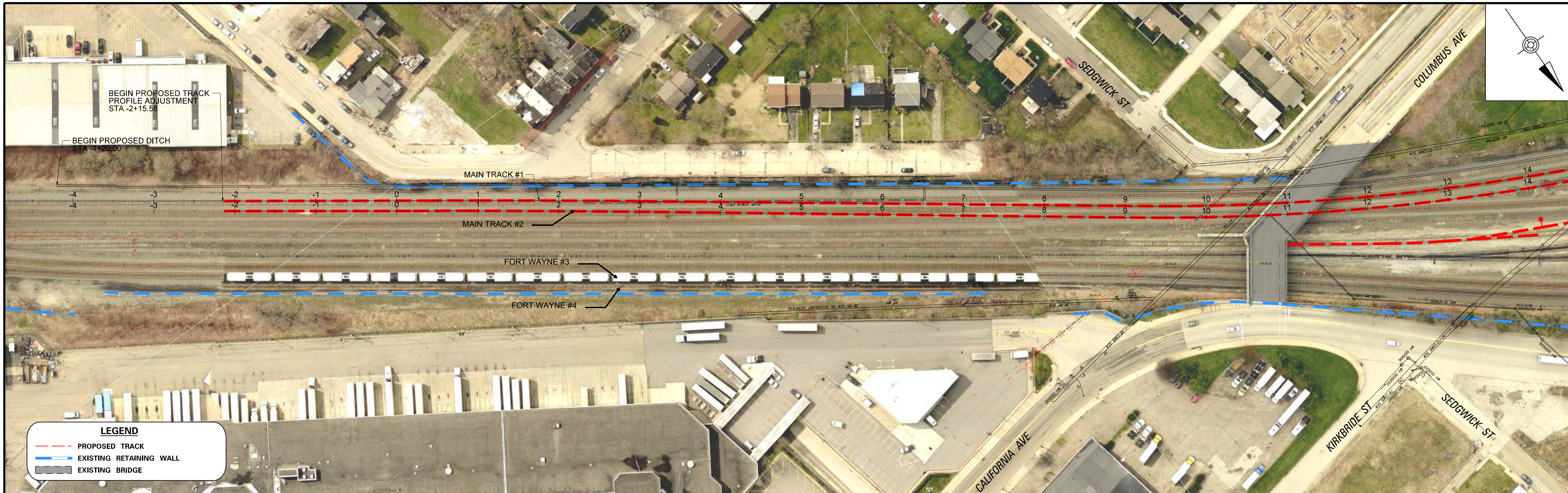

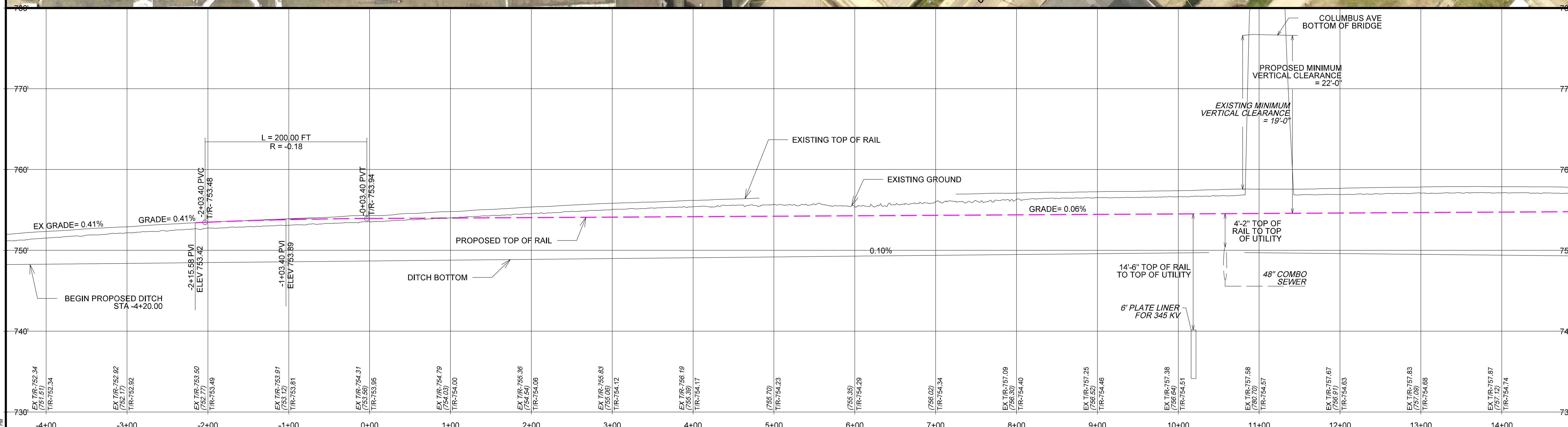

PROFILE – MAIN TRACK #1

HORIZONTAL SCALE: 1" = 120'

VERTICAL SCALE: 1" = 10'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 3B LOWER TO 22' CLEARANCE

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Moon Township, Pennsylvania 15108
Phone: (412) 269-6300
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NORFOLK SOUTHERN RAILWAY COMPANY
OWNING COMPANY

PITTSBURGH
OPERATING DIVISION

OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION: PITTSBURGH, PENNSYLVANIA

TITLE: COLUMBUS AVENUE

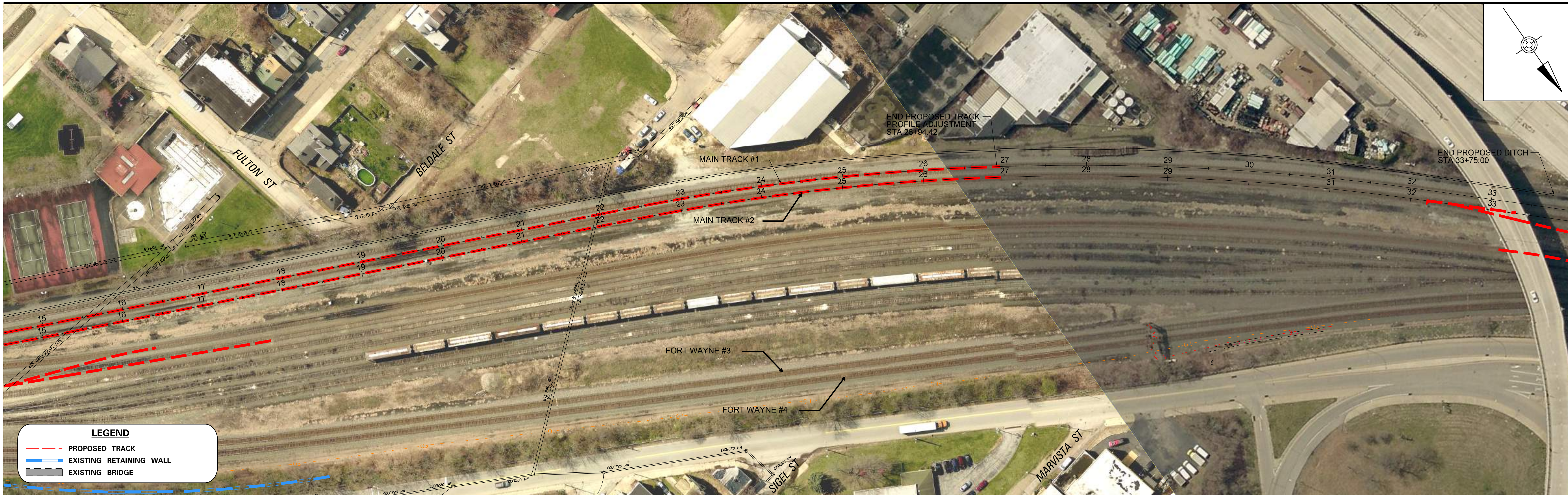
DGN: DLJ | PID No.: D2122 | VRN: 1290818–OH77 | MILE POST: PC 2.17

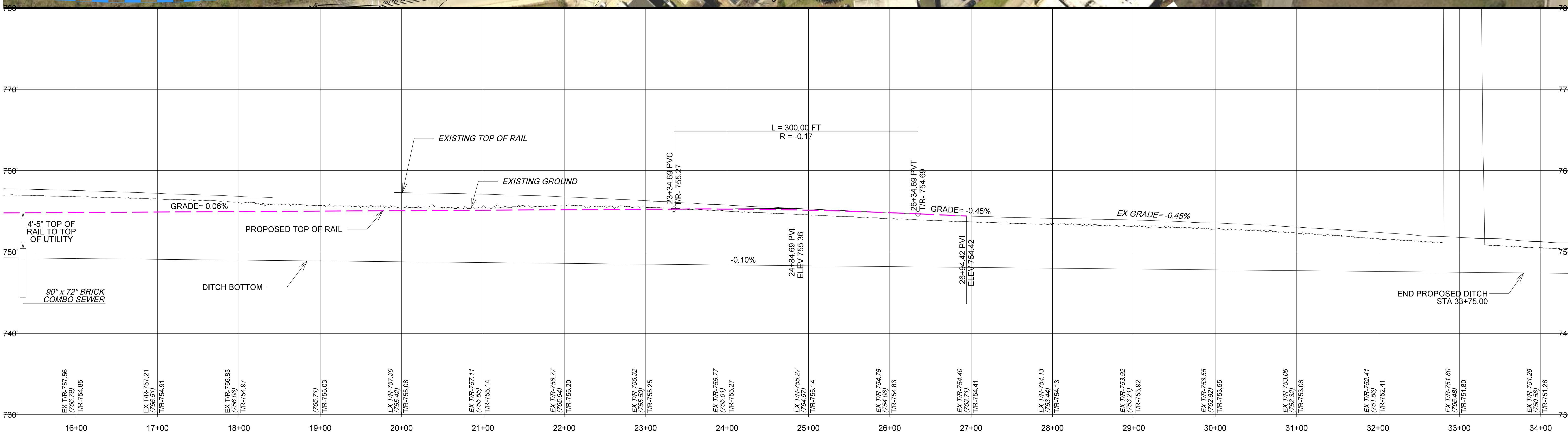
DWN: BSP | FILE No.: BLD0004795 | DRAWING NUMBER

CHK: WVB | DATE: 06/02/2020 | TD–2016–79

SHEET NO. 1 OF 2

CADD FILE: NS_Columbus_Ave_NewAlt5_plan Lower 22ft.dgn





HORIZONTAL SCALE: 1" = 120'
60' 0 60' 120'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10'
5' 0 5' 10'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

PROFILE – MAIN TRACK #1

ALTERNATE 3B
LOWER TO
22' CLEARANCE

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Moon Township, Pennsylvania 15108
Phone: (412) 269-6300
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PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

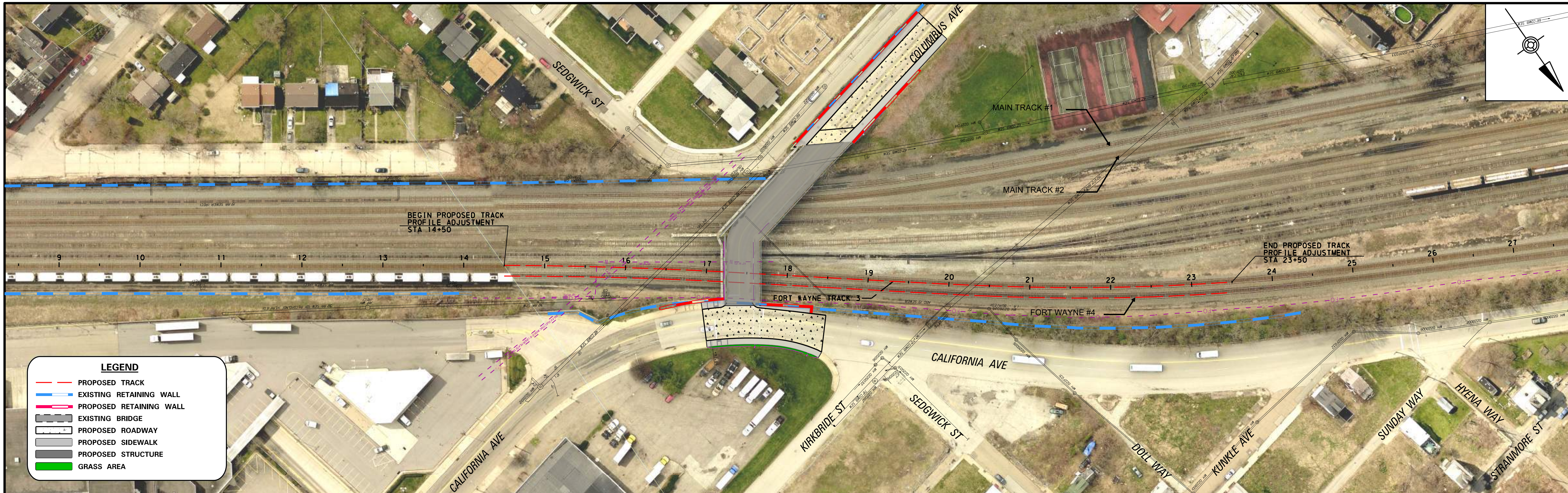
REV	BY	DATE	DESCRIPTION

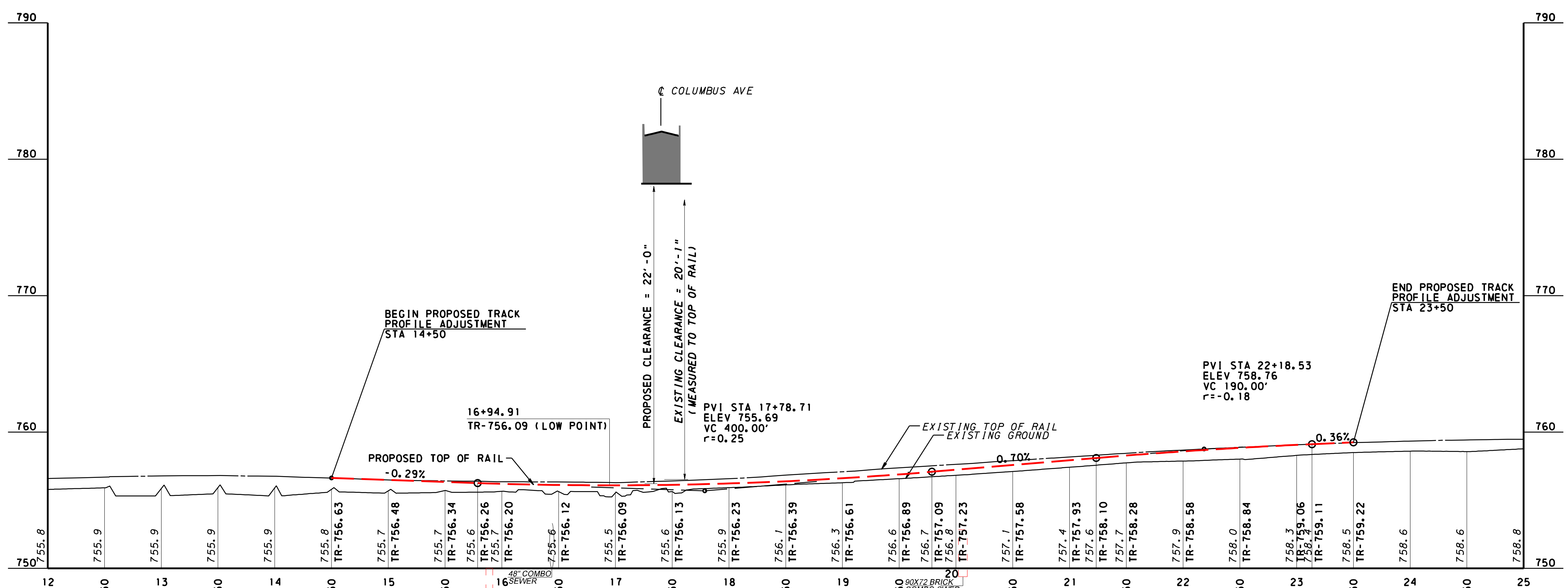
LOCATION: PITTSBURGH, PENNSYLVANIA
TITLE: COLUMBUS AVENUE

DGN DLJ	PID No. D2122	VRN 1290818–OH/77	MILE POST PC 2.17
DWN BSP	FILE No. BLD0004795	DRAWING NUMBER TD–2016–79	
CHK WVB	DATE 06/02/2020		

SHEET NO. 2 OF 2

FILE: NS_Columbus_Ave_NewAlt5_plan Lower 22ft.dgn





PROFILE – FORT WAYNE TRACK 3

HORIZONTAL SCALE: 1" = 120'

VERTICAL SCALE: 1" = 10'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 4
RAISE BRIDGE & LOWER TRACKS TO 22' CLEARANCE

Michael Baker INTERNATIONAL

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Moon Township, Pennsylvania 15108
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OWNING COMPANY

PITTSBURGH

OPERATING DIVISION

OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

REV	BY	DATE	DESCRIPTION

LOCATION: PITTSBURGH, PENNSYLVANIA

TITLE: COLUMBUS AVENUE

DGN DLJ	PID No. D2122	VRN 1290818-OH77	MILE POST PC 2.17
DWN BSP	FILE No. BLD0004795	DRAWING NUMBER	
CHK WVB	DATE 02/24/2020	TD-2016-79	

SHEET NO. 3 OF 3

CADD FILE: NS_Columbus_Ave_Alt4_plan Combo Raise & Lower 22ft.dgn

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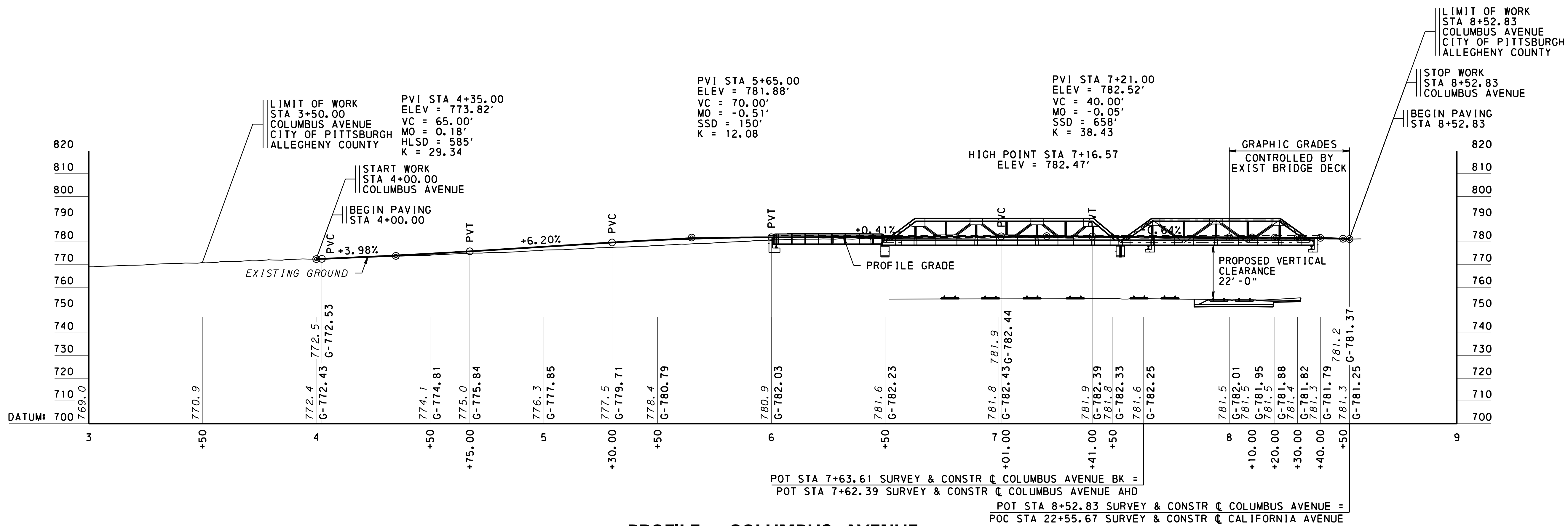
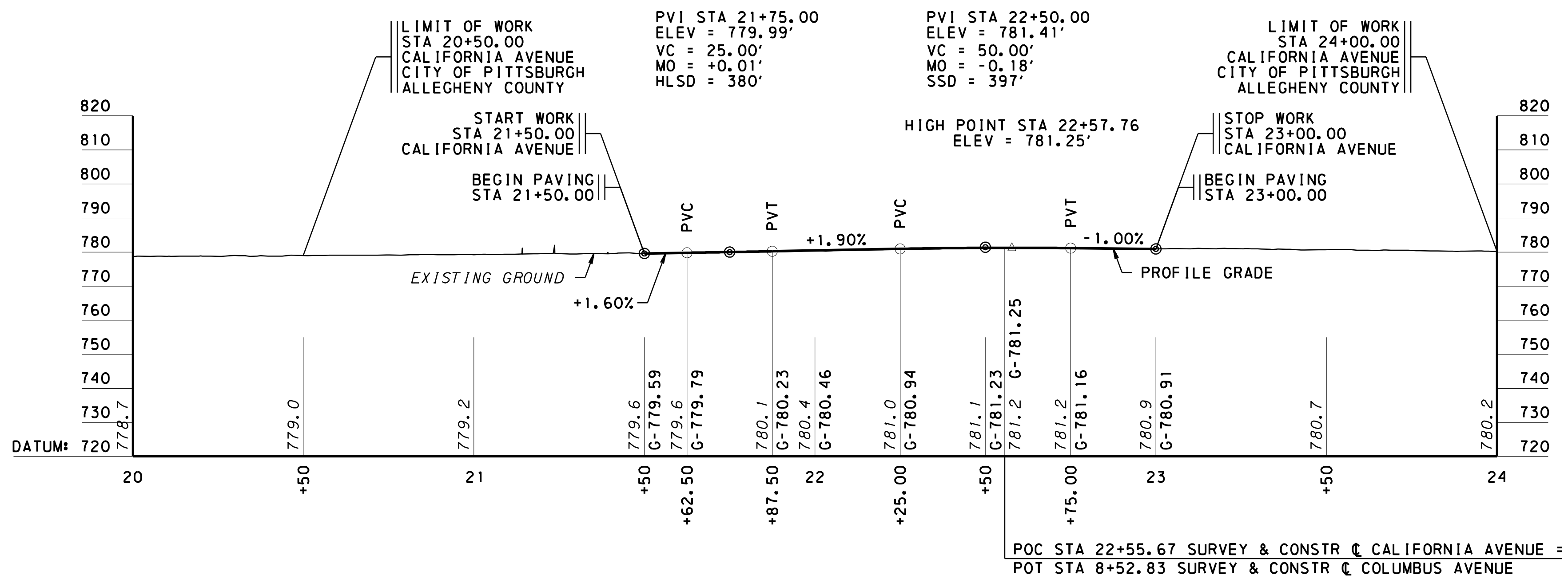


PROFILE – COLUMBUS AVENUE



PROFILE – CALIFORNIA AVENUE

SCALE: 1" = 50'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

ALTERNATE 4
RAISE BRIDGE &
LOWER TRACKS
TO 22' CLEARANCE

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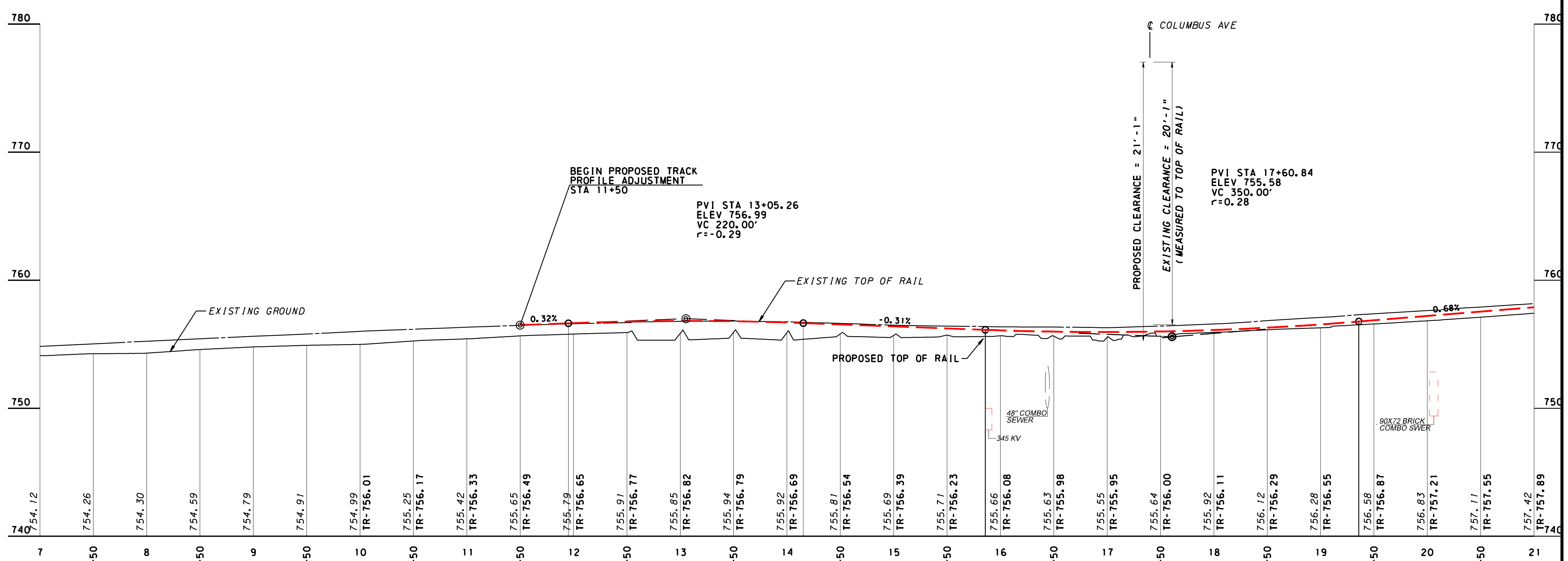
NORFOLK SOUTHERN RAILWAY COMPANY
OWNING COMPANY
PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION	PITTSBURGH, PENNSYLVANIA
TITLE	COLUMBUS AVENUE
DGN DLJ	PID No. D2122
VRN	1290818–OH77
MILE POST	PC 2.17
DWN BSP	FILE No. BLD0004795
CHK WVB	DATE 02/24/2020
DRAWING NUMBER	TD–2016–79

SHEET NO. 2 OF 3

CADD FILE: NS_Columbus_Ave_Profile Raise 21ft.dgn



PROFILE – FORT WAYNE TRACK 4

HORIZONTAL SCALE: 1" = 120'

60' 0 60' 120'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10'

5' 0 5' 10'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

DESIGN MODIFICATION 3A-LOWER TO 21' CLEARANCE

Michael Baker INTERNATIONAL

Airside Business Park
100 Airside Drive
Moon Township, Pennsylvania 15108
Phone: (412) 269-6300
MBAKERINTL.COM

NORFOLK SOUTHERN

NORFOLK SOUTHERN RAILWAY COMPANY

OWNING COMPANY

PITTSBURGH

OPERATING DIVISION

OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

REV	BY	DATE	DESCRIPTION

LOCATION: PITTSBURGH, PENNSYLVANIA

TITLE: COLUMBUS AVENUE

DGN DJJ	PID No. D2122	VRN 1290818–OH77	MILE POST PC 2.17
DWN BSP	FILE No. BLD0004795	DRAWING NUMBER	
CHK WVB	DATE 06/02/2020	TD–2016–79	

SHEET NO. 1 OF 2

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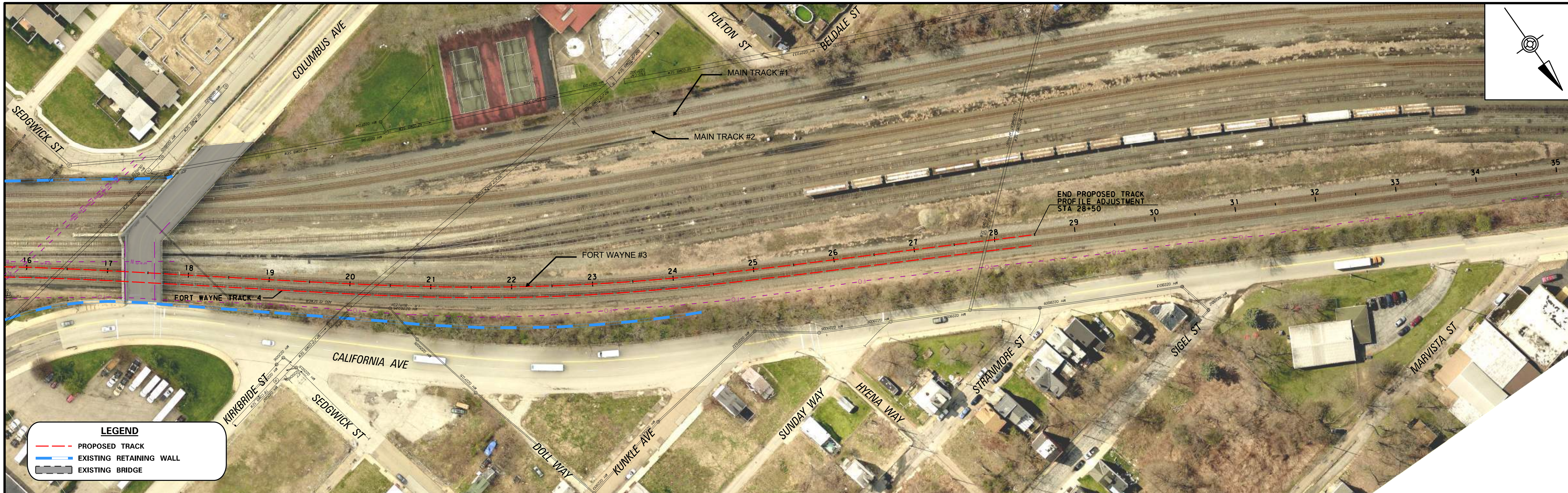
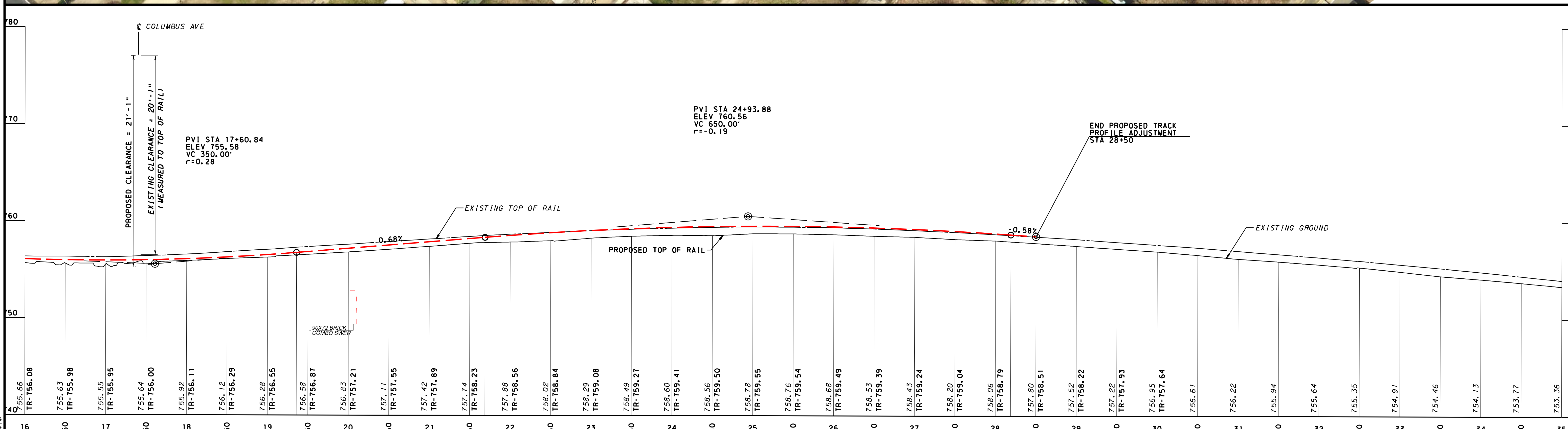
5/5/2021

CADD FILE: NS_Columbus_Ave_Alt5_plan Lower 21ft.dgn





PROFILE – FORT WAYNE TRACK 4

HORIZONTAL SCALE: 1" = 120'
60' 0 60' 120'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL SCALE: 1" = 10'
5' 0 5' 10'
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DESIGN MODIFICATION 3A-LOWER TO 21' CLEARANCE

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OWNING COMPANY
PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

REV	BY	DATE	DESCRIPTION

LOCATION: PITTSBURGH, PENNSYLVANIA
TITLE: COLUMBUS AVENUE

DGN DLJ	PID No. D2122	VRN 1290818-OH77	MILE POST PC 2.17
DWN BSP	FILE No. BLD0004795		DRAWING NUMBER
CHK WVB	DATE 06/02/2020		TD-2016-79

SHEET NO. 2 OF 2

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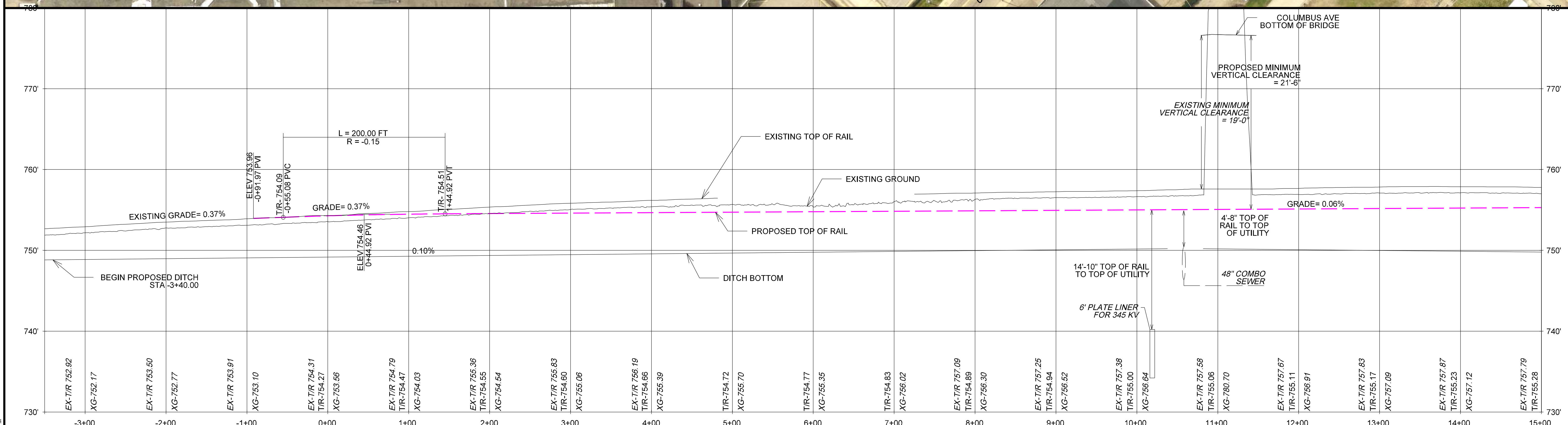

PROFILE – MAIN TRACK #1

HORIZONTAL
SCALE: 1" = 120'
60' 0 60' 120'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

VERTICAL
SCALE: 1" = 10'
5' 0 5' 10'
DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

DESIGN
MODIFICATION
3B – LOWER TO
21' CLEARANCE

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OWNING COMPANY
PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

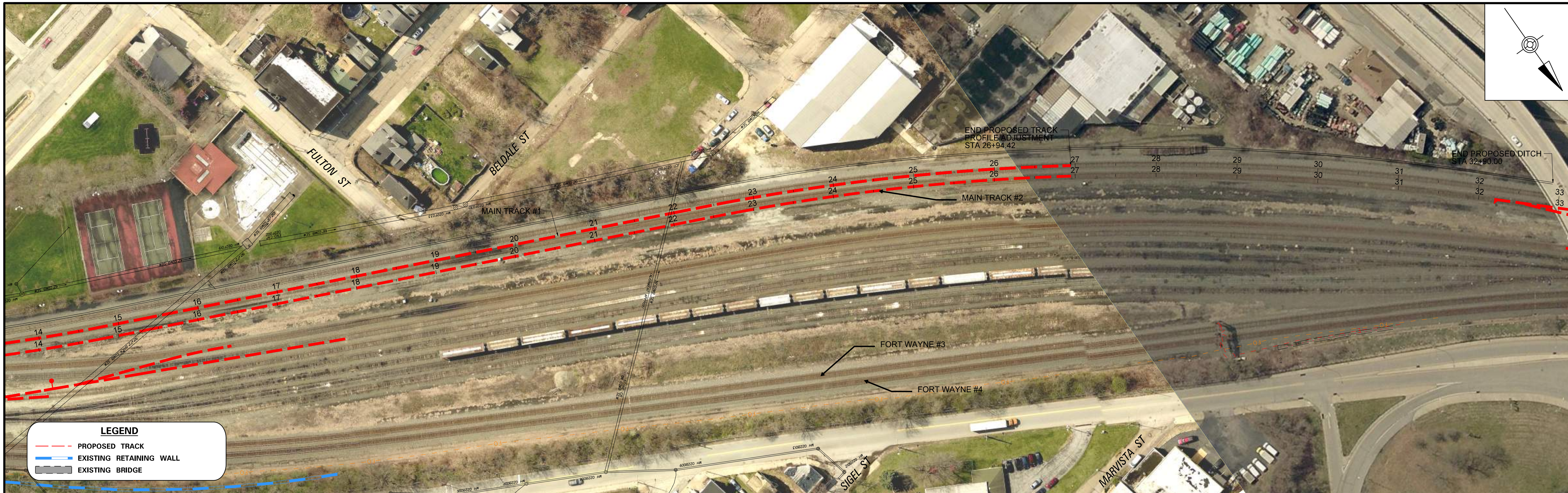
REV	BY	DATE	DESCRIPTION

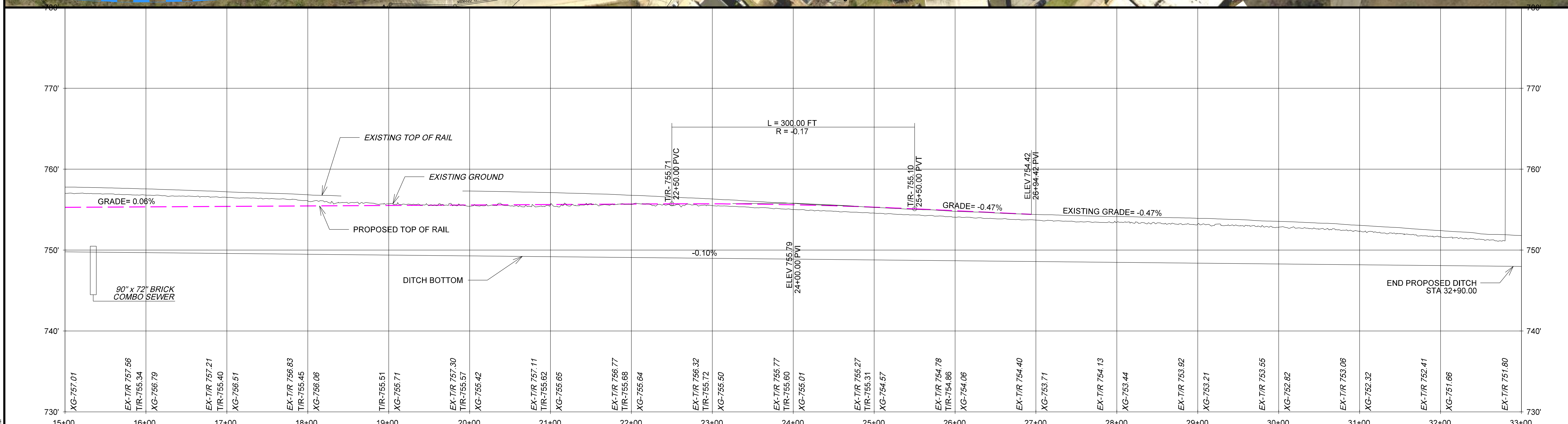
LOCATION: PITTSBURGH, PENNSYLVANIA
TITLE: COLUMBUS AVENUE

DGN DLJ	P/O No. D2122	VRN 1290818–OH/77	MILE POST PC 2.17
DWN BSP	FILE No. BLD0004795		DRAWING NUMBER
CHK WVB	DATE 06/02/2020		TD–2016–79

SHEET NO. 1 OF 2

CADD FILE: NS_Columbus_Ave_NewAlt5_plan Lower 21ft.dgn





HORIZONTAL SCALE: 1" = 120'

VERTICAL SCALE: 1" = 10'

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

PROFILE – MAIN TRACK #1

DESIGN MODIFICATION 3B – LOWER TO 21' CLEARANCE

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OWNING COMPANY
PITTSBURGH
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER – DESIGN AND CONSTRUCTION – ATLANTA, GA

LOCATION: PITTSBURGH, PENNSYLVANIA
TITLE: COLUMBUS AVENUE

DGN DLJ | PID No. D2122 | VRN 1290818-OH/77 | MILE POST PC 2.17
DWN BSP | FILE No. BLD0004795 | DRAWING NUMBER
CHK WVB | DATE 06/02/2020 | TD-2016-79

SHEET NO. 2 OF 35

CADD FILE: NS_Columbus_Ave_NewAlt5_plan Lower 21ft.dgn

APPENDIX C

Conceptual Cost Estimates

SO No.:

Subject : Norfolk Southern Bridges

Washington Ave

Structures Alternatives Cost Summary

Computed By: LTS Date: 2/13/2020 Checked By: CGF Date: 2/2020

Michael Baker INTERNATIONAL

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SUMMARY ALTERNATIVES QUANTITIES AND COST ESTIMATE

WASHINGTON AVENUE BRIDGE OVER BUSWAY, NSRR, & WAVERLY AVENUE

Rev1 CGF 12-13-22

ALTERNATIVES	STRUCTURES SUBTOTAL	CONTINGENCY (20%)	STRUCTURE TOTAL
RAISE EXISTING STRUCTURE	$ 1,563,110.00	$ 312,622.00	$ 1,876,000.00
LOWER RAILROAD TRACKS	$ 1,905,025.00	$ 381,005.00	$ 2,287,000.00
RAISE EXISTING STRUCTURE & LOWER RAILROAD TRACKS	$ 1,559,592.00	$ 311,919.00	$ 1,872,000.00

SO No.:

Subject : Norfolk Southern Bridges

Washington Ave - Raising Existing Structures

Quantity Calculations

Computed By: LTS Date: 2/13/2020 Checked By: CGF Date: 2/2020

Michael Baker INTERNATIONAL

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SUMMARY OF QUANTITIES AND COST ESTIMATE

WASHINGTON AVENUE BRIDGE OVER BUSWAY, NSRR, & WAVERLY AVENUE

Rev1 CGF 12-13-22

ITEM DESCRIPTION	UNIT	UNIT COST	UNIT TOTAL	TOTAL COST
MOBILIZATION	LS	$ 100,000.00	1	$ 100,000
REMOVAL OF PORTION OF EXISTING BRIDGE (ABUTMENTS)	CY	$ 50.00	30	$ 1,500
CLASS 3 EXCAVATION	CY	$ 40.00	650	$ 26,000
SELECT STRUCTURE BACKFILL	CY	$ 55.00	285	$ 15,675
EXPANDED POLYSTYRENE (EPS) GEOFOAM BLOCK	CY	$ 150.00	190	$ 28,500
DOWELS, #5	EA	$ 40.00	208	$ 8,320
ARMORED NEOPRENE STRIP SEAL DAM, 3" MOVEMENT	LF	$ 450.00	120	$ 54,000
REPAIR DETERIORATED CONCRETE	CF	$ 500.00	3	$ 1,500
MASONRY REPOINTING, TYPE A	LF	$ 60.00	585	$ 35,100
ABUTMENT STRENGTHENING	LF	$ 150.00	950	$ 142,500
CLASS AA CEMENT CONCRETE	CY	$ 1,200.00	90	$ 108,000
CLASS A CEMENT CONCRETE	CY	$ 1,100.00	70	$ 77,000
EPOXY COATED REINFORCEMENT STEEL	LBS	$ 2.00	30000	$ 60,000
STEEL STRENGTHENING	LBS	$ 25.00	4460	$ 111,500
FABRICATED STRUCTURAL STEEL	LBS	$ 2.00	1100	$ 2,200
BEARINGS, FABRICATED STEEL, HIGH-LOAD	EA	$ 5,000.00	6	$ 30,000
SPAN 1 DECK REPLACEMENT	LS	$ 312,000.00	1	$ 312,000
DECK DEMO AND CONTAINMENT	LS	$ 109,000.00	1	$ 109,000
JACKING BRIDGE SUPERSTRUCTURE	LS	$ 340,314.20	1	$ 340,314

STRUCTURE SUBTOTAL = $ 1,563,110

CONTINGENCY @ 20% = $ 312,622

STRUCTURE TOTAL = $ 1,876,000

SO No.:

Subject : Norfolk Southern Bridges

Washington Ave - Lowering Tracks

Quantity Calculations

Michael Baker INTERNATIONAL

Computed By: LTS Date: 2/13/2020 Checked By: CGF Date: 2/2020

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SUMMARY OF QUANTITIES AND COST ESTIMATE

WASHINGTON AVENUE BRIDGE OVER BUSWAY, NSRR, & WAVERLY AVENUE

Rev1 CGF 12-13-22

ITEM DESCRIPTION	UNIT	UNIT COST	UNIT TOTAL	TOTAL COST
WASHINGTON AVE BRIDGE				
MOBILIZATION	LS	$ 100,000.00	1	$ 100,000
CLASS 3 EXCAVATION	CY	$ 40.00	650	$ 26,000
SELECT STRUCTURE BACKFILL	CY	$ 55.00	285	$ 15,675
EXPANDED POLYSTYRENE (EPS) GEOFOAM BLOCK	CY	$ 150.00	190	$ 28,500
ARMORED NEOPRENE STRIP SEAL DAM, 3" MOVEMENT	LF	$ 450.00	120	$ 54,000
STEEL STRENGTHENING	LBS	$ 25.00	1010	$ 25,250
SPAN 1 DECK REPLACEMENT	LS	$ 312,000.00	1	$ 312,000
DECK DEMO AND CONTAINMENT	LS	$ 109,000.00	1	$ 109,000
REPAIR DETERIORATED CONCRETE	CF	$ 500.00	3	$ 1,500
MASONRY REPOINTING, TYPE A	LF	$ 60.00	585	$ 35,100
ABUTMENT STRENGTHENING	LF	$ 150.00	1002	$ 150,300
CLASS AA CEMENT CONCRETE	CY	$ 1,200.00	90	$ 108,000
EPOXY COATED REINFORCEMENT STEEL	LBS	$ 2.00	20000	$ 40,000
SOUTH BRADDOCK AVE BRIDGE				
SUPER STRUCTURE JACKING	LS	$ 600,000.00	1	$ 600,000
TEMPORARY EXCAVATION SUPPORT AND PROTECTIVE SYSTEM	LS	$ 31,500.00	1	$ 31,500
SELECTIVE DEMOLITION	CY	$ 1,000.00	70	$ 70,000
CLASS 3 EXCAVATION	CY	$ 75.00	110	$ 8,250
SELECT STRUCTURAL BACKFILL	CY	$ 55.00	90	$ 4,950
PRECAST CONCRETE CAP	CY	$ 5,000.00	20	$ 100,000
PRECAST CONCRETE BACKWALL	CY	$ 5,000.00	15	$ 75,000
PRECAST CONCRETE PEDESTALS	CY	$ 5,000.00	2	$ 10,000

STRUCTURE SUBTOTAL = $ 1,905,025

CONTINGENCY @ 20% = $ 381,005

STRUCTURE TOTAL = $ 2,287,000

SO No.:

Subject : Norfolk Southern Bridges

Washington Ave - Raising Ex. Struc. & Lowering Tracks

Quantity Calculations

Michael Baker INTERNATIONAL

Computed By: LTS Date: 2/13/2020 Checked By: CGF Date: 2/2020

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SUMMARY OF QUANTITIES AND COST ESTIMATE

WASHINGTON AVENUE BRIDGE OVER BUSWAY, NSRR, & WAVERLY AVENUE

Rev1 CGF 12-13-22

ITEM DESCRIPTION	UNIT	UNIT COST	UNIT TOTAL	TOTAL COST
MOBILIZATION	LS	$ 100,000.00	1	$ 100,000
REMOVAL OF PORTION OF EXISTING BRIDGE (ABUTMENTS)	CY	$ 50.00	30	$ 1,500
CLASS 3 EXCAVATION	CY	$ 40.00	550	$ 22,000
SELECT STRUCTURE BACKFILL	CY	$ 55.00	285	$ 15,675
EXPANDED POLYSTYRENE (EPS) GEOFOAM BLOCK	CY	$ 150.00	190	$ 28,500
DOWELS, #5	EA	$ 40.00	208	$ 8,320
ARMORED NEOPRENE STRIP SEAL DAM, 3" MOVEMENT	LF	$ 450.00	120	$ 54,000
REPAIR DETERIORATED CONCRETE	CF	$ 500.00	3	$ 1,500
MASONRY REPOINTING, TYPE A	LF	$ 60.00	585	$ 35,100
ABUTMENT STRENGTHENING	LF	$ 150.00	963	$ 144,450
CLASS AA CEMENT CONCRETE	CY	$ 1,200.00	90	$ 108,000
CLASS A CEMENT CONCRETE	CY	$ 1,100.00	70	$ 77,000
EPOXY COATED REINFORCEMENT STEEL	LBS	$ 2.00	30000	$ 60,000
STEEL STRENGTHENING	LBS	$ 25.00	4460	$ 111,500
SPAN 1 DECK REPLACEMENT	LS	$ 312,000.00	1	$ 312,000
DECK DEMO AND CONTAINMENT	LS	$ 109,000.00	1	$ 109,000
FABRICATED STRUCTURAL STEEL	LBS	$ 2.00	900	$ 1,800
BEARINGS, FABRICATED STEEL, HIGH-LOAD	EA	$ 5,000.00	6	$ 30,000
JACKING BRIDGE SUPERSTRUCTURE	LS	$ 339,246.20	1	$ 339,246

STRUCTURE SUBTOTAL = $ 1,559,592

CONTINGENCY @ 20% = $ 311,919

STRUCTURE TOTAL = $ 1,872,000

Amtrak Station

Michael Baker INTERNATIONAL

Norfolk Southern Vertical Clearance
Pittsburgh Amtrak Station Modifications
Alternative 2
Construction Cost Estimate

January 2022

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
Asbestos Abatement	1	LS	$3,808,760	$3,808,760
Canopy Concept	1	LS	$3,385,144	$3,385,144
Bay Removal	1	LS	$4,303,601	$4,303,601
			TOTAL CONSTRUCTION COST	**$11,497,505**

Cost estimate does not include the following:

-Final Design Engineering

-Consultation during construction

Michael Baker INTERNATIONAL

Norfolk Southern Vertical Clearance
Pittsburgh Station Platform Canopy - 12' wide
Construction Cost Estimate

January 2022

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE (2018)	INFLATION RATE			UNIT PRICE (2021)	COST
					2019	2020	2021		
1	SAWCUT AND REMOVE EXISTING PLATFORM CONCRETE	4,818	SF	$18.00	3.0%	3.0%	5.0%	$20.05	$96,605.77
2	EXCAVATION FOR FOUNDATION AND DRAIN PIPE	635	CY	$60.00	3.0%	3.0%	5.0%	$66.84	$42,441.30
3	TRANSPORT / STORAGE OF EXCAVATED MATERIALS	635	CY	$5.00	3.0%	3.0%	5.0%	$5.57	$3,536.78
4	BACKFILLING AND COMPACTION	400	CY	$30.00	3.0%	3.0%	5.0%	$33.42	$13,367.34
5	PLATFORM CONCRETE REPAIR/ RECONSTRUCTION (6" THICK SLAB-ON-GRADE INCL.FINISHING)	4,818	SF	$6.50	3.0%	3.0%	5.0%	$7.24	$34,885.42
6	WWF REINFORCING FOR PLATFORM RECONSTRUCTION	4,818	SF	$1.50	3.0%	3.0%	5.0%	$1.67	$8,050.48
7	MINI-PILES (FOR FOUNDATION LOCATIONS SPANNING OVER EXISTING TUNNEL)	82	EACH	$2,500.00	3.0%	3.0%	5.0%	$2,784.86	$228,358.73
8	CONCRETE MATERIAL FOR PILE CAPS IN PLACE	127	CY	$720.00	3.0%	3.0%	5.0%	$802.04	$101,859.13
9	CONCRETE MATERIAL FOR FOOTINGS IN PLACE	20	CY	$720.00	3.0%	3.0%	5.0%	$802.04	$16,040.81
10	REINFORCING FOR FOOTINGS AND PILE CAPS	(INCLUDED IN ITEMS 7 AND 8 ABOVE)							$0.00
11	CONCRETE PEDESTALS (INCLUDING REINFORCING AND FORMWORK)	6	CY	$1,632.00	3.0%	3.0%	5.0%	$1,817.96	$10,907.75
12	COMPRESSIBLE MATERIAL FOR FORMING OVER TUNNEL (STYROFOAM)	1,200	SF	$4.50	3.0%	3.0%	5.0%	$5.01	$6,015.30
13	STRUCTURAL STEEL, CONNECTIONS, AND DETAILING MATERIAL	110	TON	$5,800.00	3.0%	3.0%	5.0%	$6,460.88	$710,696.91
14	METAL ROOF DECK (STRUCTURE)	11,000	SF	$4.50	3.0%	3.0%	5.0%	$5.01	$55,140.28
15	ROOFING BASE MATERIALS	11,000	SF	$2.50	3.0%	3.0%	5.0%	$2.78	$30,633.49
16	ROOFING SURFACE MATERIALS	11,000	SF	$7.00	3.0%	3.0%	5.0%	$7.80	$85,773.77
17	COLD-FORMED METAL FACIA	2,600	SF	$9.00	3.0%	3.0%	5.0%	$10.03	$26,066.31
18	GUTTER	900	LF	$12.00	3.0%	3.0%	5.0%	$13.37	$12,030.61
19	DOWNSPOUT (ABOVE GRADE)	600	LF	$12.50	3.0%	3.0%	5.0%	$13.92	$8,354.59
20	DRAIN PIPING	1,200	LF	$16.00	3.0%	3.0%	5.0%	$17.82	$21,387.74
	CONSTRUCTION SUBTOTAL								**$1,512,200**
	4% MOBILIZATION								**$60,500**
	25% CONTINGENCY								**$378,100**
	TOTAL CONSTRUCTION COST								**$1,950,800**
	12% CONSTRUCTION OVERSIGHT								**$234,100**
	6.0% / YEAR ESCALATION (2 YEARS)								**$241,120**
	TOTAL CONSTRUCTION COST FOR 860 LF								**$2,426,020**
	ADDITIONAL CONSTRUCTION COST FOR 1,200 LF								**$959,124**
	TOTAL CONSTRUCTION COST FOR 1,200 LF								**$3,385,144**

Cost estimate does not include the following:

-Final Design Engineering

-Consultation during construction

Michael Baker INTERNATIONAL

January 2022

Norfolk Southern Vertical Clearance
Pittsburgh Station Full Bay Removal
Construction Cost Estimate

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
Tangent Bay Removal				
SKYLIGHT REMOVAL (2.5 DAYS)				
IRON WORKERS (2 @ 20 HRS EACH)	40	HR	$70.93	$2,837
LABORERS (2 @ 20 HRS EACH)	40	HR	$39.97	$1,599
TRUCK DRIVER	20	HR	$51.64	$1,033
CRANE OPERATOR	20	HR	$60.44	$1,209
SUPERVISOR	20	HR	$85.50	$1,710
SKYLIGHT REMOVAL SUBTOTAL				**$8,388**
PRECAST ROOF SLAB REMOVAL (1.5 DAYS)				
LABORERS (3 @ 12 HRS EACH)	36	HR	$39.97	$1,439
TRUCK DRIVER	12	HR	$51.64	$620
CRANE OPERATOR	12	HR	$60.44	$725
SUPERVISOR	12	HR	$85.50	$1,026
PRECAST ROOF SLAB REMOVAL SUBTOTAL				**$3,810**
STRUCTURAL FRAMING REMOVAL (2.5 DAYS)				
IRON WORKERS (2 @ 20 HRS EACH)	40	HR	$70.93	$2,837
LABORERS (2 @ 20 HRS EACH)	40	HR	$39.97	$1,599
TRUCK DRIVER	20	HR	$51.64	$1,033
CRANE OPERATOR	20	HR	$60.44	$1,209
SUPERVISOR	20	HR	$85.50	$1,710
STRUCTURAL FRAMING REMOVAL SUBTOTAL				**$8,388**
REDUCE WALL HEIGHT (1 DAY)				
LABORERS (2 @ 8 HRS EACH)	16	HR	$39.97	$640
TRUCK DRIVER	8	HR	$51.64	$413
CRANE OPERATOR	8	HR	$60.44	$484
SUPERVISOR	8	HR	$85.50	$684
STRUCTURAL FRAMING REMOVAL SUBTOTAL				**$2,220**
REPAIR ROOF EDGE (2 DAYS)				
LABORERS (3 @ 16 HRS EACH)	48	HR	$39.97	$1,919
SUPERVISOR	16	HR	$85.50	$1,368
STRUCTURAL FRAMING REMOVAL SUBTOTAL				**$3,287**
REMOVAL OF SINGLE TANGENT BAY (PER TRACK) SUBTOTAL				**$26,092**
REMOVAL OF 22 TANGENT BAYS (PER TRACK) SUBTOTAL				**$574,020**
UMBRELLA CANOPY				
INSTALL UMBRELLA CANOPY	200	LF	$1,000.00	$200,000.00
UMBRELLA CANOPY SUBTOTAL				**$200,000**
REMOVAL OF 22 TANGENT BAYS OVER 2 TRACKS SUBTOTAL				**$1,348,039**

Michael Baker INTERNATIONAL

Norfolk Southern Vertical Clearance
Pittsburgh Station Full Bay Removal
Construction Cost Estimate

January 2022

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
Curved Bay Removal				
PRECAST ROOF SLAB REMOVAL (2 DAYS)				
LABORERS (3 @ 16 HRS EACH)	48	HR	$39.97	$1,919
TRUCK DRIVER	16	HR	$51.64	$826
CRANE OPERATOR	16	HR	$60.44	$967
SUPERVISOR	16	HR	$85.50	$1,368
PRECAST ROOF SLAB REMOVAL SUBTOTAL				**$5,080**
STRUCTURAL FRAMING REMOVAL (3.25 DAYS)				
IRON WORKERS (2 @ 26 HRS EACH)	52	HR	$70.93	$3,688
LABORERS (2 @ 26 HRS EACH)	52	HR	$39.97	$2,078
TRUCK DRIVER	26	HR	$51.64	$1,343
CRANE OPERATOR	26	HR	$60.44	$1,571
SUPERVISOR	26	HR	$85.50	$2,223
STRUCTURAL FRAMING REMOVAL SUBTOTAL				**$10,904**
REDUCE WALL HEIGHT (1.5 DAY)				
LABORERS (2 @ 12 HRS EACH)	24	HR	$39.97	$959
TRUCK DRIVER	12	HR	$51.64	$620
CRANE OPERATOR	12	HR	$60.44	$725
SUPERVISOR	12	HR	$85.50	$1,026
STRUCTURAL FRAMING REMOVAL SUBTOTAL				**$3,330**
REPAIR ROOF EDGE (2.5 DAYS)				
LABORERS (3 @ 20 HRS EACH)	60	HR	$39.97	$2,398
SUPERVISOR	20	HR	$85.50	$1,710
STRUCTURAL FRAMING REMOVAL SUBTOTAL				**$4,108**
REMOVAL OF SINGL CURVED BAY (PER TRACK) SUBTOTAL				**$23,422**
REMOVAL OF 12 CURVED BAYS (PER TRACK) SUBTOTAL				**$281,066**
UMBRELLA CANOPY				
INSTALL UMBRELLA CANOPY	200	LF	$1,000.00	$200,000
UMBRELLA CANOPY SUBTOTAL				**$200,000**
REMOVAL OF 12 CURVED BAYS OVER 2 TRACKS SUBTOTAL				**$762,132**
FULL BAY REMOVAL SUBTOTAL				**$2,110,171**
25% RAIL TRAFFIC CONTROL/RESTRICTION				**$527,500**
10% TRAFFIC CONTROL				**$211,000**
5% PERMITTING				**$105,500**
4% MOBILIZATION				**$84,400**
20% CONTINGENCY				**$422,000**
TOTAL CONSTRUCTION COST				**$3,460,571**
12% CONSTRUCTION OVERSIGHT				**$415,300**
6.0% / YEAR ESCALATION (2 YEARS)				**$427,730**
TOTAL				**$4,303,601**

Cost estimate does not include the following:

-Final Design Engineering

-Consultation during construction

Michael Baker INTERNATIONAL

Norfolk Southern Vertical Clearance
Pittsburgh Amtrak Station Modifications
Alternative 3

January 2022

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
MOBILIZATION/DEMOBILIZATION/RR COORDINATION/FLAGGING	1	LS	$539,000	$539,000
CONSTRUCTION BARRICADES AND SEQUENCING	1	LS	$125,000	$125,000
HAZARDOUS MATERIALS DEMOLITION	1	LS	$400,000	$400,000
CHUTE RETROFIT	1	LS	$959,200	$959,200
STRUCTURAL MODIFICATIONS	1	LS	$1,715,521	$1,715,521
STRUCTURAL REPAIRS (DAMAGED COLUMNS)	4	EACH	$50,000	$200,000
ROOF MODIFICATIONS AND RETROFIT	0	EACH	$2,000	$0
DRAINAGE SYSTEM RECONFIGURATION	0	EACH	$1,000	$0
REROOF OF EFFECTED AREA	0	LS	$0	$0
MEP REPAIRS AND RECONSTRUCTION	1	LS	$75,000	$75,000
			CONSTRUCTION SUBTOTAL	**$4,013,700**
		0%	**MOBILIZATION (included above)**	**$0**
		10%	**CONTINGENCY**	**$401,400**
			TOTAL CONSTRUCTION COST	**$4,415,100**
	12%		**CONSTRUCTION OVERSIGHT**	**$529,800**
	6.0%		**/ YEAR ESCALATION (2 YEARS)**	**$545,710**
			TOTAL	**$5,490,610**

Cost estimate does not include the following:

-Right-of-Way Acquisition

-Final Design Engineering

-Consultation during construction

December 2021

Michael Baker INTERNATIONAL

Pittsburgh Subdivision Vertical Clearance Project
North Avenue Bridge - Alternate 2 - Replace to 22' Clearance
Preliminary Cost Estimate

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
REMOVAL OF EXISTING PAVEMENT AND SIDEWALKS	2,840	CY	$23.00	$65,320.00
FOREIGN BORROW EXCAVATION	4,124	CY	$26.00	$107,224.00
GEOTEXTILE, CLASS 1	1,842	LF	$2.00	$3,684.00
SUPERPAVE ASPHALT MIXTURE DESIGN, BASE COURSE, 4" DEPTH	4,043	SY	$20.00	$80,860.00
SUPERPAVE ASPHALT MIXTURE DESIGN, WEARING COURSE, 1 1/2" DEPTH	4,043	SY	$11.50	$46,494.50
SUPERPAVE ASPHALT MIXTURE DESIGN, BINDER COURSE, 2 1/2" DEPTH	4,043	SY	$14.75	$59,634.25
ASPHALT TACK COAT	11,866	SY	$0.50	$5,933.00
SUBBASE 5" DEPTH (NO. 2A)	183	SY	$16.25	$2,973.75
SUBBASE 6" DEPTH (NO. 2A)	4,508	SY	$15.75	$71,001.00
REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH	183	SY	$128.00	$23,424.00
PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS	3,170	SY	$2.00	$6,340.00
BRIDGE APPROACH SLAB	465	SY	$570.00	$265,050.00
INSPECTOR'S FIELD OFFICE AND INSPECTION FACILITIES, TYPE B	1	LS	$18,000.00	$18,000.00
EQUIPMENT PACKAGE	1	LS	$3,500.00	$3,500.00
4" PIPE UNDERDRAIN, TYPE 1 BACKFILL	1,842	LF	$15.50	$28,551.00
CONCRETE DEEP CURB	2,039	LF	$41.25	$84,108.75
CEMENT CONCRETE SIDEWALK MODIFIED	2,031	SY	$97.00	$197,007.00
TOE WALL SIDEWALK WITH PEDESTRIAN HANDRAIL	374	LF	$1,150.00	$430,100.00
RETAINING WALL	50	SF	$250.00	$12,500.00
RESET BUS STOP SHELTER	1	LS	$7,000.00	$7,000.00
CONSTRUCTION SURVEYING, TYPE B	1	LS	$20,000.00	$20,000.00
CONSTRUCTION SURVEYING, TYPE D	1	LS	$20,000.00	$20,000.00
CPM SCHEDULE	1	LS	$5,500.00	$5,500.00
DETECTABLE WARNING SURFACE, POLYMER CONCRETE	140	SF	$32.75	$4,585.00
TOPSOIL, FURNISHED AND PLACED	110	CY	$65.50	$7,205.00
SEEDING AND SOIL SUPPLEMENTS, FORMULA B	25	LB	$85.50	$2,137.50
RESET FENCE	476	LF	$45.00	$21,420.00
TREE REMOVAL	6	EA	$2,000.00	$12,000.00
LANDSCAPING	1	LS	$10,000.00	$10,000.00
AESTHETIC TREATMENTS FOR PEDESTRIAN AREA	1	LS	$30,000.00	$30,000.00
STREET LIGHTING ADJUSTMENTS	12	EACH	$20,000.00	$240,000.00
EROSION AND SEDIMENT POLLUTION CONTROL MEASURES	1	LS	$38,000.00	$38,000.00
TRAFFIC SIGNAL	1	LS	$225,000.00	$225,000.00
MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION	1	LS	$57,000.00	$57,000.00
SIGNING & PAVEMENT MARKINGS	1	LS	$17,000.00	$17,000.00
DRAINAGE	1	LS	$95,000.00	$95,000.00
UTILITY RELOCATIONS (NORTH AVENUE)	1	LS	$95,000.00	$95,000.00
ROADWAY CONSTRUCTION ITEMS SUBTOTAL				**$2,418,600**
4% MOBILIZATION				**$96,700**
20% CONTINGENCY				**$483,700**
TOTAL ROADWAY CONSTRUCTION SUBTOTAL				**$2,999,000**
12% CONSTRUCTION OVERSIGHT				**$359,900**
6.0% / YEAR ESCALATION (1 YEAR)				**$180,000**
TOTAL CONSTRUCTION COST				**$3,538,900**

Cost estimate does not include the following:
- Right-of-Way Acquisition
- Final Design Engineering
- Consultation during construction
- Bridge Construction Cost

Computed By: DLJ
Checked By: TJA

Michael Baker INTERNATIONAL

Pittsburgh Subdivision Vertical Clearance Project
North Avenue Bridge - Alternate 3 - Replace Bridge and Lower Tracks to 22' Clearance
Preliminary Cost Estimate

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
REMOVAL OF EXISTING PAVEMENT AND SIDEWALKS	645	CY	$23.00	$14,835.00
FOREIGN BORROW EXCAVATION	63	CY	$26.00	$1,638.00
GEOTEXTILE, CLASS 1	451	LF	$2.00	$902.00
SUPERPAVE ASPHALT MIXTURE DESIGN, BASE COURSE, 4" DEPTH	445	SY	$20.00	$8,900.00
SUPERPAVE ASPHALT MIXTURE DESIGN, WEARING COURSE, 1 1/2" DEPTH	445	SY	$11.50	$5,117.50
SUPERPAVE ASPHALT MIXTURE DESIGN, BINDER COURSE, 2 1/2" DEPTH	445	SY	$14.75	$6,563.75
ASPHALT TACK COAT	891	SY	$0.50	$445.50
SUBBASE 6" DEPTH (NO. 2A)	445	SY	$15.75	$7,008.75
PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS	1,037	SY	$2.00	$2,074.00
BRIDGE APPROACH SLAB	463	SY	$570.00	$263,910.00
INSPECTOR'S FIELD OFFICE AND INSPECTION FACILITIES, TYPE B	1	LS	$18,000.00	$18,000.00
EQUIPMENT PACKAGE	1	LS	$3,500.00	$3,500.00
4" PIPE UNDERDRAIN, TYPE 1 BACKFILL	451	LF	$15.50	$6,990.50
CONCRETE DEEP CURB	451	LF	$41.25	$18,603.75
CEMENT CONCRETE SIDEWALK MODIFIED	511	SY	$97.00	$49,567.00
CONSTRUCTION SURVEYING, TYPE B	1	LS	$20,000.00	$20,000.00
CONSTRUCTION SURVEYING, TYPE D	1	LS	$20,000.00	$20,000.00
CPM SCHEDULE	1	LS	$5,500.00	$5,500.00
DETECTABLE WARNING SURFACE, POLYMER CONCRETE	90	SF	$32.75	$2,947.50
TOPSOIL, FURNISHED AND PLACED	30	CY	$65.50	$1,965.00
SEEDING AND SOIL SUPPLEMENTS, FORMULA B	6	LB	$85.50	$513.00
RESET FENCE	279	LF	$45.00	$12,555.00
LANDSCAPING	1	LS	$10,000.00	$10,000.00
AESTHETIC TREATMENTS FOR PEDESTRIAN AREA	1	LS	$30,000.00	$30,000.00
STREET LIGHTING ADJUSTMENTS	7	EACH	$20,000.00	$240,000.00
EROSION AND SEDIMENT POLLUTION CONTROL MEASURES	1	LS	$16,000.00	$16,000.00
TRAFFIC SIGNAL	1	LS	$225,000.00	$225,000.00
MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION	1	LS	$24,000.00	$24,000.00
SIGNING & PAVEMENT MARKINGS	1	LS	$8,000.00	$8,000.00
DRAINAGE	1	LS	$40,000.00	$40,000.00
UTILITY RELOCATIONS (NORTH AVENUE)	1	LS	$40,000.00	$40,000.00
ROADWAY CONSTRUCTION ITEMS SUBTOTAL				**$1,104,500**
4%	**MOBILIZATION**			**$44,200**
20%	**CONTINGENCY**			**$220,900**
TOTAL ROADWAY CONSTRUCTION SUBTOTAL				**$1,369,600**
12%	**CONSTRUCTION OVERSIGHT**			**$164,400**
6.0%	**/ YEAR ESCALATION (1 YEAR)**			**$82,200**
TOTAL ROADWAY CONSTRUCTION COST				**$1,616,200**
TRACK LOWERING - OPTION 1: REDUCING TRACKS FROM 4 TO 3 AND BUTTRESSING RETAINING WALLS	1	LS	$52,000,000.00	$52,000,000.00
30" PWSA WATERMAIN REPLACEMENT	1	LS	$1,080,000.00	$1,080,000.00
345KV/138KV DUQUESNE LIGHT PRIMARY REPLACEMENT	1	LS	$3,520,000.00	$3,520,000.00
DRAINAGE AND GROUND WATER MITIGATION	1	LS	$500,000.00	$500,000.00
TOTAL RAILROAD CONSTRUCTION COST				**$57,100,000**
TOTAL CONSTRUCTION COST				**$58,716,200**

Note: North Avenue Alternate 3 is necessarily accompanied by Pennsylvania Avenue Alternate 3 as track lowering limits extend under both the Pennsylvania Avenue Bridge and the North Avenue Bridge.

Cost estimate does not include the following:
-Right-of-Way Acquisition
-Final Design Engineering
-Consultation during construction
-Bridge Construction Cost

Computed By: DLJ
Checked By: TJA

Michael Baker INTERNATIONAL

Pittsburgh Subdivision Vertical Clearance Project
North Avenue Bridge - Alternate 4 - Raise Bridge and Lower Tracks to 22' Clearance
Preliminary Cost Estimate

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
REMOVAL OF EXISTING PAVEMENT AND SIDEWALKS	2,696	CY	$23.00	$62,008.00
FOREIGN BORROW EXCAVATION	3,247	CY	$26.00	$84,422.00
GEOTEXTILE, CLASS 1	1,799	LF	$2.00	$3,598.00
SUPERPAVE ASPHALT MIXTURE DESIGN, BASE COURSE, 4" DEPTH	3,813	SY	$20.00	$76,260.00
SUPERPAVE ASPHALT MIXTURE DESIGN, WEARING COURSE, 1 1/2" DEPTH	3,813	SY	$11.50	$43,849.50
SUPERPAVE ASPHALT MIXTURE DESIGN, BINDER COURSE, 2 1/2" DEPTH	3,813	SY	$14.75	$56,241.75
ASPHALT TACK COAT	11,227	SY	$0.50	$5,613.50
SUBBASE 5" DEPTH (NO. 2A)	139	SY	$16.25	$2,258.75
SUBBASE 6" DEPTH (NO. 2A)	4,278	SY	$15.75	$67,378.50
REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH	139	SY	$128.00	$17,792.00
PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS	3,003	SY	$2.00	$6,006.00
BRIDGE APPROACH SLAB	465	SY	$570.00	$265,050.00
INSPECTOR'S FIELD OFFICE AND INSPECTION FACILITIES, TYPE B	1	LS	$18,000.00	$18,000.00
EQUIPMENT PACKAGE	1	LS	$3,500.00	$3,500.00
4" PIPE UNDERDRAIN, TYPE 1 BACKFILL	1,799	LF	$15.50	$27,884.50
CONCRETE DEEP CURB	1,916	LF	$41.25	$79,035.00
CEMENT CONCRETE SIDEWALK MODIFIED	1,935	SY	$97.00	$187,695.00
TOE WALL SIDEWALK WITH PEDESTRIAN HANDRAIL	364	LF	$1,150.00	$418,600.00
RETAINING WALL	50	SF	$250.00	$12,500.00
RESET BUS STOP SHELTER	1	LS	$7,000.00	$7,000.00
CONSTRUCTION SURVEYING, TYPE B	1	LS	$20,000.00	$20,000.00
CONSTRUCTION SURVEYING, TYPE D	1	LS	$20,000.00	$20,000.00
CPM SCHEDULE	1	LS	$5,500.00	$5,500.00
DETECTABLE WARNING SURFACE, POLYMER CONCRETE	130	SF	$32.75	$4,257.50
TOPSOIL, FURNISHED AND PLACED	110	CY	$65.50	$7,205.00
SEEDING AND SOIL SUPPLEMENTS, FORMULA B	25	LB	$85.50	$2,137.50
RESET FENCE	476	LF	$45.00	$21,420.00
TREE REMOVAL	6	EA	$2,000.00	$12,000.00
LANDSCAPING	1	LS	$10,000.00	$10,000.00
AESTHETIC TREATMENTS FOR PEDESTRIAN AREA	1	LS	$30,000.00	$30,000.00
STREET LIGHTING ADJUSTMENTS	12	EACH	$20,000.00	$240,000.00
EROSION AND SEDIMENT POLLUTION CONTROL MEASURES	1	LS	$38,000.00	$38,000.00
TRAFFIC SIGNAL	1	LS	$225,000.00	$225,000.00
MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION	1	LS	$57,000.00	$57,000.00
SIGNING & PAVEMENT MARKINGS	1	LS	$19,000.00	$19,000.00
DRAINAGE	1	LS	$95,000.00	$95,000.00
UTILITY RELOCATIONS (NORTH AVENUE)	1	LS	$95,000.00	$95,000.00
ROADWAY CONSTRUCTION ITEMS SUBTOTAL				**$2,346,200**
4%	**MOBILIZATION**			**$93,800**
20%	**CONTINGENCY**			**$469,200**
TOTAL ROADWAY CONSTRUCTION SUBTOTAL				**$2,909,200**
12%	**CONSTRUCTION OVERSIGHT**			**$349,100**
6.0%	**/ YEAR ESCALATION (1 YEAR)**			**$174,600**
TOTAL ROADWAY CONSTRUCTION COST				**$3,432,900**
TRACK LOWERING	18,862	TF	$430.00	$8,110,660.00
30" PWSA WATERMAIN REPLACEMENT	1	LS	$1,080,000.00	$1,080,000.00
345KV/138KV DUQUESNE LIGHT PRIMARY REPLACEMENT	1	LS	$3,520,000.00	$3,520,000.00
DRAINAGE AND GROUND WATER MITIGATION	1	LS	$500,000.00	$500,000.00
TOTAL RAILROAD CONSTRUCTION COST				**$13,210,660**
TOTAL CONSTRUCTION COST				**$16,643,560**

Cost estimate does not include the following:

- Right-of-Way Acquisition
- Final Design Engineering
- Consultation during construction
- Bridge Construction Cost

Computed By: DLJ
Checked By: TJA

Michael Baker INTERNATIONAL

Pittsburgh Subdivision Vertical Clearance Project
North Avenue Bridge - Alternate 2 - Design Modficiation - Replace to 21'-4" Clearance
Preliminary Cost Estimate

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
REMOVAL OF EXISTING PAVEMENT AND SIDEWALKS	2,696	CY	$23.00	$62,008.00
FOREIGN BORROW EXCAVATION	3,247	CY	$26.00	$84,422.00
GEOTEXTILE, CLASS 1	1,799	LF	$2.00	$3,598.00
SUPERPAVE ASPHALT MIXTURE DESIGN, BASE COURSE, 4" DEPTH	3,813	SY	$20.00	$76,260.00
SUPERPAVE ASPHALT MIXTURE DESIGN, WEARING COURSE, 1 1/2" DEPTH	3,813	SY	$11.50	$43,849.50
SUPERPAVE ASPHALT MIXTURE DESIGN, BINDER COURSE, 2 1/2" DEPTH	3,813	SY	$14.75	$56,241.75
ASPHALT TACK COAT	11,227	SY	$0.50	$5,613.50
SUBBASE 5" DEPTH (NO. 2A)	139	SY	$16.25	$2,258.75
SUBBASE 6" DEPTH (NO. 2A)	4,278	SY	$15.75	$67,378.50
REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH	139	SY	$128.00	$17,792.00
PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS	3,003	SY	$2.00	$6,006.00
BRIDGE APPROACH SLAB	465	SY	$570.00	$265,050.00
INSPECTOR'S FIELD OFFICE AND INSPECTION FACILITIES, TYPE B	1	LS	$18,000.00	$18,000.00
EQUIPMENT PACKAGE	1	LS	$3,500.00	$3,500.00
4" PIPE UNDERDRAIN, TYPE 1 BACKFILL	1,799	LF	$15.50	$27,884.50
CONCRETE DEEP CURB	1,916	LF	$41.25	$79,035.00
CEMENT CONCRETE SIDEWALK MODIFIED	1,935	SY	$97.00	$187,695.00
TOE WALL SIDEWALK WITH PEDESTRIAN HANDRAIL	364	LF	$1,150.00	$418,600.00
RETAINING WALL	50	SF	$250.00	$12,500.00
RESET BUS STOP SHELTER	1	LS	$7,000.00	$7,000.00
CONSTRUCTION SURVEYING, TYPE B	1	LS	$20,000.00	$20,000.00
CONSTRUCTION SURVEYING, TYPE D	1	LS	$20,000.00	$20,000.00
CPM SCHEDULE	1	LS	$5,500.00	$5,500.00
DETECTABLE WARNING SURFACE, POLYMER CONCRETE	130	SF	$32.75	$4,257.50
TOPSOIL, FURNISHED AND PLACED	110	CY	$65.50	$7,205.00
SEEDING AND SOIL SUPPLEMENTS, FORMULA B	25	LB	$85.50	$2,137.50
RESET FENCE	476	LF	$45.00	$21,420.00
TREE REMOVAL	6	EA	$2,000.00	$12,000.00
LANDSCAPING	1	LS	$10,000.00	$10,000.00
AESTHETIC TREATMENTS FOR PEDESTRIAN AREA	1	LS	$30,000.00	$30,000.00
STREET LIGHTING ADJUSTMENTS	12	EACH	$20,000.00	$240,000.00
EROSION AND SEDIMENT POLLUTION CONTROL MEASURES	1	LS	$38,000.00	$38,000.00
TRAFFIC SIGNAL	1	LS	$225,000.00	$225,000.00
MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION	1	LS	$57,000.00	$57,000.00
SIGNING & PAVEMENT MARKINGS	1	LS	$19,000.00	$19,000.00
DRAINAGE	1	LS	$95,000.00	$95,000.00
UTILITY RELOCATIONS (NORTH AVENUE)	1	LS	$95,000.00	$95,000.00
ROADWAY CONSTRUCTION ITEMS SUBTOTAL				**$2,346,200**
4% MOBILIZATION				**$93,800**
20% CONTINGENCY				**$469,200**
TOTAL ROADWAY CONSTRUCTION SUBTOTAL				**$2,909,200**
12% CONSTRUCTION OVERSIGHT				**$349,100**
6.0% / YEAR ESCALATION (1 YEAR)				**$174,600**
TOTAL CONSTRUCTION COST				**$3,432,900**

Cost estimate does not include the following:
- Right-of-Way Acquisition
- Final Design Engineering
- Consultation during construction
- Bridge Construction Cost

Computed By: DLJ
Checked By: TJA

COST ESTIMATE - TS&L INVESTIGATIONS

Rev1 CGF 11/5/2018
Rev2 CGF 1/14/2022

SUPERSTRUCTURE

ITEM DESCRIPTION	UNIT	UNIT COST	UNIT TOTAL	TOTAL COST
CLASS AAAP CEMENT CONCRETE	CY	$ 750.00	480	$ 360,000
CLASS AA CEMENT CONCRETE	CY	$ 850.00	212	$ 180,200
EPOXY COATED REINFORCEMENT STEEL	LB	$ 2.00	96880	$ 193,760
PENETRATING SEALER	SY	$ 6.00	1743	$ 10,458
PROTECTIVE FENCE, SPECIAL COMBINED BARRIER	LF	$ 1,450.00	146	$ 211,700
REMOVAL OF PORTION OF EXISTING BRIDGE	LS	$292,000.00	1	$ 292,000
PRESTRESSED CONCRETE SPREAD BOX BEAMS, 48"x33"	LF	$ 390.00	2316	$ 903,240
PEDESTRIAN RAILING	LF	$ 200.00	169	$ 33,800
ARCHITECTURAL SURFACE TREATMENT	SF	$ 4.00	361	$ 1,444

Subtotal Superstructure Cost = $ 2,186,602

SUBSTRUCTURE

ITEM DESCRIPTION	UNIT	UNIT COST	UNIT TOTAL	TOTAL COST
CLASS 3 EXCAVATION	CY	$ 25.00	1327	$ 33,175
STRUCTURE BACKFILL	CY	$ 55.00	1650	$ 90,750
DOWELS	EA	$ 50.00	466	$ 23,300
CLASS A CEMENT CONCRETE	CY	$ 350.00	688	$ 240,800
CLASS AA CEMENT CONCRETE	CY	$ 850.00	6	$ 5,100
EPOXY COATED REINFORCEMENT STEEL	LB	$ 2.00	31420	$ 62,840
MEMBRANE WATERPROOFING	SY	$ 25.00	430	$ 10,750
PREFORMED CELLULAR POLYSTYRENE	SY	$ 25.00	189	$ 4,725
REPAIR DETERIORATED CONCRETE	CF	$ 350.00	122	$ 42,700
6" FOUNDATION DRAIN	LF	$ 20.00	564	$ 11,280

Subtotal Substructure Cost = $ 525,420

Subtotal Combined Cost = $ 2,712,022

Cost per SF = $210.60

Contingency (20%) = $ 542,404

Total Cost = $ 3,255,000

Pittsburgh Subdivision Vertical Clearance Project
Pennsylvania Avenue Bridge - Alternate 2 - Replace and Raise Bridge to Acheive 22' Clearance
Preliminary Cost Estimate

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
REMOVAL OF EXISTING PAVEMENT AND SIDEWALKS	1,379	CY	$26.00	$35,854.00
FOREIGN BORROW EXCAVATION	909	CY	$30.00	$27,270.00
GEOTEXTILE, CLASS 1	777	LF	$2.00	$1,554.00
EITHER CEMENT TREATED PERMEABLE BASE COURSE, 4" DEPTH	1,675	SY	$33.00	$55,275.00
OR ASPHALT TREATED PERMEABLE BASE COURSE, 4" DEPTH	1,675	SY	-	-
SUBBASE 4" DEPTH (NO. 2A)	2,462	SY	$11.50	$28,313.00
SUBBASE 5" DEPTH (NO. 2A)	371	SY	$16.25	$6,028.75
REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH	371	SY	$128.00	$47,488.00
REINFORCED CEMENT CONCRETE PAVEMENT, 10" DEPTH	1,675	SY	$160.00	$268,000.00
PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS	3,407	SY	$2.00	$6,814.00
PAVEMENT RELIEF JOINT	88	LF	$250.00	$22,000.00
INSPECTOR'S FIELD OFFICE AND INSPECTION FACILITIES, TYPE B	1	LS	$18,000.00	$18,000.00
EQUIPMENT PACKAGE	1	LS	$3,500.00	$3,500.00
4" PIPE UNDERDRAIN, TYPE 1 BACKFILL	777	LF	$16.50	$12,820.50
CONCRETE DEEP CURB	800	LF	$54.00	$43,200.00
PLAIN CONCRETE MOUNTABLE CURB	46	LF	$73.00	$3,358.00
CEMENT CONCRETE SIDEWALK MODIFIED	665	SY	$116.00	$77,110.36
TOE WALL SIDEWALK WITH PEDESTRIAN HANDRAIL	82	LF	$380.00	$31,160.00
SIDEWALK MOMENT SLAB	203	LF	$2,260.00	$457,943.80
CONSTRUCTION SURVEYING, TYPE B	1	LS	$20,000.00	$20,000.00
CONSTRUCTION SURVEYING, TYPE D	1	LS	$20,000.00	$20,000.00
CPM SCHEDULE	1	LS	$5,500.00	$5,500.00
DETECTABLE WARNING SURFACE, POLYMER CONCRETE	30	SF	$38.00	$1,140.00
TOPSOIL, FURNISHED AND PLACED	10	CY	$95.00	$950.00
SEEDING AND SOIL SUPPLEMENTS, FORMULA B	2	LB	$240.00	$480.00
RESET FENCE	343	LF	$48.50	$16,635.50
TREE REMOVAL	7	EA	$2,000.00	$14,000.00
LANDSCAPING	1	LS	$5,000.00	$5,000.00
STREET LIGHTING ADJUSTMENTS	4	EA	$20,000.00	$80,000.00
EXCAVATION AND BACKFILL OF UNSUITABLE SLAG MATERIAL	1	LS	$14,000.00	$14,000.00
EROSION AND SEDIMENT POLLUTION CONTROL MEASURES	1	LS	$28,000.00	$28,000.00
MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION	1	LS	$42,000.00	$42,000.00
SIGNING & PAVEMENT MARKINGS	1	LS	$14,000.00	$14,000.00
DRAINAGE	1	LS	$70,000.00	$70,000.00
UTILITY RELOCATIONS	1	LS	$70,000.00	$70,000.00
ROADWAY CONSTRUCTION ITEMS SUBTOTAL				**$1,547,400**
4% MOBILIZATION				**$61,900**
20% CONTINGENCY				**$309,500**
TOTAL ROADWAY CONSTRUCTION SUBTOTAL				**$1,918,800**
12% CONSTRUCTION OVERSIGHT				**$230,300**
6.0% / YEAR ESCALATION (1 YEAR)				**$115,200**
TOTAL CONSTRUCTION COST				**$2,264,300**

Cost estimate does not include the following:
-Right-of-Way Acquisition
-Final Design Engineering
-Consultation during construction
-Bridge Construction costs

Computed By: TJA
Checked By: DLJ

Michael Baker INTERNATIONAL

Pittsburgh Subdivision Vertical Clearance Project
Pennsylvania Avenue Bridge - Alternate 3 -
Repair Substructure and Lower Tracks to Achieve 22' Clearance
Preliminary Cost Estimate

February 2022

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
TRACK LOWERING - OPTION 1: REDUCING TRACKS FROM 4 TO 3 AND BUTTRESSING RETAINING WALLS	1	LS	$52,000,000.00	$52,000,000.00
30" PWSA WATERMAIN REPLACEMENT	1	LS	$1,080,000.00	$1,080,000.00
345KV/138KV DUQUESNE LIGHT PRIMARY REPLACEMENT	1	LS	$3,520,000.00	$3,520,000.00
DRAINAGE AND GROUND WATER MITIGATION	1	LS	$500,000.00	$500,000.00
TOTAL RAILROAD CONSTRUCTION COST				**$57,100,000**
TOTAL CONSTRUCTION COST				**$57,100,000**

Note: Pennsylvania Avenue Alternate 3 is necessarily accompanied by North Avenue Alternate 3 as track lowering limits extend under both the Pennsylvania Avenue Bridge and the North Avenue Bridge.

Cost estimate does not include the following:
-Right-of-Way Acquisition
-Final Design Engineering
-Consultation during construction
-Bridge Rehabilitation Cost
-North Avenue Bridge Replacement and Roadway Reconstruction

Computed By: DLJ
Checked By: TJA

Michael Baker INTERNATIONAL

Pittsburgh Subdivision Vertical Clearance Project
Pennsylvania Avenue Bridge - Alternative 4 -
Combination Replace and Raise Bridge and Lower Tracks to 22' Clearance
Preliminary Cost Estimate

February 2022

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
P	918	CY	$26.00	$23,868.00
FOREIGN BORROW EXCAVATION	503	CY	$30.00	$15,090.00
GEOTEXTILE, CLASS 1	572	LF	$2.00	$1,144.00
EITHER CEMENT TREATED PERMEABLE BASE COURSE, 4" DEPTH	1,079	SY	$33.00	$35,607.00
OR ASPHALT TREATED PERMEABLE BASE COURSE, 4" DEPTH	1,079	SY	-	-
SUBBASE 4" DEPTH (NO. 2A)	1,818	SY	$11.50	$20,907.00
SUBBASE 5" DEPTH (NO. 2A)	128	SY	$16.25	$2,080.00
REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH	128	SY	$128.00	$16,384.00
REINFORCED CEMENT CONCRETE PAVEMENT, 10" DEPTH	1,079	SY	$160.00	$172,640.00
PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS	2,332	SY	$2.00	$4,664.00
PAVEMENT RELIEF JOINT	88	LF	$250.00	$22,000.00
INSPECTOR'S FIELD OFFICE AND INSPECTION FACILITIES, TYPE B	1	LS	$18,000.00	$18,000.00
EQUIPMENT PACKAGE	1	LS	$3,500.00	$3,500.00
4" PIPE UNDERDRAIN, TYPE 1 BACKFILL	572	LF	$16.50	$9,438.00
CONCRETE DEEP CURB	511	LF	$54.00	$27,594.00
CEMENT CONCRETE SIDEWALK MODIFIED	495	SY	$116.00	$57,380.04
TOE WALL WITH PEDESTRIAN HANDRAIL	37	LF	$380.00	$14,060.00
SIDEWALK MOMENT SLAB	203	LF	$2,260.00	$457,943.80
CONSTRUCTION SURVEYING, TYPE B	1	LS	$20,000.00	$20,000.00
CONSTRUCTION SURVEYING, TYPE D	1	LS	$20,000.00	$20,000.00
CPM SCHEDULE	1	LS	$5,500.00	$5,500.00
DETECTABLE WARNING SURFACE, POLYMER CONCRETE	30	SF	$38.00	$1,140.00
TOPSOIL, FURNISHED AND PLACED	9	CY	$95.00	$855.00
SEEDING AND SOIL SUPPLEMENTS, FORMULA B	4	LB	$240.00	$960.00
RESET FENCE	149	LF	$48.50	$7,226.50
TREE REMOVAL	5	EA	$2,000.00	$10,000.00
LANDSCAPING	1	LS	$5,000.00	$5,000.00
STREET LIGHTING ADJUSTMENTS	3	EACH	$20,000.00	$60,000.00
EXCAVATION AND BACKFILL OF UNSUITABLE SLAG MATERIAL	1	LS	$14,000.00	$14,000.00
EROSION AND SEDIMENT POLLUTION CONTROL MEASURES	1	LS	$22,000.00	$22,000.00
MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION	1	LS	$33,000.00	$33,000.00
SIGNING & PAVEMENT MARKINGS	1	LS	$11,000.00	$11,000.00
DRAINAGE	1	LS	$55,000.00	$55,000.00
UTILITY RELOCATIONS	1	LS	$55,000.00	$55,000.00
ROADWAY CONSTRUCTION ITEMS SUBTOTAL				**$1,223,000**
4% MOBILIZATION				**$48,900**
20% CONTINGENCY				**$244,600**
TOTAL ROADWAY CONSTRUCTION SUBTOTAL				**$1,516,500**
12% CONSTRUCTION OVERSIGHT				**$182,000**
6.0% / YEAR ESCALATION (1 YEAR)				**$91,000**
TOTAL ROADWAY CONSTRUCTION COST				**$1,789,500**
TRACK LOWERING	18,862	TF	$430.00	$8,110,660.00
30" PWSA WATERMAIN REPLACEMENT	1	LS	$1,080,000.00	$1,080,000.00
345KV/138KV DUQUESNE LIGHT PRIMARY REPLACEMENT	1	LS	$3,520,000.00	$3,520,000.00
DRAINAGE AND GROUND WATER MITIGATION	1	LS	$500,000.00	$500,000.00
TOTAL RAILROAD CONSTRUCTION COST				**$13,210,660**
TOTAL CONSTRUCTION COST				**$15,000,160**

Cost estimate does not include the following:
-Right-of-Way Acquisition
-Final Design Engineering
-Consultation during construction
-Bridge Construction costs

Computed By: TJA
Checked By:DLJ

Pittsburgh Subdivision Vertical Clearance Project
Pennsylvania Avenue Bridge - Design Modification A -
Replace and Raise Bridge to Acheive 21'-2" Clearance
Preliminary Cost Estimate

February 2022

Michael Baker INTERNATIONAL

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
REMOVAL OF EXISTING PAVEMENT AND SIDEWALKS	918	CY	$26.00	$23,868.00
FOREIGN BORROW EXCAVATION	503	CY	$30.00	$15,090.00
GEOTEXTILE, CLASS 1	572	LF	$2.00	$1,144.00
EITHER CEMENT TREATED PERMEABLE BASE COURSE, 4" DEPTH	1,079	SY	$33.00	$35,607.00
OR ASPHALT TREATED PERMEABLE BASE COURSE, 4" DEPTH	1,079	SY	-	-
SUBBASE 4" DEPTH (NO. 2A)	1,818	SY	$11.50	$20,907.00
SUBBASE 5" DEPTH (NO. 2A)	128	SY	$16.25	$2,080.00
REINFORCED CEMENT CONCRETE PAVEMENT, 8" DEPTH	128	SY	$128.00	$16,384.00
REINFORCED CEMENT CONCRETE PAVEMENT, 10" DEPTH	1,079	SY	$160.00	$172,640.00
PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS	2,332	SY	$2.00	$4,664.00
PAVEMENT RELIEF JOINT	88	LF	$250.00	$22,000.00
INSPECTOR'S FIELD OFFICE AND INSPECTION FACILITIES, TYPE B	1	LS	$18,000.00	$18,000.00
EQUIPMENT PACKAGE	1	LS	$3,500.00	$3,500.00
4" PIPE UNDERDRAIN, TYPE 1 BACKFILL	572	LF	$16.50	$9,438.00
CONCRETE DEEP CURB	511	LF	$54.00	$27,594.00
CEMENT CONCRETE SIDEWALK MODIFIED	495	SY	$116.00	$57,380.04
TOE WALL WITH PEDESTRIAN HANDRAIL	37	LF	$380.00	$14,060.00
SIDEWALK MOMENT SLAB	203	LF	$2,260.00	$457,943.80
CONSTRUCTION SURVEYING, TYPE B	1	LS	$20,000.00	$20,000.00
CONSTRUCTION SURVEYING, TYPE D	1	LS	$20,000.00	$20,000.00
CPM SCHEDULE	1	LS	$5,500.00	$5,500.00
DETECTABLE WARNING SURFACE, POLYMER CONCRETE	30	SF	$38.00	$1,140.00
TOPSOIL, FURNISHED AND PLACED	9	CY	$95.00	$855.00
SEEDING AND SOIL SUPPLEMENTS, FORMULA B	4	LB	$240.00	$960.00
RESET FENCE	149	LF	$48.50	$7,226.50
TREE REMOVAL	5	EA	$2,000.00	$10,000.00
LANDSCAPING	1	LS	$5,000.00	$5,000.00
STREET LIGHTING ADJUSTMENTS	3	EA	$20,000.00	$60,000.00
EXCAVATION AND BACKFILL OF UNSUITABLE SLAG MATERIAL	1	LS	$14,000.00	$14,000.00
EROSION AND SEDIMENT POLLUTION CONTROL MEASURES	1	LS	$22,000.00	$22,000.00
MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION	1	LS	$33,000.00	$33,000.00
SIGNING & PAVEMENT MARKINGS	1	LS	$11,000.00	$11,000.00
DRAINAGE	1	LS	$55,000.00	$55,000.00
UTILITY RELOCATIONS	1	LS	$55,000.00	$55,000.00
ROADWAY CONSTRUCTION ITEMS SUBTOTAL				**$1,223,000**
4%	**MOBILIZATION**			**$48,900**
20%	**CONTINGENCY**			**$244,600**
TOTAL ROADWAY CONSTRUCTION SUBTOTAL				**$1,516,500**
12%	**CONSTRUCTION OVERSIGHT**			**$182,000**
6.0%	**/ YEAR ESCALATION (1 YEAR)**			**$91,000**
TOTAL CONSTRUCTION COST				**$1,789,500**

Cost estimate does not include the following:
-Right-of-Way Acquisition
-Final Design Engineering
-Consultation during construction
-Bridge Construction costs

Computed By: TJA
Checked By:DLJ

SO No.	161571
Subject :	Pennsylvania Avenue Bridge - Preliminary Quantities
	Superstructure

Computed By: RMS Checked By: ABC Date: 11/16/2018

Michael Baker INTERNATIONAL

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Rev By: CGF 1/2020 and 12/2021

COST ESTIMATE - TS&L INVESTIGATIONS TRUSS, 21 ft VC - ALT 2 (MOD A) & ALT 4

SUPERSTRUCTURE

ITEM DESCRIPTION	UNIT	UNIT COST	UNIT TOTAL	TOTAL COST
CLASS AAAP CEMENT CONCRETE	CY	$ 850.00	188	$ 159,800
CLASS AA CEMENT CONCRETE	CY	$ 850.00	94	$ 79,900
EPOXY COATED REINFORCEMENT STEEL	LBS	$ 2.00	63500	$ 127,000
FABRICATED STRUCTURAL STEEL	LBS	$ 3.00	575000	$ 1,725,000
PENETRATING SEALER	SY	$ 10.00	1130	$ 11,300
DISC BEARINGS	EA	$ 11,000.00	6	$ 66,000
PROTECTIVE FENCE	LF	$ 150.00	398	$ 59,700
REMOVAL OF PORTION OF EXISTING BRIDGE	LS	$ 452,000.00	1	$ 452,000
NEOPRENE STRIP SEAL, (4" MOVEMENT)	LF	$ 450.00	171	$ 76,950

Subtotal Superstructure Cost = $ 2,757,650

APPROACH SLABS

ITEM DESCRIPTION	UNIT	UNIT COST	UNIT TOTAL	TOTAL COST
CLASS AAAP CEMENT CONCRETE	CY	$ 850.00	117	$ 99,450
CLASS AA CEMENT CONCRETE	CY	$ 850.00	42	$ 35,700
EPOXY COATED REINFORCEMENT STEEL	LB	$ 2.00	32312	$ 64,624
PROTECTIVE COATING	SY	$ 10.00	109	$ 1,090

SubTotal Approach Slab Cost = $ 200,864

SUBSTRUCTURE

ITEM DESCRIPTION	UNIT	UNIT COST	UNIT TOTAL	TOTAL COST
CLASS III EXCAVATION	CY	$ 30.00	1733	$ 51,990
STRUCTURAL BACKFILL	CY	$ 70.00	362	$ 25,340
FLOWABLE BACKFILL (TYPE D)	CY	$ 210.00	1591	$ 334,110
DOWELS	EA	$ 40.00	90	$ 3,600
CLASS A CEMENT CONCRETE	CY	$ 650.00	119	$ 77,350
CLASS AA CEMENT CONCRETE	CY	$ 850.00	79	$ 67,150
EPOXY COATED REINFORCEMENT STEEL	LBS	$ 2.00	56300	$ 112,600
REMOVAL OF EXISTING STRUCTURE	LS	$ 24,100.00	1	$ 24,100
PREFORMED CELLULAR POLYSTYRENE	SY	$ 50.00	105	$ 5,250

Subtotal Substructure Cost = $ 701,490

Subtotal Combined Cost = $ 3,660,004

cost per sf = **Contingency 20%= $ 732,001**

$453.59 **Total Cost = $ 4,393,000**

SO No.	161571		
Subject :	Pennsylvania Avenue Bridge - Preliminary Quantities		
	Superstructure		
Computed By: RMS	Checked By: ABC	Date: 11/16/2018	

Michael Baker INTERNATIONAL

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Rev By: CGF 1/2020 and 12/2021

COST ESTIMATE - TS&L INVESTIGATIONS TRUSS, 22 ft VC - ALT 2

SUPERSTRUCTURE

ITEM DESCRIPTION	UNIT	UNIT COST	UNIT TOTAL	TOTAL COST
CLASS AAAP CEMENT CONCRETE	CY	$ 850.00	188	$ 159,800
CLASS AA CEMENT CONCRETE	CY	$ 850.00	94	$ 79,900
EPOXY COATED REINFORCEMENT STEEL	LBS	$ 2.00	63500	$ 127,000
FABRICATED STRUCTURAL STEEL	LBS	$ 3.00	575000	$ 1,725,000
PENETRATING SEALER	SY	$ 10.00	1130	$ 11,300
DISC BEARINGS	EA	$ 11,000.00	6	$ 66,000
PROTECTIVE FENCE	LF	$ 150.00	398	$ 59,700
REMOVAL OF PORTION OF EXISTING BRIDGE	LS	$ 452,000.00	1	$ 452,000
NEOPRENE STRIP SEAL, (4" MOVEMENT)	LF	$ 450.00	171	$ 76,950

Subtotal Superstructure Cost = $ 2,757,650

APPROACH SLABS

ITEM DESCRIPTION	UNIT	UNIT COST	UNIT TOTAL	TOTAL COST
CLASS AAAP CEMENT CONCRETE	CY	$ 850.00	117	$ 99,450
CLASS AA CEMENT CONCRETE	CY	$ 850.00	42	$ 35,700
EPOXY COATED REINFORCEMENT STEEL	LB	$ 2.00	32312	$ 64,624
PROTECTIVE COATING	SY	$ 10.00	109	$ 1,090

SubTotal Approach Slab Cost = $ 200,864

SUBSTRUCTURE

ITEM DESCRIPTION	UNIT	UNIT COST	UNIT TOTAL	TOTAL COST
CLASS III EXCAVATION	CY	$ 30.00	1733	$ 51,990
STRUCTURAL BACKFILL	CY	$ 70.00	406	$ 28,420
FLOWABLE BACKFILL (TYPE D)	CY	$ 210.00	1591	$ 334,110
DOWELS	EA	$ 40.00	90	$ 3,600
CLASS A CEMENT CONCRETE	CY	$ 650.00	152	$ 98,800
CLASS AA CEMENT CONCRETE	CY	$ 850.00	79	$ 67,150
EPOXY COATED REINFORCEMENT STEEL	LBS	$ 2.00	57600	$ 115,200
REMOVAL OF EXISTING STRUCTURE	LS	$ 24,100.00	1	$ 24,100
PREFORMED CELLULAR POLYSTYRENE	SY	$ 50.00	105	$ 5,250

Subtotal Substructure Cost = $ 728,620

Subtotal Combined Cost = $ 3,687,134

cost per sf = $456.89

Contingency 20%= $ 737,427

Total Cost = $ 4,425,000

SO No.	161571		
Subject :	Pennsylvania Avenue Bridge - Preliminary Quantities		
	Superstructure		
Computed By: RMS	Checked By: ABC	Date: 11/16/2018	

Michael Baker INTERNATIONAL

N:\Norfolk Southern\Pittsburgh Vertical Clearance\NS_North Avenue\Structures\Quantities and Cost Estimate\[North Avenue Bridge Preliminary Quantities and Costs.xlsx]Summary

COST ESTIMATE - TS&L INVESTIGATIONS - ALT 3

Rev1 CGF 11/5/2018
Rev2 CGF 1/14/2022

SUBSTRUCTURE

ITEM DESCRIPTION	UNIT	UNIT COST	UNIT TOTAL	TOTAL COST
REPAIR DETERIORATED CONCRETE	CF	$ 350.00	27	$ 9,450

Subtotal Substructure Cost = $ 9,450

Subtotal Combined Cost = $ 9,450

Contingency (20%) = $ 1,890

Total Cost = $ 12,000

Michael Baker INTERNATIONAL

Pittsburgh Subdivision Vertical Clearance Project
Columbus Avenue Bridge - Alternate 2 - Raise to 22' Clearance
Preliminary Cost Estimate

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
REMOVAL OF EXISTING PAVEMENT AND SIDEWALKS	924	CY	$26.50	$24,486.00
FOREIGN BORROW EXCAVATION	277	CY	$32.00	$8,864.00
GEOTEXTILE, CLASS 1	1,019	LF	$2.25	$2,292.75
SUPERPAVE ASPHALT MIXTURE DESIGN, WEARING COURSE, 1 1/2" DEPTH	1,995	SY	$12.25	$24,438.75
SUPERPAVE ASPHALT MIXTURE DESIGN, BINDER COURSE, 2 1/2" DEPTH	1,995	SY	$16.50	$32,917.50
SUBBASE 4" DEPTH (NO. 2A)	678	SY	$16.00	$10,848.00
SUBBASE 8" DEPTH (NO. 2A)	2,084	SY	$16.50	$34,386.00
REINFORCED CEMENT CONCRETE PAVEMENT, 10" DEPTH	1,995	SY	$147.00	$293,265.00
PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS	403	SY	$4.00	$1,612.00
PAVEMENT RELIEF JOINT	113	LF	$250.00	$28,250.00
INSPECTOR'S FIELD OFFICE AND INSPECTION FACILITIES, TYPE B	1	LS	$18,000.00	$18,000.00
EQUIPMENT PACKAGE	1	LS	$3,500.00	$3,500.00
4" PIPE UNDERDRAIN, TYPE 1 BACKFILL	1,019	LF	$16.50	$16,813.50
CONCRETE DEEP CURB	967	LF	$50.00	$48,350.00
CEMENT CONCRETE SIDEWALK MODIFIED	268	SY	$120.00	$32,160.00
CONSTRUCTION SURVEYING, TYPE B	1	LS	$20,000.00	$20,000.00
CONSTRUCTION SURVEYING, TYPE D	1	LS	$20,000.00	$20,000.00
CPM SCHEDULE	1	LS	$5,500.00	$5,500.00
DETECTABLE WARNING SURFACE, POLYMER CONCRETE	20	SF	$40.00	$800.00
TOPSOIL, FURNISHED AND PLACED	22	CY	$90.00	$1,980.00
SEEDING AND SOIL SUPPLEMENTS, FORMULA B	8	LB	$210.00	$1,680.00
CHAIN LINK FENCE	250	LF	$46.50	$11,625.00
CONCRETE BARRIER SIDEWALK MOMENT SLAB	600	LF	$1,365.00	$819,000.00
DRAINAGE	1	LS	$58,000.00	$58,000.00
STREET LIGHTING ADJUSTMENTS	1	LS	$20,000.00	$20,000.00
EROSION AND SEDIMENT POLLUTION CONTROL MEASURES	1	LS	$28,000.00	$28,000.00
SIGNING AND PAVEMENT MARKING	1	LS	$15,000.00	$15,000.00
MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION	1	LS	$28,000.00	$28,000.00
UTILITY RELOCATIONS	1	LS	$72,000.00	$72,000.00
			CONSTRUCTION SUBTOTAL	**$1,681,800**
4%	**MOBILIZATION**			**$67,300**
25%	**CONTINGENCY**			**$420,500**
			TOTAL CONSTRUCTION COST	**$2,169,600**
12%	**CONSTRUCTION OVERSIGHT**			**$260,400**
6.0%	**/ YEAR ESCALATION (1 YEAR)**			**$130,200**
			TOTAL	**$2,560,200**

Cost estimate does not include the following:

-Right-of-Way Acquisition

-Final Design Engineering

-Consultation during construction

-Bridge construction costs

Michael Baker INTERNATIONAL

Pittsburgh Subdivision Vertical Clearance Project
Columbus Avenue Bridge - Alternate 3A - Lower tracks to 22' Clearance
Preliminary Cost Estimate

January 2022

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
TRACK LOWERING OPERATION (UTILIZING TRACK UNDERCUTTER)	6,400	TF	$430.00	$2,752,000.00
CONSTRUCTION SUBTOTAL				**$2,752,000**
TOTAL RAILROAD CONSTRUCTION COST				**$2,752,000**
TOTAL CONSTRUCTION COST				**$2,752,000**

Cost estimate does not include the following:

-Right-of-Way Acquisition

-Final Design Engineering

-Consultation during construction

Pittsburgh Subdivision Vertical Clearance Project
Columbus Avenue Bridge - Alternate 3B - Lower west tracks to 22' Clearance
Preliminary Cost Estimate

November 2022

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
TRACK LOWERING, YARD AND SIDING TRACK RECONFIGURATION, SIGNAL SYSTEM	1	LS	$7,000,000.00	$7,000,000.00
SEWER LINE PROTECTION AND STRENGTHENING	2	EACH	$300,000.00	$600,000.00
CONSTRUCTION SUBTOTAL				**$7,600,000**
TOTAL RAILROAD CONSTRUCTION COST				**$7,600,000**
TOTAL CONSTRUCTION COST				**$7,600,000**

Cost estimate does not include the following:

-Right-of-Way Acquisition

-Final Design Engineering

-Consultation during construction

Michael Baker INTERNATIONAL

Pittsburgh Subdivision Vertical Clearance Project
Columbus Avenue Bridge - Alternate 4 - Raise bridge and Lower tracks to 22' Clearance
Preliminary Cost Estimate

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
REMOVAL OF EXISTING PAVEMENT AND SIDEWALKS	866	CY	$27.00	$23,382.00
FOREIGN BORROW EXCAVATION	41	CY	$38.00	$1,558.00
GEOTEXTILE, CLASS 1	669	LF	$2.25	$1,505.25
SUPERPAVE ASPHALT MIXTURE DESIGN, HMA WEARING COURSE, 1 1/2" DEPTH	1,250	SY	$12.50	$15,625.00
SUPERPAVE ASPHALT MIXTURE DESIGN, HMA BINDER COURSE, 2 1/2" DEPTH	1,250	SY	$16.50	$20,625.00
SUBBASE 4" DEPTH (NO. 2A)	443	SY	$12.00	$5,316.00
SUBBASE 8" DEPTH (NO. 2A)	1,338	SY	$16.50	$22,077.00
REINFORCED CEMENT CONCRETE PAVEMENT, 10" DEPTH	1,250	SY	$147.00	$183,750.00
PROTECTIVE COATING FOR CEMENT CONCRETE PAVEMENTS	256	SY	$4.50	$1,152.00
PAVEMENT RELIEF JOINT	113	LF	$175.00	$19,775.00
INSPECTOR'S FIELD OFFICE AND INSPECTION FACILITIES, TYPE B	1	LS	$15,000.00	$15,000.00
EQUIPMENT PACKAGE	1	LS	$5,500.00	$5,500.00
4" PIPE UNDERDRAIN, TYPE 1 BACKFILL	669	LF	$16.50	$11,038.50
CONCRETE DEEP CURB	642	LF	$50.00	$32,100.00
CEMENT CONCRETE SIDEWALK MODIFIED	167	SY	$120.00	$20,040.00
CONSTRUCTION SURVEYING, TYPE B	1	LS	$20,000.00	$20,000.00
CONSTRUCTION SURVEYING, TYPE D	1	LS	$20,000.00	$20,000.00
CPM SCHEDULE	1	LS	$5,500.00	$5,500.00
DETECTABLE WARNING SURFACE, POLYMER CONCRETE	20	SF	$40.00	$800.00
TOPSOIL, FURNISHED AND PLACED	4	CY	$90.00	$360.00
SEEDING AND SOIL SUPPLEMENTS, FORMULA B	2	LB	$210.00	$420.00
CONCRETE BARRIER SIDEWALK MOMENT SLAB	485	LF	$1,365.00	$662,025.00
DRAINAGE	1	LS	$42,000.00	$42,000.00
STREET LIGHTING ADJUSTMENTS	1	LS	$20,000.00	$20,000.00
EROSION AND SEDIMENT POLLUTION CONTROL MEASURES	1	LS	$21,000.00	$21,000.00
SIGNING AND PAVEMENT MARKINGS	1	LS	$11,000.00	$11,000.00
MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION	1	LS	$21,000.00	$21,000.00
UTILITY RELOCATIONS	1	LS	$53,000.00	$53,000.00
			CONSTRUCTION SUBTOTAL	**$1,255,500**
	4%		**MOBILIZATION**	**$50,200**
	25%		**CONTINGENCY**	**$313,900**
			TOTAL CONSTRUCTION COST	**$1,619,600**
	12%		**CONSTRUCTION OVERSIGHT**	**$194,400**
	6.0%		**/ YEAR ESCALATION (1 YEAR)**	**$97,200**
			TOTAL ROADWAY CONSTRUCTION COST	**$1,911,200**
			TOTAL RAILROAD CONSTRUCTION COST *(1800' tracks @ $430/TF)*	**$774,000**
			TOTAL CONSTRUCTION COST	**$2,685,200**

Cost estimate does not include the following:

-Right-of-Way Acquisition

-Final Design Engineering

-Consultation during construction

-Bridge construction costs

Michael Baker INTERNATIONAL

Pittsburgh Subdivision Vertical Clearance Project
Columbus Avenue Bridge - Design Modification 3A - Lower tracks to 21' Clearance
Preliminary Cost Estimate

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
TRACK LOWERING OPERATION (UTILIZING TRACK UNDERCUTTER)	3,400	TF	$430.00	$1,462,000.00
CONSTRUCTION SUBTOTAL				**$1,462,000**
TOTAL RAILROAD CONSTRUCTION COST				**$1,462,000**
TOTAL CONSTRUCTION COST				**$1,462,000**

Cost estimate does not include the following:

-Right-of-Way Acquisition

-Final Design Engineering

-Consultation during construction

Michael Baker INTERNATIONAL

Pittsburgh Subdivision Vertical Clearance Project
Columbus Avenue Bridge - Design Modification 3B - Lower west tracks to 21'-6" Clearance
Preliminary Cost Estimate

November 2022

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
TRACK LOWERING OPERATION (UTILIZING TRACK UNDERCUTTER)	1	LS	$7,000,000.00	$7,000,000.00
CONSTRUCTION SUBTOTAL				**$7,000,000**
TOTAL RAILROAD CONSTRUCTION COST				**$7,000,000**
TOTAL CONSTRUCTION COST				**$7,000,000**

Cost estimate does not include the following:

-Right-of-Way Acquisition

-Final Design Engineering

-Consultation during construction

SO No. ____________________
Subject : Columbus Avenue Bridge
Summary of Estimated Quantities
Computed By: ABC Checked By: CGF Date: 11/26/2018

Michael Baker INTERNATIONAL

Costs Updated - CGF 12/15/2021

SUMMARY OF QUANTITIES AND COST ESTIMATE
COLUMBUS AVENUE BRIDGE

ALTERNATIVES	STRUCTURES SUBTOTAL	CONTINGENCY (20%)	STRUCTURE TOTAL
RAISE BRIDGE	$1,778,515.00	$355,703.00	$2,135,000.00
LOWER TRACKS	$254,075.00	$50,815.00	$305,000.00
DESIGN MOD (REPAIR DETERIORATED CONCRETE)	$20,350.00	$4,070.00	$25,000.00
RAISE BRIDGE/LOWER TRACKS	$1,713,215.00	$342,643.00	$2,056,000.00

SO No. ____________________

Subject : Columbus Avenue Bridge

Summary of Estimated Quantities

Computed By: ABC Checked By: CGF Date: 11/26/2018

Michael Baker INTERNATIONAL

Costs Updated - CGF 12/15/2021

SUMMARY OF QUANTITIES AND COST ESTIMATE

COLUMBUS AVENUE BRIDGE

SUPERSTRUCTURE

ITEM DESCRIPTION	UNIT	Raise Bridge UNIT COST	UNIT TOTAL	TOTAL COST
MOBILIZATION	LS	$ 100,000.00	1	$ 100,000
REMOVAL OF PORTION OF EXISTING BRIDGE (ABUTMENTS)	CY	$ 150.00	70	$ 10,500
CLASS 3 EXCAVATION	CY	$ 30.00	146	$ 4,380
SELECT STRUCTURAL BACKFILL	CY	$ 90.00	22	$ 1,980
DOWELS, #5	EA	$ 45.00	248	$ 11,160
JACKING, TEMPORARY SUPPORT, & GRADE ADJUSTMENT, WHOLE STRUCTURE	LS	$ 662,000.00	1	$ 662,000
PENETRATING SEALER, SUPERSTRUCTURES	SY	$ 7.00	1325	$ 9,275
REPAIR DETERIORATED CONCRETE	CF	$ 370.00	55	$ 20,350
CLASS AA CEMENT CONCRETE	CY	$ 1,200.00	108	$ 129,600
CLASS A CEMENT CONCRETE	CY	$ 730.00	74	$ 54,020
EPOXY COATED REINFORCEMENT STEEL	LBS	$ 2.10	27500	$ 57,750
FABRICATED STRUCTURAL STEEL	LBS	$ 10.00	3000	$ 30,000
RETAINING WALL, SOLDIER-PILE OR OTHER TYPE	SF	$ 125.00	5500	$ 687,500

STRUCTURE SUBTOTAL = $ 1,778,515

CONTINGENCY @ 20% = $ 355,703

STRUCTURE SUBTOTAL = $ 2,135,000

SO No. ______

Subject : Columbus Avenue Bridge

Summary of Estimated Quantities

Computed By: ABC Checked By: CGF Date: 11/26/2018

Michael Baker INTERNATIONAL

Costs Updated - CGF 12/15/2021

SUMMARY OF QUANTITIES AND COST ESTIMATE

COLUMBUS AVENUE BRIDGE

Lower Tracks

ITEM DESCRIPTION	UNIT	UNIT COST	UNIT TOTAL	TOTAL COST
MOBILIZATION	LS	$ 100,000.00	1	$ 100,000
REMOVAL OF PORTION OF EXISTING BRIDGE (ABUTMENTS)	CY	$ 150.00	20	$ 3,000
CLASS 3 EXCAVATION	CY	$ 35.00	36	$ 1,260
SELECT STRUCTURAL BACKFILL	CY	$ 110.00	4	$ 440
DOWELS, #5	EA	$ 40.00	150	$ 6,000
JACKING, TEMPORARY SUPPORT, & GRADE ADJUSTMENT, WHOLE STRUCTURE	LS			$ -
PENETRATING SEALER, SUPERSTRUCTURES	SY	$ 7.00	1325	$ 9,275
REPAIR DETERIORATED CONCRETE	CF	$ 370.00	55	$ 20,350
CLASS AA CEMENT CONCRETE	CY	$ 1,250.00	70	$ 87,500
CLASS A CEMENT CONCRETE	CY			$ -
EPOXY COATED REINFORCEMENT STEEL	LBS	$ 2.50	10500	$ 26,250
FABRICATED STRUCTURAL STEEL	LBS			$ -
RETAINING WALL, SOLDIER-PILE OR OTHER TYPE	SF			$ -

STRUCTURE SUBTOTAL = $ 254,075

CONTINGENCY @ 20% = $ 50,815

STRUCTURE SUBTOTAL = $ 305,000

SO No. ____________________

Subject : Columbus Avenue Bridge

Summary of Estimated Quantities

Computed By: ABC Checked By: CGF Date: 11/26/2018

Michael Baker INTERNATIONAL

Costs Updated - CGF 12/15/2021

SUMMARY OF QUANTITIES AND COST ESTIMATE

COLUMBUS AVENUE BRIDGE

Design Mod

ITEM DESCRIPTION	UNIT	UNIT COST	UNIT TOTAL	TOTAL COST
REPAIR DETERIORATED CONCRETE	CF	$ 370.00	55	$ 20,350

STRUCTURE SUBTOTAL = $ 20,350

CONTINGENCY @ 20% = $ 4,070

STRUCTURE SUBTOTAL = $ 25,000

SO No. __________________________

Subject : Columbus Avenue Bridge

Summary of Estimated Quantities

Computed By: ABC Checked By: CGF Date: 11/26/2018

Michael Baker INTERNATIONAL

Costs Updated - CGF 12/15/2021

SUMMARY OF QUANTITIES AND COST ESTIMATE

COLUMBUS AVENUE BRIDGE

ITEM DESCRIPTION	UNIT	Raise Bridge/Lower Tracks UNIT COST	UNIT TOTAL	TOTAL COST
MOBILIZATION	LS	$ 100,000.00	1	$ 100,000
REMOVAL OF PORTION OF EXISTING BRIDGE (ABUTMENTS)	CY	$ 150.00	70	$ 10,500
CLASS 3 EXCAVATION	CY	$ 30.00	146	$ 4,380
SELECT STRUCTURAL BACKFILL	CY	$ 100.00	8	$ 800
DOWELS, #5	EA	$ 45.00	248	$ 11,160
JACKING, TEMPORARY SUPPORT, & GRADE ADJUSTMENT, WHOLE STRUCTURE	LS	$ 662,000.00	1	$ 662,000
PENETRATING SEALER, SUPERSTRUCTURES	SY	$ 7.00	1325	$ 9,275
REPAIR DETERIORATED CONCRETE	CF	$ 370.00	55	$ 20,350
CLASS AA CEMENT CONCRETE	CY	$ 1,200.00	86	$ 103,200
CLASS A CEMENT CONCRETE	CY	$ 1,010.00	30	$ 30,300
EPOXY COATED REINFORCEMENT STEEL	LBS	$ 2.50	17500	$ 43,750
FABRICATED STRUCTURAL STEEL	LBS	$ 10.00	3000	$ 30,000
RETAINING WALL, SOLDIER-PILE OR OTHER TYPE	SF	$ 125.00	5500	$ 687,500

STRUCTURE SUBTOTAL = $ 1,713,215

CONTINGENCY @ 20% = $ 342,643

STRUCTURE SUBTOTAL = $ 2,056,000

APPENDIX D

Alternatives Comparison Matrices

WASHINGTON AVENUE BRIDGE ALTERNATIVES COMPARISON MATRIX

Measures of Effectiveness	Alternative 1 No Build Alternative	Alternative 2 Raise the Bridge to Achieve 22' Clearance	Alternative 3 Lower Tracks to Achieve 22' Clearance		Alternative 4 Raise the Bridge and Lower the Tracks to Achieve 22' Clearance
			Alt 3	Design Mod	
1 PURPOSE AND NEED					
A. Forecasted Traffic Demands	*No*	*Yes*	*Yes*	*Yes*	*Yes*
B. Vertical Clearance Constraints	*No*	*Yes*	*Yes*	*Yes*	*Yes*
C. Operational Safety and Reliability	*No*	*Yes*	*Yes*	*Yes*	*Yes*
D. Public Safety	*No*	*Yes*	*Yes*	*Yes*	*Yes*
E. Facility Deficiencies	*No*	*Yes*	*Yes*	*Yes*	*Yes*
2 ENGINEERING					
A. Construction Phases	*0*	*1*	*2*	*2*	*2*
B. Avoids Construction Detour	*Yes*	*No*	*Yes*	*Yes*	*No*
C. Building Entrances Impacted	*0*	*12*	*0*	*0*	*12*
D. Driveways Impacted	*0*	*5*	*0*	*0*	*5*
E. 24-Hour Closure of Rail Traffic Along Bridge over South Braddock Avenue	*No*	*No*	*Yes*	*No*	*No*
3 ENVIRONMENTAL & SOCIAL IMPACTS					
A. Air Quality	*None*	*None*	*None*	*None*	*None*
B. Noise	*Low*	*Low*	*Low*	*Low*	*Low*
C. Vibration	*None*	*None*	*None*	*None*	*None*
D. Hazardous or Residual Waste Sites	*None*	*Low to Moderate*	*Moderate*	*Low*	*Low to Moderate*
E. Historic Properties	*None*	*Low to Moderate*	*Low*	*Low*	*Low to Moderate*
F. Section 2002 Resources	*0*	*1*	*1*	*1*	*1*
3 CONSTRUCTABILITY					
A. **Construction Length**					
- Railroad Corridor	*N/A*	*N/A*	*3000'*	*2400'*	*2,400'*
- Washington Avenue	*N/A*	*400'*	*N/A*	*N/A*	*375'*
- Palmer Street	*N/A*	*100'*	*N/A*	*N/A*	*100'*
- Center Street	*N/A*	*120'*	*N/A*	*N/A*	*120'*
- Total Construction Length	*N/A*	*620'*	*3000'*	*2400'*	*2995'*
B. Utility Involvement	*No*	*Yes*	*Yes*	*Yes*	*Yes*
C. Lower South Braddock Avenue RR Bridge	*No*	*No*	*Yes*	*No*	*No*
4 ESTIMATED CONSTRUCTION COSTS (ROW, Utilitiy Relocations, etc. not included)					
A. Roadway/Railroad Costs	-	*$ 989,510.00*	*$ 3,947,700.00*	*$ 3,120,000.00*	*$ 3,947,700.00*
B. Initial Structure Costs	-	*$ 1,876,000.00*	*$ 2,287,000.00*	*$ 44,000.00*	*$ 1,872,000.00*
C. Total	-	*$ 2,865,510.00*	*$ 6,234,700.00*	*$ 3,164,000.00*	*$ 5,819,700.00*

Amtrak Station

AMTRAK ALTERNATIVES COMPARISON MATRIX

Measures of Effectiveness	Alternative 1 No Build Alternative	Alternative 2 Remove portion of train shed	Alternative 3 Adjust train shed roof beams to achieve 21'-0" vertical clearance
1 PURPOSE AND NEED			
A. Forecasted Traffic Demands	*No*	*Yes*	*Yes*
B. Vertical Clearance Constraints	*No*	*Yes*	*Yes*
C. Operational Safety and Reliability	*No*	*Yes*	*Yes*
D. Public Safety	*No*	*Yes*	*Yes*
E. Facility Deficiencies	*No*	*Yes*	*Yes*
2 ENGINEERING			
A. Construction Phases	*0*	*2*	*2*
B. Avoids Construction Detour	*Yes*	*No*	*Yes*
C. Building Entrance Impacts	*N/A*	*N/A*	*N/A*
D. Driveways Impacted	*N/A*	*N/A*	*N/A*
E. Property Impacts	*N/A*	*N/A*	*N/A*
3 ENVIRONMENTAL & SOCIAL IMPACTS			
A. Air Quality	*None (Increased)**	*None (Decreased)***	*None (Decreased)***
B. Noise	*None (Increased)**	*None (Decreased)***	*None (Decreased)***
C. Vibration	*None (Increased)**	*None (Decreased)***	*None (Decreased)***
D. Hazardous Waste Potential	*None*	*High*	*High*
E. Historic Properties	*None*	*High*	*Low to Moderate*
F. Section 2002 Resources	*0*	*2*	*2*
3 CONSTRUCTABILITY			
A. **Construction Length**			
- Structure Over Railroad Corridor (SW portion)	*N/A*	*450'*	*450'*
-Structure Over Railroad Corridor (NE portion)	*N/A*	*650'*	*650'*
- Total Construction Length	*N/A*	*1100'*	*1100'*
B. Utility Involvement	*No*	*Yes*	*No*
4 ESTIMATED COSTS (Millions)			
A. Roadway/Railroad Costs	-	-	-
B. Initial Structure Costs	-	*$ 11,497,505.00*	*$ 5,490,610.00*
C. Total	-	*$ 11,497,505.00*	*$ 5,490,610.00*

*None = Does not meet regulatory thresholds to qualify as an impact; however, some changes from existing conditions may occur. "Increased" denotes an increase between years 2019 and 2045 under the No-Build Alternative.

**None = Does not meet regulatory thresholds to qualify as an impact; however, some changes from existing conditions may occur. "Decreased" denotes a decrease compared to future 2045 no-build conditions.

W. NORTH AVENUE BRIDGE ALTERNATIVES COMPARISON MATRIX

Measures of Effectiveness	Alternative 1 No Build Alternative	Alternative 2 Replace and Raise Bridge to Achieve 22' / 21' Clearance Alt 2 22' Clearance	Alternative 2 Replace and Raise Bridge to Achieve 22' / 21' Clearance Design Mod 21'-4" Clearance	Alternative 3*** Replace Bridge and Lower Tracks to Achieve 22' Clearance	Alternative 4 Replace and Raise Bridge and Lower Tracks to Achieve 22' Clearance
1 PURPOSE AND NEED					
A. Forecasted Traffic Demands	*No*	*Yes*	*Yes*	*Yes*	*Yes*
B. Vertical Clearance Constraints	*No*	*Yes*	*Yes*	*Yes*	*Yes*
C. Operational Safety and Reliability	*No*	*Yes*	*Yes*	*Yes*	*Yes*
D. Public Safety	*No*	*Yes*	*Yes*	*Yes*	*Yes*
E. Facility Deficiencies	*No*	*Yes*	*Yes*	*Yes*	*Yes*
2 ENGINEERING					
A. Construction Phases	*0*	*1*	*1*	*2*	*2*
B. Avoids Construction Detour	*Yes*	*No*	*No*	*No*	*No*
C. Building Entrances Impacted	*0*	*9*	*8*	*0*	*8*
D. Driveways Impacted	*0*	*2*	*2*	*0*	*2*
E. Property Impacts	*No*	*11*	*9*	*1*	*9*
F. Maintains 4 Railroad Tracks	*Yes*	*Yes*	*Yes*	*No*	*Yes*
3 ENVIRONMENTAL & SOCIAL IMPACTS					
A. Air Quality	*None (Increased)**	*None (Decreased)**	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***
B. Noise	*None (Increased)**	*None (Decreased)**	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***
C. Vibration	*None (Increased)**	*None (Decreased)**	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***
D. Hazardous Waste Potential	*None*	*Low*	*Low*	*Moderate to High*	*Low to Moderate*
E. Historic Properties	*None*	*Moderate to High*	*Moderate to High*	*Moderate to High*	*Moderate to High*
F. Section 2002 Resources	*0*	*3*	*3*	*2*	*3*
3 CONSTRUCTABILITY					
A. **Construction Length**					
- Railroad Corridor	*N/A*	*N/A*	*N/A*	*6,850'*	*3,310'*
- Brighton Road	*N/A*	*670'*	*655'*	*250'*	*655'*
- North Avenue	*N/A*	*512'*	*487'*	*345'*	*487'*
- Total Construction Length	*N/A*	*1182'*	*1142'*	*7445'*	*4452'*
B. Utility Involvement	*No*	*Yes*	*Yes*	*Yes*	*Yes*
4 ESTIMATED COSTS (Millions)					
A. Roadway/Railroad Costs	-	*$ 3,538,900.00*	*$ 3,432,900.00*	*$ 58,716,200.00*	*$ 16,643,560.00*
B. Initial Structure Costs	-	*$ 3,255,000.00*	*$ 3,255,000.00*	*$ 3,255,000.00*	*$ 3,255,000.00*
C. Total	-	*$ 6,793,900.00*	*$ 6,687,900.00*	*$ 61,971,200.00*	*$ 19,898,560.00*

*None = Does not meet regulatory thresholds to qualify as an impact; however, some changes from existing conditions may occur. "Increased" denotes an increase between years 2019 and 2045 under the No-Build Alternative.

**None = Does not meet regulatory thresholds to qualify as an impact; however, some changes from existing conditions may occur. "Decreased" denotes a decrease compared to future 2045 no-build conditions.

***North Avenue Alternate 3 is necessarily accompanied by Pennsylvania Avenue Alternate 3 as track lowering limits extend under both the Pennsylvania Avenue Bridge and the North Avenue Bridge. $57,100,000 is the total track lowering cost for the entire corridor common to both North Avenue and Pennsylvania Avenue.

PENNSYLVANIA AVENUE BRIDGE ALTERNATIVES COMPARISON MATRIX

	Alternative 1 No Build Alternative	Alternative 2 Replace and Raise Bridge to Achieve 22' / 21'-2" Clearance Alt 2 22' Clearance	Alternative 2 Replace and Raise Bridge to Achieve 22' / 21'-2" Clearance Design Mod 21'-2" Clearance	Alternative 3*** Repair substructure and Lower Tracks to Achieve 22' Clearance	Alternative 4 Replace and Raise Bridge and Lower Tracks to Achieve 22' Clearance
1 PURPOSE AND NEED					
A. Forecasted Traffic Demands	*No*	*Yes*	*Yes*	*Yes*	*Yes*
B. Vertical Clearance Constraints	*No*	*Yes*	*Yes*	*Yes*	*Yes*
C. Operational Safety and Reliability	*No*	*Yes*	*Yes*	*Yes*	*Yes*
D. Public Safety	*No*	*Yes*	*Yes*	*Yes*	*Yes*
E. Facility Deficiencies	*No*	*Yes*	*Yes*	*Yes*	*Yes*
2 ENGINEERING					
A. Construction Phases	*0*	*1*	*1*	*2*	*2*
B. Avoids Construction Detour	*Yes*	*No*	*No*	*Yes*	*No*
C. Building Entrances Impacted	*0*	*1*	*1*	*0*	*1*
D. Driveways Impacted	*0*	*1*	*1*	*0*	*1*
E. Property Impacts	*No*	*5*	*5*	*0*	*5*
F. Maintains 4 Railroad Tracks	*Yes*	*Yes*	*Yes*	*No*	*Yes*
3 ENVIRONMENTAL & SOCIAL IMPACTS					
A. Air Quality	*None (Increased)**	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***
B. Noise	*None (Increased)**	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***
C. Vibration	*None (Increased)**	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***
D. Hazardous Waste Potential	*None*	*Low to Moderate*	*Low*	*Moderate to High*	*Moderate*
E. Historic Properties	*None*	*Low to Moderate*	*Low to Moderate*	*Moderate to High*	*Moderate*
F. Section 2002 Resources	*0*	*2*	*2*	*2*	*2*
3 CONSTRUCTABILITY					
A. **Construction Length**					
- Railroad Corridor	*N/A*	*N/A*	*N/A*	*7,700'*	*3,310'*
- Pennsylvania Avenue	*N/A*	*555'*	*449'*	*0'*	*449'*
- Total Construction Length	*N/A*	*555'*	*449'*	*7700'*	*3759'*
B. Utility Involvement	*No*	*Yes*	*Yes*	*Yes*	*Yes*
4 ESTIMATED COSTS (Millions)					
A. Roadway/Railroad Costs	-	*$ 2,264,300.00*	*$ 1,789,500.00*	*$ 57,100,000.00*	*$ 15,000,160.00*
B. Initial Structure Costs	-	*$ 4,425,000.00*	*$ 4,393,000.00*	*$ 12,000.00*	*$ 4,393,000.00*
C. Total	-	*$ 6,689,300.00*	*$ 6,182,500.00*	*$ 57,112,000.00*	*$ 19,393,160.00*

*None = Does not meet regulatory thresholds to qualify as an impact; however, some changes from existing conditions may occur. "Increased" denotes an increase between years 2019 and 2045 under the No-Build Alternative.

**None = Does not meet regulatory thresholds to qualify as an impact; however, some changes from existing conditions may occur. "Decreased" denotes a decrease compared to future 2045 no-build conditions.

***Pennsylvania Avenue Alternate 3 is necessarily accompanied by North Avenue Alternate 3 as track lowering limits extend under both the Pennsylvania Avenue Bridge and the North Avenue Bridge. $57,100,000 is the total track lowering cost for the entire corridor common to both North Avenue and Pennsylvania Avenue.

COLUMBUS AVENUE BRIDGE ALTERNATIVES COMPARISON MATRIX

Measures of Effectiveness	**Alternative 1** No Build Alternative	**Alternative 2** Repair and Raise the Bridge to Achieve 22' Clearance	**Alternative 3A** Repair Substructure and Lower Tracks to Achieve 22' / 21'-1" Clearance		**Alternative 3B** Repair Substructure and Lower Tracks to Achieve 22' / 21'-6" Clearance		**Alternative 4** Raise Bridge and Lower the Tracks to Achieve 22' Clearance
			Alt 3A	**Design Mod 3A**	**Alt 3B**	**Design Mod 3B**	
1 PURPOSE AND NEED							
A. Forecasted Traffic Demands	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
B. Vertical Clearance Constraints	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
C. Operational Safety and Reliability	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
D. Public Safety	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
E. Facility Deficiencies	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
2 ENGINEERING							
A. Construction Phases	*0*	*1*	*2*	*2*	*2*	*2*	*2*
B. Avoids Construction Detour	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*No*
C. Building Entrances Impacted	*0*	*0*	*0*	*0*	*0*	*0*	*0*
D. Driveways Impacted	*0*	*0*	*0*	*0*	*0*	*0*	*0*
E. Property Impacts	*No*	*Yes*	*No*	*No*	*No*	*No*	*Yes*
3 ENVIRONMENTAL & SOCIAL IMPACTS							
A. Air Quality	*None (Increased)**	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***
B. Noise	*None (Increased)**	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***
C. Vibration	*None (Increased)**	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***	*None (Decreased)***
D. Hazardous Waste Potential	*None*	*Low*	*Moderate*	*Low*	*Moderate to High*	*Moderate*	*Low to Moderate*
E. Historic Properties	*None*	*Moderate*	*Low*	*Low*	*Low*	*Low*	*Low to Moderate*
F. Section 2002 Resources	*0*	*2*	*1*	*1*	*1*	*1*	*2*
3 CONSTRUCTABILITY							
A. **Construction Length**							
- Railroad Corridor	*N/A*	*N/A*	*2,150'*	*1,700'*	*2,900'*	*2,800'*	*900'*
- Columbus Avenue	*N/A*	*490'*	*N/A*	*N/A*	*N/A*	*N/A*	*390'*
- California Avenue	*N/A*	*275'*	*N/A*	*N/A*	*N/A*	*N/A*	*150'*
- Total Construction Length	*N/A*	*765'*	*2,150'*	*1,700'*	*2,900'*	*2,800'*	*1,440'*
B. Utility Involvement	*No*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
4 ESTIMATED COSTS (Millions)							
A. Roadway/Railroad Costs	-	*$ 2,560,200.00*	*$ 2,752,000.00*	*$ 1,462,000.00*	*$ 7,600,000.00*	*$ 7,000,000.00*	*$ 2,685,200.00*
B. Initial Structure Costs	-	*$ 2,135,000.00*	*$ 305,000.00*	*$ 25,000.00*	*$ 25,000.00*	*$ 25,000.00*	*$ 2,056,000.00*
C. Total	-	*$ 4,695,200.00*	*$ 3,057,000.00*	*$ 1,487,000.00*	*$ 7,625,000.00*	*$ 7,025,000.00*	*$ 4,741,200.00*

*None = Does not meet regulatory thresholds to qualify as an impact; however, some changes from existing conditions may occur. "Increased" denotes an increase between years 2019 and 2045 under the No-Build Alternative.

**None = Does not meet regulatory thresholds to qualify as an impact; however, some changes from existing conditions may occur. "Decreased" denotes a decrease compared to future 2045 no-build conditions.

APPENDIX E

Air Quality Memorandum

Norfolk Southern Railway Company

Pittsburgh Vertical Clearance Projects

Air Quality Technical Memorandum

HMMH Report No. 310190
November 11, 2022

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1 Introduction

The Pittsburgh Vertical Clearance Projects are comprised of four (4) railway improvement projects on the Pittsburgh and Fort Wayne Rail Lines (together referred to as the Pittsburgh Line), owned and operated by Norfolk Southern Railway Company (Norfolk Southern). The proposed projects address freight capacity and delay constraints through the City of Pittsburgh, Allegheny County, Pennsylvania. Norfolk Southern is a common carrier and the Pittsburgh Line forms a critical component of its route through Pittsburgh between Chicago and the New York/New Jersey commercial markets. These five overhead clearance projects [North Avenue Bridge (PC-1.60); Pennsylvania Avenue Bridge (PC-1.82); Columbus Avenue Bridge (PC-2.17); Washington Avenue Bridge, Swissvale (PT 344.91); and Amtrak Station Canopy (PT-353.20)] have vertical clearance obstructions along the Pittsburgh Line and prevent efficient movement of freight, especially time-sensitive intermodal freight, by rail between Chicago and New York/New Jersey, and specifically through Pennsylvania.

Unused capacity exists on the Pittsburgh Line and these clearance projects will allow the line to accommodate anticipated freight growth while allowing for double-stack intermodal freight to use the Pittsburgh Line in lieu of Norfolk Southern's Monongahela line (Mon Line) south of the rivers. The ability to move this double-stack traffic on the Pittsburgh Line will eliminate exposure to hazardous conditions and delay to time-sensitive freight relating to the unpredictable landslides from adjacent property that occur along the Mon Line.

The air quality assessment was conducted to evaluate the effects of the Pittsburgh Vertical Clearance Projects. Because air analysis is regional in nature, and while the Pittsburgh Vertical Clearance Projects are comprised of five individual projects, a regional air analysis was undertaken along a study corridor encompassing all five of the projects. Merchant Street Bridge is part of the Norfolk Southern Pittsburgh Line. The Merchant Street Bridge Project is to replace the bridge that carries the Pittsburgh Line over Merchant Street. As a separate, standalone replacement along the corridor, the air quality analysis performed for the Vertical Clearance Projects would cover this location and therefore a separate quality assessment is not necessary for the separate Merchant Street Bridge Project. Figure 1 shows the study corridor, which includes an approximately 13-mile portion of the Pittsburgh Line north of the Allegheny and Ohio Rivers from just west of the Ohio Connecting (OC) Flyover Bridge Flyover to a point east of the Point Perry Bridge. While an air quality analysis may not be needed for the review of these projects, this analysis was developed in accordance with Pennsylvania Act 120 of 1970 and is consistent with the Pennsylvania Department of Transportation (PennDOT) Publication 321. See https://www.dot.state.pa.us/public/PubsForms/Publications/PUB%20321.pdf.

This memorandum addresses the affected environment and environmental consequences of the projects currently under consideration, including an overview of regulations, general conformity and attainment status, methodology, and estimates of pollutant emissions for the existing conditions ("Existing" scenario) and for the design year conditions without the projects ("No Build" scenario) and with the projects (or "Build" scenario). Because diesel locomotive emissions are the primary emissions relating to railroad operations along railroad line, this assessment studied the potential change in diesel locomotive emissions associated with rail traffic in each of these scenarios, accommodating for forecasted growth in freight volumes as well as rerouting of double-stack traffic from the Mon Line to the Pittsburgh Line in the Build scenarios.

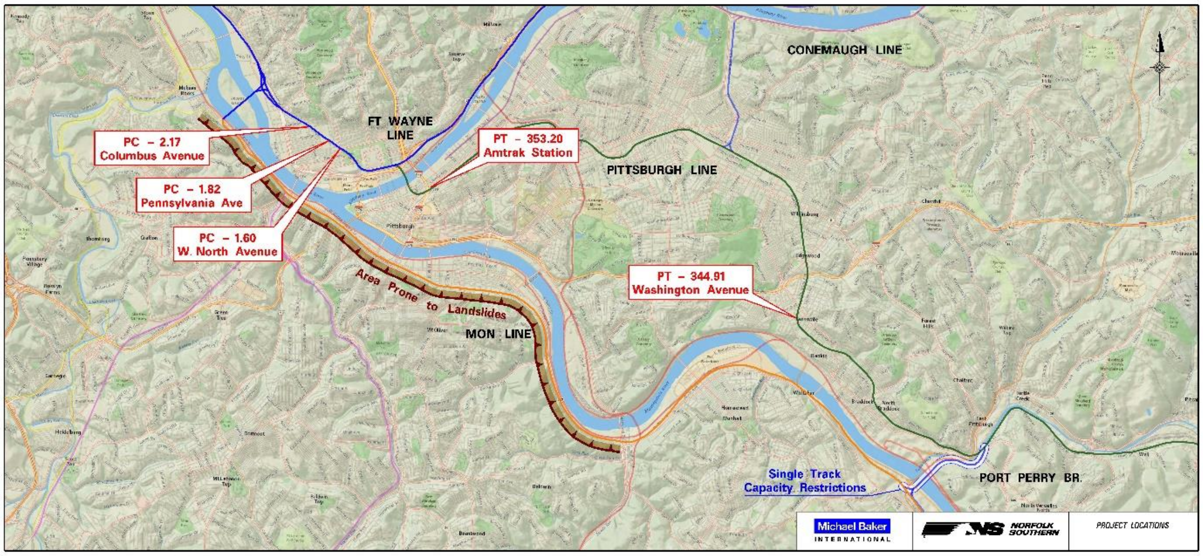


Figure 1. Location Map

2 Background and Regulatory Context

PennDOT has awarded state funding for the projects, which triggers a review under Pennsylvania's Act 120. As set forth in Publication 321, PennDOT's policy is to assess the air quality impacts of transportation improvement projects and to give consideration to the incorporation of appropriate avoidance and/or relief strategies into preliminary engineering designs and construction for those projects that have potential air quality impacts. PennDOT's guidelines are in compliance with 23 CFR Part 771, and also reflect recent procedures regarding conformity as promulgated by the United States Environmental Protection Agency (EPA) as of April 2012 (Final Conformity Rule 40 CFR Parts 51 and 93). PennDOT's policy is to follow regulations issued by EPA, the Federal Highway Administration (FHWA), and the Pennsylvania Department of Environmental Protection (DEP). To the extent Act 120 reviews would require analysis of air impacts, such analysis would be completed consistent with these guidelines. This air quality (qualitative) analysis was conducted for the projects based on the Clean Air Act, 42 U.S.C. § 7401 et seq., and the most recent EPA and DEP air quality classifications.

2.1 Criteria Pollutants and National and State Ambient Air Quality Standards

Table 1 presents the national ambient air quality standards (NAAQS), see 40 C.F.R. Part 50, established by the EPA for criteria air pollutants, namely: carbon monoxide (CO), sulfur dioxide (SO_2), ozone (O_3), particulate matter (PM), nitrogen dioxide (NO_2), and lead (Pb). There are two types of NAAQS—primary and secondary: "*Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public* *welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.*"[1]

Table 1. Criteria Pollutant NAAQS

Pollutant	Primary/Secondary	Ave.Time	Level	Form
Carbon Monoxide (CO)	Primary	8 Hour	9 ppm	Not to be exceeded more than once per year
		1 Hour	35 ppm	
Lead (Pb)	Primary and Secondary	Rolling 3-month average	0.15 µg/m,[1]	Not to be exceeded
Nitrogen Dioxide (NO_2)	Primary	1 Hour	100 ppb	98th percentile of 1 hour daily maximum concentrations, averaged over 3 years
	Primary and Secondary	Annual	53 ppb, [2]	Annual Mean
Ozone	Primary and Secondary	8 hours	0.070 ppm, [3]	Annual fourth highest daily maximum 8-hour concentration, averaged over 3 years
Particulate Matter PM_{10}	Primary and secondary	24 hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Particulate Matter $PM_{2.5}$	Primary	Annual	12.0 µg/m^3	Annual mean averaged over 3 years
	Secondary	Annual	15.0 µg/m^3	Annual mean averaged over 3 years
	Primary and Secondary	24 hour	35 µg/m^3	98th percentile, averaged over 3 years
Sulfur Dioxide (SO_2)	Primary	1 hour	75 ppb, [4]	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

(as of February 2019: Source: http://www3.epa.gov/ttn/naaqs/criteria.html)
µg/m3 = Micrograms per cubic meter
ppm = Parts per million
primary standards = provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly.
Secondary standards = provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.
Form = denotes the form of the standard and how the standard is met.. Each standard has its own criteria for how many times it may be exceeded.

1. In areas designated non-attainment for the Pb standards prior to the promulgation of the current 2008 standards, and for which implementation plans to attain or maintain the current 2008 standards have not been submitted and approved, the previous standards (1.5 ug/m^3 as a calendar quarter average) also remain in effect.
2. The annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard.
3. Final rule signed October 1, 2015 and effected December 28, 2015.
4. The previous SO_2 standards 0.14 ppm 24-hour and 0.03 ppm annual will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current 2010 standards, and (2) any area for which an implementation plan providing for attainment of the current 2010 standard has not been submitted and approved and that is designated non-attainment under the previous SO_2

[1] From the EPA preamble to the NAAQS table: https://www.epa.gov/criteria-air-pollutants/naaqs-table

standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

2.2 Pollutants of Concern

As discussed above, the EPA established NAAQS for commonly found air pollutants, called criteria pollutants, in the CAA and 1990 Clean Air Act Amendments (CAAA). The seven criteria pollutants are CO, ozone, $PM_{2.5}$, PM_{10}, NO_2, SO_2, and lead. A number of these pollutants, such as CO, PM, ozone, and NO_2 commonly result from transportation-related sources. In particular[2]:

- CO is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of combustion engine exhaust, which contributes approximately 56 percent of all carbon emissions nationally. CO is affected by variations in temperature and vehicle speeds.
- PM is a term used to describe particles in the air including dust, dirt, soot, smoke, and liquid droplets. Sources that directly emit PM include on-road motor vehicles, construction activities, locomotives, and unpaved roads. Sources of particles that form in the air from chemical processes involving sunlight and water vapor include fuel combustion in combustion engines, at power plants and from industrial processes. PM_{10} is used as a measure of coarse particulate, in which the particles are 10 microns or less in size. Coarse particles of this size are typically formed by earth-based materials such as construction and re-entrained road dust and brake and tire wear. $PM_{2.5}$ is used as a measure of fine particulate, in which the particles are 2.5 microns or less in size. Fine particles of this size are typically, but not exclusively, formed as a product of combustion.
- Ozone (i.e., ground-level photochemical smog) is different from CO and PM in that it results from a chemical reaction between volatile organic compounds and oxides of nitrogen in the presence of sunlight. Also, the concentration and dispersion of ozone are significantly affected by an area's meteorology and topography. Because it is primarily an area wide pollutant, it is typically assessed in system-level planning as part of the air quality State Implementation Plan (SIP) development and conformity process. Through the Transportation Improvements Program (TIP)/SIP evaluation process, this pollutant is evaluated on a regional level.
- NO_2, along with particles in the air, is often seen as a reddish-brown layer over urban areas. The primary sources of NO_2 emissions are combustion engines, electric utilities, and industrial, commercial, and residential sources that burn fuel. NO_2 is considered an ozone precursor and are evaluated as part of the regional conformity requirements during the project planning phases.
- SO_2 is a product of fuel combustion at power plants, businesses, and residential locations using coal or oil containing sulfur. It forms acidic aerosols harmful to the respiratory tract and can aggravate symptoms associated with lung disease like asthma and bronchitis. SO_2 is a primary contributor to acid deposition which leads to acidification of lakes and streams and damage to vegetation and materials, along with diminution of visibility.
- Lead (Pb) is an elemental heavy metal found naturally in the environment as well as in manufactured products and industrially in the production of gasoline. Lead can be released directly into the air, as suspended particles. Low lead exposure can have adverse effects on the nervous system of fetuses and young children. Historic major sources of lead air emissions were motor vehicles and industrial sources. After lead was phased out of vehicle fuels in 1995, emissions of lead from the automotive

[2] Pennsylvania Department of Transportation, Project-Level Air Quality Handbook: https://www.dot.state.pa.us/public/PubsForms/Publications/PUB%20321.pdf

section have declined. Today, most lead emissions in the U.S. are from leaded aviation fuel in piston engine aircraft and industrial operations such as smelters.

2.3 NAAQS Attainment Status

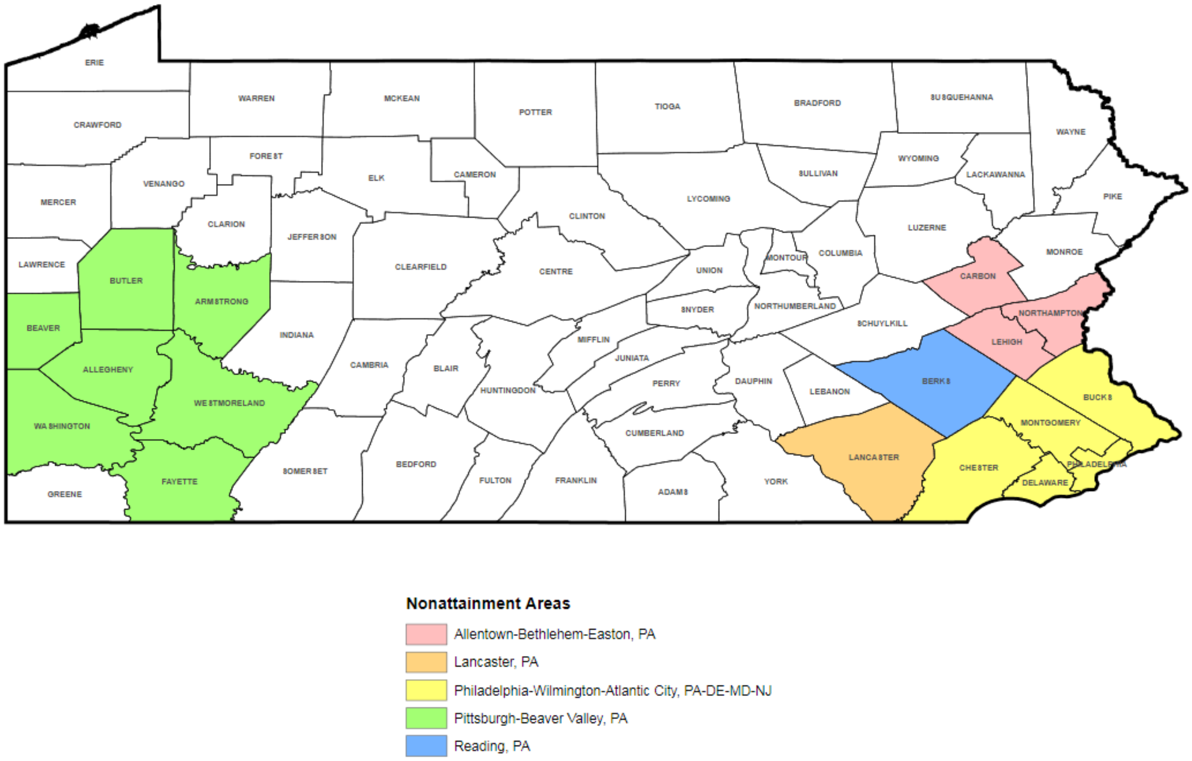
Areas that have never been designated by EPA as nonattainment for one or more of the NAAQS are classified as attainment areas, while areas that do not meet one or more of the NAAQS may be designated by EPA as nonattainment areas for that or those criteria pollutants. Areas that have failed to meet the NAAQS in the past but have since re-attained them may be re-designated as attainment (maintenance) areas, which are commonly referred to as maintenance areas.

The EPA Green Book[3] and the DEP[4] lists non-attainment, maintenance, and attainment areas across the nation. The current designations for the Pittsburgh area (located in Allegheny County), within which the projects lie, are as follows:

- Marginal nonattainment for the 2008 ozone standard;
- Maintenance for the 1971 carbon monoxide standard;
- Maintenance for the 2006 $PM_{2.5}$ standard;
- Moderate nonattainment for the 2012 $PM_{2.5}$ standard; and
- Nonattainment for the 2010 SO_2 standard.

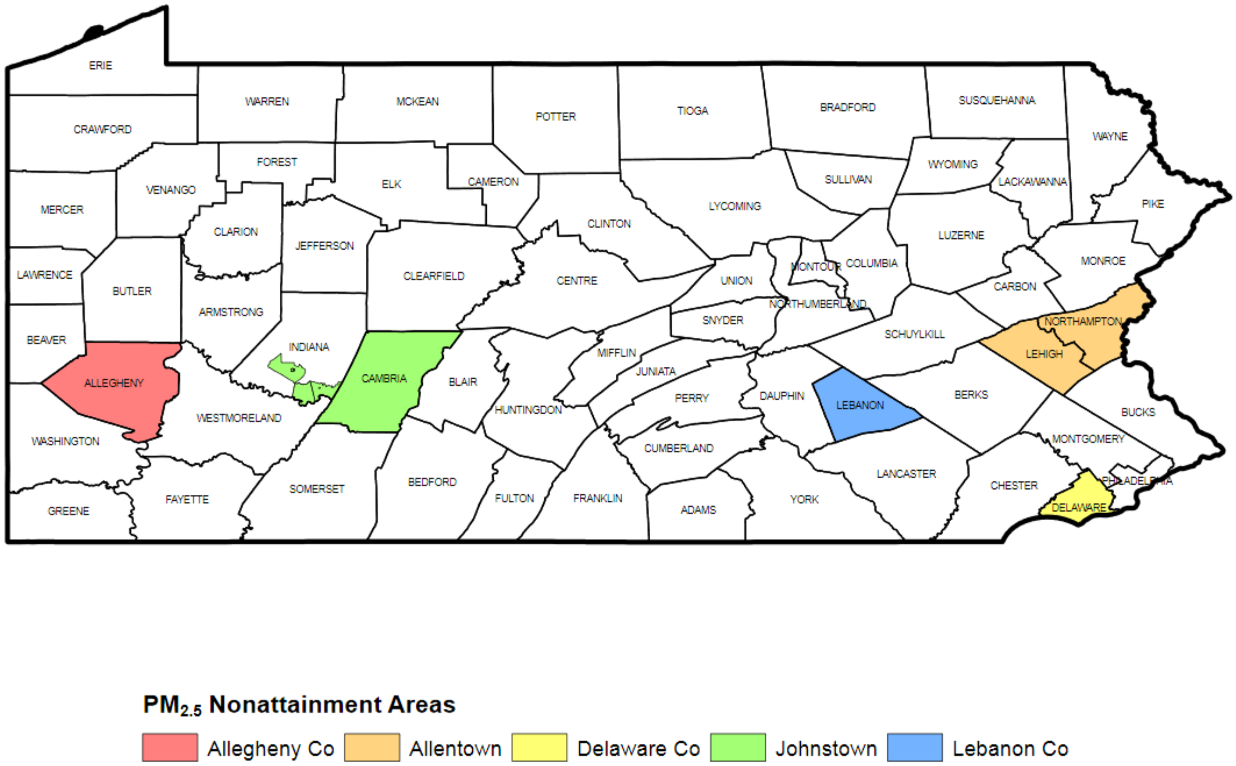
Figure 2 to Figure 4 show graphically the nonattainment region for each pollutant per DEP[5]. The remaining pollutants lead and NO_2 are designated as being in attainment for the NAAQS.

[3] EPA Green Book: https://www.epa.gov/green-book.
[4] Pennsylvania Department of Environmental Protection: https://www.dep.pa.gov/business/air/baq/regulations/pages/attainment-status.aspx
[5] https://www.dep.pa.gov/business/air/baq/regulations/pages/attainment-status.aspx



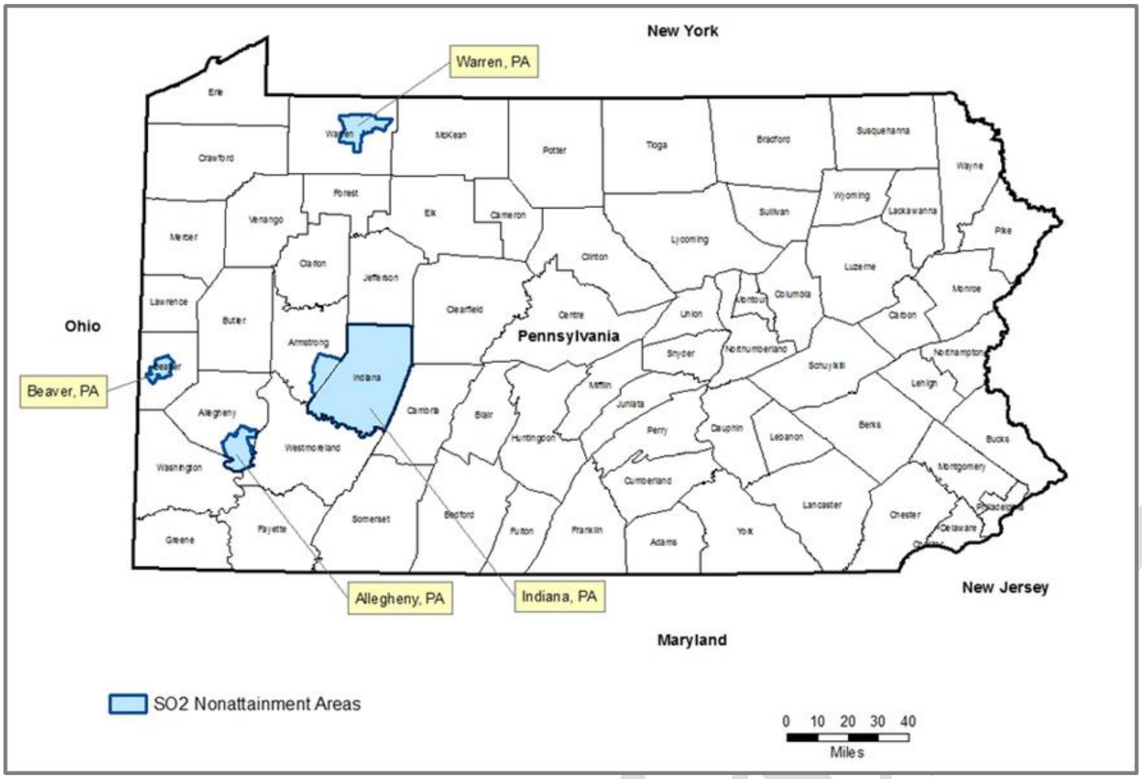
Source: https://www.dep.pa.gov/business/air/baq/regulations/pages/attainment-status.aspx
Note: Current Nonattainment: (All are classified Marginal) Allegheny, Armstrong, Beaver, Berks, Bucks, Butler, Carbon, Chester, Delaware, Fayette, Lancaster, Lehigh, Montgomery, Northampton, Philadelphia, Washington and Westmoreland.

Figure 2. Pennsylvania Ozone Nonattainment Area (2008 Standard)



Source: https://www.dep.pa.gov/business/air/baq/regulations/pages/attainment-status.aspx
Notes: current attainment status for PM2.5 is Allegheny, Delaware, and Lebanon are currently classified as moderate non attainment

Figure 3. Pennsylvania PM2.5 Nonattainment Area (2012 Standard)



Source: https://www.dep.pa.gov/business/air/baq/regulations/pages/attainment-status.aspx
Notes: current attainment status for PM2.5 is Allegheny, Delaware, and Lebanon are currently classified as moderate non attainment

Figure 4. Pennsylvania SO2 Nonattainment Area (2010 Standard)

2.4 General Conformity

Pursuant to 40 CFR Parts 51 and 93, the general conformity rule (GCR) applies to federal actions for non-FHWA components of a transportation project requiring actions by federal agencies in nonattainment or maintenance areas for any of the applicable criteria pollutants. The GCR specifies *de minimis* emission levels by pollutant to determine the applicability of a conformity requirement for a project. A conformity applicability analysis under GCR is the first step of a conformity evaluation and determines whether a conformity determination would be undertaken for a federal action.

The Pittsburgh Vertical Clearance Projects are not federal actions and require no action, approvals, or funding from any US Department of Transportation agency, including the Federal Railroad Administration (FRA), FHWA, or Federal Transit Authority (FTA). Rather, PennDOT has awarded state funding for these projects, which triggers a review under Pennsylvania's Act 120. To the extent Act 120 reviews would require analysis of air impacts, such analysis would be completed consistent with the GCR. If the analysis results indicate that the total projected emissions under both the construction and operational activities would not exceed the *de minimis* levels, then the conformity evaluation is the final step. If, however, the *de minimis* levels would be exceeded by the proposed action, under the federal GCR process, a general conformity determination would be undertaken for the applicable nonattainment/maintenance pollutants.

While the GCR analysis is not necessary for the vertical clearance projects, the applicability analysis was conducted to identify if *de minimis* levels have the potential to be exceeded by the projects.

3 Existing Air Quality

Existing air quality conditions in Allegheny County can be reflected through the current status of the NAAQS attainment and the recent ambient air monitoring data collected by DEP and published by EPA.

As shown above, the project area has EPA designations as follows:

- Marginal nonattainment for the 2008 ozone standard;
- Maintenance for the 1971 carbon monoxide standard;
- Maintenance for the 2006 $PM_{2.5}$ standard;
- Moderate nonattainment for the 2012 $PM_{2.5}$ standard;
- Nonattainment for the 2010 SO_2 standard.

The DEP operates the Commonwealth of Pennsylvania Air Monitoring System (COPAMS) air monitoring sites, including ambient (i.e., outdoor) air monitoring sites, to continuously monitor pollutant levels throughout the state. This data is used to monitor compliance with federal and state ambient air quality standards and is provided to the public in annual reports. According to its website, the DEP does not generally monitor air quality in Allegheny County and relies on the independent Allegheny County Health Department Air Quality Program to monitor air quality monitoring in the county.

The Allegheny County Health Department Air Quality Program's Annual Reports for 2016, 2017, and 2018 include both published data for each year as well as analysis concerning 1997-2018 air quality trends. Data provided for the most recent three years at the monitoring stations nearest the project area are used to describe the representative ambient air quality in the project area and are presented in Table 2. The measured ambient air concentrations closest to the project area were all well below the corresponding NAAQS, except for the exceedance of the 8-hour ozone standard recorded in Lawrenceville in 2016, 2017, and 2018. However, the annual fourth highest daily maximum 8-hour concentration averaged over 3 years, which is how EPA measures the compliance standard, are below the standard.

Table 2. Representative Monitored Ambient Air Quality Data

Pollutant	Averaging Time	Year			Primary Standard	Monitoring Site Location
		2021	2020	2019		
Carbon Monoxide (CO)	1-hour Maximum (ppm)	2.3	1.9	2.2	35	Lawrenceville
	8-hour Maximum (ppm)	1.1	1.4	1.4	9	
Ozone (O_3)	8-hour Maximum (ppm)	0.068	0.071	0.067	0.070	Lawrenceville
		2019 to 2021 3-Year Average of 4th Maximum 0.064				
Nitrogen Dioxide (NO_2)	1-hour Maximum (ppb)	46	51	40	100	Parkway East
	Annual (ppb)	10	9.0	10.0	53	
Particulate Matter (PM_{10})[1]	24-hour Maximum(ug/m^3)	24	31	26	150	Clairton
Particulate Matter ($PM_{2.5}$)[1]	24-hour (98th Percentile) (ug/m^3)	23.1	18.9	21.7	35	Lawrenceville
	Annual	8.8	7.7	9.0	12	
Sulfur Dioxide (SO_2)	1-hour Maximum (ppb)	15	7	21	75	Lawrenceville

Note: [1]Filter based monitor results presented.

Source: Allegheny County Air Quality Reports, 2019[6], 2020[7], 2021[8]

4 Methodology

The Pittsburgh Vertical Clearance Projects are designed to improve mobility and efficiency along the east-west rail corridor by allowing double stack intermodal train traffic to be rerouted from the Mon Line to the Pittsburgh Line, each of which are located within the Pittsburgh, PA metropolitan area. Currently, double stack intermodal traffic crosses the OC Bridge Flyover over the Ohio River and follows the Mon Line on the west side of the Ohio and Monongahela Rivers down to the single tracked Port Perry Bridge, where it crosses back over and connects to the Pittsburgh Line. Train emissions result primarily from the diesel fuel used in locomotives. Locomotives and locomotive engines, as well as the fuel allowed to be used in locomotives, are subject to federal EPA emissions standards. The air quality assessment is focused on the regional annual net changes in locomotive emissions that would result from the proposed projects. The GCR applicability analysis was completed for the net change in annual CO, $PM_{2.5}$, NO_2 and volatile organic compounds (VOCs) from locomotives to evaluate air quality impacts. Ultra-low sulfur diesel oil (ULSD) was fully phased in for locomotives by 2014, resulting in low SO_2 emissions. Therefore, emissions of SO_2 were not included and are expected to be well below the EPA *de minimis* levels. Emissions were estimated for the Existing (2019), the No Build (2045), and Build (2045)

[6] Allegheny County, 2019 Air Quality Annual Report: 2019-Air-Quality-Annual-Report.pdf (alleghenycounty.us)
[7] Allegheny County, 2020 Air Quality Annual Report: 2020-Air-Quality-Annual-Report.pdf (alleghenycounty.us)
[8] Allegheny County, 2021 Air Quality Annual Report: 2021-data-summary.pdf (alleghenycounty.us)

scenarios. The design year analysis is an anticipated future scenario informed by United States Department of Transportation (DOT) and PennDOT rail traffic forecasts.

Locomotive emissions were estimated using a weighted average of the fleet distribution of the current and expected fleet mix, assuming the EPA-established line haul locomotive exhaust emission standards (Tier 0, Tier 1, Tier 2, Tier 3, and Tier 4)[9]. For purposes of this analysis, Tier 0 and some of the Tier 0+ and Tier 1+ locomotives assumed for the existing condition will be phased out over time, with higher proportions of Tier 2, Tier 3, and Tier 4 locomotive engines comprising the fleet mix in the design year. The emission factors for the anticipated Norfolk Southern locomotive fleet mix for each condition is presented in Table 3.

Table 3. Norfolk Southern Fleet Mix Emission Factors

Operating Condition	N-S Systemwide Locomotive Emission Factors (g/bhp-hr)			
	NO_2	PM	CO	HC
2019 Existing Conditions	6.76	0.22	2.04	0.81
2045 Design Conditions	4.82	0.12	1.87	0.36

Note: PM represents $PM_{2.5}$ and PM_{10} emissions.

Figure 5 presents the air quality analysis segments. The study corridor along which the projects lie was divided into three segments: Segment 1 – Pittsburgh Line, Braddock/East Pittsburgh to Downtown Pittsburgh (distance of 11.8 miles); Segment 2 – Pittsburgh Line, Northside Segment, Mile Post 0.0 to PC 3.17 (distance of 3.9 miles); and Segment 3 – Mon Line from where it crosses the OC Bridge Flyover over the Ohio River and follows the Mon Line on the west side of the Ohio and Monongahela Rivers down to the single tracked Port Perry Bridge, where it crosses back over and connects to the Pittsburgh Line (distance of 15.9 miles). These segments encompass the entire study area. Daily locomotive movements were estimated for both the freight line and the passenger traffic over the two Amtrak routes along each segment. The Existing and No Build scenarios do not include the rerouting of any intermodal trains with double stacked cars from the Mon Line to the Pittsburgh Line because the Pittsburgh Line would not accommodate double stack in those scenarios, but the No Build scenario does include forecasted traffic projections for a low-growth scenario and a high-growth scenario. The low-growth scenario is based on the Pennsylvania Department of Transportation (PennDOT) 2020 Rail Plan[10] and the high-growth scenario is based on the PennDOT 2015 Rail Plan[11].

The high growth scenario is a result of the freight flow projections developed as part of the 2015 PA Freight Plan where PennDOT is projecting an 80+% growth in intermodal container traffic. The (low growth) projections for 2045 in the 2020 PA Freight Plan were modified significantly to reflect changes in global freight changes. The low growth reflects minor (1-2%) growth in intermodal over the next 20+

[9] See 40 CFR 1033.101
[10] Pennsylvania Department of Transportation 20202 Rail Plan: (PennDOT 2021 https://www.penndot.pa.gov/Doing-Business/RailFreightAndPorts/Planning/Documents/2020%20Pennsylvania%20State%20Rail%20Plan/2020%20Pennsylvania%20State%20Rail%20Plan.pdf)
[11] Pennsylvania Department of Transportation 2015 Rail Plan: (PennDOT 2016 https://www.penndot.pa.gov/Doing-Business/Transit/InformationandReports/Documents/2015%20Pennsylvania%20State%20Rail%20Plan%20(low).pdf)

years. Thus, the only changes between low and high growth for this analysis are the number of intermodal trains.

The Build scenarios assume the rerouting of intermodal trains with double stacked traffic to the Pittsburgh Line from the Mon Line as well as forecasted traffic projections. The Mon Line is currently operating at or near capacity. Therefore, the study presumes that under all future scenarios, to accommodate growth in intermodal train movements through the Pittsburgh area, additional trains operating with double stacked rail cars (in the Build scenario) or trains operating with single stacked rail cars (in the No Build scenario) would operate on the Pittsburgh Line. In general, this would mean that under the No Build condition, the Mon Line would continue to operate at capacity with double stack traffic and the study presumes growth in intermodal rail traffic would be routed in a larger number of single stack trains on the Pittsburgh Line. For the Build condition, growth in intermodal rail traffic is presumed to shift from the Mon Line to the Pittsburgh Line and all intermodal growth is presumed to also occur on the Pittsburgh Line. Remaining traffic on the Mon Line with the Build condition would include existing freight movements of any non-double stack intermodal trains.

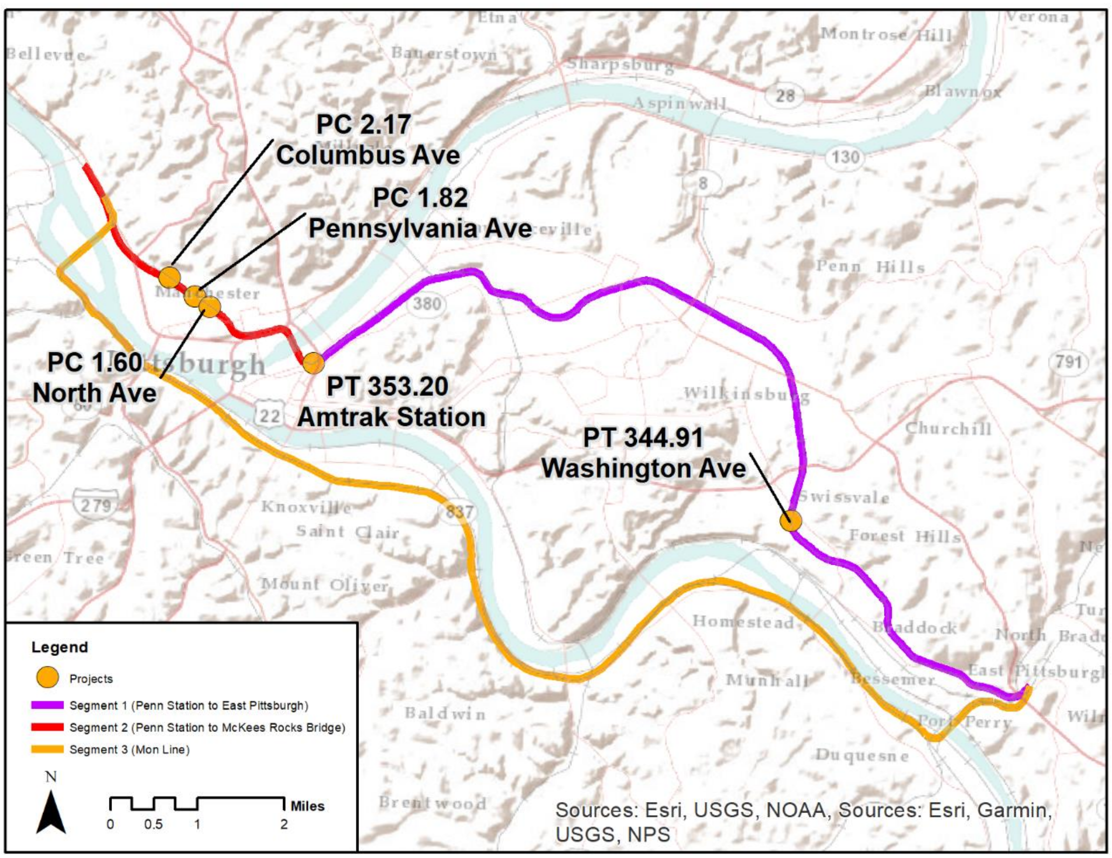


Figure 5. Air Quality Analysis Segments

There is variability in how locomotives operate throughout the study corridor, and generally in railroad operations, due to a number of factors, including maximum track speeds, slowing down or idling due to speed changes, increasing speed and use of higher throttle settings, and specific train consists (i.e., the number of locomotives, cars and their contents on a train). For these reasons, average locomotive speeds, weighted emission factors, average engine horsepower rating, and average load factors were included in the emission calculation. In lieu of project-specific values, a load factor of 0.28 was assumed for Existing and No Build and Build scenarios based on typical locomotives at these speeds. The load factor corresponds to the percentage of full power applied in a given notch setting on the locomotive. Notch settings include engine braking, idle, and numeric values ranging from 1 to 8. A load factor of 0.28 means that the locomotive is using about 28% of full power, which corresponds to a notch setting of 3 or 4. Emissions were estimated for each of the segments for the Existing and 2045 No Build and Build scenarios, with a low-growth and high-growth scenario included for all future conditions. Table 4 and Table 5 summarizes the pollutant emissions in tons per year for each condition and segment with future low-growth in intermodal traffic and high-growth conditions, respectively.

Table 4. Locomotive Emissions Summary for Each Scenario under Low Growth in Intermodal Traffic

									NS Systemwide Locomotive Emission Factors (g/bhp-hr)[4]				Emissions Tons per Year (TPY)			
N-S Rail Line Operational Condition	Rail Segment Description	Train Type	Distance (miles)	Number of Locomotives per Day[1]	Annual VMT[2]	Ave. Speed (mph)	Load Factor[3]	Horsepower	NO_2	PM[5]	CO	HC[6]	NO_2	PM[5]	CO	HC[6]
2019 Existing Conditions	Pittsburgh Line - Braddock to Downtown Pittsburgh Segment - Milepost PT-341.00 to PT-353.35 (Pittsburgh Line from MP 341.0 to Start of Fort Wayne Line)	Freight	11.8	38	164,338.6	26.67	0.28	1226.1	6.76	0.22	2.04	0.81	15.7695	0.5171	4.7687	1.8933
		Passenger (Amtrak Pennsylvania Line)	11.8	2	8,649.4	30	0.28	1226.1	6.76	0.22	2.04	0.81	0.7378	0.0242	0.2231	0.0886
		Passenger (Amtrak Capitol Limited Line)	11.8	4	17,298.8	30	0.28	1226.1	6.76	0.22	2.04	0.81	1.4757	0.0484	0.4463	0.1772
	Pittsburgh Line - Northside Segment - Milepost PC-0.00 to PC-3.17 (From convergence of Fort Wayne and Conemaugh Lines westward to convergence of Ft. Wayne and Mon Lines west of OC Bridge)	Freight	3.9	68	96,386.7	26.67	0.28	1226.1	6.76	0.22	2.04	0.81	9.2490	0.3033	2.7969	1.1104
		Passenger (Amtrak Capitol Limited Line)	3.9	4	5,669.8	30.84	0.28	1226.1	6.76	0.22	2.04	0.81	0.4705	0.0154	0.1423	0.0565
	Mon Line (OC Bridge Flyover across the Ohio River south to the Port Perry Bridge and connectiont to the Pittsburgh Line)	Freight	15.9	68	395,370.3	30	0.28	1226.1	6.76	0.22	2.04	0.81	33.7275	1.1059	10.1993	4.0494
												Total	**61.43**	**2.01**	**18.58**	**7.38**
2045 No Build	Braddock to Downtown Pittsburgh Segment - Milepost PT-341.00 to PT-353.35 (Pittsburgh Line from MP 341.0 to Start of Fort Wayne Line)	Freight	11.8	82	354,624.7	26.67	0.28	1248.4	4.82	0.12	1.87	0.36	24.6814	0.6097	9.5627	1.8198
		Passenger (Amtrak Pennsylvania Line)	11.8	2	8,649.4	30	0.28	1248.4	4.82	0.12	1.87	0.36	0.5352	0.0132	0.2073	0.0395
		Passenger (Amtrak Capitol Limited Line)	11.8	4	17,298.8	30	0.28	1248.4	4.82	0.12	1.87	0.36	1.0703	0.0264	0.4147	0.0789
	Pittsburgh Line - Northside Segment - Milepost PC-0.00 to PC-3.17 (From convergence of Fort Wayne and Conemaugh Lines westward to convergence of Ft. Wayne and Mon Lines west of OC Bridge)	Freight	3.9	118	167,258.9	26.67	0.28	1248.4	4.82	0.12	1.87	0.36	11.6410	0.2876	4.5102	0.8583
		Passenger (Amtrak Capitol Limited Line)	3.9	4	5,669.8	30.84	0.28	1248.4	4.82	0.12	1.87	0.36	0.3413	0.0084	0.1322	0.0252
	Mon Line (OC Bridge Flyover across the Ohio River south to the Port Perry Bridge and connectiont to the Pittsburgh Line)	Freight	15.9	22	127,913.9	30	0.28	1248.4	4.82	0.12	1.87	0.36	7.9145	0.1955	3.0664	0.5836
												Total	**46.18**	**1.14**	**17.89**	**3.41**
2045 Build	Braddock to Downtown Pittsburgh Segment - Milepost PT-341.00 to PT-353.35 (Pittsburgh Line from MP 341.0 to Start of Fort Wayne Line)	Freight	11.8	58	250,832.1	26.67	0.28	1248.4	4.82	0.12	1.87	0.36	17.4576	0.4313	6.7638	1.2872
		Passenger (Amtrak Pennsylvania Line)	11.8	2	8,649.4	30	0.28	1248.4	4.82	0.12	1.87	0.36	0.5352	0.0132	0.2073	0.0395
		Passenger (Amtrak Capitol Limited Line)	11.8	4	17,298.8	30	0.28	1248.4	4.82	0.12	1.87	0.36	1.0703	0.0264	0.4147	0.0789
	Pittsburgh Line - Northside Segment - Milepost PC-0.00 to PC-3.17 (From convergence of Fort Wayne and Conemaugh Lines westward to convergence of Ft. Wayne and Mon Lines west of OC Bridge)	Freight	3.9	90	127,570.3	29.17	0.28	1248.4	4.82	0.12	1.87	0.36	8.1178	0.2005	3.1452	0.5986
		Passenger (Amtrak Capitol Limited Line)	3.9	4	5,669.8	30.84	0.28	1248.4	4.82	0.12	1.87	0.36	0.3413	0.0084	0.1322	0.0252
	Mon Line (OC Bridge Flyover across the Ohio River south to the Port Perry Bridge and connectiont to the Pittsburgh Line)	Freight	15.9	0	0.0	30	0.28	1248.4	4.82	0.12	1.87	0.36	0.0000	0.0000	0.0000	0.0000
												Total	**27.52**	**0.68**	**10.66**	**2.03**

Notes:

1. Number of locomotives per day assumptions are based on existing train movements with forecasted increases from the 2020 Pennsylvania Rail Plan (PennDOT 2021).
2. Vehicle Miles Traveled (VMT) assumes number of locomotives a day occur every day for 365 days per year.
3. Load factor of 0.28 based on typical engine at 20 to 25 mph.
4. Existing line haul emission factors use weighted average for 2019 Norfolk Southern fleet. Design line haul emission factors use weighted average of expected NS fleet mix for 2045 design year.
5. PM includes both PM_{10} and $PM_{2.5}$ emissions
6. Hydrocarbons (HC) are synonymous with volatile organic compounds (VOC)

Definitions:

VMT - Vehicle miles traveled is the total number of miles traveled by trains on each of the rail segments.

Load Factor - the load factor is the based on the notch setting (or throttle setting) of the locomotives operating along the segments and is based on an average setting provided by Norfolk Southern's operations staff.

Table 5. Locomotive Emissions Summary for Each Scenario under High Growth in Intermodal Traffic

									NS Systemwide Locomotive Emission Factors (g/bhp-hr)[4]				Emissions Tons per Year (TPY)			
N-S Rail Line Operational Condition	Rail Segment Description	Train Type	Distance (miles)	Number of Locomotives per Day[1]	Annual VMT[2]	Ave. Speed (mph)	Load Factor[3]	Horsepower	NO_2	PM[5]	CO	HC[6]	NO_2	PM[5]	CO	HC[6]
2019 Existing Conditions	Pittsburgh Line - Braddock to Downtown Pittsburgh Segment - Milepost PT-341.00 to PT-353.35 (Pittsburgh Line from MP 341.0 to Start of Fort Wayne Line)	Freight	11.8	38	164,338.6	26.67	0.28	1226.1	6.76	0.22	2.04	0.81	15.7695	0.5171	4.7687	1.8933
		Passenger (Amtrak Pennsylvania Line)	11.8	2	8,649.4	30	0.28	1226.1	6.76	0.22	2.04	0.81	0.7378	0.0242	0.2231	0.0886
		Passenger (Amtrak Capitol Limited Line)	11.8	4	17,298.8	30	0.28	1226.1	6.76	0.22	2.04	0.81	1.4757	0.0484	0.4463	0.1772
	Pittsburgh Line - Northside Segment - Milepost PC-0.00 to PC-3.17 (From convergence of Fort Wayne and Conemaugh Lines westward to convergence of Ft. Wayne and Mon Lines west of OC Bridge)	Freight	3.9	68	96,386.7	26.67	0.28	1226.1	6.76	0.22	2.04	0.81	9.2490	0.3033	2.7969	1.1104
		Passenger (Amtrak Capitol Limited Line)	3.9	4	5,669.8	30.84	0.28	1226.1	6.76	0.22	2.04	0.81	0.4705	0.0154	0.1423	0.0565
	Mon Line (OC Bridge Flyover across the Ohio River south to the Port Perry Bridge and connectiont to the Pittsburgh Line)	Freight	15.9	68	395,370.3	30	0.28	1226.1	6.76	0.22	2.04	0.81	33.7275	1.1059	10.1993	4.0494
												Total	**61.43**	**2.01**	**18.58**	**7.38**
2045 No Build	Braddock to Downtown Pittsburgh Segment - Milepost PT-341.00 to PT-353.35 (Pittsburgh Line from MP 341.0 to Start of Fort Wayne Line)	Freight	11.8	94	406,521.0	26.67	0.28	1248.4	4.82	0.12	1.87	0.36	28.2934	0.6989	10.9621	2.0862
		Passenger (Amtrak Pennsylvania Line)	11.8	2	8,649.4	30	0.28	1248.4	4.82	0.12	1.87	0.36	0.5352	0.0132	0.2073	0.0395
		Passenger (Amtrak Capitol Limited Line)	11.8	4	17,298.8	30	0.28	1248.4	4.82	0.12	1.87	0.36	1.0703	0.0264	0.4147	0.0789
	Pittsburgh Line - Northside Segment - Milepost PC-0.00 to PC-3.17 (From convergence of Fort Wayne and Conemaugh Lines westward to convergence of Ft. Wayne and Mon Lines west of OC Bridge)	Freight	3.9	120	170,093.8	26.67	0.28	1248.4	4.82	0.12	1.87	0.36	11.8383	0.2924	4.5867	0.8729
		Passenger (Amtrak Capitol Limited Line)	3.9	4	5,669.8	30.84	0.28	1248.4	4.82	0.12	1.87	0.36	0.3413	0.0084	0.1322	0.0252
	Mon Line (OC Bridge Flyover across the Ohio River south to the Port Perry Bridge and connectiont to the Pittsburgh Line)	Freight	15.9	68	395,370.3	30	0.28	1248.4	4.82	0.12	1.87	0.36	24.4629	0.6043	9.4780	1.8037
												Total	**66.54**	**1.64**	**25.78**	**4.91**
2045 Build	Braddock to Downtown Pittsburgh Segment - Milepost PT-341.00 to PT-353.35 (Pittsburgh Line from MP 341.0 to Start of Fort Wayne Line)	Freight	11.8	90	389,222.2	26.67	0.28	1248.4	4.82	0.12	1.87	0.36	27.0894	0.6692	10.4956	1.9974
		Passenger (Amtrak Pennsylvania Line)	11.8	2	8,649.4	30	0.28	1248.4	4.82	0.12	1.87	0.36	0.5352	0.0132	0.2073	0.0395
		Passenger (Amtrak Capitol Limited Line)	11.8	4	17,298.8	30	0.28	1248.4	4.82	0.12	1.87	0.36	1.0703	0.0264	0.4147	0.0789
	Pittsburgh Line - Northside Segment - Milepost PC-0.00 to PC-3.17 (From convergence of Fort Wayne and Conemaugh Lines westward to convergence of Ft. Wayne and Mon Lines west of OC Bridge)	Freight	3.9	112	158,754.2	29.17	0.28	1248.4	4.82	0.12	1.87	0.36	10.1021	0.2496	3.9140	0.7449
		Passenger (Amtrak Capitol Limited Line)	3.9	4	5,669.8	30.84	0.28	1248.4	4.82	0.12	1.87	0.36	0.3413	0.0084	0.1322	0.0252
	Mon Line (OC Bridge Flyover across the Ohio River south to the Port Perry Bridge and connectiont to the Pittsburgh Line)	Freight	15.9	24	139,542.5	30	0.28	1248.4	4.82	0.12	1.87	0.36	8.6340	0.2133	3.3452	0.6366
												Total	**47.77**	**1.18**	**18.51**	**3.52**

Notes:

1. Number of locomotives per day assumptions are based on existing train movements with forecasted increases from the 2015 Pennsylvania Rail Plan (PennDOT 2016).
2. Vehicle Miles Traveled (VMT) assumes number of locomotives a day occur every day for 365 days per year.
3. Load factor of 0.28 based on typical engine at 20 to 25 mph.
4. Existing line haul emission factors use weighted average for 2019 Norfolk Southern fleet. Design line haul emission factors use weighted average of expected NS fleet mix for 2045 design year.
5. PM includes both PM_{10} and $PM_{2.5}$ emissions
6. Hydrocarbons (HC) are synonymous with volatile organic compounds (VOC)

Definitions:

VMT - Vehicle miles traveled is the total number of miles traveled by trains on each of the rail segments.

Load Factor - the load factor is the based on the notch setting (or throttle setting) of the locomotives operating along the segments and is based on an average setting provided by Norfolk Southern's operations staff.

5 General Conformity Rule Applicability

The GCR applicability analysis was performed for the proposed action to determine whether a formal conformity analysis would be undertaken. Table 6 and Table 7 summarizes the regional locomotive emissions estimates for the Existing, No Build, and Build conditions for NO_2, VOC, CO, and $PM_{2.5}$ for intermodal low growth and high growth projections, respectively. As noted earlier, locomotives use ultra-low-sulfur diesel fuel consistent with EPA fuel standards and corresponding SO_2 emissions are expected to be very low and well below applicable *de minimis* levels.

As shown in Table 6 and Table 7 , the predicted annual net change in operational emissions is expected to decrease for all pollutants in the subarea region for the low growth and high growth projections for the2045 Build conditions as compared to the 2045 No Build conditions. This expected reduction is primarily due to more efficient utilization of locomotives (double stacking leading to fewer locomotives for the same amount of freight) under the Build scenario. Furthermore, the net change in emissions would also be below established EPA *de minimis* thresholds for NO2, $PM_{2.5}$, and CO for both growth projections and would not result in a significant air quality impact. Therefore, a general conformity determination is not required for the Build scenarios and no adverse air quality impacts would be expected to result from the Build scenario for the low growth and high growth projections.

Table 6. Pittsburgh Regional Annual Net Change in Emissions from Build Scenario Compared to EPA *de minimis* Thresholds for the Intermodal Low-Growth Future Conditions

	Emissions (TPY)[1,2]			
Scenarios	**NO_2**	**$PM_{2.5}$**	**CO**	**VOC**
2019 Existing	61.43	2.01	18.58	7.38
2045 No Build	46.18	1.14	17.89	3.41
2045 Build	27.52	0.68	10.66	2.03
Difference in No Build and Build scenarios	**-18.66**	**-0.46**	**-7.23**	**-1.38**
EPA *de minimis* thresholds	**100**	**100**	**100**	**50**
Below the *de minimis* thresholds	**Yes**	**Yes**	**Yes**	**Yes**

Notes:

1. As a conservative assumption, all PM in Table 6 is assumed to be $PM_{2.5}$ when comparing to the $PM_{2.5}$ de minimis levels.
2. For this analysis, VOC emissions are the same as the HC emissions as presented in Table 6 above.

Table 7. Pittsburgh Regional Annual Net Change in Emissions from Build Scenario Compared to EPA *de minimis* Thresholds for the Intermodal High-Growth Future Conditions

	Emissions (TPY)[1,2]			
Scenarios	**NO_2**	**$PM_{2.5}$**	**CO**	**VOC**
2019 Existing	61.43	2.01	18.58	7.38
2045 No Build	66.54	1.64	25.78	4.91
2045 Build	47.77	1.18	18.51	3.52
Difference in No Build and Build scenarios	**-18.77**	**-0.46**	**-7.27**	**-1.38**
EPA *de minimis* thresholds	**100**	**100**	**100**	**50**
Below the *de minimis* thresholds	**Yes**	**Yes**	**Yes**	**Yes**

Notes:

3. As a conservative assumption, all PM in Table 7 is assumed to be $PM_{2.5}$ when comparing to the $PM_{2.5}$ de minimis levels.
4. For this analysis, VOC emissions are the same as the HC emissions as presented in Table 7 above.

5.1 Mobile Source Air Toxics

Based on regulations now in effect, an analysis of national trends with EPA's MOVES2014 model forecasts a combined reduction of over 90 percent in the total annual emissions rate for the priority of mobile source air toxic (MSAT) from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 45 percent (Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents, Federal Highway Administration, October 12, 2016). This will both reduce the background level MSAT as well as the possibility of even minor MSAT emissions from these projects. As shown in the GCR analysis above, these projects have been determined to generate minimal air quality impacts for Clean Air Act criteria pollutants and have not been linked with any special MSAT concerns. As such, the projects would not cause a significant increase in MSAT impacts over that of the No Build condition. Moreover, EPA regulations for locomotive engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades.

6 Construction Emissions

As indicated in PennDOT guidance, air quality impacts resulting from construction activities are typically not a concern when contractors utilize appropriate control measures. In Pennsylvania, contractors shall perform all construction activities / operations in accordance with 25 Pa. Code Article III (Chapters 121-145, Air Resources) to ensure adequate control measures are in place. PennDOT, Pub. 321, at 1.6. For that reason, the emissions results in this study only include operational emissions and do not include construction emissions, which would be temporary in nature.

7 Conclusions

Regional locomotive emissions were estimated for the Existing, 2045 Build and No Build conditions for the Proposed Action under low-growth and high-growth intermodal freight trains scenarios. Emissions of NO_2, CO, $PM_{2.5}$ (i.e. PM), and VOCs (i.e. HC) were estimated and compared to the EPA *de minimis* levels for operational emissions only to determine significant air quality impacts. Construction emissions are short-term and typically not a concern and were not included as part of this analysis. With the Proposed Action under the low growth and high growth scenario, it is estimated there would be a net reduction in annual regional locomotive operational emissions, and therefore no significant impacts would result with implementation of the projects and a general conformity determination would not be required.

This analysis does not include the indirect beneficial effects of additional freight modal shifts from highway to rail that may result after these projects are completed. One freight train can carry the freight of several hundred trucks. Emissions of particulate matter and nitrogen oxides are significantly lower for railroads than for trucks. On average railroads are four times more fuel efficient than trucks. Because greenhouse gas emissions are directly related to fuel consumption, moving freight by rail instead of truck reduces greenhouse gas emissions by 75 percent[12].

[12] See https://www.aar.org/wp-content/uploads/2018/07/AAR-Rail-Intermodal.pdf.

APPENDIX F

Noise and Vibration Analysis

Norfolk Southern Railway Company

Pittsburgh Vertical Clearance Projects

Noise and Vibration Technical Report

HMMH Report No. 310190
November 11, 2022

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Executive Summary

The Pittsburgh Vertical Clearance Projects comprise five railway improvement projects on the Pittsburgh and Fort Wayne Rail Lines (together referred to as the Pittsburgh Line), owned and operated by Norfolk Southern Railway Company (Norfolk Southern). The proposed projects will address freight capacity and delay constraints through the City of Pittsburgh, Allegheny County, Pennsylvania. Norfolk Southern is a common carrier and the Pittsburgh Line forms a critical component of its route through Pittsburgh between Chicago and the New York/New Jersey commercial markets. These five overhead clearance projects [W. North Avenue Bridge (PC-1.60); Pennsylvania Avenue Bridge (PC-1.82); Columbus Avenue Bridge (PC-2.17); Washington Avenue Bridge, Swissvale (PT 344.91); and Amtrak Station Canopy (PT-353.20)] have vertical clearance obstructions along the Pittsburgh Line and prevent efficient movement of freight, especially time-sensitive intermodal freight, by rail between Chicago and New York/New Jersey, and specifically through Pennsylvania.

Unused capacity exists on the Pittsburgh Line and these clearance projects will allow the line to accommodate anticipated freight growth while allowing for double-stack intermodal freight to use the Pittsburgh Line in lieu of Norfolk Southern's Monongahela line (Mon Line) south of the rivers. The ability to move this double-stack traffic on the Pittsburgh Line will eliminate exposure to hazardous conditions and delay to time-sensitive freight relating to the unpredictable landslides from adjacent property that occur along the Mon Line.

A community meeting was held in June 2018 to obtain feedback from the community related to the scope of the projects. The community identified noise as a primary concern related to the projects. To address that concern, although noise and vibration analyses may not be needed for the environmental review of these projects, Norfolk Southern elected to conduct this noise and vibration impact assessment to evaluate the potential impacts associated with the projects. This analysis was developed in accordance with Pennsylvania Act 120 of 1970 and is consistent with the Pennsylvania Department of Transportation (PennDOT) Publication 24 "*Project Level Highway Traffic Noise Handbook*", see https://www.dot.state.pa.us/public/pubsforms/Publications/PUB%2024.pdf. Although Publication 24 relates to highway projects, the principles of that guidance have been applied to the analysis of these projects. The United States Environmental Protection Agency (EPA) regulations at 40 C.F.R. Part 201 establish noise emission standards for transportation equipment for interstate rail carriers, and Federal Railroad Administration (FRA) regulations at 49 C.F.R. Parts 210, 222, and 227 establish noise standards for rail equipment and operations. These standards apply to Norfolk Southern's rail operations as a general matter. For environmental analysis of noise for the purpose of Act 120 analysis, PennDOT incorporates Federal Highway Administration (FWHA) processes applicable to highway projects. FHWA processes do not address freight rail. As explained below, for this analysis HMMH has applied Surface Transportation Board (STB) regulations and Federal Transit Administration (FTA) noise and vibration guidance applicable to transit rail projects and/or high-speed rail projects consistent with previous FRA analyses.

Existing noise and vibration levels were measured along the study corridor to establish existing conditions and for use in determining potential impacts applying STB noise assessment guidelines and vibration thresholds per FTA/FRA guidance, specifically the FTA's "Transit Noise and Vibration Impact Assessment Manual" (FTA 2018). Existing sound levels along the corridor are typical of an urban environment with sounds from urban sources, roadways, industrial sources, the existing Norfolk Southern line, and natural sounds.

Existing sound levels are variable depending on distance from sound sources, such as the rail line, but on average are approximately 65 day-night (L_{dn}) [1] A-weighted decibels (dBA). Under the “Build” (with projects) or “No Build” (without projects) future conditions sound levels would increase by an average of approximately 1 decibel (dB) throughout the analysis area, with slightly higher increases occurring under the No Build future conditions due to higher train traffic relative to the future Build conditions. The STB assessment guidelines are being used as a framework only and not because the projects are subject to review under the STB regulations and guidance. In accordance with 49 C.F.R. § 1105.7, STB impact thresholds are based on changes in noise exposure relative to the existing conditions, with an impact occurring if either of these two conditions occur:

1. STB regulations require identifying sensitive receptors where noise levels are increased by 3 decibels (dB) or more as a result of the Project;
2. Or, where sound levels are increased to 65 dBA L_{dn} or greater as a result of the Project.

Noise and vibration impacts were predicted for the train traffic that would result as an indirect effect of the clearance projects in the future under both the Build and No Build under low-growth and high-growth scenarios. The low-growth scenario is based on the 2020 State of Pennsylvania Rail Plan projections for freight trains and the high-growth scenario is based on the 2015 State of Pennsylvania Rail Plan projections for freight traffic. Noise levels would be slightly higher along the Pittsburgh Line under either growth scenario for the No Build scenario than the Build scenario, due to the greater number of single-stack trains that would be required to accommodate future rail traffic demand, as compared to the fewer double-stack trains capable of carrying the same amount of rail freight. Specifically, acoustic modeling identified that 58 less noise sensitive land uses would be impacted under the future Build conditions than under the future No Build conditions under both the low-growth and high-growth scenarios. In addition, all impacted land uses under the future Build conditions would also be impacted under the future No Build conditions.

Vibration from train trips is event based and for this reason is not additive like that of noise. Locomotives are the heaviest component of a train consist (the locomotives and cars in a train) and as such the most intense source of vibration from train pass-by events. The clearance projects will have no direct effect on vibration. Because the vibration source is not changing in intensity no potential indirect effects are predicted throughout the corridor. Additionally, small reductions in the vertical alignment of the Norfolk Southern line under the Build scenario provide negligible reductions in vibration, which would not be appreciably different than the No Build scenario. For these reasons no vibration impacts are predicted.

[1] The Ldn is the average equivalent sound level over a 24 hour period, with a penalty added for noise during the nighttime hours of 22:00 to 07:00. during the nighttime period 10 dB is added.

Contents

Figures

Tables

1 Introduction

The Pittsburgh Vertical Clearance Projects, also referred to as the “Build” conditions or scenario, are comprised of five (5) railway improvement projects on the Pittsburgh and Fort Wayne Rail Lines (together referred to as the Pittsburgh Line), owned and operated by Norfolk Southern Railway Company (Norfolk Southern). The proposed projects address freight capacity and delay constraints through the City of Pittsburgh, Allegheny County, Pennsylvania. Norfolk Southern is a common carrier and the Pittsburgh Line forms a critical component of its route through Pittsburgh between Chicago and the New York/New Jersey commercial markets. These five overhead clearance projects [W. North Avenue Bridge (PC-1.60); Pennsylvania Avenue Bridge (PC-1.82); Columbus Avenue Bridge (PC-2.17); Washington Avenue Bridge, Swissvale (PT 344.91); and Amtrak Station Canopy (PT-353.20)] have vertical clearance obstructions along the Pittsburgh Line and prevent efficient movement of freight, especially time-sensitive intermodal freight, by rail between Chicago and New York/New Jersey, and specifically through Pennsylvania. Unused capacity exists on the Pittsburgh Line and these clearance projects will allow the line to accommodate anticipated freight growth while allowing for double-stack intermodal freight to use the Pittsburgh Line in lieu of Norfolk Southern’s Monongahela line (Mon Line) south of the rivers. The ability to move this double-stack traffic on the Pittsburgh Line will eliminate exposure to hazardous conditions and delay to time-sensitive freight relating to the unpredictable landslides from adjacent property that occur along the Mon Line.

The bridge improvements will not have a direct effect on noise and vibration, but due to community feedback and identification of noise and vibration as an issue of interest and potential indirect effect, Norfolk Southern engaged HMMH to conduct and elected to complete a noise and vibration impact assessment for the length of the rail corridor that encompasses all five of the projects, which is approximately 13 miles in length. This document presents the measured noise and vibration levels for the existing conditions and the predicted noise and vibration impact conditions associated with the projects through this study corridor.

2 Noise and Vibration Basics

2.1 Noise Fundamentals and Descriptors

Noise is typically defined as unwanted or undesirable sound, whereas sound is characterized by small air pressure fluctuations above and below the atmospheric pressure. The basic parameters of environmental noise that affect human subjective response are (1) intensity or level, (2) frequency content and (3) variation with time. The first parameter is determined by how greatly the sound pressure fluctuates above and below the atmospheric pressure and is expressed on a compressed scale in units of decibels. By using this scale, the range of normally encountered sound can be expressed by values between 0 and 120 decibels. On a relative basis, a 3-decibel change in sound level generally represents a barely noticeable change outside the laboratory, whereas a 10-decibel change in sound level would typically be perceived as a doubling (or halving) in the loudness of a sound. A 5-decibel change is readily noticeable by people with average hearing.

The frequency content of noise is related to the tone or pitch of the sound and is expressed based on the rate of the air pressure fluctuation in terms of cycles per second (called Hertz and abbreviated as Hz). The human ear can detect a wide range of frequencies from about 20 Hz to 17,000 Hz. However, because the sensitivity of human hearing varies with frequency, the A-weighting system is commonly used when measuring environmental noise to provide a single number descriptor that correlates with human subjective response. Sound levels measured using this weighting system are called "A-weighted" sound levels and are expressed in decibel notation as "dBA." The A-weighted sound level is widely accepted by acousticians as a proper unit for describing environmental noise. To indicate what various noise levels represent, Figure 1 shows typical A-weighted sound levels for both rail and non-rail sources. As indicated on this figure, most commonly encountered outdoor noise sources generate sound levels within the range of 60 dBA to 90 dBA at a distance of 50 feet.

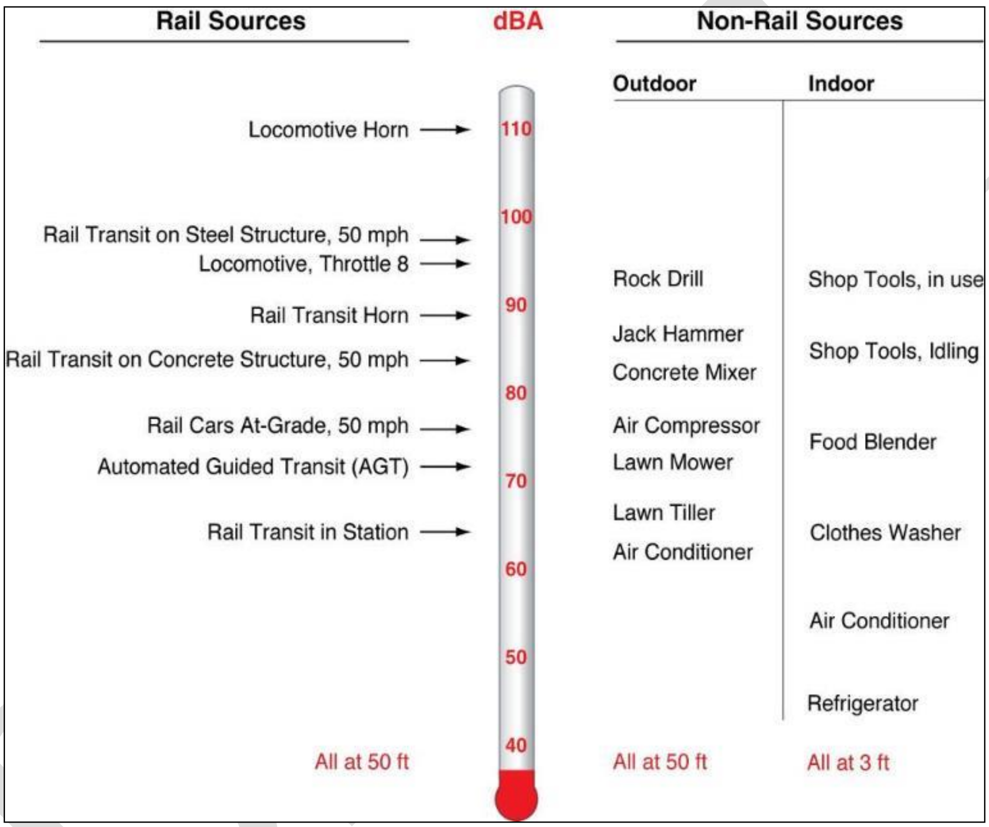


Figure 1. Weighted Sound Levels

Because environmental noise fluctuates from moment to moment, it is common practice to condense all of this information into a single number, called the “equivalent” sound level (L_{eq}). L_{eq} can be thought of as the steady sound level that represents the same sound energy as the varying sound levels over a specified time period (typically 1 hour or 24 hours). Often, the L_{eq} values over a 24-hour period are used to calculate cumulative noise exposure in terms of the Day-Night Sound Level (L_{dn}). L_{dn} is the A-weighed L_{eq} over a 24-hour period with an adjustment factor for noise during the nighttime hours (between 10:00 PM and 7:00 AM) to account for the greater sensitivity of most people to noise during the night. The effect of nighttime adjustment is that one nighttime event, such as a train passing by between 10:00 P.M. and 7:00 A.M., is equivalent to 10 similar events during the daytime. Figure 2 provides examples of typical noise environments and criteria in terms of L_{dn}. While the extremes of L_{dn} are shown to range from 35 dBA in a wilderness environment to 85 dBA in noisy urban environments, L_{dn} is generally found to range between 55 dBA and 75 dBA in most communities.

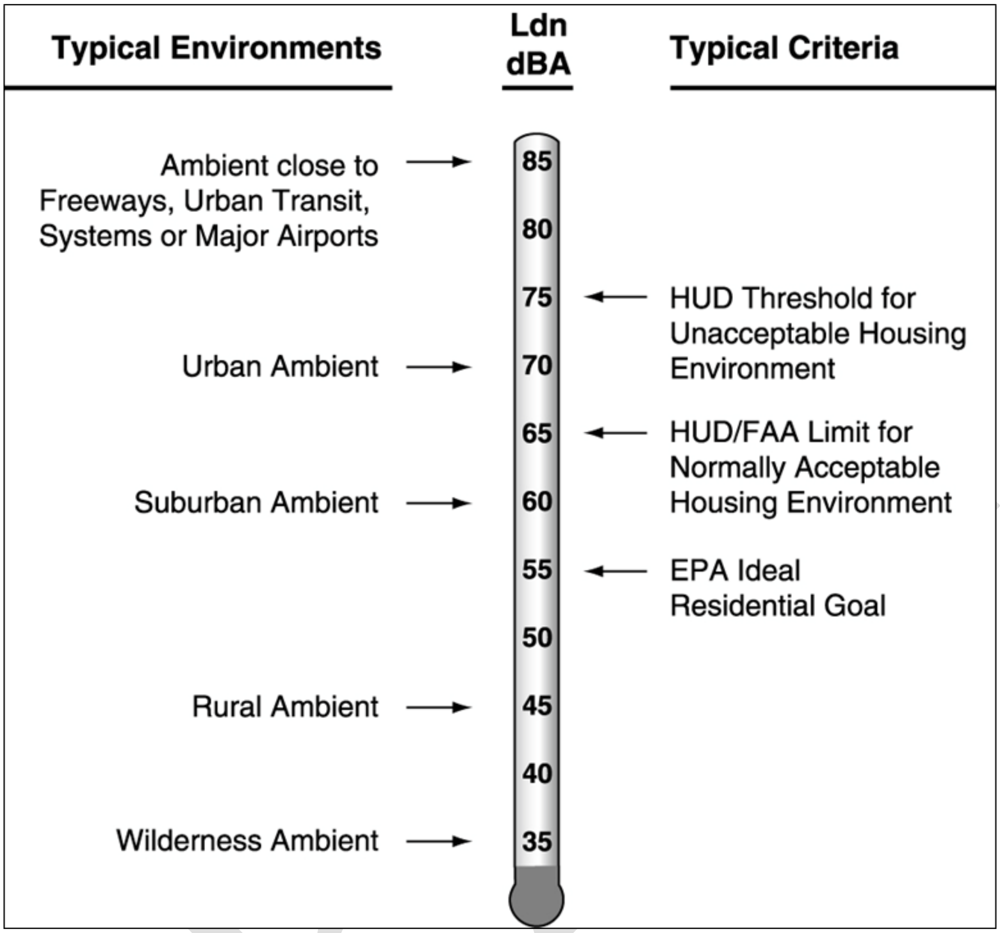


Figure 2. Examples of Typical Outdoor Noise Exposure

2.2 Ground-Borne Vibration Fundamentals and Descriptors

Ground-borne vibration is the oscillatory motion of the ground about some equilibrium position that can be described in terms of displacement, velocity or acceleration. Because sensitivity to vibration typically corresponds to the amplitude of vibration velocity within the low-frequency range of most concern for environmental vibration (roughly 5-100 Hz), velocity is the preferred measure for evaluating ground-borne vibration from transit projects.

The most common measure used to quantify vibration amplitude is the peak particle velocity (PPV), defined as the maximum instantaneous peak of the vibratory motion. PPV is typically used in monitoring blasting and other types of construction-generated vibration, since it is related to the stresses experienced by building components. Although PPV is appropriate for evaluating building damage, it is less suitable for evaluating human response, which is better related to the average vibration amplitude. Thus, ground-borne vibration from transit systems is usually characterized in terms of the "smoothed" root mean square (rms) vibration velocity level, in decibels (VdB), with a reference quantity of one micro-inch per second. VdB is used in place of dB to avoid confusing vibration decibels with sound decibels.

Figure 3 illustrates typical ground-borne vibration levels for common sources as well as criteria for human and structural response to ground-borne vibration. As shown, the range of interest is from approximately 50 to 100 VdB, from imperceptible background vibration to the threshold of damage. Although the approximate threshold of human perception to vibration is 65 VdB, annoyance is usually not significant unless the vibration exceeds 70 VdB.

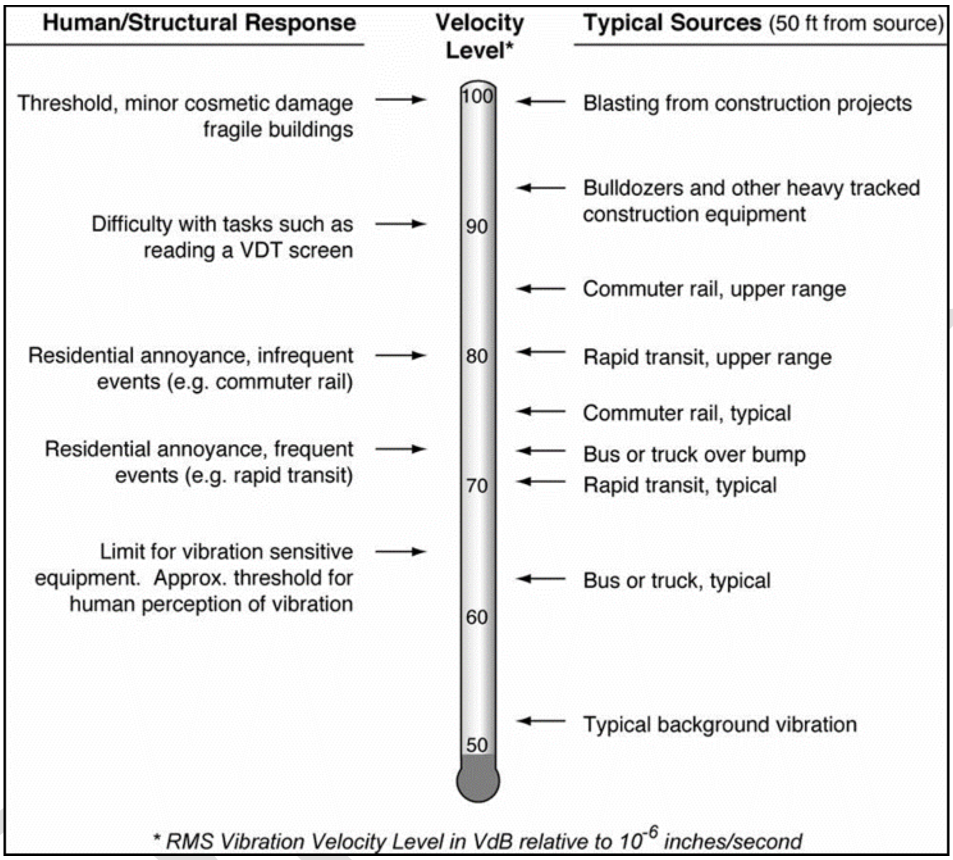


Figure 3. Typical Ground Borne Vibration Levels and Criteria

3 Noise and Vibration Impact Criteria

The following sections are included for informational purposes, to provide context for the noise and vibration levels discussed in this document. The noise assessments for these projects are based on U.S. Surface Transportation Board (STB) provisions for Procedures for Implementation of Environmental Laws in 49 C.F.R. 1105.7 and the noise and vibration impact criteria defined in the U.S. Federal Transit Administration (FTA) guidance manual, *Transit Noise and Vibration Impact Assessment* (FTA 2018) ("FTA Manual"). The Federal Railroad Administration (FRA) has applied methodology used in the FTA Manual for use on freight rail projects for environmental analysis. The FTA Manual sets forth methodologies for analyzing noise and vibration from commuter and intercity rail operations and as such are the standard methodology for assessing potential impacts of new rail bridges and transit systems. Consequently, these impact criteria were utilized in the project's noise and vibration analysis.

3.1 Rail Noise Criteria

STB noise assessment guidelines are provided in 49 C.F.R. 1105.7(e) and are based on changes in noise exposure as compared to conditions that would exist without a proposed project. STB regulations involve noise assessment guidelines in cases where STB authorization is required for certain changes in freight rail operations. The STB regulations serve as a framework for analysis because they relate specifically to impacts from changes in rail operations; the Pittsburgh Vertical Clearance Projects are not subject to STB review and do not require any federal authorizations.

The STB criteria have two conditions to determine potential impacts:

1. STB regulations require identifying sensitive receptors where noise levels are increased by 3 decibels (dB) or more as a result of the Project;
2. Or, where sound levels are increased to 65 dBA L_{dn} or greater as a result of the Project.

49 C.F.R. § 1105.7.

Where a noise increase is below 3 dB, analysis is not specified by STB regulations due to the low potential for impact. However, both components together resulting in a 3 dB increase or greater and an overall 65 dBA L_{dn} or greater level must be met in order to consider an increase to be a potentially adverse noise impact (STB 1998). Both of these components (3 dB increase or 65 dBA L_{dn}) are employed to determine whether a potential noise impact should be included in environmental reports.

The FTA Manual provides procedures for predicting and assessing noise and vibration impacts of proposed transit projects for different stages of project development and different levels of analysis. As noted above, freight rail noise regulations are met by the Norfolk Southern fleet and are found at EPA regulations at 40 C.F.R. Part 201, and FRA regulations at 49 C.F.R. Parts 210, 222, and 227. The FTA Manual is intended for use in transit projects funded by FTA which include buses, trolleys, commuter and light rail, but not freight rail. STB regulations address procedures for environmental analysis of potential freight rail noise. (See 49 C.F.R. § 1105.7.) Similar to the STB regulations, the FTA Manual is not applicable here because the FTA has no jurisdiction over the projects, but the guidelines provide a framework for noise and vibration analyses for these projects.

Generally, the FTA Manual provides methods for determining potential effects, conducting screening and noise and vibration analyses, and determining noise and vibration impacts. A first step in determining potential effect includes an evaluation of land use categories. The FTA Manual provides procedures for predicting and assessing noise and vibration impacts of proposed transit projects for different stages of project development and different levels of analysis (FTA 2018).

FTA provides a screening level noise analysis that provides distances from freight rail lines where impacts may occur. If no noise-sensitive land uses or receivers are present in the area, then no further noise assessment is needed. If noise sensitive land uses are identified within the screening distance, FTA projects can select to conduct either a “General Assessment” or a “Detailed Assessment” of noise impacts. To identify noise impacts the FTA Manual provides a sliding scale of potential impact based on existing noise exposure that are measured and/or estimated at each of the noise sensitive land uses. Unlike the STB procedures, the FTA analysis is variable depending on existing noise exposure. Predicted sound levels that are modeled to potentially result from a given project are compared to existing noise levels at sensitive land uses to identify the potential net increase in noise that would result from the project and without the project.

For noise analyses from freight railroads for the type of modeling assessment such as in the case of the projects, the most applicable regulations are the STB freight rail noise assessment procedures. This analysis has applied the STB regulations while adapting FTA's noise sensitive land use categories as defined in the FTA Manual which are provided Table 1. For example, the STB regulations require analysis at the following noise sensitive land uses which correspond to either FTA Land Use Category 2 or 3 as follows:

- Hospitals, residences, retirement communities, and nursing homes (FTA 2)
- Schools, parks (passive), and libraries (FTA 3)

FTA Land Use Category 1 includes land uses where quiet is an essential element of their intended purpose. These land uses are somewhat uncommon and would include things like the Tomb of the Unknown Soldier; whereas parks, such as the Allegheny Commons, would fall into FTA Category 3. There are no FTA Land Use Category 1 properties in the analysis area for this study.

Table 1. FTA Land Use Categories

Land Use Category	Description of Land Use Category
1	Tracts of land where quiet is an essential element in of its their intended purpose. Example land uses include preserved land for serenity and quiet, outdoor amphitheaters and concert pavilions, and as well as National Historic Landmarks with considerable outdoor use. Recording studios and concert halls are also included in this category.
2	This category is applicable to all residential land use and buildings where people normally sleep, such as hotels and hospitals.
3	This category is applicable to Institutional land uses with primarily daytime and evening use. Example land uses include schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds and recreational facilities are included in this category.

Source: Transit Noise and Vibration Impact Assessment Manual, FTA, September 2018, Table 4-3 at p. 23

In addition to the STB thresholds for railroad projects, locomotive noise is governed by U.S. Environmental Protection Agency regulations Part 201, Subpart B Interstate Rail Carrier Operations Standards. EPA's criteria establish standards for interstate rail carriers promulgated under Federal law, 42 U.S.C. § 7641, Noise Abatement, as follows:

- Locomotives produce A-weighted sound levels at 96 dB or lower when moving at any time or under any condition of grade, load, acceleration, or deceleration, when measured in accordance with the criteria specified in Subpart C of this regulation with fast meter response at 30 meters (100 feet) from the centerline of any section of track having less than a two (2) degree curve (or a radius of curvature greater than 873 meters (2865 feet)).
- Locomotives or locomotive combinations produce A-weighted sound levels at 90 dB or lower when moving at any time or under any condition of grade, load, acceleration, or deceleration, when measured in accordance with the criteria specified in Subpart C of this part with fast meter

response at 30 meters (100 feet) from the centerline of any section of track having less than a two (2) degree curve (or a radius of curvature greater than 873 meters (2,865 feet)).

• Switcher locomotives produce A-weighted sound levels at 90 dB or below when moving at any time or under any condition of grade, load, acceleration or deceleration, and when measured in accordance with the criteria in Subpart C of this part with fast meter response at 30 meters (100 feet) from the centerline of any section of track having less than a two (2) degree curve (or a radius of curvature greater than 873 meters (2,865 feet)).

These Federal requirements are not changed or altered by an individual project assessment such as this noise assessment which is developed to assess potential for impacts of a project subject to review under Pennsylvania Act 120 of 1970.

3.2 Rail Ground-Borne Vibration Criteria

The FTA ground-borne vibration impact criteria are based on land use and operational frequency, as shown in Table 2 and are given in terms of the maximum RMS vibration level for an event. The ground-borne vibration criteria are based on levels that may cause human annoyance. The FTA criteria were developed for transit rail use, not freight rail, and are therefore applied here as a guideline as opposed to the federally required criteria.

FTA guidance provides that when the project will cause vibration more than 5 VdB above the existing vibration, "the existing source can be ignored" and the standard vibration criteria are appropriate. When the project will cause vibration less than 5 VdB above the existing vibration level, FTA guidance provides assessment methodology accounting for existing vibration (FTA Manual, at 127). For a project or project segment with "frequent events" (defined as more than 70 events per day), the FTA Manual states that for rail in heavily used areas (greater than 12 trains/day), an approximate doubling of the events is required for determination that there is a significant increase. Otherwise, the thresholds in Table 2 should be applied to determine potential for impact. Again, these FTA criteria apply to transit, not freight rail operations, but are being applied in this modeling analysis as a conservative approach.

Table 2. FTA Ground-Borne Vibration and Ground-Borne Noise Impact Criteria for General Vibration Assessment

Land Use Category	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch /sec)			Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibrations would interfere with interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[4]	N/A[4]	N/A[4]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

(1) "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most freight rail projects fall into this category.

(2) "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.

(3) "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.

(4) This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

(5) Vibration-sensitive equipment is generally not sensitive to ground-borne noise.

Source: FTA Manual, September 2018, Table 6-3, p. 126

Unlike noise analysis, the FTA vibration assessment is per event, and there is not a methodology to average daily events such as with the noise L_{dn}. Thus, the FTA analytical approach is intended to assess vibration for specific events.

4 Existing Conditions

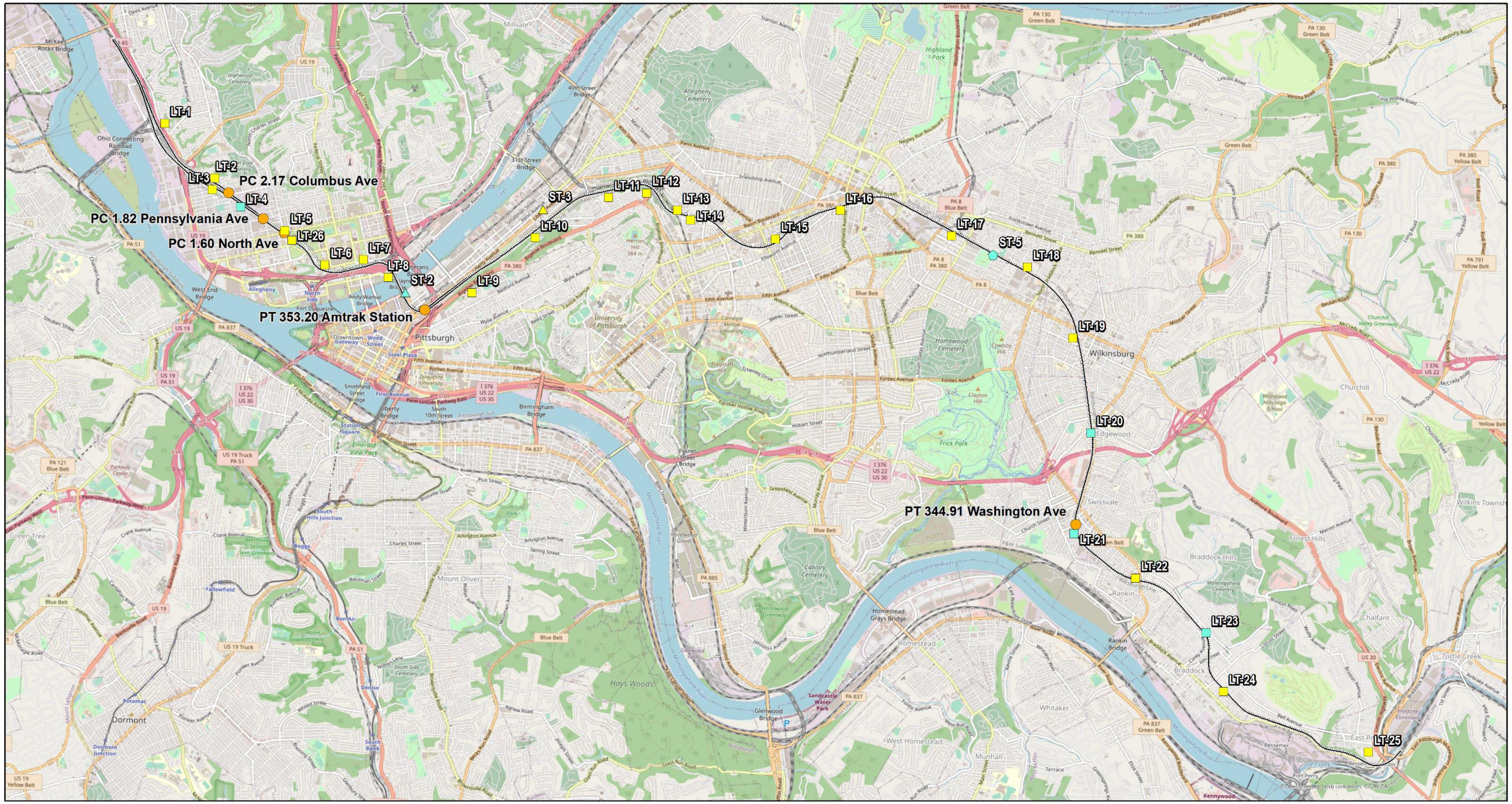
4.1 Noise Environment

The existing noise environment along the study corridor varies depending on proximity to, and occurrence of, sound sources. The dominant sound sources are rail traffic and roadway traffic, with local community noise and air traffic as secondary sources. Land use along the corridor principally falls within Category 2, which includes residential land uses, hotels, hospitals and other land uses with nighttime sensitivity. There are scattered Category 3 land uses, which are primarily churches and passive parks. The Martin Luther King Jr. East Busway is a transit use adjacent to much of the corridor under analysis and provides public bus transportation services for the City. The projects are limited to the bridges being improved to address vertical obstructions. The bridge improvements do not have direct effects on noise with the exception of temporary construction related potential effects. This analysis is being performed to assess the potential for indirect effects relating to changes in rail traffic and consequent potential vibration effects of those changes. Due to the greater capacity of double-stack intermodal trains and associated increases in freight rail efficiency, the analysis shows a long-term decrease in train trips and associated decrease in noise. The analysis included identification of changes in noise in accordance with STB assessment guidelines and potential sensitive receptors.

A baseline sound level survey was conducted throughout the study corridor to establish the existing sound levels and to determine applicable thresholds (see Section 3) for the projects. HMMH established plans for pre-project noise monitoring to establish baseline noise levels at sensitive locations. Sound was measured at these locations, which are depicted in Figures 6-41, Noise Assessment Maps. The sound measurement locations were selected to be representative of the noise sensitive areas of Category 2 and 3 land uses along the study corridor (and not necessarily near one of the project locations), and at locations most likely to be exposed to higher levels of train noise such as those near the railroad. At each site, the measurement microphone was positioned to characterize the exposure of the site to the dominant noise sources in the area. Brüel & Kjær noise monitors (models 2245, 2250 and 2270) were used for gathering noise data. The noise measurement locations are shown in Figure 4.

The results of the existing ambient noise measurements are summarized in Table 3 below. Narrative descriptions are provided in the paragraphs that follow. Appendix A and B provide additional detail on the monitoring locations and results.

Figure 4. Overview of Project Area and Measurement Locations



Miles
0 0.25 0.5 1

Existing Rail
Project Improvement Locations

Measurement Locations
- Long-Term Noise Measurement
- Long-Term Noise and Short-Term Vibration Measurement
- Short-Term Noise Measurement
- Short-Term Noise and Vibration Measurement
- Short-Term Vibration Measurement

Norfolk Southern Vertical Clearance Project
Pittsburgh Metropolitan Area, Pennsylvania

Overview of Project Area and Measurement Locations

Table 3. Summary of Existing Ambient Noise Measurement Results

Site No.	Measurement Location	Start of Measurement		Meas. Duration (hrs)	Existing Sound Exposure (dBA)						
		Date	Time		L_{dn}	Peak Hour L_{eq}	$L_{eq\ (day)}$	$L_{eq\ (night)}$	L_{10}	L_{50}	L_{90}
LT-1	2462 California Avenue	12/6/2018	10:11	24	70.6	68.6	62.1	64.3	68.3	64.1	54.4
LT-2	1234 Sunday Street	12/6/2018	10:27	24	65.9	63.5	56.5	58.7	65.0	58.2	47.9
LT-3*	1907 Fulton Street	12/11/2018	12:34	24	62.9	72.4	58.5	58.5	57.8	55.0	52.8
LT-4	1016 N. Franklin Street	12/6/2018	9:35	3	64.3	62.1	54.4	56.6	60.6	52.4	48.1
LT-5	710 W. North Avenue	12/12/2018	10:32	24	71.2	71.0	62.4	64.6	68.5	62.4	54.7
LT-6	410 W. Commons	12/12/2018	11:03	24	68.9	68.2	60.5	62.7	65.0	57.9	53.7
LT-7*	301 Cedar Avenue	12/12/2018	13.38	3	63.5	62.8	59.2	59.4	59.3	55.9	54.0
LT-8	100 Anderson Street	12/12/2018	10:00	24	67.1	65.0	58.1	60.3	64.9	58.2	53.0
LT-9	1846 Arcena Street	12/11/2018	11:00	24	59.5	58.4	48.9	51.1	57.1	53.6	47.8
LT-10	2630 Brereton Street	12/11/2018	9:42	24	59.4	64.7	48.7	50.9	55.3	51.6	46.2
LT-11	3415 Flavian Street	12/6/2018	8:38	24	61.2	60.0	51.6	53.8	56.5	47.8	42.2
LT-12	3811 Fleetwood Street	12/3/2018	11:26	24	59.3	59.9	49.1	51.3	59.1	49.9	43.1
LT-13	4732 Juniper Street	12/6/2018	9:01	24	65.1	66.4	56.2	58.4	58.9	49.7	42.4
LT-14	15 Hemingway Street	12/11/2018	11:00	24	66.3	69.9	55.9	58.1	61.3	46.8	38.8
LT-15	5445 Potter Street	12/11/2018	9:08	24	58.8	57.5	48.9	51.1	51.7	46.4	44.0
LT-16	205 Lehigh Avenue	12/11/2018	9:00	24	59.0	59.3	49.5	51.7	53.4	50.1	47.6
LT-17	6736 Simonton Street	12/3/2018	11:56	24	62.1	60.8	52.7	55.0	56.5	48.2	40.8
LT-18	7357 Finance Street	12/3/2018	12:21	24	61.4	61.1	52.2	54.4	60.8	45.9	35.2
LT-19	444 Ross Avenue	12/4/2018	14:03	24	60.8	65.3	51.3	53.5	52.7	43.4	36.5
LT-20	1 Pennwood Avenue	12/3/2018	12:52	24	72.1	71.4	61.9	64.1	60.9	51.8	40.1
LT-21	Park Avenue	12/4/2018	14:37	24	67.3	70.7	58.4	60.6	54.4	44.2	33.8
LT-22	McKim Street	12/3/2018	10:26	24	74.9	76.2	64.0	66.2	60.8	53.7	41.6
LT-23	504 Hawkins Avenue	12/4/2018	15:34	24	71.5	75.7	60.4	62.6	51.4	42.6	35.2
LT-24	431 Verona Street	12/4/2018	15:52	24	68.2	68.5	59.4	61.6	56.1	52.7	49.3
LT-25	300 Main Street	12/4/2018	16:33	24	64.7	67.0	53.6	55.9	60.4	52.9	45.0
LT-26	Allegheny Commons Park West (Iron Deer Playground)	4/13/2022	21:53	24	74.2	72.3	64.8	68.1	59.2	50.8	47.2
ST-2	1000 Ft. Duquesne Blvd.	12/12/2018	14:55	0.5	N/A	70.6	N/A	N/A	74.8	65.9	59.8
ST-3	2901 Liberty Avenue	12/12/2018	15:44	0.5	N/A	60.5	N/A	N/A	63.2	59.8	54.7

Note: *Estimated using 1-hour samples during peak hour, midday, and nighttime.
Source: Harris Miller Miller & Hanson Inc., 2018

Site LT-1: 2462 California Avenue. The L_{dn} measured over a 24-hour period in the front yard of this single-family residence was 70.6 dBA. Marine traffic on the Ohio River, local roadway traffic on California Avenue and Highway 65, and rail traffic on the Norfolk Southern rail line contribute to the noise environment at this location. The peak hour L_{eq} sound level at this location was 68.6 dBA.

Site LT-2: 1234 Sunday Street. The L_{dn} measured over a 24-hour period in the side yard of this single-family residence was 65.9 dBA. Local roadway traffic on California Avenue and rail traffic on the Norfolk

Southern rail line contribute to the noise environment at this location. The peak hour L_{eq} sound level at this location was 63.5 dBA.

Site LT-3: 1907 Fulton Street. The L_{dn} estimated for a period of 24 hours, using 1-hour samples on the public rights of way (sidewalk), was 62.9 dBA. Local roadway traffic on Fulton and Adams Streets and rail traffic on the Norfolk Southern line contribute to the noise environment at this location. The peak hour L_{eq} at this location was 72.4 dBA.

Site LT-4: 1016 North Franklin Street. The L_{dn} measured over a 24-hour period in the side yard of this single-family residence was 64.3 dBA. Local roadway traffic on North Franklin Street and Allegheny Avenue and rail traffic on the Norfolk Southern line contribute to the noise environment at this location. The peak hour L_{eq} at this location was 62.1 dBA.

Site LT-5: 710 W. North Avenue. The L_{dn} measured over a 24-hour period from a southwest-facing balcony on the 8th floor of this apartment building was 71.2 dBA. Local roadway traffic on W. North Avenue and Brighton Road and rail traffic on the Norfolk Southern line contribute to the noise environment at this location. The peak hour L_{eq} at this location was 71.0 dBA.

Site LT-6: 401 West Commons. The L_{dn} measured over a 24-hour period in the front yard area of this retirement community was 68.9 dBA. The Norfolk Southern line and local roadway traffic on South Commons and Interstate 279 contribute to the noise environment at this location. The peak hour L_{eq} at this location was 68.2 dBA.

Site LT-7: 301 Cedar Avenue. The L_{dn} 63.5 dBA at this site was estimated using 1-hour samples from the sidewalk adjacent to an unoccupied public swimming pool complex. Local roadway traffic on Cedar and Stockton Avenues, as well as Canal Street, Anderson Street and East Commons contribute to the noise environment at this location, in addition to rail traffic on the Norfolk Southern line. The peak hour L_{eq} at this location was 62.8 dBA.

Site LT-8: 100 Anderson Street. The L_{dn} measured over a 24-hour period on the property of this riverfront apartment complex was 67.1 dBA. Freight trains on the Norfolk Southern rail line and local roadway traffic on River Avenue and Interstate 279 contribute to the noise environment at this location. Marine traffic on the Ohio River also contributed to the noise level. The peak hour L_{eq} at this location was 65.0 dBA.

Site LT-9: 1846 Arcena Street. The L_{dn} measured over a 24-hour period in the front yard of this single-family residence was 59.5 dBA. Rail traffic on the Norfolk Southern line and roadway traffic on Bigelow Boulevard and the East Busway contribute to the noise environment at this location. The peak hour L_{eq} at this location was 58.4 dBA.

Site LT-10: 2630 Brereton Street. The L_{dn} measured over a 24-hour period in the side yard of this single-family residence was 59.4 dBA. Rail traffic on the Norfolk Southern line and local roadway traffic on Brereton Street and the East Busway contribute to the noise environment at this location. The peak hour L_{eq} at this location was 64.7 dBA.

Site LT-11: 3415 Flavian Street. The L_{dn} measured over a 24-hour period in the side yard of this single-family residence was 61.2 dBA. Rail traffic on the Norfolk Southern line, bus transit on the East Busway and roadway traffic on local roads contribute to the noise environment at this location. The peak hour L_{eq} at this location was 60.0 dBA.

Site LT-12: 3811 Melwood Avenue. The L_{dn} measured over a 24-hour period in this undeveloped tax lot adjacent to single family residences was 59.3 dBA. Rail traffic on the Norfolk Southern line and local roadway traffic on Melwood Avenue and the Bloomfield Bridge contribute to the noise environment at this location. The peak hour L_{eq} at this location was 59.9 dBA.

Site LT-13: 4732 Juniper Street. The L_{dn} measured over a 24-hour period in the back yard of this single-family residence was 65.1 dBA. Rail traffic on the Norfolk Southern line and local roadway traffic on Juniper Street and the East Busway contribute to the noise environment at this location. The peak hour L_{eq} at this location was 66.4 dBA.

Site LT-14: 15 Hemingway Street. The L_{dn} measured over a 24-hour period in the rear yard of this multi-family townhome was 66.3 dBA. Rail traffic on the Norfolk Southern line and local roadway traffic on the East Busway contribute to the noise environment at this location. The peak hour L_{eq} at this location was 69.9 dBA.

Site LT-15: 5445 Potter Street. The L_{dn} measured over a 24-hour period in the back yard, behind the row of buildings, at this multi-family residence was 58.8 dBA. Rail traffic on the Norfolk Southern line and roadway traffic on the East Busway and Porter Street contribute to the noise environment at this location. The peak hour L_{eq} at this location was 57.5 dBA.

Site LT-16: 205 Lehigh Avenue. The L_{dn} measured over a 24-hour period in the back yard, behind the first row of residential structures, of this multi-family residence was 59.0 dBA. Rail traffic on the Norfolk Southern line and roadway traffic on the East Busway, Lehigh Way, Greenbriar Way, and Ellsworth Avenue contribute to the noise environment at this location. The peak hour L_{eq} at this location was 59.3 dBA.

Site LT-17: 6736 Simonton Street. The L_{dn} measured over a 24-hour period in this vacant, residentially zoned lot was 62.1 dBA. Rail traffic on the Norfolk Southern line and local roadway traffic on Simonton Street and North Linden Avenue contribute to the noise environment at this location. The peak hour L_{eq} at this location was 60.8 dBA.

Site LT-18: 7357 Finance Street. The L_{dn} measured over a 24-hour period in the front yard of this single-family residence was 61.4 dBA. Rail traffic on the Norfolk Southern line and roadway traffic on Finance Street and the East Busway contribute to the noise environment at this location. The peak hour L_{eq} at this location was 61.1 dBA.

Site LT-19: 444 Ross Avenue. The L_{dn} measured over a 24-hour period in the back yard of this single-family residence was 60.8 dBA. Rail traffic on the Norfolk Southern line and roadway traffic on Ross and Pennwood Avenues contribute to the noise environment at this location. The peak hour L_{eq} at this location was 65.3 dBA.

Site LT-20: 1 Pennwood Avenue. The L_{dn} measured over a 24-hour period in the rear outdoor storage area of the C.C. Mellor Memorial Library was 72.1 dBA. Rail traffic on the Norfolk Southern line in addition to local roadway traffic on Pennwood Avenue, Edgewood Avenue and the East Busway contribute to the noise environment at this location. The peak hour L_{eq} at this location was 71.4 dBA.

Site LT-21: 7499 Park Avenue. The L_{dn} measured over a 24-hour period in this public-use park area was 67.3 dBA. Rail traffic on the Norfolk Southern line and local roadway traffic on Park Avenue, Palmer Street and the East Busway contribute to the noise environment at this location. The peak hour L_{eq} at this location was 70.7 dBA.

Site LT-22: 2501 McKim Street. The L_{dn} measured over a 24-hour period in this road-facing wooded area was 74.9 dBA. Rail traffic on the Norfolk Southern line and bus transit on the East Busway contribute to the noise environment at this location. The peak hour L_{eq} at this location was 76.2 dBA.

Site LT-23: 504 Hawkins Avenue. The L_{dn} measured over a 24-hour period in the back yard of this single-family residence was 71.5 dBA. Rail traffic on the Norfolk Southern line and local roadway traffic on Hawkins Avenue contribute to the noise environment at this location. The peak hour L_{eq} at this location was 75.7 dBA.

Site LT-24: 431 Verona Street. The L_{dn} measured over a 24-hour period in the back yard of this single-family residence was 68.2 dBA. Rail traffic on the Norfolk Southern line and local roadway traffic on Ash Street contribute to the noise environment at this location. The peak L_{eq} at this location was 68.5 dBA.

Site LT-25: 300 Main Street. The L_{dn} measured over a 24-hour period in this wooded area abutting a public park was 64.7 dBA. Rail traffic on the Norfolk Southern line, which includes the use of locomotive warning horns at a nearby public grade crossing, and local roadway traffic on Bluff Street contribute to the noise environment at this location. The peak hour L_{eq} at this location was 67.0 dBA.

Site LT-26: Iron Deer Playground (a.k.a., Deer Pit Playground) at Allegheny Commons Park West. The L_{dn} measured over a 24-hour period in the park near the playground adjacent to the railroad was 74.2 dBA. Rail traffic on the Norfolk Southern line and local roadway traffic on Brighton Road and Ohio Street contribute to the noise environment at this location. The peak hour L_{eq} at this location was 72.3 dBA.

Site ST-2: The L_{eq} measured over a 30-minute period was 70.6 dBA. This site was located in a public park area northwest of the intersection of Fort Duquesne Boulevard and Fort Wayne Bridge. A short-term 30-minute long noise measurement was completed at this public open space site during peak-hour conditions. Two train events crossing the Fort Wayne Bridge and relatively heavy roadway traffic on Fort Duquesne Boulevard were the dominant sound sources during the measurement.

Site ST-3: Denny Park. A short-term 30-minute-long noise measurement was completed at this public park during peak-hour conditions and measured 60.5 dBA L_{eq}. One train event crossing, in addition to relatively heavy roadway traffic on Liberty Avenue were the dominant sound sources during the measurement.

4.2 Existing Vibration Environment

The existing vibration environment in the vicinity of the Norfolk Southern railway in Pittsburgh varies with proximity to rail lines. To characterize existing vibration levels, measurements were obtained at the same locations where noise measurements were completed at LT-4, LT-20, LT-21, LT-23, and ST-2, and only vibrations were measured at ST-5, each of which are vibration sensitive uses or are representative of vibration sensitive uses. Vibration measurements were obtained from train pass-by events to determine if ground propagation characteristics are typical for the study corridor. Measurements were completed using a PCB 393A and 393C accelerometers and Brüel & Kjær noise and vibration monitors (model 2270). Two vibration accelerometers were deployed at each measurement site to obtain samples of vibration attenuation rates as a function of distance. Typically, the sensor situated nearest to the Norfolk Southern train tracks ("near sensor") was located approximately 25 feet closer to the tracks than the sensor placed further away ("far sensor"). The vibration measurement locations are shown in Figure 4. Overview of Project Area and Measurement Locations, and the distances from the train tracks for each sensor are provided in Table 4. Summary of Existing Vibration Measurements, along with the maximum measured vibration levels (VdB).

Table 4. Summary of Existing Vibration Measurements

Site No.	Measurement Location Description	Date/Time	Near Sensor Distance (feet)[1]	Far Sensor Distance (feet)[1]	Max VdB (near)	Max VdB (far)
LT-4	1016 N. Franklin Street	12/13/2018 10:16	75	94	80.8	79.7
LT-20	1 Pennwood Avenue	12/3/2018 15:53	60	85	85.2	83.5
LT-21	Park Avenue	12/5/2018 13:26	70	95	80.1	83.3
LT-23	504 Hawkins Avenue	12/5/2018 15:00	75	100	82.3	78.6
ST-2	1000 Ft. Duquesne Blvd. Fort Wayne Bridge	12/12/2018 14:33	11.0	30	80.9	80.6
ST-2	1000 Ft. Duquesne Blvd. Fort Wayne Bridge	12/12/2018 14:50	11.0	30	80.9	76.8
ST-5	7051 Thomas Blvd.	12/5/2018 10:59	60	85	83.7	80.5

1. As measured from nearest rail.
Source: Harris Miller Miller & Hanson Inc., 2018

Site LT-4: 1016 North Franklin Street. Vibration sensors were deployed at locations 75 feet and 94 feet from the nearest track. One train pass-by event with a speed 30 mph was observed. The train was comprised of three locomotives and 115 rail cars.

Site LT-20: 1 Pennwood Avenue. Vibration sensors were placed at locations 60 feet and 85 feet from the nearest track. One train pass-by event with a speed of 20 mph was monitored. The train included two locomotives and no rail cars.

Site LT-21: Park Avenue. Vibration sensors were deployed at locations 70 feet and 95 feet from the nearest track. One train pass-by event with a speed of 35 mph was observed in which the train was comprised of four locomotives and 143 rail cars.

Site LT-23: 504 Hawkins Avenue. Vibration sensors were deployed at locations 75 feet and 100 feet from the nearest track. One train pass-by event with a speed of 20 mph was monitored. The train included 2 locomotives and 100 rail cars.

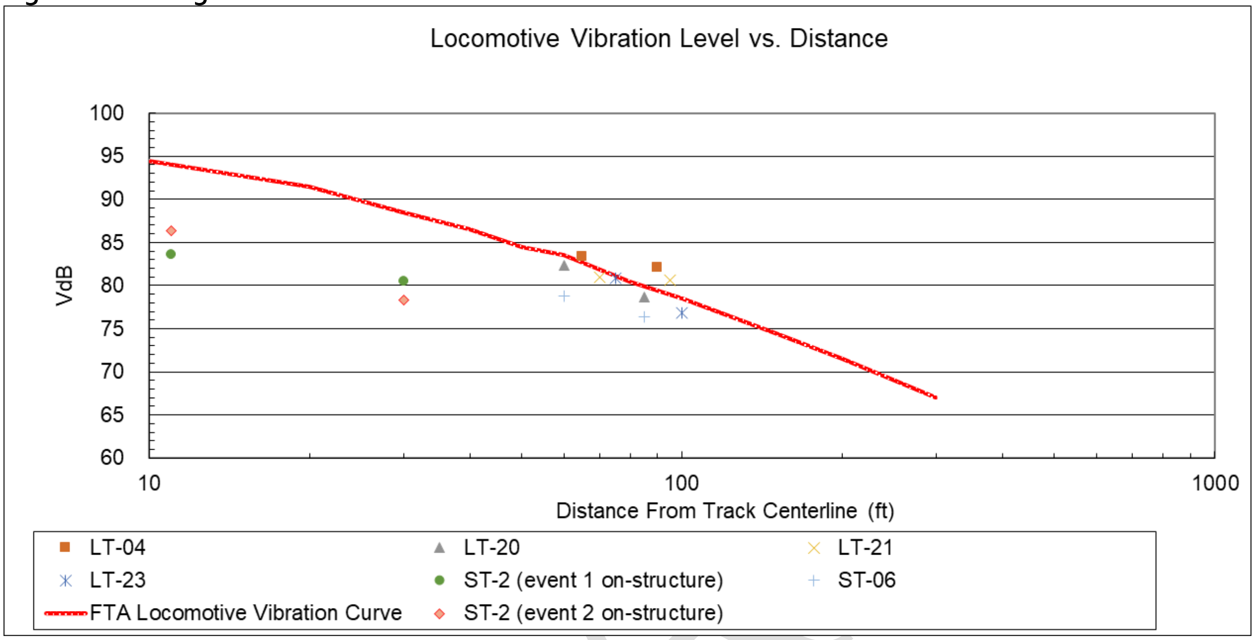
Site ST-2: One vibration sensor was located at the base of the concrete footing of the Fort Wayne Bridge and the second sensor was placed 19 feet away from the structure. Two train pass-by events were monitored. The first event included a train consisted of two locomotives and no rail cars and the second event included a train that was comprised of 2 locomotives and 150 rail cars. The speed of the first event was 11 mph and the speed of the second event was 20 mph.

Site ST-5 : This vibration-only measurement was completed at Westinghouse Park. Vibration sensors were located at locations 60 feet and 85 feet from the nearest track. One train pass-by event with a speed of 25 mph was monitored of a train with two locomotives and 54 rail cars.

Measurement data were normalized by adjusting vibration levels to match the reference speed of 50 mph for a diesel electric locomotive which is the heaviest component of each train and generally results in the highest vibration levels. The normalized vibration levels were plotted on a graph (Figure 5) and compared to the general vibration curve for diesel locomotives obtained from the FTA Manual. As Figure 5 demonstrates, all of the vibration measurements of trains operating on the ground show good agreement with the general locomotive vibration curve except for the vibration measurements near the

Fort Wayne Bridge (Site ST-2). These measurements are approximately 8 to 10 VdB lower than the general vibration curve for locomotives. The FTA Manual indicates that trains operating on structure typically result in vibration levels 10 VdB lower than those operating on the ground; therefore, these measurements show that the FTA adjustment factor of -10 VdB for on structure vibration sources is accurate for these projects.

Figure 5. Existing Vibration Levels



5 Methodology for Assessment of Noise and Vibration

Consistent with STB regulations for noise and FTA/FRA guidelines for vibration, a noise and vibration impact assessment was conducted for a study area covering the proposed projects. This section presents the information used in conducting the noise and vibration assessment. Section 6 presents the results of the assessments.

The following summarizes the primary alternatives being considered for each of the projects. These alternatives are for purposes of this analysis and a more detailed analysis for each project is being developed separately for the Act 120 analysis and other applicable provisions. For the purpose of this modeling analysis the alternative list below adequately covers the range of potential for direct, indirect, and cumulative effects vis a vis the noise and vibration analysis assessment.

Amtrak Station

- No Build Alternative
- Remove portion of train shed to achieve appropriate vertical clearance
- Adjust train shed roof beams to achieve appropriate vertical clearance

W. North Avenue Bridge Project

- No Build Alternative
- Rehabilitate and raise bridge to achieve appropriate vertical clearance
- Rehabilitate bridge and lower tracks to achieve appropriate vertical clearance
- Combination rehabilitate and raise bridge and lower tracks to achieve appropriate vertical clearance
- Replace and raise bridge to achieve appropriate vertical clearance
- Replace bridge and lower tracks to achieve appropriate vertical clearance
- Combination replace and raise bridge and lower railroad tracks to achieve appropriate vertical clearance

Pennsylvania Avenue Bridge Project

- No Build Alternative
- Replace and raise bridge to achieve appropriate vertical clearance
- Repair substructure and lower tracks to achieve appropriate vertical clearance
- Combination replace and raise bridge and lower tracks to achieve appropriate vertical clearance

Columbus Avenue Bridge Project

- No Build Alternative
- Repair and raise bridge to achieve appropriate vertical clearance
- Repair substructure and lower tracks to achieve appropriate vertical clearance
- Combination repair and raise bridge and lower tracks to achieve appropriate vertical clearance

5.1 Noise Projections

The primary components of wayside noise from train operations are engine/exhaust noise for diesel locomotives and wheel/rail noise from the steel wheels rolling on steel rails for freight railcars. Projections of train operation noise were completed for two operational conditions, the post-project timeframe with the projects complete (the “Build” condition or scenario) and post-project timeframe without the projects completed (the “No Build” condition or scenario). The projection of wayside noise was carried out using models specified in the FTA Manual as they are implemented in three-dimensional acoustic modeling software package SoundPLAN Gmbh version 8.0 with the following assumptions:

- Noise measurements were completed throughout the areas in proximity to the study corridor as documented in Section 4. These measurements were used to determine the impact conditions for the projects.

- Increased rail traffic that would result with or without the projects is included in the prediction and was logarithmically added to the existing measured sound levels throughout the project area to identify the cumulative noise increases that would occur. Two rail traffic scenarios were evaluated:
    - Low-Growth: these projections are based on the Pennsylvania Department of Transportation (PennDOT) 2020 Pennsylvania Rail Plan (PennDOT 2021).
    - High-Growth: these projections are based on the PennDOT 2015 Pennsylvania Rail Plan (PennDOT 2016).
- Increased rail traffic would all consist of intermodal trains with two diesel electric locomotives and 125 single-stack intermodal rail cars or 125 double-stack intermodal rail cars for the No Build and Build future conditions, respectively.
- Sound exposure level (SEL) for the intermodal trains is based on measurements of intermodal train pass-by events on the Mon Line.
    - Measurements were normalized using FTA's methodology which results in an SEL of 100 dBA.
- Special track work locations, such as crossovers and turnouts, include a 5 dB increase adjustment consistent with FTA Manual, page 42.
- Locomotive noise would comply with 40 CFR 201.12.
- In accordance with the FRA train horn rule (49 CFR; Part 222; Part 229), horn use was included in the predictions for trains approaching within 20-seconds of the one public grade crossing where Norfolk Southern trains currently sound their horn as required, located at the southeastern end of the study corridor, with the assumption that they operate at 35 miles per hour (mph).
- Where trains operate on structure, the modeling includes a 4 dB increase adjustment consistent with the FTA Manual.
- Train speeds throughout the study corridor are assumed to operate at the maximum allowable speeds to be conservative.
    - Note that changes in operational speed from higher speeds to lower speeds can reduce noise levels; however, this reduction is offset somewhat because this also would result in a longer time period where the noise source is present.
- Predictions assume a track type of continuously welded rail on ballast and tie.

5.2 Vibration Projections

The potential vibration impact from trains operating along the study corridor was assessed using the FTA criteria. The following factors were used in determining potential vibration impacts along the proposed rail alignment:

- Existing ground-borne vibration measurements were conducted at 6 sites in the study area. These measurement results were compared with the typical locomotive maximum vibration level versus distance curve in the FTA Manual, as shown in Section 4. This curve was used to model vibration levels at sensitive receptor locations along the study corridor.

- The existing vibration conditions in the study area were assumed to be in the category of a "Heavily Used Rail Corridor," as defined in the FTA Manual.
- In locations where the existing train vibration exceeds the impact criteria, the projects will cause additional impact only if the project vibration is 3 VdB or more than existing vibration levels.
- For projects, in locations where the existing train vibration does not exceed the impact criteria, impact is assessed based on an exceedance of the vibration criteria.
- Due to the length of freight trains and the duration of the vibration events, freight operations were assessed using the "Frequent Events" category in the vibration impact criteria, as defined by the FTA Manual.
- Vibration predictions assume the same operational speeds as the noise predictions.
- Predictions of vibration from trains operating on aerial structures are reduced by 10 VdB consistent with FTA Manual.
- Predictions of vibration at locations where wheel impacts occur at special track areas such as crossovers or turnouts are increased by 10 VdB consistent with FTA guidance.

6 Noise and Vibration Impact Assessment

Two scenarios were evaluated, the low-growth scenario based on the 2020 Pennsylvania State Rail Plan (PennDOT 2021) and the high-growth scenario based on the 2015 Pennsylvania State Rail Plan (PennDOT 2015). Sections 6.1 and 6.2 summarize these two noise impact scenarios, respectively. The vibration impact assessment is summarized in Section 6.3 and would be the same for either the low-growth or high-growth scenarios since impacts are based on individual train pass-by events.

6.1 Noise Impact Assessment Low-Growth Scenario

Table 5 summarizes the results of the noise impact assessment for the project under the low-growth scenario compared to the No Build conditions at places where people sleep (Category 2) and institutional (Category 3) locations. The table provides information by noise sensitive receptor group, each of which is represented by a noise measurement location. Also provided in the table are the distances to the nearest rail line, train speeds, existing and predicted noise levels, impact criteria, and the numbers of both moderate and severe noise impacts predicted for each land use category.

Increases in Build and No build noise are predominantly a result of the increase in rail traffic during daytime and nighttime hours. The variation in vertical alignments of either the track or the roadways crossing the track that is associated with the alternatives for projects at W. North Avenue/Brighton Road, Pennsylvania Avenue, and Columbus Avenue are small, anticipated to be less than five feet. Changes in vertical track or vertical bridge alignment associated with these alternatives would result in generally imperceptible differences that are within tenths of dB of one another. The dominant consideration for noise in these circumstances is the number of train operations, and that would not be different for any of the alternatives for these projects. Therefore, from a noise perspective, any of the approaches to achieving the needed vertical clearance at these locations are considered the same. Nighttime train movements are more impactful than daytime train movements from a noise impact assessment perspective since the L_{dn} noise metric applies a 10 dB penalty to sounds that occur at night to account for heightened sensitivity during this time period. Rail traffic would increase in the study corridor in the Build (low-growth scenario) and No Build conditions as follows:

Milepost PT-341 to PT-353.35

- Daytime (7:00 a.m. to 10:00 p.m.) – existing 11 train movements, future Build 15 train movements, and future No Build 26 train movements
- Nighttime (10:00 p.m. to 7:00 a.m.) – existing 10 train movements, future Build 17 train movements, and future No Build 16 train movements

Milepost PC-0.00 to PC-3.17

- Daytime (7:00 a.m. to 10:00 p.m.) – existing 17 train movements, future Build 22 train movements, and future No Build 31 train movements
- Nighttime (10:00 p.m. to 7:00 a.m.) – existing 17 train movements, future Build 23 train movements, and future No Build 25 train movements

As Table 5 shows, the future Build low-growth scenario would result in 181 sites exceeding the STB assessment guidelines (e.g., increase above 3 dB or change to a level above 65 dB) and under the future No Build low-growth scenario 239 sites exceeding STB assessment guidelines would potentially result. Additionally, all of the Build scenario impacts would be impacted under the No Build scenario. This is due to future freight demand under the low-growth scenario which is constant with or without the projects, and the projects' clearance features allowing movement of more freight with fewer trains.

Table 5. Low-Growth Scenario Noise Impact Projections

NSA Group	Land Use Cat.	Distance to Near Track / Lane (ft)	Maximum Speed (mph)	Existing Noise Level (dBA L_{dn})	STB Assessment Guideline		No Build Sound Levels (dBA L_{dn})			Build Sound Levels (dBA L_{dn})			Number of Noise Sensitive Land Use Sites Above Threshold	
					W/ Project Limit if Existing <65 dBA L_{dn}	Increase over Existing (dB)	Predicted Noise Only	Predicted plus Existing	Increase over Existing	Predicted Noise Only	Predicted plus Existing	Increase over Existing	W/O Project Scenario	W/ Project Scenario
LT-1	2	184 - 470	40	66.3 - 77.5	65.0	3.0	48.3 - 60.6	66.4 - 77.6	0 - 0.4	46.7 - 59	66.3 - 77.6	0 - 0.3	0	0
	3	212 - 388		65.4 - 73.5	65.0	3.0	44 - 54.5	65.4 - 73.5	0 - 0.1	39.6 - 50.2	65.4 - 73.5	0 - 0	0	0
LT-2	2	80 - 439	40	62.2 - 71.5	65.0	3.0	47.3 - 67.6	62.3 - 73	0.1 - 1.5	45.6 - 66	62.3 - 72.6	0.1 - 1.1	0	0
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-3	2	157 - 473	40	63 - 74.3	65.0	3.0	51.6 - 61.4	63.5 - 74.3	0.1 - 1.6	50 - 59.8	63.3 - 74.3	0 - 1.2	0	0
	3	270 - 270		58.3 - 60.3	65.0	3.0	51.5 - 54.3	59.1 - 61.2	0.8 - 1	45.9 - 49.4	58.5 - 60.6	0.2 - 0.3	0	0
LT-4	2	69 - 503	40	57.6 - 68.2	65.0	3.0	47 - 67.8	58 - 71	0.3 - 3.8	45.6 - 66	57.9 - 70.3	0.2 - 2	13	13
	3	392 - 392		58.7 - 60.6	65.0	3.0	43.5 - 47.2	58.8 - 60.8	0.1 - 0.2	39.1 - 42.8	58.7 - 60.7	0 - 0.1	0	0
LT-5	2	94 - 504	40	64.5 - 72.1	65.0	3.0	45.3 - 61.8	64.6 - 72.2	0 - 0.4	43.7 - 60.3	64.6 - 72.2	0 - 0.3	0	0
	3	262 - 262		67.3 - 69.3	65.0	3.0	47 - 49.6	67.4 - 69.4	0 - 0	42.6 - 45.2	67.3 - 69.3	0 - 0	0	0
LT-6	2	194 - 654	20	63.7 - 75.6	65.0	3.0	42.1 - 60.5	63.7 - 75.7	0 - 0.3	40.5 - 58.9	63.7 - 75.6	0 - 0.2	0	0
	3	69 - 437		65.4 - 73.4	65.0	3.0	37 - 50.9	65.4 - 73.5	0 - 0	32.6 - 46.6	65.4 - 73.5	0 - 0	0	0
LT-7	2	252 - 471	20	60.5 - 69.6	65.0	3.0	48.8 - 61.9	60.8 - 69.7	0.1 - 1.1	47.2 - 60.3	60.7 - 69.7	0.1 - 0.8	0	0
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-8	2	53 - 488	20	67.9 - 75.8	65.0	3.0	#N/A	#N/A	#N/A	46.8 - 66.2	68.2 - 76.1	0 - 0.8	0	0
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-9	2	441 - 575	20	60 - 63.8	65.0	3.0	39.5 - 48.1	60.1 - 63.9	0 - 0.1	38.1 - 46.6	60.1 - 63.9	0 - 0.1	0	0
	3	96 - 96		57.9 - 59.9	65.0	3.0	51.3 - 53.4	58.7 - 60.7	0.8 - 0.9	45.7 - 47.8	58.1 - 60.1	0.2 - 0.3	0	0
LT-10	2	156 - 464	30	56.5 - 63.2	65.0	3.0	48.3 - 63	57.3 - 65.7	0.5 - 3.5	47 - 61.8	57.1 - 65.2	0.4 - 2.8	2	2
	3	213 - 478		57.6 - 64.9	65.0	3.0	39.4 - 57.1	57.7 - 65.1	0 - 1.5	33.8 - 51.3	57.6 - 64.9	0 - 0.5	0	0
LT-11	2	93 - 473	30	58.8 - 67.9	65.0	3.0	46.2 - 65.9	59.1 - 70	0.2 - 2.9	44.9 - 64.6	59 - 69.5	0.1 - 2.3	2	2
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-12	2	149 - 215	30	60.5 - 64.1	65.0	3.0	52.3 - 63.6	61.2 - 66.9	0.6 - 2.8	51 - 62.4	61.1 - 66.3	0.4 - 2.3	2	2

Table 5. Low-Growth Scenario Noise Impact Projections

NSA Group	Land Use Cat.	Distance to Near Track / Lane (ft)	Maximum Speed (mph)	Existing Noise Level (dBA L_{dn})	STB Assessment Guideline		No Build Sound Levels (dBA L_{dn})			Build Sound Levels (dBA L_{dn})			Number of Noise Sensitive Land Use Sites Above Threshold	
					W/ Project Limit if Existing <65 dBA L_{dn}	Increase over Existing (dB)	Predicted Noise Only	Predicted plus Existing	Increase over Existing	Predicted Noise Only	Predicted plus Existing	Increase over Existing	W/O Project Scenario	W/ Project Scenario
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-13	2	60 - 497	30	59.1 - 70.3	65.0	3.0	45.1 - 66.3	59.3 - 71.7	0.1 - 3.9	43.8 - 65	59.2 - 71.4	0.1 - 3.1	7	7
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-14	2	117 - 475	30	61.4 - 69.4	65.0	3.0	42.5 - 64.2	61.4 - 70.6	0.1 - 1.2	41.2 - 62.9	61.4 - 70.3	0 - 0.9	0	0
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-15	2	27 - 463	30	52.7 - 72	65.0	3.0	46.9 - 71.9	53.9 - 74.9	0.2 - 6.4	45.6 - 70.7	53.6 - 74.4	0.1 - 5.4	50	33
	3	412 - 412		58.2 - 60.2	65.0	3.0	42.1 - 43.5	58.3 - 60.3	0.1 - 0.1	36.3 - 37.8	58.2 - 60.2	0 - 0	0	0
LT-16	2	24 - 459	30	54.2 - 74	65.0	3.0	47.7 - 70.2	55.5 - 75.5	0.2 - 4	46.5 - 69	55.2 - 75.2	0.1 - 3.3	0	0
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-17	2	158 - 454	40	58.4 - 69.7	65.0	3.0	49.9 - 63	59.3 - 70.1	0.2 - 3	48.7 - 61.8	59.1 - 70	0.1 - 2.4	2	0
	3	139 - 139		63.3 - 63.3	65.0	3.0	56.8 - 56.8	64.2 - 64.2	0.9 - 0.9	51 - 51	63.6 - 63.6	0.2 - 0.2	0	0
LT-18	2	58 - 464	40	57 - 68	65.0	3.0	46.8 - 69.9	57.8 - 72.1	0.3 - 5.3	45.5 - 68.7	57.7 - 71.4	0.2 - 4.5	22	14
	3	432 - 432		57.3 - 59.3	65.0	3.0	51.7 - 54	58.4 - 60.4	0.9 - 1.1	46 - 48.2	57.7 - 59.7	0.3 - 0.3	0	0
LT-19	2	59 - 463	40	56.8 - 67.8	65.0	3.0	50.6 - 68.7	57.9 - 71.3	0.3 - 5.6	49.4 - 67.5	57.7 - 70.6	0.2 - 4.8	87	69
	3	332 - 406		57.4 - 60.3	65.0	3.0	50.9 - 55.1	58.3 - 61.4	0.8 - 1.2	45.1 - 49.4	57.7 - 60.6	0.2 - 0.3	0	0
LT-20	2	18 - 464	40	62.2 - 81.6	65.0	3.0	49.1 - 75	62.4 - 81.8	0 - 2.4	47.9 - 73.7	62.3 - 81.7	0 - 1.9	0	0
	3	47 - 47		72.1 - 74.1	65.0	3.0	66.2 - 66.3	73.1 - 74.8	0.7 - 1	60.4 - 60.5	72.4 - 74.3	0.2 - 0.3	0	0
LT-21	2	67 - 487	40	61 - 71.6	65.0	3.0	47.8 - 68.7	61.6 - 73.2	0.1 - 2.3	46.6 - 67.5	61.4 - 72.9	0.1 - 1.8	0	0
	3	388 - 388		62 - 64	65.0	3.0	50.8 - 53.8	62.3 - 64.4	0.3 - 0.4	45.1 - 48.1	62.1 - 64.1	0.1 - 0.1	0	0
LT-22	2	44 - 437	40	65.5 - 77.5	65.0	3.0	48.4 - 70.3	65.7 - 78.2	0.1 - 1.1	47.2 - 69.1	65.6 - 78.1	0.1 - 0.9	0	0
	3	226 - 263		67.7 - 70.4	65.0	3.0	50.6 - 54	67.8 - 70.5	0.1 - 0.1	44.9 - 48.3	67.8 - 70.4	0 - 0	0	0
LT-23	2	51 - 449	40	62.6 - 74	65.0	3.0	52.4 - 69.8	63.3 - 75.3	0.2 - 3.3	51.1 - 68.5	63.2 - 75.1	0.1 - 2.6	1	1
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-24	2	27 - 436	40	59.9 - 74	65.0	3.0	47.2 - 73.8	60.2 - 76.9	0.2 - 4	46 - 72.6	60.1 - 76.3	0.1 - 3.3	27	14

Table 5. Low-Growth Scenario Noise Impact Projections

NSA Group	Land Use Cat.	Distance to Near Track / Lane (ft)	Maximum Speed (mph)	Existing Noise Level (dBA L_{dn})	STB Assessment Guideline		No Build Sound Levels (dBA L_{dn})			Build Sound Levels (dBA L_{dn})			Number of Noise Sensitive Land Use Sites Above Threshold	
					W/ Project Limit if Existing <65 dBA L_{dn}	Increase over Existing (dB)	Predicted Noise Only	Predicted plus Existing	Increase over Existing	Predicted Noise Only	Predicted plus Existing	Increase over Existing	W/O Project Scenario	W/ Project Scenario
	3	177 - 326		61.1 - 65.8	65.0	3.0	46.8 - 57.1	61.3 - 65.9	0.1 - 0.7	41.1 - 51.4	61.2 - 65.8	0 - 0.2	0	0
LT-25	2	211 - 493	40	63.9 - 69.5	65.0	3.0	54.9 - 73.1	65.6 - 74	0.2 - 7.5	53.6 - 71.8	65.3 - 73	0.1 - 6.5	24	24
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-26	2	0 - 0	20	0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
	3	47 - 47		72.4 - 72.4	65.0	3.0	54.7 - 54.7	72.4 - 72.4	0.1 - 0.1	50.3 - 50.3	72.4 - 72.4	0 - 0	0	0
ST-2	2	0 - 0	20	0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
	3	105 - 290		66.2 - 70.6	65.0	3.0	51.9 - 54.2	66.3 - 70.7	0.1 - 0.2	47.5 - 49.7	66.2 - 70.6	0 - 0.1	0	0
												Total	**239**	**181**

6.2 Noise Impact Assessment High-Growth Scenario

Table 6 summarizes the results of the noise impact assessment for the project high-growth scenario compared to the No Build conditions at places where people sleep (Category 2) and institutional (Category 3) locations. The table provides information by noise sensitive receptor group, each of which is represented by a noise measurement location. Also provided in the table are the distances to the nearest rail line, train speeds, existing and project high-growth scenario noise levels, impact criteria, and the numbers of both moderate and severe noise impacts predicted for each land use category.

Increases in Build and No build noise under the high-growth scenario are predominantly a result of the increase in rail traffic during daytime and nighttime hours. The variation in vertical alignments of either the track or the roadways crossing the track that is associated with the alternatives for projects at Washington Avenue, W. North Avenue/Brighton Road, Pennsylvania Avenue, and Columbus Avenue are small, anticipated to be less than five feet. Changes in vertical track or vertical bridge alignment associated with these alternatives would result in generally imperceptible differences that are within tenths of dB of one another. The dominant consideration for noise in these circumstances is the number of train operations, and that would not be different for any of the alternatives for these projects. Therefore, from a noise perspective, any of the approaches to achieving the needed vertical clearance at these locations are considered the same. Nighttime train movements are more impactful than daytime train movements from a noise impact assessment perspective since the L_{dn} noise metric applies a 10 dB penalty to sounds that occur at night to account for heightened sensitivity during this time period. Rail traffic would increase in the study corridor in the Build and No Build conditions as follows:

Milepost PT-341 to PT-353.35

- Daytime (7:00 a.m. to 10:00 p.m.) – existing 11 train movements, future Build 29 train movements, and future No Build 29 train movements
- Nighttime (10:00 p.m. to 7:00 a.m.) – existing 10 train movements, future Build 20 train movements, and future No Build 21 train movements

Milepost PC-0.00 to PC-3.17

- Daytime (7:00 a.m. to 10:00 p.m.) – existing 17 train movements, future Build 31 train movements, and future No Build 34 train movements
- Nighttime (10:00 p.m. to 7:00 a.m.) – existing 17 train movements, future Build 27 train movements, and future No Build 28 train movements

As Table 6 shows, the future Build scenario would result in 263 sites exceeding the STB assessment guidelines (e.g., increase above 3 dB or change to a level above 65 dB) and under the future No Build scenario 321 sites exceeding STB assessment guidelines would potentially result. Additionally, all of the Build scenario impacts would also be impacted under the No Build scenario. This is due to future freight demand which is constant with or without the projects, and the projects' clearance features allowing movement of more freight with fewer trains.

6.3 Vibration Impact Assessment

No vibration impacts are predicted for the low-growth or high-growth Build scenarios. Currently the study corridor is defined as "heavily-used" (more than 12 freight trains per day). Under future conditions there is no change to the train speeds or track locations, other than small changes in vertical alignment in areas that would result in a negligible change in vibration; therefore, both the Build scenario and No Build scenarios would only result in an increase in the number of trains per day. However, because the number of trains is not predicted to result in an increase of 3 VdB or greater at any vibration sensitive land uses, there would be no vibration impacts under either the Build or No Build scenarios.

Additionally, the variation in vertical alignments of either the track or the roadways crossing the track that is associated with the alternatives for projects at Washington Avenue, W. North Avenue/Brighton Road, Pennsylvania Avenue, and Columbus Avenue are small, anticipated to be less than five feet. Additionally, none of these vertical alignment adjustments would result in the train tracks being closer to sensitive properties, which means that under any of the alternatives where the vertical alignment of the track is changed there would be a small reduction in vibration relative to the No Build conditions. Imperceptible differences in vibration from train operations would occur because the differences proposed for each of these projects' alternatives are small.

Table 6. High-Growth Scenario Noise Impact Projections

NSA Group	Land Use Cat.	Distance to Near Track / Lane (ft)	Maximum Speed (mph)	Existing Noise Level (dBA L_{dn})	STB Assessment Guideline		No Build Sound Levels (dBA L_{dn})			Build Sound Levels (dBA L_{dn})			Number of Noise Sensitive Land Use Sites Above Threshold	
					W/ Project Limit if Existing <65 dBA L_{dn}	Increase over Existing (dB)	Predicted Noise Only	Predicted plus Existing	Increase over Existing	Predicted Noise Only	Predicted plus Existing	Increase over Existing	W/O Project Scenario	W/ Project Scenario
LT-1	2	184 - 470	40	66.3 - 77.5	65.0	3.0	49.7 - 62	66.4 - 77.6	0 - 0.6	49.1 - 61.5	66.4 - 77.6	0 - 0.5	0	0
	3	212 - 388		65.4 - 73.5	65.0	3.0	44.8 - 55.3	65.4 - 73.5	0 - 0.1	44 - 54.5	65.4 - 73.5	0 - 0.1	0	0
LT-2	2	80 - 439	40	62.2 - 71.5	65.0	3.0	48.7 - 69	62.4 - 73.5	0.2 - 1.9	48 - 68.5	62.3 - 73.3	0.2 - 1.8	0	0
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-3	2	157 - 473	40	63 - 74.3	65.0	3.0	52.9 - 62.7	63.7 - 74.4	0.1 - 2.1	52.4 - 62.2	63.6 - 74.3	0.1 - 1.9	0	0
	3	270 - 270		58.3 - 60.3	65.0	3.0	52.4 - 55.2	59.3 - 61.4	0.9 - 1.2	50.4 - 53.9	58.9 - 61.2	0.7 - 0.9	0	0
LT-4	2	69 - 503	40	57.6 - 68.2	65.0	3.0	48.4 - 69.4	58.1 - 71.9	0.4 - 4.8	48 - 68.6	58.1 - 71.4	0.4 - 3.2	13	13
	3	392 - 392		58.7 - 60.6	65.0	3.0	44.3 - 48	58.8 - 60.9	0.1 - 0.2	43.5 - 47.2	58.8 - 60.8	0.1 - 0.2	0	0
LT-5	2	94 - 504	40	64.5 - 72.1	65.0	3.0	46.7 - 63.1	64.6 - 72.3	0 - 0.6	46.2 - 62.6	64.6 - 72.3	0 - 0.5	0	0
	3	262 - 262		67.3 - 69.3	65.0	3.0	47.8 - 50.6	67.4 - 69.4	0 - 0.1	46.9 - 49.8	67.4 - 69.4	0 - 0	0	0
LT-6	2	194 - 654	20	63.7 - 75.6	65.0	3.0	43.5 - 61.8	63.7 - 75.7	0 - 0.4	42.9 - 61.3	63.7 - 75.7	0 - 0.4	0	0
	3	69 - 437		65.4 - 73.4	65.0	3.0	37.8 - 51.8	65.4 - 73.5	0 - 0	37 - 51	65.4 - 73.5	0 - 0	0	0
LT-7	2	252 - 471	20	60.5 - 69.6	65.0	3.0	50.1 - 63.2	60.9 - 69.7	0.1 - 1.5	49.7 - 62.8	60.9 - 69.7	0.1 - 1.4	0	0
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-8	2	53 - 488	20	67.9 - 75.8	65.0	3.0	49.6 - 69.1	68.5 - 76.3	0 - 1.4	49.1 - 68.6	68.4 - 76.3	0 - 1.3	0	0
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-9	2	441 - 575	20	61.2 - 63.8	65.0	3.0	41.2 - 49.4	61.2 - 63.9	0 - 0.2	40.7 - 48.9	61.2 - 63.9	0 - 0.1	0	0
	3	96 - 96		57.9 - 59.9	65.0	3.0	52.4 - 54.5	59 - 61	1 - 1.1	52.1 - 54.2	58.9 - 60.9	0.9 - 1	0	0
LT-10	2	156 - 464	30	56.5 - 63.2	65.0	3.0	49 - 63.7	57.4 - 66.1	0.6 - 3.9	48.5 - 63.1	57.3 - 65.8	0.5 - 3.6	2	2
	3	213 - 478		57.6 - 64.9	65.0	3.0	40.4 - 58.1	57.7 - 65.2	0.1 - 1.9	40.1 - 57.8	57.7 - 65.1	0.1 - 1.8	0	0
LT-11	2	93 - 473	30	58.8 - 67.9	65.0	3.0	46.8 - 66.5	59.1 - 70.2	0.2 - 3.2	46.3 - 66	59.1 - 70	0.2 - 3	2	2
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-12	2	149 - 215	30	60.5 - 64.1	65.0	3.0	52.9 - 64.3	61.3 - 67.2	0.7 - 3.1	52.4 - 63.8	61.2 - 67	0.6 - 2.9	2	2

Table 6. High-Growth Scenario Noise Impact Projections

NSA Group	Land Use Cat.	Distance to Near Track / Lane (ft)	Maximum Speed (mph)	Existing Noise Level (dBA L_{dn})	STB Assessment Guideline		No Build Sound Levels (dBA L_{dn})			Build Sound Levels (dBA L_{dn})			Number of Noise Sensitive Land Use Sites Above Threshold	
					W/ Project Limit if Existing <65 dBA L_{dn}	Increase over Existing (dB)	Predicted Noise Only	Predicted plus Existing	Increase over Existing	Predicted Noise Only	Predicted plus Existing	Increase over Existing	W/O Project Scenario	W/ Project Scenario
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-13	2	60 - 497	30	59.1 - 70.3	65.0	3.0	45.7 - 66.9	59.3 - 71.9	0.1 - 4.2	45.2 - 66.4	59.3 - 71.8	0.1 - 3.9	7	7
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-14	2	117 - 475	30	61.4 - 69.4	65.0	3.0	43.1 - 64.9	61.4 - 70.7	0.1 - 1.3	42.6 - 64.3	61.4 - 70.6	0.1 - 1.2	0	0
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-15	2	27 - 463	30	52.7 - 72	65.0	3.0	47.6 - 72.6	54 - 75.3	0.2 - 6.8	47 - 72.1	53.9 - 75	0.2 - 6.4	92	56
	3	412 - 412		58.2 - 60.2	65.0	3.0	42.9 - 44.5	58.3 - 60.3	0.1 - 0.1	42.7 - 44.2	58.3 - 60.3	0.1 - 0.1	0	0
LT-16	2	24 - 459	30	54.2 - 74	65.0	3.0	48.4 - 70.9	55.6 - 75.8	0.2 - 4.4	47.9 - 70.4	55.5 - 75.6	0.2 - 4.1	0	0
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-17	2	158 - 454	40	58.4 - 69.7	65.0	3.0	50.6 - 63.7	59.4 - 70.2	0.2 - 3.3	50.1 - 63.2	59.3 - 70.1	0.2 - 3.1	2	2
	3	139 - 139		63.3 - 63.3	65.0	3.0	57.8 - 57.8	64.4 - 64.4	1.1 - 1.1	57.6 - 57.6	64.3 - 64.3	1 - 1	0	0
LT-18	2	58 - 464	40	57 - 68	65.0	3.0	47.4 - 70.6	57.9 - 72.5	0.4 - 5.8	46.9 - 70.1	57.9 - 72.2	0.3 - 5.4	27	23
	3	432 - 432		57.3 - 59.3	65.0	3.0	52.8 - 55	58.7 - 60.7	1.2 - 1.4	52.5 - 54.8	58.6 - 60.6	1.1 - 1.3	0	0
LT-19	2	59 - 463	40	56.8 - 67.8	65.0	3.0	51.3 - 69.4	58 - 71.7	0.3 - 6.1	50.8 - 68.9	57.9 - 71.4	0.3 - 5.7	95	88
	3	332 - 406		57.4 - 60.3	65.0	3.0	51.9 - 56.1	58.5 - 61.7	1 - 1.4	51.7 - 55.9	58.4 - 61.6	0.9 - 1.4	0	0
LT-20	2	18 - 464	40	62.2 - 81.6	65.0	3.0	49.8 - 75.6	62.4 - 81.8	0 - 2.7	49.3 - 75.1	62.4 - 81.8	0 - 2.4	0	0
	3	47 - 47		72.1 - 74.1	65.0	3.0	67.2 - 67.3	73.3 - 74.9	0.8 - 1.2	67 - 67.1	73.3 - 74.9	0.8 - 1.2	0	0
LT-21	2	67 - 487	40	61 - 71.6	65.0	3.0	48.5 - 69.4	61.7 - 73.4	0.1 - 2.6	48 - 68.9	61.6 - 73.3	0.1 - 2.3	0	0
	3	388 - 388		62 - 64	65.0	3.0	51.9 - 54.8	62.4 - 64.5	0.4 - 0.5	51.6 - 54.6	62.4 - 64.4	0.4 - 0.5	0	0
LT-22	2	44 - 437	40	65.5 - 77.5	65.0	3.0	49.1 - 71	65.7 - 78.4	0.1 - 1.3	48.6 - 70.5	65.7 - 78.3	0.1 - 1.2	0	0
	3	226 - 263		67.7 - 70.4	65.0	3.0	51.7 - 55.1	67.8 - 70.5	0.1 - 0.1	51.4 - 54.8	67.8 - 70.5	0.1 - 0.1	0	0
LT-23	2	51 - 449	40	62.6 - 74	65.0	3.0	53 - 70.4	63.4 - 75.5	0.2 - 3.6	52.5 - 69.9	63.3 - 75.4	0.2 - 3.3	3	1
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-24	2	27 - 436	40	59.9 - 74	65.0	3.0	47.9 - 74.5	60.2 - 77.2	0.2 - 4.4	47.3 - 74	60.2 - 76.9	0.2 - 4.1	39	33

Table 6. High-Growth Scenario Noise Impact Projections

NSA Group	Land Use Cat.	Distance to Near Track / Lane (ft)	Maximum Speed (mph)	Existing Noise Level (dBA L_{dn})	STB Assessment Guideline		No Build Sound Levels (dBA L_{dn})			Build Sound Levels (dBA L_{dn})			Number of Noise Sensitive Land Use Sites Above Threshold	
					W/ Project Limit if Existing <65 dBA L_{dn}	Increase over Existing (dB)	Predicted Noise Only	Predicted plus Existing	Increase over Existing	Predicted Noise Only	Predicted plus Existing	Increase over Existing	W/O Project Scenario	W/ Project Scenario
	3	177 - 326		61.1 - 65.8	65.0	3.0	47.8 - 58.1	61.3 - 65.9	0.1 - 0.8	47.6 - 57.9	61.3 - 65.9	0.1 - 0.8	0	0
LT-25	2	211 - 493	40	63.9 - 69.5	65.0	3.0	55.5 - 73.7	65.7 - 74.5	0.2 - 8.1	55 - 73.2	65.6 - 74.1	0.2 - 7.7	37	34
	3	0 - 0		0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
LT-26	2	0 - 0	20	0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
	3	47 - 47		72.4 - 72.4	65.0	3.0	55.5 - 55.5	72.4 - 72.4	0.1 - 0.1	54.7 - 54.7	72.4 - 72.4	0.1 - 0.1	0	0
ST-2	2	0 - 0	20	0 - 0	65.0	3.0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0	0
	3	105 - 290		66.2 - 70.6	65.0	3.0	52.8 - 55	66.4 - 70.7	0.1 - 0.2	51.9 - 54.2	66.3 - 70.7	0.1 - 0.2	0	0
												Total	**321**	**263**

7 References

FTA. 2018. Transit Noise and Vibration Impact Assessment (September 2018) ("FTA Manual").

Pennsylvania Department of Transportation (PennDOT): 2016. 2015 Pennsylvania State Rail Plan.

Pennsylvania Department of Transportation (PennDOT): 2021. 2020 Pennsylvania State Rail Plan.

STB. 1998. Final Environmental Impact Statement No. 980194, Conrail Acquisition (Finance Docket No. 33388) https://www.stb.gov/stb/docs/conrail_summary.pdf

8 Maps

This section provides detailed mapping for potential noise and vibration receptors within the 13-mile corridor assessed in this analysis. Figure 6 through Figure 41 are maps of the low-growth scenario impact conditions and Figure 42 through Figure 77 are maps of the high-growth scenario.

Figure 6. Low-Growth Scenario Noise and Vibration Assessment Map 1

Figure 7. Low-Growth Scenario Noise and Vibration Assessment Map 2

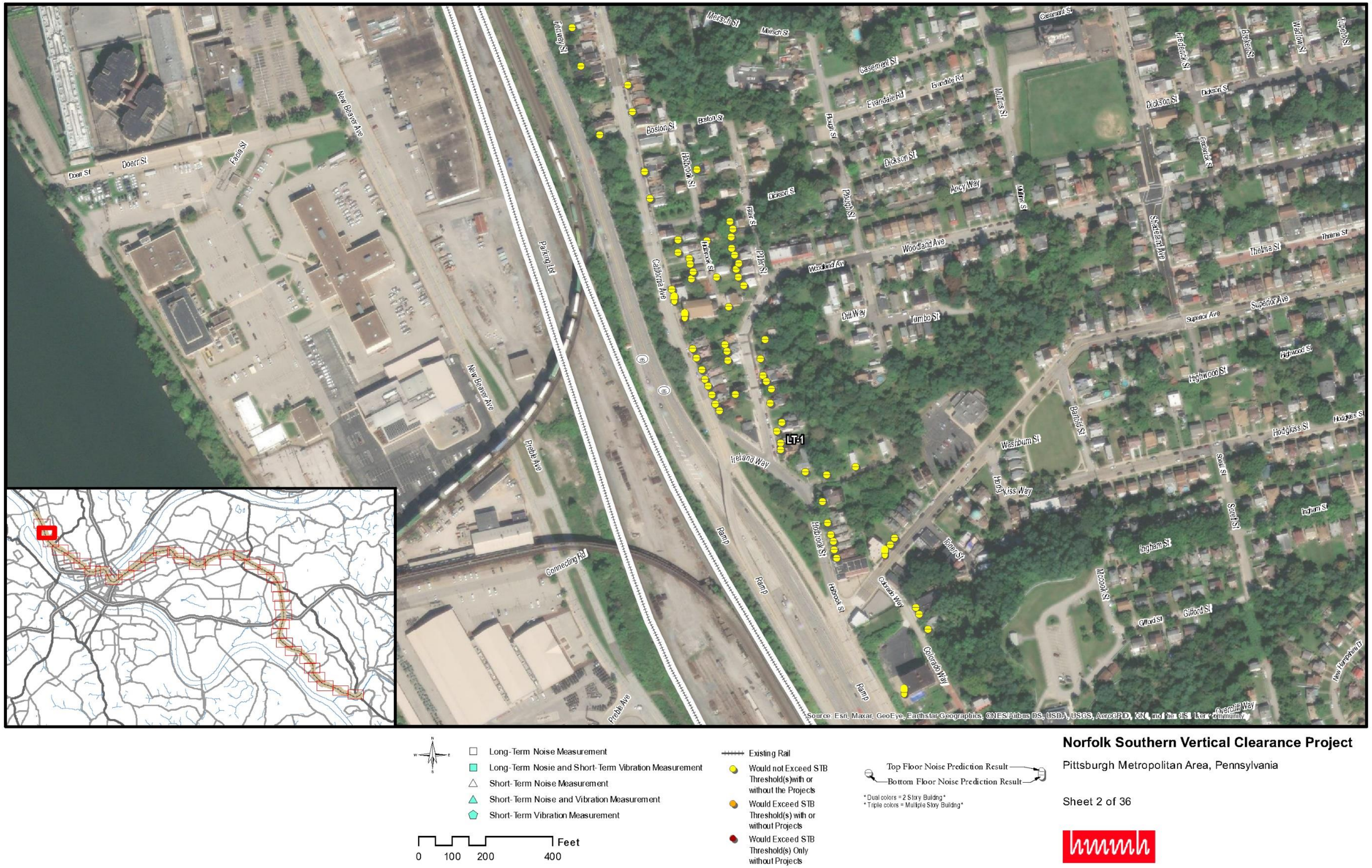


Figure 8. Low-Growth Scenario Noise and Vibration Assessment Map 3

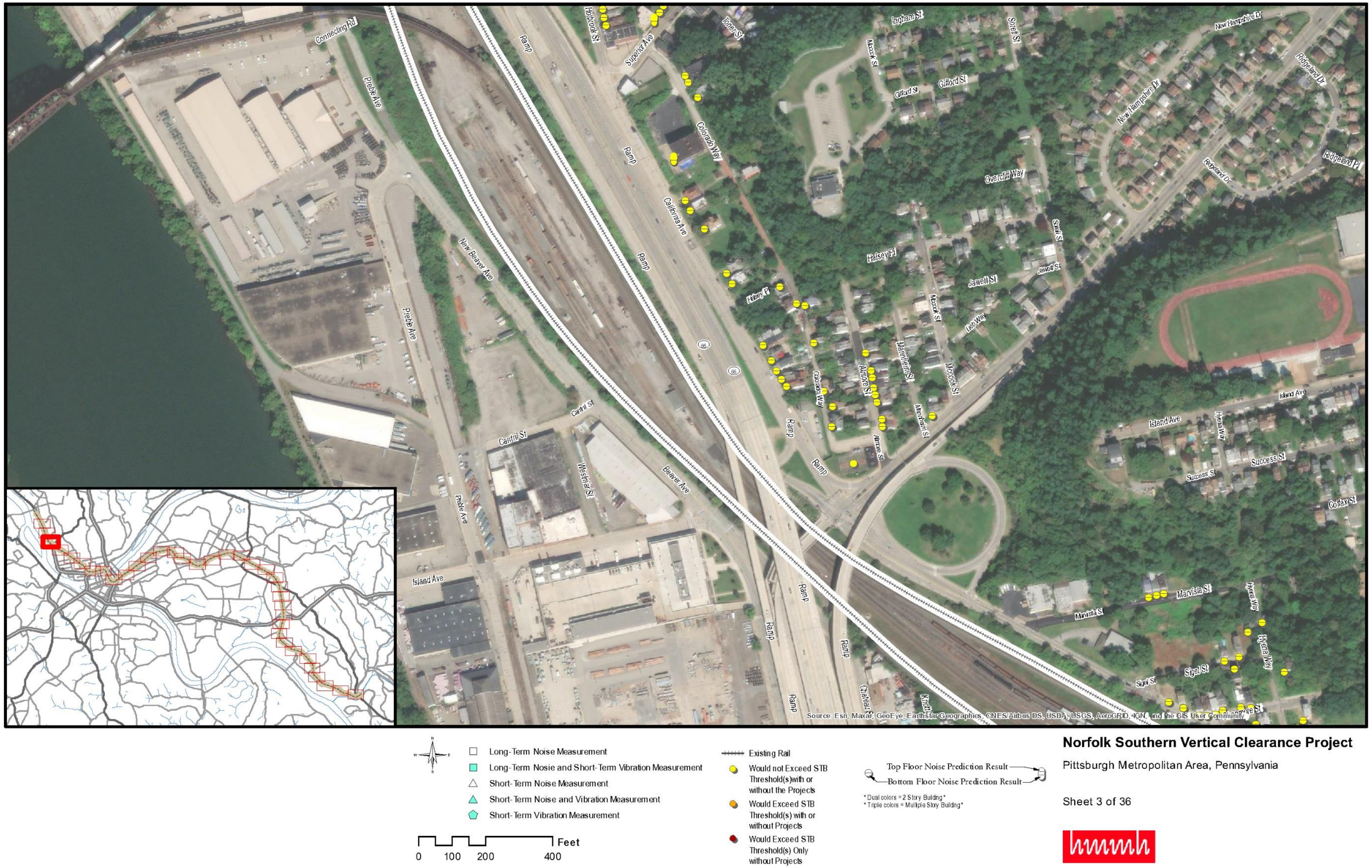


Figure 9. Low-Growth Scenario Noise and Vibration Assessment Map 4

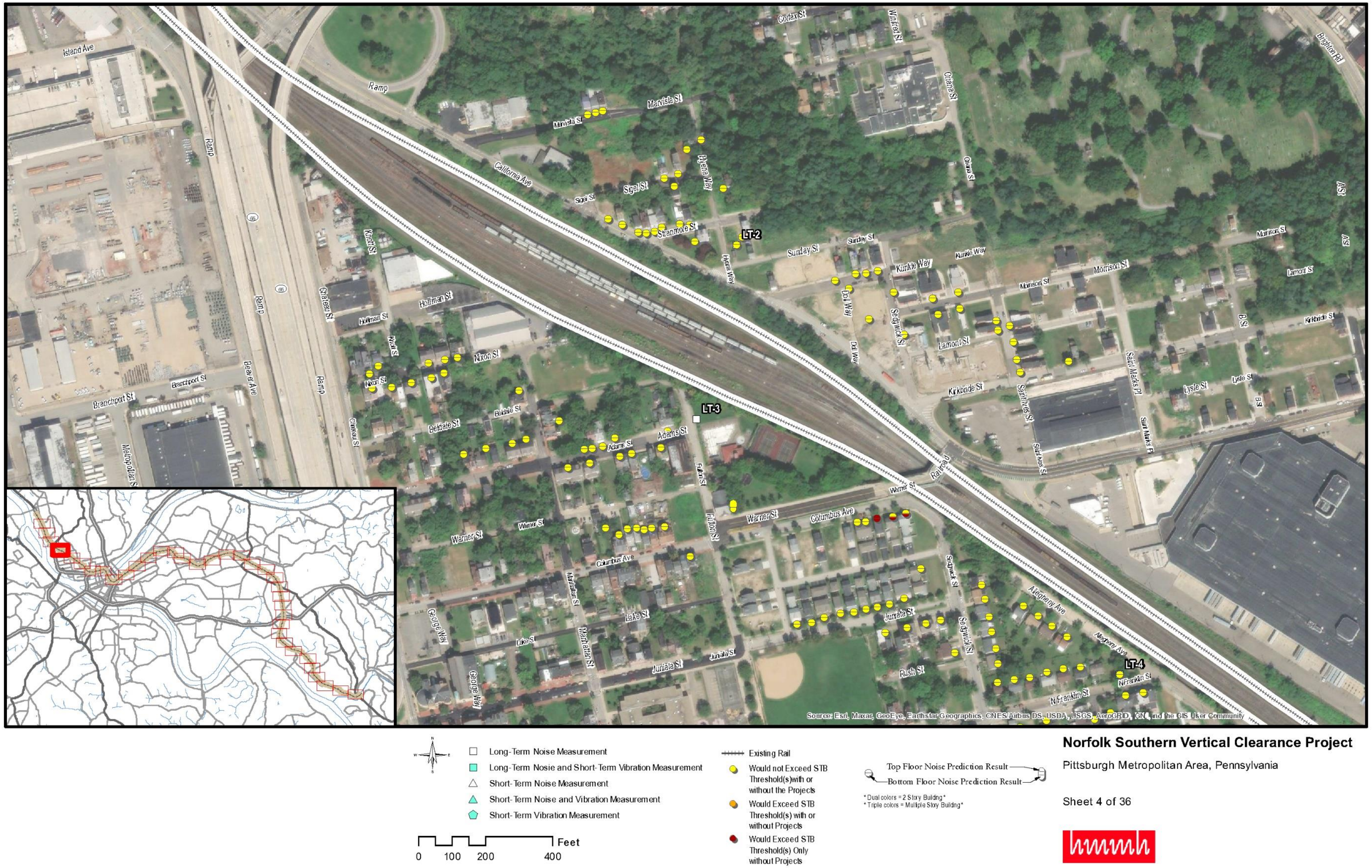


Figure 10. Low-Growth Scenario Noise and Vibration Assessment Map 5

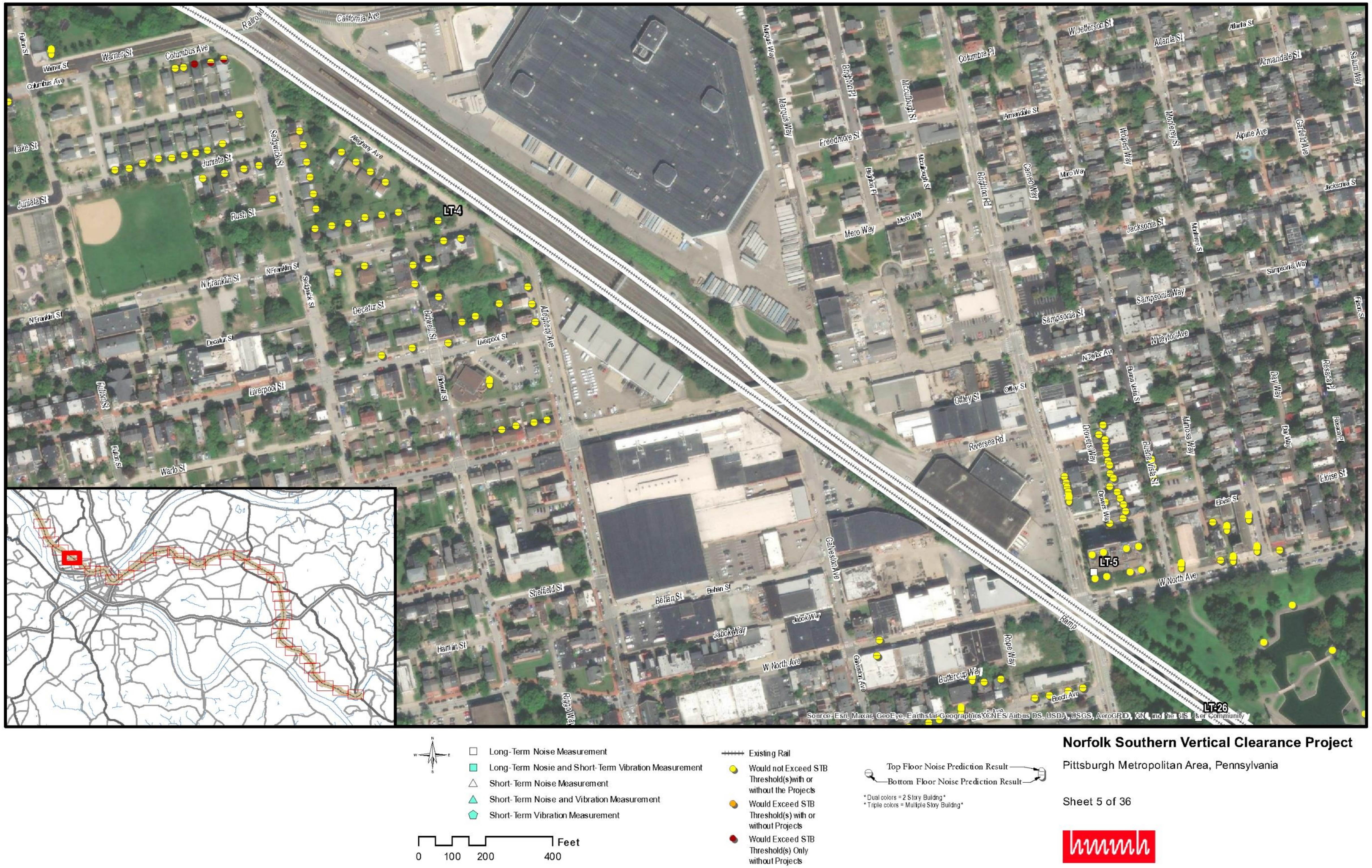


Figure 11. Low-Growth Scenario Noise and Vibration Assessment Map 6

Figure 12. Low-Growth Scenario Noise and Vibration Assessment Map 7

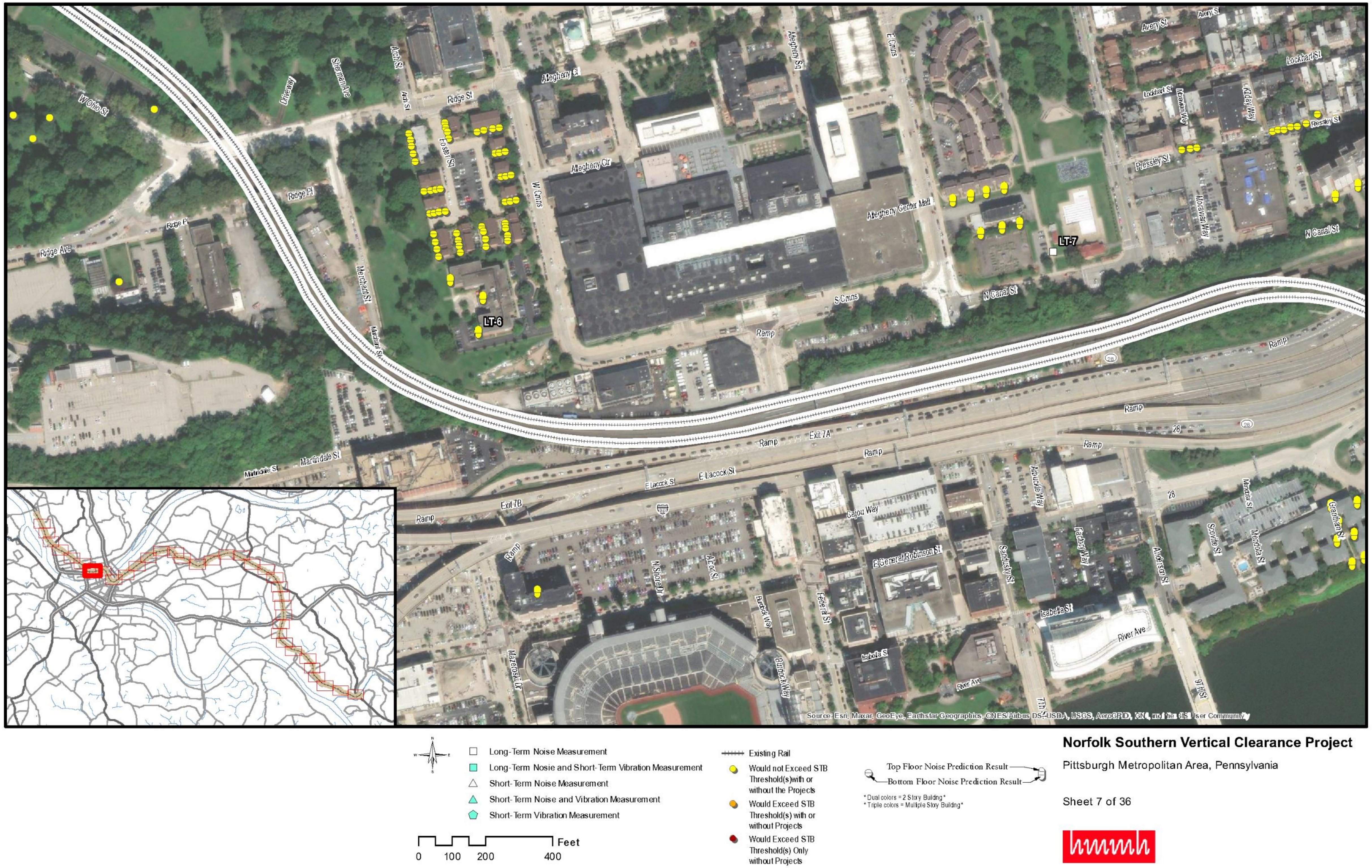


Figure 13. Low-Growth Scenario Noise and Vibration Assessment Map 8

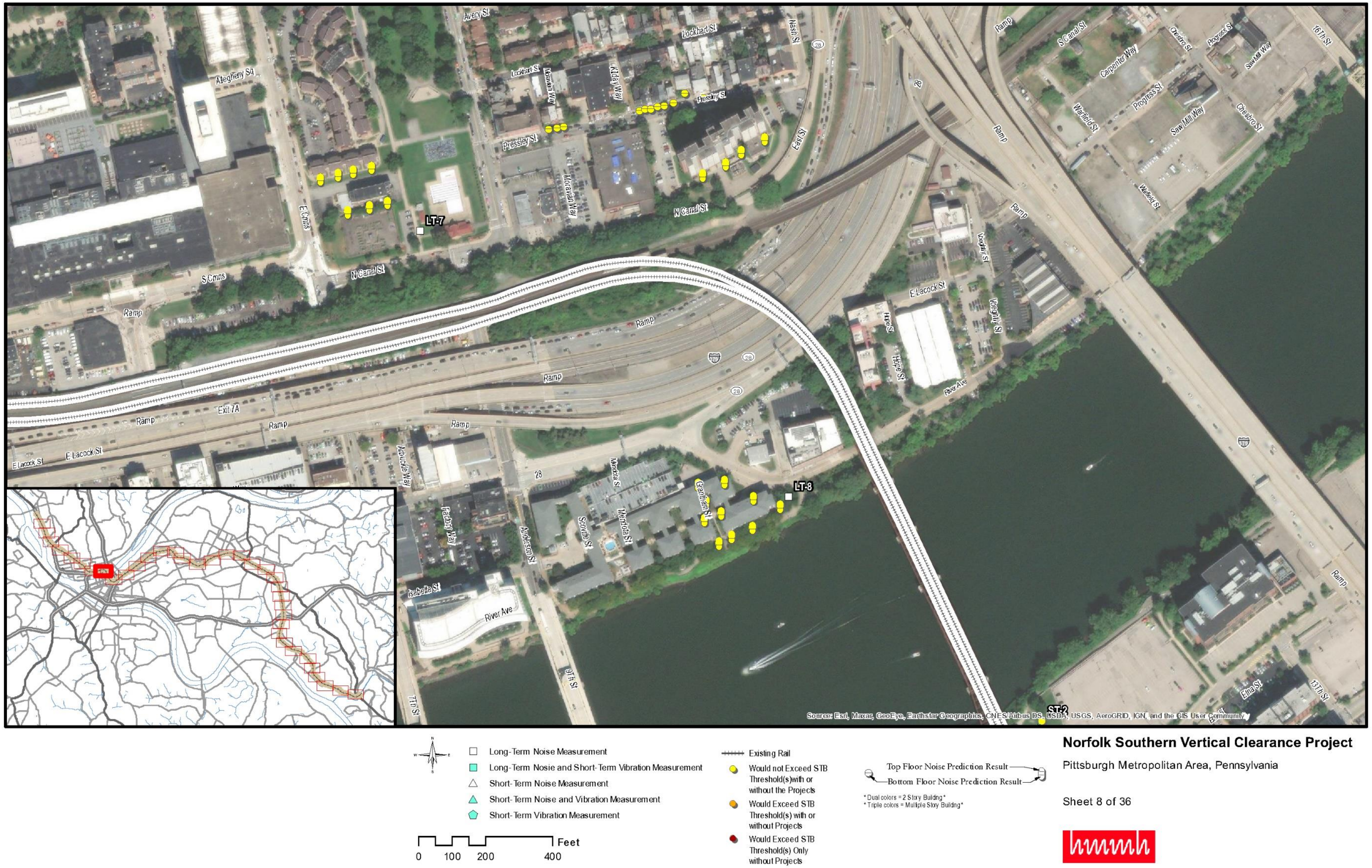


Figure 14. Low-Growth Scenario Noise and Vibration Assessment Map 9

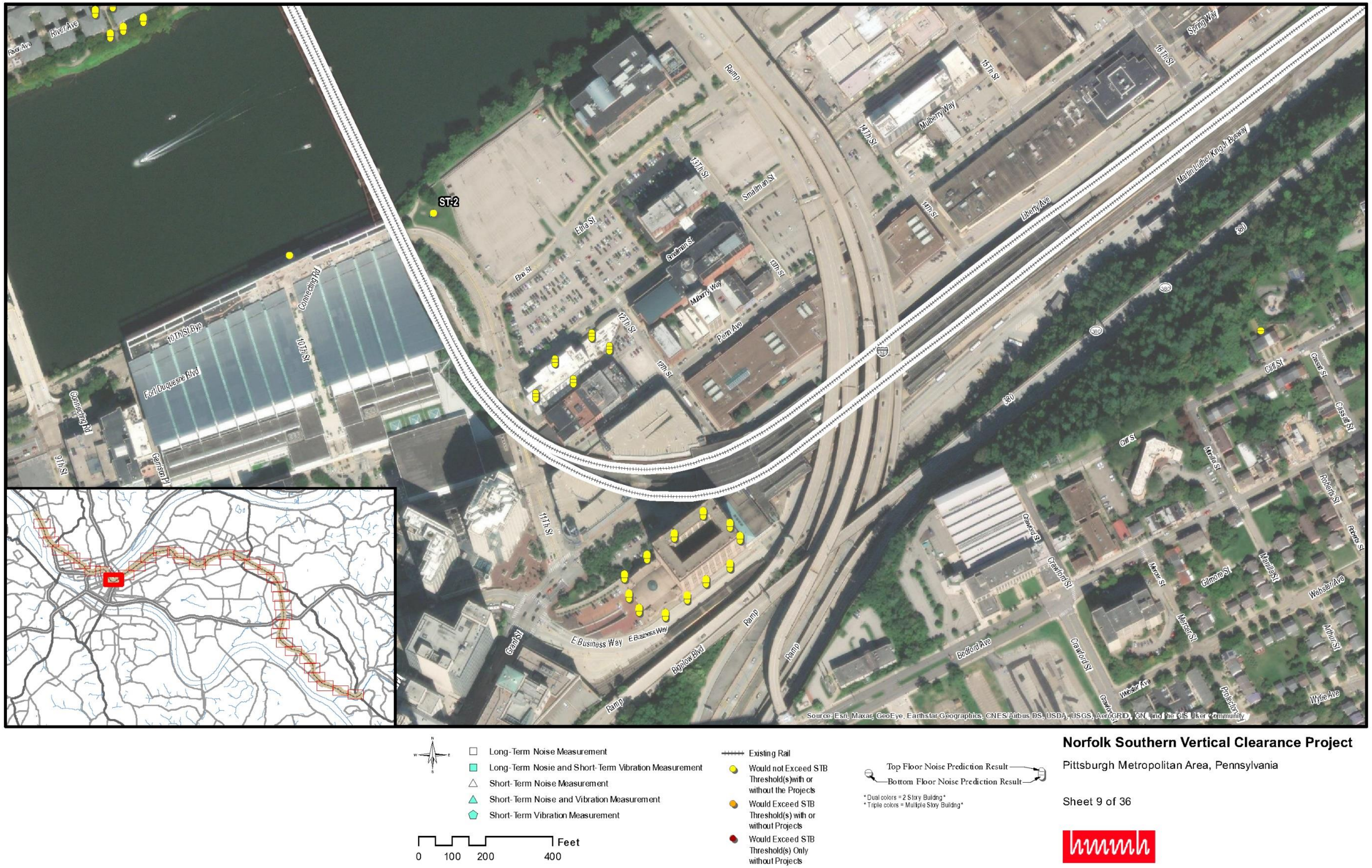


Figure 15. Low-Growth Scenario Noise and Vibration Assessment Map 10

Figure 16. Low-Growth Scenario Noise and Vibration Assessment Map 11

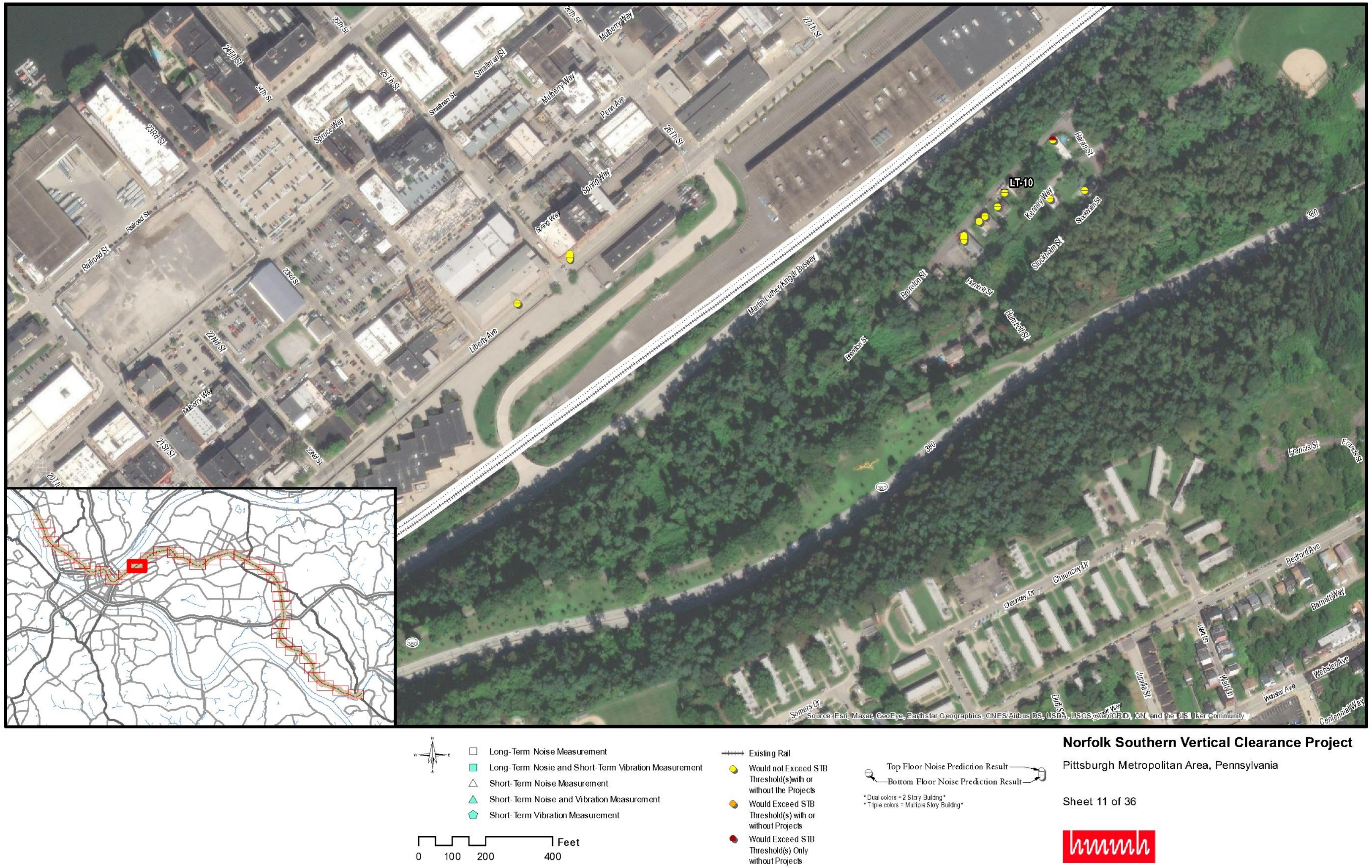


Figure 17. Low-Growth Scenario Noise and Vibration Assessment Map 12

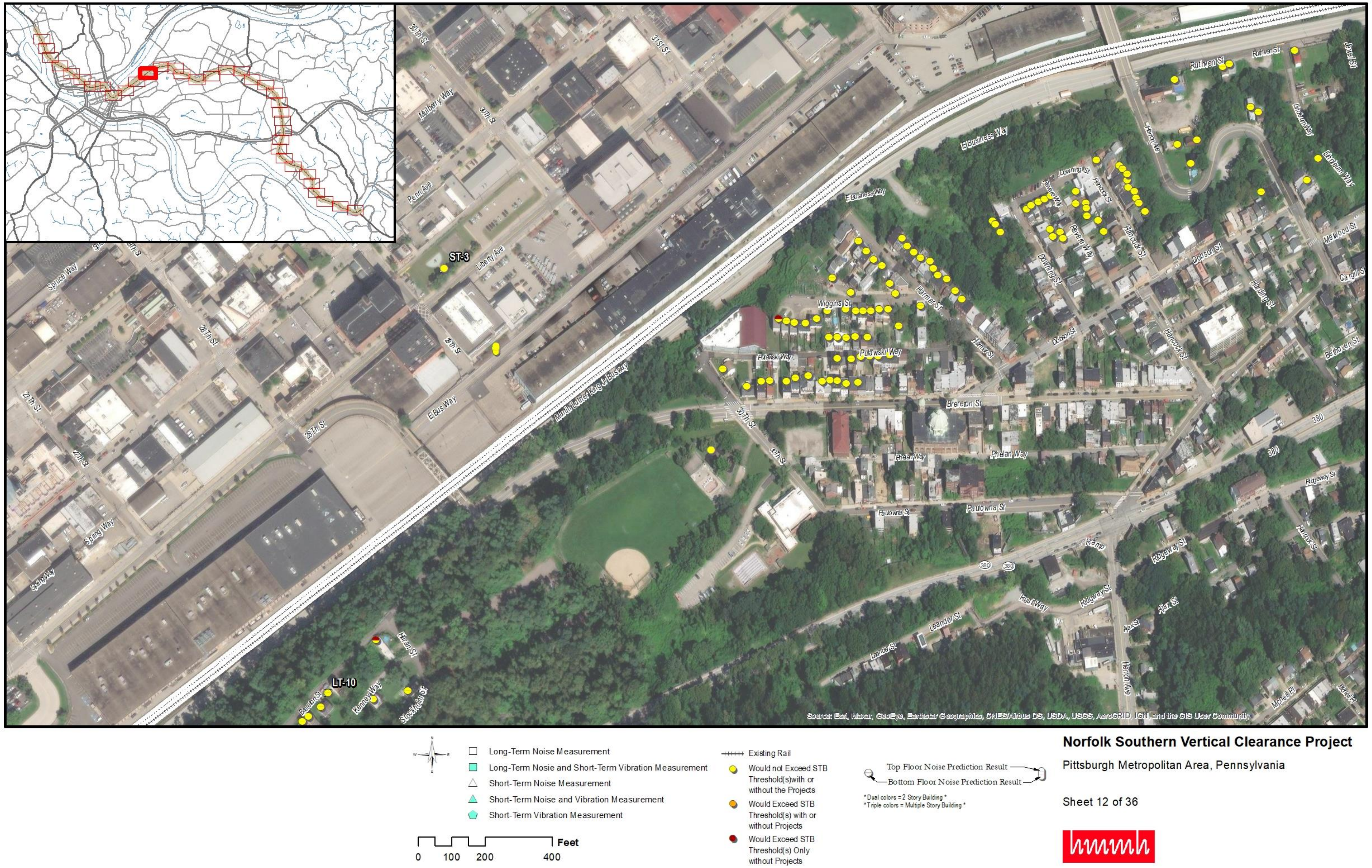


Figure 18. Low-Growth Scenario Noise and Vibration Assessment Map 13

Figure 19. Low-Growth Scenario Noise and Vibration Assessment Map 14

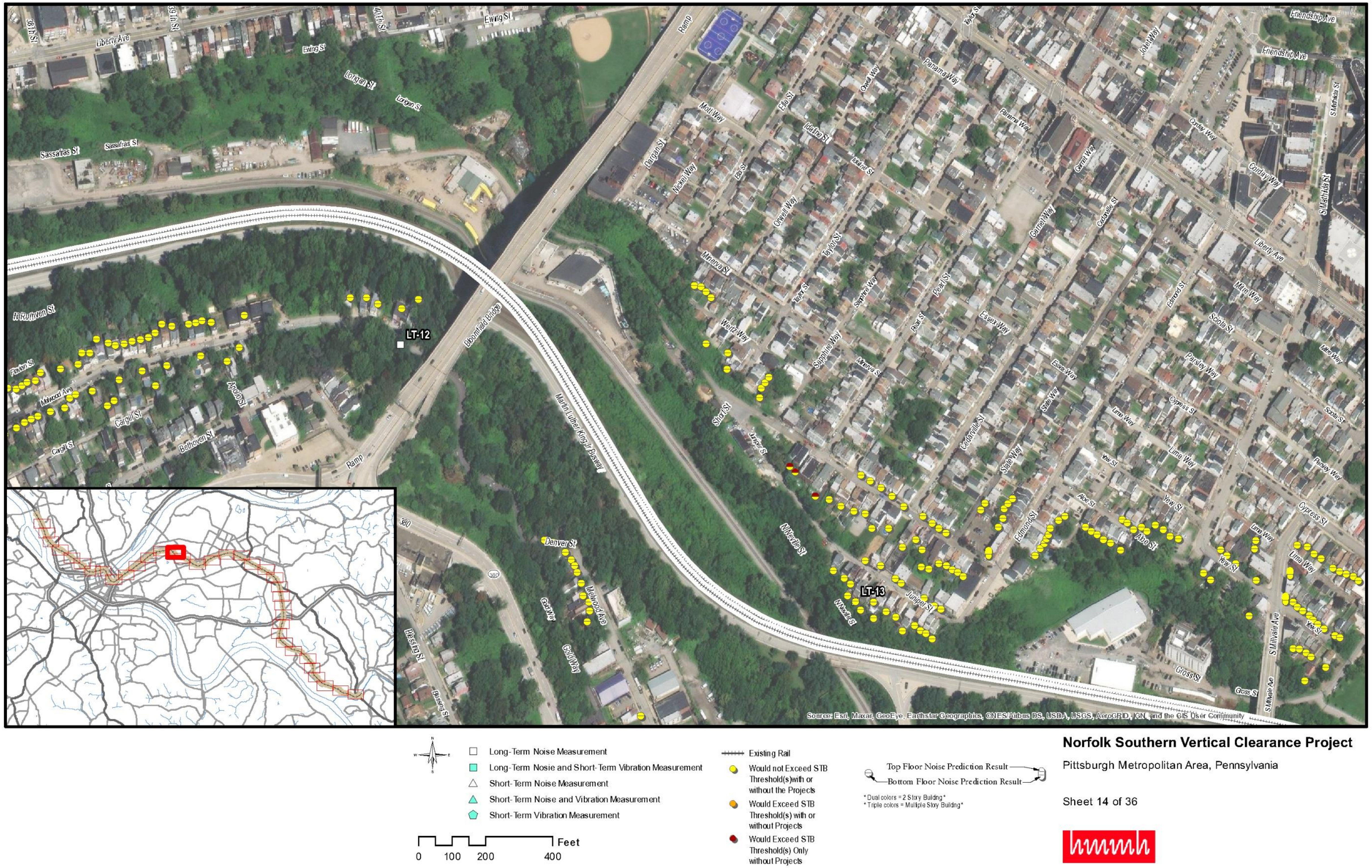


Figure 20. Low-Growth Scenario Noise and Vibration Assessment Map 15

Figure 21. Low-Growth Scenario Noise and Vibration Assessment Map 16

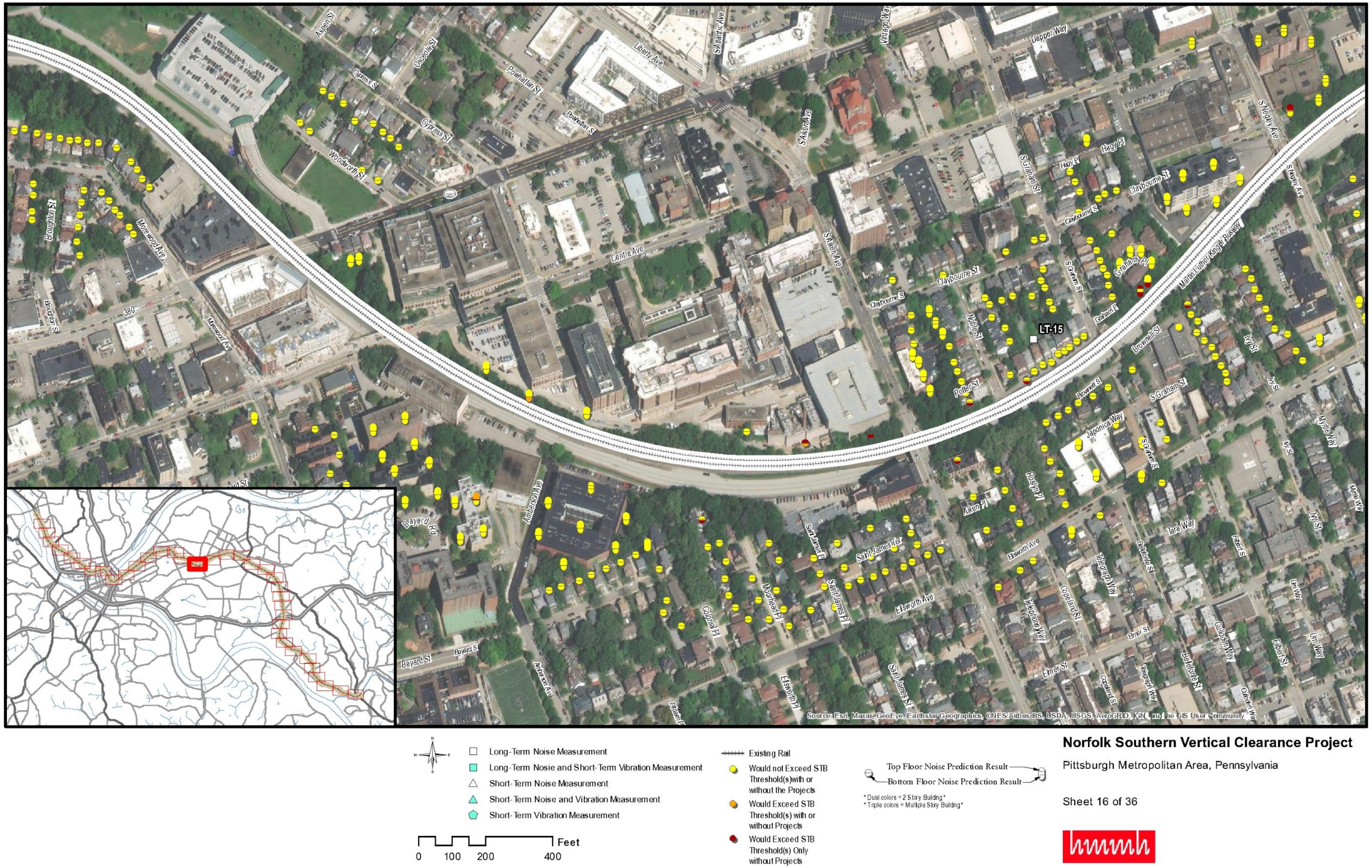


Figure 22. Low-Growth Scenario Noise and Vibration Assessment Map 17

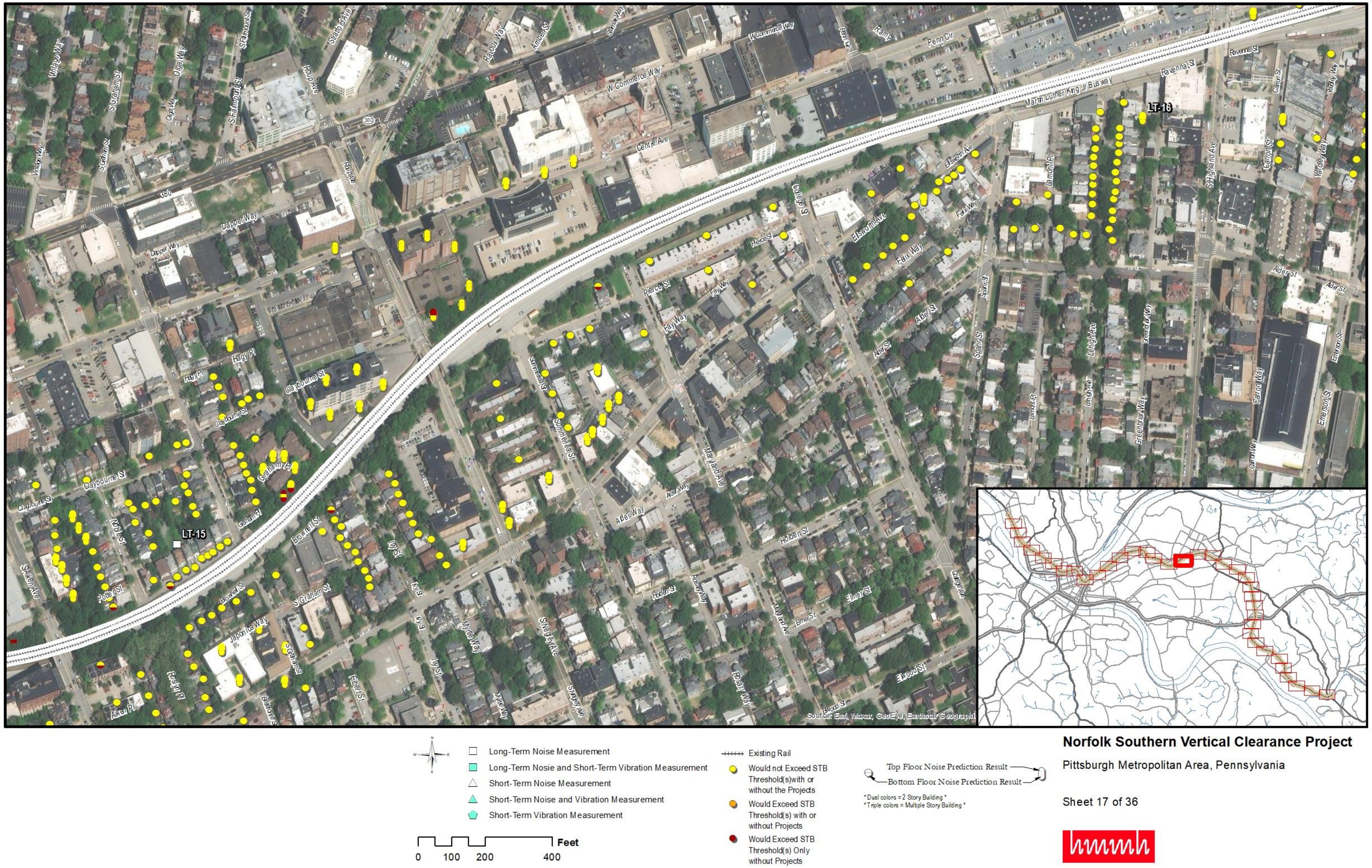


Figure 23. High-Growth Scenario Noise and Vibration Assessment Map 18

Figure 24. Low-Growth Scenario Noise and Vibration Assessment Map 19

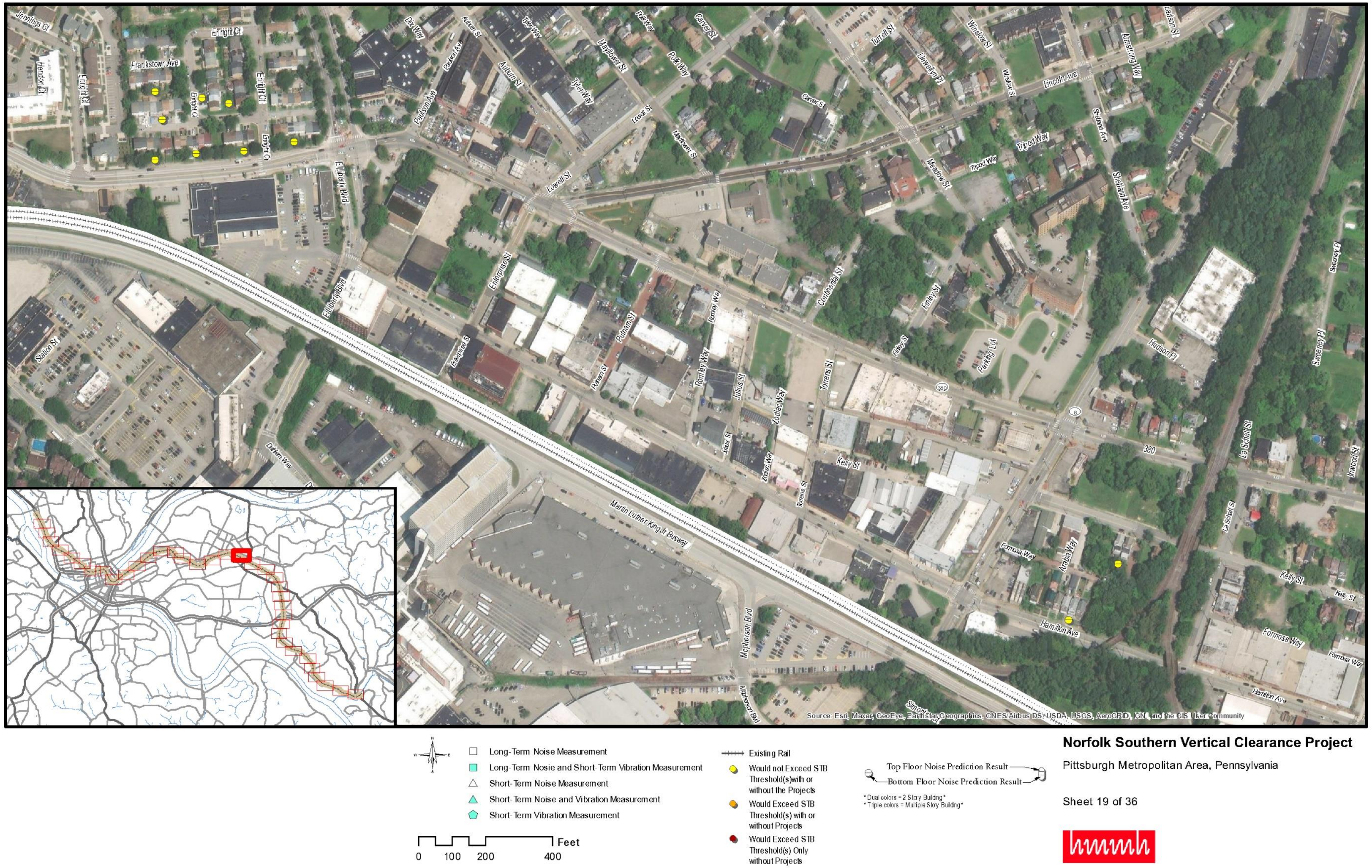
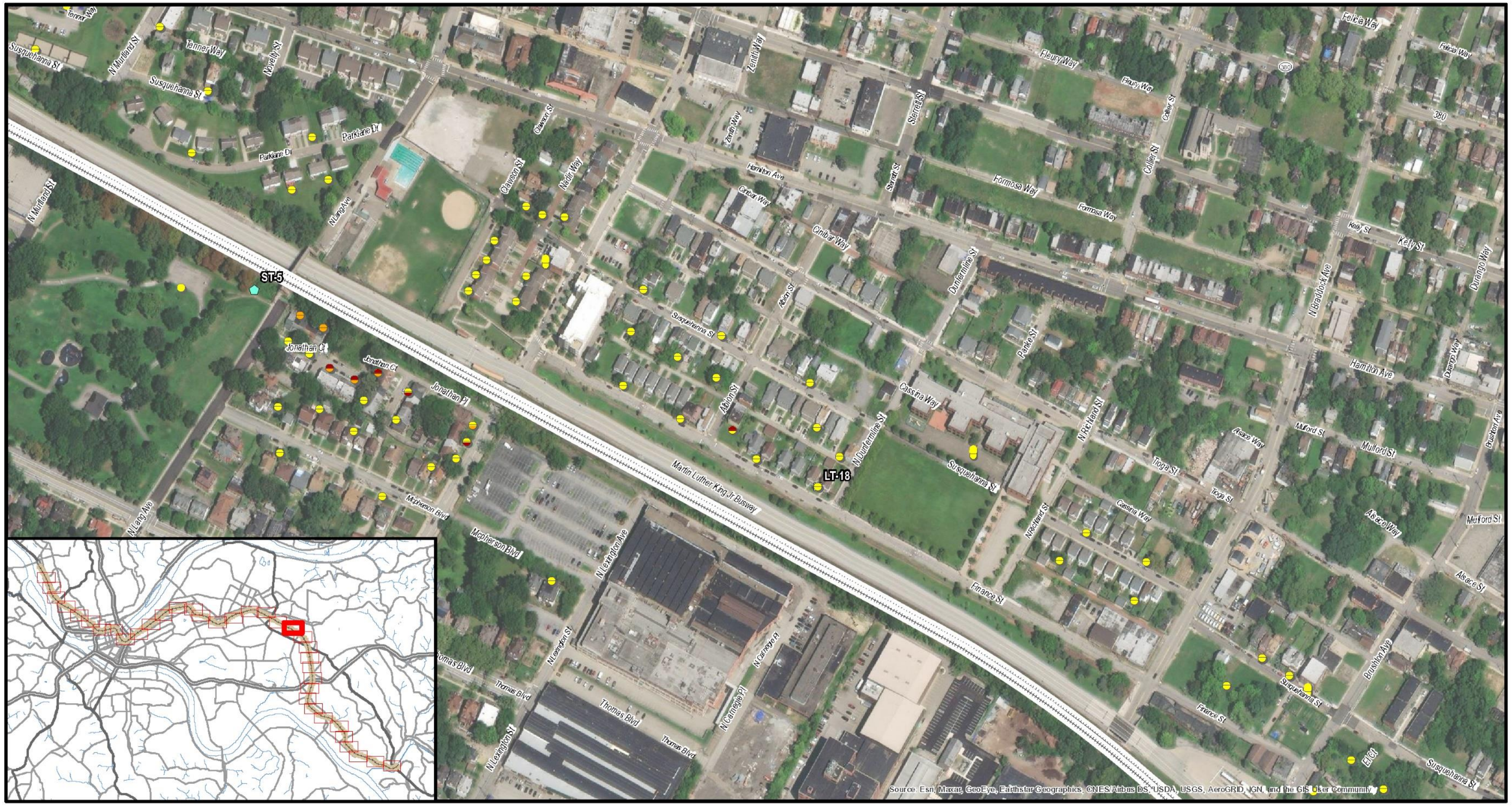


Figure 25. Low-Growth Scenario Noise and Vibration Assessment Map 20

Figure 26. Low-Growth Scenario Noise and Vibration Assessment Map 21



- Long-Term Noise Measurement
- Long-Term Nosie and Short-Term Vibration Measurement
- Short-Term Noise Measurement
- Short-Term Noise and Vibration Measurement
- Short-Term Vibration Measurement

Feet
0 100 200 400

- Existing Rail
- Would not Exceed STB Threshold(s) with or without the Projects
- Would Exceed STB Threshold(s) with or without Projects
- Would Exceed STB Threshold(s) Only without Projects

Top Floor Noise Prediction Result
Bottom Floor Noise Prediction Result
* Dual colors = 2 Story Building*
* Triple colors = Multiple Story Building*

Norfolk Southern Vertical Clearance Project

Pittsburgh Metropolitan Area, Pennsylvania

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Figure 27. Low-Growth Scenario Noise and Vibration Assessment Map 22

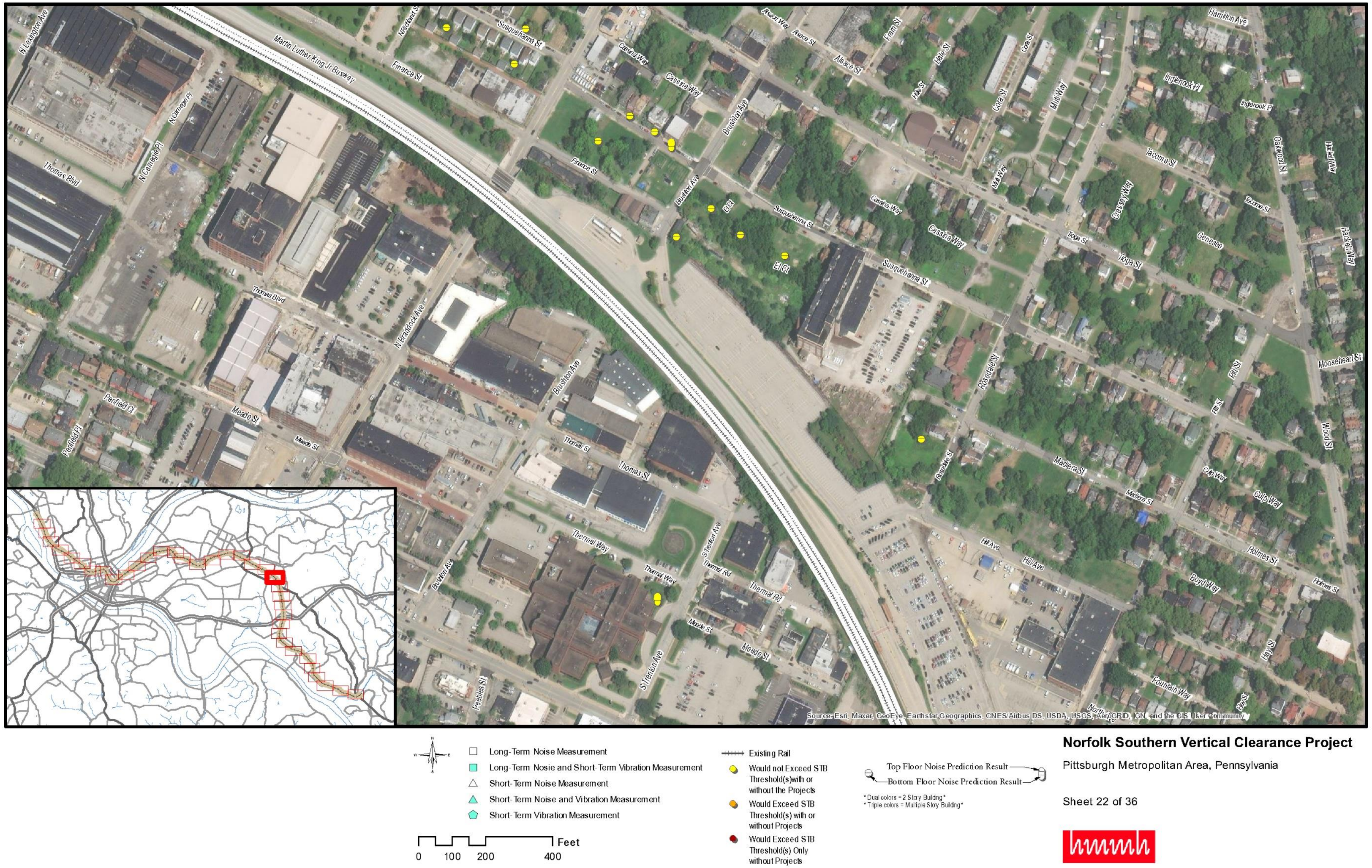

Figure 28. Low-Growth Scenario Noise and Vibration Assessment Map 23

Figure 29. Low-Growth Scenario Noise and Vibration Assessment Map 24

Figure 30. Low-Growth Scenario Noise and Vibration Assessment Map 25

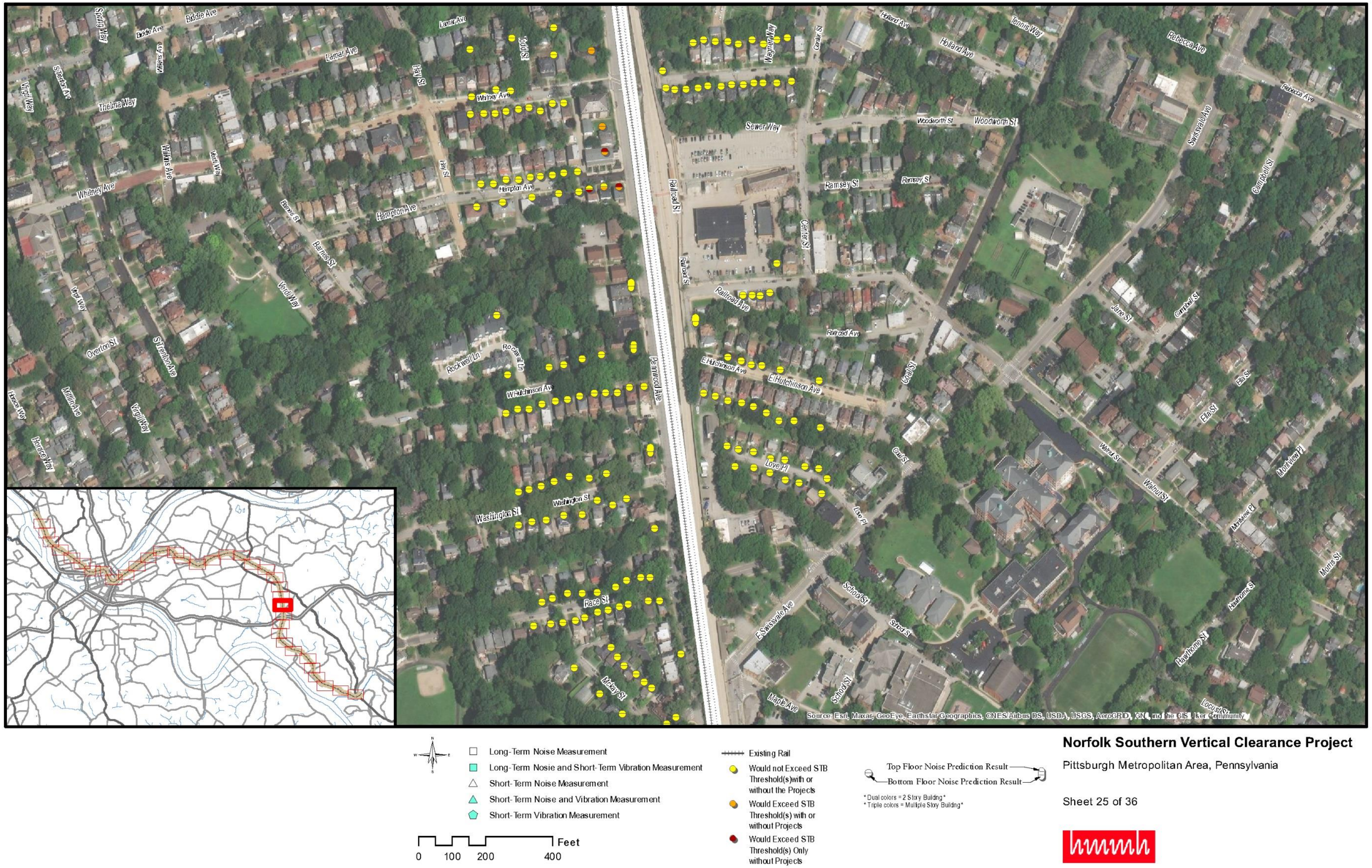

Figure 31. Low-Growth Scenario Noise and Vibration Assessment Map 26

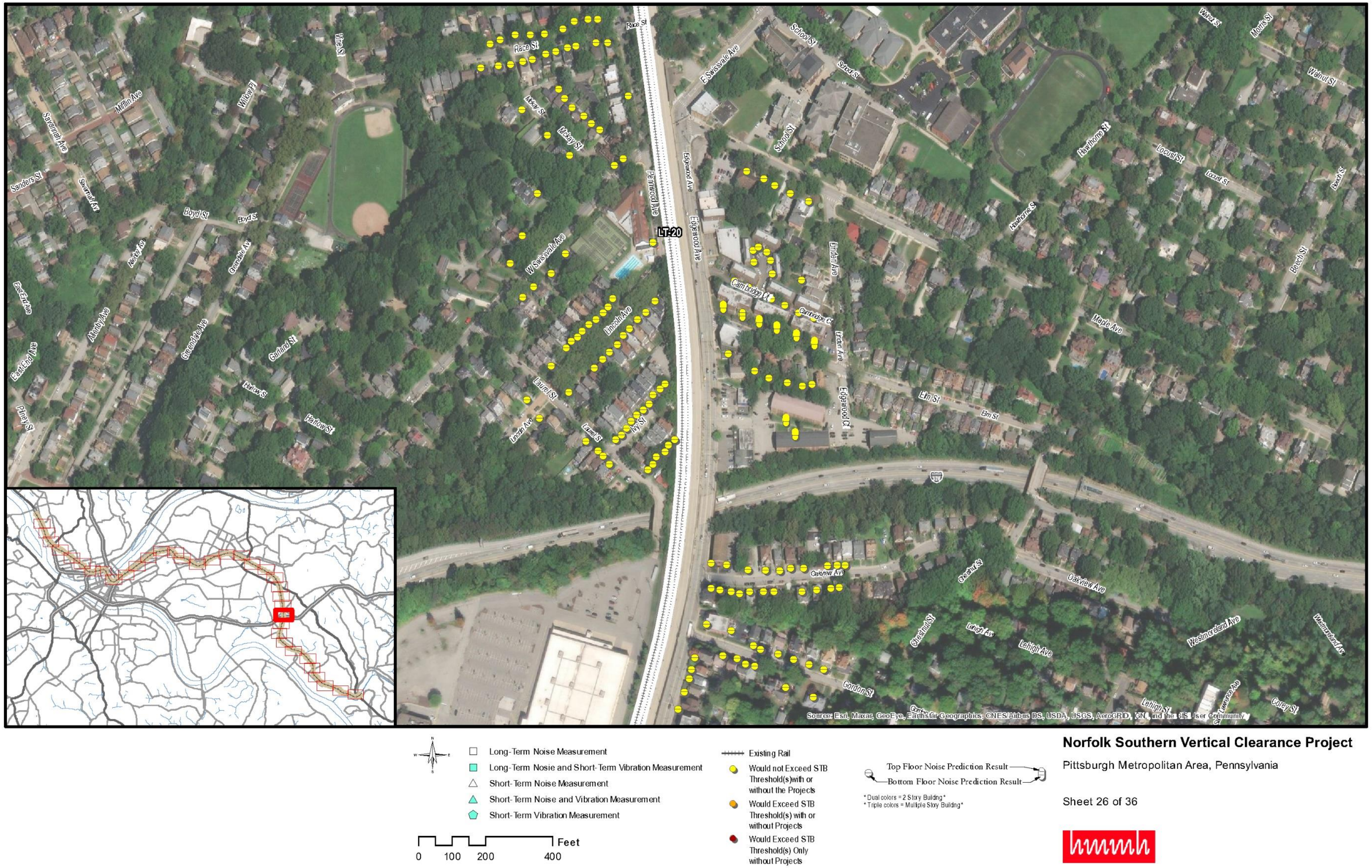

Figure 32. Low-Growth Scenario Noise and Vibration Assessment Map 27

Figure 33. Low-Growth Scenario Noise and Vibration Assessment Map 28

Figure 34. Low-Growth Scenario Noise and Vibration Assessment Map 29

Figure 35. Low-Growth Scenario Noise and Vibration Assessment Map 30

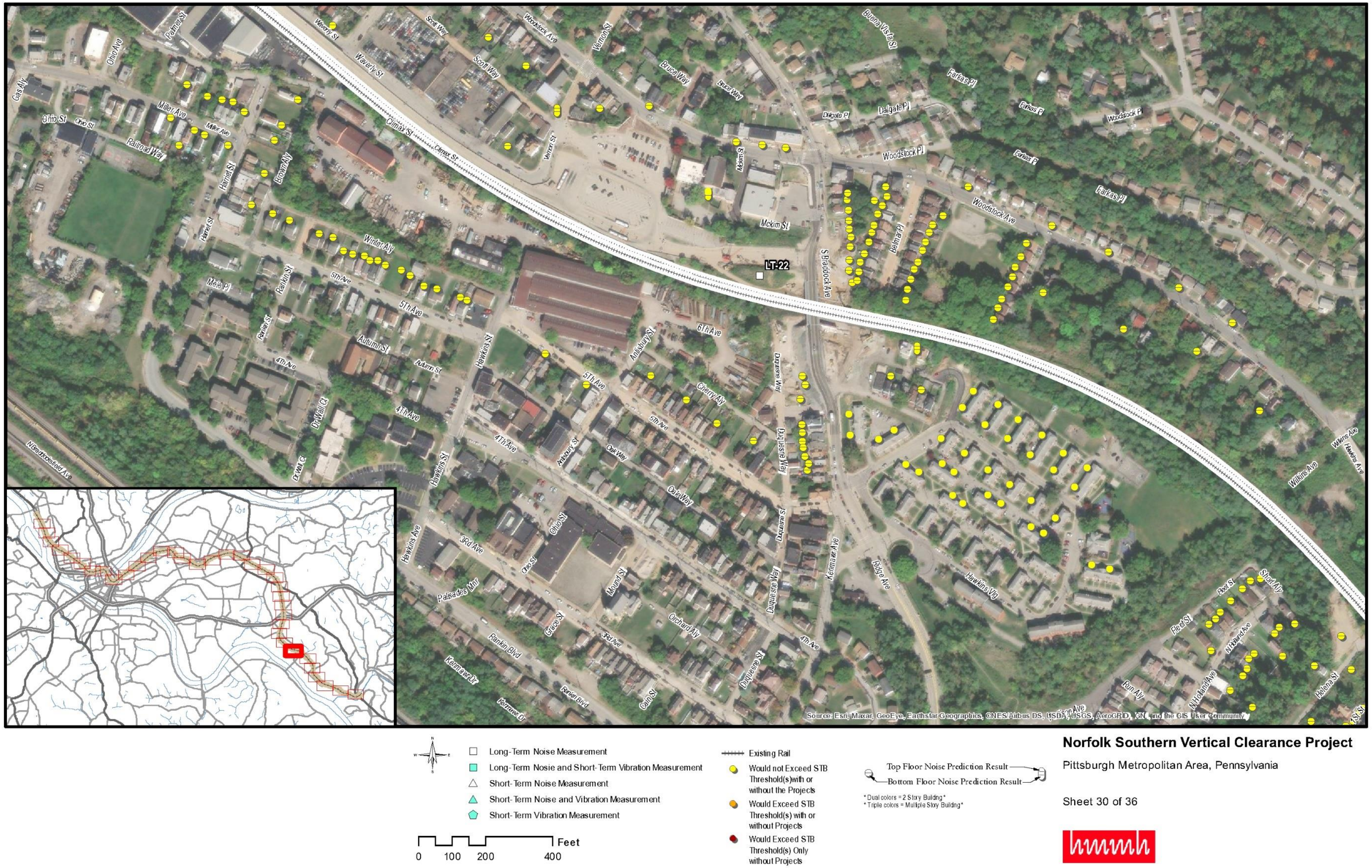

Figure 36. Low-Growth Scenario Noise and Vibration Assessment Map 31

Figure 37. Low-Growth Scenario Noise and Vibration Assessment Map 32

Figure 38. Low-Growth Scenario Noise and Vibration Assessment Map 33

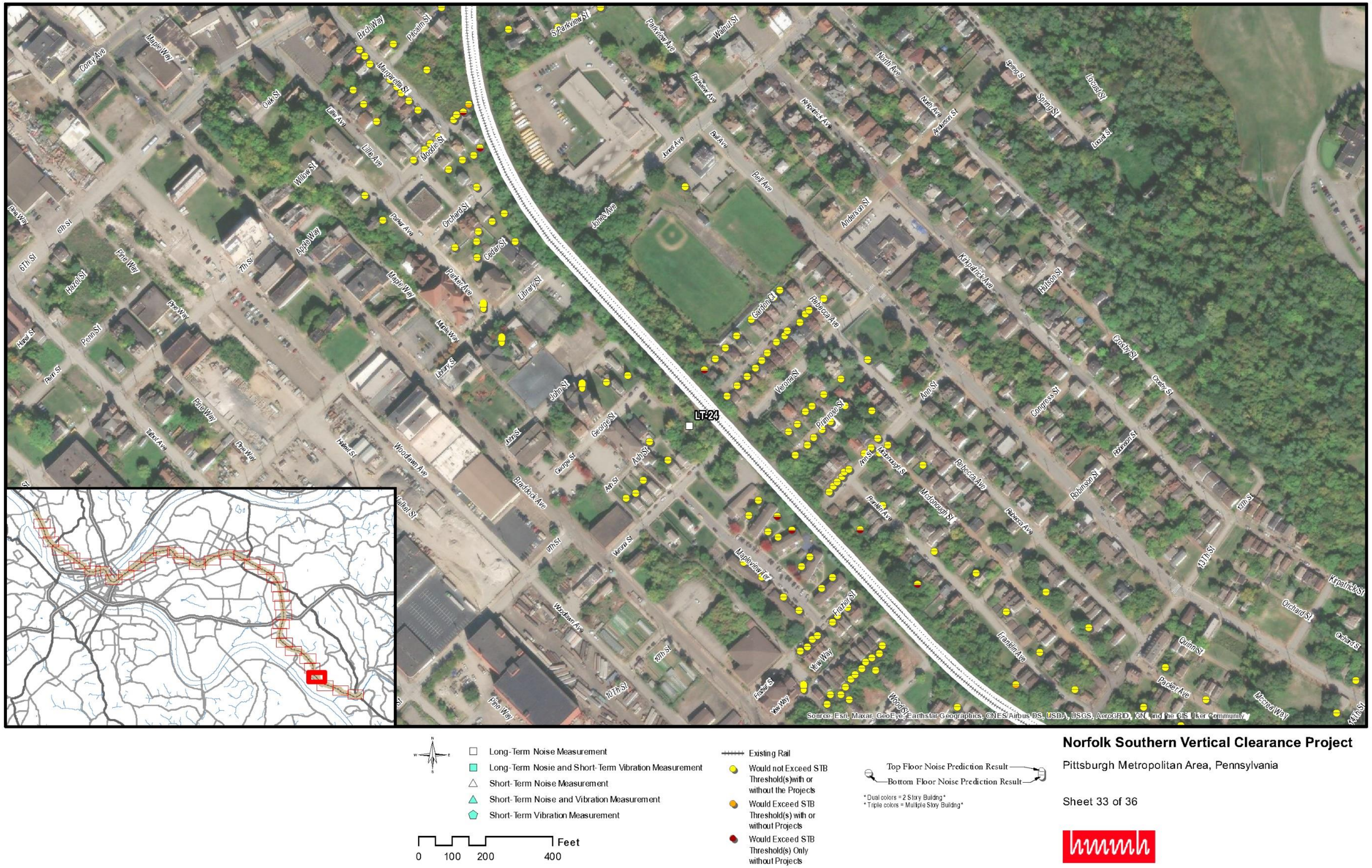

Figure 39. Low-Growth Scenario Noise and Vibration Assessment Map 34

- Long-Term Noise Measurement
- Long-Term Nosie and Short-Term Vibration Measurement
- Short-Term Noise Measurement
- Short-Term Noise and Vibration Measurement
- Short-Term Vibration Measurement

Feet
0 100 200 400

- Existing Rail
- Would not Exceed STB Threshold(s)with or without the Projects
- Would Exceed STB Threshold(s) with or without Projects
- Would Exceed STB Threshold(s) Only without Projects

Top Floor Noise Prediction Result
Bottom Floor Noise Prediction Result
* Dual colors = 2 Story Building*
* Triple colors = Multiple Story Building*

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Figure 40. Low-Growth Scenario Noise and Vibration Assessment Map 35

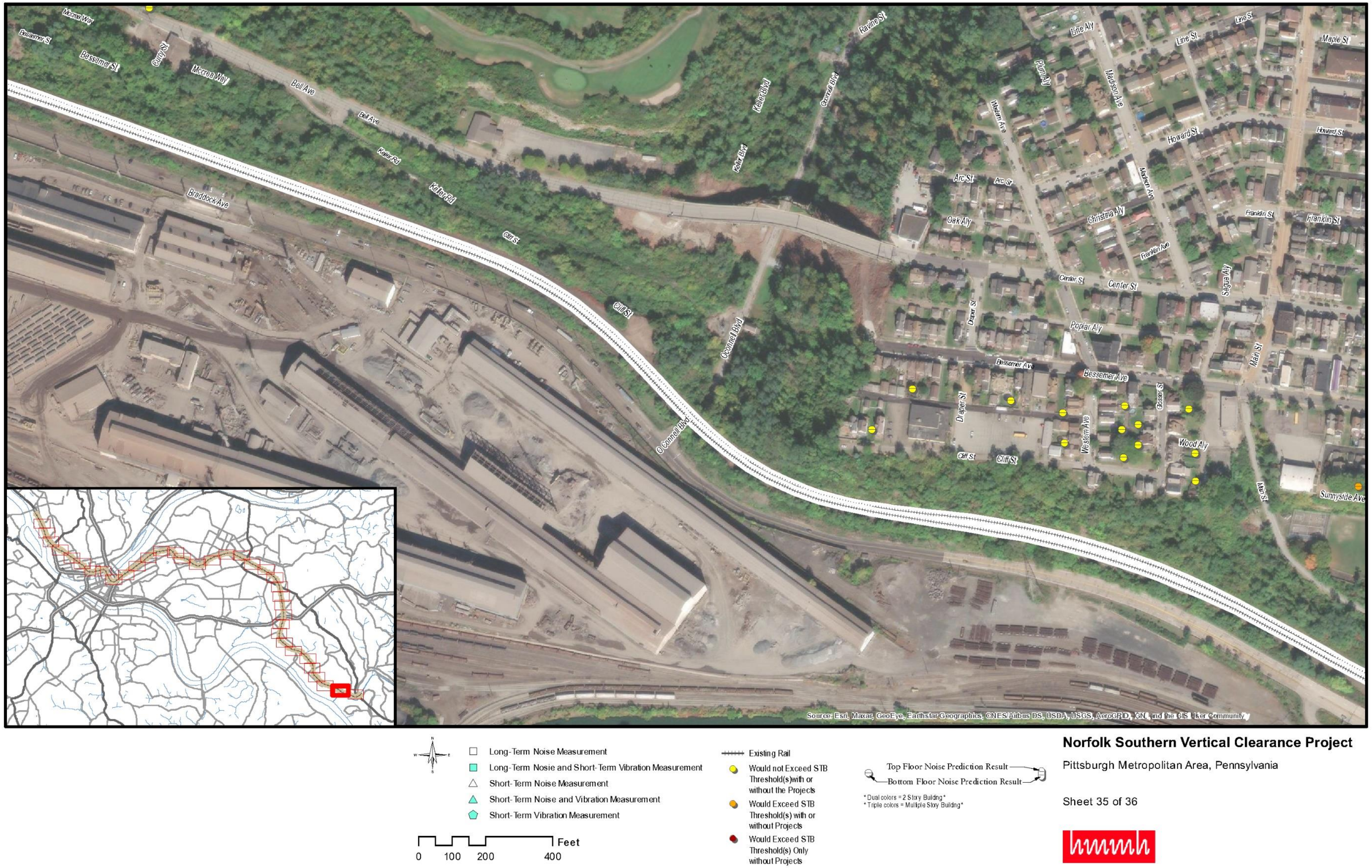

Figure 41. Low-Growth Scenario Noise and Vibration Assessment Map 36

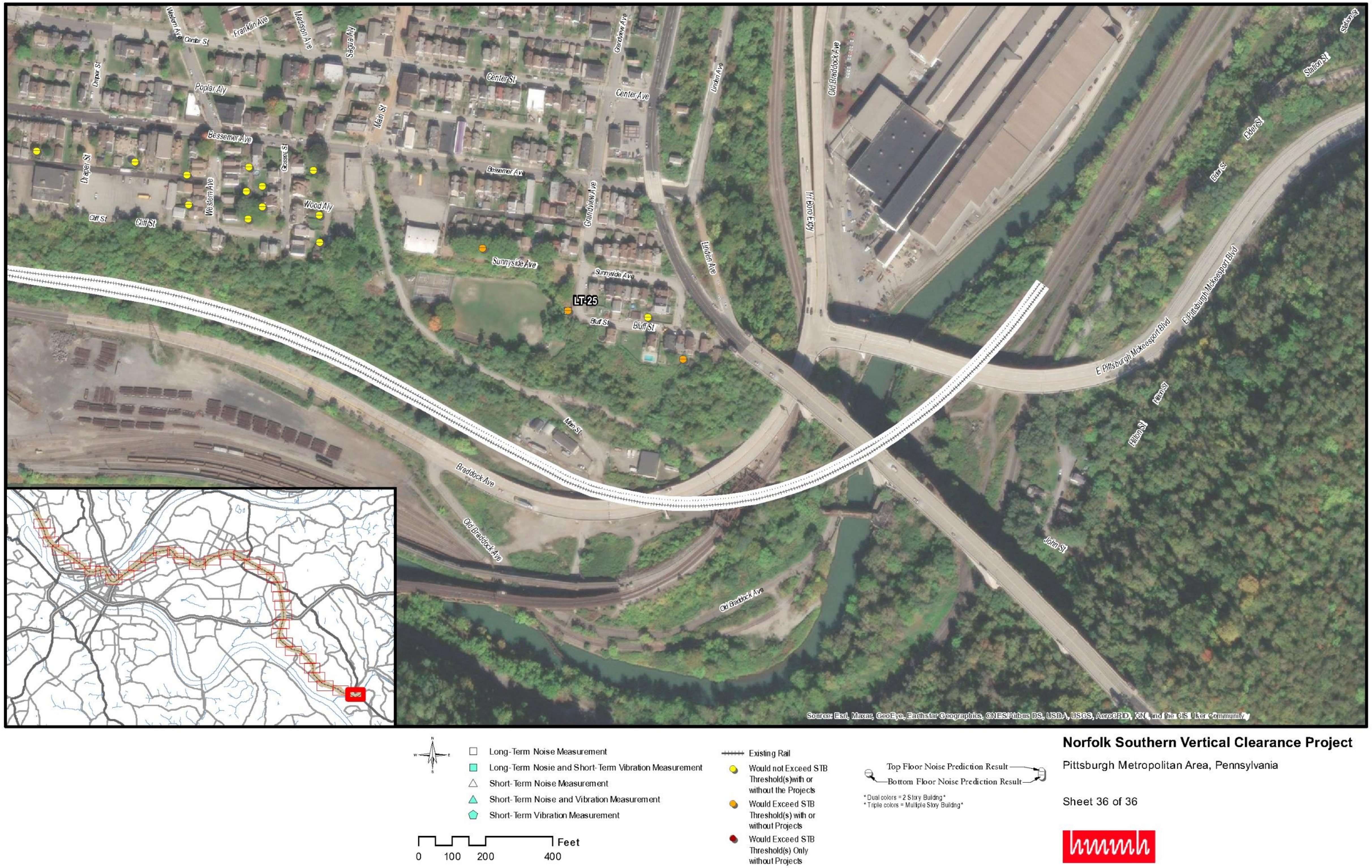

Figure 42. High-Growth Scenario Noise and Vibration Assessment Map 1

Figure 43. High-Growth Scenario Noise and Vibration Assessment Map 2

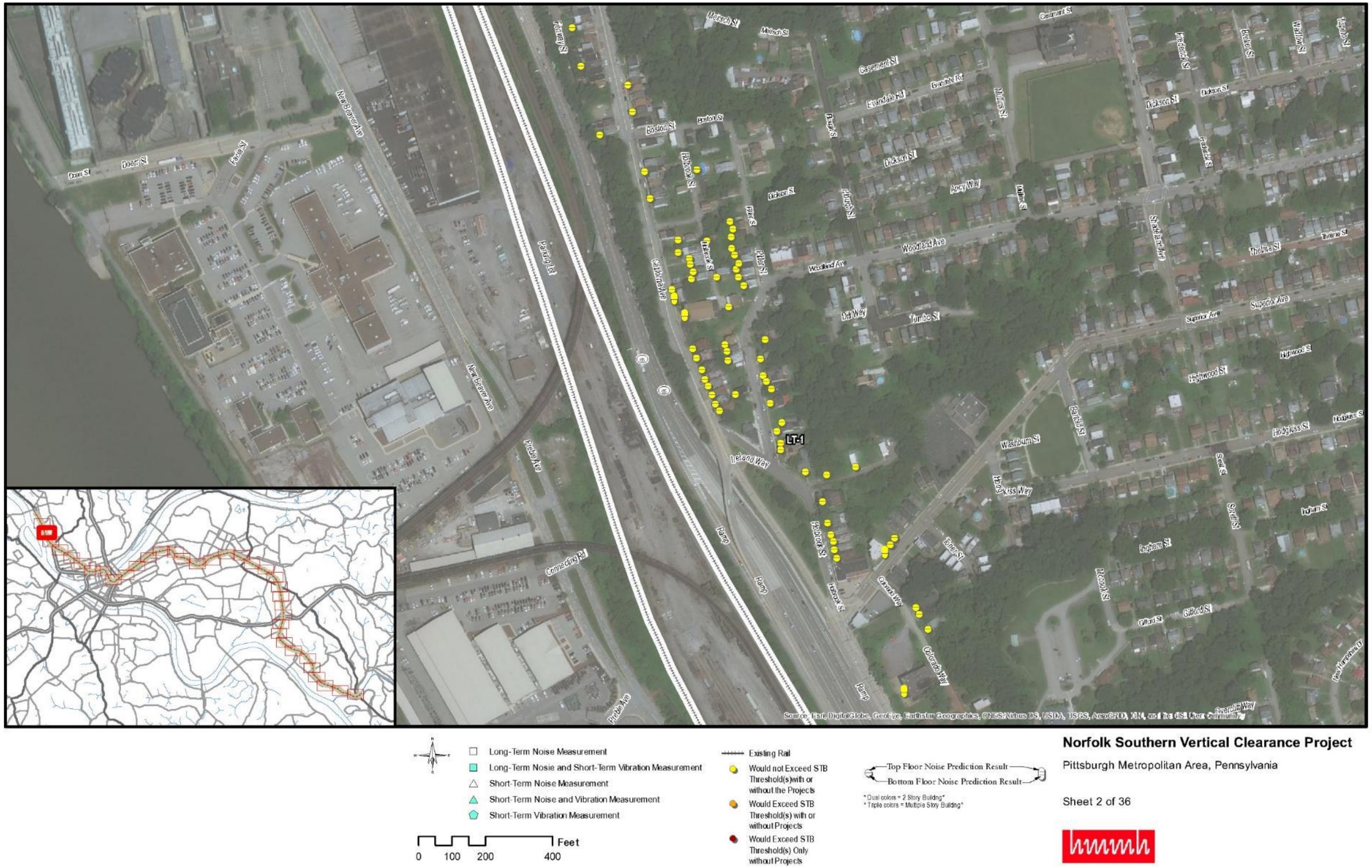

Figure 44. High-Growth Scenario Noise and Vibration Assessment Map 3

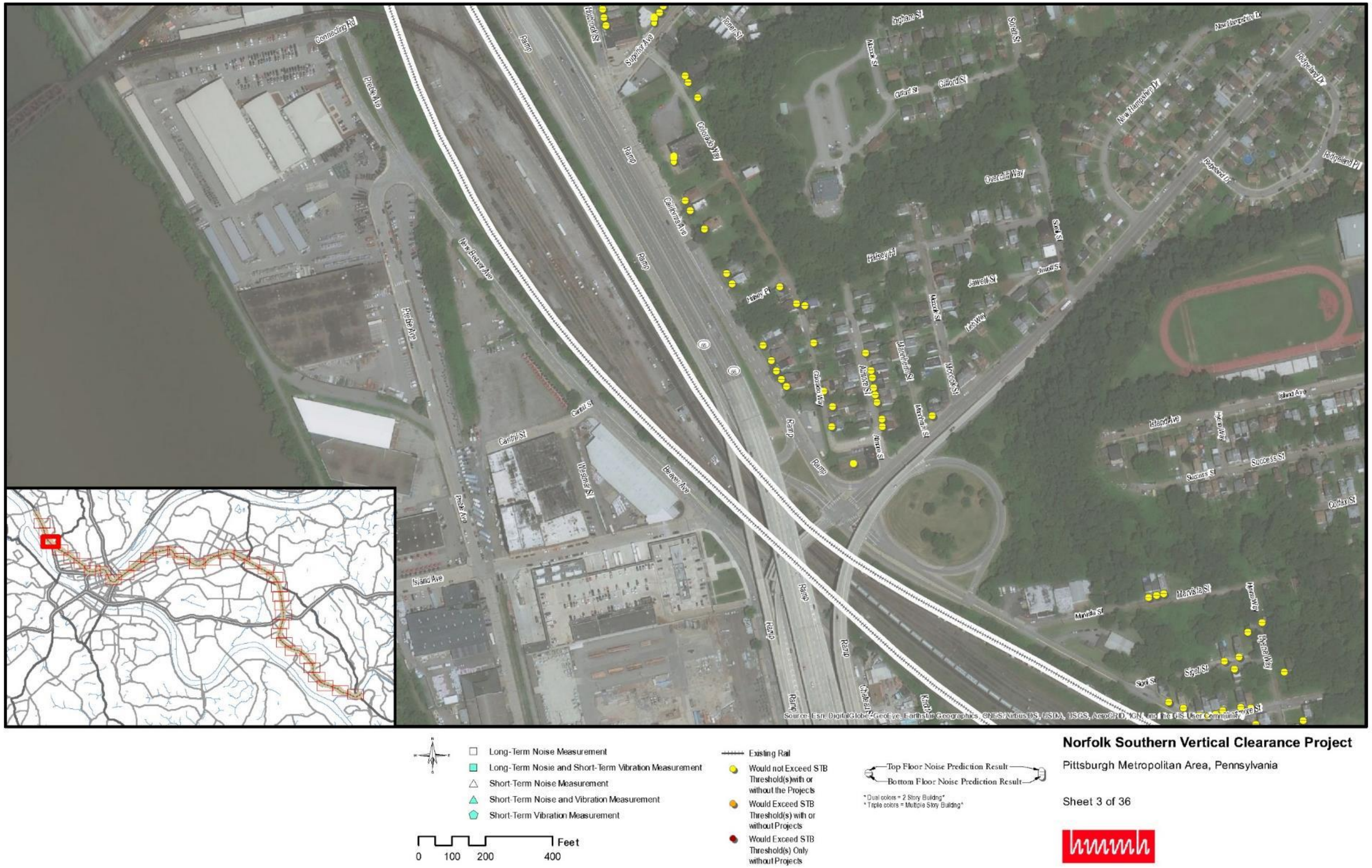

Figure 45. High-Growth Scenario Noise and Vibration Assessment Map 4

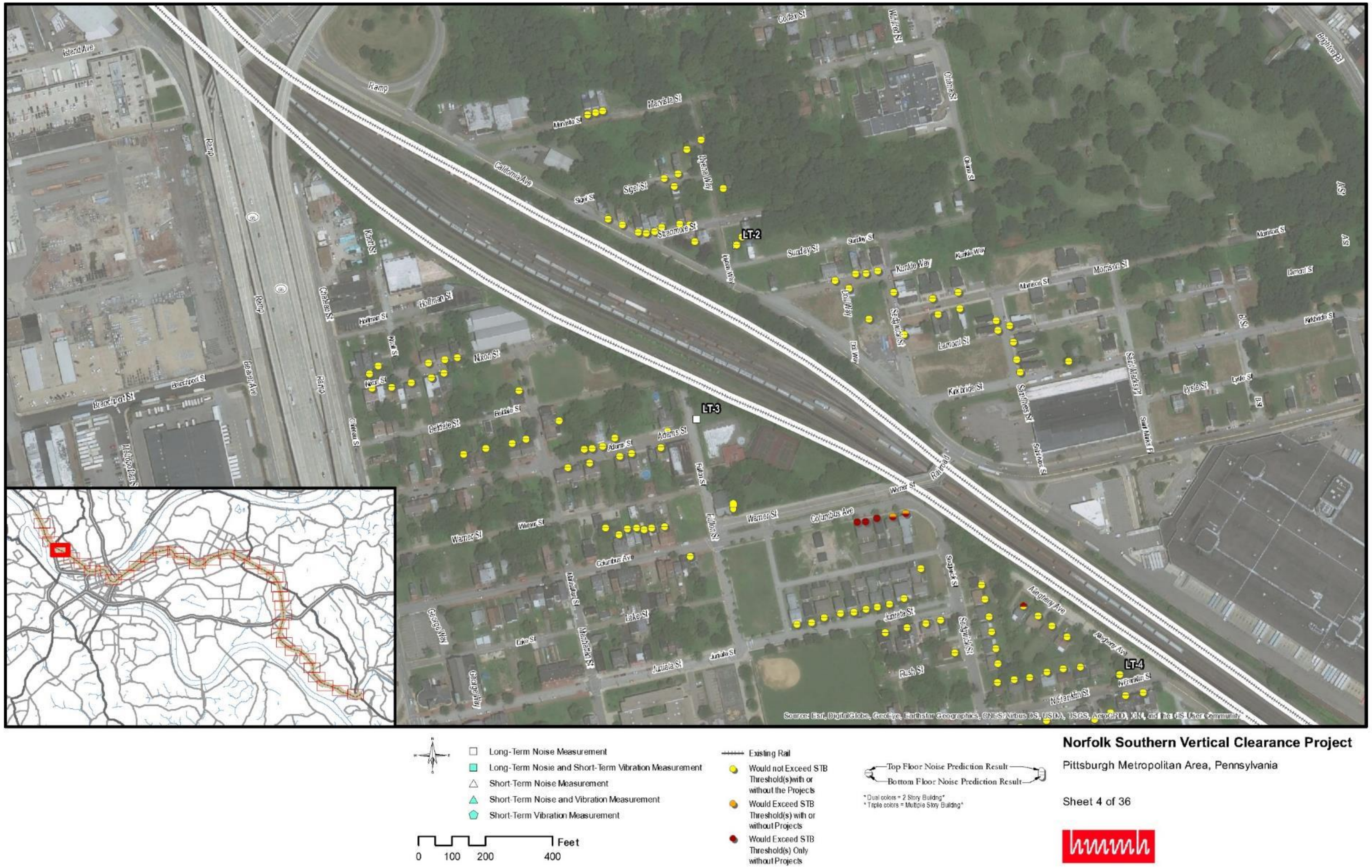

Figure 46. High-Growth Scenario Noise and Vibration Assessment Map 5

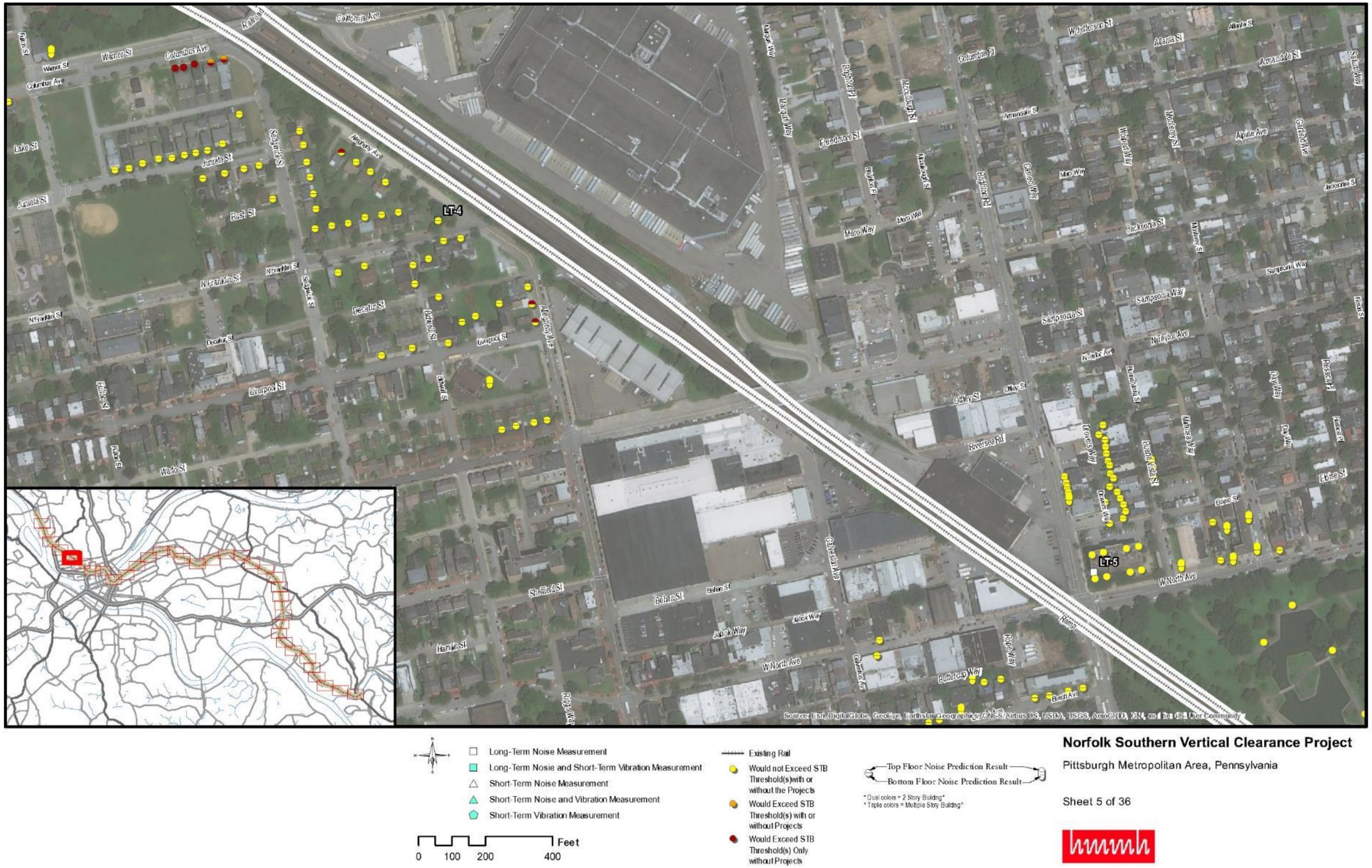

Figure 47. High-Growth Scenario Noise and Vibration Assessment Map 6

Figure 48. High-Growth Scenario Noise and Vibration Assessment Map 7

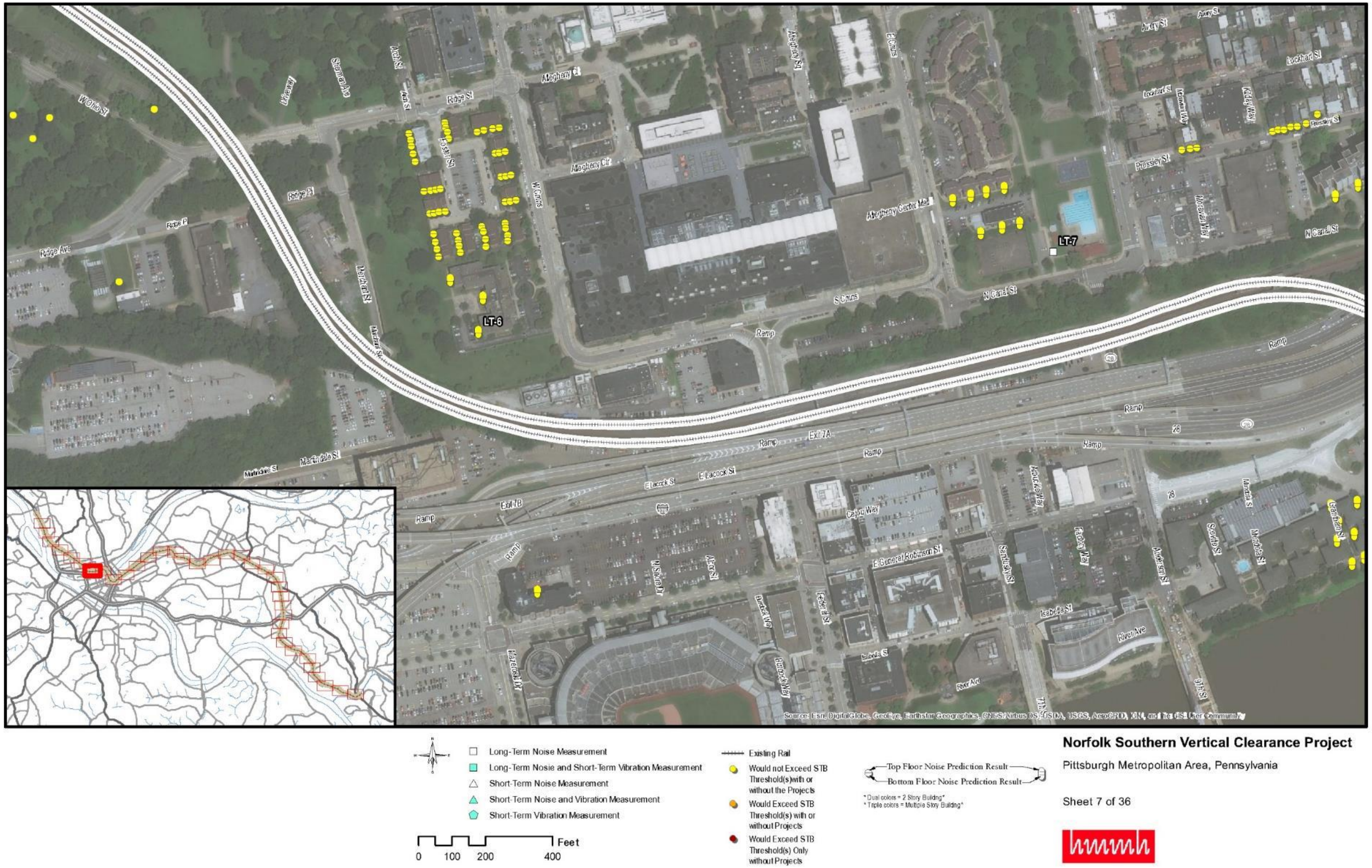

Figure 49. High-Growth Scenario Noise and Vibration Assessment Map 8

Figure 50. High-Growth Scenario Noise and Vibration Assessment Map 9

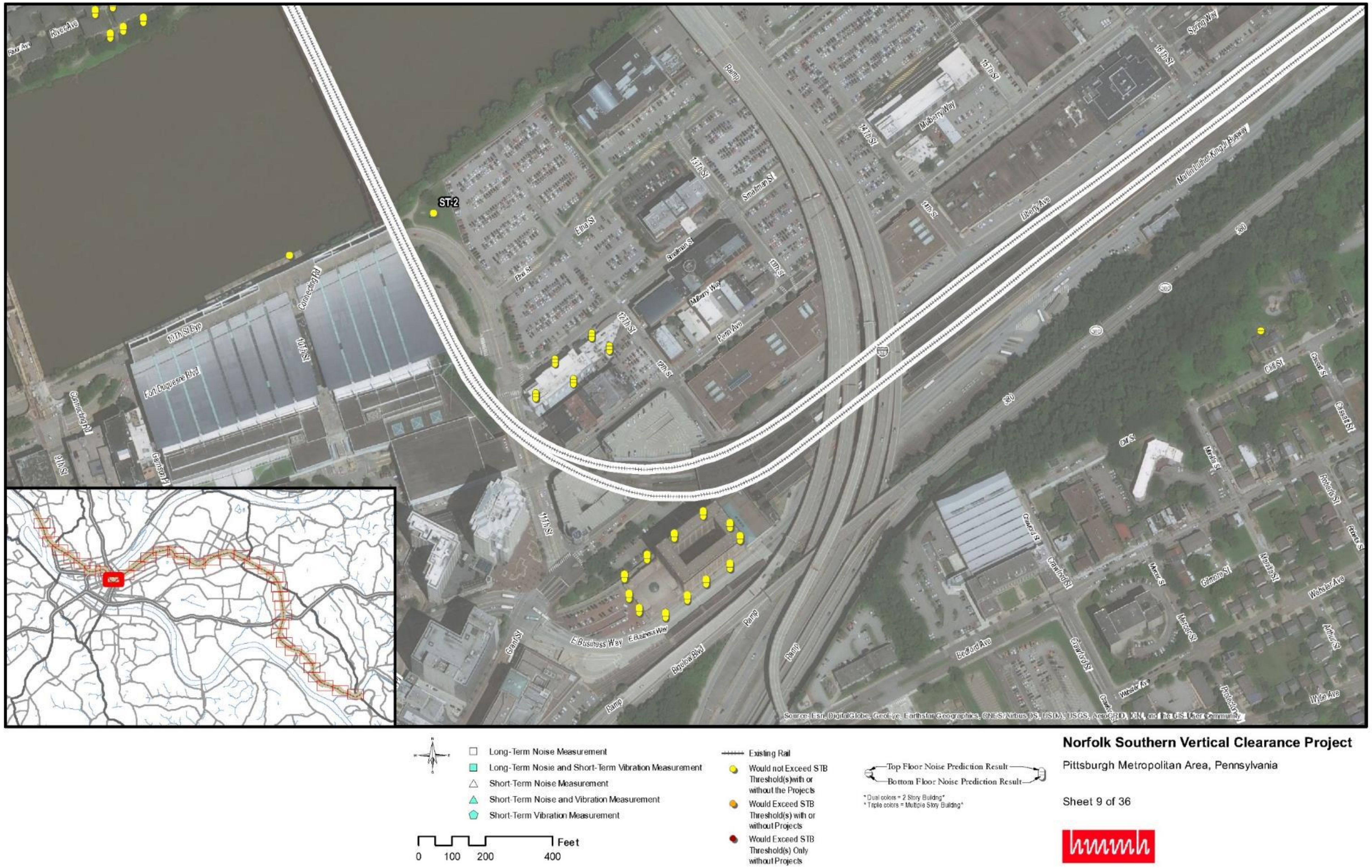

Figure 51. High-Growth Scenario Noise and Vibration Assessment Map 10

Long-Term Noise Measurement
Long-Term Nosie and Short-Term Vibration Measurement
Short-Term Noise Measurement
Short-Term Noise and Vibration Measurement
Short-Term Vibration Measurement

Feet
0 100 200 400

Existing Rail
Would not Exceed STB Threshold(s) with or without the Projects
Would Exceed STB Threshold(s) with or without Projects
Would Exceed STB Threshold(s) Only without Projects

Top Floor Noise Prediction Result
Bottom Floor Noise Prediction Result
* Dual colors = 2 Story Building*
* Triple colors = Multiple Story Building*

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Figure 52. High-Growth Scenario Noise and Vibration Assessment Map 11

Figure 53. High-Growth Scenario Noise and Vibration Assessment Map 12

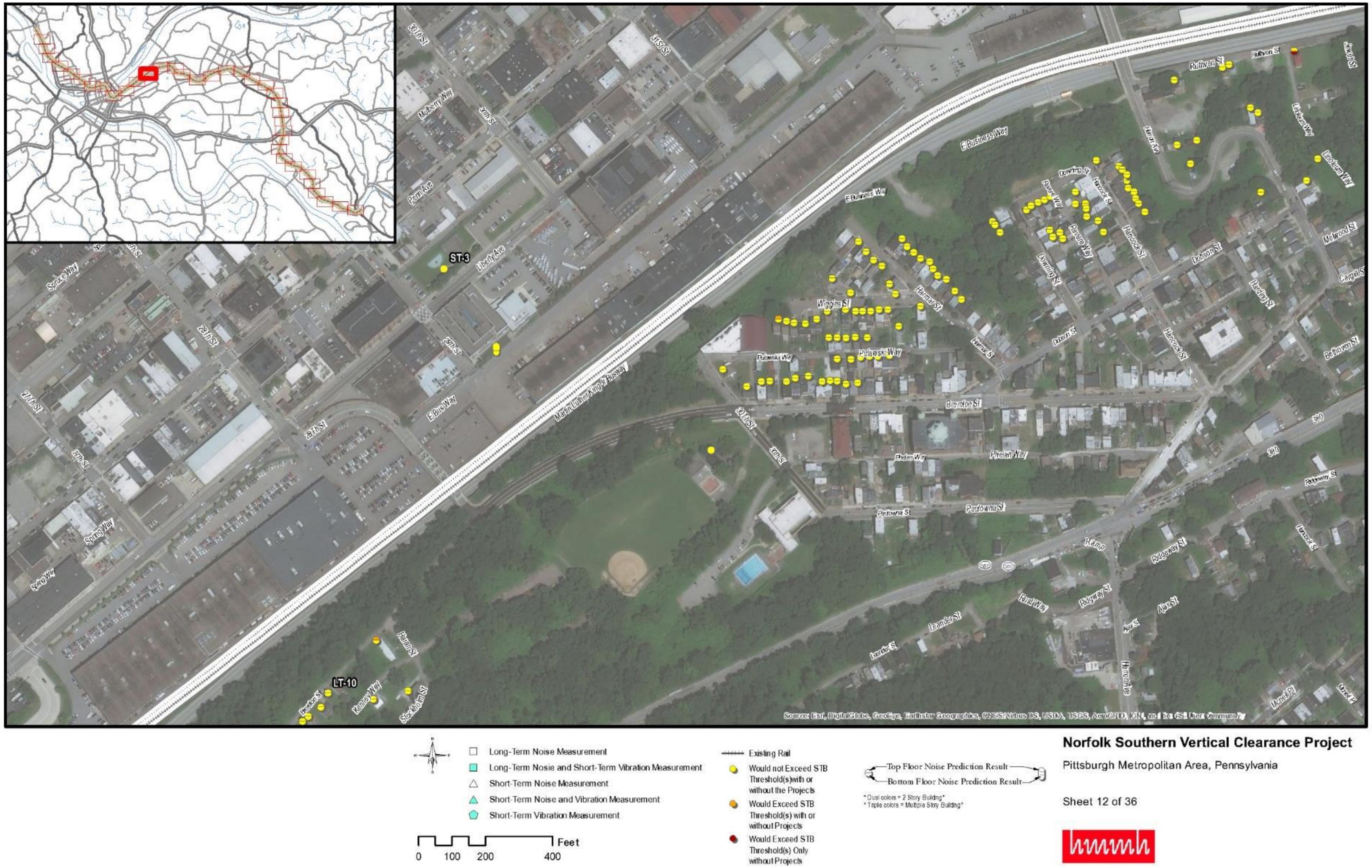


Figure 54. High-Growth Scenario Noise and Vibration Assessment Map 13

Figure 55. High-Growth Scenario Noise and Vibration Assessment Map 14

Figure 56. High-Growth Scenario Noise and Vibration Assessment Map 15

Figure 57. High-Growth Scenario Noise and Vibration Assessment Map 16

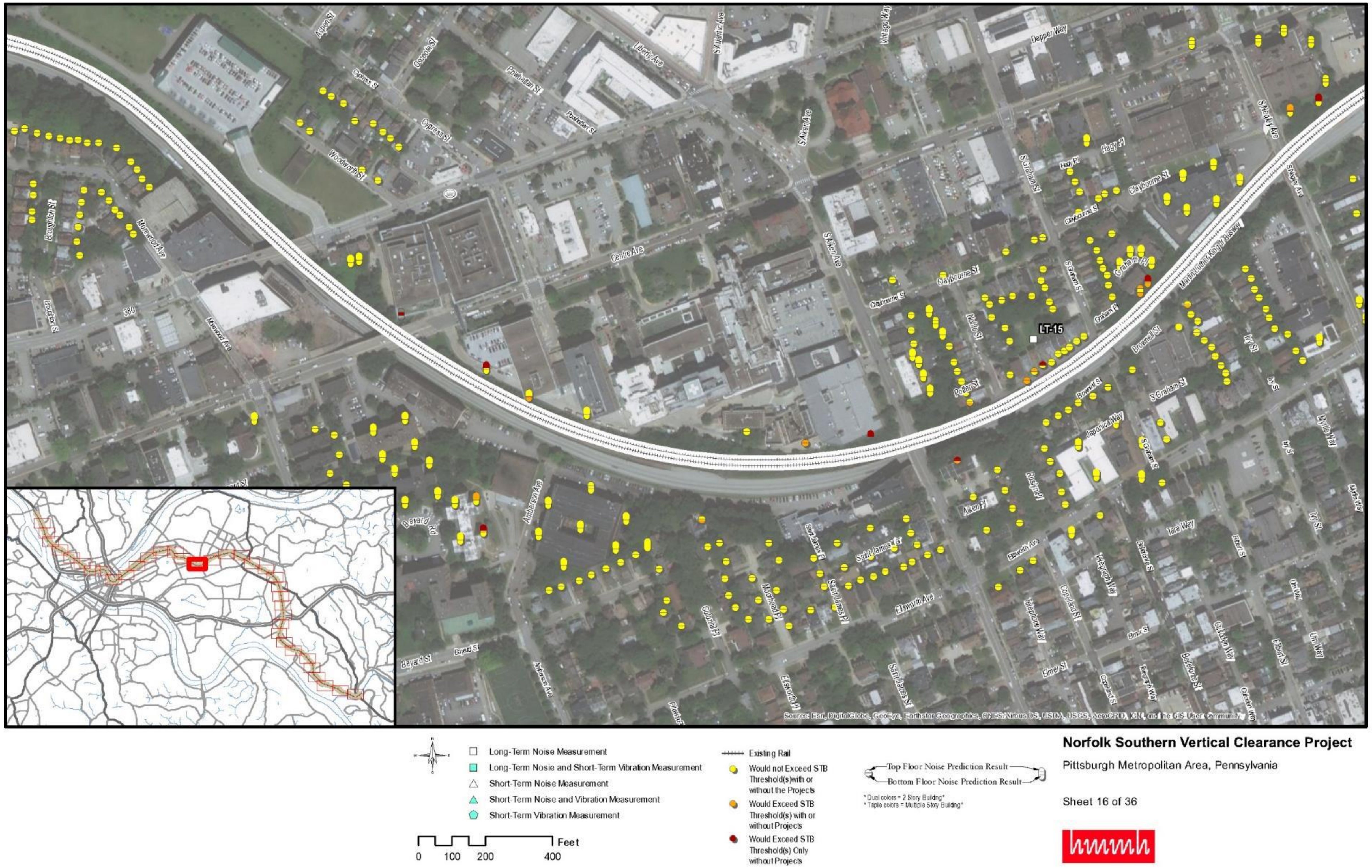


Figure 58. High-Growth Scenario Noise and Vibration Assessment Map 17

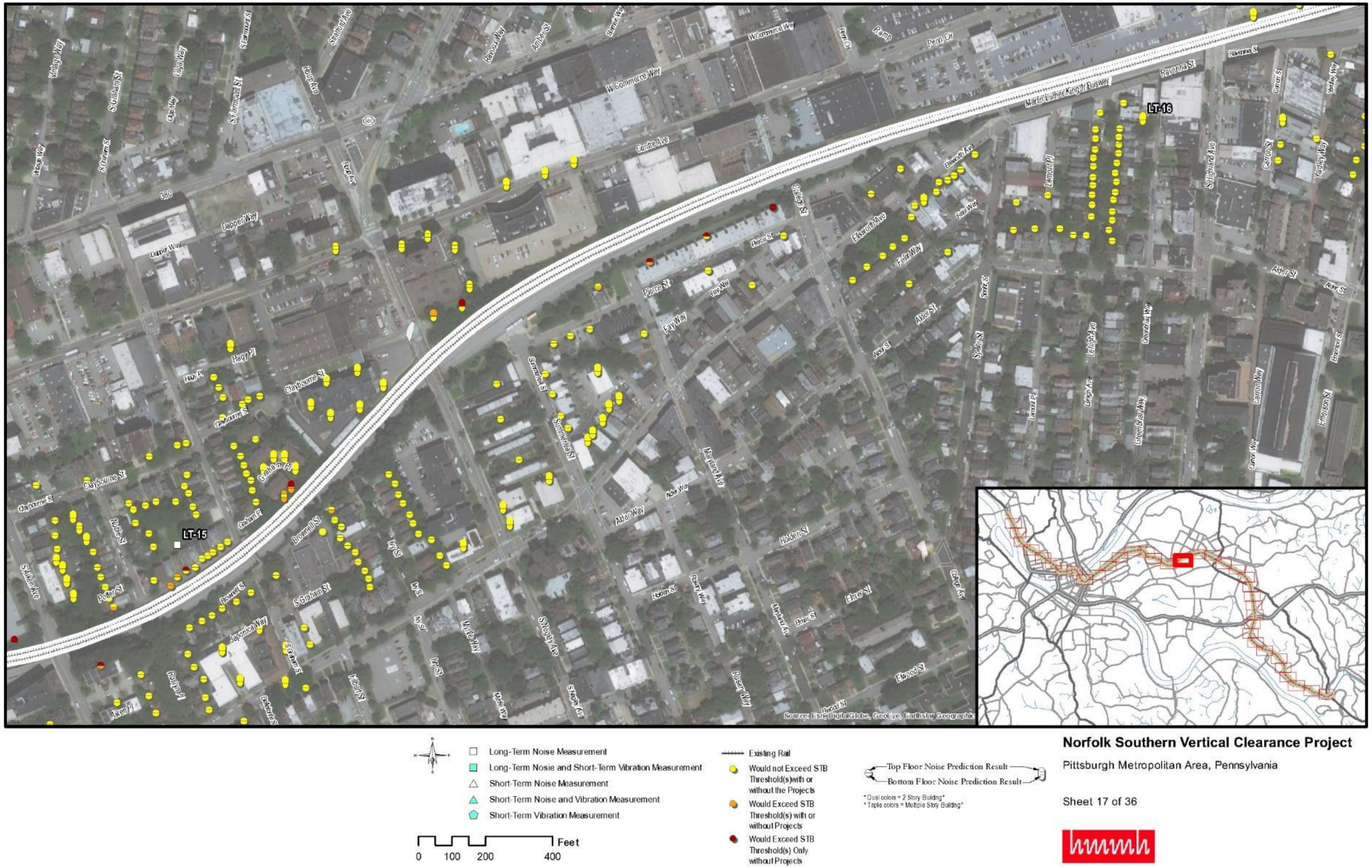


Figure 59. High-Growth Scenario Noise and Vibration Assessment Map 18

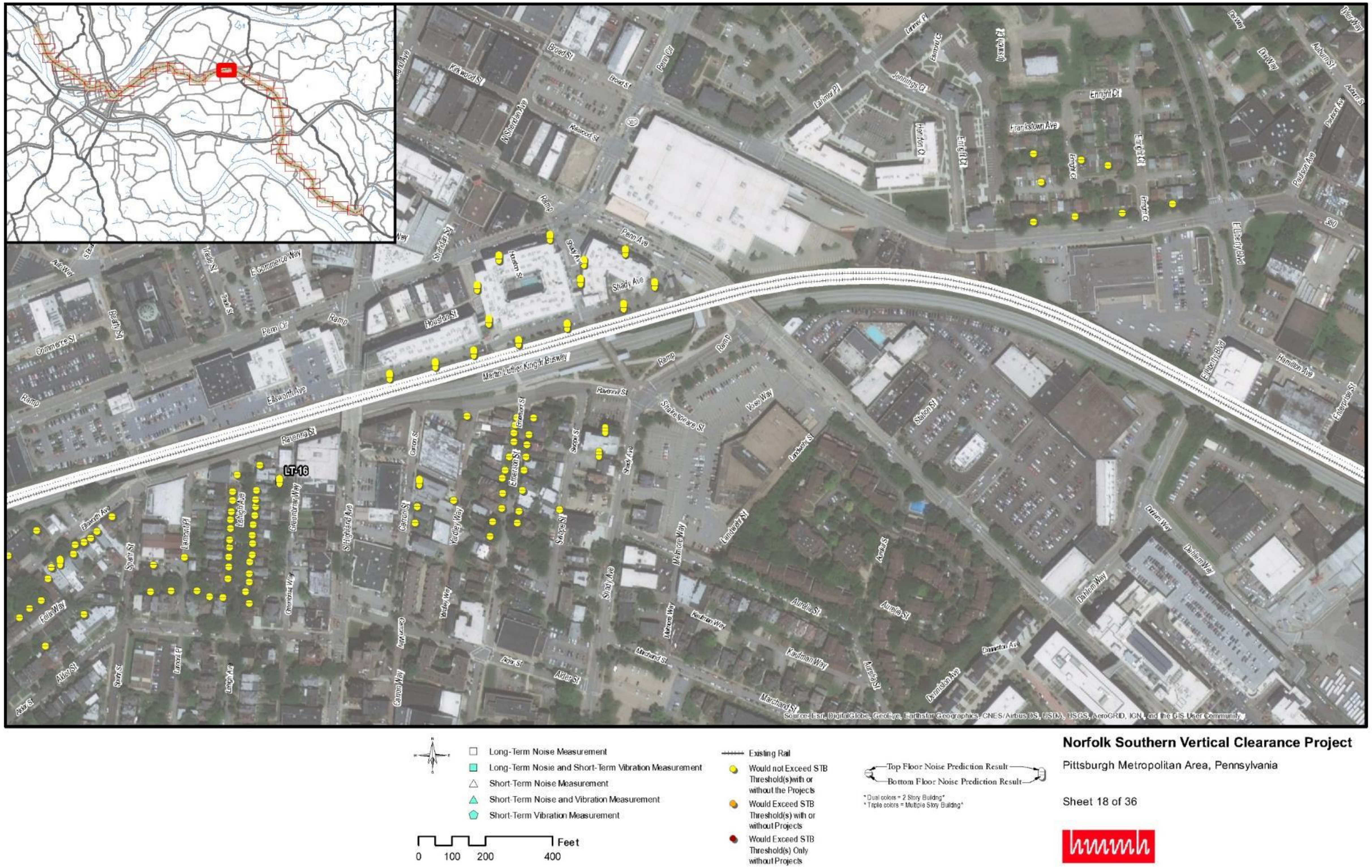


Figure 60. High-Growth Scenario Noise and Vibration Assessment Map 19

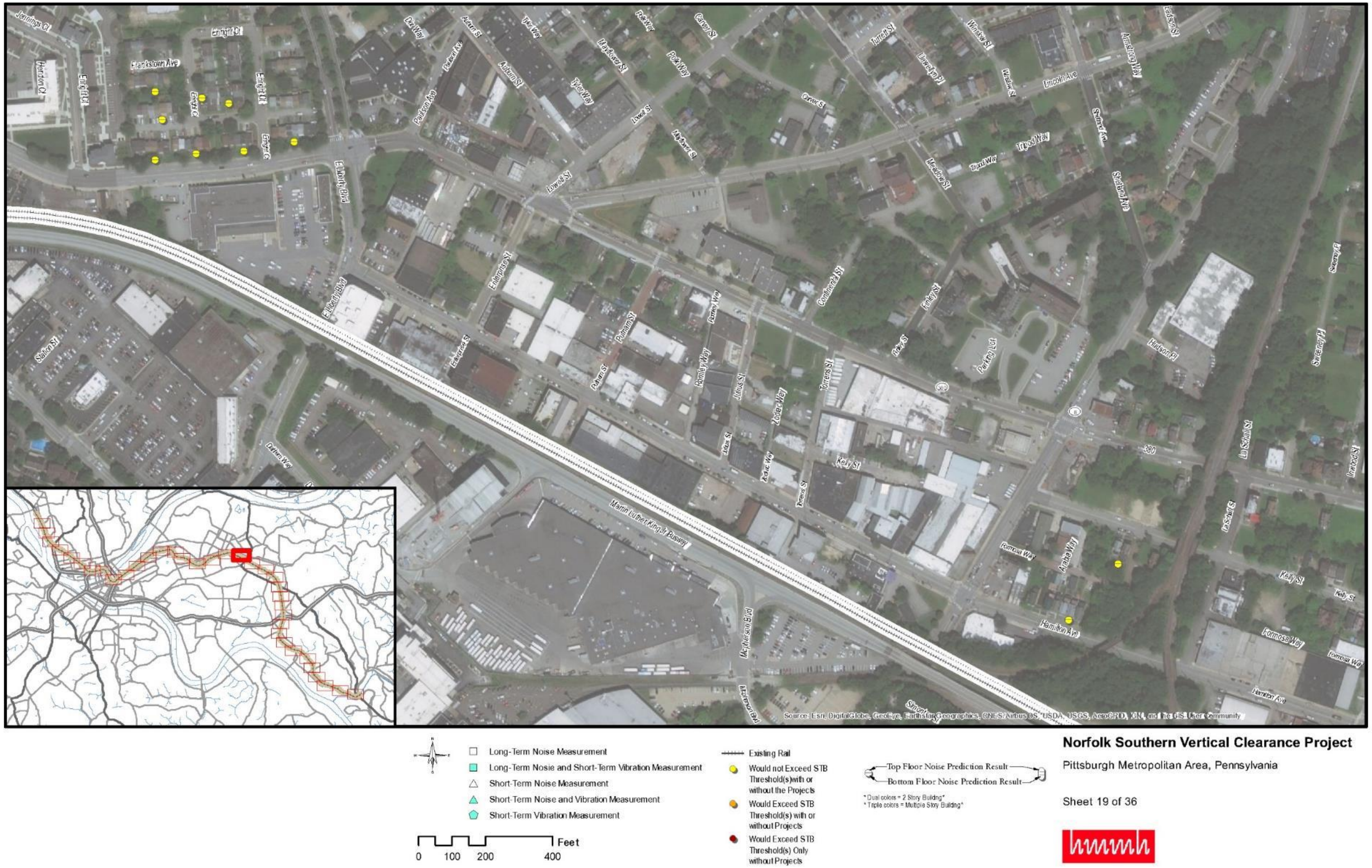


Figure 61. High-Growth Scenario Noise and Vibration Assessment Map 20

Figure 62. High-Growth Scenario Noise and Vibration Assessment Map 21

Figure 63. High-Growth Scenario Noise and Vibration Assessment Map 22

Figure 64. High-Growth Scenario Noise and Vibration Assessment Map 23

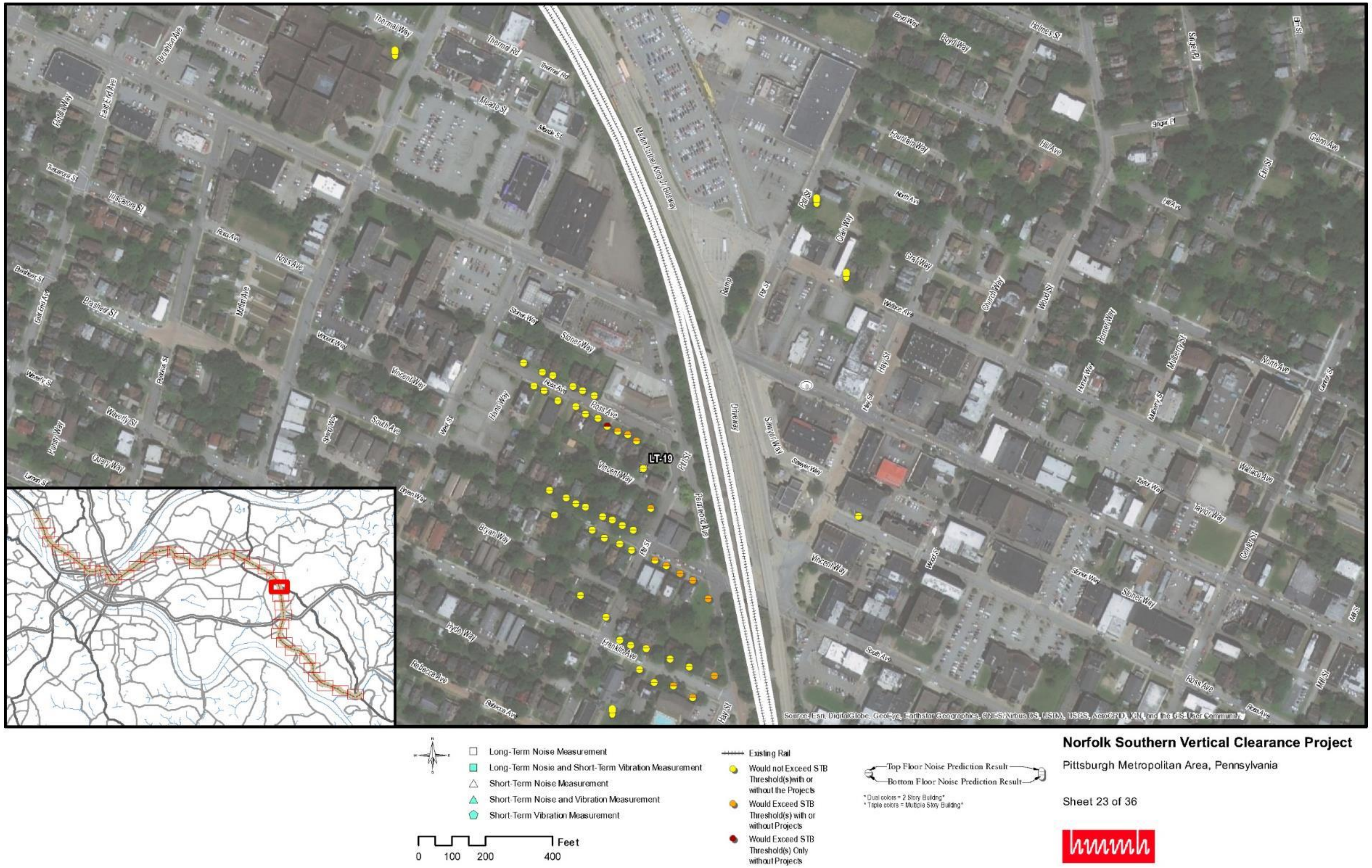


Figure 65. High-Growth Scenario Noise and Vibration Assessment Map 24

Figure 66. High-Growth Scenario Noise and Vibration Assessment Map 25

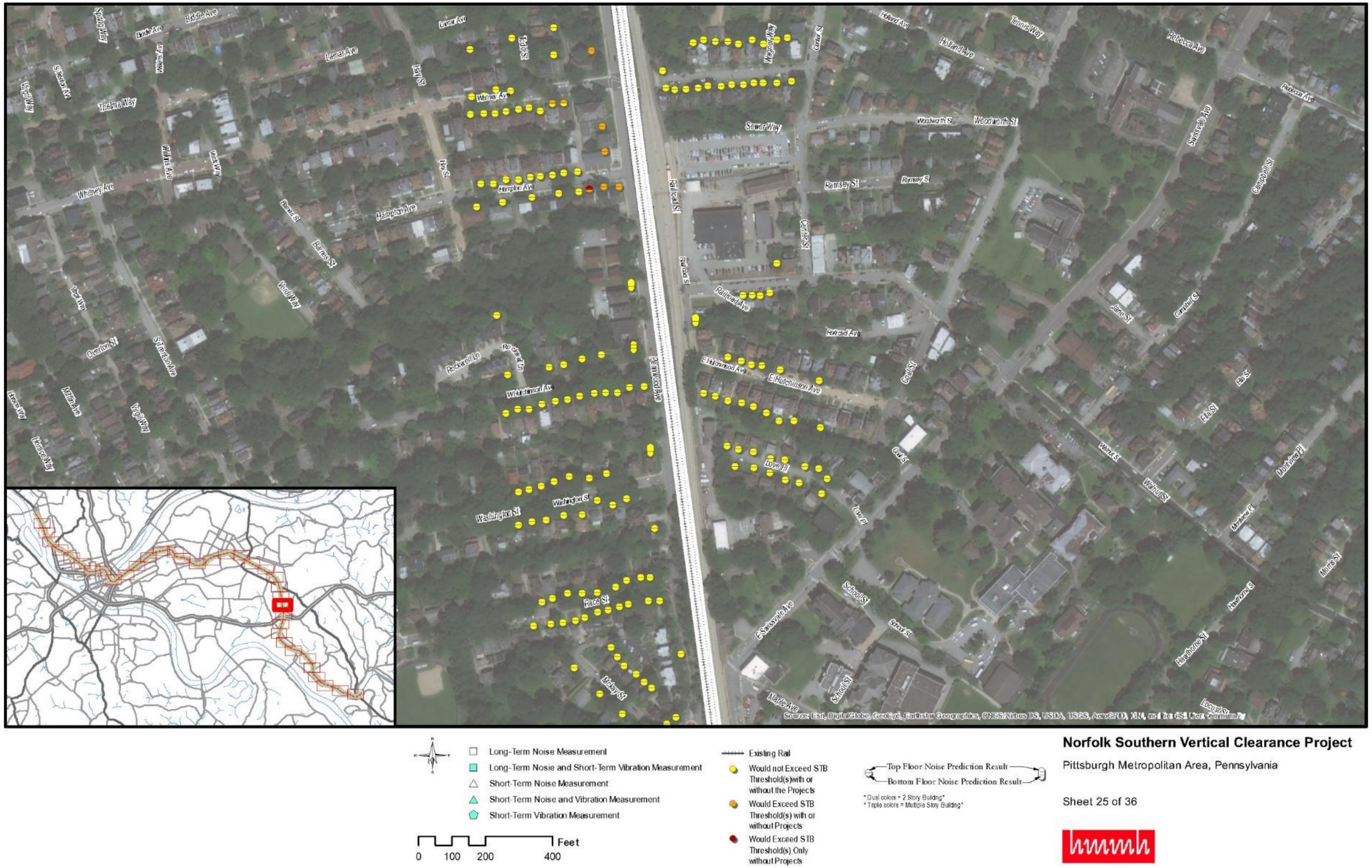


Figure 67. High-Growth Scenario Noise and Vibration Assessment Map 26

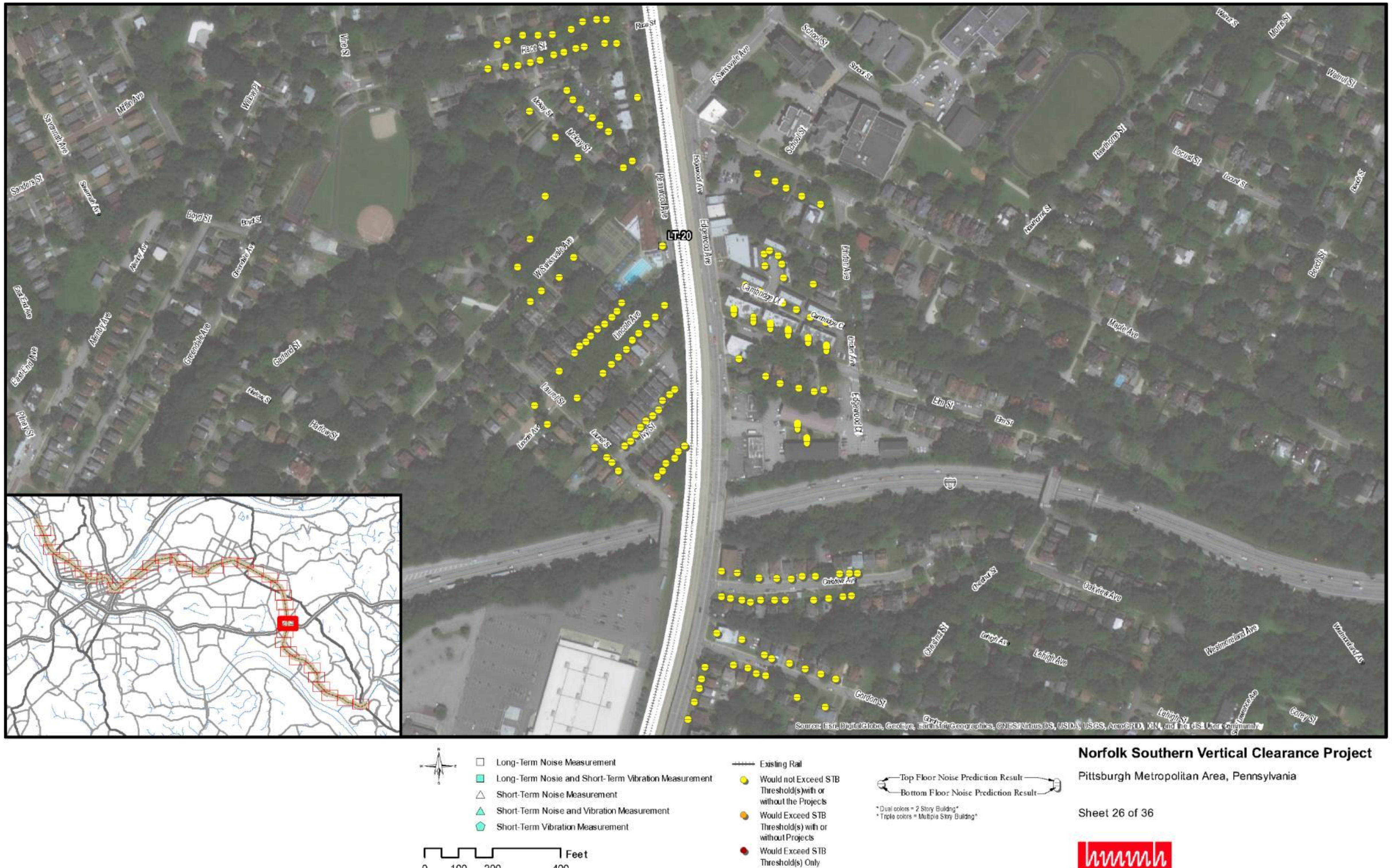


Figure 68. High-Growth Scenario Noise and Vibration Assessment Map 27

Figure 69. High-Growth Scenario Noise and Vibration Assessment Map 28

Figure 70. High-Growth Scenario Noise and Vibration Assessment Map 29

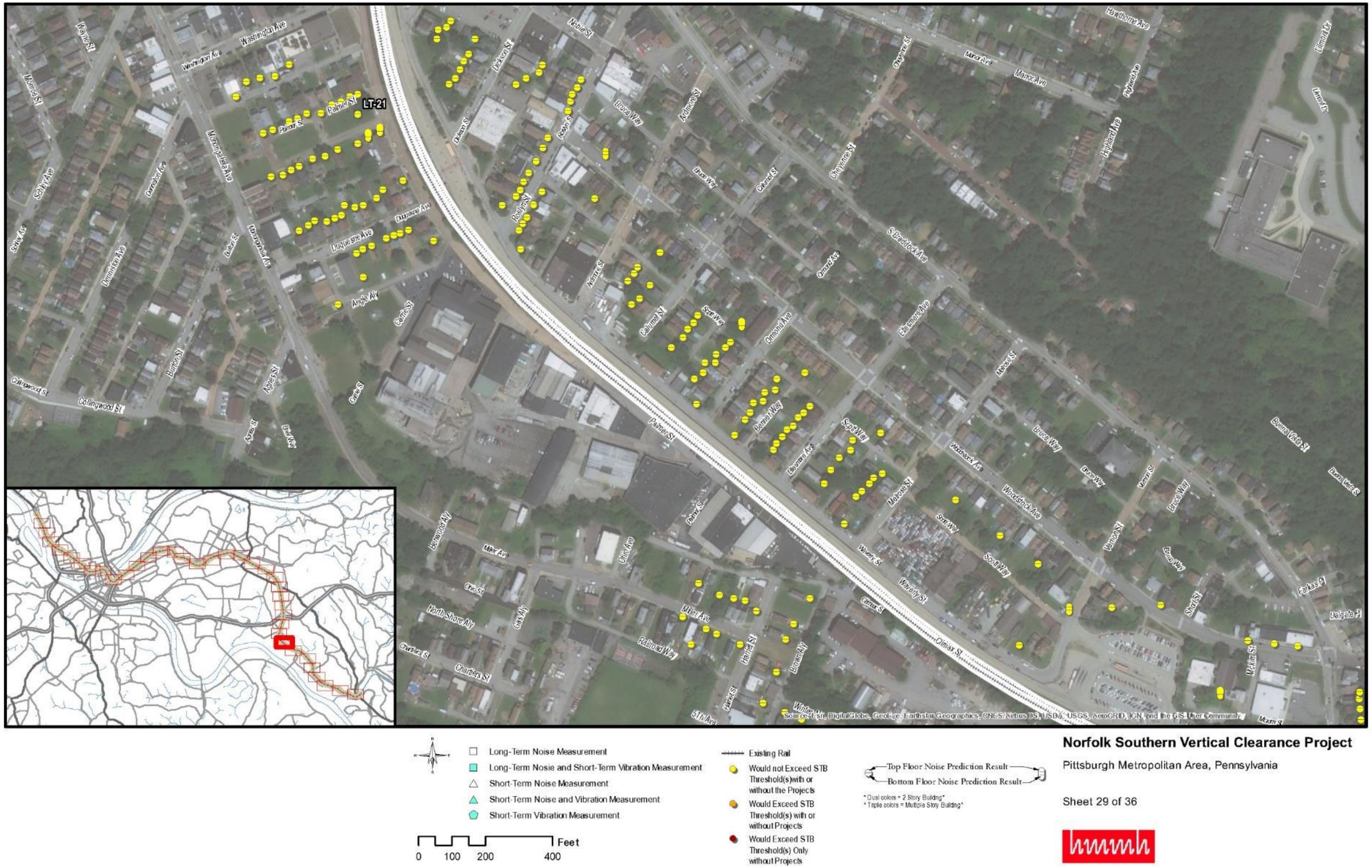


Figure 71. High-Growth Scenario Noise and Vibration Assessment Map 30

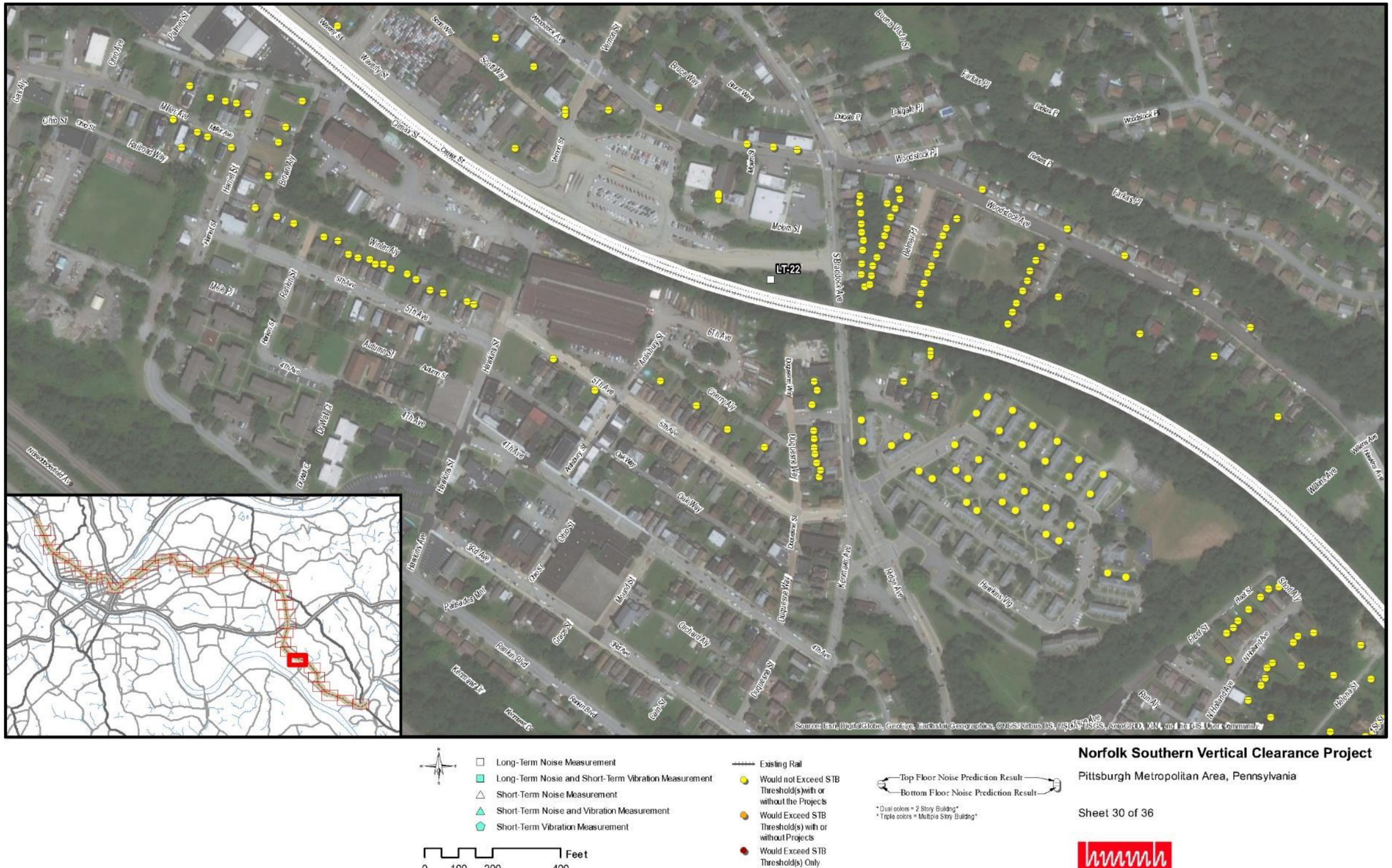


Figure 72. High-Growth Scenario Noise and Vibration Assessment Map 31

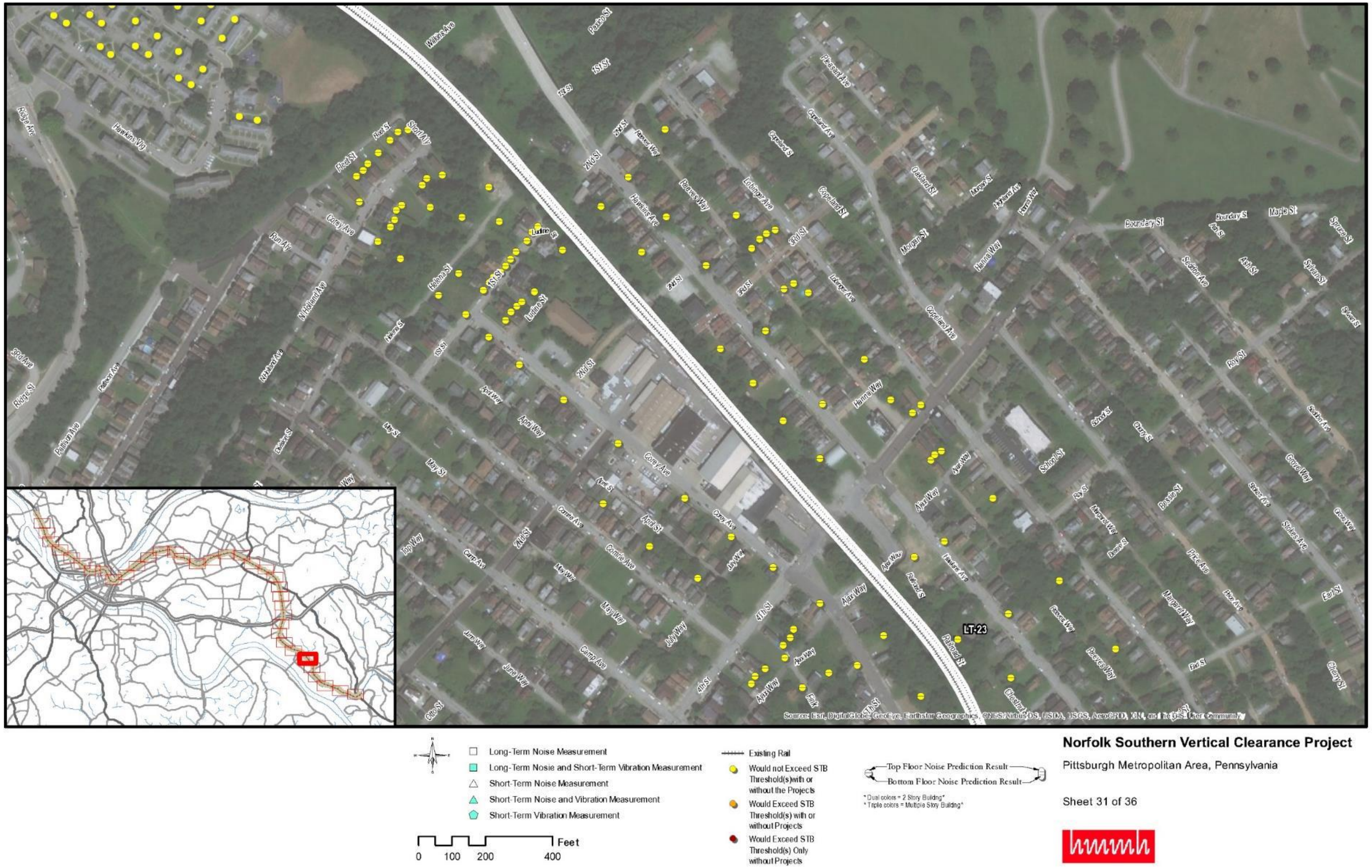


Figure 73. High-Growth Scenario Noise and Vibration Assessment Map 32

Figure 74. High-Growth Scenario Noise and Vibration Assessment Map 33

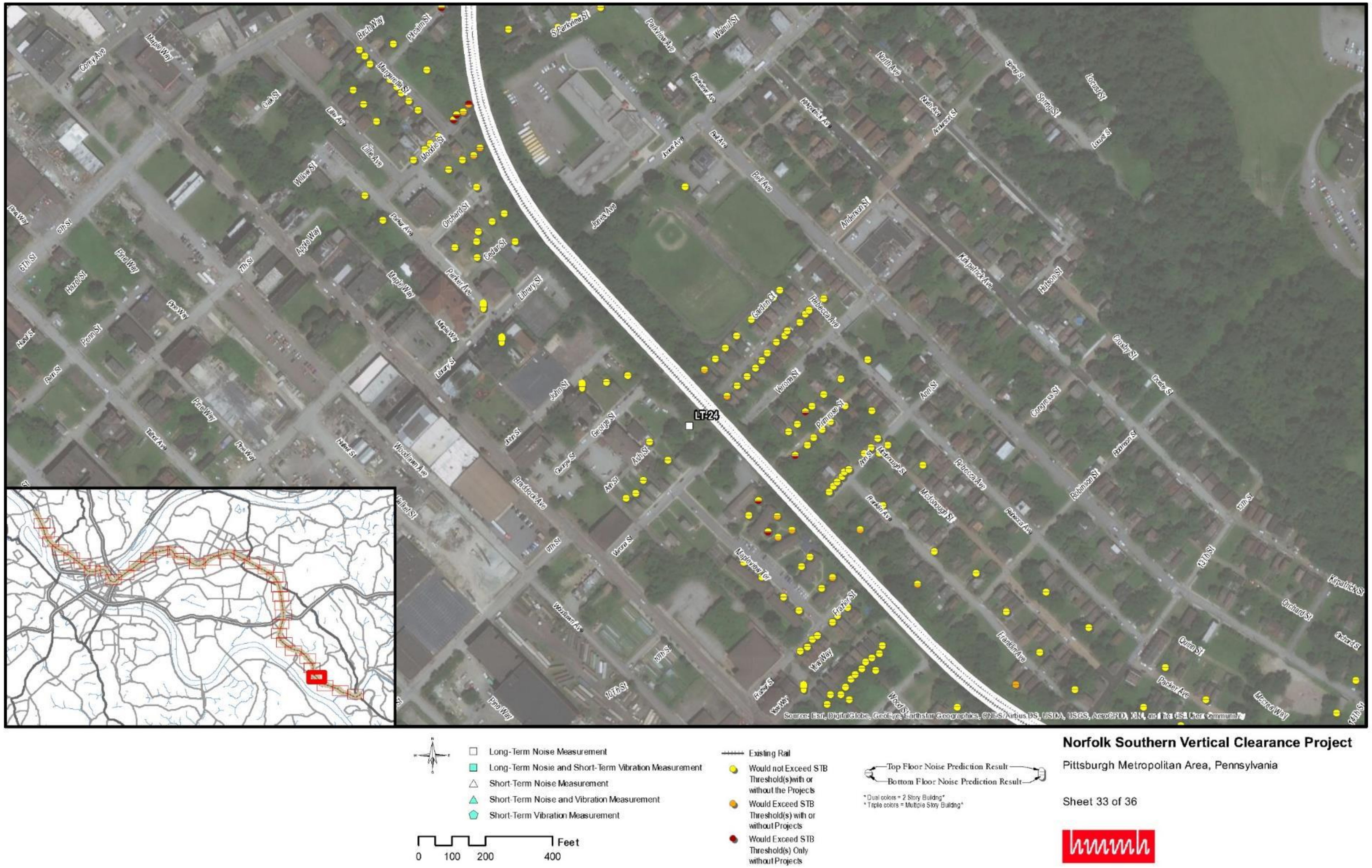


Figure 75. High-Growth Scenario Noise and Vibration Assessment Map 34

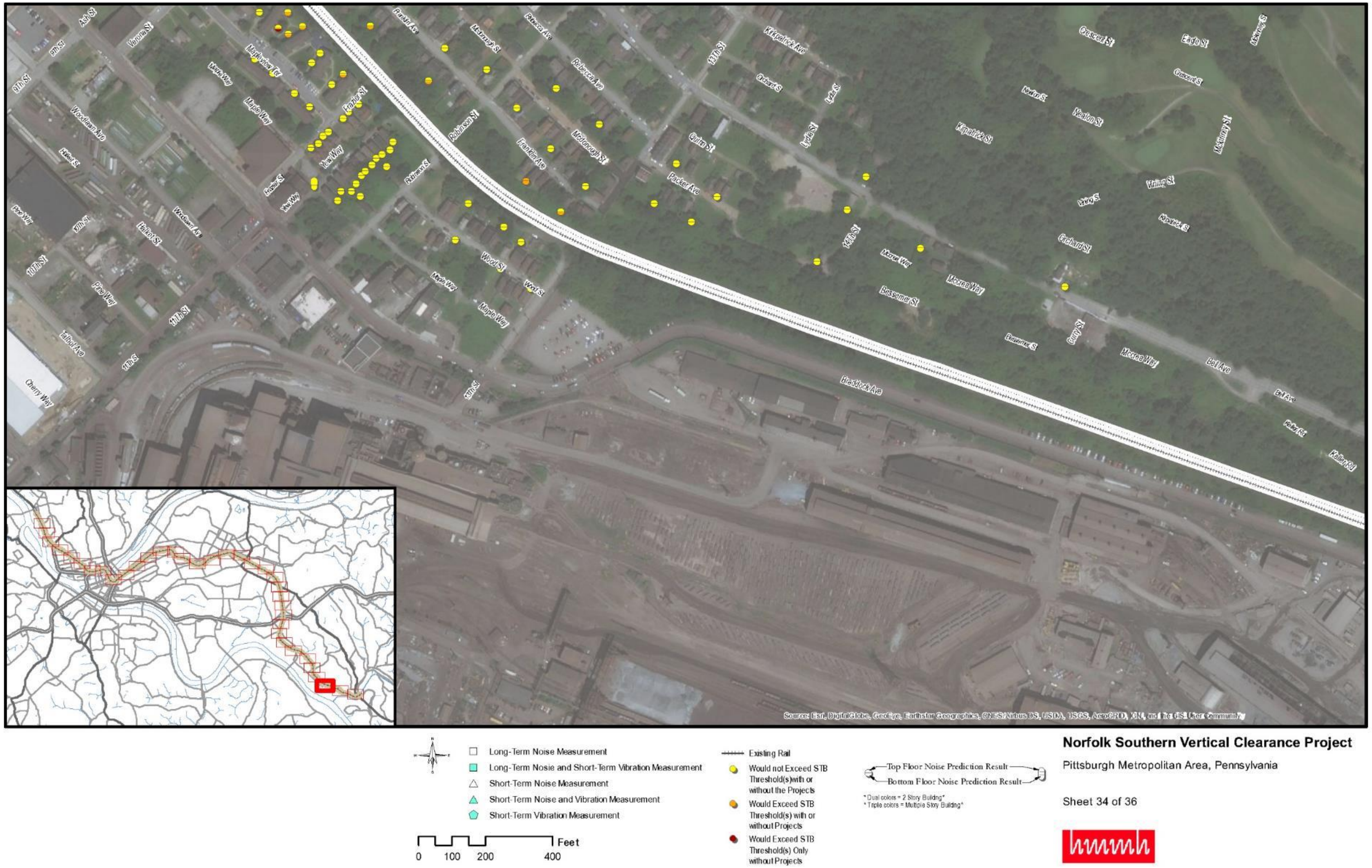


Figure 76. High-Growth Scenario Noise and Vibration Assessment Map 35

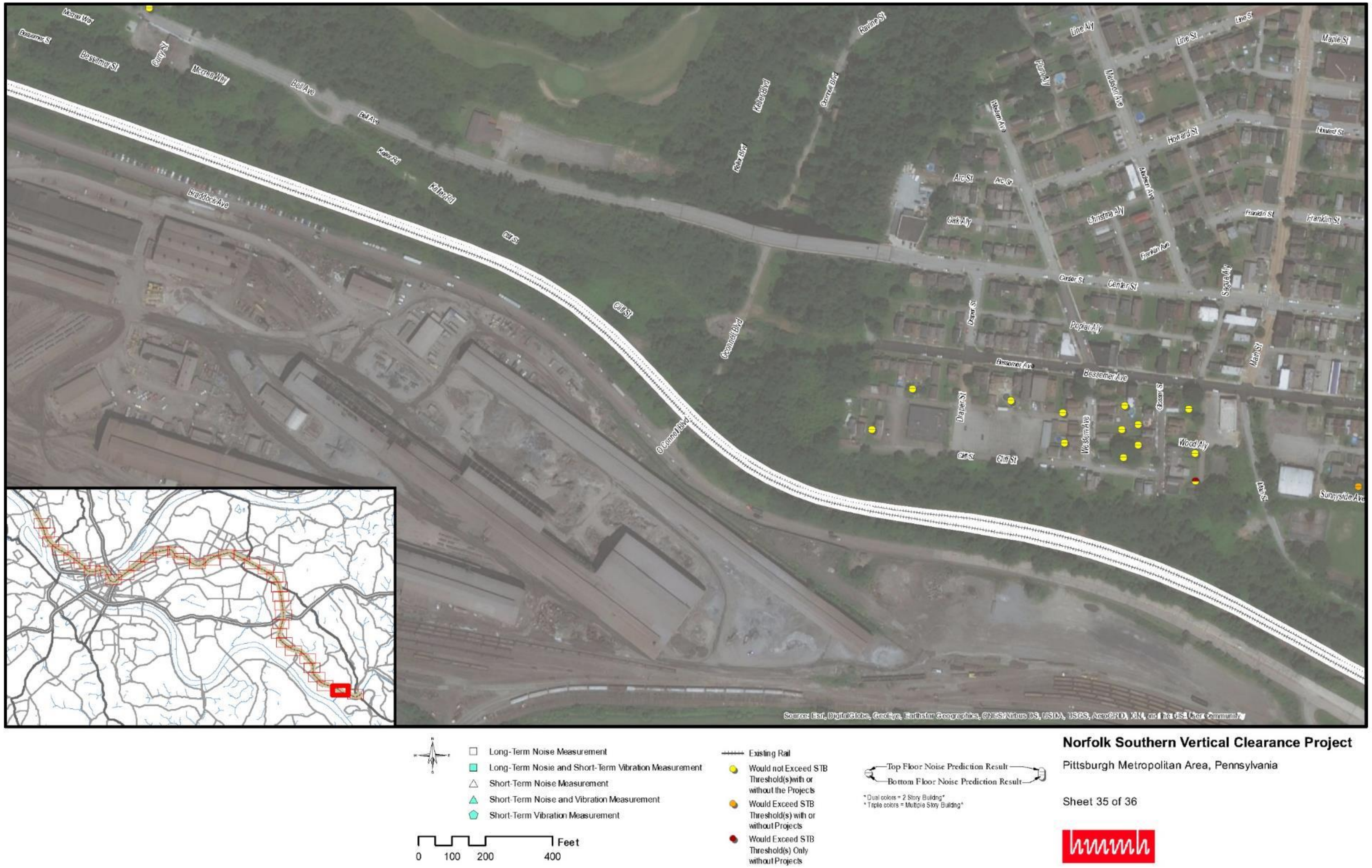
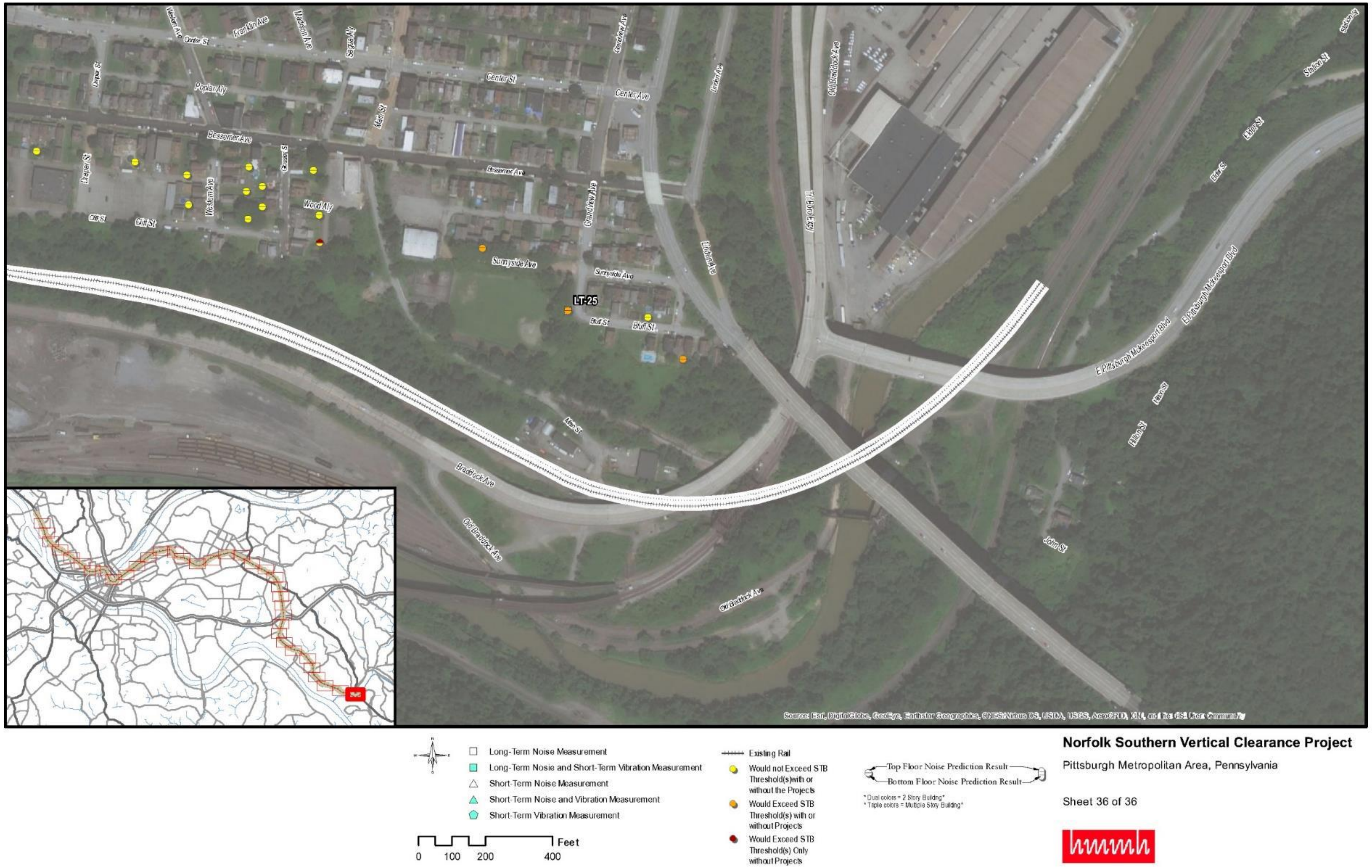


Figure 77. High-Growth Scenario Noise and Vibration Assessment Map 36



Appendix A Measurement Site Photographs

A.1 Long- and Short-Term Noise Measurement Locations

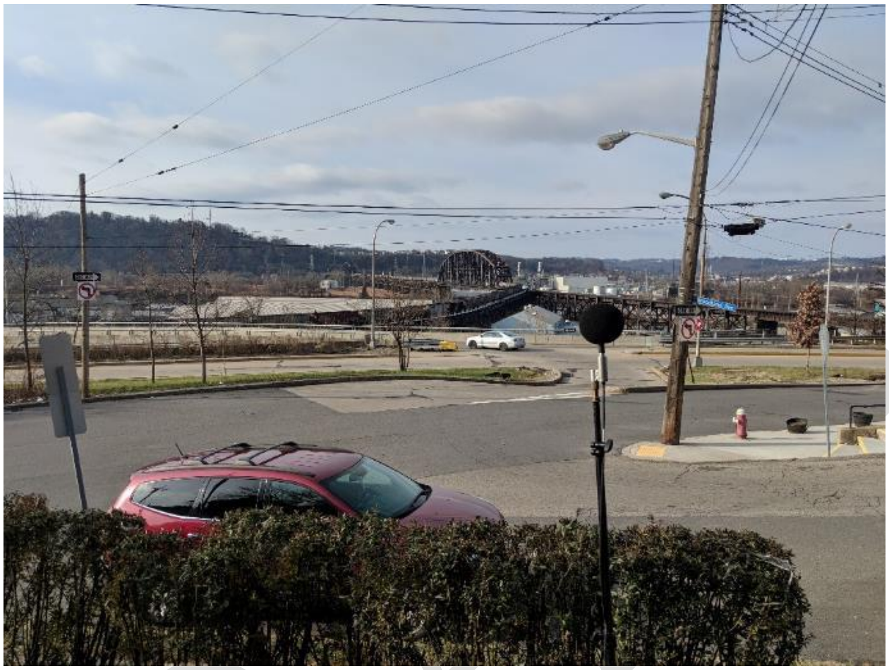


Figure A-1A. Site LT-1: 2462 California Avenue

Figure A-1B. Site LT-1: 2462 California Avenue

Figure A-2. Site LT-2: 1234 Sunday Street

Figure A-3. Site LT-3: 1907 Fulton Street

Figure A-3A. Site LT-3: 1907 Fulton Street

Figure A-4. Site LT-4: 1016 N. Franklin Street

Figure A-5. Site LT-5: 710 W. North Avenue

Figure A-6. Site LT-6: 401 W. Commons

Figure A-7. Site LT-7: 301 Cedar Avenue

Figure A-8. Site LT-8: 100 Anderson Street

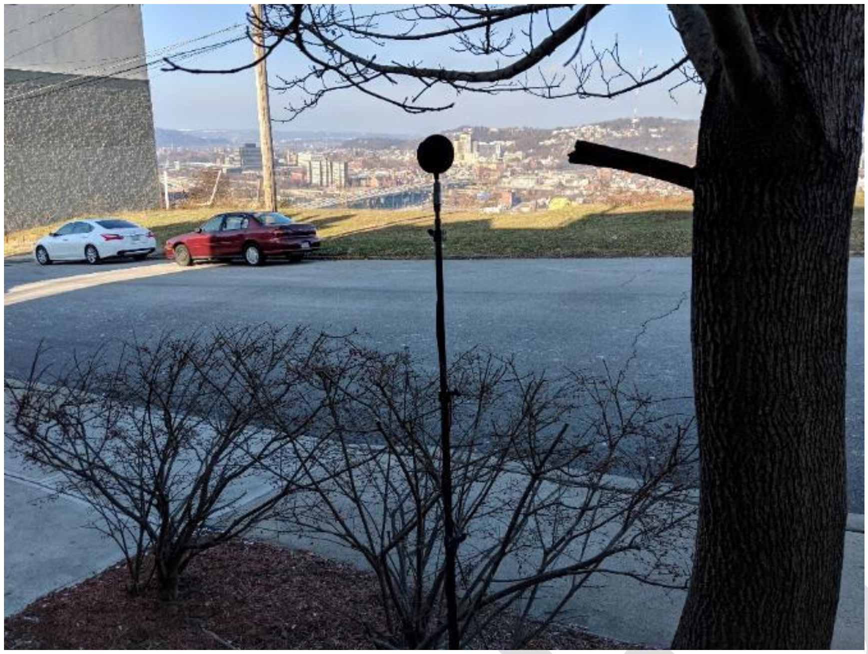


Figure A-9. Site LT-9: 1846 Arcena Street

Figure A-10. Site LT-10: 2630 Brereton Street

Figure A-11. Site LT-11: 3415 Flavian Street

Figure A-12. Site LT-12: 3811 Fleetwood Street

Figure A-13. Site LT-13: 4732 Juniper Street

Figure A-14. Site LT-14: 15 Hemingway Street

Figure A-15. Site LT-15: 5445 Potter Street

Figure A-16. Site LT-16: 205 Lehigh Avenue

Figure A-17. Site LT-17: 6736 Simonton Street

Figure A-18. Site LT-18: 7357 Finance Street

Figure A-19. Site LT-19: 444 Ross Avenue

Figure A-20. Site LT-20: 1 Pennwood Avenue

Figure A-21. Site LT-21: Park Avenue

Figure A-22. Site LT-22: McKim Street

Figure A-23. Site LT-23: 504 Hawkins Avenue

Figure A-24. Site LT-24: 431 Verona Street

Figure A-25. Site LT-25: 300 Main Street

Figure A-26. Site ST-2: 1000 Ft. Duquesne Boulevard

Figure A-27. Site ST-3: 2901 Liberty Avenue

A.2 Vibration Measurement Locations

Figure A-4A. Site LT-4: 1016 N. Franklin Street

Figure A-15A. Site LT-15: 5445 Potter Street

Figure A-20A. Site LT-20: 1 Pennwood Avenue

Figure A-21A. Site LT-21: Park Avenue

Figure A-24A. Site LT-24: 431 Verona Street

Figure A-26A. Site ST-02: 1000 Ft. Duquesne Boulevard

Figure A-28. Site ST-06: 7051 Thomas Boulevard

Figure A-29. Site ST-26: Iron Deer Playground at Allegheny Commons Park West

Appendix B Long Term Noise Measurement Data

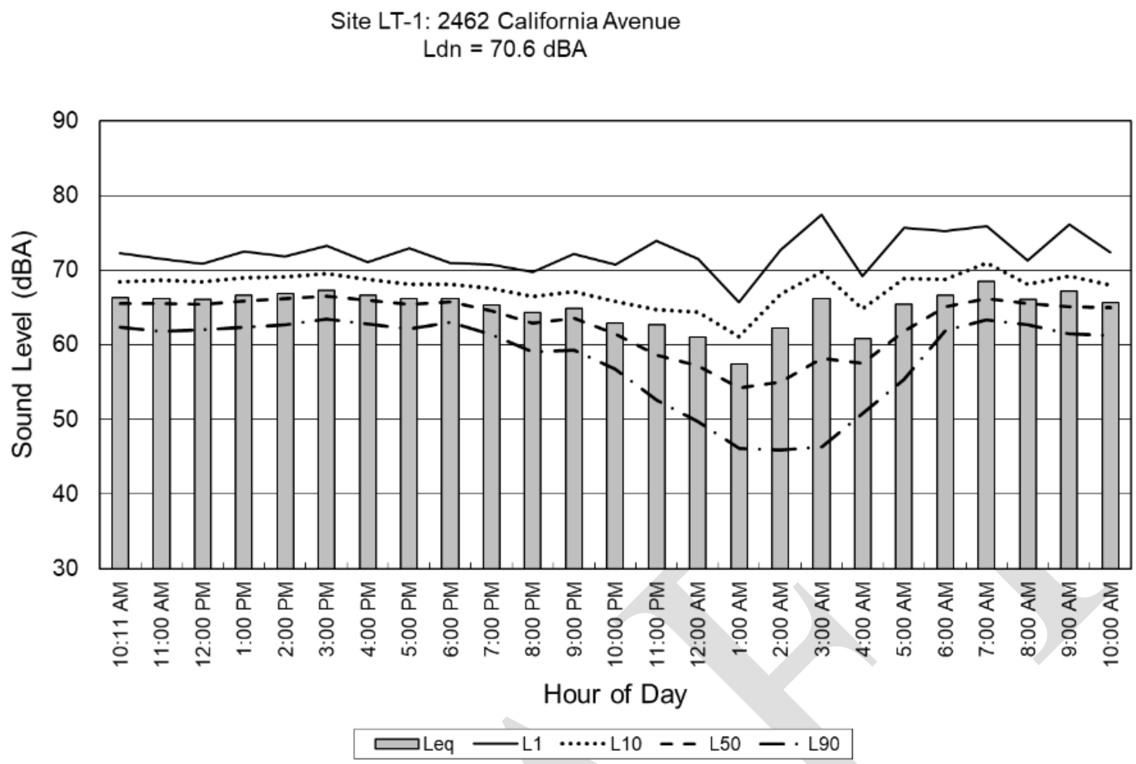


Figure B-1. Site LT-01 Time History Chart

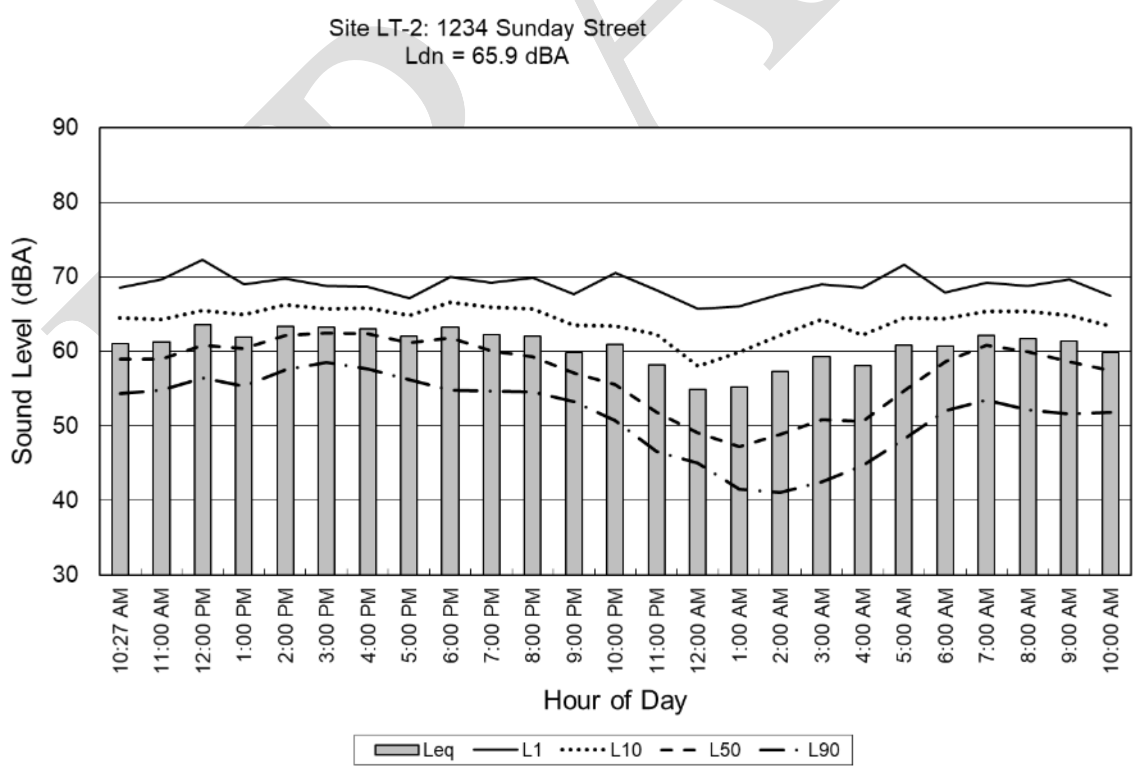


Figure B-2. Site LT-02 Time History Chart

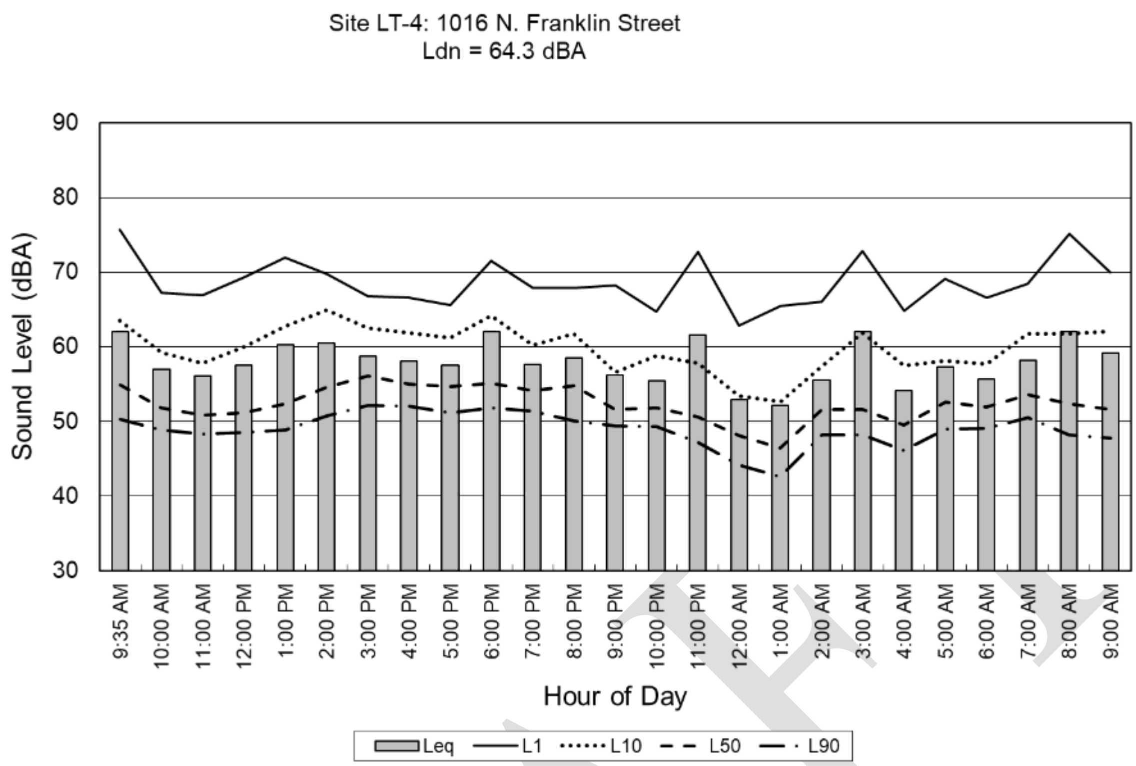


Figure B-3. Site LT-04 Time History Chart

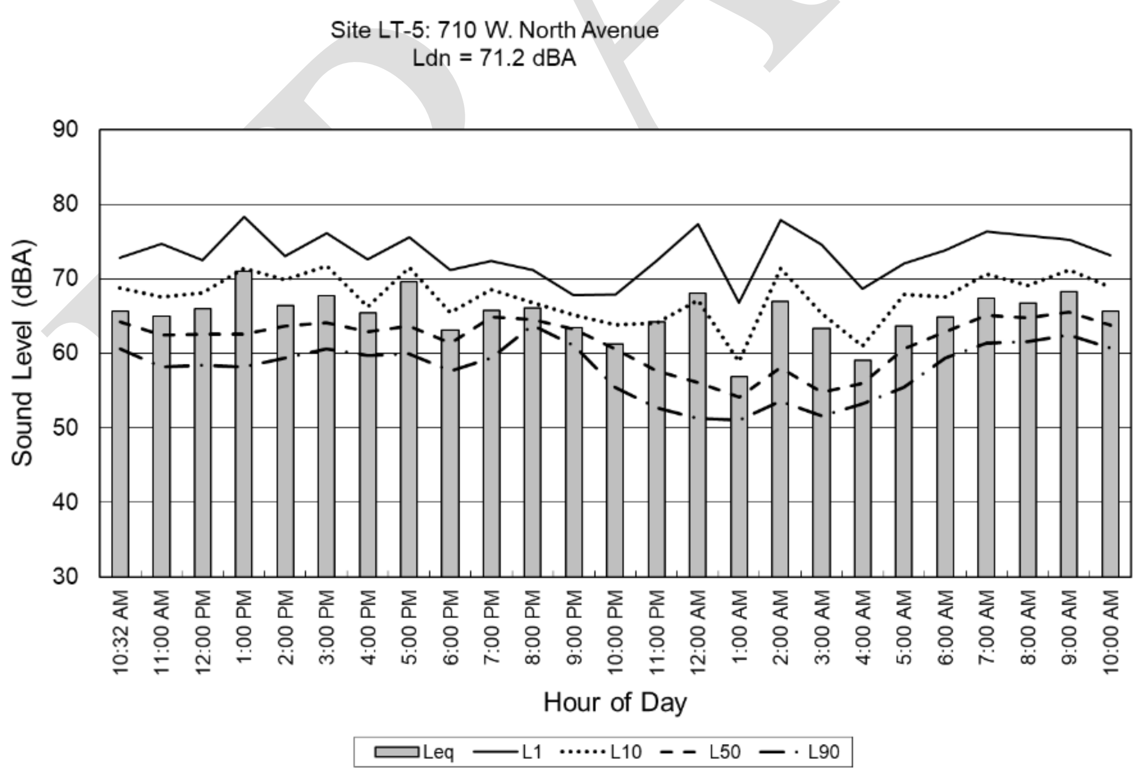


Figure B-4. Site LT-05 Time History Chart

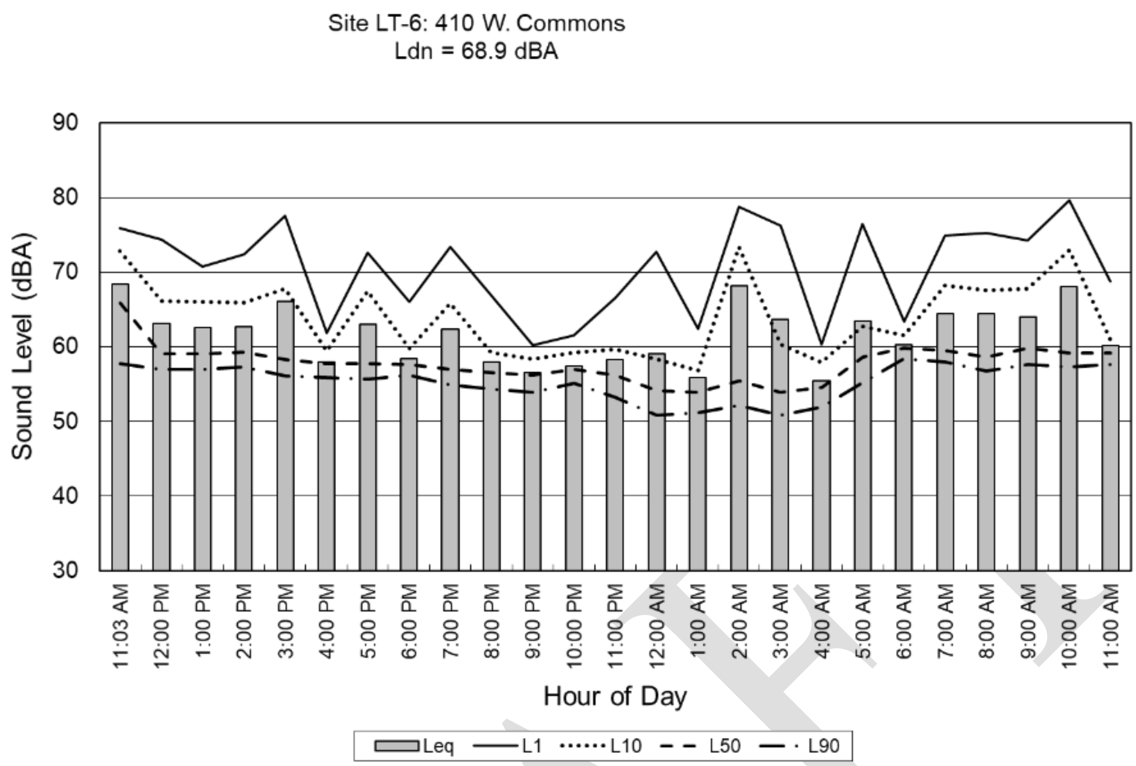


Figure B-5. Site LT-06 Time History Chart

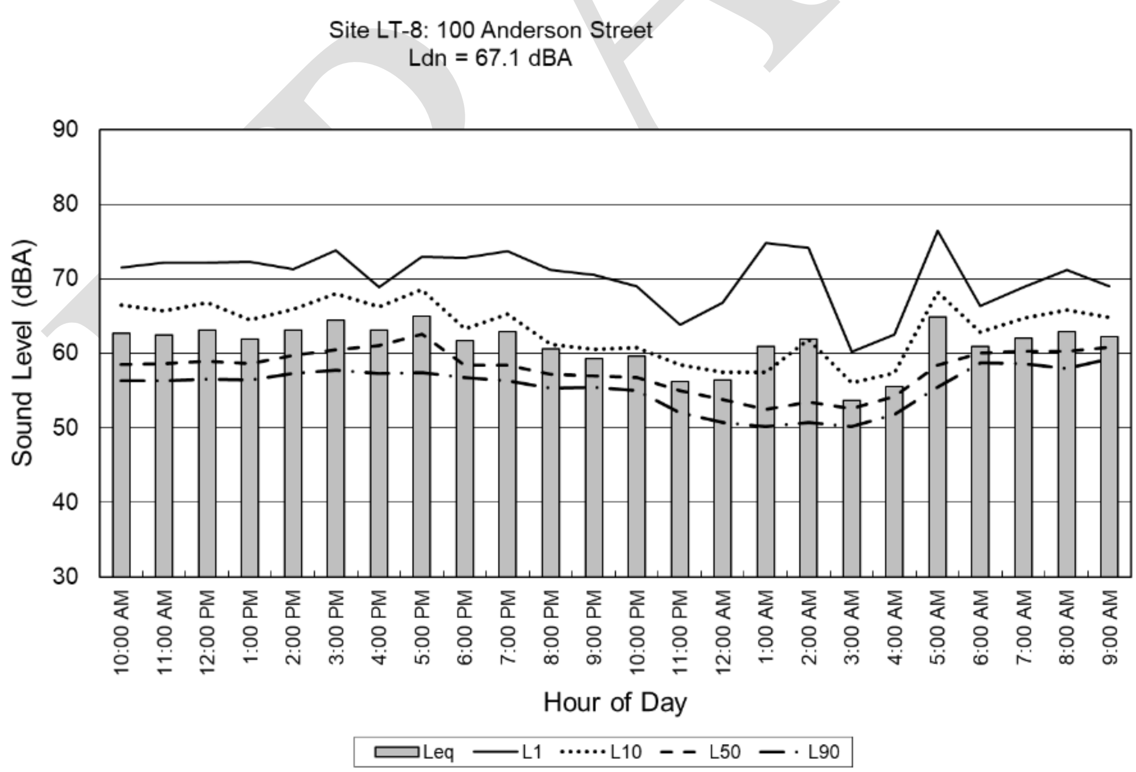


Figure B-6. Site LT-08 Time History Chart

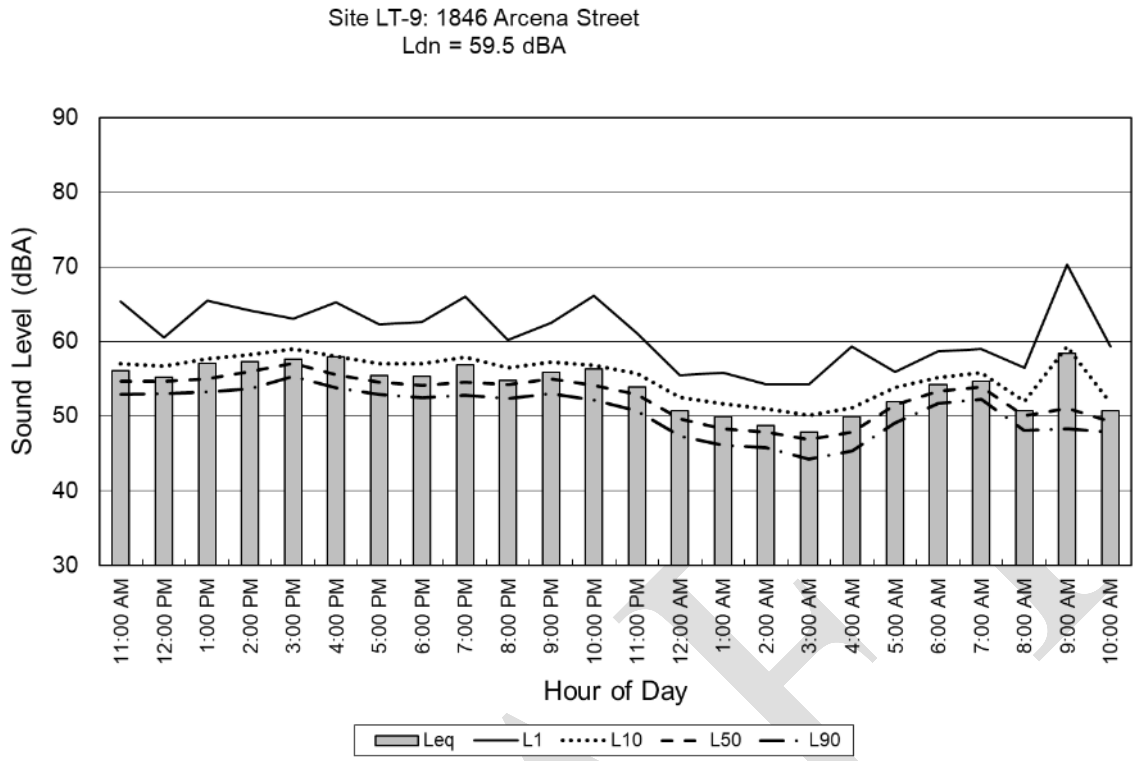


Figure B-7. Site LT-09 Time History Chart

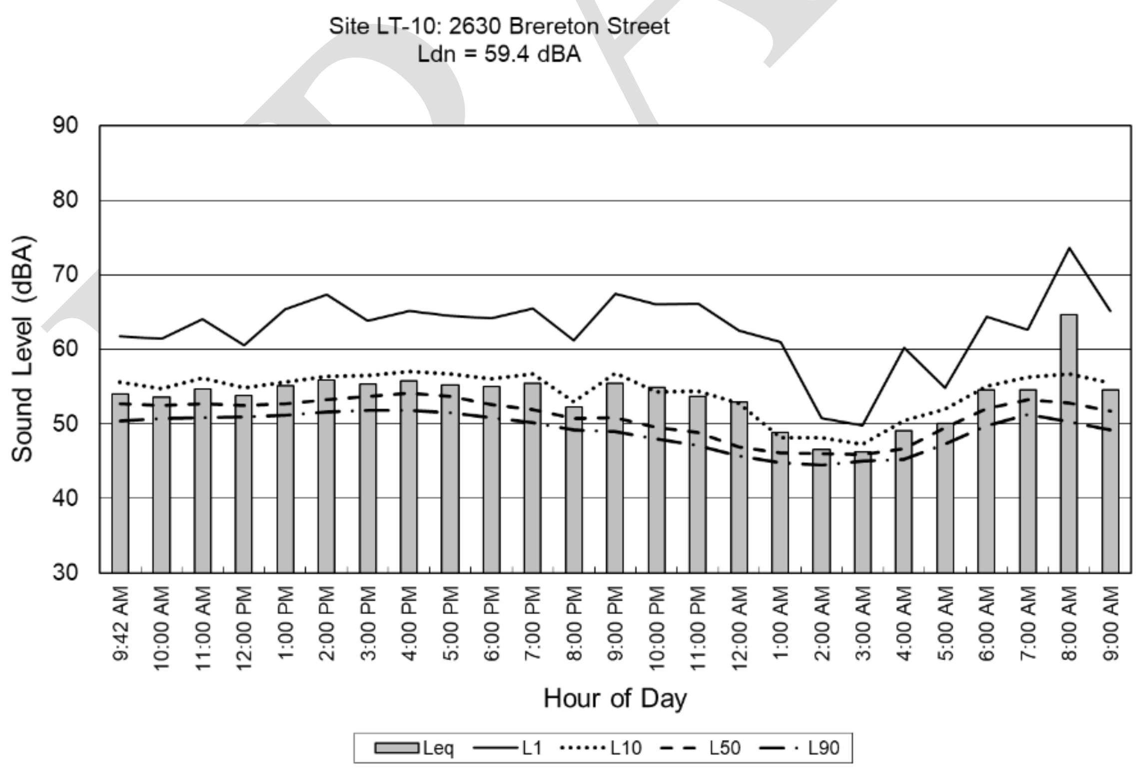


Figure B-8. Site LT-10 Time History Chart

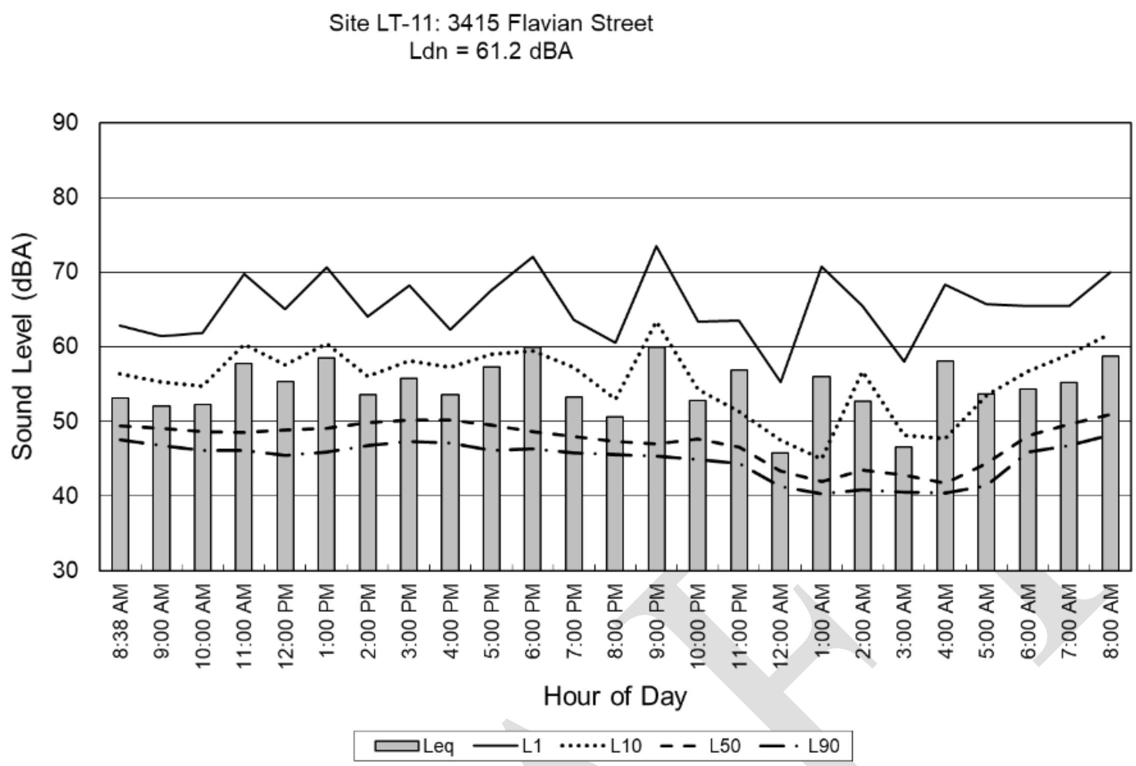


Figure B-9. Site LT-11 Time History Chart

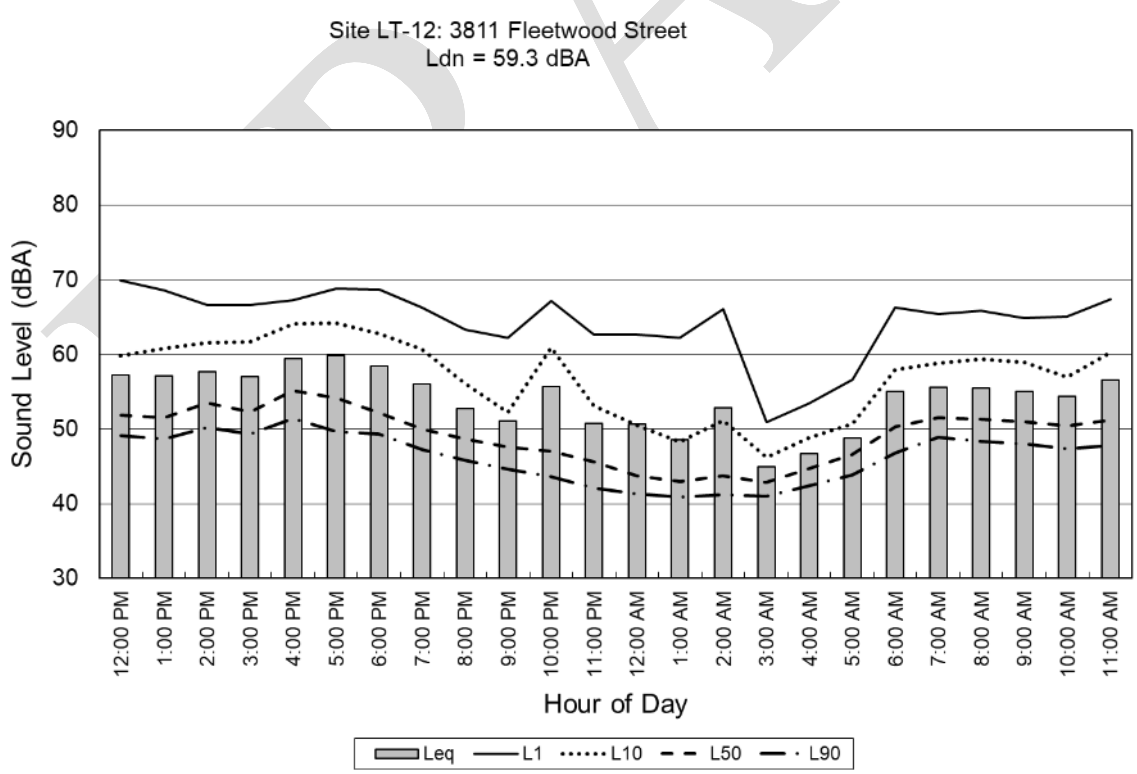


Figure B-10. Site LT-12 Time History Chart

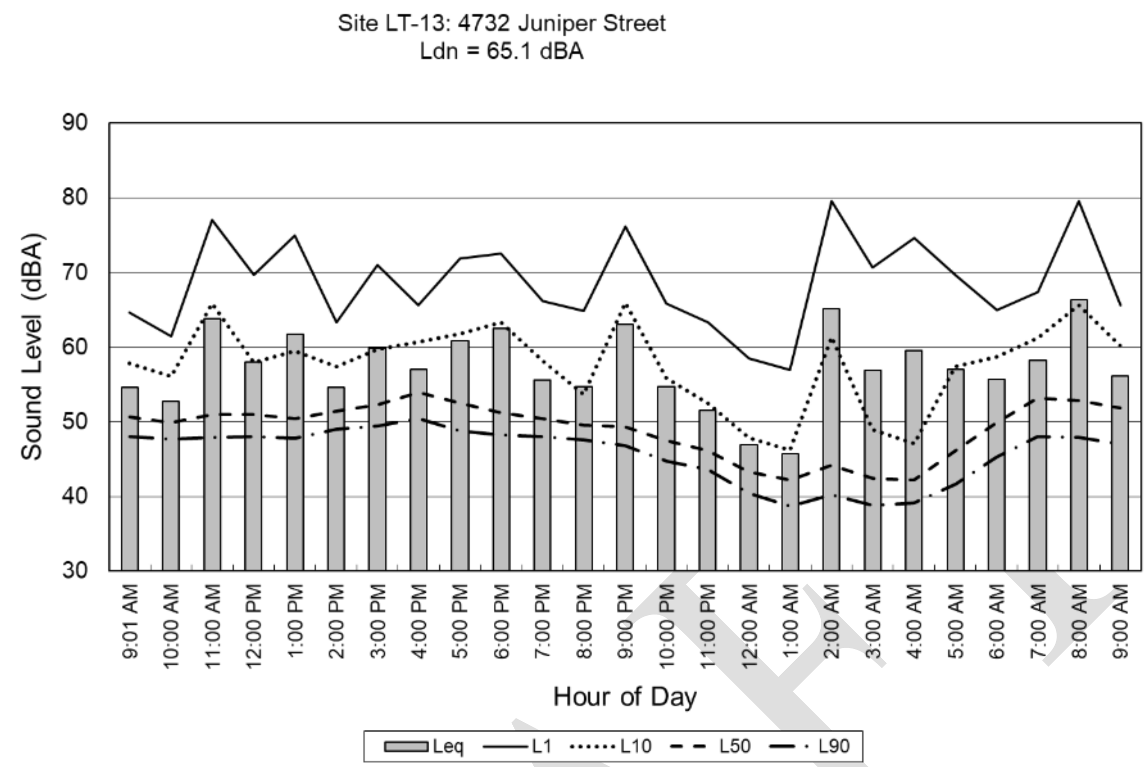


Figure B-11. Site LT-13 Time History Chart

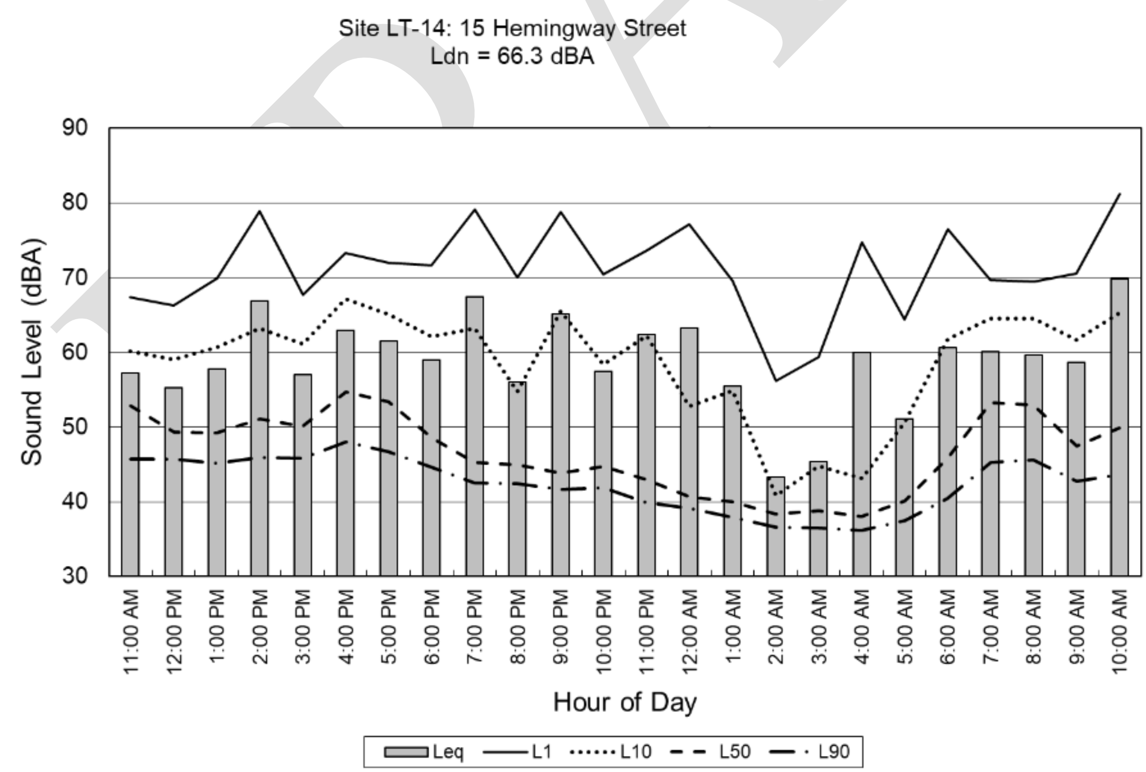


Figure B-12. Site LT-14 Time History Chart

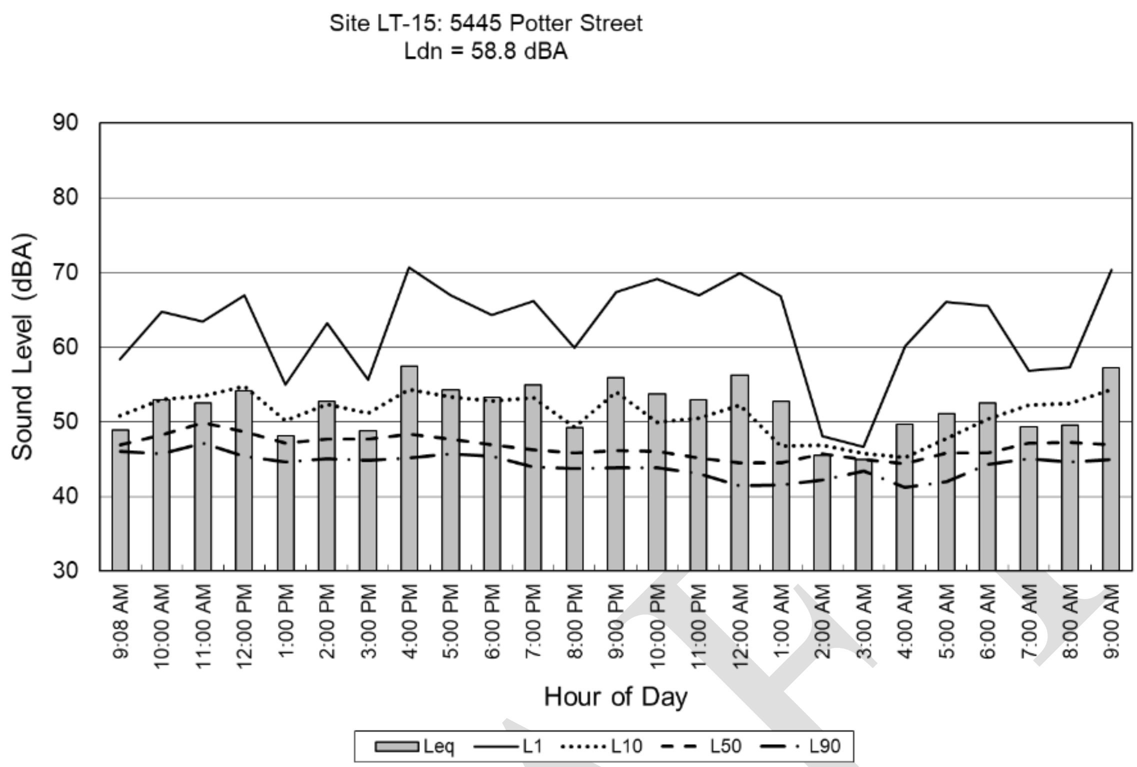


Figure B-13. Site LT-15 Time History Chart

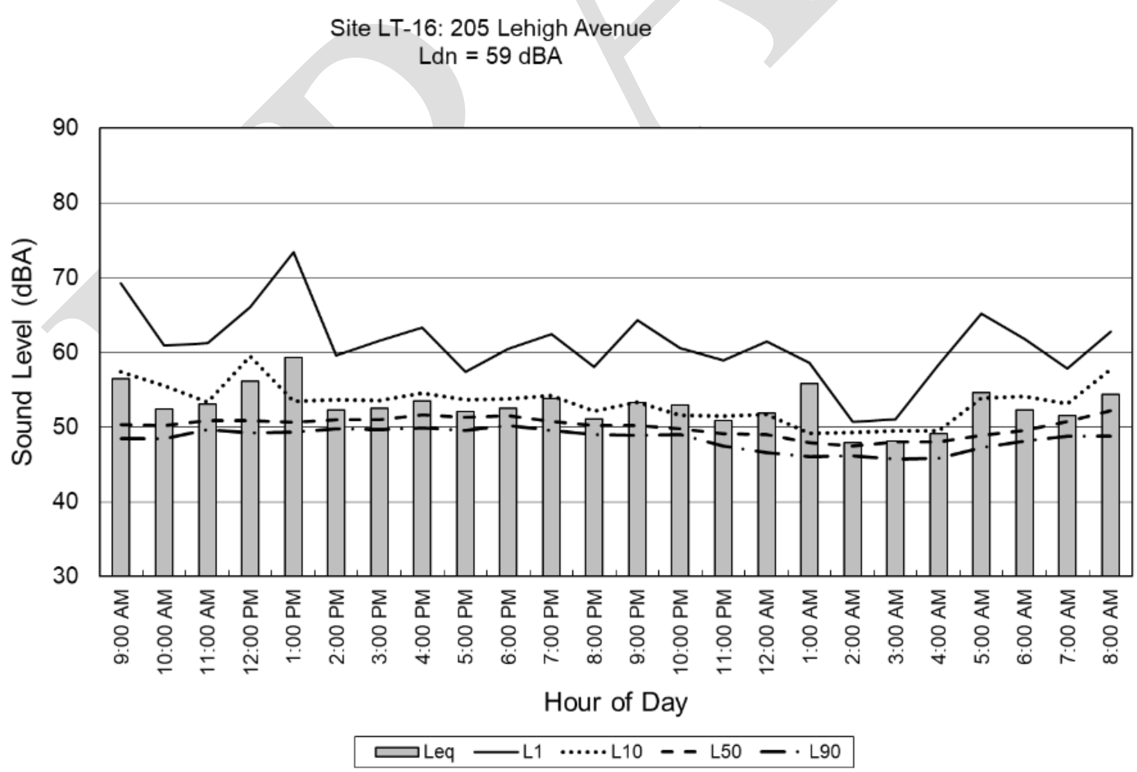


Figure B-14. Site LT-16 Time History Chart

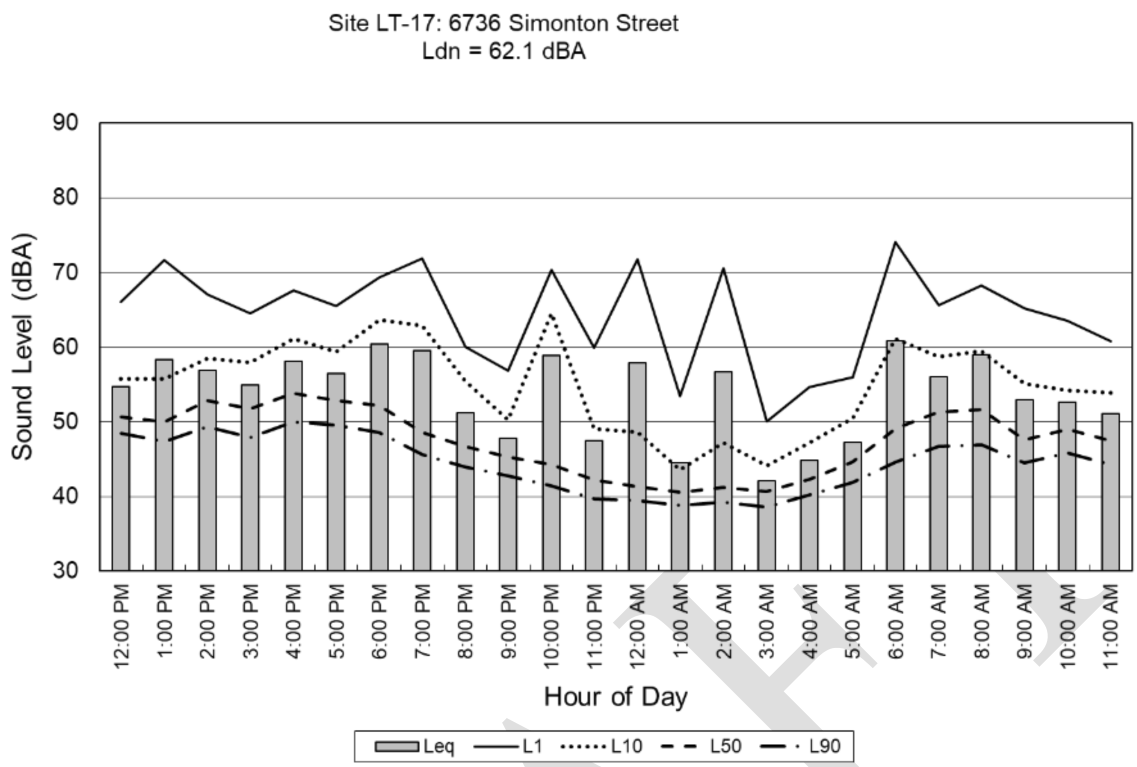


Figure B-15. Site LT-17 Time History Chart

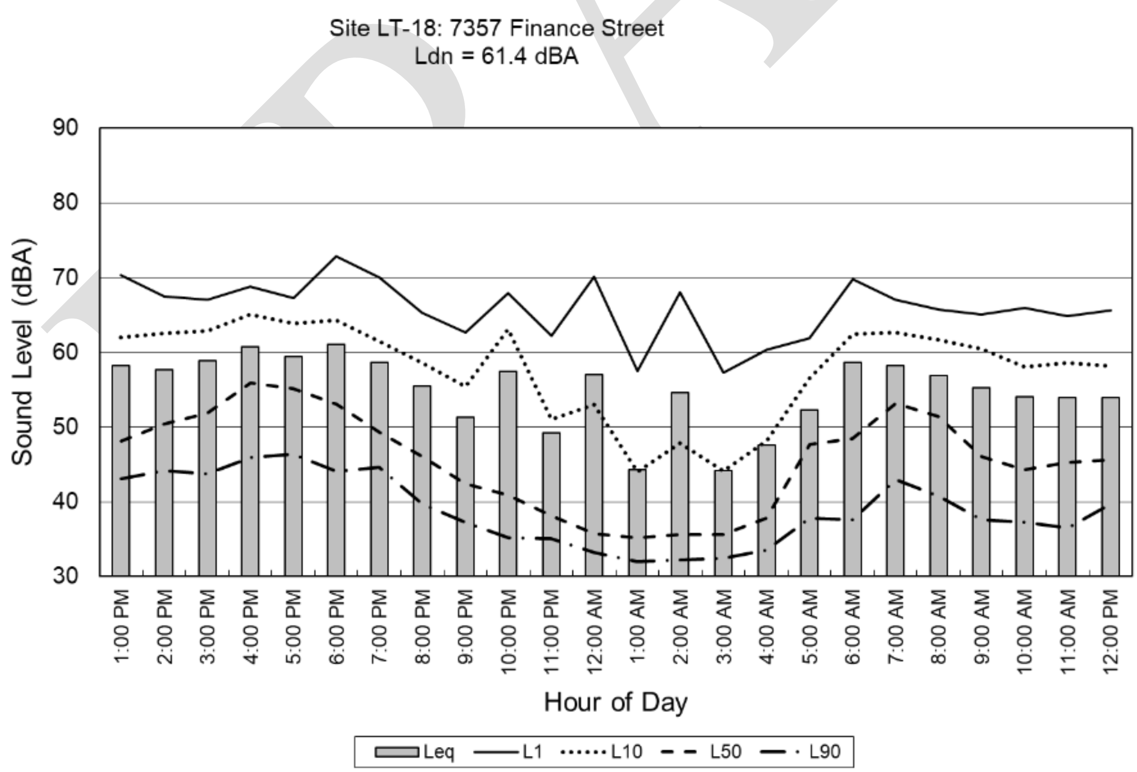


Figure B-16. Site LT-18 Time History Chart

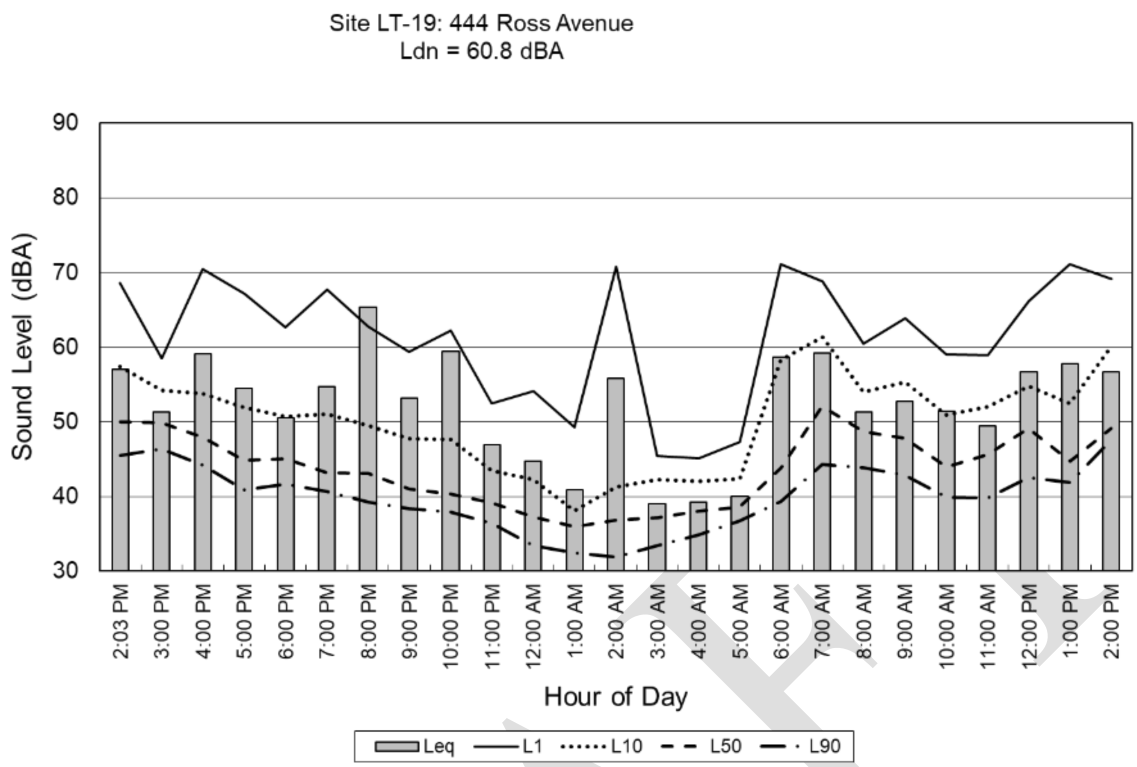


Figure B-17. Site LT-19 Time History Chart

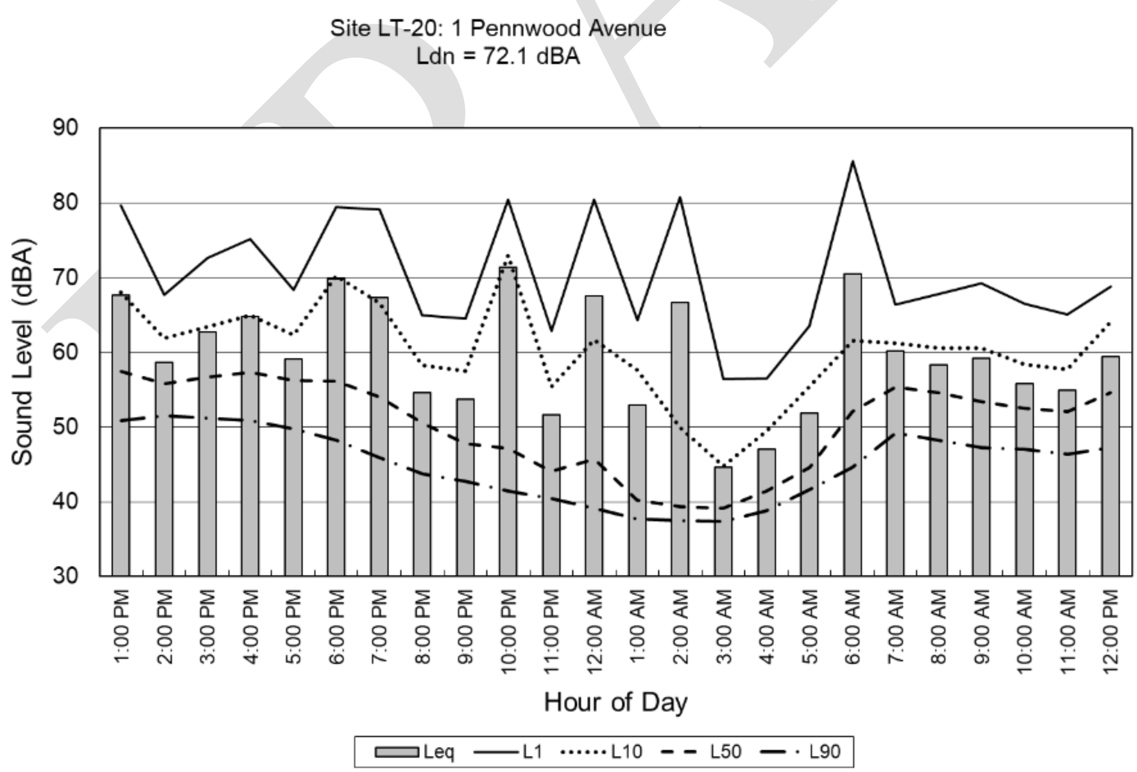


Figure B-18. Site LT-20 Time History Chart

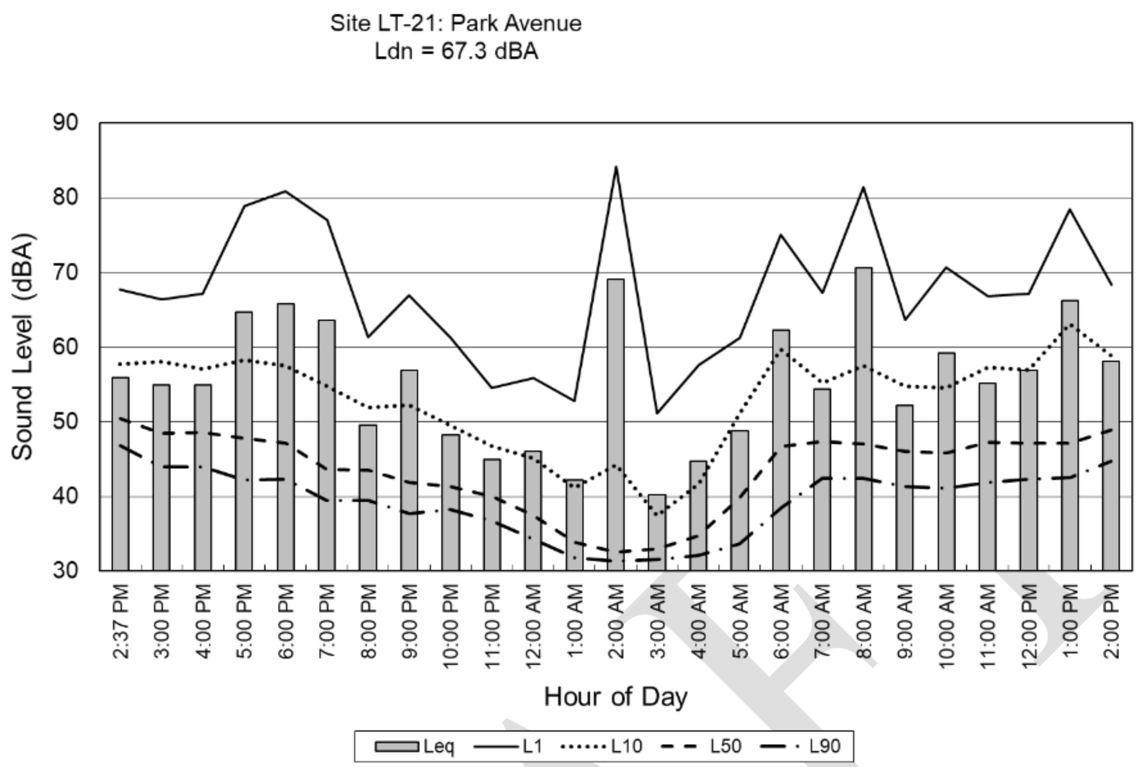


Figure B-19. Site LT-21 Time History Chart

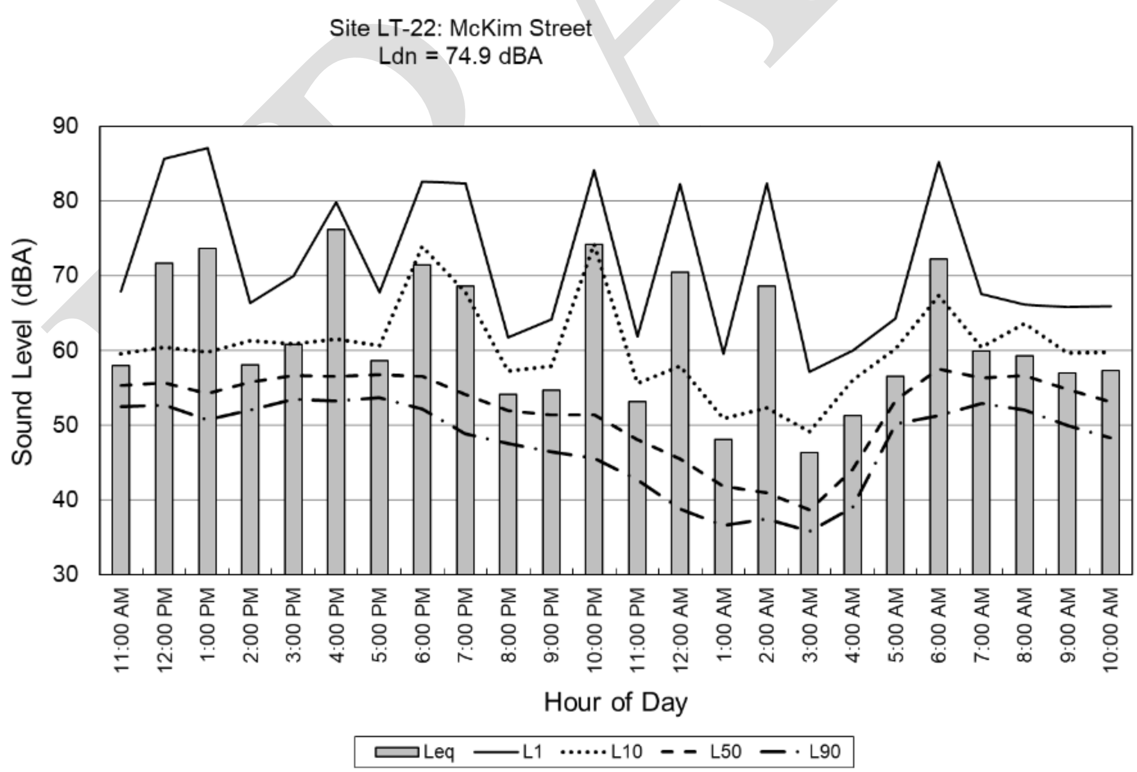


Figure B-20. Site LT-22Time History Chart

Site LT-23: 504 Hawkins Avenue
Ldn = 71.5 dBA

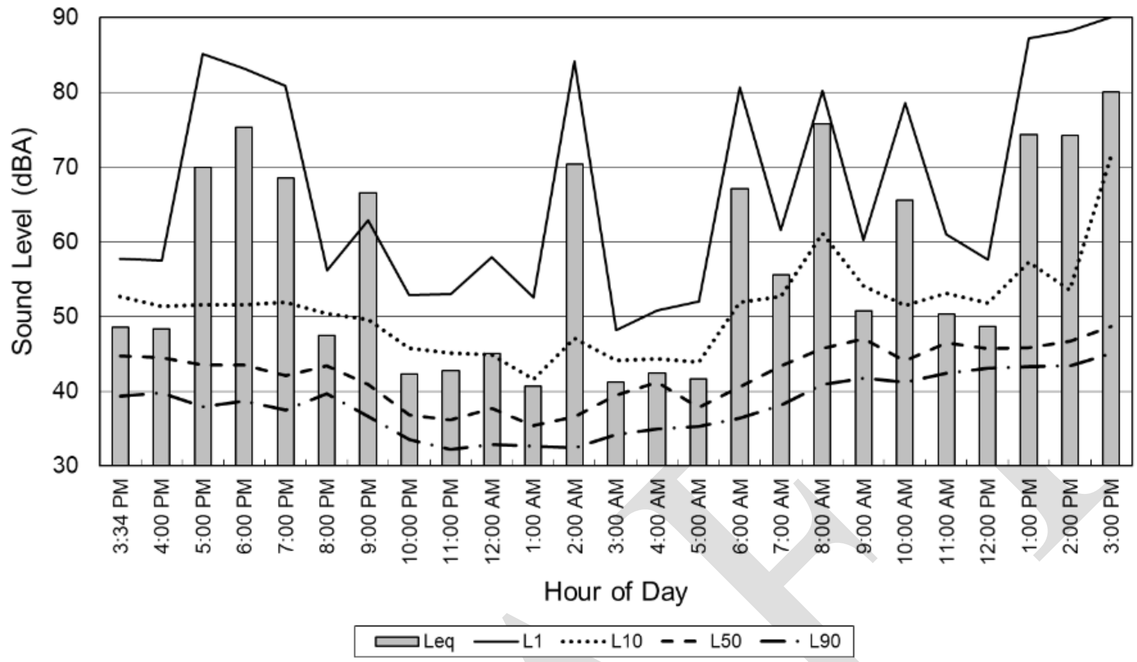


Figure B-21. Site LT-23 Time History Chart

Site LT-24: 431 Verona Street
Ldn = 68.2 dBA

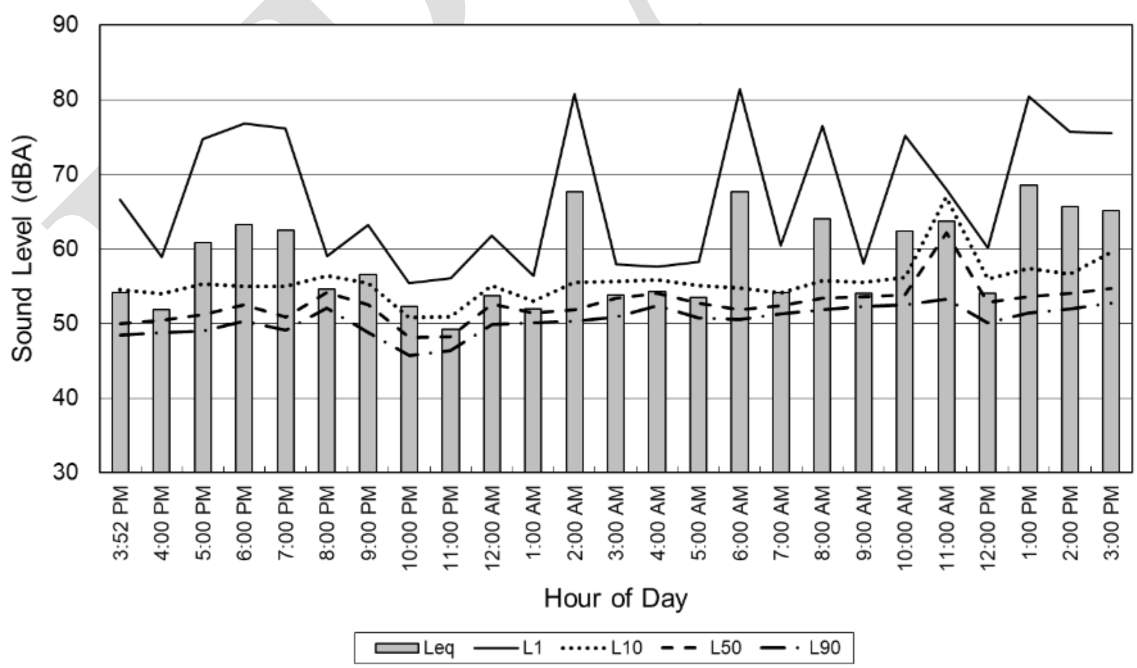


Figure B-22. Site LT-24 Time History Chart

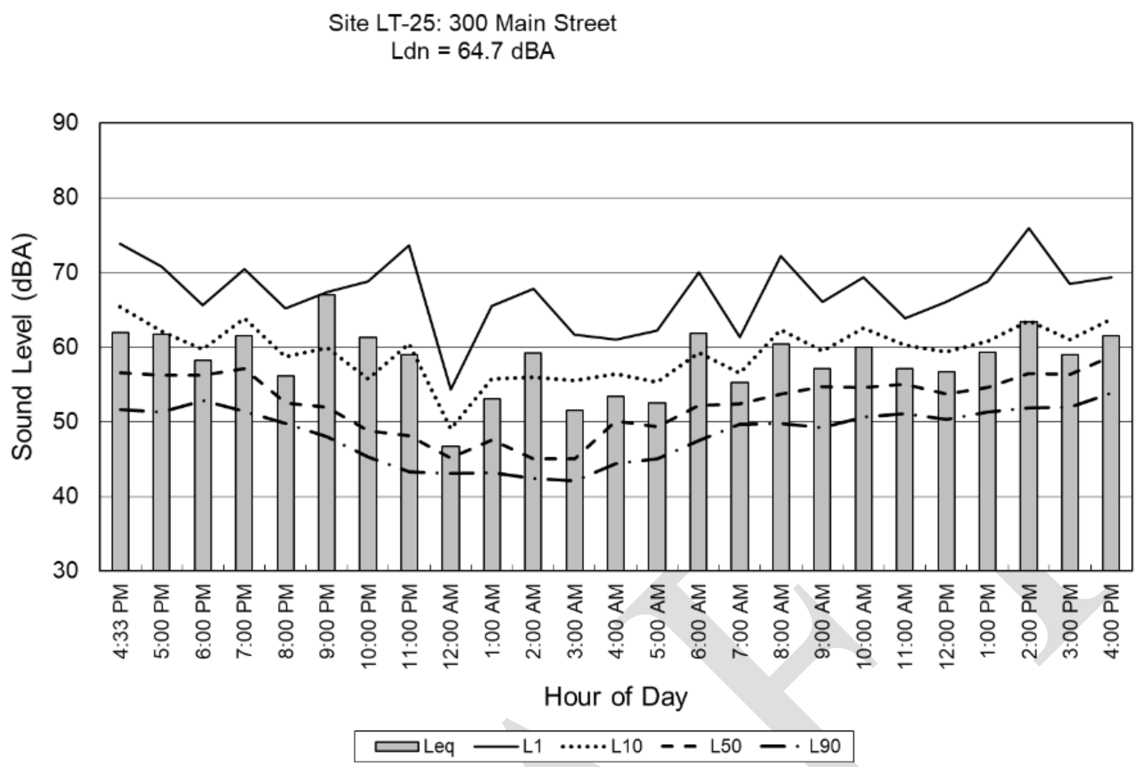


Figure B-23. Site LT-25 Time History Chart

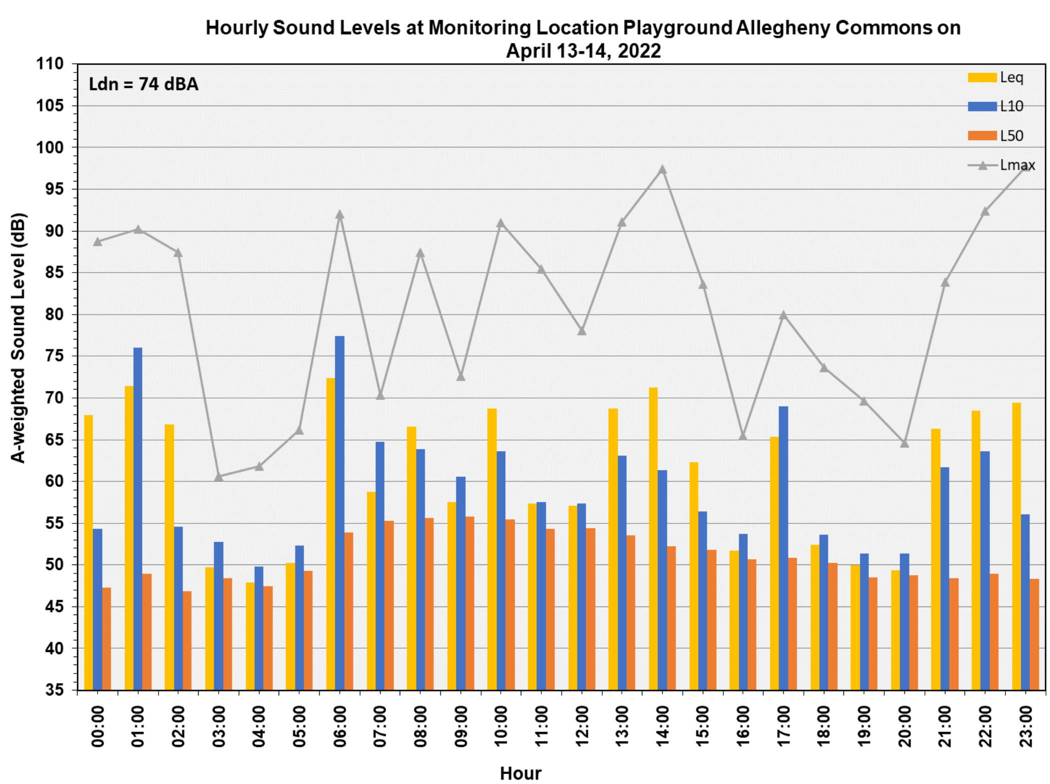


Figure B-24. Site LT-26 Time History Chart