Seattle Department of Transportation

NE 45th Street Viaduct: West Approach Replacement Project

Seattle, Washington

SEPA Checklist

January 13, 2010

STATE ENVIRONMENTAL POLICY ACT (SEPA) ENVIRONMENTAL CHECKLIST

A. BACKGROUND

1. Name of proposed project, if applicable:

NE 45th Street Viaduct West Approach Replacement Project

2. Name of applicant:

Seattle Department of Transportation (SDOT)

3. Address and phone number of applicant and contact person:

Michael Ward, PE
Project Manager – CPRS
SDOT
P.O. Box 34996
Seattle, WA 98124-4996

(206) 684-8493

4. Date checklist prepared

January 13, 2010

5. Agency requesting checklist:

SDOT

6. Proposed timing or schedule (including phasing, if applicable):

Project construction is scheduled to begin May 2010 and be complete by October 2010. The 45th Street Viaduct is anticipated to be closed to traffic from June to September. This will allow the project to take advantage of reduced traffic and student population in order to minimize the overall project duration and disruption to the community.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

A seismic retrofit for the main span and eastern approach was studied during the early stages of project development; however, there are no plans to retrofit these structures at this time. A separate environmental analysis will be conducted if and when additional retrofitting will be designed.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

Several technical reports that address potential environmental impacts of the project, as well as means for avoiding, minimizing or mitigating impacts have been prepared for this project. The following reports are attached to this SEPA Checklist as supporting documents:

- *Wetland Technical Memorandum*, ESA Adolfson, January 2009
- *Hazardous Materials Technical Memorandum*, Shannon and Wilson, December 2009
- *Historic, Cultural and Archaeological Resources Technical Memorandum*, ESA Adolfson, November 2009
- *SEPA Traffic Summary Report*, Fehr & Peers / Mirai, December 2009.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

No known applications are pending.

10. List any government approvals or permits that will be needed for your proposal, if known.

- NPDES Construction Stormwater General Permit, Washington State Department of Ecology
- Noise variance, City of Seattle Department of Planning and Development (DPD)
- Grading Permit, DPD
- Street Use Permit, SDOT

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page.

The NE 45th Street Viaduct is a bridge that conveys NE 45th St. over Kincaid Ravine in the University District (see Figures 1 and 2). The bridge consists of a 468-foot-long west approach, a 730-foot-long main span, and a 286-foot-long east approach. This project will replace the existing aging treated timber trestle west approach with a new structure to carry three lanes of traffic, one lane eastbound and two lanes westbound, and one pedestrian walkway; bicycles will continue to use the traffic lanes. Detours for vehicular and pedestrian traffic will be established to alleviate impacts to the traveling public, essential services, local businesses and institutions.

The project will not add traffic lanes or increase traffic capacity over existing conditions. The project will replace existing function only. Figures 3, 4, and 5 detail the roadway, bridge, and stormwater components of the proposed project. The project encompasses an area of approximately 1.7 acres.

The existing timber supports will be replaced with a Mechanically Stabilized Flowable Fill (MSFF) solid structure. Construction will generally entail excavation and trenching beneath the existing structure in order to place concrete panel walls that will contain the flowable fill. From access points on NE 45th St., approximately 12,000 cubic yards (CY) of MSFF will be added beneath the viaduct, up to the existing grade of the roadway. The majority of the existing timber trestles will not be removed; instead they will be permanently encapsulated into the flowable fill wall structure. This allows the roadway to remain open during the initial stages of construction while the contractor constructs the

entire lower portion of the wall structure. After the fill has been added, the project will reconstruct NE 45th St. from 20th Ave. NE to the eastern end of the west approach.

Access to the construction area will be from NE 45th St. and the Ravenna Ave. N roadway and right-of-way (ROW), which will be used to access the underside and south side of the viaduct. SDOT will obtain a temporary construction easement from the University of Washington which will encompass approximately 0.9 acres to the southeast of the viaduct and will include a 30-foot strip of land along the length of the southern side of the viaduct. Following completion of the proposed project, up to 15 feet of the cleared easement would be maintained by the University of Washington. Figure 6 displays the limits of this proposed maintenance corridor.

In addition to the replacement of the NE 45th Street Viaduct west approach structure, the project will repave 22nd Ave. NE beginning at NE 45th St., continuing east along NE 54th St., then along NE 55th St., to 25th Ave NE. (please see Figure 1). The work will include planing the top layer of the existing asphalt, removing and replacing the concrete base where it has failed, repaving, adding or retrofitting existing curb ramps, and removing and replacing several driveway approaches. It is expected that the 22nd Ave. NE segment can be completed while the viaduct is closed to traffic. The NE 55th St. segment will be completed while the viaduct is open.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The proposal will include construction, as described above, primarily along NE 45th St., 22nd Ave. NE, and NE 55th St. in Seattle, Washington (see Figures 1 and 2). NE 45th St. provides a direct route from Interstate 5 to the University Village shopping center and Laurelhurst neighborhood. In addition, NE 45th St. serves the University of Washington campus and the Seattle Children's Hospital medical campus. 22nd Ave. NE and NE 55th St. provide access to residential areas north of the viaduct and Ravenna Park. The project is located in T 25N R 4E, Sections 9 and 16.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (circle one): Flat, rolling, <u>hilly</u>, <u>steep slopes</u>, mountainous, <u>other</u>:

The site beneath and adjacent to the viaduct is characterized by varied terrain generally sloping in a southeasterly direction. The site along 22nd Ave. NE and NE 55th St. is flat, although the terrain slopes gently upward toward the north.

b. What is the steepest slope on the site (approximate percent slope)?

Slopes on the site range from 2 to 90 percent and the approximate grade of NE 45th St. down the hill toward the east is 12.5 percent.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Soils generally consist of a layer of loose to medium dense silty sand over a layer of medium dense to dense sandy to clayey silt. The project site does not contain any agricultural soils.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

The viaduct carries NE 45th St. over a steep slope from the UW Campus to the University Village shopping center. According to the GIS maps from the City of Seattle DPD, a portion of the project area lies within steep slope Environmentally Critical Areas (ECAs). Two landslides were identified north of NE 45th St. near 22nd Ave. NE; however, these areas will not be impacted during construction of the project as all work along 22nd Ave. NE will be within developed ROW.

A geotechnical analysis of the slope underneath the western approach determined it would be stable under the load of the MSFF wall. The project will remove loose sandy soils and excavate in a terraced fashion to reduce the average slope of the contact between the MSFF and the native soil surface. These measures will increase the stability of the slope against sliding during seismic loading conditions.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

The footprint of the proposed project is approximately 5.6 acres, which includes the replacement of the viaduct's west approach, reconstruction of NE 45th St. between 20th Ave. NE and the east end of the west approach, and repaving along 22nd Ave. NE/NE 55th St.

In order to prepare the site for foundation and MSFF wall construction the contractor will excavate an estimated 1,526 cubic yards. Concrete panel walls will be constructed along the northern and southern edges of the west approach, and backfilled with flowable fill material. Once sufficient wall height has been reached, the existing bridge deck and portions of the timber trestle will be removed and the remaining wall height will be constructed up to grade. Approximately 12,000 cubic yards of MSFF will be required in order to create the base of the new western approach; approximately 3,000 cubic yards of additional soil fill will be needed to reconstruct the roadway.

The temporary access road includes land adjacent to the viaduct inside the 30-foot temporary easement to be obtained from the University of Washington. This access road will be graded so that construction equipment will be able to gain access to the base of the bridge. Approximately 900 cubic yards of common excavation and fill will be required to construct temporary access. Once the project is complete, an (unimproved) corridor up to 15 feet wide will remain adjacent to the viaduct for maintenance access purposes.

Only minor grading or filling will be required during the repaving work in areas where the concrete base is being replaced; the roadway elevation will not change.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Erosion could occur on areas of the project that have been cleared or graded. Any bare soils would be susceptible to erosion from rain or wind. Project specifications will include Best Management Practices (BMPs) for erosion and sediment control to minimize erosion.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Approximately 96 percent of the project site will consist of impervious surfaces following project construction. There will be significant replacement of the concrete and asphalt roadway surfaces between 20th Ave. NE and the viaduct and along 22nd Ave. NE and NE 55th St. The footprint of the finished structure and roadway will be approximately the same as the existing condition however, so the change in impervious surfaces will be negligible.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

The project will be required to comply with an NPDES Construction General Stormwater Permit and the City of Seattle stormwater and grading regulations. In addition, the project will obtain and follow the provisions of a grading permit from the City of Seattle DPD. Prior to construction, a Temporary Erosion and Sediment Control (TESC) Plan and a Stormwater Pollution Prevention Plan (SWPPP) will be developed by the contractor. BMPs from the TESC Plan and the SWPPP will be implemented to minimize erosion on the project site. The contractor will be required to implement, inspect, maintain, and modify if needed, all BMPs that are on the site to ensure maximum protection from erosion.

2. Air

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke, greenhouse gases) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Exhaust from construction equipment will contribute to air emissions, but the impact will be temporary and will not significantly degrade air quality. Heavy equipment that is anticipated to be used includes backhoes, excavators, bobcats, cement trucks, dump trucks, pump trucks, vibratory equipment, flatbed trucks, and cranes. This construction equipment would likely be powered by internal combustion engines that would generate nitrogen dioxide, reactive organic gases, odors, sulfur dioxide, carbon monoxide, and inhalable particulate matter (PM_{10}). PM_{10} emissions will result primarily from fugitive dust generated by earth-moving activities, but will not be significant enough to present a health concern due to the project's location within existing paved areas.

Operational air pollutant emissions would result from traffic driving on the re-built structure, which would generate localized, short-term emissions of nitrogen oxides, particulates, carbon monoxide,

and volatile organic compounds. Since the project will not add any capacity to the roadway, traffic emissions will remain at current levels, which are below the allowable ambient standards.

The project is estimated to produce up to approximately 12,461 metric tons of carbon dioxide equivalent ($MTCO_2e$), which accounts for repaving 22nd Ave. NE and NE 55th St., the reconstruction of NE 45th St., the cement content of the MSFF, and emissions from construction vehicle trips to place the MSFF and panel walls. Please see Figure 7 for the calculations and assumptions used to estimate the carbon footprint of the project.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

There are no off-site sources of emission that would affect the project.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

During project construction, contract specifications will require the contractor to implement BMPs to reduce and control impacts to air from vehicle emissions and dust. These may include minimizing vehicle idling, properly maintaining construction equipment, using alternative fuels for construction equipment, covering loads of materials to or from the construction site, and installing wheel wash stations for vehicles leaving the site. Particular care will be taken to control dust along the unpaved section of Ravenna Ave. N, which will be used to access the construction site.

3. Water

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

There are two isolated wetlands in the immediate vicinity of the project. Wetland D is a drainage ditch adjacent to the Burke-Gilman Trail, and Wetland E is located in Kincaid Ravine. Figure 6 displays the boundaries of these wetlands in relation to the viaduct. Please refer to the attached *Wetlands Technical Memorandum* for a complete description of these wetlands.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

There will be no impacts to surface waters or wetlands. However, approximately 0.52 acre of the buffers to Wetlands D and E will be impacted during construction activities within the construction easement as shown in Figure 6.

3) **Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.**

No fill would be placed in or removed from wetlands near the project area. Up to 0.43 acre of the buffers of Wetlands D and E would be temporarily graded or filled during construction of the project and approximately 0.09 acre of the buffers of Wetlands D and E would be permanently graded or filled due to the proposed maintenance corridor adjacent to the viaduct.

4) **Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.**

No surface water withdrawals or diversions are proposed.

5) **Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.**

The proposal does not lie within a 100-year floodplain.

6) **Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

There will be no discharge of waste materials to surface waters.

b. Ground:

1) **Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.**

There will be no ground water withdrawal or discharges to ground water as a result of the project.

2) **Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals . . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.**

No waste material will be discharged into the ground.

c. Water runoff (including stormwater):

1) **Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.**

The primary source of runoff will be from precipitation onto the site and surrounding areas. Before beginning construction activities, the contractor will prepare a SWPPP that will detail

how the construction site will be protected from water entering the site, and how runoff leaving the site will be controlled.

Construction of the project will not result in a net increase of impervious area, but will reconstruct approximately 5.4 acres of existing impervious surface area. Once the project is complete, stormwater runoff from portions of NE 45th St., 20th Ave. NE, and 21st Ave. NE will be collected in a new underground stormwater vault along NE 45th St. between 20th and 21st Ave. NE. This stormwater will be detained before flowing into a newly constructed combined sewer overflow (CSO), which will run along the north side of NE 45th St. to replace the CSO that currently runs along the south side of the street. Stormwater from the remaining portion of NE 45th St. and the western approach will be allowed to flow directly into the CSO through existing connections.

Stormwater runoff along 22nd Ave. NE and NE 55th St. will continue to follow current flow patterns to the existing drainage system.

2) Could waste materials enter ground or surface waters? If so, generally describe.

No direct discharges to ground or surface water will occur during construction of the project. Any stormwater that leaves the construction site untreated would either infiltrate into the ground or would flow down the viaduct to the storm drains beneath the eastern approach. Erosion control measures will prevent release of waste materials to ground or surface waters as described below. All wastes generated by construction of the project will be hauled off-site for disposal at a pre-approved facility.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

Runoff water impacts during construction would be prevented by erosion and sediment control measures implemented according to the TESC Plan and the SWPPP in order to comply with the NPDES Construction Stormwater General Permit. The TESC Plan would specify BMPs to be implemented and maintained before, during, and immediately after construction.

Potential measures for the TESC Plan include:

- Limiting clearing, grading, and excavation to areas necessary for access to and work at the project site. The construction limits will be marked in the field and equipment will not be allowed outside the work area.
- Site preparation and other earth disturbing activities will be completed during dry weather to the extent practical.
- Stockpiles of excavated materials or erodible raw material such as soil, sand, and backfill materials will be covered with plastic or other protective covering when not being used.
- Silt fences will be installed along the perimeter of the work areas to help confine sediment and runoff. Straw bales will be used if concentrated surface water flow is observed
- Inspections of the erosion control measures will be conducted daily during construction to ensure the effectiveness of the measures and to determine the need for maintenance or additional measures.

The project will also comply with any provisions of a grading permit that concern construction within wetland buffer areas. A site restoration plan will be developed in coordination with

SDOT Urban Forestry and the University of Washington Landscape Architect and will include replacement of removed vegetation with native grass, shrub and tree species.

4. Plants

a. Check or circle types of vegetation found on the site:

__X__ deciduous tree: alder, maple, aspen, other
_____ evergreen tree: fir, cedar, pine, other
__X__ shrubs
_____ grass
_____ pasture
_____ crop or grain
__X__ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
_____ water plants: water lily, eelgrass, milfoil, other
_____ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Up to 0.91 acres of vegetation may be cleared during replacement of the west approach. Most of the vegetation that will be removed consists of invasive species such as English ivy; however, some tree removal may be necessary to provide equipment access along the temporary easement to the south of the viaduct. Vegetation clearing will be minimized and limited to pruning where possible.

As mentioned previously, the project includes both temporary and permanent impacts to wetland buffer areas beneath and immediately adjacent to the existing viaduct. These areas are highly degraded and vegetation consists primarily of invasive species, such as ivy. Please refer to the attached *Wetlands Technical Memorandum* for more information.

No vegetation will be removed for the 22nd Ave. NE and NE 55th St. repaving portion of the project.

c. List threatened or endangered species known to be on or near the site.

No threatened or endangered plant species are known to occupy the project area.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Vegetation impacts will be limited to the existing NE 45th St. ROW and the temporary easement to be obtained from the University of Washington. The project will comply with any provisions of a grading permit that concern construction within wetland buffer areas. A site restoration plan will be developed in coordination with SDOT Urban Forestry and the University of Washington Landscape Architect and will include replacement of removed vegetation with native grass, shrub and tree species.

5. Animals

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site *(indicated by* **bold, underlined** *font)***:**

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other:

b. List any threatened or endangered species known to be on or near the site.

No threatened or endangered species are known to be on or near the project site.

c. Is the site part of a migration route? If so, explain.

Seattle lies within the Pacific Flyway corridor for migratory birds.

d. Proposed measures to preserve or enhance wildlife, if any:

Construction specifications will be developed to prevent take of migratory birds, occupied nests and eggs per the requirements of the Migratory Bird Treaty Act. For example, specifications may require the contractor to protect trees occupied by nesting migratory birds. The landscaping plan will include trees and shrubs to replace and enhance habitat removed for project construction.

6. Energy and natural resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Seattle City Light currently owns and maintains an electrical conduit on the viaduct that carries power to the street lighting that is mounted on the structure. The energy needs of the completed project are not expected to change from those existing.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No. The project will not affect the potential use of solar energy by adjacent properties.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

There are no energy conservation features included in this proposal

7. Environmental health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

A hazardous materials investigation was conducted to determine the likelihood of encountering any potentially contaminated materials. The investigation did not find any suspected or known contaminated sites that would impact the project. However, the existing trestles contain wood treated with creosote or other preservatives. Please see the attached *Hazardous Materials Technical Memorandum* for more information.

Fuels and other lubricant spills could occur from construction equipment during project construction; however, the implementation of a Spill Prevention and Control Plan (SPCP) and BMPs from the SWPPP will prevent or lessen the impact of a spill to the environment.

Any treated wood that is removed from the existing western approach of the viaduct will be properly handled and disposed of at a licensed facility. In addition, any soil that is excavated from around the existing piers of the western approach will also be properly handled and disposed of at a licensed facility.

According to the Seattle DPD, the project lies within a 1000-foot methane buffer Environmentally Critical Area. No evidence of methane gas was noted during the subsurface explorations for the geotechnical investigation conducted for the project. Further, based on the distance from the Montlake Landfill and the general absence and/or low concentrations of methane gas detected in monitoring points northwest of the landfill, there does not appear to be a methane gas hazard at the site.

1) Describe special emergency services that might be required.

Construction related accidents or injuries may require response from local fire, police, aid units, and/or ambulances. Since these services would be temporarily affected due to the closure of NE 45th St. during construction, it will be important that the contractor identify the locations of the appropriate emergency services prior to construction.

2) Proposed measures to reduce or control environmental health hazards, if any:

Prior to construction, the contractor will develop a SPCP. The SPCP will include a contingency plan describing actions to be taken in the event of a spill. If a spill were to occur, the contractor will be required to immediately contain the spill and begin cleanup procedures. The contractor will also develop a project Health and Safety Plan to detail the proper procedures to prevent the risk of fire and/or explosion as a result of various construction activities.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

There are no existing noises that would affect the project.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

In order to complete the project in time to reopen the viaduct in September, the project proposes intermittent nighttime work over a period of approximately 20 weeks. This would apply only for the viaduct replacement work; repaving activities for 22nd Ave. NE and NE 55th St. would only be done during daytime hours.

Typical construction noises would be created from construction equipment such as dump trucks, excavators, cranes, concrete mixer, pavement scarafiers, and flat bed trucks. At a distance of 50 feet, the noise level generated by construction activities occurring during project construction would range from approximately 75 dBA to 95 dBA[1]. This range specifies anticipated levels without implementation of any noise control and reduction strategies; potential mitigation strategies are summarized in the response to the next question.

Several residential properties adjacent to the project site have been identified as potential noise-sensitive receptors that could be temporarily affected during construction of the project. Existing nighttime ambient sound levels at these receptors average between approximately 47 and 69 decibels (dBA), based on monitoring conducted in October of 2009. A preliminary noise analysis was conducted using the Federal Highway Administration Roadway Construction Noise Model to estimate the potential construction noise impacts to those receptors.

The noise model estimated sound levels assuming a crane, concrete mixer truck, and concrete pump truck would be used simultaneously throughout the nighttime period, between 10:00 p.m. and 7:00 a.m. Model outputs for sound levels expected at the identified residential receptors were tabulated and averaged into predicted sound level ranges based on proximity to the viaduct construction site. Based on the model, nighttime sound levels due to construction are predicted to range between approximately 60 and 90 dBA, depending on the location of the receptor and where within the project site construction is actually occurring. As with the daytime noise levels, this range represents anticipated noise levels without any noise control or reduction strategies. Potential mitigation strategies are summarized below.

A temporary noise variance application will be submitted to the City of Seattle Department of Planning and Development (DPD) that will include a detailed discussion of ambient noise levels and analysis of anticipated noise levels during nighttime construction activities. Actual

[1] This range is based on construction noise emission data found in the Federal Highway Administration (FHWA) *Construction Noise Model User's Guide*. This data is often cited by FHWA and the Washington State Department of Transportation in discussions of impacts from construction noise.

hours of nighttime construction will be determined by the selected contractor and by any limitations imposed by DPD under the noise variance.

3) Proposed measures to reduce or control noise impacts, if any:

SDOT will develop a temporary noise variance application in consultation with DPD to develop noise performance standards for any nighttime work. The contractor will submit a nighttime noise management construction plan that will detail measures to reduce and control construction noise. All technically and reasonably feasible noise control measures will be implemented during nighttime construction activities pursuant with the variance requirements of the Seattle Noise Control Ordinance. Potential measures under consideration include:

- Installing construction screening curtains between the roadway and the immediately adjacent residential properties
- Specifying that compression brakes would not be allowed at or nearby the construction site
- Requiring that no tonal backup alarms would be used
- Requiring that equipment engines would not be allowed to idle for longer than five minutes at the construction site
- Developing, maintaining, and enforcing a construction noise management and mitigation plan prior to the onset of nighttime construction.

Before and during the entire construction period, SDOT's Public Outreach staff will be able to assist citizens by providing up-to-date information on proposed construction activities and responding to and assisting in resolving any noise complaints that may be received. SDOT staff and DPD's Noise Abatement Specialist will work in close coordination with the contractor to ensure that the public is kept aware of any changes to the work environment that may affect nighttime noise levels, and that all complaints are dealt with in a timely and effective manner.

8. Land and shoreline use

a. What is the current use of the site and adjacent properties?

NE 45th St. is an east-west principal arterial, which connects the Laurelhurst and University District neighborhoods to points west. The NE 45th Street Viaduct carries traffic along NE 45th St. through the University District. Adjacent properties include the Kincaid Ravine (an undeveloped open space area owned by the University of Washington), student housing, single-family residences, and apartment buildings.

22 Ave. NE and NE 55th St. are collector arterials, generally running north-south, that provide access to residential areas north of the university and to Ravenna Park.

b. Has the site been used for agriculture? If so, describe.

The project site has not been used for agricultural purposes.

c. Describe any structures on the site.

The NE 45th Street Viaduct is a bridge that consists of a wooden trestle west approach span connected to a concrete main span and east approach.

d. Will any structures be demolished? If so, what?

Approximately nine timber bents will have to be re-braced prior to encasing the western approach span with wall panels because of their conflict with the wall location. Three bents are currently outside the SDOT ROW. Once the wall panels are in place and backfilled to sufficient height with flowable fill material, portions of these timber bents and the bridge deck will be removed. The remaining wall height can then be built up to grade and a new bridge deck will be constructed.

e. What is the current zoning classification of the site?

Adjacent zoning includes Lowrise 3 Multi-family, Lowrise 4 Residential/Commercial, Lowrise/Duplex/Triplex Multi-family, Commercial 1-65, Major Institution Overlay-50/Commercial 1-40, Major Institution Overlay-160/Midrise, and Major Institution Overlay-105/Midrise.

f. What is the current comprehensive plan designation of the site?

The site is designated as roadway in the current comprehensive plan.

g. If applicable, what is the current shoreline master program designation of the site?

Not applicable.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

City of Seattle GIS data shows that the west approach span of the bridge is over land classified as steep slope and peat settlement-prone Environmentally Critical Areas (ECAs) and is adjacent to a liquefaction prone ECA. As mentioned previously, two wetlands were identified south and east of the structure.

The project site is within a 1000-foot methane buffer for an abandoned landfill. However, there does not appear to be a methane gas hazard at the site as no evidence of methane gas was noted during subsurface explorations conducted for the project and quarterly monitoring data from the landfill show no or low concentrations of methane gas.

The 22nd Ave. NE and NE 55th St. roadways are within and adjacent to steep slope and liquefaction areas and are near known landslide areas. However, work along 22nd Ave. NE and NE 55th St. will take place completely within developed street ROW; there will be no impact to surrounding ECAs.

i. Approximately how many people would reside or work in the completed project?

There would be no changes in residencies or employment as a result of this project.

j. Approximately how many people would the completed project displace?

There would be no displacement of people as a result of this project.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Not Applicable.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The project will be required to obtain a grading permit from DPD, which will include stipulations for work within any environmentally critical areas. Project design has implemented recommendations from the geotechnical investigation to ensure the stability of the new structure within steep slope and settlement areas. A site restoration plan will be developed in coordination with SDOT Urban Forestry and the University of Washington Landscape Architect and will include replacement of removed vegetation with native grass, shrub and tree species.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

None.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None.

c. Proposed measures to reduce or control housing impacts, if any:

Not Applicable.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

At its tallest height, the proposed western approach span of the viaduct will be approximately 30 feet above ground, similar to the existing roadway. The exterior of the western approach will be made up of pre-cast panels.

b. What views in the immediate vicinity would be altered or obstructed?

The only view to be altered as a result of the project is the current view of and from under the west approach span since the existing trestle would be replaced with a solid structure.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Once construction of a new west approach is completed, the ROW along NE 45th St. between 20th Ave. NE and the beginning of the western approach span will be replanted according to a landscape plan that will be developed prior to construction.

11. Light and glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

No new light or glare will be produced by this project. Streetlights that currently exist along NE 45th St. will be replaced with new ones.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

c. What existing off-site sources of light or glare may affect your proposal?

None are known.

d. Proposed measures to reduce or control light and glare impacts, if any:

No permanent measures are proposed since the potential impacts are negligible.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

The Burke-Gilman Trail travels beneath the NE 45th Street Viaduct, near the eastern terminus of the west approach structure. Ravenna Park abuts NE 55th St. to the north; however, repaving activities along NE 55th St. will not impact access to and from Ravenna Park.

Additional recreational opportunities, such as sports fields, tennis courts, and a golf driving range, are located within the University of Washington campus south of the project site, outside the project's immediate vicinity.

b. Would the proposed project displace any existing recreational uses? If so, describe.

Once completed, the project will not displace or disrupt any existing recreational uses.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

During construction, pedestrians and bicyclists that currently utilize the viaduct for transportation between the University of Washington Campus and the University Village Shopping Center will be re-routed around the project site. Signage will be placed along the Burke-Gilman Trail to alert users

about the construction activities that are taking place up the hill from the trail. Flaggers will alert users of the Burke-Gilman Trail when construction equipment is crossing over to the access road adjacent to the viaduct.

Bicycle detours will rely primarily on the existing local street network and connections to the Burke-Gilman Trail via the university campus. No specific detour for bicycle traffic will likely be designated, although bicycle traffic will be accommodated along the 22nd Ave. NE detour route and SDOT may implement sharrow pavement markings along 22nd Ave. NE to highlight the bicycle routing.

Existing pedestrian routes will provide alternative routes for pedestrians while the viaduct is closed. An ADA compliant detour route will travel along 22nd Avenue NE, between NE 45th St. and NE 55th St. and then follow NE 55th St. between Ravenna Blvd. and 25th Ave. NE. Another alternative route will include the NE 52nd Street Staircase. Please see the attached *SEPA Traffic Summary Report* for more detail.

13. Historic and cultural preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

The Sigma Kappa Mu Chapter House, located at 4510 22nd Ave. NE, is a designated City of Seattle landmark and is on the National Register of Historic Places (ID #07000305). Completed in 1930, it was the first individual fraternity or sorority house to be placed on the Register. It was designed by Seattle architect Joseph L. Skoog and represents the important role played by sororities and fraternities on the University of Washington campus during the 1930s to present times.

The NE 45th St. Viaduct was evaluated for eligibility as a historic resource for landmark consideration and determined not to be eligible. Please see the attached *Historic, Cultural and Archaeological Resources Technical Memorandum* for more information.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

The Sigma Kappa Mu Chapter House is a designated City of Seattle landmark that is adjacent to the project site. Construction activities will not alter the structure and access to the house will be maintained throughout the duration of the project. No other cultural, historic, or archaeological resources are known to be located on or nearby the project site.

c. Proposed measures to reduce or control impacts, if any:

While construction noise will be heard from the Sigma Kappa Mu Chapter House, there will be no anticipated impacts to the house itself. Potential noise reducing measures are described in the noise section above. If potentially significant cultural resources are identified during construction activities, work will halt in the immediate area and the appropriate state and city officials will be contacted.

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

The major public streets that serve the site include NE 45th St., 22nd Ave. NE and NE 55th St. 20th Ave. NE, 21st Ave. NE, NE 54th St., Ravenna Ave NE, and Ravenna Pl NE are local streets that feed into the site. The existing configuration of these streets will not change.

b. Is the site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

The site is served by public transit. King County Metro Transit Route 25 travels on NE 45th St. between downtown Seattle, the University District, and the Laurelhurst neighborhood. King County Metro Transit Routes 68, 74, 243, and 372 all travel beneath NE 45th St. on 25th Ave. NE between several different destinations. Metro routes 30 and 74 travel along NE 55th St. between Sand Point and the Seattle Center.

c. How many parking spaces would the completed project have? How many would the project eliminate?

There will be no permanent changes in parking spaces as a result of the project. While the viaduct is closed, however, parking restrictions will be increased during peak hours along 15th Ave. NE, 25th Ave. NE, and NE 65th St. This would temporarily affect 251 spaces during the 6 AM to 9 AM peak period and 243 spaces during the 3 PM to 6 PM peak period. Please see the attached *SEPA Traffic Summary Report* for more detail.

Parking restrictions will also be implemented during the repaving activities for approximately three weeks along 22nd Ave NE and approximately two weeks along NE 55th St. Project specifications will require that 50 percent of parking remain open during repaving of each street segment.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

The project will not require any new roads or streets.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No. The project will not use or occur in the immediate vicinity of water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

The project will maintain the existing number of travel lanes along NE 45th St, 22nd Ave NE, and NE 55th St. No new vehicular trips per day would be generated as a result of construction of the project.

g. Proposed measures to reduce or control transportation impacts, if any:

NE 45th St. will be closed to all traffic between 21st Ave. NE and Montlake Blvd. NE between June and September, 2010. Closure of the viaduct will have temporary impacts on pedestrian, transit, motor vehicle, and emergency response traffic and, to a lesser extent, on bicycle and freight traffic. With the following measures, these impacts will not be significant.

Detour routes will be created and signage will be posted prior to construction. The following arterials have also been identified as likely detour routes for vehicles during the construction period and are shown graphically in Figure 8:

- 15th Avenue NE between NE Pacific Street and NE 65th Street
- 25th Avenue NE between Montlake Boulevard NE and NE 65th Street
- Montlake Boulevard NE between NE 45th Street and NE Pacific Place
- NE Pacific Place between Montlake Boulevard NE and NE Pacific Street
- NE Pacific Street between 15th Avenue NE and NE Pacific Place
- NE 65th Street between 15th Avenue NE and Sand Point Way NE

Several traffic control measures will be developed through a Traffic Control Plan (TCP). Proposed measures currently include the following (please see the attached *SEPA Traffic Summary Report* for more detailed information):

- Dynamic message, informational, and detour signs
- Signal timing and phasing adjustments
- Roadway restriping to increase vehicle queue areas
- Enhanced crosswalk and roadway markings along pedestrian and bicycle detours
- Signal priority for emergency vehicles
- Bus stop enhancements and detours
- Public outreach, including real-time traffic information and trip reduction efforts
- On-street parking restrictions

Although there will be temporary parking restrictions during repaving activities, two-way travel will be maintained along 22nd Ave. NE and NE 55th St.

15. Public services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

The project will not result in an increased need for public services. However, the project will temporarily impact some public services, such as King County Metro Transit, fire, police, and medical services, since the closure of the viaduct will force these services to take a detour route in order to get to some of their destinations.

Seattle Fire Department staff have modeled fire response times under a full viaduct closure condition. The study area is served by two fire stations with primary response to any incidents in the vicinity: Station 17 is located at 1050 NE 50th St. and Station 38 at 5503 33rd Ave. NE. Station 17 would be the first responder for incidents on the west side of the viaduct and Station 38

would respond first for incidents to the east of the viaduct. Medic Unit response will come from Station 16 near Green Lake (6846 Oswego Place NE).

Seattle Fire will retain its ability to provide Primary Response coverage—basic life support—with minor delays for incidents both on the east and west sides of the project site. Primary Response includes paramedic units with supporting water pumper vehicles.

Secondary Response—this includes the larger fire vehicles such as ladder tracks in addition to the Primary Response vehicles—for a west end incident would not experience any difference in response times for engine, aid car (Medic Unit) or ladder truck responders. Secondary Response by the first ladder truck to an east end incident coming from Station 17 could take an additional 2.5 minutes to travel to the incident. Response time for a second engine to the incident would be delayed slightly less, by 2.25 minutes. Similar delays may be expected for police and ambulance services that would normally travel these routes.

There are no impacts to public services (temporary or permanent) anticipated as a result of the repaving activities along 22nd Ave. NE and NE 55th St. Two-way travel will be maintained throughout construction and priority will be given to any emergency vehicles that need to travel through the area.

b. Proposed measures to reduce or control direct impacts on public services, if any.

In order to reduce impacts on emergency response times, SDOT proposes to install traffic signal prioritization and restrict parking along designated detour routes. The Seattle Fire Department found that with these measures, both Primary and Secondary response times will be within acceptable limits while the viaduct is closed.

SDOT proposes to install Opticom signal prioritization systems at five signalized intersections on 25th Ave. NE from Pend Oreille Way to NE 55th St. These systems are connected to the traffic signal controllers so that when a fire department vehicle is coming toward the intersection, a sensor on the vehicle prompts the signal to change to green, therefore giving the fire department vehicles the right-of-way through the intersection.

As discussed previously, SDOT will implement parking restrictions along three arterials: 15th Ave. NE, NE 65th St., and 25th Ave. NE. These arterials will be designated detour routes for traffic when the viaduct is closed. As there are currently parking restrictions on these routes, SDOT will look to increase the restrictions for peak hour traffic and possibly daytime traffic as well.

16. Utilities

a. Circle utilities currently available at the site: <u>electricity</u>, <u>natural gas</u>, <u>water</u>, refuse service, telephone, <u>sanitary sewer</u>, septic system, other.

Seattle City Light provides electricity service to the surrounding area, and although there are no substations within the project area, an electrical conduit on the viaduct carries power to street lighting mounted on the structure.

Puget Sound Energy has a six-inch gas line beneath NE 45th St. through the project area.

Seattle Public Utilities has an eight-inch waterline and 15-inch pressurized sanitary sewer line, both of which are buried beneath NE 45th St. through the project area. The existing CSO crosses beneath the viaduct underground at the western end of the west approach. Currently stormwater flows untreated from NE 45th St. and the western approach into this CSO.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Based on interviews with service and utility providers, it is unlikely that the project will have any adverse effect on the operations of utilities such as electricity, phone, internet, and cable since relocating underground pipes and conduit would not be necessary. However, identifying and field-locating any existing utilities in the study area and coordinating with these agencies and local utilities will be necessary prior to construction beginning in order to minimize any potential construction impacts and any potential disruptions of utility service.

The project will not have any adverse effect on the electrical service operations of Seattle City Light to the area surrounding the project since no substations have to be relocated. Once construction of NE 45th St. and the replacement of the western approach are completed, street lighting will be re-installed through the project area.

The project will alter how stormwater run-off is currently collected from NE 45th St. and how it is fed into the existing CSO. Because the CSO runs directly to the municipal treatment facility, on-site treatment is not required; however, runoff generated from the project area must be detained per City of Seattle requirements. Once the project is complete, stormwater runoff from portions of NE 45th St., 20th Ave. NE, and 21st Ave. NE will be collected in an underground vault along 45th between 20th and 21st Ave. Stormwater that is collected will then be detained prior to flowing into the CSO to mitigate the impervious surface area replaced by the project. Stormwater from the remaining portion of NE 45th St. and runoff from the western approach will be allowed to flow directly into the CSO. Figure 5 details the proposed stormwater conveyance for the project.

C. SIGNATURE

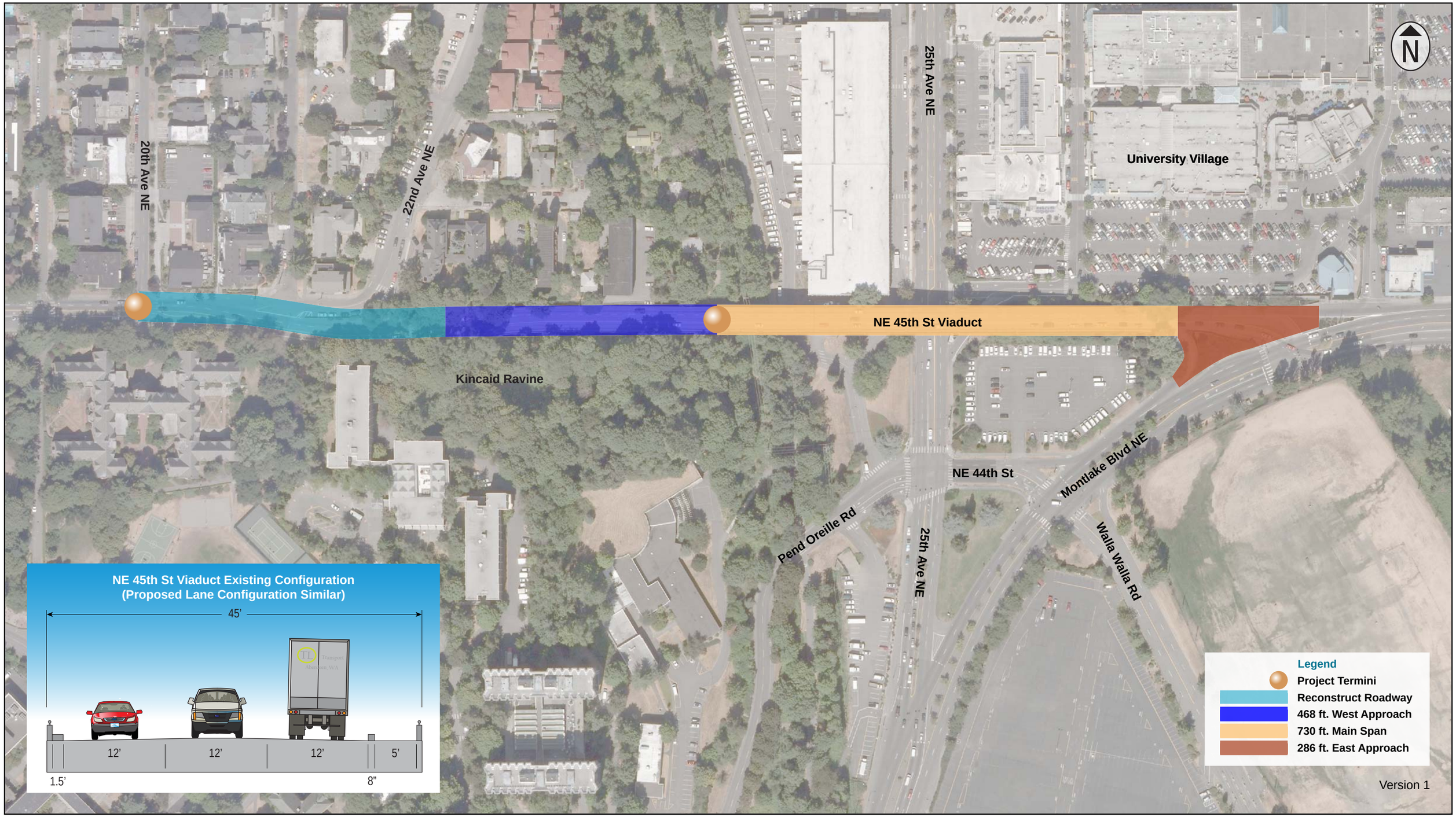
The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

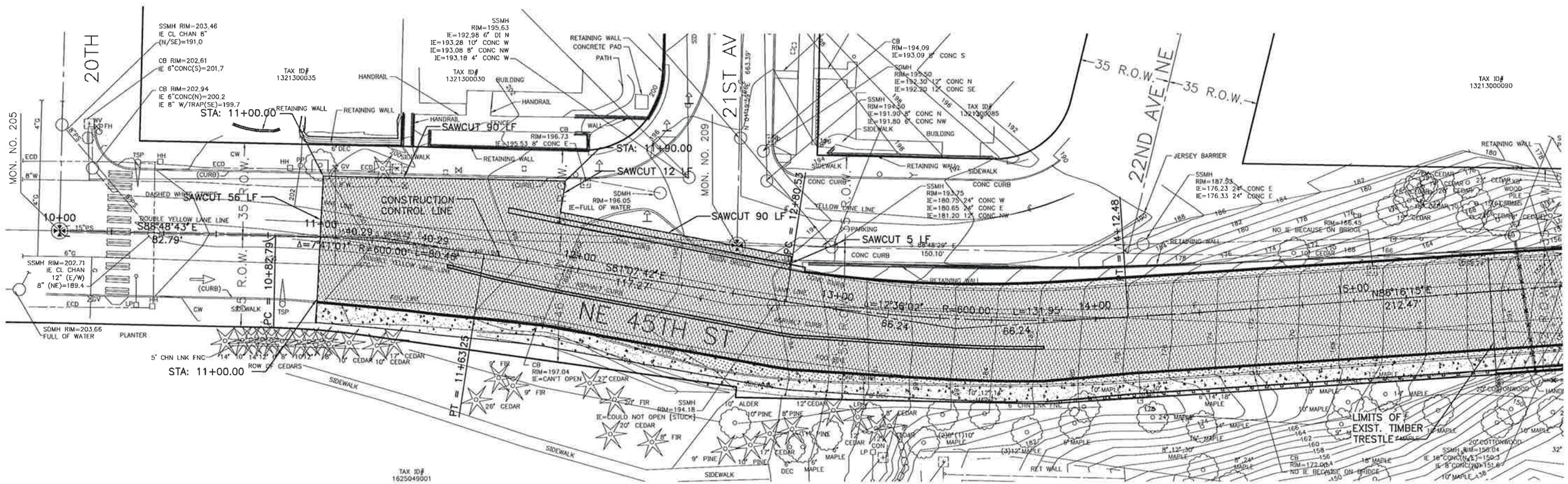
Signature: .....

Date Submitted: .....1.19.10.....

Figure 1. Project Vicinity Map, NE 45th Street Viaduct Replacement Project, Seattle, Washington.

Figure 2: NE 45th Street Viaduct Project Area





LEGEND

REBUILT ROADWAY

SIDEWALK

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Seattle Department of Transportation

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NE 45TH STREET VIADUCT PROJECT

PROPOSED PROJECT
ROADWAY COMPONENT

JOB NO. PC R/W CO
VAULT PLAN NO.
SHEET 3 OF 6

VAULT SERIAL NO.	DATE	MARK	NATURE REVISIONS	MADE	CHK'D	REV'D

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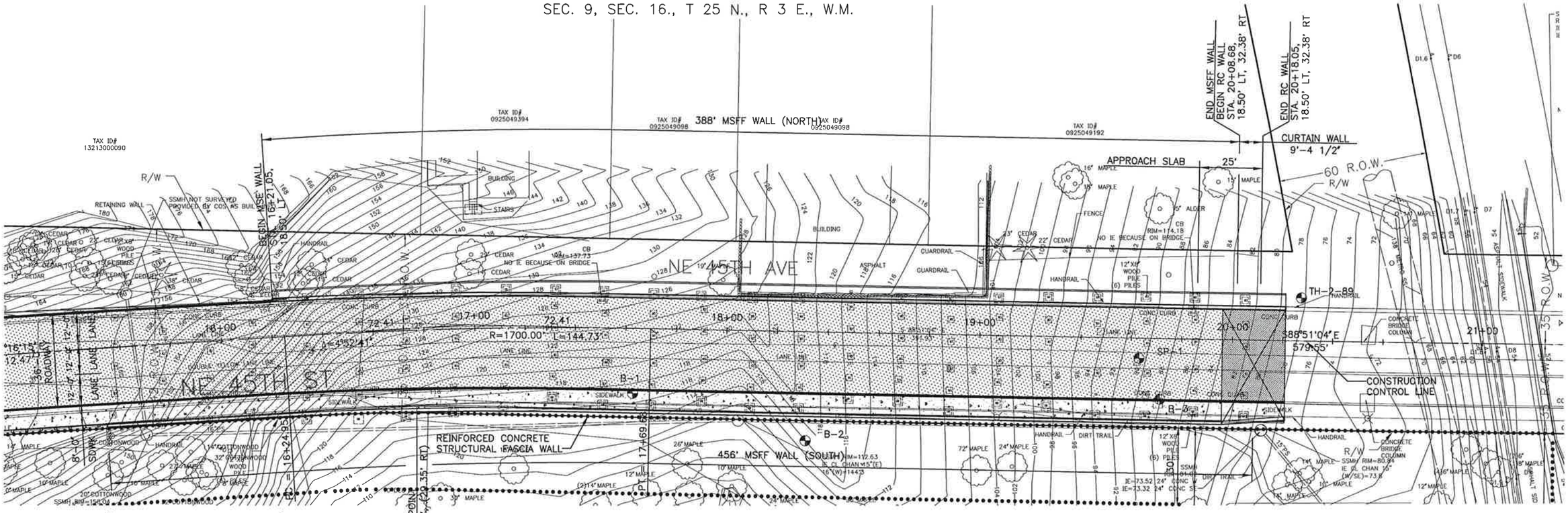

PLAN

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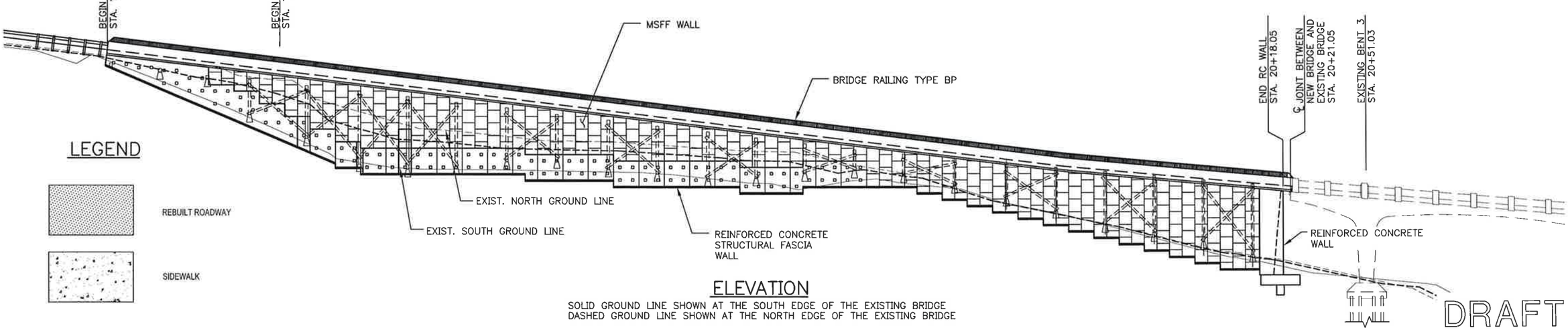

ELEVATION

SOLID GROUND LINE SHOWN AT THE SOUTH EDGE OF THE EXISTING BRIDGE
DASHED GROUND LINE SHOWN AT THE NORTH EDGE OF THE EXISTING BRIDGE

LEGEND

- REBUILT ROADWAY
- SIDEWALK

VAULT SERIAL NO.	DATE	MARK	NATURE REVISIONS	MADE	CHK'D	REV'D

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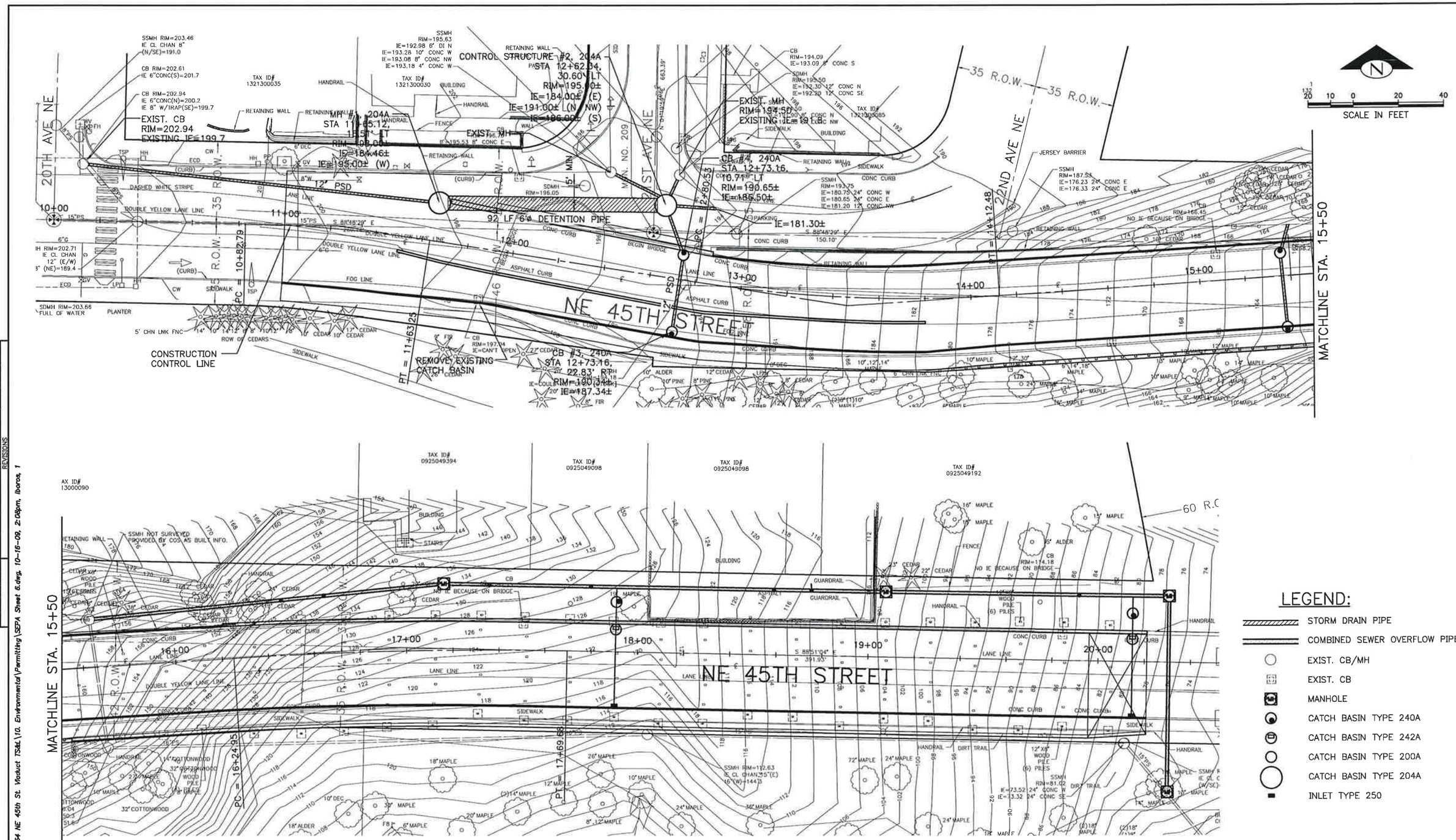
NE 45TH STREET VIADUCT PROJECT

PROPOSED PROJECT
BRIDGE COMPONENT

JOB NO. PC R/W CO

VAULT PLAN NO.

SHEET 4 OF 6



LEGEND:

- STORM DRAIN PIPE
- COMBINED SEWER OVERFLOW PIPE
- EXIST. CB/MH
- EXIST. CB
- MANHOLE
- CATCH BASIN TYPE 240A
- CATCH BASIN TYPE 242A
- CATCH BASIN TYPE 200A
- CATCH BASIN TYPE 204A
- INLET TYPE 250

PLAN

DRAFT

VAULT SERIAL NO.	DATE	MARK	NATURE REVISIONS	MADE	CHK'D	REV'D

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NE 45TH STREET VIADUCT PROJECT

PROPOSED PROJECT
STORMWATER COMPONENT

JOB NO. PC R/W CO

VAULT PLAN NO.

SHEET 5 OF 6

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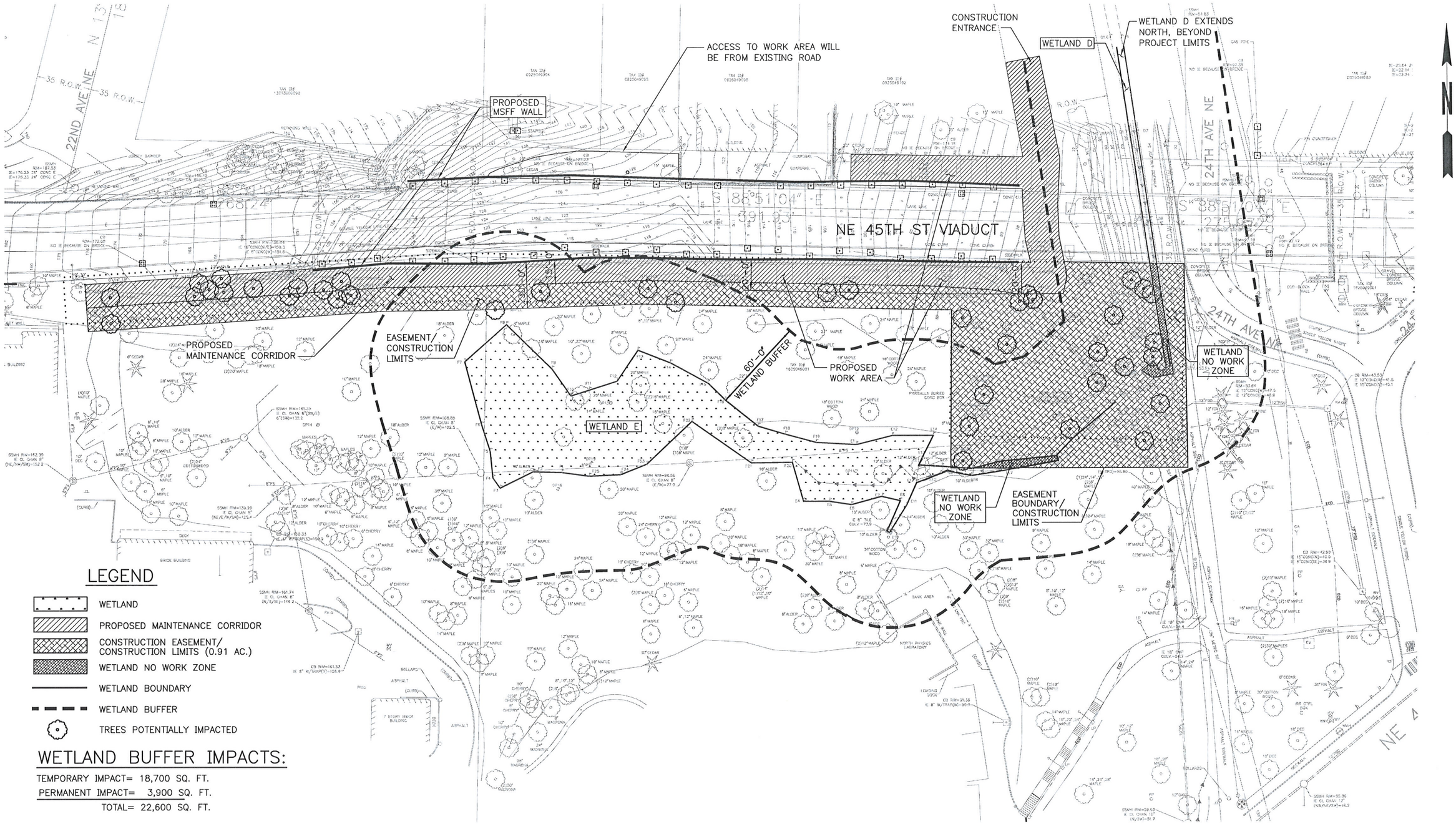

FIGURE 6 WETLAND BUFFER IMPACTS AND PROPOSED MAINTENANCE CORRIDOR

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NE 45TH STREET VIADUCT
WEST APPROACH REPLACEMENT
ALTERNATIVE 3B

JOB NO.	PC	TS4280A
	R/W	?
	CO	?
VAULT PLAN NO. ?		
SHEET OF		

NE 45th Street Viaduct Western Approach Replacement Project
Figure 7.

Greenhouse Gas Emissions Worksheet

	VMT for project	*gallons fuel/mile*	*lbs CO_2e/ gallons diesel*	*$MTCO_2e$ for Diesel*
Heavy Trucks	41,400	0.1250	26.55	62
	Square Feet of Roadway		*$MTCO_2e$/1,000 sf of asphalt or concrete pavement*	*$MTCO_2e$ for Roadway*
Roadway Reconstruction	236340		50	11,817
	Cubic Yards of Fill	*lbs cement/cubic yard of MSFF*	*$MTCO_2e$/ ton of cement*	*$MTCO_2e$ for MSFF*
MSFF	12,000	100	0.97	582
Total Metric Tons of CO2 equivalent				**12,461**

Data sources:

1. Vehicle miles travelled for placement of fill and construction of panel wall: An estimate of 1,200 truck trips travelling 30 miles rountrip was used for placement of the MSFF; an estimate of 54 truck trips travelling 100 miles round trip was used for construction of the panel walls.

2. Gallons of fuel per mile: This is the weighted national average fuel efficiency for all heavy single-unit trucks in 2006. This includes single-unit trucks which have more than two axles or more than four tires. The 0.125 gallons/mile used here is the inverse of the more commonly known term "miles/per gallon," which is 8.0 for medium weight (10,000 - 26,000 lbs) trucks most commonly used for construction. (*Transportation Energy Data Book*. 27th Edition. 2008. Chapter 5: Heavy Vehicles and Characteristics.)

3. Pounds of CO_2 equivalent per gallon of diesel: The CO_2 emissions estimates for diesel include the extraction, transport, and refinement of petroleum as well as their combustion. The emissions estimates for diesel were used instead of gasoline diesel combustion has a greater carbon impact. (*Life-Cycle CO_2 Emissions for Various New Vehicles*. 2006. RENew Northfield.)

4. Metric tons of CO_2 equivalent per 1,000 sf of asphalt or concrete production: Based on King County's conservative estimate for the embodied emissions over a development's life cycle. (Meil, J. *A Life Cycle Perspective on Concrete and Asphalt Roadways: Embodied Primary Energy and Global Warming Potential*. 2006; Park, K, Hwang, Y., Seo, S., M.ASCE, and Seo, H. , "Quantitative Assessment of Environmental Impacts on Life Cycle of Highways," *Journal of Construction Engineering and Management* , Vol 129, January/February 2003; Stripple, H. *Life Cycle Assessment of Road. A Pilot Study for Inventory Analysis*. Second Revised Edition. IVL Swedish Environmental Research Institute Ltd. 2001; Treloar, G., Love, P.E.D., and Crawford, R.H. "Hybrid Life-Cycle Inventory for Road Construction and Use." *Journal of Construction Engineering and Management*. January/February 2004.)

5. Metric tons of CO_2 equivalent per ton of cement: This figure represents a national weighted average for cement production in the U.S., as presented in *CO2 Emissions profile of the U.S. Cement Industry* (L. Hanle, US EPA; K. Jayaraman, ICF Consulting), presented at the 13th International Emission Inventory Conference, "Working for Clean Air in Clearwater" in 2004. Available: <http://www.epa.gov/ttn/chief/conference/ei13/index.html#ses-2>.

Figure 8. Detour Routes and Traffic Control Signs for the NE 45th Street Viaduct Construction