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2020-1299

**TYPE III VARIANCE APPLICATION
CITY OF COLUMBUS STORMWATER DRAINAGE MANUAL**

Cannon Drive Phase 2

The Ohio State University

Parcels 010-067007-00 and 010-203994-00

December 2, 2022

emht.com

**TYPE III VARIANCE REQUEST
THE OHIO STATE UNIVERSITY
PARCELS 010-067007-00 and 010-203994-00
DECEMBER 2022**

Executive Summary

The Ohio State University (Ohio State) is requesting a variance from the City of Columbus Stormwater Drainage Manual (the Manual) for the parcels (PID 010-067007-00 and 010-203994-00) containing the planned Cannon Drive Phase 2 project (CC-18761). Specifically, Ohio State is requesting a Type III Variance for relief from requirements of “Section 1.3 – Stream Corridor Protection Zone (SCPZ)” of the Manual in order to construct the project. The proposed work is located along the east bank of the Olentangy River from near John Herrick Drive to near Woody Hayes Drive. Refer to the Location Map on the following page for additional information. The proposed project consists of the following components located within or near the SCPZ:

- Reconstruction of the Olentangy River Trail, with connectivity to existing upper level paths at John Herrick Drive and Woody Hayes Drive.
- Reconstruction of the existing earthen flood control berm as an engineered flood control levee.
- Maintenance replacement of four (4) existing stormwater outfalls.
- Various earthwork activities associated with the above improvements.

The proposed work will encroach upon approximately 1.42 acres of SCPZ, with approximately 0.52 acres of encroachment due to non-permissible SCPZ uses associated with the proposed levee construction and long-term maintenance. Disturbed SCPZ areas will be restored either as a passive recreational paved trail or with no mow grasses, consistent with the requirements of the Manual. Reforestation and enhancement of the existing Environmental Covenant protected land is proposed as mitigation for impacts to SCPZ trees and for non-permissible SCPZ uses.

Figure 1 – Location Map



1.0 Project Background and Purpose

The Ohio State University (Ohio State) has been planning infrastructure improvements to the Cannon Drive corridor for over a decade. These improvements consist of substantial investments in the vehicular and pedestrian transportation networks, flood control system (including reconstruction of the existing earthen berm as a modern engineered levee to protect campus from 500-year flood events on the Olentangy River), and utility mains. Ohio State has been diligent to coordinate these plans with the multiple stakeholders and regulatory agencies, including the City of Columbus, Ohio Environmental Protection Agency, and Ohio Department of Natural Resources. The following list contains information on prior activities performed during the planning of the Cannon Drive corridor improvements that are specifically relevant to this Variance Application.

1. **Environmental Covenant:** An Environmental Covenant was recorded along the Olentangy River at the project site related to the construction of the 5th Avenue Dam Removal and River Restoration project in 2012. The Environmental Covenant was established by the City and State of Ohio to protect the benefits resulting from completion of the dam removal project and restoration of the quality and functionality of the Olentangy River in this area.
2. **Cannon Drive Preliminary Engineering Report (dated September 22, 2014):** This report included, among other topics, a review of stormwater and floodplain management requirements for the project corridor from King Avenue to Lane Avenue. An SCPZ boundary for the corridor was established along the east bank of the Olentangy River representing a 50-foot offset from the proposed top of bank for the river (based on the planned 5th Avenue Dam Removal and River Restoration project). This information is shown on Exhibit 5-1 of the report (PDF page 49/176) – reference Attachment 1.

The report was reviewed and comments were provided by City Department of Public Utilities (DPU) staff. Comments provided by DPU staff related to the SCPZ were in reference to permitted uses and potential need for mitigation depending on proposed activities within the SCPZ.

EMH&T utilized the same methodology from the 2014 report to delineate the “Proposed SCPZ” linework, as shown on current Cannon Drive Phase 2 plan set. Where the floodway extends beyond the 50-foot offset, the SCPZ boundary was extended to match the floodway. The SCPZ boundary follows near the east bank of the river adjacent to the Environmental Covenant limits previously established in 2012. The Environmental Covenant implements use restrictions on the river corridor promoting preservation as a Natural Area, similar to the intent of the SCPZ.

3. **April 8, 2021:** Project renderings were developed to identify and communicate the master planning concepts for the Cannon Drive Phase 2 project. The renderings include a robust landscaping master plan, which involves the installation of new trees along the project corridor between John Herrick Drive and Woody Hayes Drive. Reference Attachment 2.

4. May 21, 2021 Meeting: This meeting was held to provide a project status update to City staff. Renderings of the proposed project were presented from the prior month, including work along the Environmental Covenant boundary. Reference Attachment 3.
5. Initial CC plans for the Cannon Drive Phase 2 project were submitted on December 5, 2019 to the City of Columbus. Due to budget challenges and market conditions, the project was modified and subsequently re-submitted on July 9, 2021 per the revised concept to maintain the section of Cannon Drive between Lincoln Tower to the Stadium near existing grade to minimize project costs. April 29, 2022; August 12, 2022; October 10, 2022: EMH&T submitted updated Stormwater Management Reports to the City for the Cannon Drive Phase 2 Project. The reports include a discussion of the SCPZ impacts proposed by the project and a proposed mitigation strategy based on an increase in riparian “no mow” grasses located within the SCPZ as a result of the project.

City plan review staff have provided the following comment on this material: “Impacts of disturbance within SCPZ being evaluated,” from May 9, 2022.

6. October 10, 2022: The current Landscape Master Plan for the project corridor depicts 86 street trees to be installed with the Cannon Drive Phase 2 project. The master plan also depicts additional planned tree installation locations along the river corridor, including 46 future trees planned to be installed within the existing Environmental Covenant boundary between John Herrick Drive and Woody Hayes Drive. Reference Attachment 4.

1.1 Project Schedule

Ohio State intends to begin construction of the Cannon Drive Phase 2 project immediately. As discussed with City staff, Ohio State is planning to start clearing operations on December 19, 2022 for all trees located outside of the SCPZ. This work has been specifically planned to minimize disruption to campus operations while considering the safety of adjacent existing pathways. It is Ohio State’s desire to resolve this Variance request prior to this date, such that the additional trees located in the SCPZ that are scheduled to be removed can be cleared as part of this work. This work will be followed by the planned demolition of existing buildings, including Drake Union, two abandoned Cyclotron Buildings, and one abandoned Pump House. These buildings are located outside of the SCPZ, and demolition will occur by no later than March 1, 2023 per approved State of Ohio permits.

1.2 Permits

Ohio State has secured the following permits and approvals for the Cannon Drive Phase 2 project that are relevant to the SCPZ.

1. United States Army Corps of Engineers, Section 404 Nationwide Permit – Issued.
2. FEMA Conditional Letter of Map Revision – Issued.
3. Ohio Environmental Protection Agency, Environmental Covenant Coordination – Completed.

2.0 Existing Site Conditions

The SCPZ boundary line on the parcels is generally located between the 2012 Environmental Covenant boundary and the existing earthen berm previously constructed to provide flood protection for the Ohio State Campus. Land cover in this portion of the SCPZ includes: turf grass, riparian grasses, two trees (measuring greater than 6" dbh) and an asphalt path (Olentangy River Trail). These features are summarized in Tables 1 and 2. This portion of the Olentangy River corridor has been highly impacted over the past century, with construction of the existing earthen berm, campus facilities, and Olentangy River Trail. The Trail is heavily utilized by commuters, recreational users, and campus pedestrians and bicyclists.

Table 1: Summary of SCPZ Area Included in Variance Request

Existing Land Use	Acres
Impervious Surfaces	0.29
Turf Grasses	0.50
Riparian and No Mow Grasses	0.63
TOTAL	1.42

Table 2: Summary of Trees Included in SCPZ Area

Quantity of Trees	2
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3.0 Summary of Impacts

Attachment 5 presents the site plan for the proposed work (Preferred Alternative) located between John Herrick Drive and Woody Hayes Drive. Proposed encroachments to the SCPZ south of Ohio Stadium include reconstruction of the Olentangy River Trail, partial demolition of an existing retaining wall, and replacement of existing storm sewer outfalls, all with associated earthwork. These activities are permissible uses of the SCPZ according to the Manual, and encompass approximately 0.54 acres of the SCPZ. One tree (measuring greater than 6" dbh) will be removed from the SCPZ in this area. The proposed levee does not encroach into the SCPZ in this area.

Proposed encroachments to the SCPZ adjacent to the Ohio Stadium include reconstruction of the Olentangy River Trail, replacement of existing storm sewer outfalls, and construction and maintenance of the proposed levee. The City has designated portions of the project where the levee coincides with the proposed trail to be a non-permissible use of the SCPZ due to concerns that include long-term maintenance (vegetation control) for the embankment. For purposes of this SCPZ evaluation, Ohio State has designated the non-permissible use area to be limited to locations where the proposed levee "Landscape Exclusion Zone" encroaches into the SCPZ. The Landscape Exclusion Zone has been approved by the Ohio Department of Natural Resources, and is the portion of the levee that includes the levee clay core and riverside structural fill slope, as well as a buffer where the ground surface must be maintained to prevent growth and establishment of woody vegetation. Based on this definition, the non-permissible use area of the SCPZ for this project is approximately 0.52 acres, as reflected by the red hatched area on Attachment 5, Sheet 2 of 2. This 0.52 acre area includes 0.16 acres of existing impervious area

associated with the Olentangy River trail and one tree (measuring greater than 6" dbh) that will be removed. This segment of the project adjacent to the Ohio Stadium also includes 0.36 acres of permissible SCPZ uses, where the levee Landscape Exclusion Zone does not encroach into the SCPZ.

Table 3 summarizes the SCPZ encroachments associated with the proposed project.

Table 3: Summary of Proposed SCPZ Encroachments

Encroachment Type	Area	Trees to be Removed	Use Designation
Stormwater Outfall Replacement	Maintenance	0	Permissible
Trail Construction	0.54 + 0.36 = 0.90 Acres	1	Permissible
Levee Landscape Exclusion Zone	0.52 Acres	1	Non-Permissible
Total	1.42 acres	2	

4.0 Alternative Site Plans

Ohio State has prepared two alternative site plans in support of this Variance Application. Development of a third alternative site plan, as required by the Manual, is not feasible based on site constraints and the proposed relief requested.

Preferred Alternative (Attachment 5) – This alternative proposes to construct the proposed improvements within the SCPZ as discussed above in Section 3. Outcomes associated with the Preferred Alternative include the following:

- The project satisfies the flood control requirements for the University. **POSITIVE**
- The project provides a reconstructed river trail with connectivity between the riverside and Cannon Drive trails and pathways. The connectivity provides the greatest utility to the passive recreational users of the corridor. **POSITIVE**
- The project results in no increases in 100-year flood levels along the Olentangy River, as demonstrated by the hydraulic study submitted in support of the project. **POSITIVE**
- The project results in no adverse impacts to the natural functions of the SCPZ. Stream velocities within the SCPZ are low; grass cover will protect the SCPZ surface from erosion. The project will result in a decrease in impervious area and provide suitable restoration with no mow grasses, as shown in Table 4. **POSITIVE**
- Ohio State will provide an easement covering the portion of the SCPZ within the project area between the SCPZ and Environmental Covenant boundaries, as discussed with City staff. **POSITIVE**

Table 4: Comparison of Land Coverage Within Affected SCPZ

Land Use	Existing Acreage	Proposed Acreage	Change	Benefit
Impervious Surfaces	0.29	0.03	-0.26	Positive
Turf Grasses	0.50	0.00	-0.50	Positive
Riparian and No Mow Grasses	0.63	1.39	+0.76	Positive
TOTAL	1.42	1.42		

Full Compliance Alternative (Attachment 6) – Non-permissible SCPZ uses for the proposed project are limited to areas where the levee encroaches into the SCPZ. Therefore, in order to develop a Full Compliance Alternative, Ohio State has prepared a site plan where the levee Landscape Exclusion Zone is located fully outside of the SCPZ. This alternative includes construction of approximately 900 linear feet of the proposed levee as a structural floodwall instead of the earthen embankment. The floodwall would be approximately 12 feet in height and located approximately 20 feet east of the SCPZ boundary to avoid construction impacts and Landscape Exclusion Zone encroachments into the SCPZ. Although the floodwall would satisfy the flood control requirements of the project, the wall will create a vertical barrier preventing connectivity between the trails along the river and Cannon Drive, resulting in an adverse impact to the passive recreational users of the corridor. Further, the floodwall will impose both a greater initial construction cost and long term maintenance burden for Ohio State staff, as compared to the earthen embankment.¹ Outcomes associated with the Full Compliance Alternative include the following:

- The project satisfies the flood control requirements for the University. **POSITIVE**
- The project does not provide a reconstructed river trail with connectivity between the riverside and Cannon Drive trails and pathways. The floodwall will create a vertical barrier between trails along the river and Cannon Drive, an adverse impact to the passive recreational users of the corridor. **NEGATIVE**
- The proposed floodwall will isolate approximately 900 LF of Olentangy River Trail with the river on the west side and the tall, structural floodwall on the east side of the trail. This configuration raises safety concerns for users of the trail. Further, the floodwall will itself be a fall hazard, with the estimated height of 12 feet above the riverside grade. **NEGATIVE**
- The exposed face of the floodwall will be oriented towards the Olentangy River, which is out of the line of sight of campus facilities. The wall will likely attract vandalism and become an aesthetic detractor in conflict with the University’s vision for the proposed park. **NEGATIVE**
- The proposed floodwall will be more expensive to construct than the proposed earthen embankment. Based on a cost analysis performed by Ohio State during preliminary planning for the project and updated for current market conditions, the floodwall is

¹ Ohio State developed planning level unit costs for various levee configurations during the preliminary phases of the Cannon Drive project. This effort estimated the construction cost per linear foot for a structural floodwall will exceed the construction cost per linear foot for an equivalent earthen embankment. Ohio State recently updated this analysis to reflect current market conditions, which resulted in a differential in unit costs of approximately \$4,500 per linear foot. This differential cost can be greater based on structural material design selections.

expected to add a minimum of $900 \text{ LF} * \$4,500 / \text{LF} = \$4,000,000$ to the project construction cost. **NEGATIVE**

- The project results in no adverse impacts to the natural functions of the SCPZ consistent with the Preferred Alternative. Stream velocities within the SCPZ are low; grass cover will protect the SCPZ surface from erosion. However, the project will not result in a decrease in impervious area nor receive restoration with no mow grasses; existing pavement and turf grass within the SCPZ will remain. **NEGATIVE RELATIVE TO THE PREFERRED ALTERNATIVE**

5.0 Request for Relief / Hardship Statement

Ohio State is requesting approval to perform work within the SCPZ along the east side of the Olentangy River as presented in the Preferred Alternative and CC-18761. The proposed plan has been developed to achieve the University's goals for the project (flood control with passive recreational enhancements along the river corridor), while controlling project costs and ensuring no adverse impacts to the natural functions of the SCPZ. The project as designed will result in a significant uplift in passive recreational utility along this portion of the river corridor through the reconstruction of the Olentangy River Trail, proposed tree planting according to the University's master plan, and removal of Drake Union and the existing abandoned Cyclotron and Pump House buildings. Approval of these permits for demolition have been obtained.

As discussed in Section 4, implementation of the Full Compliance Alternative reduces the magnitude and type of encroachments into the SCPZ, but with unacceptable and unproportional adverse impacts to the resulting project. These adverse impacts include significant added cost and complexity for the floodwall construction, isolation of the Olentangy River Trail with no connections to Cannon Drive for over 900 linear feet adjacent to Ohio Stadium, and safety concerns associated with both the floodwall and isolation of the Trail.

6.0 Mitigation

The Manual notes that mitigation for impacts to the SCPZ and not directly to a stream shall be performed as follows:

“If a temporary impact is proposed, then the SCPZ must be restored to preserve or improve the existing SCPZ quality and function. If the proposed impacts removed a portion of the SCPZ, then the applicant must provide adequate mitigation by creating equivalent mitigation SCPZ elsewhere or perform adequate ecological mitigation work on-site or off-site to replace functions lost as a result of the proposed impact.”

6.1 SCPZ Function

Although the Preferred Alternative will encroach into the SCPZ, it is important to note that no loss of SCPZ function is expected due to the proposed project. The proposed work will result in an increase in riparian grasses and decrease in impervious surfaces located in the affected SCPZ area, which will provide additional erosion control and water quality protection, as seen in Table 4 and on Attachment 5. No adverse flood hazard impacts will occur, as demonstrated by the slight decrease in 100-year flood elevations along this portion of the Olentangy River documented in the flood hazard study submitted by Ohio State in support of the plan. Ohio State will maintain these benefits in accordance with the University's master plan.

6.2 SCPZ Protection

Ohio State is willing to provide an easement or other restrictive instrument covering the SCPZ as required by the Manual. Through discussion with City staff, the easement limits will be generally bounded by the Environmental Covenant boundary on the west, Woody Hayes Drive on the north, the SCPZ boundary on the east, and John Herrick Drive on the south. Ohio State will install SCPZ identification signage and markers as required by the Manual.

6.3 SCPZ Revegetation

Ohio State proposes to revegetate disturbed areas within the SCPZ using riparian and no mow grasses. Proposed impervious areas within the SCPZ are limited to the Olentangy River Trail reconstruction and cover less acreage than the existing impervious area coverage, as shown in Table 4.

6.4 SCPZ Reforestation

Ohio State proposes to perform SCPZ Reforestation as part of the Mitigation Plan, consistent with the Manual and prior Type III Variance Requests. Reforestation is proposed to consist of 1-inch caliper trees to be planted within a minimum of 0.52 acres of the existing Environmental Covenant lands immediately adjacent to the proposed project as enhancement of the riparian zone along the Olentangy River streambank. A species list will be confirmed with City staff, but is expected to include native species common to Central Ohio and suitable for the site conditions. Ohio State is not proposing to install mitigation trees within the portion of the SCPZ located outside of the Environmental Covenant limits at this time, as only two trees are planned for removal from this area under this project. However, Ohio State reserves the right to install additional trees in this zone in the future as an additional, voluntary enhancement activity.

Reforestation Calculations:

1. For tree mitigation due to permissible activities: Impacted trees measuring > 6 inches dbh shall be replaced based on a mitigation ratio consistent with recent Type III Variance approvals as follows. Trees shall be 1-inch caliper size with a 100% contractor warranty.
 - a. Trees with a 6 to 12 inch DBH, shall be replaced on a 1:1 basis;
 - b. Trees with a >12 to 18 inch DBH, shall be replaced on a 2:1 basis;
 - c. Trees with a >18 to 24 inch DBH, shall be replaced on a 3:1 basis;
 - d. Trees with a >24 inch DBH, shall be replaced on a 4:1 basis.

Replacement Requirements: The proposed project will remove one tree from this portion of the SCPZ, with replacement requirements shown below in Table 5.

Table 5: Tree Replacement Requirements for SCPZ Permissible Uses

Species	DBH	Replacement Ratio	# Replacement Trees
Sycamore	6 inches	1:1	1

2. For tree mitigation due to non-permissible activities: Ohio State is proposing to provide 125 1-inch caliper trees per acre of SCPZ encroachment with a 100% contractor

warranty, again consistent with recent Type III Variance approvals. This replacement ratio will allow for 100 trees/acre based on a long-term survival rate of 80%. However, Ohio State proposes to provide reforestation for only the pervious portion of this encroachment area. Providing additional reforestation for impacts to existing paved surfaces, which will be removed by the proposed project and replaced with no mow grasses, is not logical. Further this portion of the Olentangy River corridor is not currently in a pristine, natural condition due to the historical site uses. The proposed reforestation work is appropriate for mitigation of the proposed encroachment.

Replacement Requirements: The proposed project will remove one tree from this portion of the SCPZ, with replacement requirements shown below in Table 6.

Table 6: Tree Replacement Requirements for SCPZ Non-Permissible Uses

Total Encroachment Area	Less Existing Paved Surfaces	Net Encroachment Area Requiring Mitigation	Replacement Ratio	# Replacement Trees
0.52 acres	-0.16 acres	0.36 acres	125 trees/acre	45

3. Summary of Mitigation Tree Planting:

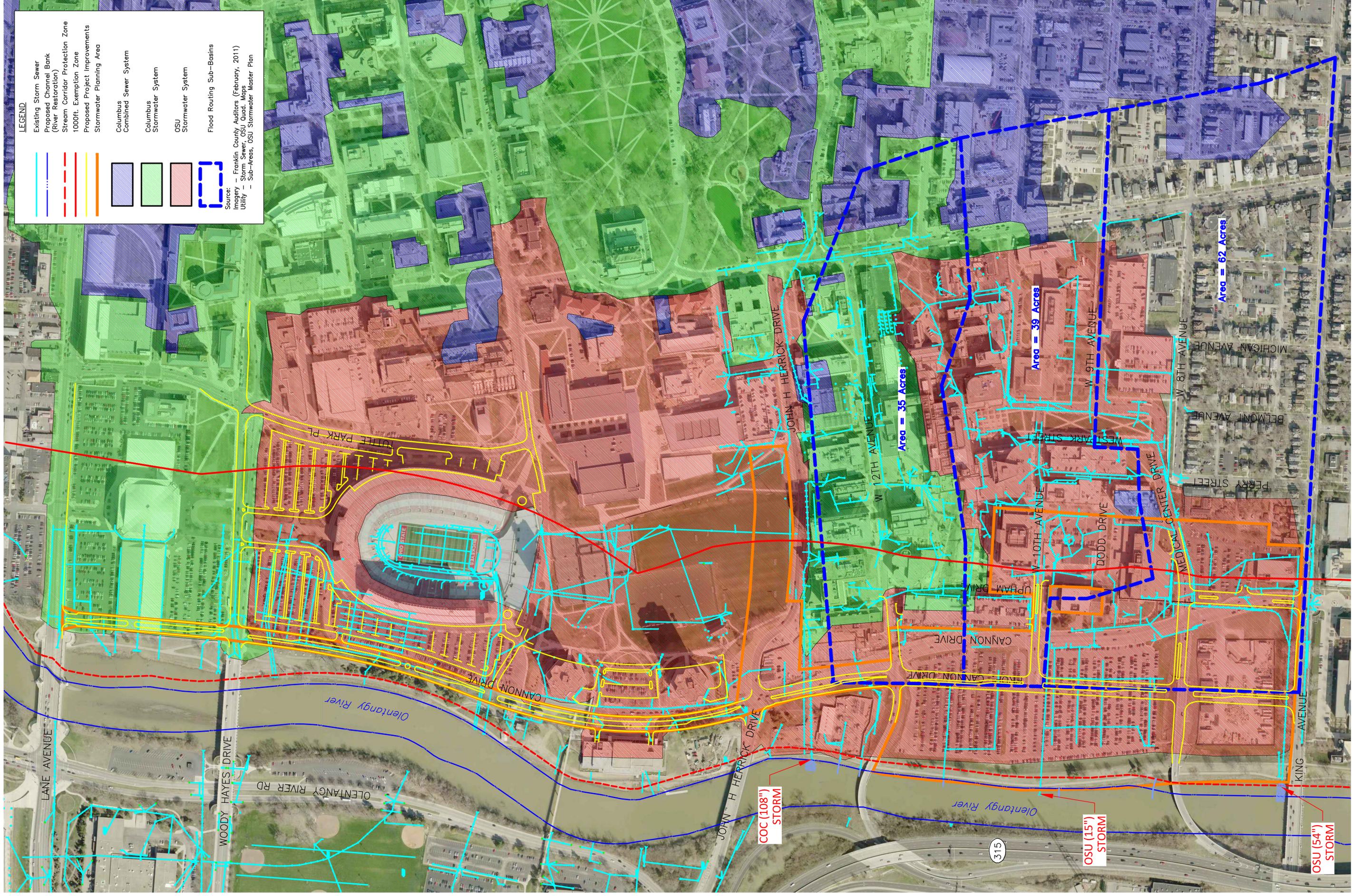
Permissible Use Area Mitigation = 1
Non-Permissible Use Area Mitigation = 45
 Total = 46

Total # of Trees to be Removed = 2

7.0 Conclusions

Ohio State respectfully requests approval of the Type III variance for the Preferred Alternative for the Cannon Drive Phase 2 project. The proposed non-permissible impacts to 0.52 acres of SCPZ have been carefully considered, and ultimately determined to be necessary to meet the project’s requirements. Reducing or eliminating these impacts would have a significant impact on the project’s viability, as described herein.

The mitigation proposed for the Preferred Alternative will be achieved on the project site and includes the enhancement of 0.52 acres of native riparian tree planting within the SCPZ and Environmental Covenant protected lands. The proposed mitigation is more than equivalent to offset the impacts due to the proposed SCPZ encroachment.



LEGEND

- Existing Storm Sewer (River Restoration)
- Proposed Storm Sewer (River Restoration)
- Stream Corridor Protection Zone
- 1000ft. Exemption Zone
- Proposed Project Improvements
- Stormwater Planning Area

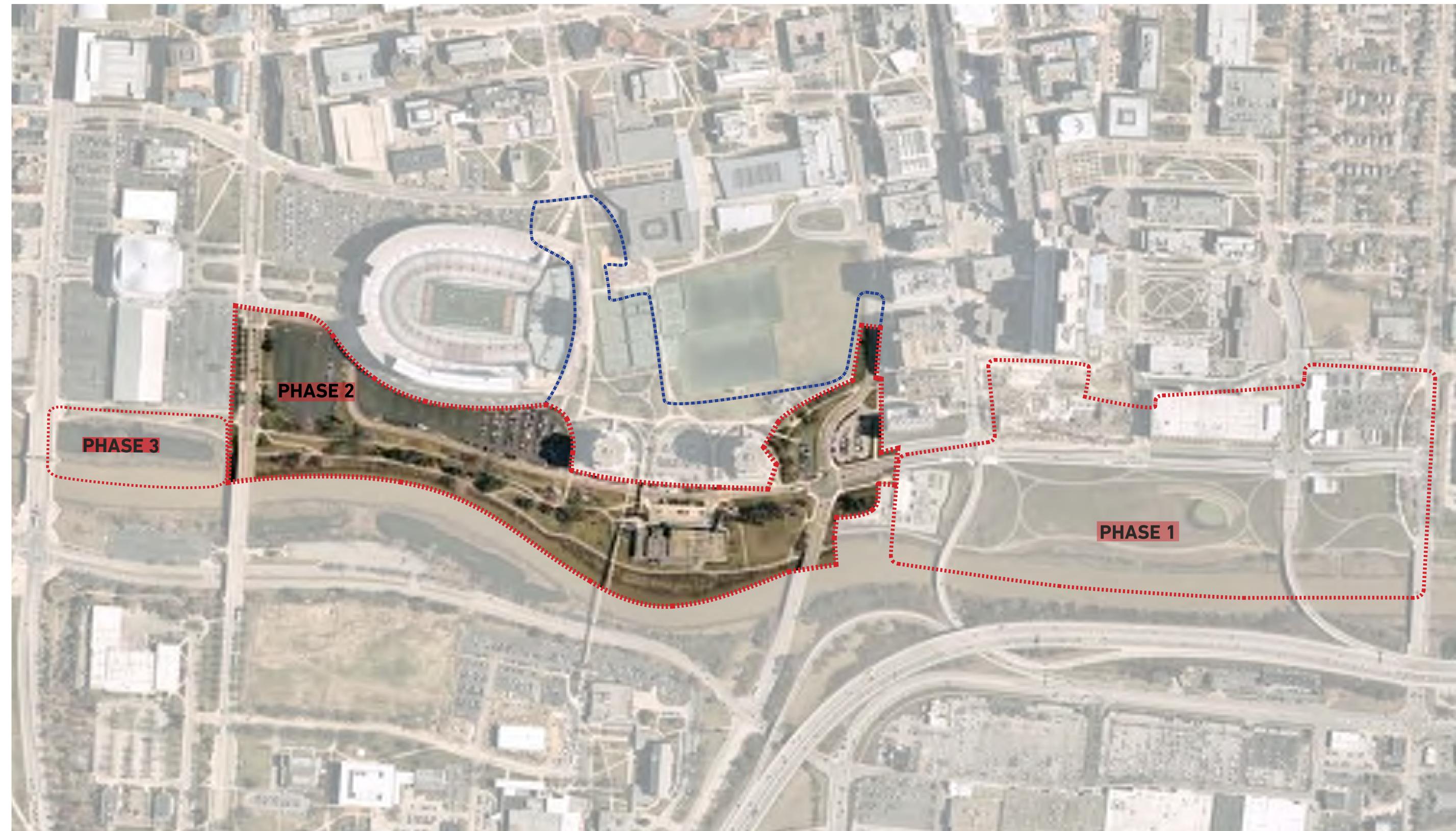
- Columbus Combined Sewer System
- Columbus Stormwater System
- OSU Stormwater System
- Flood Routing Sub-Basins

Source: - Franklin County Auditors (February, 2011)
 Imagery - Storm Sewer, OSU Quad, Maps Utility - Sub-Areas, OSU Stormwater Master Plan

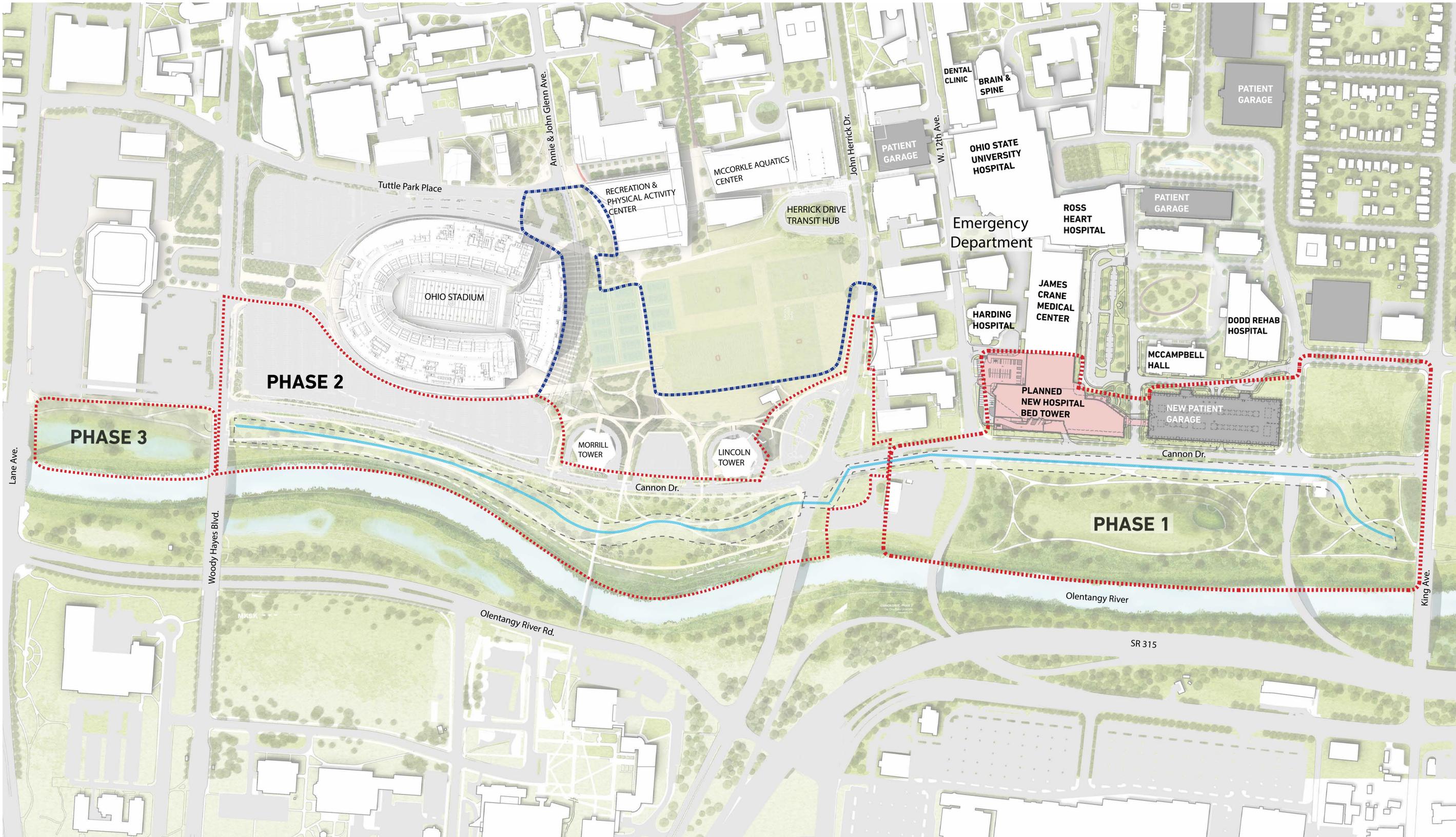
\\20120219\pww\0459661\Exhibits\Exhibits\Water Resources Dept\Resources\Exhibits\Exhibit - Existing Conditions.dwg last saved By: jromer, 12/18/2012 2:24 PM last printed By: jromer, 12/18/2012 3:03 PM (No Xrefs)

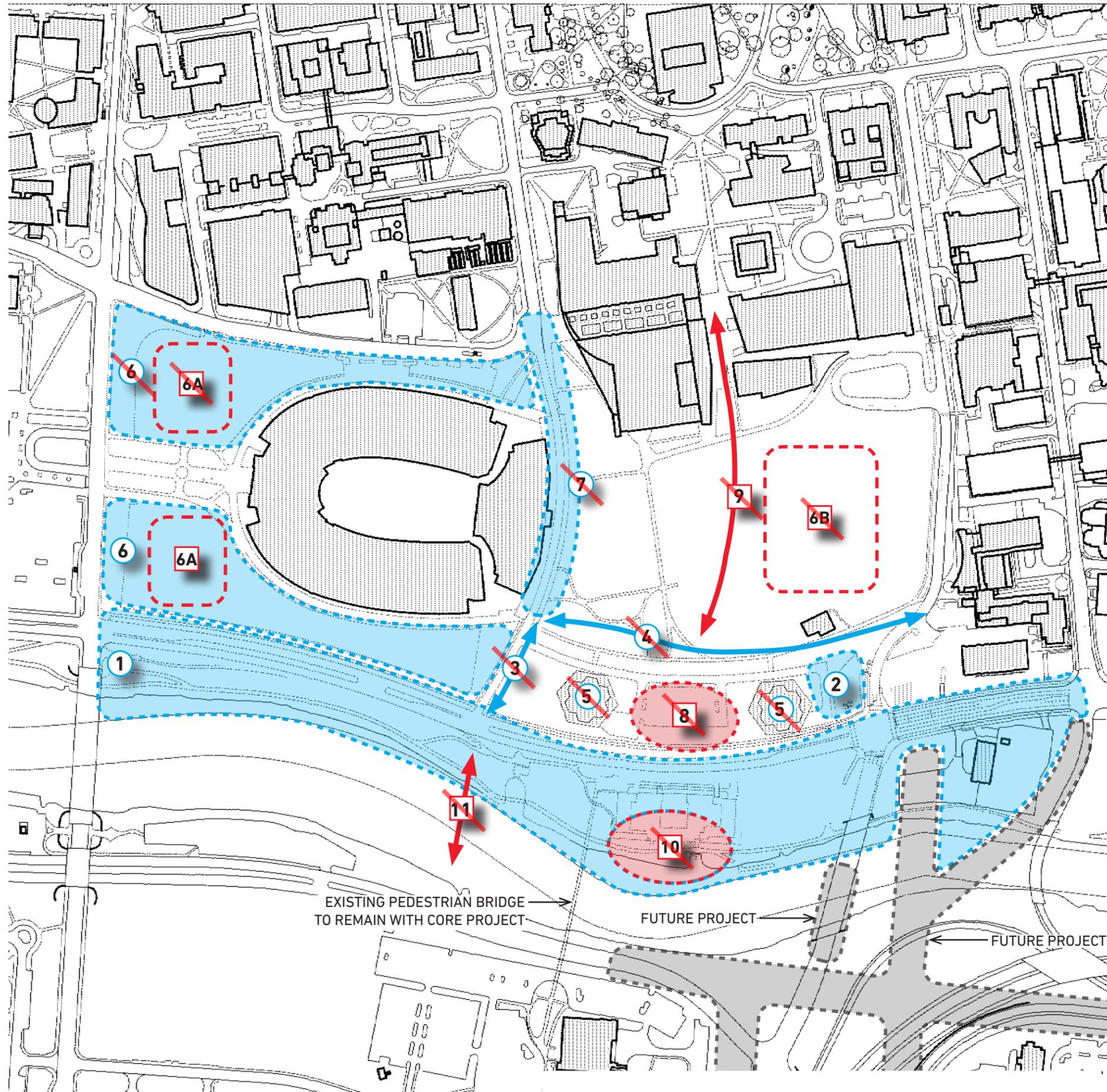
CANNON DRIVE - PHASE II
DRB PRESENTATION - REVISED SCOPE
APRIL 8TH, 2021

CANNON DRIVE CORRIDOR EXISTING CONDITIONS



CANNON DRIVE CORRIDOR MASTERPLAN





CANNON DRIVE: PHASE 2 - SUMMARY OF PROJECTS

CORE PROJECTS

- ① CANNON DRIVE PHASE 2 ROADWAY & LANDSCAPE IMPROVEMENTS
- ② PARKING LOT AT NORTHEAST HERRICK DRIVE AND CANNON DRIVE
- ~~③ ANNIE & JOHN GLENN AVENUE TO TOWER DRIVE~~
- ~~④ TOWER DRIVE~~
- ~~⑤ LINCOLN & MORRILL TOWER MODIFICATIONS~~
- ⑥ OHIO STADIUM LOT NORTHWEST & WEST LOT
- ~~⑦ ANNIE & JOHN GLENN AVENUE CONNECTION TO RPAC~~

ADDITIONAL PROJECTS

- 6A SUPPLEMENTAL STORMWATER MANAGEMENT - STADIUM PARKING LOT
- ~~6B SUPPLEMENTAL STORMWATER MANAGEMENT - RECREATIONAL FIELDS~~
- ~~⑧ OPEN SPACE AT TOWERS~~
- ~~⑨ LONG WALK TO OVAL~~
- ~~⑩ AMPHITHEATER & COMPANION BUILDING~~
- ~~⑪ PEDESTRIAN BRIDGE~~
- ~~⑫ TREES AT CANNON DRIVE PHASE 1 PARK~~
- ~~⑬ ENTRY FEATURE AT KING AVE~~

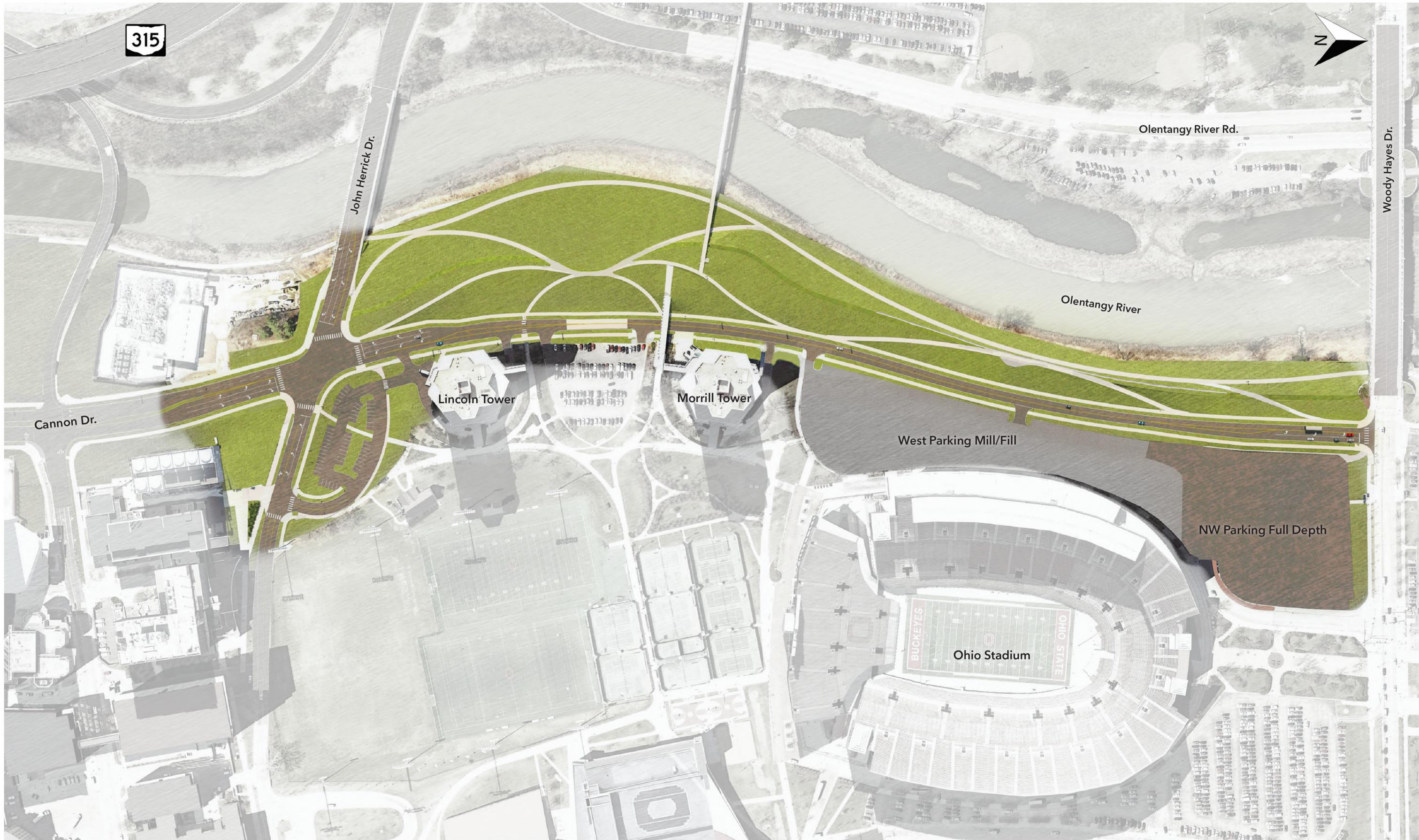
○ CORE PROJECT □ ADDITIONAL PROJECT

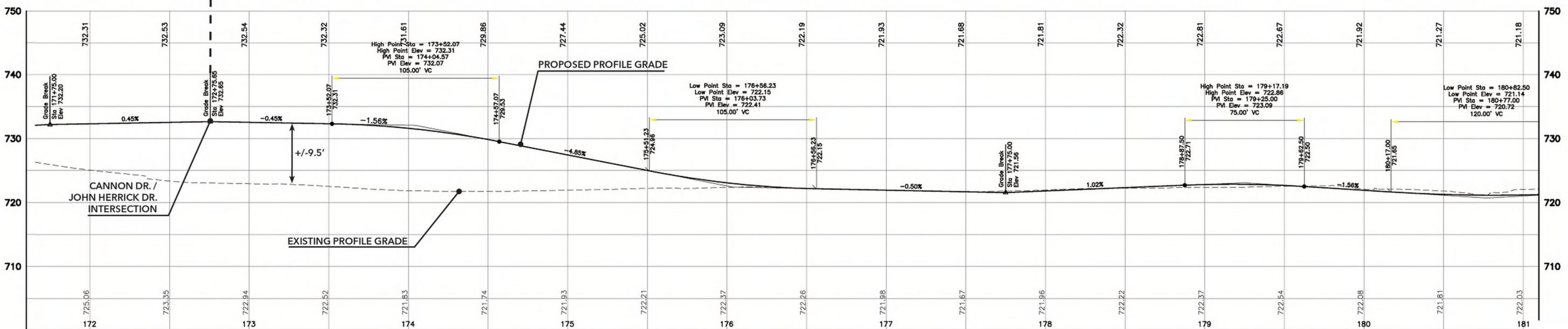
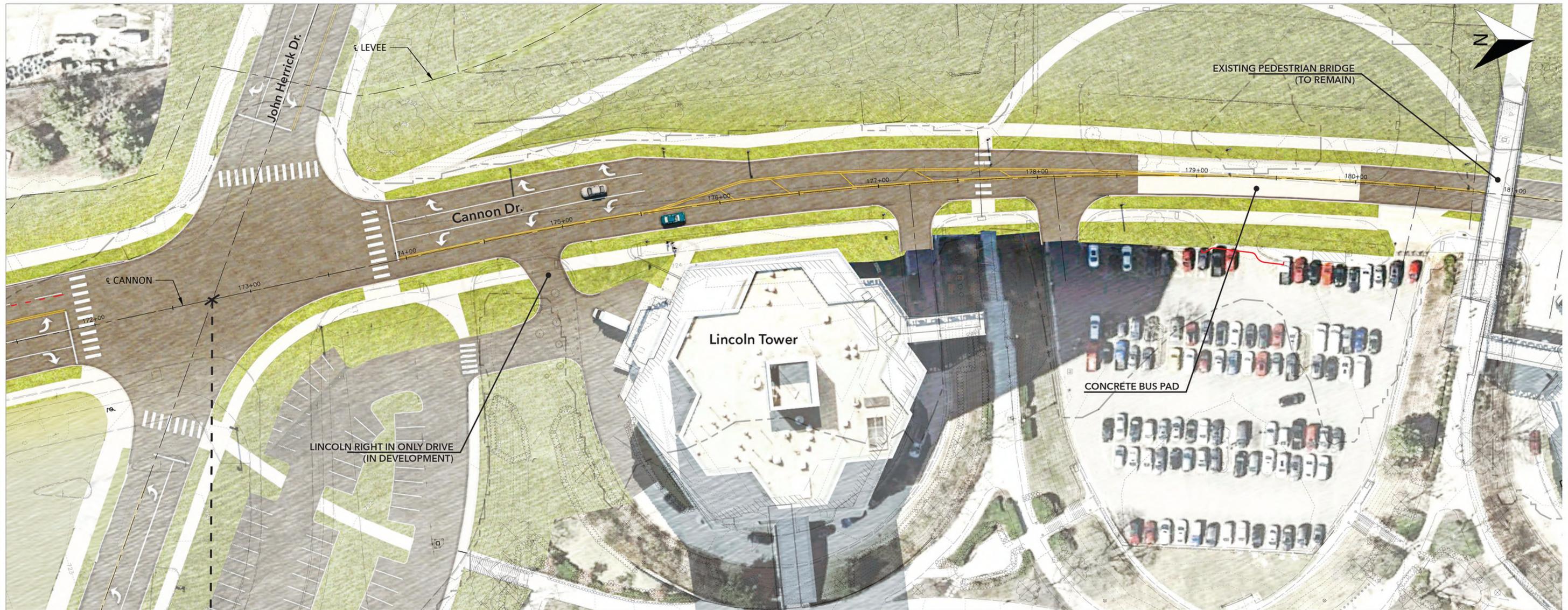
EXISTING PEDESTRIAN BRIDGE TO REMAIN WITH CORE PROJECT

FUTURE PROJECT

FUTURE PROJECT

Cannon PH2 2018 Project vs 2021 Project









Lincoln Tower



LINCOLN RIGHT IN ONLY DRIVE
(IN DEVELOPMENT)

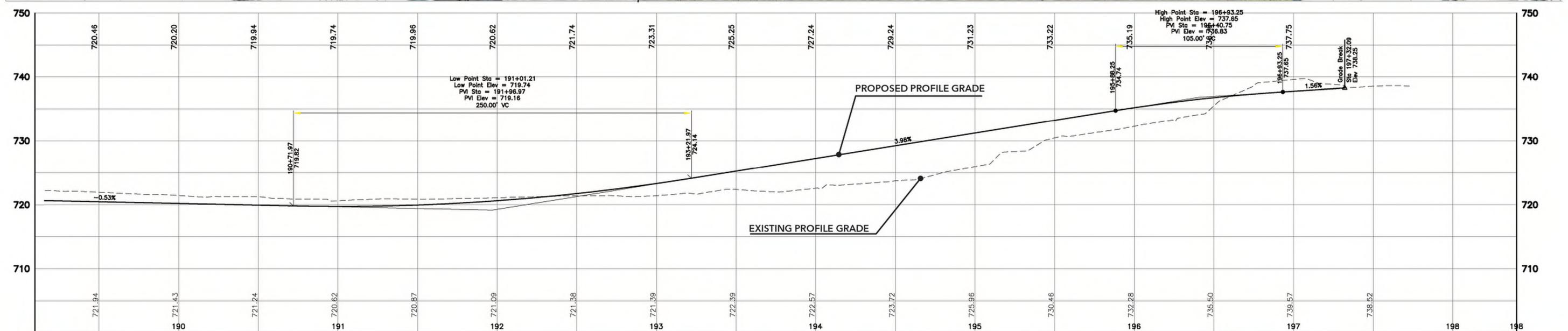


Lincoln Tower

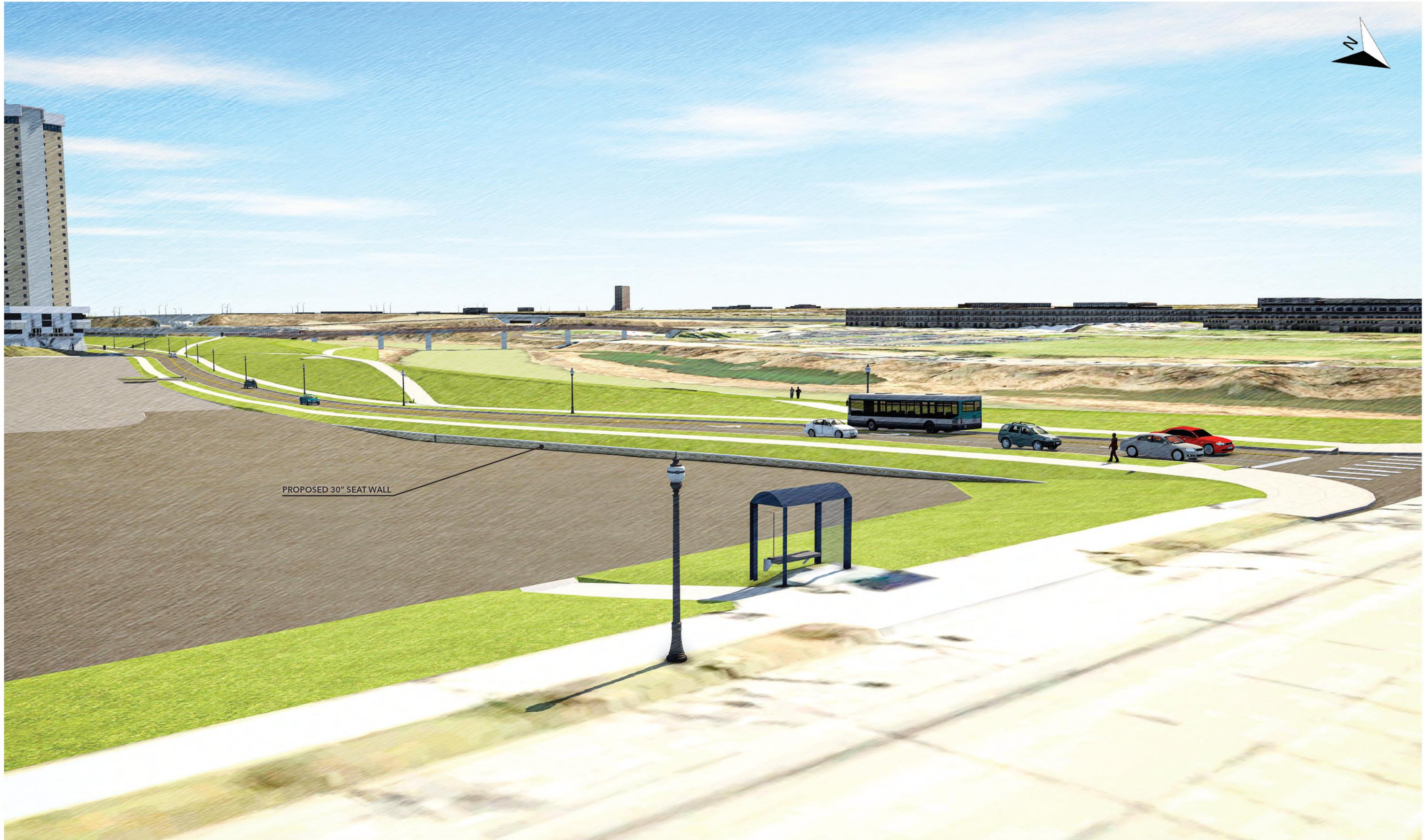
Future Hospital Tower

Chiller Plant



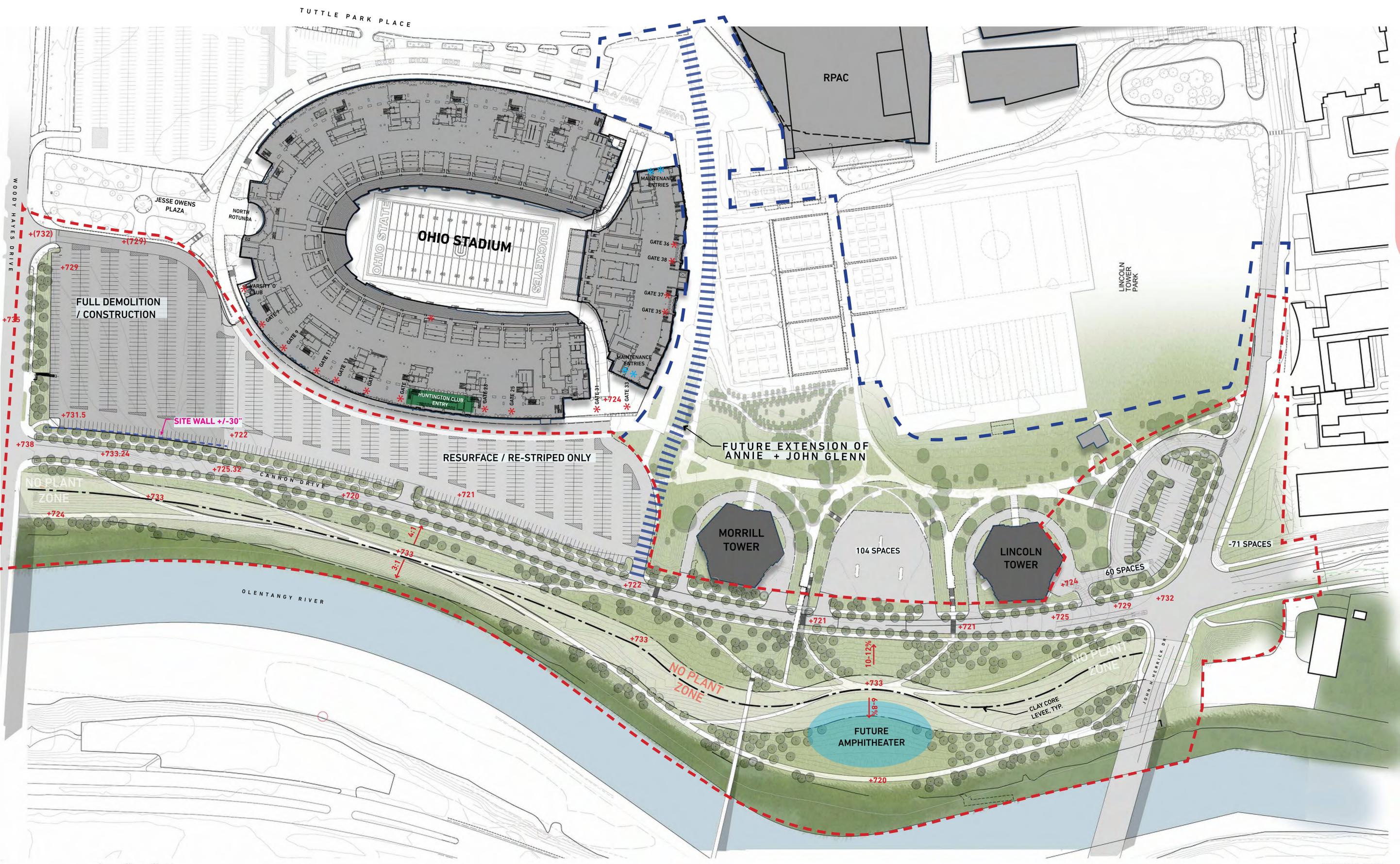






PROPOSED 30" SEAT WALL

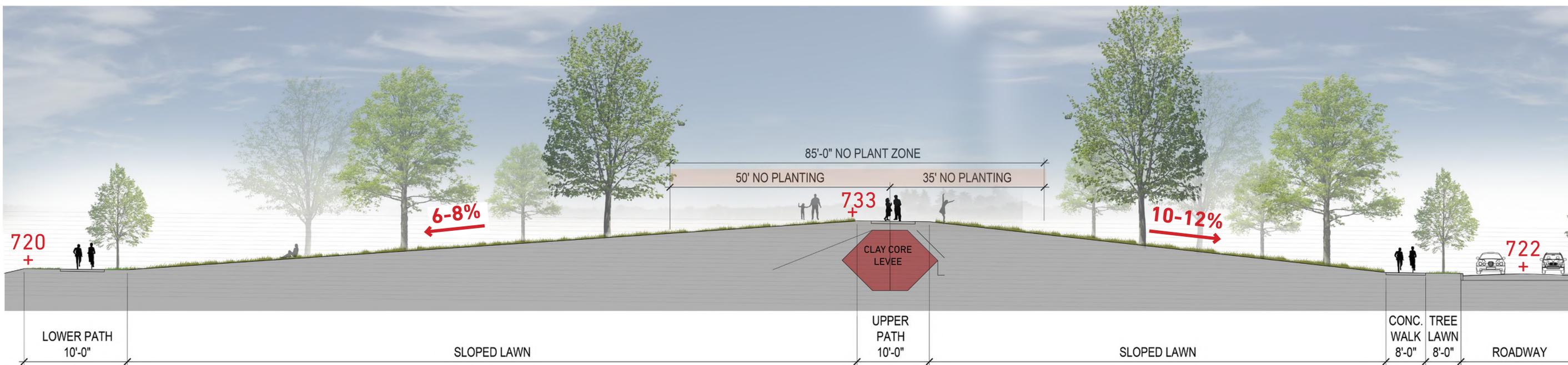
CANNON DRIVE CORRIDOR SITE PLAN UPDATE



CANNON DRIVE CORRIDOR TOWER GREEN CONNECTION



CANNON DRIVE CORRIDOR TOWER GREEN CONNECTION



CANNON DRIVE CORRIDOR TOWER GREEN CONNECTION



CANNON DRIVE CORRIDOR TOWER GREEN CONNECTION



CANNON DRIVE CORRIDOR STADIUM LOT ENLARGEMENT

Option 2 Parking

Stadium Lot

Current Existing Spaces: 871

Proposed Spaces (Op2): 968

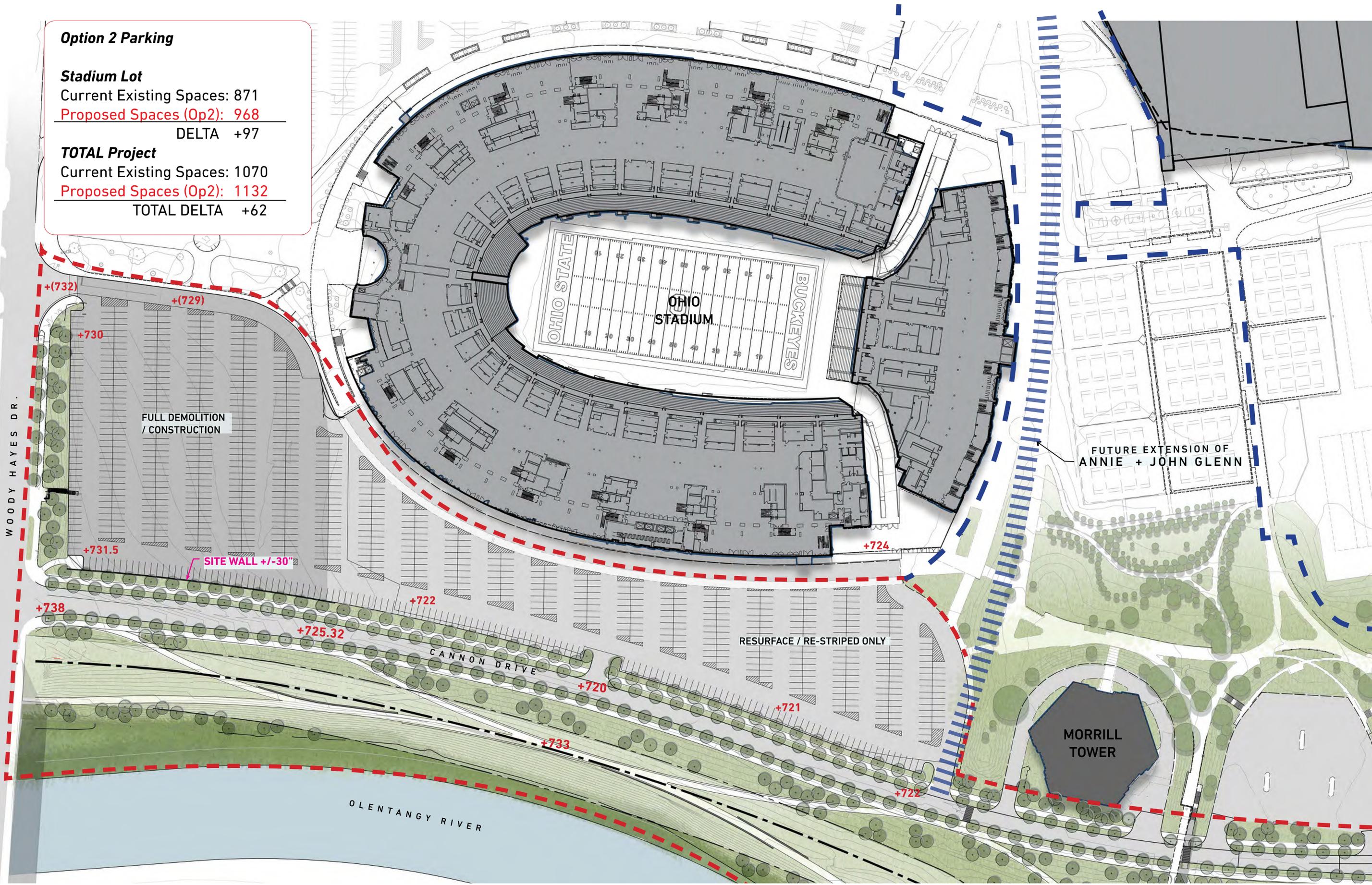
DELTA +97

TOTAL Project

Current Existing Spaces: 1070

Proposed Spaces (Op2): 1132

TOTAL DELTA +62



WOODY HAYES DR.

FUTURE EXTENSION OF ANNIE + JOHN GLENN

MORRILL TOWER

OLENTANGY RIVER

CANNON DRIVE

OHIO STADIUM

OHIO STATE

BUCKEYES

FULL DEMOLITION / CONSTRUCTION

RESURFACE / RE-STRIPED ONLY

SITE WALL +/-30"

END

12.7 Clinton Sewer District #3 Trunk Sewer Siphon

The West Campus Infrastructure Study (dated January 22, 2021) presented to The Ohio State University (OSU) and the City of Columbus (City), identified alternatives for providing sanitary sewer capacity to the West Campus Development Program Boundary. Figure 12.7A illustrates the tributary boundary for the proposed redevelopment that would necessitate the additional sanitary sewer capacity. The City of Columbus has selected the Woody Hayes Sewer Extension as the preferred alternative for serving this area. This alternative requires an increase in capacity of the existing siphon under the Olentangy River by constructing an additional 24-inch barrel.

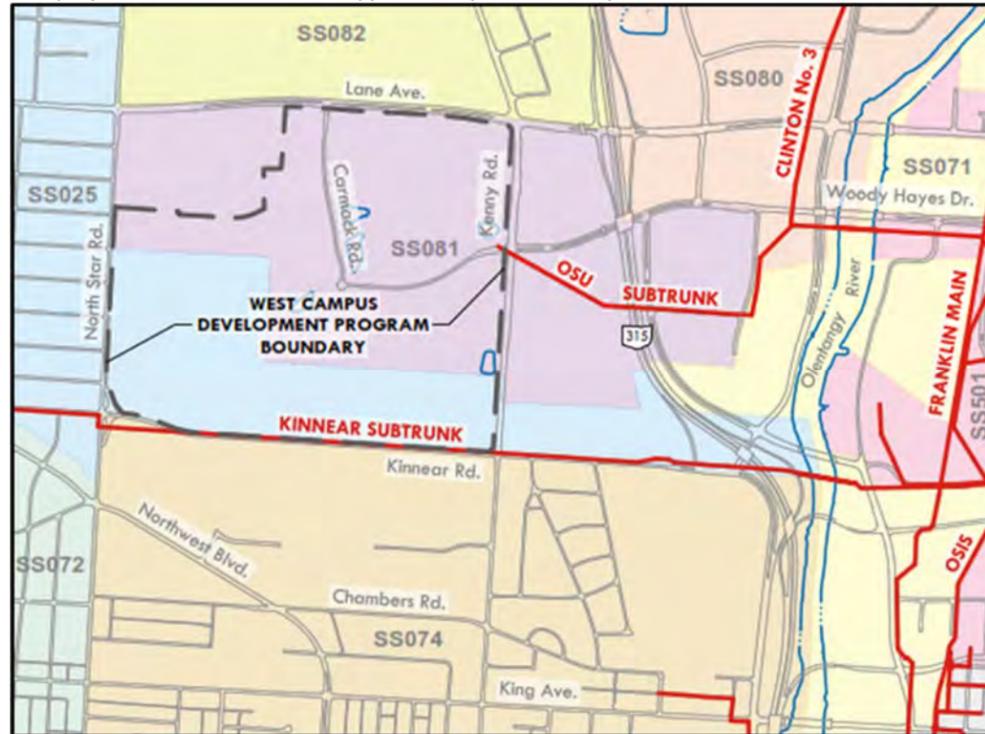


Figure 12.7A Sanitary Sewer Tributary Boundaries

OSU is in the process of the preliminary design on Cannon Drive Phase 2. This project includes the relocation of Cannon Drive and construction of a levee along the Olentangy River’s east bank. The existing Clinton Sewer District

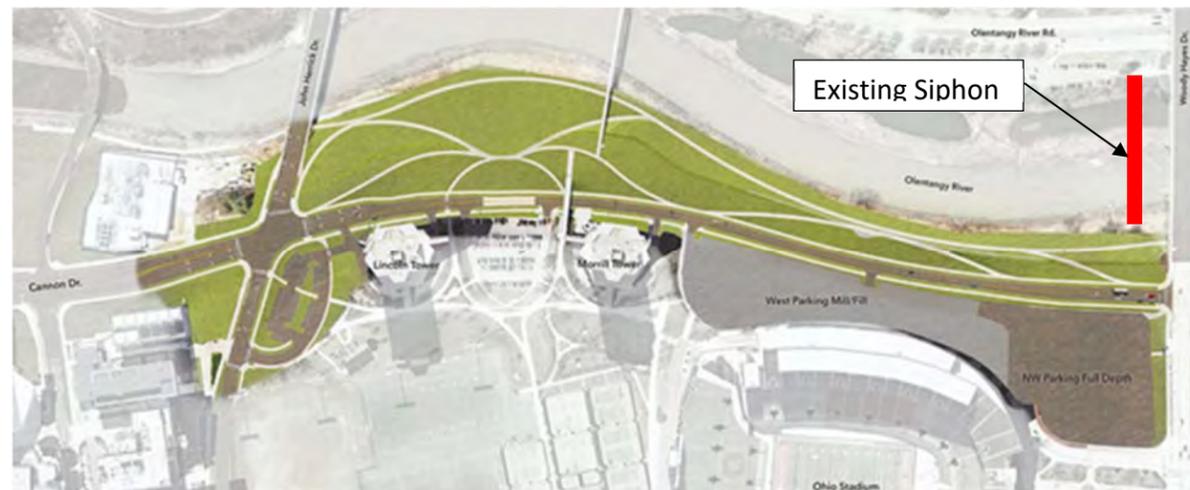


Figure 12.7B Clinton Sewer District #3 Trunk Sewer Siphon Location

#3Trunk Sewer Siphon is located within the proposed construction footprint of this project. To avoid future disruption to the proposed OSU facilities and the certified levee, improvements to the siphon is recommended to be designed and constructed as part of the Cannon Drive Phase 2 project. Figure 12.7B shows the location of the existing siphon with respect to the OSU improvements.

12.7.1 Alignment Options for the Siphon Modification

As stated previously, the capacity improvements to the Clinton Sewer District #3 Trunk Sewer Siphon will require an additional 24-inch barrel added to the existing siphon. The existing siphon constructed in 1947 includes three existing barrels including a 10-inch, 18-inch and a 30-inch. There are two options to available for modifying the siphon – modifying the existing siphon and construction of a separate siphon. A schematic layout for the two options are shown.

Option A – Modify Existing Siphon: This option would include constructing the new 24-inch barrel by modifying the existing siphon. This would be an open cut construction method and would require modifications to the existing structures on either side of the river to allow flow to enter the 24-inch barrel.

Option B – Construct Separate Siphon: This option would include construction of an equalization pipe and separate 24-inch siphon. This option has two construction options - open cut construction or trenchless construction.

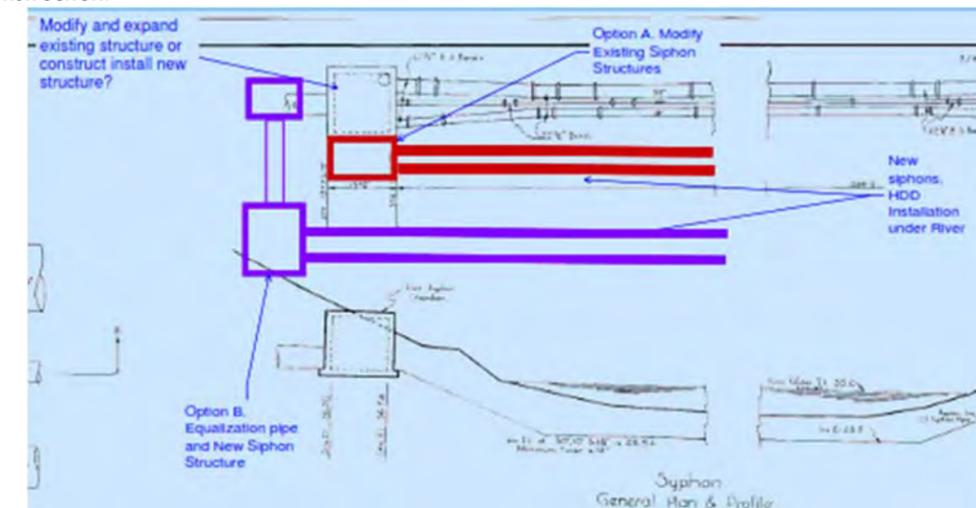


Figure 12.7.1 Option Concepts

12.7.2 Construction Methods

The alignment and method of construction will be evaluated during the design of the sewer improvement. The feasibility of each construction method will be dependent on the results of the geotechnical investigation, survey, modeling results, permitting issues, land acquisition, stakeholders (Ohio EPA, U.S. Army Corps of Engineers, etc.) and coordination with the City of Columbus.

1. Open Cut Construction – This method would require excavating across the Olentangy River corridor and Environmental Covenant Area. If this method is selected for construction an environmental evaluation will be required prior to construction. A mitigation plan would be developed considering specific site features, flows, plants and wildlife found within the construction area to ensure potential impacts to these features are minimized. **Figure 12.7.2A** illustrates two conceptual open cut alignments for the project.
2. Jack and Bore Construction – This method would include trenchless installation of a 48-inch steel casing pipe as a carrier pipe for the 24-inch siphon pipe under the Olentangy River. This method of construction would avoid surface impacts within the River corridor and Environmental Covenant area; however, placement of jacking and receiving pits could be challenging near the river banks. Jack and Boring is dependent on proper soil condition. **Figure 12.7.2B** illustrates a conceptual jack and bore alignment.

3. Horizontal Directional Drilling (HDD) – This method would include trenchless installation of a 24-inch siphon pipe. This installation method would allow surface impacts within the Olentangy River corridor and Environmental Covenant Area to be minimized. The construction footprint of directional boring is dependent on several factors including pipe size, soil conditions, pipe lay down area, and available space on each side of the crossing. **Figure 12.7.2C** illustrates a conceptual HDD alignment.

Based on preliminary discussion with the CMR, Igel/Ruhlin, in March 2021, this open cut method is the recommended alternative at this time for a construction risk perspective. OSU noted that on a prior river jack and bore for their electrical upgrades the contractor had major difficulties with underground river crossings due to large boulders encountered under the bottom of the river, which resulted in major delays and claims.

- Permitting Agency: City of Columbus
- **Open Cut Construction Only – In Stream Waiver If Construction is between March 15-June 30)**
Permitting Agency: ODNR

A permit table summarizing permit overlaps with Cannon Drive Phase 2 and other potential considerations as performed by our office is include in Figure 12.7.5.

12.7.6 Siphon Concept Plans – Other Considerations

Siphon concept plans have been included in figure 12.7.2A – 12.7.2C. Considerations to interim phasing will be reviewed with the University and an advanced GMP may be required for the sale of this project per the schedule in Section 16.

12.7.7 Schedule

For consistency in the report, a separate schedule has been included in Section 16 that requires follow-up revised with the OEPA, City of Columbus, OSU and other associated stakeholders.

12.7.3 Design Constraints

A preliminary review of potential design/constructability issues and project risks was conducted for the Woody Hayes alignment. The key issues explored were:

- **Land Acquisition** –The City of Columbus will require additional permanent easement for the proposed siphon improvements. The temporary construction easements should not be necessary since the surrounding area is owned by OSU.
- **Temporary Construction Easement/Work Zone** – During the evaluation of alignment alternatives coordination with OSU with regard to event planning, parking impacts, traffic impacts is critical.
- **USACE** – Project construction coordination with the USACE, Huntington District will be required to understand upstream water release rates and water levels.
- **Environmental Covenant Area Encroachment** – The construction of the siphon will require an encroachment on the Environmental Covenant Area.
- **Ohio Department of Natural Resources** – There is a restriction of In-stream work between March 15 and March 30th of every year. Construction during this time fame will require a special permit.
- **Development of the Upstream Tributary Area** – Continued coordination with Columbus on development upstream of the siphon improvement will be require. Total tributary build out will require the completion of the Lower Olentangy Tunnel (LOT) to ensure adequate capacity and operation within the downstream sewers.

12.7.4 Geotechnical

A geotechnical investigation is critical to the design of the siphon. This investigation will need to be completed as soon as possible to assist the design team on the alignment evaluation and construction alternatives. The number of borings and the required depths will be provided to the Geotechnical Consultant for preparation of a scope and fee.

12.7.5 Permitting

The proposed siphon modification project will have the following permitting requirements:

- **Special Flood Hazard Area Development and Use (Floodplain) Permit,**
Permitting Agency: City of Columbus
- **Section 404 Nationwide Permit,**
Permitting Agency: USACE, Huntington District
- **Notice of Intent (NOI)**
Permitting Agency: Ohio EPA
- **Permit to Install (PTI)**
Permitting Agency: Ohio EPA
- **Ohio EPA Environmental Covenant Encroachment**
Permitting Agency: Ohio EPA
- **CC Sanitary Plan Approval**

Regulatory permitting and environmental summary

A summary of permits known to date are defined in the table below. Critical items relevant to the siphon construction near the Woody Hayes bridge are shown in **RED**

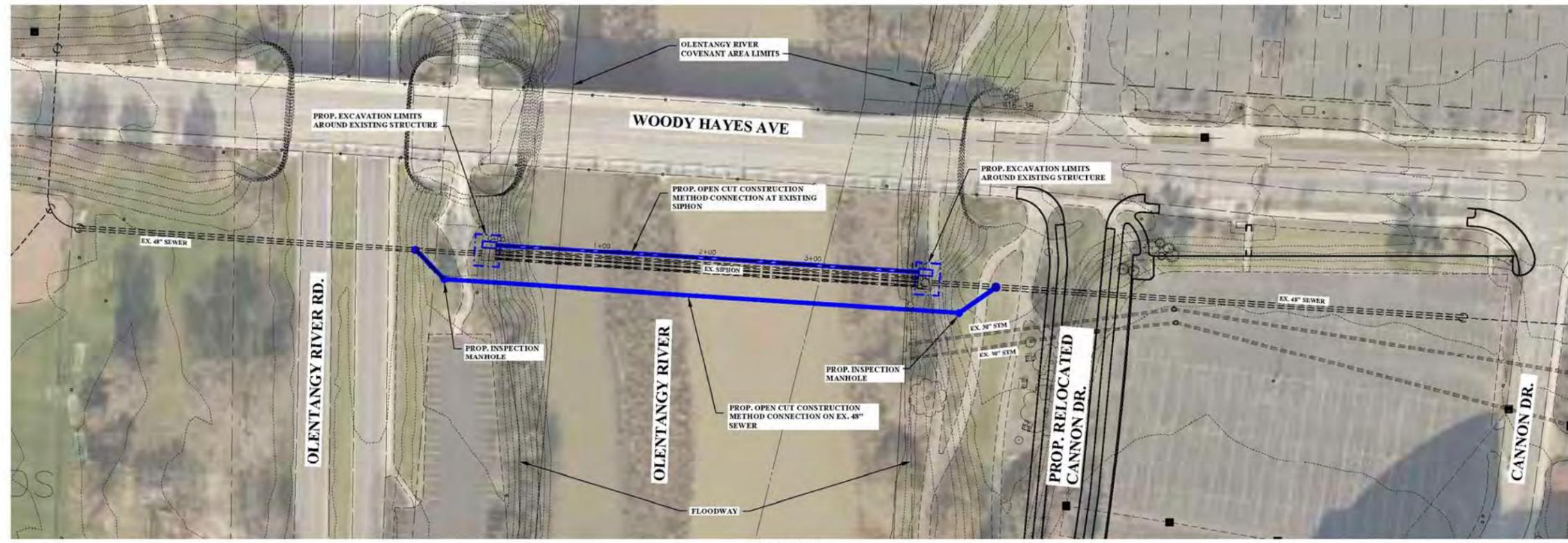
Permit	Special Flood Hazard Area Development and Use (Floodplain) Permit	Section 404 Nationwide Permit	Notice of Intent (NOI)	Permit-to-Install (PTI)	CC Plan Storm/Sanitary Sewer	OhioEPA Environmental Covenant Encroachment
Regulatory Agency:	City of Columbus	The U.S. Army Corps of Engineers (USACE), Huntington District	Ohio EPA	Ohio EPA	City of Columbus	OhioEPA
Contact:	Ann Aubry, P.E. – Deputy Public Utilities Director [REDACTED] Rob Herr, P.E. (DPU) [REDACTED]	Teresa Spagna, Chief North Regulatory Branch [REDACTED]	Mike Joseph, Central Office Division of Surface Water [REDACTED]	John R. Owen, P.E., BCEE [REDACTED]	Andy Beard [REDACTED]	
Requirement for Permit:	The City regulates all floodplain and floodway filling activities.	The federal government regulates construction activities within jurisdictional waters of the U.S. (streams and wetlands); The 404 NWP will cover minor impacts to the Olentangy River.	The State of Ohio regulates all earth disturbing activities in excess of 1 acre.	The State of Ohio regulates the installation of all sanitary facilities	For grading and sanitary or storm sewer installation	Encroachment within existing Environmental Covenant
Regulatory Authority:	Chapter 1150 of the City's Codified Ordinances.	Section 404 of the Clean Water Act	ORC 6111.04	ORC 6111.44 and 6111.45 and OAC 3745-42	See City Code	Refer to Environmental Covenant agreement
Preceding Activities:	Olentangy River floodplain model is available for use from Cannon Drive project.	Coordination with the Ohio EPA will need to be completed to discuss impacts within the existing Environmental Covenant area prior to any work completion. A mussel survey/relocation investigation will need to be completed prior to any work being completed in the Olentangy River. A meeting with OEPA representatives is needed for confirmation of an understanding of previously established overlapping permits.	A new NOI will be required for this work.	Obtain Plan approval from Columbus Public Utilities or a letter from DOSD Administrator supporting the project.		City/OSU have rights to maintain the existing siphon in the Environmental Covenant agreement. Coordination with OhioEPA required.

Table (Continued)

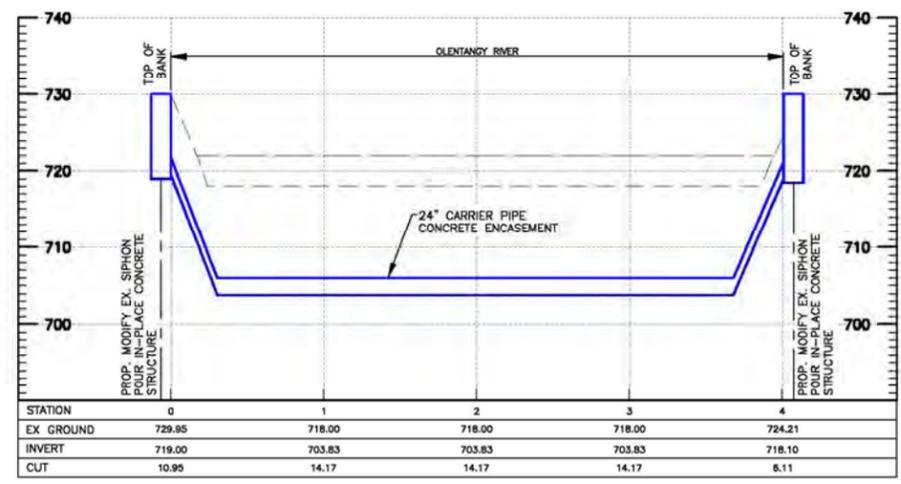
Permit	Special Flood Hazard Area Development and Use (Floodplain) Permit	Section 404 Nationwide Permit	Notice of Intent (NOI)	Permit-to-Install (PTI)	CC Plan Storm/Sanitary Sewer	OhioEPA Environmental Covenant Encroachment
Pending Activities:	<p>A flood hazard impact study will be required for the temporary causeway. City may require a CLOMR for the causeway for temporary increases to the 100-year flood elevations. With the changes to the pending SWDM, EMH&T cannot predict a response from Cols and FEMA. Discussions with Ann Aubry are needed to confirm if the City will require a "No-Rise" certification for the temporary causeway and how this overlaps with the Engie bridge construction.</p> <p>The City will approve a floodplain permit by signing the final engineering plans; they will not approve the floodplain permit until the CLOMR is issued (if a CLOMR is required).</p>	<p>Prepare and submit a Section 404 NWP for the proposed temporary causeway and open-cut siphon trench associated with the project. We anticipate no permit action will be required with the State of Ohio (OEPA) at this time.</p> <p>A restoration plan may be required by the OEPA for any temporary impacts associated with the temporary causeway, open-cut trench and site access required within the Environmental Covenant area.</p> <p>Stream/Wetland impact mitigation may be required for stream/wetland impacts associated with the project depending on the amount of impacts.</p>	<p>Prepare SWPPP document and NOI application form. Under the new statewide permit, the SWPPP must now be submitted to the OEPA with the NOI application. The SWPPP must document compliance with post-construction water quality requirements, which may also be changing from the current requirements.</p>	<p>It is undetermined at this time if a PTI is needed. If needed, we will accelerate plan approval for the sanitary sewer improvements. In the past, we have requested the City allow submittal of an original "blue signature" plan set to OEPA with the City initial DPU Director signature and EMH&T stamp to allow the PTI process to start.</p>	<p>Prepare plans for sanitary siphon expansion.</p> <p>Coordinate siphon plans with future Cannon Drive Phase 2 levee.</p> <p>Review compliance with upcoming SWDM requirements, as applicable. Details as of 3/1/2021 are pending final release from City of Cols. Updates will include</p> <ul style="list-style-type: none"> - Easements needed for BMPs - Easements required for stream corridor protection zone prior to signatory of the construction plans - As-built certification for BMPs - Construction bond for BMPs - Variance for detention volume below floodplain elevation. 	<p>A restoration plan may be required by the OEPA for any temporary impacts associated with the temporary causeway, open-cut trench and site access required within the Environmental Covenant area.</p>

Notes:

1. Conversations with Engie and OSU are required by no later than April 16, 2021 to establish a schedule for overlapping of permits to further evaluate and then present to other stakeholders.
2. Conversations with OEPA and Columbus must begin by no later than May 3, 2021 to ensure that current permitting is clearly understood and a pathway is established moving forward for potential overlaps with permits.
3. In order to start construction by June 2022, EMH&T will need to be released for permitting and design by June 1, 2021 to ensure permits can be processed in time.



PLAN VIEW



PROFILE VIEW CONNECTION AT EXISTING SIPHON



**PRELIMINARY
NOT TO BE USED
FOR CONSTRUCTION**

THE OHIO STATE UNIVERSITY
**WEST CAMPUS
 INFRASTRUCTURE STUDY**
 SANITARY SEWER IMPROVEMENTS
 48" TRUNK SEWER SIPHON CROSSING
 OLENTANGY RIVER NEAR WOODY HAYES AVE.
 OPTION 1: OPEN CUT

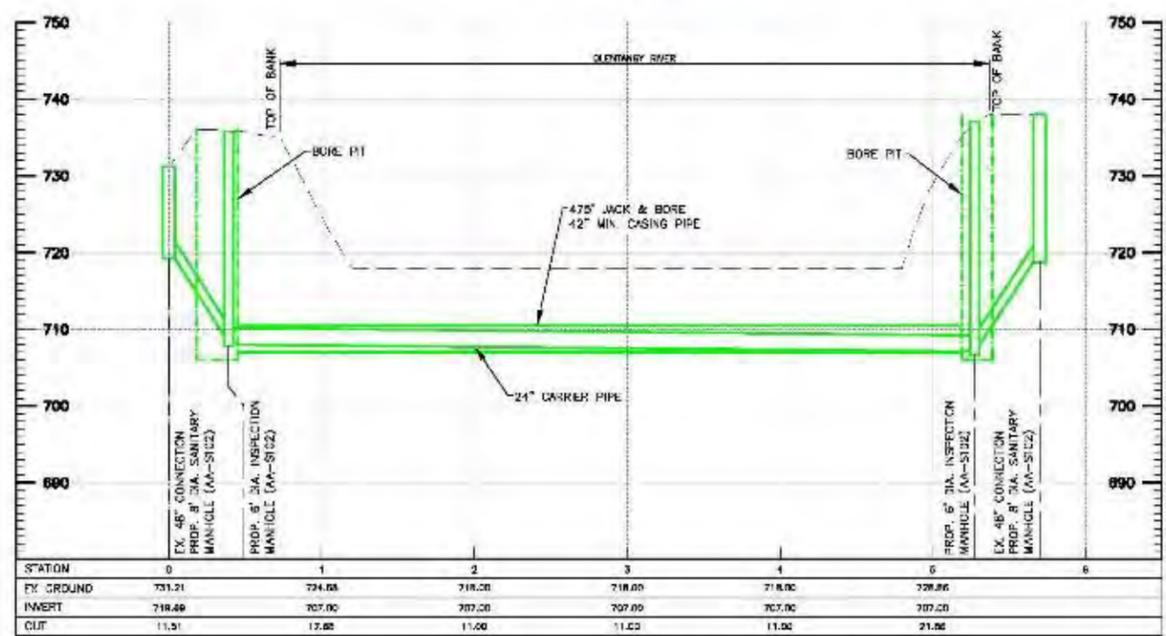
Date: APRIL, 27 2021
 Scale: H: 1" = 50' V: 1" = 10'
 Job No: 2020-1299
 Sheet: 1 of 1

EMHT
 Evans, Mechwart, Hambleton & Thors, Inc.
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 emht.com

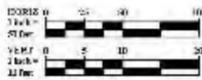
Figure 12.7.2A



PLAN VIEW



PROFILE VIEW



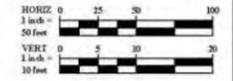
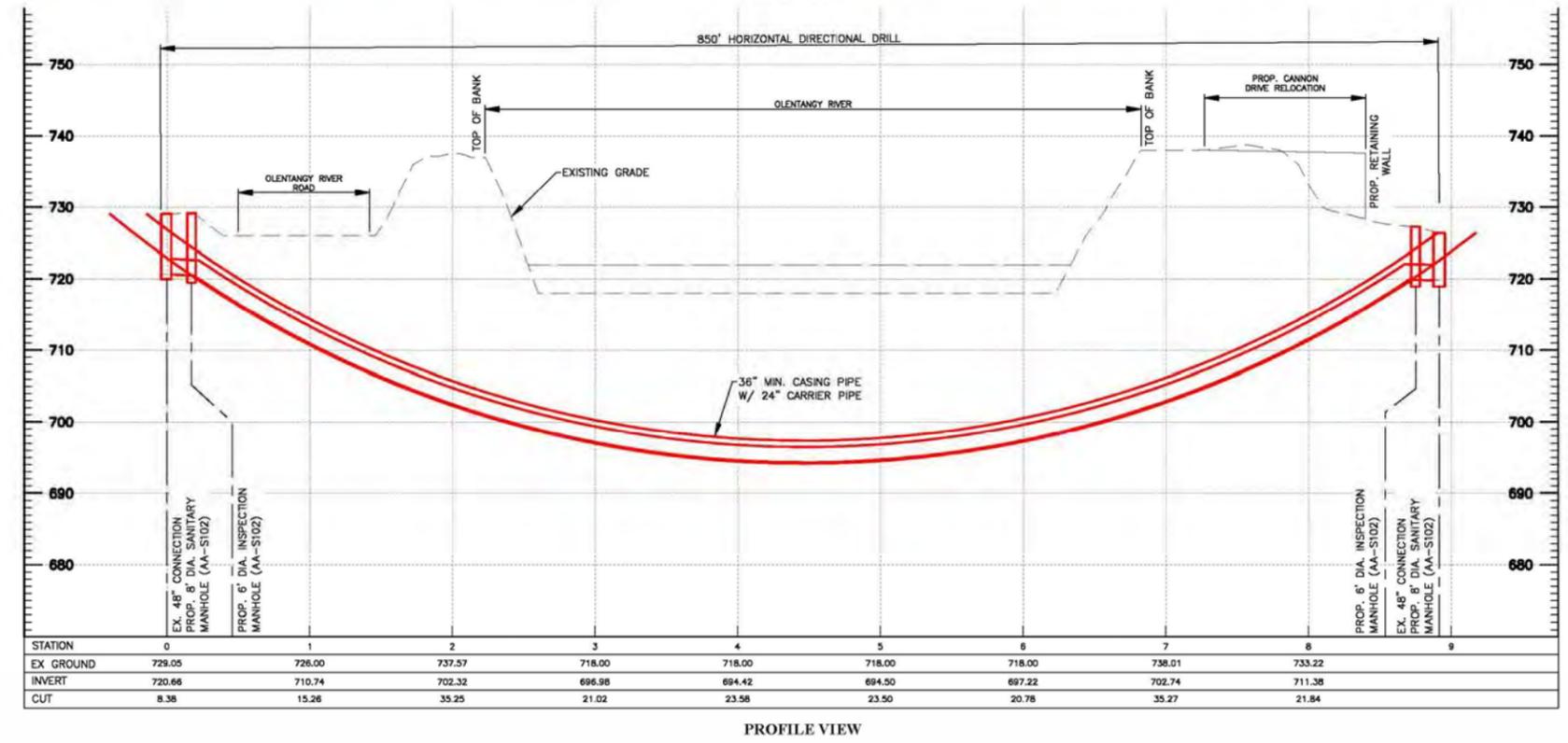
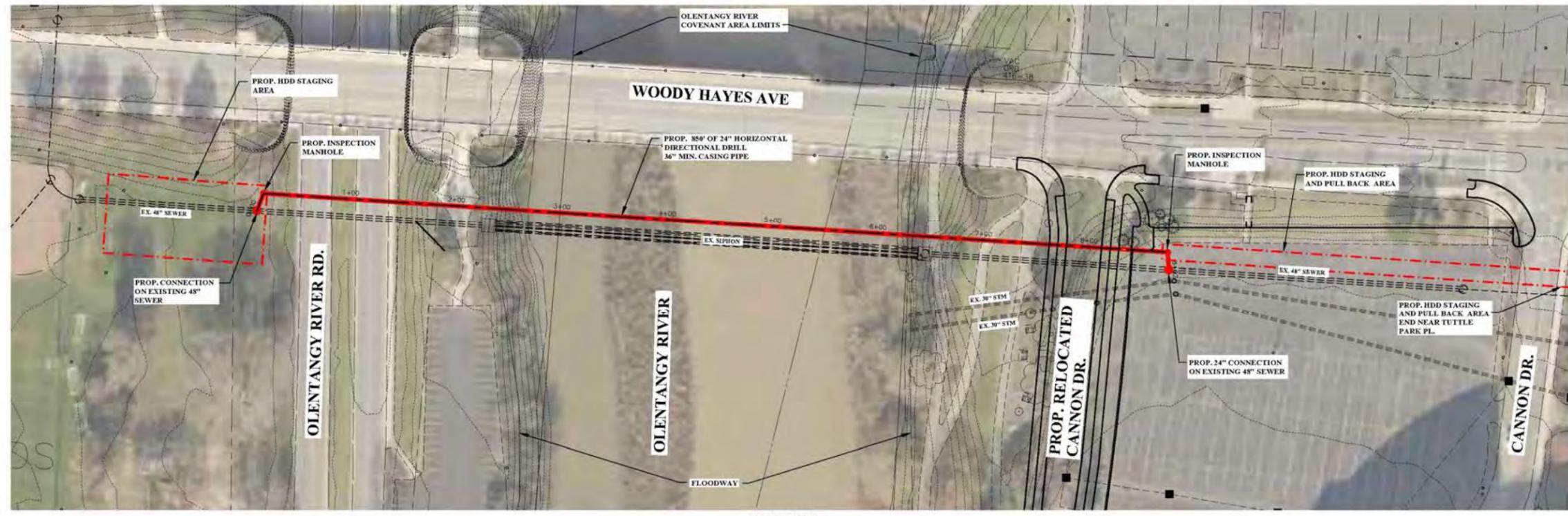
PRELIMINARY
NOT TO BE USED
FOR CONSTRUCTION

THE OHIO STATE UNIVERSITY
WEST CAMPUS
INFRASTRUCTURE STUDY
SANITARY SEWER IMPROVEMENTS
 80" DIA. SANITARY SEWER CROSSING
 OLENTANGY RIVER NEAR WOODY HAYES AVE,
 OFFSHOOT JACK AND BORE

EMHT
 Earth & Environmental
 Engineering & Construction
 480 West Broad Street, Columbus, OH 43210
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 emht.com

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 Date: 2014 12/09
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Figure 12.7.2B



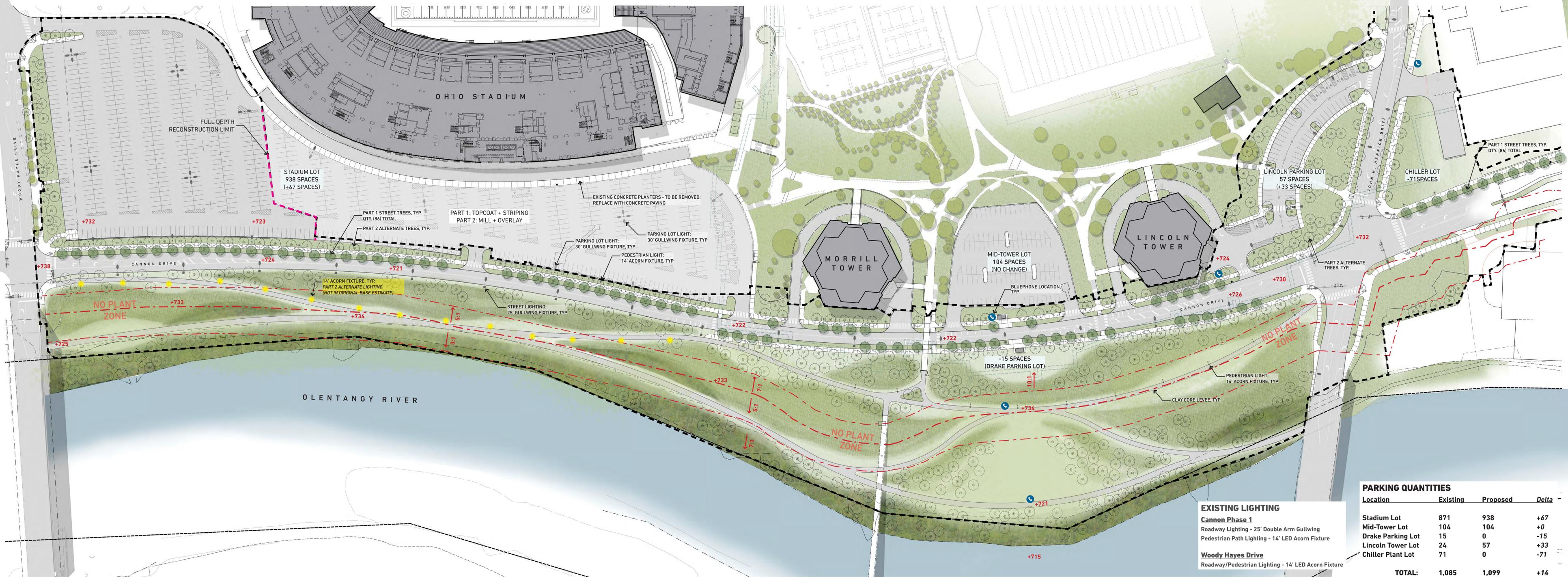
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FOR CONSTRUCTION**

THE OHIO STATE UNIVERSITY
**WEST CAMPUS
 INFRASTRUCTURE STUDY**
 SANITARY SEWER IMPROVEMENTS
 48" TRUNK SEWER SIPHON CROSSING
 OLENTANGY RIVER NEAR WOODY HAYES AVE.
 Horizontal Directional Drilling

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Date: APRIL, 27 2021
 Scale: H: 1" = 50' V: 1" = 10'
 Job No: 2020-1299
 Sheet: 1 of 1

Figure 12.7.2C



CANNON DRIVE - PHASE 2
THE OHIO STATE UNIVERSITY
OCTOBER 2022

EXISTING LIGHTING

Cannon Phase 1
Roadway Lighting - 25' Double Arm Gullwing
Pedestrian Path Lighting - 14' LED Acorn Fixture

Woody Hayes Drive
Roadway/Pedestrian Lighting - 14' LED Acorn Fixture

PARKING QUANTITIES			
Location	Existing	Proposed	Delta
Stadium Lot	871	938	+67
Mid-Tower Lot	104	104	+0
Drake Parking Lot	15	0	-15
Lincoln Tower Lot	24	57	+33
Chiller Plant Lot	71	0	-71
TOTAL:	1,085	1,099	+14

ATTACHMENT 4

LANDSCAPE SCROLL PLOT

85% GMP4 10-10-2022



