COMMUNITY

CHARACTER

YARBROUGH DRIVE MASTER PLAN

9 July 2013

NCSU Project: 200820026

FUNCTIONALITY

CONNECTIVITY

NC STATE UNIVERSITY

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TABLE OF CONTENTS

List of Figures

Table of Contents

OVERVIEW

Project Overview

Yarbrough Drive's primary role is to serve as the primary east to west service corridor for the North Campus of NC State University. The road provides access for deliveries, facilities maintenance, and pedestrian connectivity. The road also is a utility corridor. With the planned future development of the Pedestrian Bridge at the Talley Student Center, the redevelopment of Broughton Hall and the long range plans for a future Light Rail network, Yarbrough Drive's continued ability to serve in this role needs to be evaluated.

The purpose of the Yarbrough Drive Master Plan project is to analyze the corridor's functionality, evaluate existing conditions, identify constraints, and use these findings to provide a conceptual vision that compliments the NC State University Physical Master Plan. This conceptual vision will serve as a first step for future development.

The project boundary encompasses the Yarbrough Drive corridor from Dan Allen Drive to Pullen Drive. The southern boundary is the existing North Carolina Rail Road, the northern boundary is Stinson Drive and points beyond, to include key vehicular access connections and pedestrian pathways. Refer to the exhibit on next page.

Project Objectives

- Identification of University goals for Yarbrough Drive
- Analyze the existing conditions within the project area
- Identify opportunities for vehicular and pedestrian circulation
- Develop a long range vision for Yarbrough Drive
- Provide an implementation strategy

Planning Team

The planning team included O'Brien/Atkins and Ramey Kemp Associates. O'Brien/Atkins served as the design lead while Ramey Kemp associates provided traffic consultation. The Planning team worked with a stakeholder committee that included NC State University's Office of the University Architect, Capital Project Management, Facilities Division, University Transportation, University Housing and the Real Estate Office.

Referenced Documents:

The Master Plan report includes information researched from various documents and resources including the Schematic Design Package for Broughton Hall, the NC State Physical Master Plan, the Triangle Transit's schematic design package (produced July 2011), existing conditions information provided by the Campus Surveyor and Physical Plant staff, and the University's design standards.

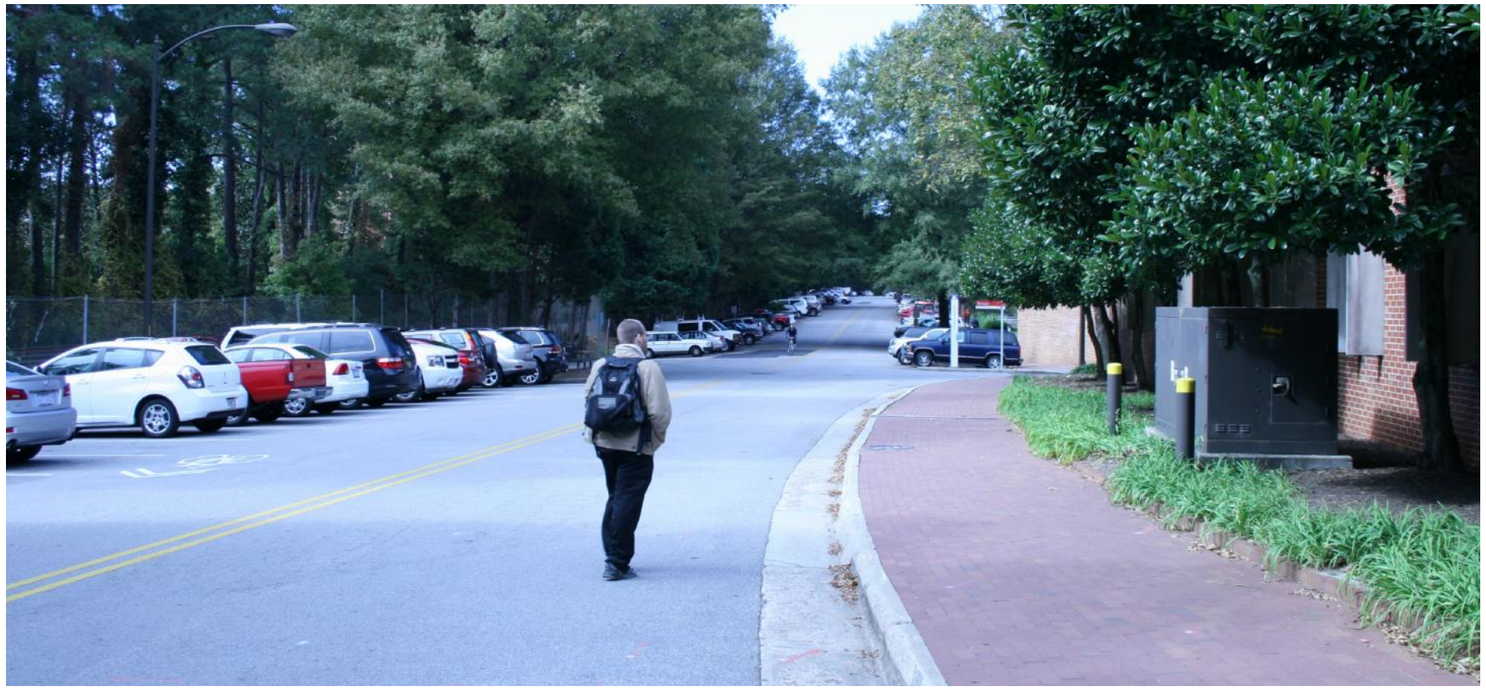


Photo 1: View looking west along Yarbrough Drive, Broughton Hall to right of photo

University Goals for the Project

- **Outline the Rail Road ROW easement requirements**
- **Maintain Yarbrough Drive as a key service road**
- **Identify utility issues within the Railroad ROW and Yarbrough Drive**
- **Maintain service access to dumpsters and services adjacent to Yarbrough Drive**
- **Provide recommendations for existing and proposed pedestrian crossings at the Railroad**
- **Develop a concept that creates a continuous Yarbrough Drive from Dan Allen Drive to Pullen Road**
- **Preserve and enhance the functionality around the existing Yarbrough Steam Plant**
- **Maintain as much parking capacity within the corridor as feasible**
- **Make recommendations for the proposed pedestrian bridge height between Broughton Hall and Talley Student Center**
- **Provide a phasing plan for implementing the Yarbrough Drive recommendations**

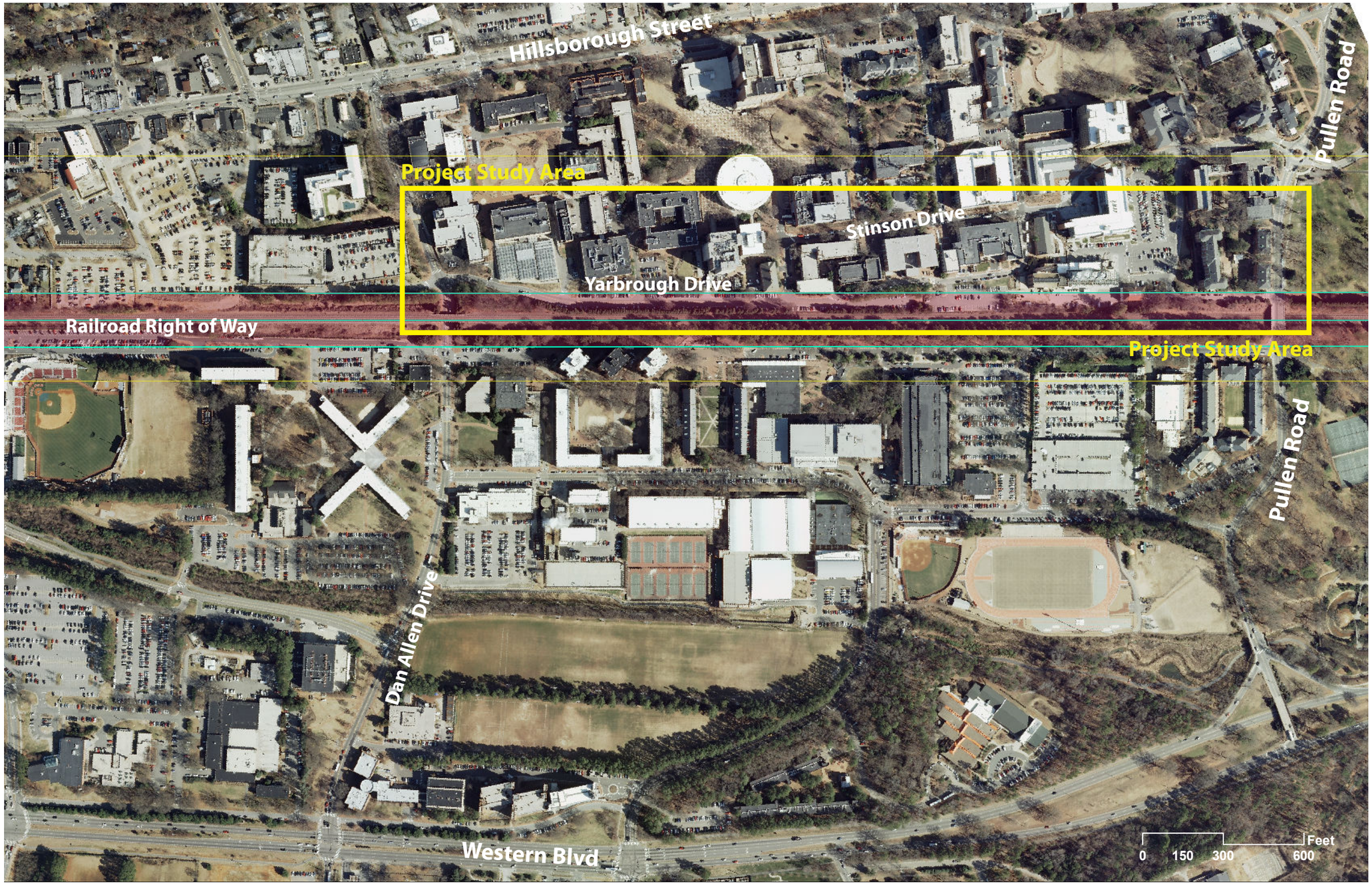


Figure 1: Project Study Area

EXISTING CONDITIONS

Yarbrough Drive is the primary east-west connection between Dan Allen Drive and Stinson Drive, with Stinson Drive providing the final connection to Pullen Road. Stinson Drive and Yarbrough Drive form a one way loop along the south and north faces of Riddick, Mann, and Broughton Halls. The highest volume of traffic utilizing Yarbrough Drive originates from Dan Allen Drive, split between the campus bus system and delivery vehicles. The existing cross section for the main portion of Yarbrough Drive provides parking along both sides of travel lanes. This double loaded parking is contained between Dan Allen Drive and the western intersection with Stinson Drive. Further east of the Stinson Drive intersection are two dead end parking lots, accessed from Yarbrough Drive.

Three existing pedestrian tunnels cross under the railroad tracks, the Free Expression Tunnel, the Coliseum Tunnel, and the East Tunnel. These tunnels are critical pedestrian connections between north and south campuses. The Free Expression Tunnel has been upgraded to provide an accessible route between south campus and north campus. The Coliseum tunnel is located south of Mann Hall and Riddick Hall. The Coliseum tunnel is not an accessible route due to the significant grade change from the tunnel's exit up to Yarbrough Drive. An existing steam tunnel that runs parallel with Yarbrough drive, through the Coliseum tunnel's exit stairs, will impede any future improvements to the grade. The top of the tunnel is flush with one of the middle stair treads. The East Tunnel is located directly south of the field house and is not an accessible path due to the grade transition found at both entry points into the tunnel.

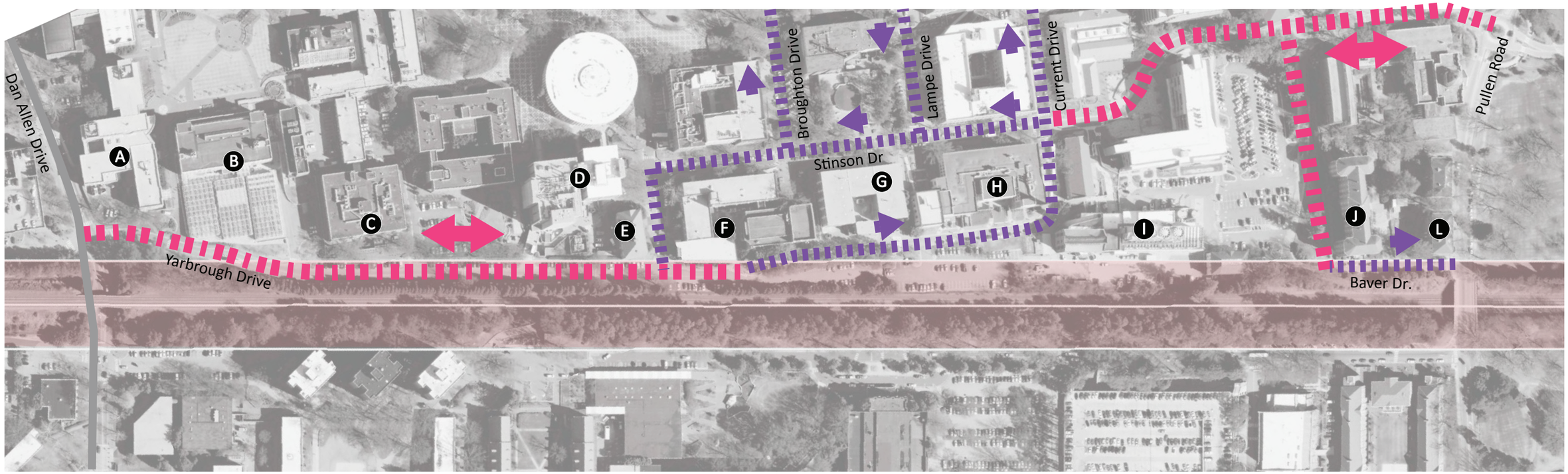
The majority of the length of Yarbrough Drive is fully within the railroad right of way. The only portions not within the right of way are the intersection at Dan Allen Drive and the one-way portion that runs directly behind Mann Hall and Riddick Hall. The service yard behind the steam plant is also within the railroad right of way.

To fully understand the existing constraints and opportunities, the planning team has observed the corridor for the following systems:

- Vehicular circulation
- Pedestrian paths and main entry points
- Service yards and utility areas

Photo 2: view of the railroad from Pullen Drive looking west

EXISTING VEHICULAR CIRCULATION



Legend

- Two-Way Circulation
- One-Way Circulation
- Railroad Right of Way
- Building Reference
- Traffic Direction

N 0 100 200 300 ft

Building Reference

A. David Clark Labs
B. Fox Science Teaching Lab
C. Thomas Hall
D. Dabney/Cox Halls
E. Bureau of Mines
F. Broughton Hall
G. Mann Hall
H. Riddick Hall
I. Yarbrough Plant
J. Syme Residence Hall
L. Welch Residence Hall

Figure 2: Diagram of existing vehicular circulation

Yarbrough Drive is two way between Dan Allen Drive and Stinson Drive. East of Stinson Drive, Yarbrough constricts to a one-way road, eastbound, with parallel parking along the south side of the road. The existing grade is approximately 8%.

The one-way portion of Yarbrough Drive travels east and then north to connect with Stinson Drive. Stinson Drive is one way westbound and two-way eastbound. This allows delivery vehicles to travel from Dan Allen Drive east along Yarbrough Drive to Stinson Drive, accessing multiple buildings including Broughton, Mann, and Riddick Halls. These delivery vehicles can then use Stinson Drive west to access Current and Broughton Drives to reach further north into the campus.

Buses travel from Dan Allen Drive east along Yarbrough and then continue east along Stinson Drive to exit the campus at Pullen Road. Bus stops are located at both Yarbrough/Stinson intersections.

Traffic Analysis

Photo 3: View of Stinson Drive at SAS Hall, priority given to pedestrian movements

Photo 4: View of Dan Allen Drive looking south from Yarbrough Drive

Photo 5: View of Students traveling along Stinson Drive, Language Lab in foreground

Traffic data collection was completed at the following intersections:

- Yarbrough Drive and Dan Allen Drive
- Yarbrough Drive/Current Drive and Stinson Drive
- Baver Drive and Pullen Road

The data was collected during the weekday AM and PM peak hours in November 2012 while NCSU was in session.

Turning movement counts of vehicles were completed for each turning movement at the intersections. In addition, pedestrians and bicycles were counted at the intersections. Pedestrians were counted based on the approach they crossed.

Yarbrough Drive and Dan Allen Drive

The westbound approach of Yarbrough Drive operates at a poor level of service during the PM peak hour. The intersection was not signalized at the time of data collection; however, changes have occurred since the data collection and analysis that should improve traffic operations for the intersection. Dan Allen Drive is now closed to through traffic during the weekday business hours (9:00 AM – 5:00 PM) and a traffic signal was recently installed at the intersection.

Pedestrian volumes are significant at this intersection, particularly crossing Yarbrough Drive. Striped crosswalks exist at the intersection and the recent improvements on Dan Allen Drive would be expected to improve conditions for pedestrians crossing the intersection during times when Dan Allen Drive is closed to through vehicle traffic.

Yarbrough Drive/Current Drive and Stinson Drive

Vehicle traffic volumes are relatively low at this intersection; therefore, adequate capacity exists to accommodate existing traffic volumes. Stinson Drive is currently a one-way street in the westbound direction.

Pedestrian volumes are much higher than vehicle volumes at this intersection. Pedestrian movements are heavy crossing Current Drive, Yarbrough Drive, and westbound Stinson Drive. Pedestrian crosswalks are striped on three of the four intersection approaches (westbound Stinson Drive is not striped). A Wolf line bus stop is located on Yarbrough Drive near the intersection.

Photo 6: View of intersection of Baver Drive and Pullen Road

Baver Drive and Pullen Road

Traffic volumes along Pullen Road are heaviest during the lunchtime and evening hours. Baver Drive is a one-way street in the eastbound direction and intersects Pullen Road with a separate left turn lane and right turn lane. Turning vehicles from Baver Drive are relatively low during the peak periods probably due to the delays experienced turning from Baver Drive at an not signalized intersection. Vehicles are likely exiting onto Pullen Drive using the roundabout at Stinson Drive.

Pedestrian volumes are relatively high crossing Baver Drive, but are low crossing Pullen Road. A crosswalk is located on Baver Drive, which connects to sidewalk located along the west side of the bridge just to the south over the railroad.

Baver Drive is adjacent to railroad right-of-way to the south and buildings immediately north; therefore, this roadway has limited opportunities to be widened in the future. In addition, the intersection is located near the bridge on Pullen Road that carries two travel lanes with no feasible opportunity for widening to provide a left turn lane. For these reasons, it is unlikely that a traffic signal would be installed at this intersection in the future.

It should be noted that data collection along Pullen Road occurred prior to the closure of Dan Allen Drive to through traffic during weekday business hours. It is possible that Pullen Road will carry even higher traffic volumes during these times making it more difficult to turn from Baver Drive.

Photo 7: View looking north along Yarbrough Drive, between Language Lab and Riddick Hall

Transit

A Wolfline transit route currently exists in the eastbound direction along Yarbrough Drive between Dan Allen Drive and Stinson Drive. Stops are currently at the following locations:

- South side of Yarbrough Drive east of Dan Allen Drive
- South side of Yarbrough Drive just west of Stinson Drive (near Broughton Hall)
- East side of Yarbrough Drive just south of Stinson Drive/Current Drive intersection (at Language and Computer Lab building)

It would be desirable to maintain the current general stop locations since these stops provide convenient access for pedestrians to buildings within campus. If the Yarbrough/Stinson/Current Drive stop were relocated to the new Yarbrough Drive alignment (south of Riddick Hall), it would cause students to walk longer distances to their destinations which are located further north within campus.

The current bus stop located on Yarbrough Drive at the Language and Computer Lab building results in riders waiting at stop near the sidewalk entrance to the Language and Computer Lab building. The pedestrian route to the door of this building is partially blocked during certain times due to riders waiting at the stop. It would be recommended to relocate the bus stop slightly south on Yarbrough to minimize this interference.

It is recommended to consider relocating the stop on Yarbrough Drive near

Photo 8: View of main entry to Yarbrough Plant, Language Labs to right of photo

Broughton Hall from the existing location west of the intersection with Stinson Drive to the east side of the intersect creating a far-side stop. In addition, a pedestrian crosswalk can be added on Yarbrough Drive at the intersection with Stinson near this location to facilitate a safe pedestrian crossing.

EXISTING SERVICE AREAS

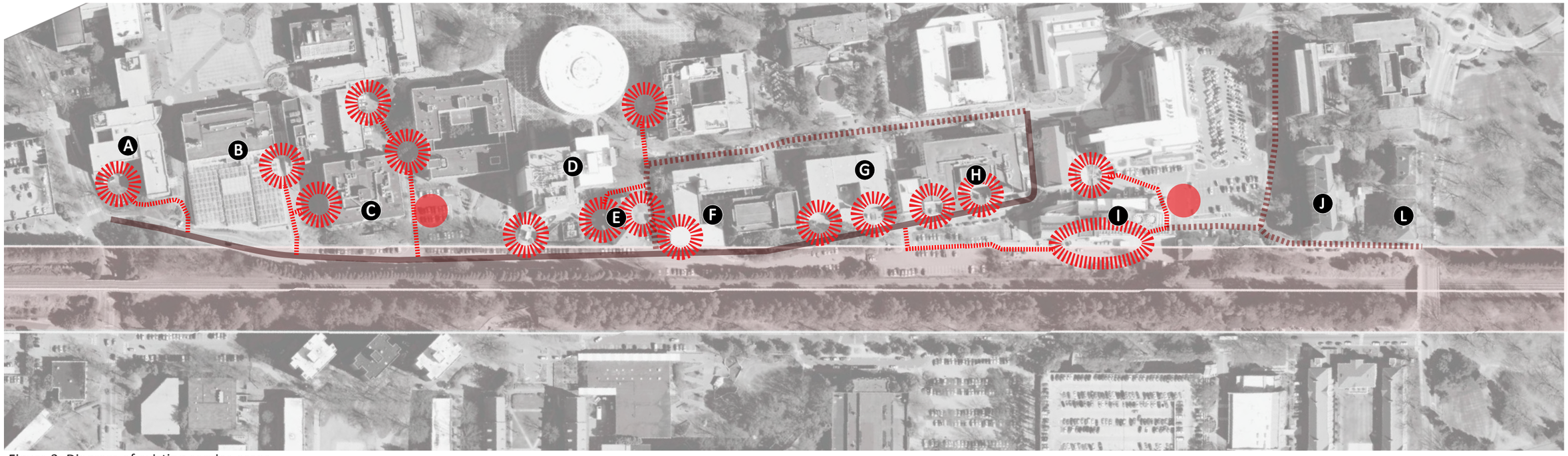


Figure 3: Diagram of existing service areas

Legend

- Secondary Service Road
- Primary Service Road
- Access to Loading Dock
- Loading Dock/Service Dock
- Pull Out Area for Dumpster Servicing
- Railroad Right of Way
- Building Reference

Building Reference

A. David Clark Labs
B. Fox Science Teaching Lab
C. Thomas Hall
D. Dabney/Cox Halls
E. Bureau of Mines
F. Broughton Hall
G. Mann Hall
H. Riddick Hall
I. Yarbrough Plant
J. Syme Residence Hall
L. Welch Residence Hall

N

0 100 200 300 ft

Yarbrough Drive is a major service road for north campus, providing access to over eleven buildings and fifteen service areas. The buildings along Yarbrough Drive have the service areas oriented south towards the road. The only access to these service areas is from Yarbrough Drive.

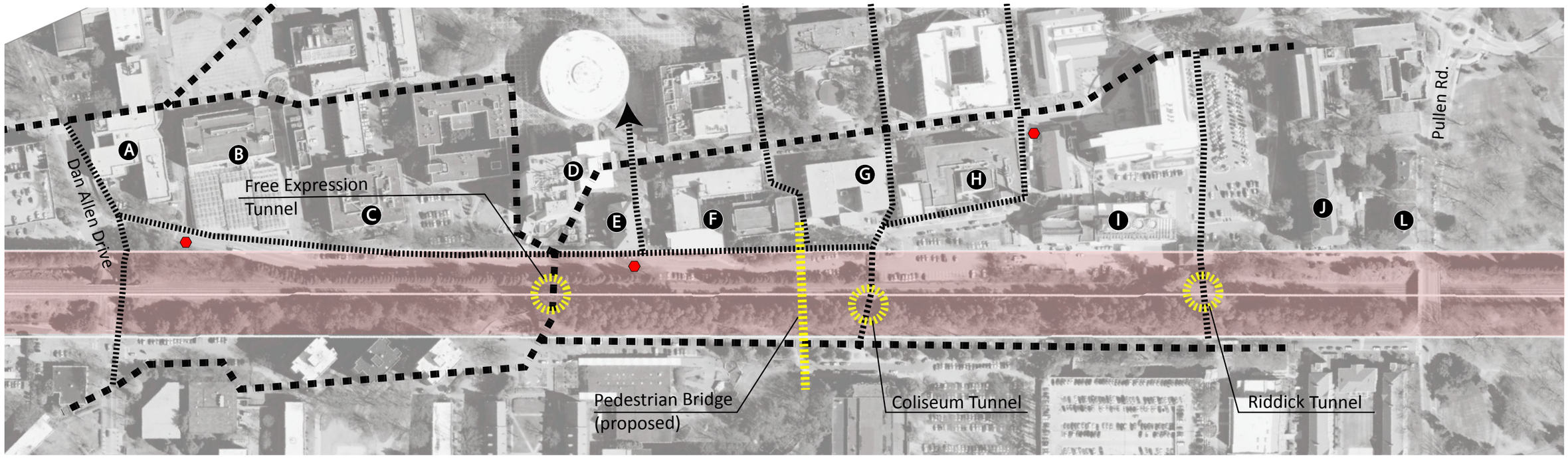
Zone shops, work areas for NC State facilities management groups, are located at David Clark and the Steam Plant. These shops require the storage of multiple vehicles and materials staging areas to facilitate the daily maintenance and upkeep of the North Campus.

While several of the service areas are clustered tightly together, the access to these areas limits the size of vehicle, which requires multiple moves of individual containers to facilitate waste pick up. These areas are identified as “Pull Out” areas on the diagram above.

The existing vehicle storage areas are not secure and are limited in capacity. The existing service areas around the Yarbrough Plant require approximately 30 spaces to stage work trucks and other service vehicles.

Refer to the enlarged constraints exhibits for additional analysis.

EXISTING PEDESTRIAN CIRCULATION



Legend

- Main Campus Path
- Secondary Campus Path
- Pedestrian Bridge
- Pedestrian Tunnel
- Railroad Right of Way
- Building reference
- Wolfline Bus Stop

N

0 100 200 300 ft

Building Reference

A. David Clark Labs
B. Fox Science Teaching Lab
C. Thomas Hall
D. Dabney/Cox Halls
E. Bureau of Mines
F. Broughton Hall
G. Mann Hall
H. Riddick Hall
I. Yarbrough Plant
J. Syme Residence Hall
L. Welch Residence Hall

Figure 4: Diagram of Existing Pedestrian Circulation

The existing pedestrian circulation for North Campus is based on a hierarchy as outlined by the NC State University Master Plan. The major East-West corridors for pedestrian movement follow Stinson Drive, Cates Avenue, and Founders Way. In addition, a number of students were observed walking along Yarbrough Drive as a short cut to access the Coliseum Tunnel. Future development of Yarbrough Drive should include adding additional pedestrian pathways along the road edges.

Circulation between the north and south halves of the campus is accomplised by the pedestrian walkways at Pullen Road and Dan Allen Drive at each end of the study corridor. Three tunnels provide access between the campuses. These tunnels are the Free Expression Tunnel, Coliseum Tunnel, and the East Tunnel.

A pedestrian bridge is planned to connect the Talley Student Center with the future plaza at Broughton Hall. This connection will provide an accessible route from South Campus to North Campus and would allow the removal of the Coliseum Tunnel to be considered.

EXISTING CONSTRAINTS

The planning team completed an analysis of the existing conditions within the corridor to identify important constraints and key areas of opportunity. This analysis includes evaluating the impacts from several proposed projects including the Broughton Hall Addition and Renovation, the North Campus Parking Deck, the Talley Student Center Pedestrian Bridge over the railroad, and the proposed Light Rail Station located at Dan Allen Drive.

To understand the constraints in better detail, the corridor has been subdivided into three areas as shown in figure 5. These areas have been studied to identify the following:

- Topography
- Utility conflicts including mission critical elements
- Circulation for both vehicle and pedestrian
- Service access points
- Accessibility
- Development limitations
- Parking

Parking Overview

The north portion of the campus has a limited quantity of parking as a result of the urban character. Within the project area, an inventory of 379 spaces exists as counted by the NC State Transportation department. These spaces are permitted for different uses including staff and service vehicles. Development concepts proposed will attempt to minimize the impact to the existing parking while improving overall functionality.

Photo 9: View of East Tunnel looking south

Figure 5: Key Map of Corridor Constraints Exhibits

AREA A - CONSTRAINTS

Topography

Dan Allen Drive slopes towards the south to provide clearance under the railroad bridge, creating a grade separation along the frontage of David Clark Labs. The change in grade required of Dan Allen Drive, creates a steep slope along Yarbrough Drive. Views of the David Clark Labs service area are prominent from Yarbrough Drive and merit consideration for screening.

Pedestrian Circulation

The main volume of pedestrian circulation is concentrated at the Free Expression Tunnel, represented by the blue dashed line in the adjacent figure. The flow of these pedestrians is two way and connects the south campus to the Brickyard via two pathways, the west path is accessible while the east has multiple stairs. While the tunnel's path does not intersect Yarbrough Drive at grade, access to the tunnel from Yarbrough is through a service yard between Dabney Cox and the Bureau of Mines.

A sidewalk is located along the north side of Stinson Drive to provide pedestrian access to the existing parking. Improvements to slow traffic and provide crossing zones should be considered.

Vehicular Circulation

Circulation within this area is a two-way path of travel. An existing access point restricts the overall traffic volume utilizing Yarbrough Drive to service vehicles, buses, and permit holders.

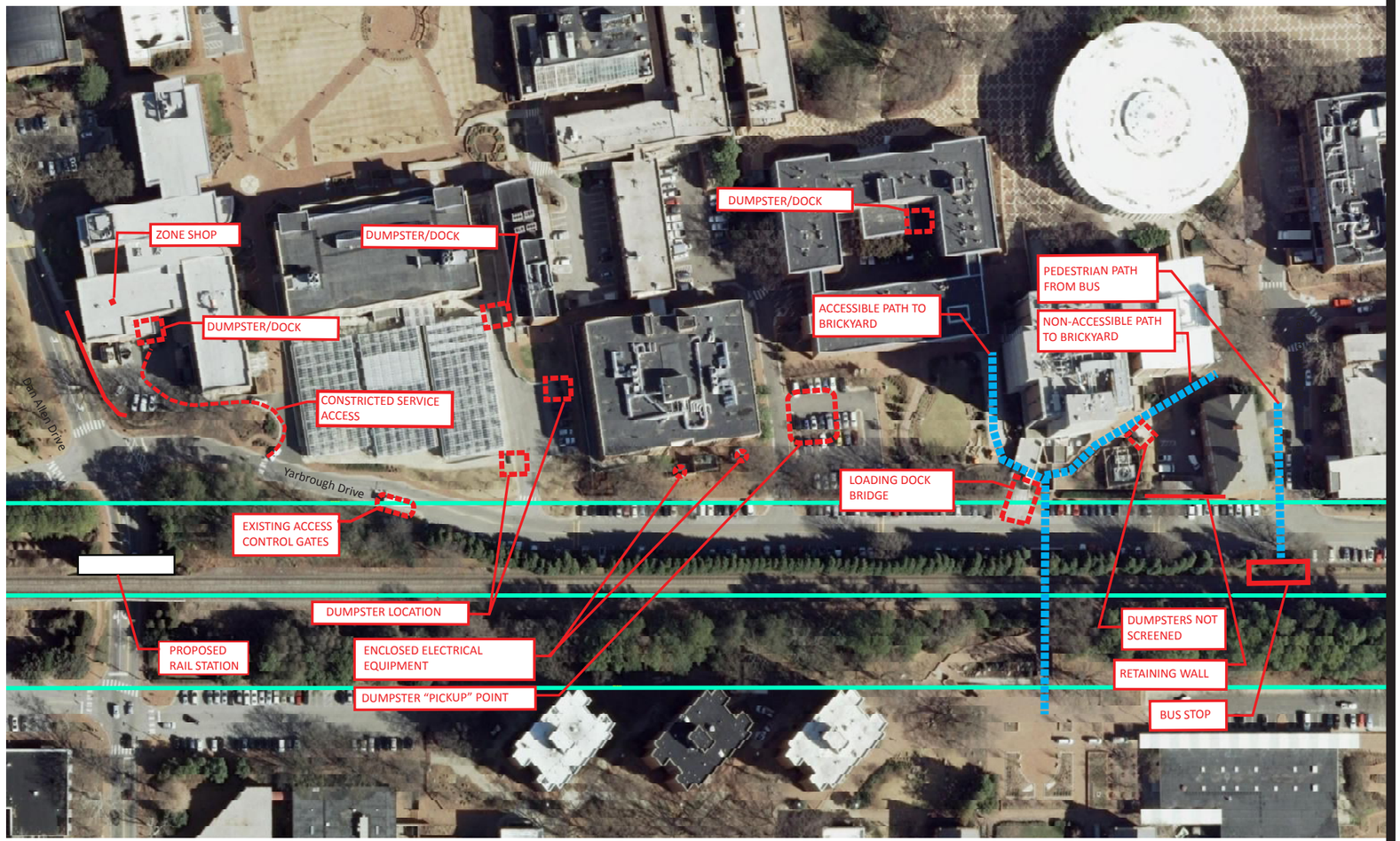
Service Access

Access to David Clark Labs is through a constrained driveway. Fox Labs is serviced by a shared access path. An existing dumpster at the southeast corner of the greenhouse should be considered for relocation to improve visible character.

The service area behind the Bureau of Mines building is located adjacent to the main pedestrian movement from the Free Expression Tunnel. This area merits improvements to screen the dumpsters, delineate clear pedestrian and vehicular areas, and to provide security to the existing materials storage behind the Bureau of Mines Building.

Accessibility

The free expression tunnel has been improved to provide an accessible route from south campus to the brick yard. Further improvements to the accessible routes from the bus stop to the brick yard along Stinson should include improving the crossing of Yarbrough Drive and modifications to the service access entry at the north end of Bureau of Mines.



SEE PAGE 15

Figure 6: Area A constraints

SEE PAGE 14

SEE PAGE 16

Figure 7: Area B constraints

AREA B - CONSTRAINTS

Topography

The grade change between Stinson Drive and the railroad right of way will facilitate a pedestrian bridge between the future Broughton Hall Addition plaza with the Talley Student Center. The current alignment of Yarbrough Drive requires the proposed bridge to be held to a higher elevation to provide clearance for service vehicles.

An existing retaining wall seperates the parking area on the east side of the Coliseum Tunnel Exit path, see the purple line in the adjacent figure representing this exit path. This is a low wall and could be removed through regrading of the parking area. An existing steam tunnel, runs parallel with Yarbrough Drive and is exposed at the area noted in yellow.

Pedestrian Circulation

The Coliseum Tunnel is a major connection between north and south campus and conveys a large volume of pedestrian traffic. This pathway creates a major conflict with service vehicles and buses using Yarbrough Drive at class changes.

Vehicular Circulation

Yarbrough Drive transitions to a one-way path of travel at the west intersection of Stinson and Yarbrough. A two-way access drive, south of Yarbrough, provides access to a dead end parking area. Parallel parking along Yarbrough drive further reduces the available width to Yarbrough Drive along the south side of Broughton, Mann, and Riddick Halls.

Service Access

Mann Hall and Riddick Hall are accessed off of the one-way portion of Yarbrough Drive, these access points require pick trucks to stage the dumpsters in the parking areas to allow for the large front loading dump trucks to empty them. A large materials testing waste area is located at Riddick and requires the use of front end loaders to remove the test samples 2-3 times an academic year. The existing parking area west of the steam plant is used by facilities management vehicles for storage and staging of equipment.

Accessibility

The Coliseum Tunnel is not an accessible route between north and south campus. The proposed pedestrian bridge will provide a vital connection between the campuses that is accessible. In addition this bridge will reduce the conflicts between the pedestrian and vehicular circulation routes.

AREA C - CONSTRAINTS

Topography

A significant grade separation exists between Yarbrough Drive and the south side of the Yarbrough Plant. This grade separation is currently mitigated by a large retaining wall that supports the electrical switch gear to the west of the Yarbrough plant.

An access drive has been installed from the parking area to the Yarbrough Plant service yard, the slope is greater than 10%.

The exit out of the East Tunnel is approximately 3 feet lower than the pavement grade behind the existing field house, requiring stairs to mitigate the grade.

Pedestrian Circulation

The East Tunnel is a major connection between north and south campus due to its location directly north of the large Coliseum Parking deck. This pathway leads from the tunnel to the Court of North Carolina, traversing the existing surface parking lot and climbing grade at Stinson Drive through a significant set of stairs.

Vehicular Circulation

Access behind the Yarbrough Plant is limited to service vehicles through manual gates. The slope change between the parking lot, west to the plant, and the service yard limits the functionality of this connection. Tractor trailers are required to service the oil tanks at the plant, the current circulation is challenging to navigate by large trucks. Improvements at Boney, Baver, and at the access ramp all should be considered to maintain the functionality of the plant.

There is also a need to maintain parking for over 40 vehicles, including large power trucks, tractors and light duty service vehicles. These vehicles need to be secured from the student population.

Service Access

Service access to the Yarbrough plant dumpsters requires the use of pick trucks to stage the dumpsters for the large front loading trash vehicles. Several overhead doors are located on the north face of the Yarbrough Plant and at a Zone Shop at the southwest corner of SAS Hall. These doors require access by work trucks and delivery vehicles.

Accessibility

The East Tunnel is not an accessible route between north and south campus. The renovation of this tunnel should be considered to provide an eastern accessible route between the two campuses.

SEE PAGE 14

Figure 8: Area B constraints

Photo 10: View of grade change at East Tunnel

Photo 11: View of oil fill point at east side of Yarbrough Plant

Photo 12: View of stairs at the pedestrian walk leading to Stinson Drive, taken from Boney Parking Lot

Photo 13: View of access drive at south of Yarbrough Plant

Photo 14: View of service yard at Yarbrough Plant

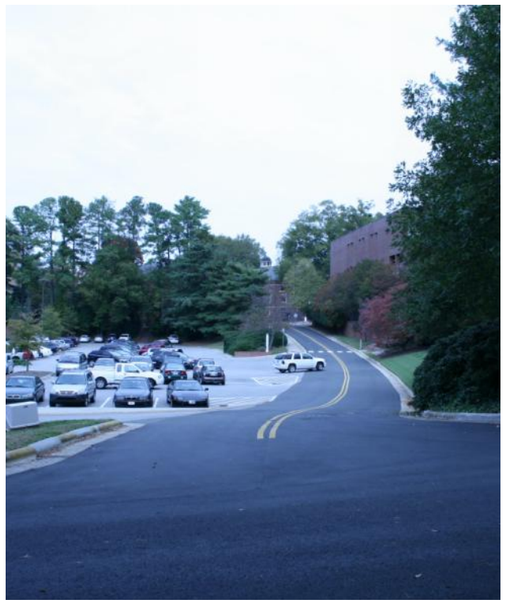


Photo 15: View of Boney Drive, note the “curves”

Utilities Observations

Steam

The primary Steam line runs parallel with Yarbrough Drive from the Plant to the rear of Dabney/Cox Halls. Any new vehicular crossings over the steam tunnel will require detailed evaluation to determine if adequate cover and structural integrity are present.

Sanitary Sewer

The sanitary sewer for North Campus crosses under the existing railroad to out fall through South campus. There are three significant crossings, one adjacent to the Free Expression Tunnel, the other two are located in proximity to the Yarbrough Drive/Stinson Drive intersection.

Chilled Water

The main pipeline serving north campus has been relocated to Stinson Drive. South Campus is served by a utility tunnel running from the south face of Yarbrough Plant under the railroad right of way. This tunnel needs to be evaluated for structural integrity and minimum cover if vehicular traffic is increased along the south face of the Yarbrough Plant.

Electric and Telecommunications

An existing set of switches is located at the west face of the Yarbrough Plant. This set of switches is reaching the end of its service life and should be considered for relocation and replacement. The location of this switch is directly obstructing a potential connection between Stinson Drive and a re-aligned Yarbrough Drive.

An existing generator provides emergency backup for the Yarbrough Plant, its current location is within the Railroad Right of Way. A new location for this generator should be identified outside of the Right of way.

Natural Gas

The main gas distribution connection for north campus is located south of the Yarbrough Plant. This location is currently within the railroad right of way. Relocating this distribution connection will need to be evaluated further with PSNC as it is directly tied to the gas main they have located within the railroad right of way.

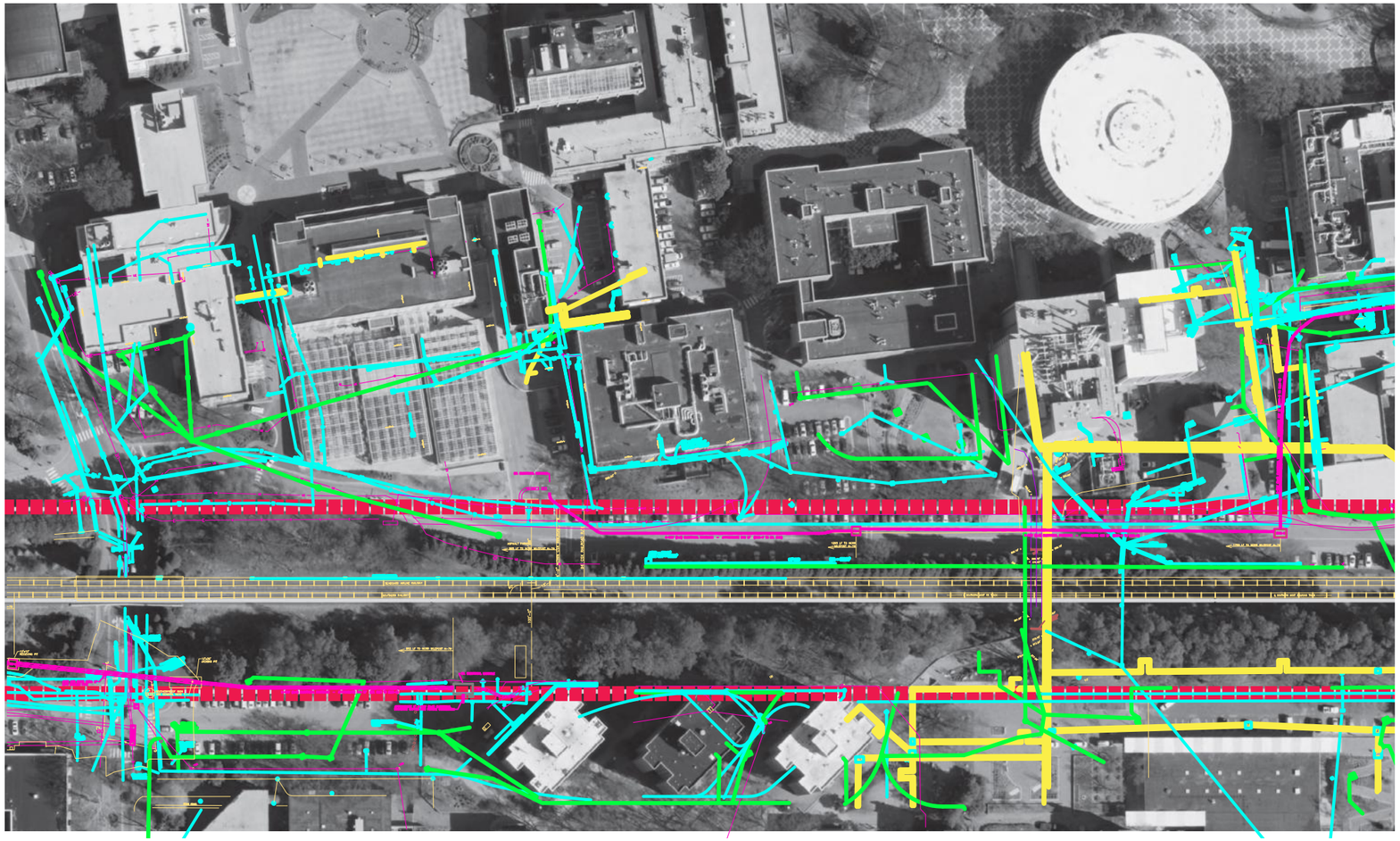


Figure 9a: Utilities composite map - west

UTILITY LEGEND

- ELECTRICAL AND TELECOM
- STEAM
- WATER (INCLUDES CHILLED WATER AND DOMESTIC)
- SANITARY SEWER

Figure 9b: Utilities composite map - east

SECTIONS OF EXISTING CONDITIONS

Figure 10:Existing sections key map

To visualize the topographic and physical constraints of the corridor, the planning team has developed sections through the project area. The locations for these section cuts relate to locations identified for future development, areas of existing physical constraints, and at major intersection points.

These sections are based on preliminary information provided by NC State University and are to be used for visualization only. Prior to implementing the design process, the planning team recommends a detailed survey be complete for the specific project area mapping existing topography, pavements, underground utilities, parking capacity and assignment, and building faces including subsurface encroachments along the railroad right of way.

EXISTING SECTION A

Photo 16: View of Dan Allen Drive, looking north towards Yarbrough Drive

Photo 17: View of Dan Allen Drive, looking north towards Hillsborough Street, taken from Yarbrough Drive

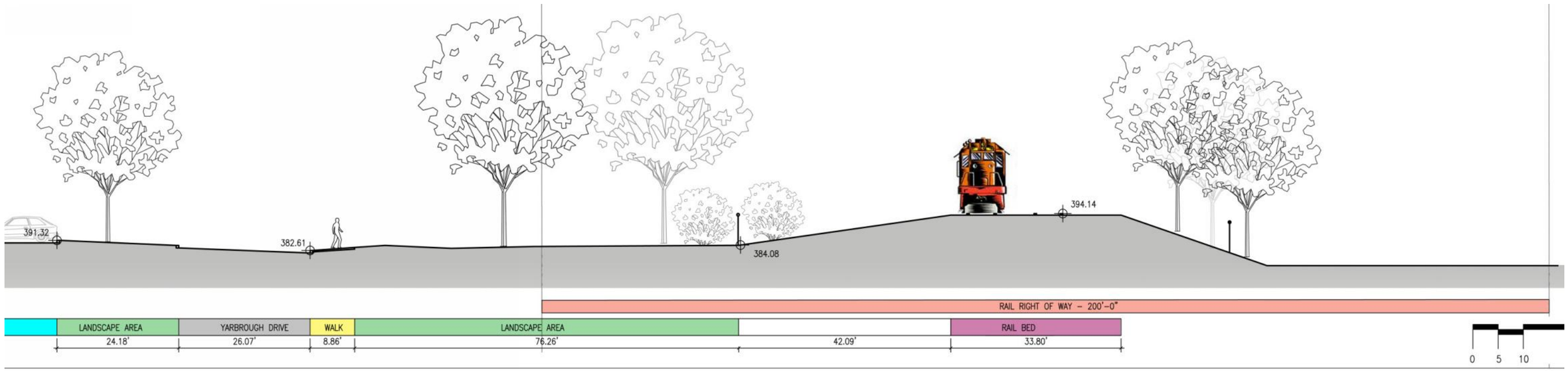


Figure 11:Existing section - A, looking east

EXISTING SECTION B

Photo 17: View of Yarbrough Drive, looking east from Dan Allen Drive

Photo 18: View of Yarbrough Drive at Fox Labs, looking west

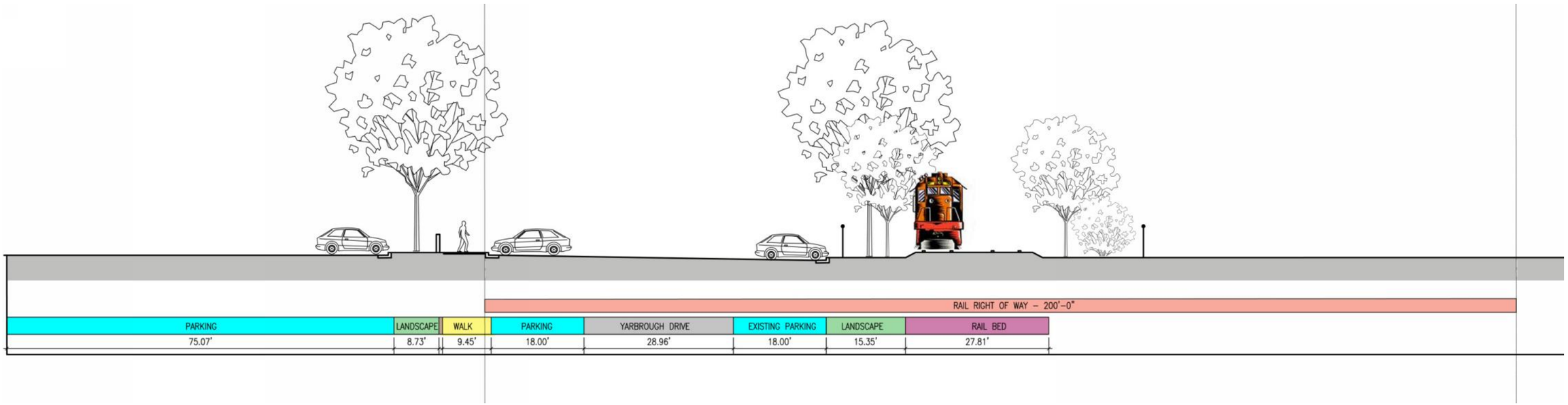


Figure 12:Existing section - B, looking east

EXISTING SECTION C

Photo 19: View of Diesel Building (Broughton Hall). Pedestrian bridge and Broughton Hall replace this building. Second floor is approximate to bridge connection height.

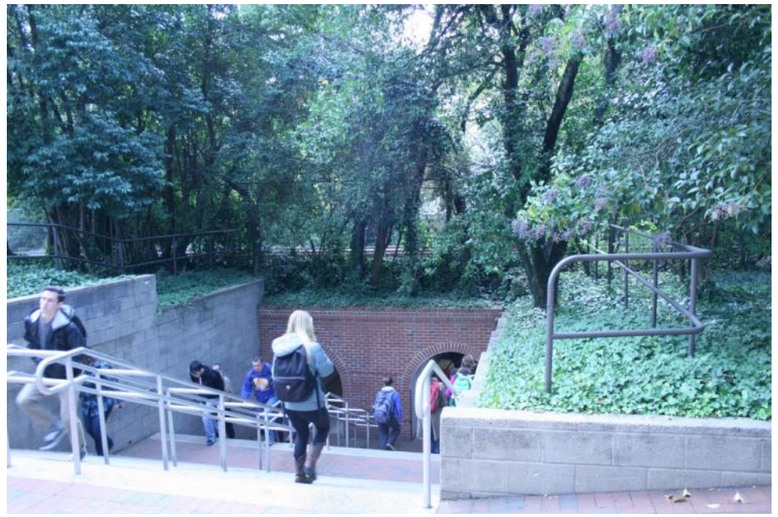


Photo 20: View of Coliseum Tunnel, north entry. Significant grade change exists between parking area and tunnel entry.

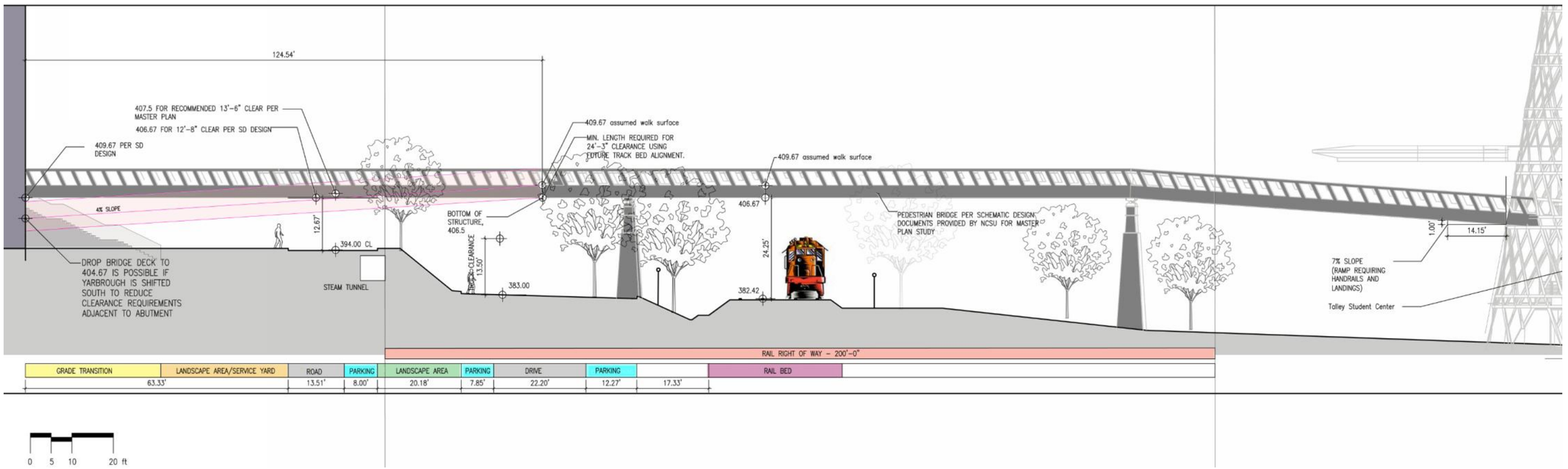
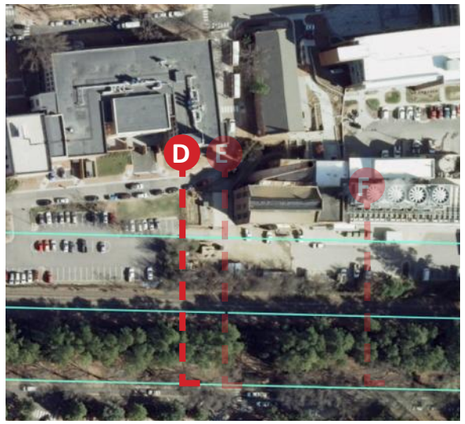


Figure 13: Existing section - C, looking east

EXISTING SECTION D



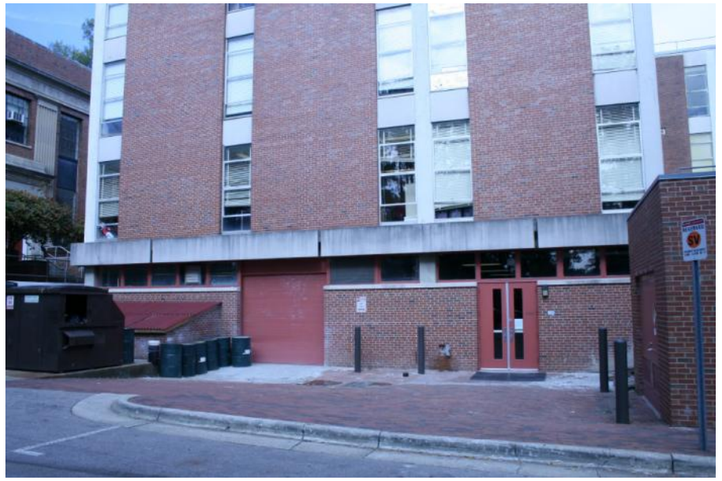


Photo 21: View of Mann Hall service area, visible from pedestrian walkways.

Photo 22: View of Yarbrough Drive, looking west from Yarbrough Plant

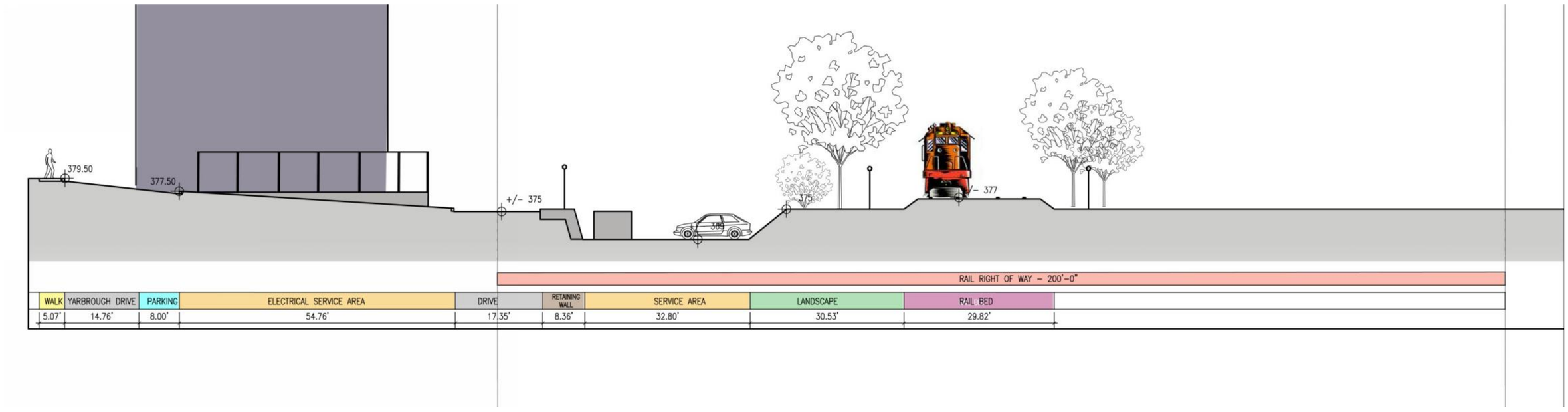


Figure 14:Existing section - D, looking east

EXISTING SECTION E

Photo 23: View of temporary landscape materials and equipment storage, at parking lot south of Riddick Hall

Photo 24: View of Yarbrough Plant, electrical switch gear just in front of old building. Service vehicles stored in parking area to left

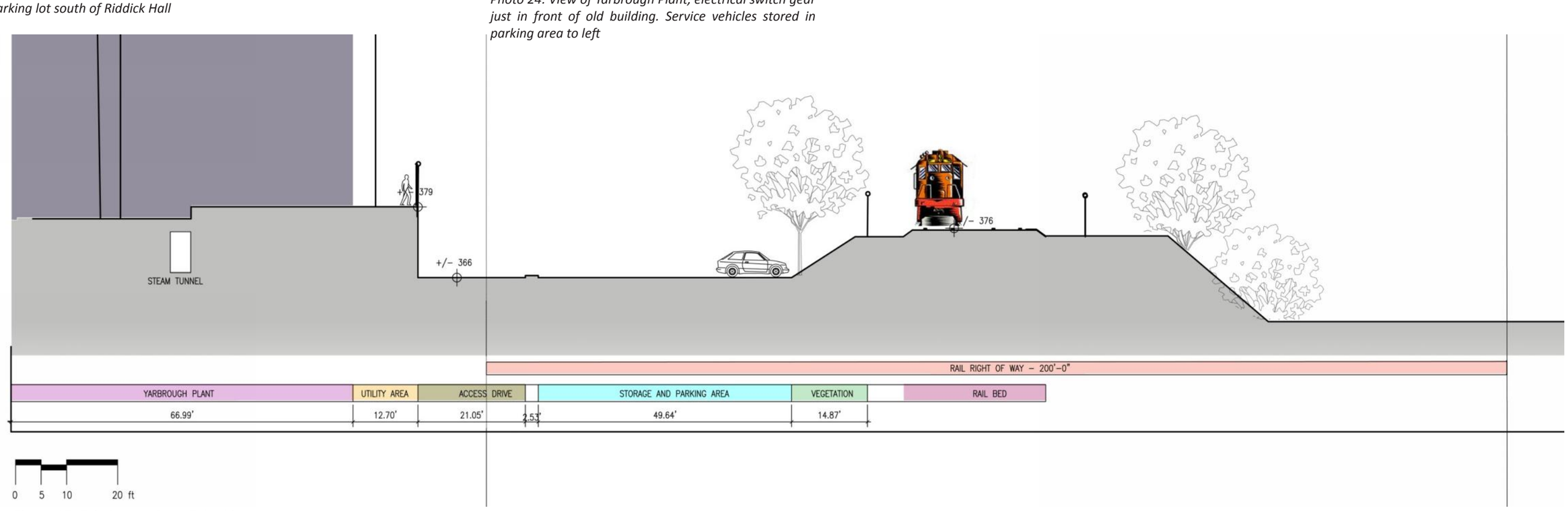


Figure 15: Existing section - E, looking east

EXISTING SECTION F

Photo 25: View access ramp from parking area to service yard along south face of Yarbrough Plant

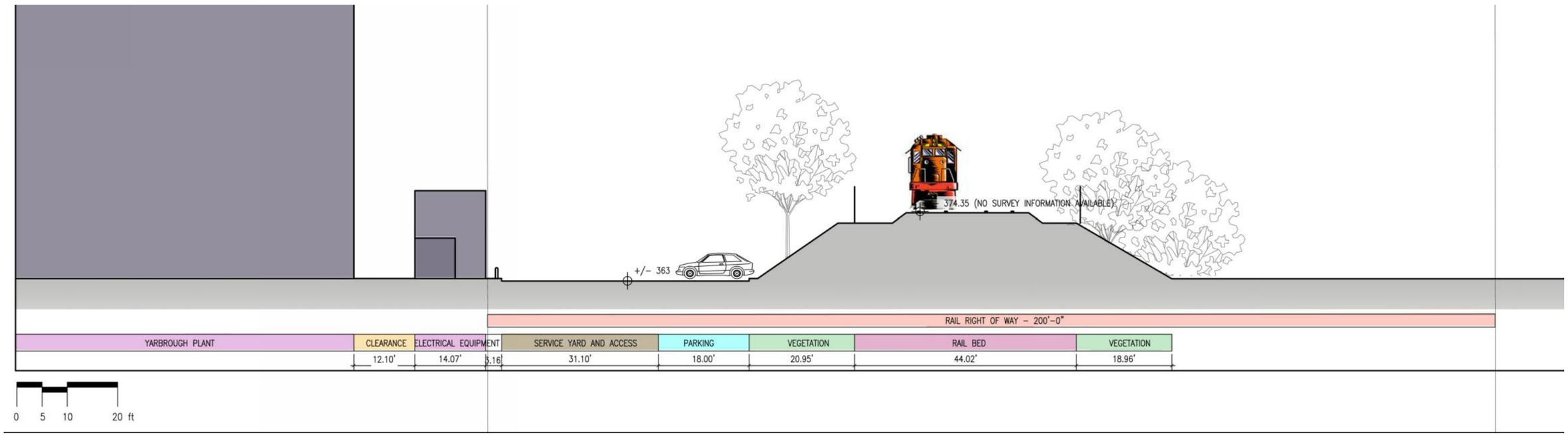


Figure 16: Existing section - F, looking east

EXISTING SECTION G

Photo 26: View of parking area east of existing field house, North Deck parking project will remove this parking. Field house is approved for demolition 2013 calender year.

Photo 27: View of East Tunnel, rail road above asphalt in foreground.

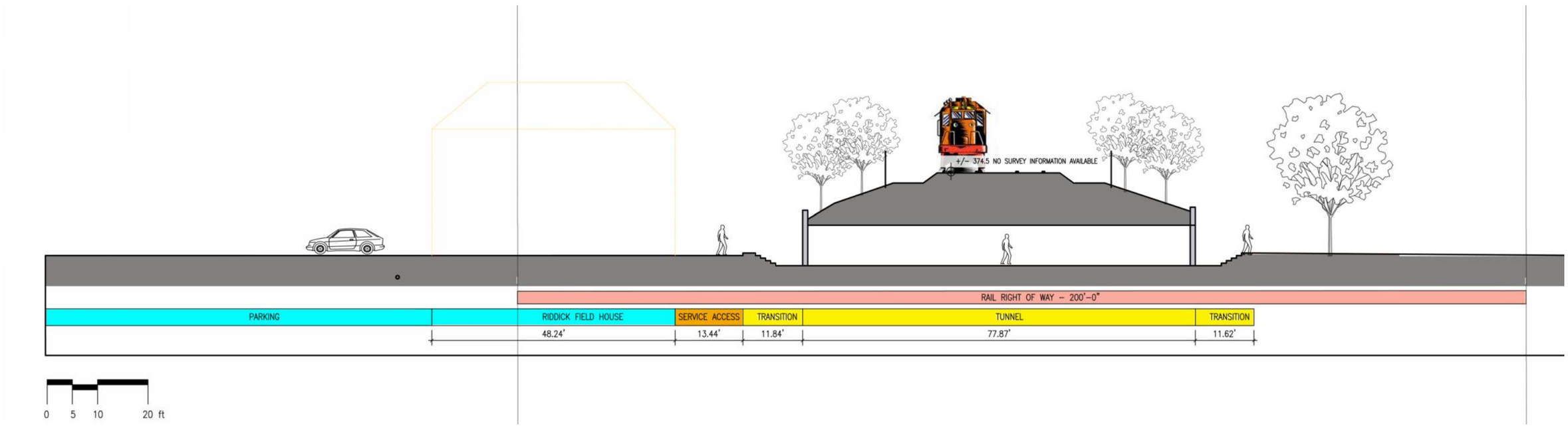


Figure 17: Existing section - G, looking east

EXISTING SECTION H

Photo 28: View of Baver Drive, Syme Residence Hall to left of photo.

Photo 29: View of waste management area, on axis with Syme Courtyard.

Photo 30: View of Syme Courtyard, standing at curb looking north from waste management area.

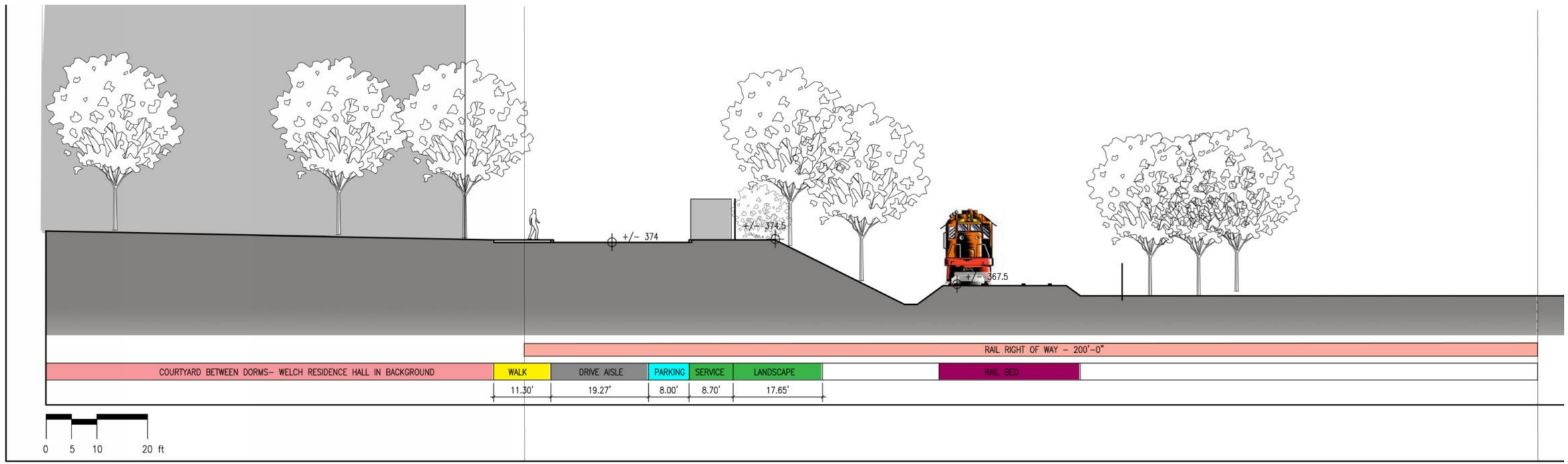
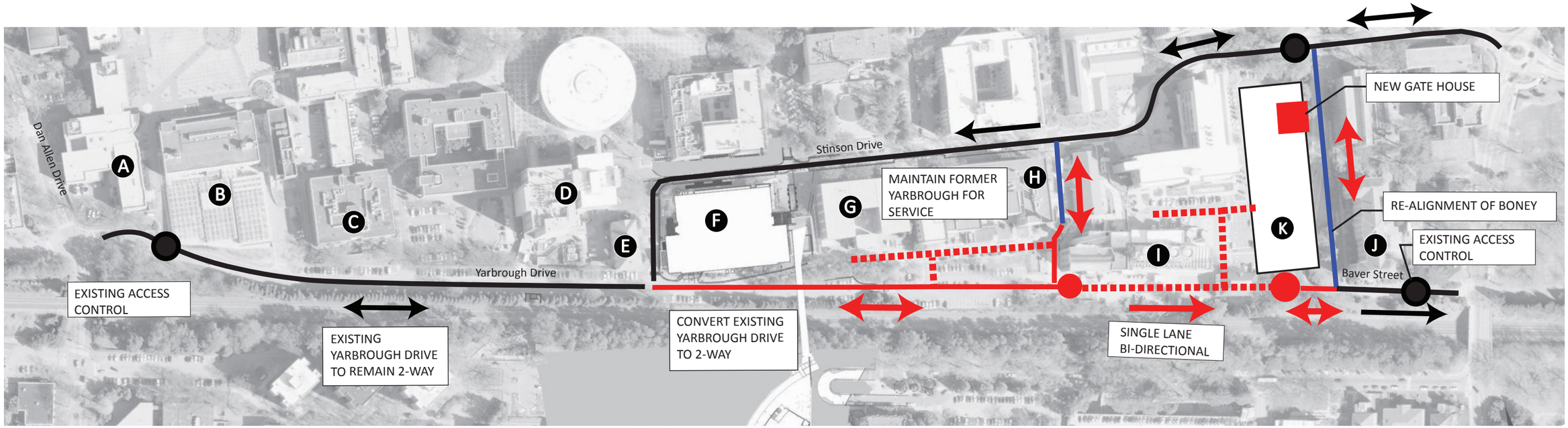


Figure 18: Existing section - H, looking east

CONCEPT DIAGRAM



Legend

- EXISTING ROADWAY
- PROPOSED ROADWAY
- PROPOSED ROADWAY
- SERVICE ACCESS ROADS
- TRAFFIC FLOW

N

0 100 200 ft

Building Reference

A. David Clark Labs
B. Fox Science Teaching Lab
C. Thomas Hall
D. Dabney/Cox Halls
E. Bureau of Mines
F. Broughton Hall
G. Mann Hall
H. Riddick Hall
I. Yarbrough Plant
J. Syme Residence Hall
K. Future North Parking Deck

Figure 19: Concept Diagram- Vehicular circulation

Working with key stakeholders within NC State University, the planning team developed several concept diagrams depicting the vehicular circulation options for the project area. The stakeholder group selected the scheme shown in the adjacent diagram.

This diagram provides the following benefits:

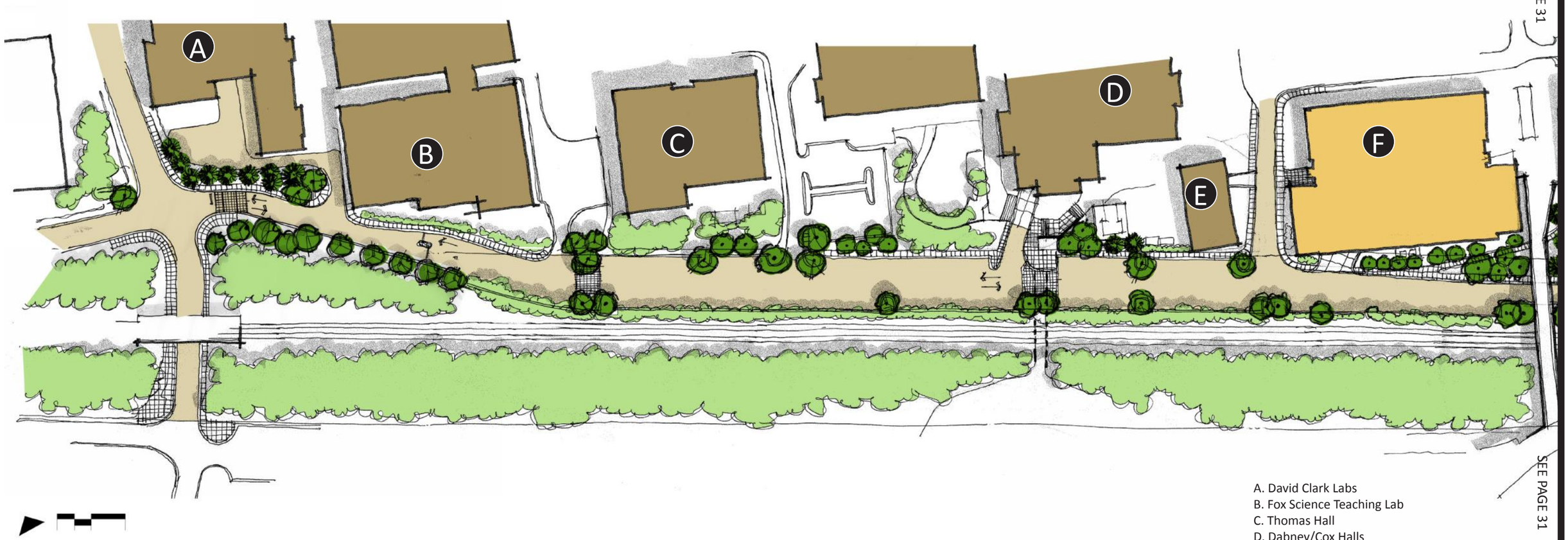
- Mediates risk to mission critical areas behind the Yarbrough Plant
- Maintains existing bus stops and bus circulation
- Maintains service yard functionality by limiting access through the service yard
- Provides minimum vehicular clearance while significantly reducing the bridge height at Broughton Hall
- Allows for improved truck maneuverability along Yarbrough Drive

Impacts to the existing condition will include:

- Reduced parking capacity along Yarbrough Drive
- Requires high reliance on Stinson Drive to provide westbound traffic access to Yarbrough Drive.
- Restricted access behind the plant

OVERALL CONCEPT PLAN

SEE PAGE 31



SEE PAGE 31

A. David Clark Labs
B. Fox Science Teaching Lab
C. Thomas Hall
D. Dabney/Cox Halls
E. Bureau of Mines
F. Broughton Hall
G. Mann Hall
H. Riddick Hall
I. Yarbrough Plant
J. Syme Residence Hall
K. Future North Parking Deck
L. Gold Residence Hall

Figure 20a: Rendered concept plan - west

SEE PAGE 30

SEE PAGE 30

A. David Clark Labs
B. Fox Science Teaching Lab
C. Thomas Hall
D. Dabney/Cox Halls
E. Bureau of Mines
F. Broughton Hall
G. Mann Hall
H. Riddick Hall
I. Yarbrough Plant
J. Syme Residence Hall
K. Future North Parking Deck
L. Gold Residence Hall

Figure 20b: Rendered concept plan - east

ENLARGED CONCEPT KEY PLAN

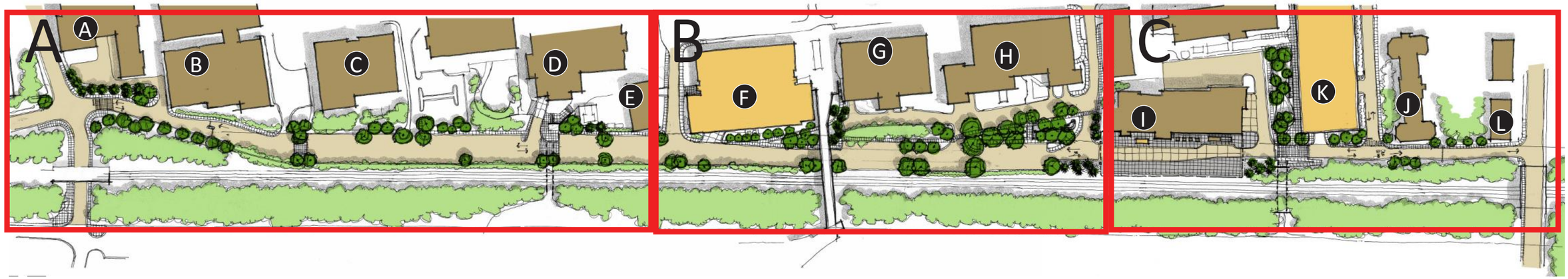
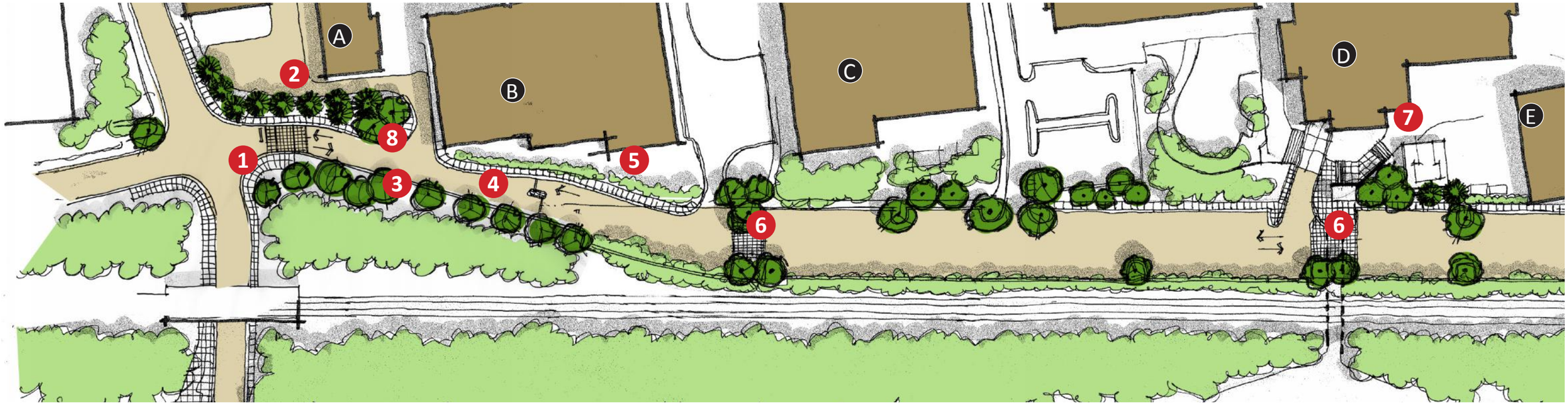


Figure 21: Concept Key Plan

A. David Clark Labs
B. Fox Science Teaching Lab
C. Thomas Hall
D. Dabney/Cox Halls
E. Bureau of Mines
F. Broughton Hall
G. Mann Hall
H. Riddick Hall
I. Yarbrough Plant
J. Syme Residence Hall
K. Future North Parking Deck
L. Gold Residence Hall

AREA A CONCEPTS



1. Improve pedestrian connections at future rail station
2. Vegetative screening of service area
3. Sidewalk and streetscape improvements
4. Maintain existing access control
5. Landscape enhancements along Fox Labs
6. Traffic calming through textured paving and speed tables
7. Construct enclosure for dumpsters and storage
8. Pedestrian crossing to rail station

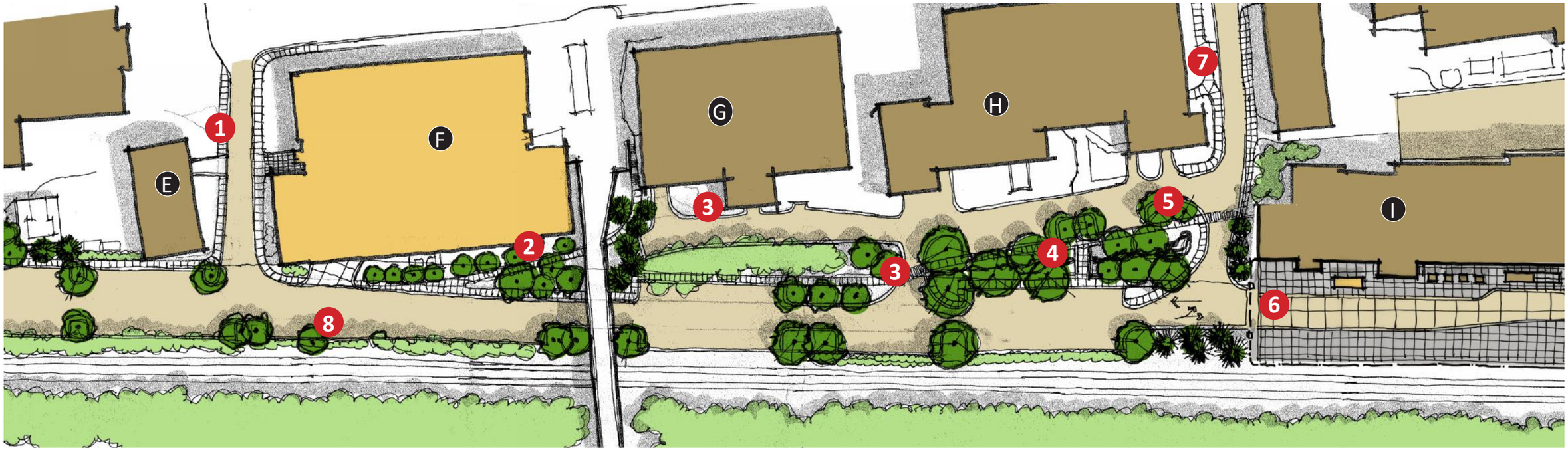
A. David Clark Labs
B. Fox Science Teaching Lab
C. Thomas Hall
D. Dabney/Cox Halls
E. Bureau of Mines
F. Broughton Hall
G. Mann Hall
H. Riddick Hall
I. Yarbrough Plant
J. Syme Residence Hall
K. Future North Parking Deck
L. Gold Residence Hall

N

0 20 40 80 FT

Figure 22: Area A concept plan and legend

AREA B CONCEPTS



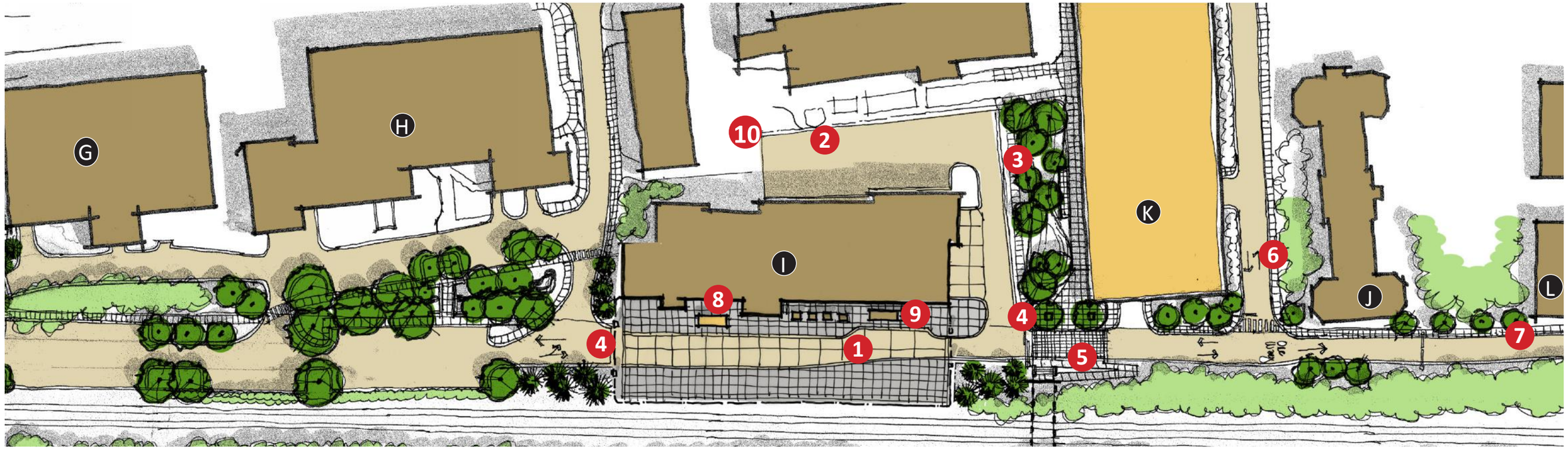
1. Stinson Drive width reduction - see Broughton Project
2. Remove old Yarbrough alignment, replace with pedestrian pathway
3. Maintain service access to Mann and Riddick Halls
4. Demonstration project for storm water management
5. New service access to provide “loop”
6. Access control
7. Widen to two-way travel
8. New Yarbrough Drive alignment, allows for reduced bridge height

N

0 20 40 80 FT

A. David Clark Labs
B. Fox Science Teaching Lab
C. Thomas Hall
D. Dabney/Cox Halls
E. Bureau of Mines
F. Broughton Hall
G. Mann Hall
H. Riddick Hall
I. Yarbrough Plant
J. Syme Residence Hall
K. Future North Parking Deck
L. Gold Residence Hall

Figure 23: Area B concept plan and legend



1. Access drive through service yard, one lane - 20ft width
2. Secure plant vehicle storage
3. Storm water demonstration and pedestrian pathways
4. Access control - pedestrian and vehicular
5. Pedestrian crossing at tunnel, tie into parking deck ramp
6. Modify alignment of Boney, add sidewalk and streetscape
7. Maintain access control
8. Relocated generator
9. Relocated Fuel Oil Truck lay-by lane and filling point
10. Barrier to deter students from cutting through service yard

N

0 20 40 80 FT

A. David Clark Labs
B. Fox Science Teaching Lab
C. Thomas Hall
D. Dabney/Cox Halls
E. Bureau of Mines
F. Broughton Hall
G. Mann Hall
H. Riddick Hall
I. Yarbrough Plant
J. Syme Residence Hall
K. Future North Parking Deck
L. Gold Residence Hall

Figure 24: Area C concept plan and legend

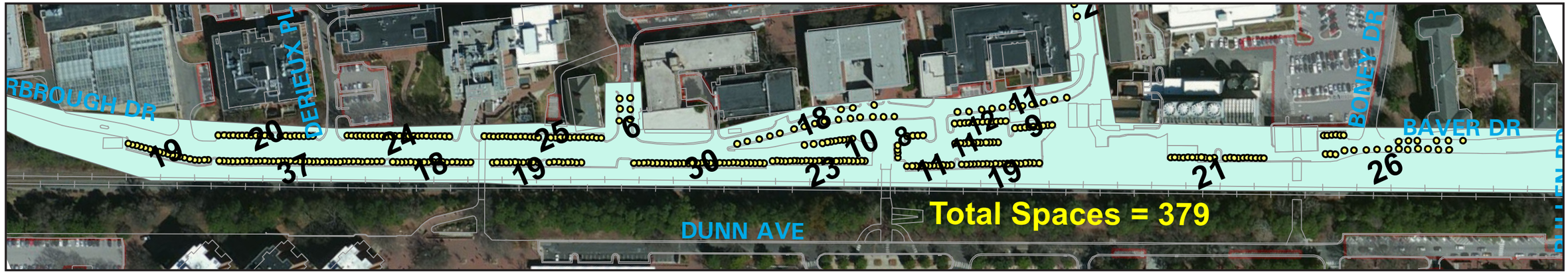
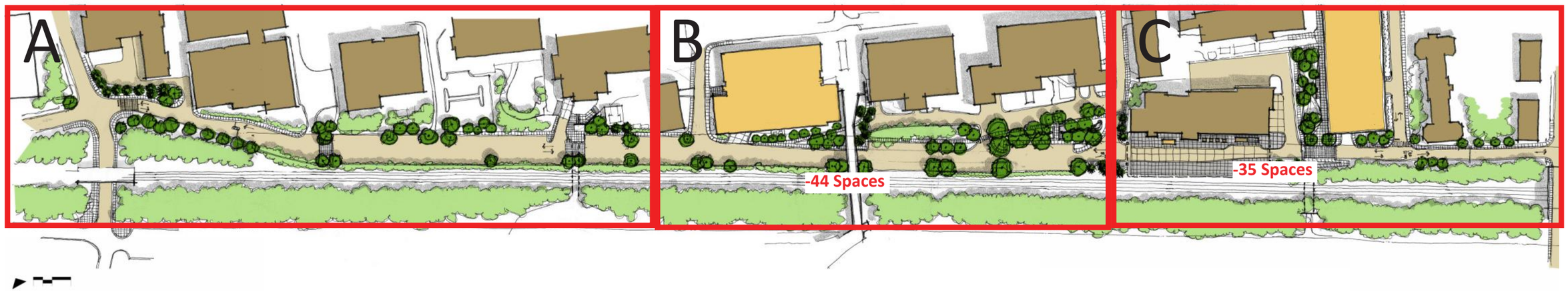


Figure 25: Existing Parking Inventory by NCSU



Existing Parking Total:	379 spaces
Proposed Parking Total:	+/- 300 spaces
Net loss:	79 spaces

Parking Impacts shown do not include the North Deck Project's impacts to the Boney Parking Lot. Realignment of Boney is included in the forecasted parking impacts if Yarbrough Drive project is constructed ahead of parking garage.

Figure 26: Estimated parking impacts

Figure 27: Implementation Key Plan

The key to the Yarbrough Drive Master Plan's success will be a coordinated implementation plan. While the vision for the Master Plan is based on a long range outlook for the entire Yarbrough Drive Corridor, several related projects must be completed for this vision to be realized; these projects include the North Parking Deck, Talley Student Center Pedestrian Bridge, and the Broughton Hall Addition and Renovation. NC State should consider the implementation of the Yarbrough Drive improvements in conjunction with these other projects.

A phasing plan has been developed to allow for prioritization of the Yarbrough Drive development goals. The phasing plan is found on the following page.

Cost opinions have been developed for these phases. The cost opinions are totals of the subareas shown in the figure above.

PHASING

Figure 28: Concept phasing plan

SEE AREA A COST OPINION

- Install landscape screening around service area
- Streetscape enhancements along Fox Labs and south edge of Yarbrough Drive
- Pedestrian Crossing improvements
- Traffic Calming features to slow traffic
- Traffic calming features
- Improve streetscape along west curb line of Stinson Drive
- Enhance service area serving Bureau of Mines and Dabney/Cox
- Bus shelter improvements

SEE AREA B COST OPINION

Phase B1

- Demolition and removal of Yarbrough Drive (north leg behind Mann and Broughton)*
- Demolition and removal of pedestrian crossing at Coliseum Tunnel (maintain tunnel for utilities - secure access points)
- Service yard improvements behind Mann and Riddick Halls
- Sidewalk connections between stinson drive and pedestrian bridge

*Requires construction of pedestrian bridge

Phase B2

- Relocation of electrical switch gear at Yarbrough Plant (west side)
- Construct two way drive aisle through existing parking area, remove parking.
- Construct connector from Yarbrough (phase III) to new drive aisle

SEE AREA C COST OPINION

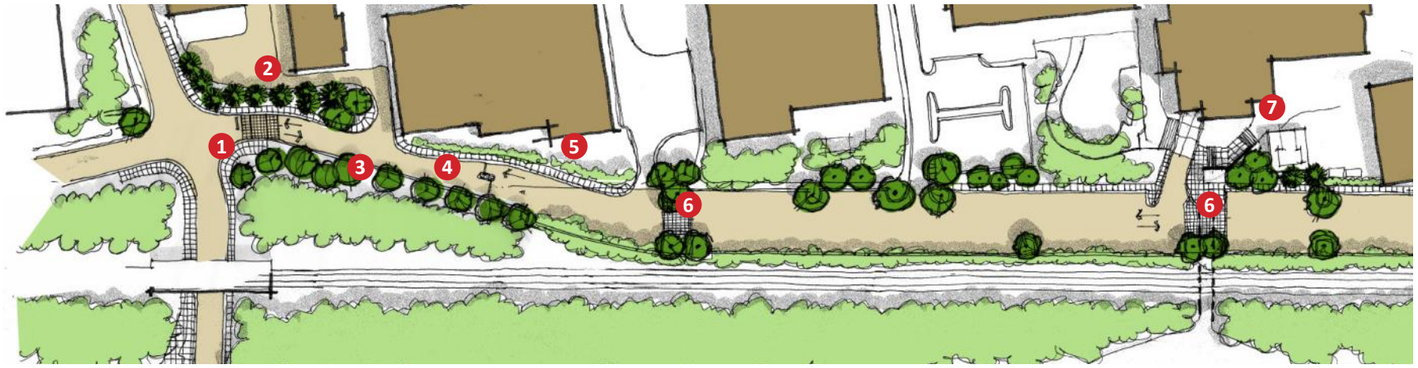
- Install access control points west end of Yarbrough Plant service alley.
- Accessible Ramp Improvements at East Tunnel
- Boney Drive realignment
- Streetscape improvements along Boney Drive and new Service Road (Yarbrough Extension)

AREA A COST OPINION

Figure 29: Area A cost opinion spreadsheet

Site Work	Qty	Unit	Unit Price	Total Cost
Site Preparation				
Clearing and Grubbing	0.50	acres	$6,500	$3,250
Demolition	1	LS	$10,000	$10,000
Bulk Grading - Balance Site	150	CY	$9	$1,275
Storm Ponds	0	Ea.	$0	$0
Storm Piping and Structures	200	LF	$50	$10,000
Erosion Control	1	LS	$15,000	$15,000
Infrastructure				
Water Supply Mains and Structures	0	LF	$0	$0
Sewer - Base Installation including manholes	0	LF	$0	$0
Sewer - Main along interior service road	0	LS	$0	$0
Natural Gas	0	LF	$0	$0
Power & communications - duct bank	0	LF	$0	$0
-Handholes (power and telecom)	0	Ea	$0	$0
- Manholes (power and telecom)	0	Ea	$0	$0
Hot Water Piping within Tunnel (non walkable)	0	LF	$0	$0
Chilled Water Piping within Tunnel (non walkable)	0	LF	$0	$0
Site Improvements				
Brick Walks with Concrete underslab	7,500	SF	$10	$75,000
Wayfinding Signage	1	Lump sum	$30,000	$30,000
Furniture and Bike racks	1	Lump sum	$30,000	$30,000
Screen Wall - architectural block/brick masonry	1,000	Sq Ft. Face	$65	$65,000
Traffic Improvements				
Surface lot - light duty asphalt, base, striping, and curb and gutter	0	pk space	$0	$0
Access drives and service courts	0	LF	$0	$0
Bus drop off - HD concrete loading zone, lighting, directory, covered shelter	1	LS	$50,000	$50,000
Lighting fixtures - Parking Lot - LED	6	Ea.	$3,500	$21,000
Lighting fixtures - Street lights - LED	15	Ea.	$3,500	$52,500
Blue Lights/Security - wireless call boxes with wired power	0	Ea.	$5,000	$0
Traffic calming/textured crossings	3	Ea.	$30,000	$90,000
Access Controls (equipment improvements)	1	Ea.	$7,500	$7,500
Landscaping				
Trees	30	Ea.	$325	$9,750
Evergreen Trees	20	Ea.	$280	$5,600
Flowering trees	20	Ea.	$250	$5,000
Shrubs	300	Ea.	$45	$13,500
Turf	50	1000 sf	$435	$21,750
Area A Construction Total				**$516,125**

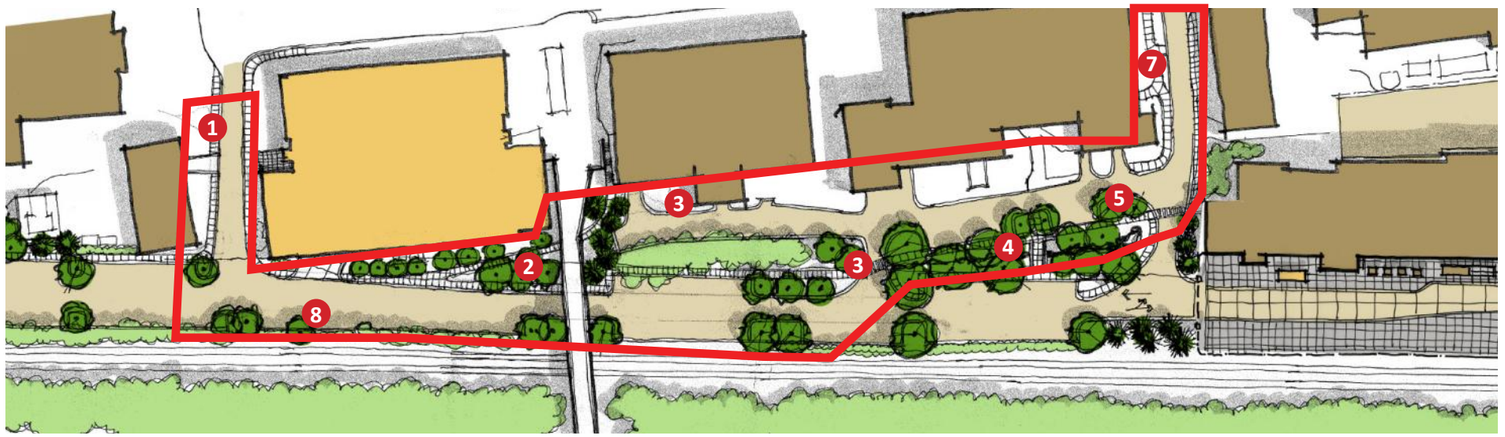
Costs based on first quarter 2013 construction costs
Total does not include design services, contractor fees, contingencies, and escalation



1. Improve pedestrian connections at future rail station
2. Vegetative screening of service area
3. Sidewalk and streetscape improvements
4. Maintain existing access control
5. Landscape enhancements along Fox Labs
6. Traffic calming through textured paving and speed tables
7. Construct enclosure for dumpsters and storage
8. Pedestrian crossing to rail station

Figure 30: Area A cost opinion reference plan

AREA B1 COST OPINION



1. Stinson Drive width reduction - see Broughton Project
2. Remove old Yarbrough alignment, replace with pedestrian pathway
3. Maintain service access to Mann and Riddick Halls
4. Demonstration project for storm water management
5. New service access to provide “loop”
6. Widen to two-way travel
7. New Yarbrough Drive alignment, allows for reduced bridge height

Figure 31: Area B1 cost opinion reference plan

Figure 32: Area B1 cost opinion spreadsheet

Phase B1

Site Work	Qty	Unit	Unit Price	Total Cost
Site Preparation				
Clearing and Grubbing	2	acres	$6,500	$9,750
Demoilition - existing asphalt, curb and gutter, sidewalks, ve	1	LS	$100,000	$100,000
Bulk Grading - Balance Site	100	CY	$25	$2,500
Storm Ponds	1	Ea.	$70,000	$70,000
Storm Piping and Structures	1,000	LF	$50	$50,000
Erosion Control	1	LS	$50,000	$50,000
Infrastructure				
Water Supply Mains and Structures	100	LF	$125	$12,500
Sewer Mains and Structures	0	LF	$0	$0
Natural Gas	0	LF	$75	$0
Power & communications - duct bank	450	LF	$100	$45,000
-Handholes (power and telecom)	5	Ea	$1,400	$7,000
- Manholes (power and telecom)	3	Ea	$6,000	$18,000
Steam Tunnel Reinforcement*	25	LF	$5,000	$125,000
Chilled Water Piping within Tunnel (non walkable)	0	LF	$200	$0
Site Improvements				
Brick Walks with Concrete Underslab	7,500	SF	$10	$75,000
Wayfinding Signage	1	Lump sum	$20,000	$20,000
Furniture and Bike racks	1	Lump sum	$75,000	$75,000
Screen Wall - architectural block/brick masonry	2,544	Sq Ft. Face	$30	$76,320
Traffic Improvenments				
Surface lot - light duty asphalt, base, striping, and curb and gutter	60	pk space	$2,300	$138,000
Access drives and service court	1,200	LF	$70	$84,000
Bus drop off - HD concrete loading zone, lighting, directory, covered shelter	1	LS	$50,000	$50,000
Lighting fixtures - Parking Lot - LED	5	Ea.	$3,500	$17,500
Lighting fixtures - Street lights - LED	8	Ea.	$3,500	$28,000
Blue Lights/Security - wireless call boxes with wired power	0	Ea.	$5,000	$0
Traffic calming/textured crossings	1	Ea.	$30,000	$30,000
Access Controls- New Equipment	1	Ea.	$15,000	$15,000
Landscaping				
Trees	10	Ea.	$325	$3,250
Evergreen Trees	10	Ea.	$280	$2,800
Flowering trees	15	Ea.	$250	$3,750
Shrubs	100	Ea.	$45	$4,500
Turf	15	1000 sf	$475	$7,125
Parking Offset				
Spaces Removed	25	Ea	$17,500	$437,500
Area B Construction Total				**$1,557,495**

Costs based on first quarter 2013 construction costs
Total does not include design services, contractor fees, contingencies, and escalation
*Steam tunnel reinforcement costs need to be evaluated further pending a detailed review and analysis of the existing tunnel conditi

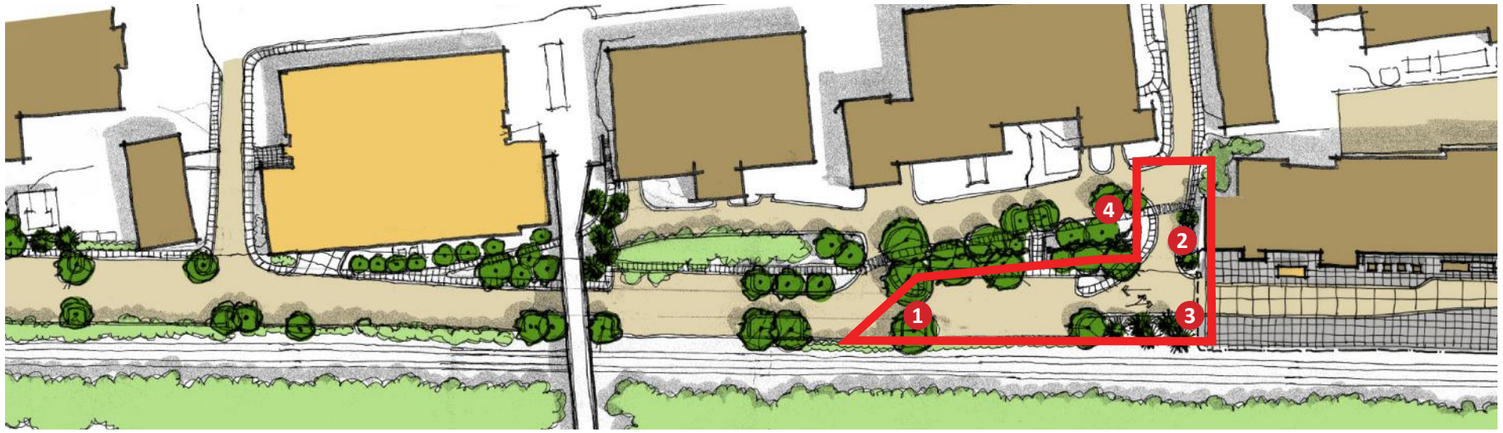
AREA B2 COST OPINION

Figure 33: Area B2 cost opinion spreadsheet

Phase B2

Site Work	Qty	Unit	Unit Price	Total Cost
Site Preparation				
Clearing and Grubbing	1	acres	$6,500	$3,250
Demoilition - existing asphalt, curb and gutter, sidewalks, ve	1	LS	$150,000	$150,000
Bulk Grading - Balance Site	150	CY	$30	$4,500
Storm Ponds	1	Ea.	$70,000	$70,000
Storm Piping and Structures	550	LF	$50	$27,500
Erosion Control	1	LS	$25,000	$25,000
Infrastructure				
Water Supply Mains and Structures	100	LF	$125	$12,500
Sewer Mains and Structures	0	LF	$0	$0
Natural Gas	0	LF	$75	$0
Power & communications - duct bank	400	LF	$250	$100,000
-Handholes (power and telecom)	3	Ea	$1,400	$4,200
- Manholes (power and telecom)	3	Ea	$6,000	$18,000
Steam Tunnel Reinforcement	10	LF	$1,000	$10,000
Chilled Water Piping within Tunnel (non walkable)	0	LF	$200	$0
Switchgear relocation	1	LS	$150,000	$150,000
Site Improvements				
Brick Walks with Concrete Underslab	1,200	SF	$10	$12,000
Wayfinding Signage	1	Lump sum	$5,000	$5,000
Furniture and Bike racks	1	Lump sum	$10,000	$10,000
Screen Wall - architectural block/brick masonry	0	Sq Ft. Face	$30	$0
Traffic Improvenments				
Surface lot - light duty asphalt-patching and resurfacing, striping, and curb and gutter patching	45	pk space	$1,500	$67,500
Access drives and service court	750	LF	$70	$52,500
Bus drop off - HD concrete loading zone, lighting, directory, covered shelter	0	LS	$50,000	$0
Lighting fixtures - Parking Lot - LED	6	Ea.	$3,500	$21,000
Lighting fixtures - Street lights - LED	5	Ea.	$3,500	$17,500
Blue Lights/Security - wireless call boxes with wired power	1	Ea.	$5,000	$5,000
Traffic calming/textured crossings	0	Ea.	$30,000	$0
Access Controls- New Equipment	1	Ea.	$15,000	$15,000
Landscaping				
Trees	8	Ea.	$325	$2,600
Evergreen Trees	5	Ea.	$280	$1,400
Flowering trees	10	Ea.	$250	$2,500
Shrubs	70	Ea.	$45	$3,150
Turf	2	1000 sf	$475	$950
Parking Offset				
Spaces Removed	19	Ea	$17,500	$332,500
Area B Construction Total				**$1,123,550**

Costs based on first quarter 2013 construction costs
Total does not include design services, contractor fees, contingencies, and escalation



1. Rebuild parking area and Yarbrough Drive
2. Relocate existing switchgear and remove existing structure, reinforce steam tunnel, complete connection between Yarbrough and Stinson
3. Access Control
4. Sidewalk and landscape improvments

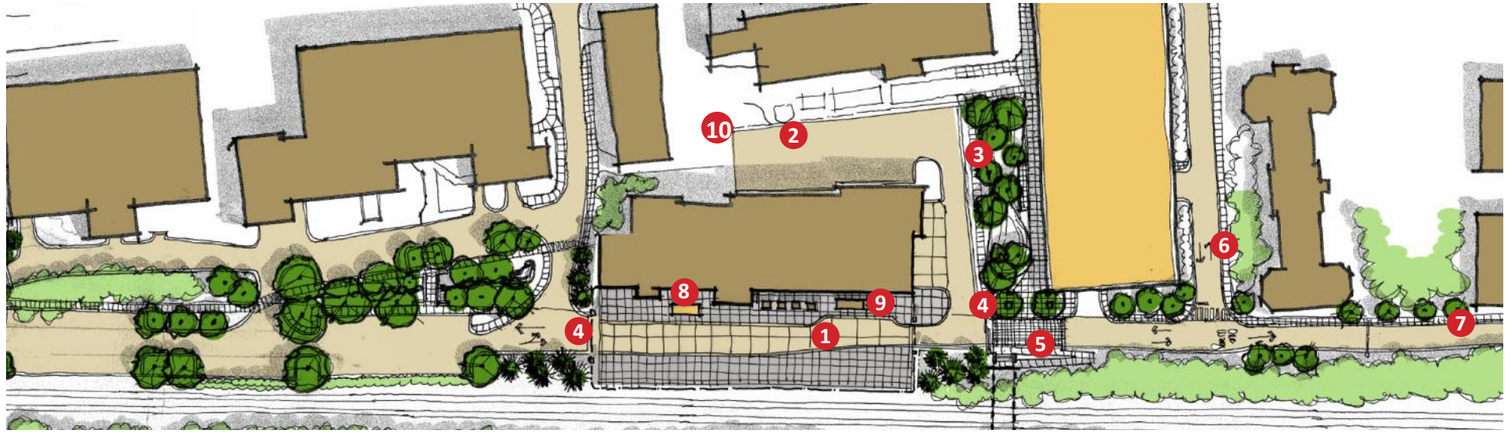
Figure 34: Area B2 cost opinion reference plan

AREA C COST OPINION

Figure 35: Area C cost opinion spreadsheet

Site Work	Qty	Unit	Unit Price	Total Cost
Site Preparation				
Clearing and Grubbing	1	acres	$6,500	$3,250
Demolition (does not include field house)	1	LS	$100,000	$100,000
Bulk Grading - Balance Site	100	CY	$35	$3,500
Storm Ponds	2	Ea.	$70,000	$140,000
Storm Piping and Structures	1,000	LF	$50	$50,000
Erosion Control	1	LS	$50,000	$50,000
Infrastructure				
Water Supply Mains and Structures	150	LF	$125	$18,750
Sewer - Main	0	LS	$153,375	$0
Natural Gas - meter station relocation	1	Ls	$125,000	$125,000
Power & communications - duct bank	500	LF	$150	$75,000
-Handholes (power and telecom)	5	Ea	$1,400	$7,000
- Manholes (power and telecom)	3	Ea	$6,000	$18,000
Steam Tunnel Reinforcement	50	LF	$1,000	$50,000
Chilled Water Piping - direct bury	50	LF	$500	$25,000
Generator relocation(does not include cost of new generator	1	LS	$150,000	$150,000
Site Improvements				
Brick Walks with Concrete Underslab	12,000	SF	$10	$120,000
Wayfinding Signage	1	Lump sum	$30,000	$30,000
Furniture and Bike racks	1	Lump sum	$75,000	$75,000
Retaining Wall and ramps at tunnel	1	LS	$125,000	$125,000
Screen Wall - architectural block/brick masonry	1,800	Sq Ft. Face	$30	$54,000
Traffic Improvements				
Surface lot - light duty asphalt resurfacing	45	pk space	$1,000	$45,000
Heavy Duty Concrete - laydown yard space	3,000	SF	$45	$135,000
Access drive at south of plant and service court	600	LF	$70	$42,000
Boney Drive intersection realignment	150	LF	$150	$22,500
Oil Fill Relocation HD concrete loading zone, lighting, fill station	1	LS	$120,000	$120,000
Lighting fixtures - Parking Lot - LED	4	Ea.	$3,500	$14,000
Lighting fixtures - Street lights - LED	8	Ea.	$3,500	$28,000
Blue Lights/Security - wireless call boxes with wired power	0	Ea.	$5,000	$0
Access Control points	2	Ea.	$15,000	$30,000
Landscape Enhancments				
Trees	10	Ea.	$325	$3,250
Evergreen Trees	5	Ea.	$280	$1,400
Flowering trees	5	Ea.	$250	$1,250
Shrubs	100	Ea.	$45	$4,500
Turf	5	1000sf	$435	$2,175
Parking Offset				
Spaces Removed	35	Ea	$17,500	$612,500
Total Construction Total				**$2,281,075**

Costs based on first quarter 2013 construction costs
Total does not include design services, contractor fees, contingencies, and escalation



1. Access drive through service yard, one lane - 20ft width
2. Secure plant vehicle storage
3. Storm water demonstration and pedestrian pathways
4. Access control
5. Pedestrian crossing at tunnel, tie into parking deck ramp
6. Modify alignment of Boney, add sidewalk and streetscape
7. Maintain access control
8. Relocated generator
9. Relocated Fuel Oil Truck lay-by lane and filling point
10. Barrier to deter students from cutting through service yard

Figure 36: Area C cost opinion reference plan

Appendix Contents

NC STATE UNIVERSITY

WORKSHOP 1 - MEETING MINUTES

Meeting Minutes

Project: **NCSU Yarbrough Drive MP** Project Number: 2010057.01
Work Session 1
Purpose: Kick Off / orientation meeting
Meeting Location: NCSU
Meeting Date: 10/29/12
Prepared By: Jay W. Smith RLA, ASLA, LEED AP

Attendees:					
Name	*Company*	*Initials*	*Name*	*Company*	*Initials*
Jay W. Smith	O/A	JS	Ralph Recche	NCSU	RR
Jonathan Parsons	O/A	JP	Tom Kendig	NCSU	TK
Bill Davis	NCSU	BD	Pete Fraccaroli	NCSU	PF
Carolyn Axtman	NCSU	CA	Alan Daeke	NCSU	AD
Lisa Johnson	NCSU	LJ	Jeff Hightower	NCSU	JH
Robert Mathes, Jr	NCSU	RM	Cameron Smith	NCSU	CS
Dave Josephus	NCSU	DJ			

Distribution:		
Name	*Company*	
Tom Skolnicki	NCSU	All Attendees
Rick Ericson	O/A	O/A File 201057.01

Bold type initials below indicates action items that need to be addressed at next meeting.

ITEMS	NOTES/ ISSUES/ ACTION	RESP	DUE DATE
1.0	JS welcomed everyone and the meeting's agenda was reviewed.	Record	
2.0	JS asked if all attending would be able to continue their attendance at future meetings and or send someone to represent their interest – all agreed they could attend or send someone.	Record	
2.1	JS asked if there was anyone not at the table who interest needed to be represented in the project. The group agreed that 'Grounds' and 'Recycling' should be added to the stakeholders list. BD will contact them and invite them to the next work session.	**BD**	**11-1-12**
3.1	JS presented the scope and extents of the project. A large base map of the project area was reviewed and the group agreed that it correctly represented the project / study area.	Record	
3.2	LJ asked O/A to reference the 'project scope statement' written by NCSU and monitor and track progress against it.	Record	
3.3	Future RxR light rail / commuter rail plans were discussed. NCSU said these were available - BD will find them send to O/A (o/a will also look for them other resources related to rail lines and their expansion)	**BD**	**11-8-12**
4.0	JS asked the group what the key issues were regarding Yarbrough Drive and the project at large. The following were the responses: • The team will need to understand the railroad ROW issues and easements etc… • The vast majority of the Yarbrough drive study area is within the RxR ROW. • Yarbrough Drive is a key service road and has critical utility functions for the entire campus. • Many key utilities are within the Yarbrough Drive confines – ranging from the PSNC natural gas lines & gas meters at the Yarbrough drive utility plant, storm water, sanitary sewer & water lines, Sprint communication lines etc… • Special Utility Note: The Sprint telecomm line(s) and PSNC gas meters / lines will be difficult to move and will need to be worked around as they are now. • The dumpster locations at Syme / Gold/ Welch buildings along Baver Drive are important and need to be considered in the planning. • Pedestrian crossings are very important at the RxR - The pedestrian tunnel at Reynolds may be eliminated in the future – the team will evaluate this recommendation. • A new signal and gate arms are in place at Dan Allen Drive – this will need to factor into plans for Yarbrough Drives circulation. • It was expressed that Yarbrough drive should connect through to Pullen Drive. The old Riddick field house lies in the direct path if this connection is made. • NCSU stated that if they have permission to demolish Riddick Field house. The team will continue to evaluate this possibility. • Yarborough Dr is now one way traffic flow – the team asked if two way options are possible – while not likely – the team will look into that possibility. • Large trucks currently make difficult turns to access the campus and get to Yarbrough Dr – in particular fuel oil trucks. The team will need to examine truck turning conditions and look to improve them. • It was stated that the primary role of Yarbrough Dr was to be a primary service road that supports the function and utility of the campus. • It was stated that Yarbrough Dr is not a heavy pedestrian circulation pattern – however a good number of parking spaces are located along it and need to be maintained. • The height and conditions of the future pedestrian bridge crossing the RxR ROW and Yarbrough Dr from the Talley Student Center are to be examined. • The subject of how to phase the Yarbrough Dr recommendations was discussed – the team will look examine this and make recommendations.		
4.1	The Wolf Line bus plans / routes are needed – TK will get these and send to BD -	**TK**	**11-8-12**
4.2	The RxR right of way conditions were discussed extensively. The RxR easements and legalities need to be confirmed. The team discussed the need to at least understand what NCSU's minimal requirements would be if the RxR were to take back the full Right of Way. It was agreed this would be looked at for internal purposes only and not a report recommendation.	Record	

NCSU Yarbrough Drive MP – meeting minutes

4.3	BD will send link to RxR easements to O/A for their review.	**BD**	**11-8-12**
4.4	An exhibit was presented that illustrated how much of the project area O/A currently has base / survey info for. BD will send O/A the additional areas needed.	**BD**	**11-8-12**
5.0	JS reviewed the project schedule. The following are the future work sessions: • Work session 2 – Nov 8 2:00 – 3:30 • Work session 3 Nov 27 10:00 – 12:30 • Work session 4 Dec 12 3:00 – 4:30 • Work session 5 Jan 10 1:00 – 3:30 • Work session 6 Feb 11 1:00 – 2:30	Record	
6.0	The meeting was concluded	Record	

Make any corrections or edits to the writer as soon as possible

Attachments:
Schedule / work session focus
RxR plans

NCSU - Yarbrough Drive Master Plan

Project Schedule and Work Session Focus

Work session 1 - Kick off.....October 29, 2012

- Kick off meeting with planning team
- Discuss project issues/ ID keys to success

Work session 2 – Preliminary Concepts.....November 8, 2012

- Present preliminary concepts / approaches
- Utility progress / update

Work session 3 – Concept Update and Utilities.....November 27, 2012

- Present utility findings
- Concept plans review – select preferred alternative
- Transportation progress / update

Work session 4 – Concept refinement & Transportation.....December 12, 2012

- Present selected plan alternative
- Present transportation findings
- Report outline draft

Work session 5 – Final plan.....January 10, 21012

- Final plan adjustments & sign off
- Review report draft

Work session 6 – Present Draft MP.....February 11, 2012

- Present final draft report

NC STATE UNIVERSITY

WORKSHOP 2 - MEETING MINUTES

Meeting Minutes

Project: **NCSU Yarbrough Drive MP** Project Number: 2010057.01
Work Session 1
Purpose: Site assessment / preliminary concepts
Meeting Location: NCSU
Meeting Date: 11/8/12
Prepared By: Jay W. Smith RLA, ASLA, LEED AP

Attendees:					
Name	*Company*	*Initials*	*Name*	*Company*	*Initials*
Jay W. Smith	O/A	JS	Ralph Recchie	NCSU	RR
Jonathan Parsons	O/A	JP	Tom Kendig	NCSU	TK
Rick Ericson	O/A	RE	Pete Fraccaroli	NCSU	PF
Lisa Johnson	NCSU	LJ	Alan Daeke	NCSU	AD
Robert Mathes, Jr	NCSU	RM	Jeff Hightower	NCSU	JH
Dave Josephus	NCSU	DJ	Cameron Smith	NCSU	CS
Sarah Ketchem	NCSU	SK	Tom Skolnicki	NCSU	TS
Bill Davis	NCSU	BD	Jeff Delpinal	NCSU	JD

Distribution:	
Name	*Company*
All Attendees	
O/A File 201057.01	
Carolyn Axtman	NCSU

Bold type initials below indicates action items that need to be addressed at next meeting.

ITEMS	NOTES/ ISSUES/ ACTION	RESP	DUE DATE
1.0	JS welcomed everyone and the meeting's agenda was reviewed.	Record	
2.0	JS gave an update on the traffic study progress. The work will be done by Ramey Kemp Associates(RKA). The field work will begin the week of Nov.11. The three intersections to be evaluated are: • Stinson and Dan Allen • Stinson and Yarbrough • Beaver and Pullen An update from RKA will be presented at the next work session.	Record	
2.1	TK indicated that there is existing traffic information in the areas being studied by RKA. TK will find the info and send to O/A (through BD) so we can adjust our study areas if need be.	**BD/ TK**	**a.s.a.p.**
2.2	JS gave an overview of the easements and rights recorded in the RxR right of way. The first recorded documents reviewed date back 1904 and are as current as February 2012. The easements appear to be comprehensive in that they account for all the know improvements made by NCSU inside the RxR right of way. All agreements state that NCSU is responsible for the maintenance of the improvements and that if improvements are not maintained the agreements are nullified. Also the agreements state that NCSU 'holds harmless' the RxR for any claims, cost etc….	Record	
3.1	Jonathan Parsons gave an overview of the project area through a series of photographs of the project area. Reactions and thoughts from those attending include the follow: • There are parts of the Yarbrough drive walking areas that appear to be disconnected from the campus – "it appears your leaving the campus"…. • The recycling areas need to be properly screened • 2 of 3 tunnels are not ADA compliant – due to their steps. A study of how to bring them into compliance was discussed • TS offered that a parking deck plan (North Deck), in Design Development phase, is prepared for the Riddick Parking Lot area and it evaluated the ADA conditions at the tunnel. O/A will review these – BD to get us copies of the plans. **Action BD 11-16-12** • Pedestrians are currently climbing a fence and jumping off retaining wall at the Yarbrough utility plant – team to look at alternate acceptable routes • The boilers in the yard area at the plant are temporary and will be removed from the yard • A fair amount of parking is occurring in the Yarbrough plant yard area – it is not formal or recognized on the campus parking plan – but a significant number of utility vehicles are parked in this location • The team will consider the elimination of the pedestrian tunnel at the Coliseum when the Talley pedestrian overpass is in place • The team is look for a new location for the dumpsters at Bureau of mines / Dabney Cox • It was noted that Dabney Cox has heavy deliveries – gases etc… • The location of the light rail station was discussed near Dan Allen Drive – the team will factor this into the plans • The site study area was asked to be extended at Syme Hall – we will edit this area and show at the next work session • There is a duct bank running through portions of Yarbrough drive. The extents of this duct bank need to be clarified	Record	
3.2	JP presented a Utility survey of the study area. It was noted by several that there is inaccurate information on the survey plans – especially in regard to the duct banks and chilled water lines. Also a water line exist at Pullen Drive at the bridge over the RxR. BD to meet with facility group to review this and provide us with a updated utility survey	**BD**	**11-20-12**
3.3	It was mentioned that the light rail study in 2003? did a utility survey – BD to get a copy of that plan to the team	**BD**	**11-20-12**
3.4	JP presented a 2 flow diagrams of the project area for pedestrians and vehicles	Record	
4.0	JS informed the team that meetings will soon be held with key stakeholders including: • TTA (Jaunita Swink) • Steam Plant – key personnel	Record	

NCSU Yarbrough Drive MP – meeting minutes

4.1	A potential meeting with the RxR was discussed – however the team was directed <u>not</u> to meet with them at this time	Record	
4.2	The parking count is still needed in the project area	**TK**	**a.s.a.p.**
5.0	JS reviewed the project schedule. The following are the future work session dates and times: • Work session 3 Nov 27 10:00 – 12:30 • Work session 4 Dec 12 3:00 – 4:30 • Work session 5 Jan 10 1:00 – 3:30 • Work session 6 Feb 11 1:00 – 2:30	Record	
6.0	The meeting was concluded	Record	

Make any corrections or edits to the writer as soon as possible

Post script – a few edits to the meeting minutes from work session #1 were offered after work session #2 was conducted – they are:

From 4.0 the following:

- New gate at Dan Allen is not currently in place. Please check NCSU transportation website for timeline.
- Facilities have permission to demolish Riddick Field House. Timeline TBD.
- Yarbrough Drive is currently two-way traffic until the road splits at the southern parking lots just past Stinson Drive (midway at Broughton Hall).
- Yarbrough Drive is not a major pedestrian pathway east to west, however, it serves (3) tunnel access points north to south, which are major pedestrian pathways.

Attachments:

Plans presented at meeting including - Utility plan, traffic flow, pedestrian flow, service access and study area

NC STATE UNIVERSITY

WORKSHOP 3 - MEETING MINUTES

Meeting Minutes

Project: **NCSU Yarbrough Drive MP** Project Number: 2010057.01
Work Session 3
Purpose: Traffic review / concept direction
Meeting Location: NCSU
Meeting Date: 11/27/12
Prepared By: Jay W. Smith RLA, ASLA, LEED AP

Attendees:

Name	*Company*	*Initials*	*Name*	*Company*	*Initials*
Jay W. Smith	O/A	JS	Ralph Recchie	NCSU	RR
Jonathan Parsons	O/A	JP	Tom Kendig	NCSU	TK
Rynal Stephenson	RKA	RS	Alan Daeke	NCSU	AD
Lisa Johnson	NCSU	LJ	Jeff Hightower	NCSU	JH
Robert Mathes, Jr	NCSU	RM	Tom Skolnicki	NCSU	TS
Dave Josephus	NCSU	DJ	Jeff Delpinal	NCSU	JD
Bill Davis	NCSU	BD	Carolyn Axtman	NCSU	CA
Cameron Smith	NCSU	CS			

Distribution:

Name	*Company*	*Name*	*Company*
All Attendees		Sarah Ketchem	NCSU
O/A File 201057.01		Pete Fraccaroli	NCSU
Rick Ericson	O/A		

Bold type initials below indicates action items that need to be addressed at next meeting.

ITEMS	NOTES/ ISSUES/ ACTION	RESP	DUE DATE
1.0	JS welcomed everyone and the meeting's agenda was reviewed.	Record	
2.0	RS with Ramey Kemp Associates gave an overview of the traffic issues pertaining to the project area and the three intersections they studied. RS presented slides of the project area including preliminary recommendations on traffic flow. The following is the general exchange of comments from the group: • The Yarbrough Drive intersection at Pullen road is very constrained – at best a 'right in – right out' arrangement might be considered or just one way condition to Boney drive. The group decided that the best course of action was to keep the Baver Drive portion of the study one-way only. • Stinson will factor heavily into the Yarbrough traffic flow – one versus two way and hybrids thereof • Bus stop locations on both Yarbrough and Stinson will be examined as well • The Pullen Road extension project was mentioned – it was agreed it should not impact this project • Regardless of one way / two way and alignments – the team should maximize the number of parking spaces along Yarbrough Drive • While pedestrian walks / conditions should be 'cleaned up' and 'gaps' filled in – emphasis on pedestrian moves should be oriented toward the north and south i.e. Stinson & bridge and tunnel crossings • The traffic flow diagrams will be refined and presented again at the next work session • AD indicated that approx. 30-40 service vehicles park in the Yarbrough plant area	Record	
3.0	JP gave an overview of the TTA station proposals in the RxR right of way. The following is the general exchange of comments from the group: • The old TTA station location form 2005 - behind Broughton - is no longer desired • Best location for a light rail station is going to be nearer to Dan Allen drive • TTA has a 2011 schematic plan – O/A will try to get a copy of this plan • JP reviewed the pedestrian bridge from Talley Center - the clearance where Yarbrough Dr goes beneath it should be a min of 13'-6" the team will continue to study this	Record	
4.0	Items still needed for the planning team to proceed include: the North Deck parking. One logistics issue discussed was that the info booth at the Pullen Drive entrance to campus will be removed as part of the North Deck project. Restricted access to campus will be part of the construction project, but will begin west of the new deck. At that point, Boney Drive will not be restricted access.	**TS/ LJ**	**a.s.a.p.**
4.1	Also still needed is the parking survey information	**TK**	**a.s.a.p.**
5.0	JP will meet with the Yarbrough plant staff on 11-28-12 to learn more specifically their needs and how the plant and its service area functions – JP will report on this meeting at the next work session	**JP**	**12-4-12**
5.1	JS informed the team that the next work session will include concepts for the project area	Record	
5.0	JS reviewed the project schedule. The following are the future work session dates and times: • Work session 4 Dec 12 3:00 – 4:30 • Work session 5 Jan 10 1:00 – 3:30 • Work session 6 Feb 11 1:00 – 2:30	Record	
6.0	The meeting was concluded	Record	

Make any corrections or edits to the writer as soon as possible

Attachments:

Plans presented at meeting including - Utility plan, traffic flow, pedestrian flow, service access and study area

NCSU Yarbrough Drive MP – meeting minutes

Meeting Minutes

Project: **NCSU Yarbrough Drive MP** Project Number: 2010057.01
Work Session 4
Purpose: Concepts / options
Meeting Location: NCSU
Meeting Date: 12/12/12
Prepared By: Jay W. Smith RLA, ASLA, LEED AP

Attendees:					
Name	*Company*	*Initials*	*Name*	*Company*	*Initials*
Jay W. Smith	O/A	JS	Ralph Recchie	NCSU	RR
Jonathan Parsons	O/A	JP	Tom Kendig	NCSU	TK
Rick Ericson	O/A	RE	Alan Daeke	NCSU	AD
Rynal Stephenson	RKA	RS	Jeff Hightower	NCSU	JH
Robert Mathes, Jr	NCSU	RM	Tom Skolnicki	NCSU	TS
Dave Josephus	NCSU	DJ	Pete Fraccaroli	NCSU	PF
Bill Davis	NCSU	BD	Carolyn Axtman	NCSU	CA
Cameron Smith	NCSU	CS			
Lisa Johnson	NCSU	LJ			

Distribution:			
Name	*Company*	*Name*	*Company*
All Attendees		Sarah Ketchem	NCSU
O/A File 201057.01		Jeff Delpinal	NCSU

Bold type initials below indicates action items that need to be addressed at next meeting.

ITEMS	NOTES/ ISSUES/ ACTION	RESP	DUE DATE
1.0	JS welcomed everyone and the meeting's agenda was reviewed.	Record	
2.0	JP gave and overview of his meetings with the Yarbrough Plant staff and waste management staff.	Record	
2.1	JP gave an overview of constraints across the project area based on the information gained in above mentioned meetings. The following was noted by the group in that review: • Many vehicles are parked behind the Bureau of Mines building – this is a congested area – it poses a safety issue. • The sidewalk along the west side of Broughton on Stinson Street is tight / congested at equipment areas – this also poses a safety concern. • The Harrelson Replacement project should remedy the service issues between Harrelson and Polk halls • The service dock at Polk was noted as too short – congesting and pedestrian traffic poses a safety issue • The 'Pit' at Mann Hall is difficult – 2 times a year pick up of debris etc… ….long range plan to convert Mann Hall to Phycology classroom use – this will remedy this situation. That said - this project will make recommendations on its improvement. • A pair of double doors was discussed at the east side of Riddick hall – there use is to be confirmed - but the group thought they were not an issue – perhaps just exiting? • An enclosed chain link fence area was discussed at the Yarbrough Plant – it protects electrical distribution switches – that need to remain – the generator and transformer though could be moved. • Access to the chillers and boilers at the back of the plant was discussed – a layby area needs to be planned for to service these pieces of equipment if traffic is introduced behind the plant. • We have shown a block diagram of the Riddick parking deck – we will update it to show a walkway parallel to its eastern edge and move the gatehouse check points inside the footprint.	Record	
3.0	JP gave an overview of Options 1, 2 and 3 and their Pro's and Con's. The options emphasize primary movements / flow of Yarbrough Drive. Discussion / comments on the options are described as follows: **Option 1:** • TS indicated that Inter-circulation back through campus will be difficult / inconvenient • Staging areas behind the Yarbrough Plant will be compromised • Expensive to relocate equipment (generators) behind plant • A possible improvement to the scheme would be to designate the area behind the pant as one way? Team will review. • Much of the below grade utilities behind the plant are aging and are at or near their functional life span – if utility plans propose the replacement of these utilities – organize those efforts with the Yarbrough MP recommendations. • AD pointed out the fueling locations around the Plant that need to be incorporated into the planning. • LJ asked if a 'straight line' connection could be made at the existing Yarbrough Drive down to the road behind the plant – team will review this – utility relocations etc… • While interesting – this option was not preferred **Option 2:** • Better bus stop locations • Better ability to interconnect internal to the campus • Edits would include – adjust connection of old / existing Yarbrough down to the access behind the Plant, move the access controls to the south side of the Riddick Parking Deck, consider pavement variations / textures to inform users, make Stinson one way once past Riddick Park deck. • Option 2 was generally preferred by the group **Option 3:** • Keeps the Yarbrough alignment essentially as it is today with some refinements. • Many comments similar to Option 1 repeated • This option was not preferred	Record	

NCSU Yarbrough Drive MP – meeting minutes

NC STATE UNIVERSITY

WORKSHOP 5 - MEETING MINUTES

Meeting Minutes

Project: **NCSU Yarbrough Drive MP** Project Number: 2010057.01
Work Session #5
Purpose: Concepts / options
Meeting Location: NCSU
Meeting Date: 1/10/13
Prepared By: Jonathan Parsons RLA, ASLA

Attendees:					
Name	*Company*	*Initials*	*Name*	*Company*	*Initials*
Robert Mathes, Jr	NCSU	RM	Alan Daeke	NCSU	AD
Dave Josephus	NCSU	DJ	Jeff Hightower	NCSU	JH
Bill Davis	NCSU	BD	Tom Skolnicki	NCSU	TS
Nessa Stone	NCSU	NS	Pete Fraccaroli	NCSU	PF
Lisa Johnson	NCSU	LJ	Carolyn Axtman	NCSU	CA
Sara Ketchum	NCSU	SK	Jonathan Parsons	O/A	JP
Tom Kendig	NCSU	TK	Rick Erickson	O/A	RE

Distribution:			
Name	*Company*	*Name*	*Company*
All Attendees			
O/A File 201057.01			

Bold type initials below indicates action items that need to be addressed at next meeting.

ITEMS	NOTES/ ISSUES/ ACTION	RESP	DUE DATE
1.0	JP welcomed everyone and the meeting's agenda was reviewed.	Record	
2.0	JP gave an reviewed the decisions made in Work Session #4 and then presented a Power Point of the updates to the Mater Plan (copy attached). The following was noted by the group in that review: • LJ asked O/A to show a phasing scenario that can be accomplished by phasing. Phasing specifically needed around field house/plant area as that is where the significant utility rework is required. • Constrain traffic behind Plant using one way signage and controlled access points. • LJ noted the field house may come down soon. JP reviewed the cross sections of the existing conditions. • *Section A – showed the site of the proposed rail station.* • *Section B – showed a typical section of parking each side of the 2-way cart path. JP to reletter section B in the power point slide* • Section C shows the maintenance of Yarborough, group discussed the light rail track bed width and its possible implications. • Section D shows the existing grade where rework will be needed, group asked that design team dash in steam tunnel • Section E, add Steam Tunnel, water line. AD will provide ROM cost for the relocation of the transformers and feeders. The ramp slope needs to be maintained at less than 10%, JP noted that 8% is max fire access and will examine the intersection further. • Section F – shows the existing condition between electrical equipment and rail bed • Section G @ tunnel field hose to be demolished.... • Section H LJ asked to add the profiles of the dormitories in background to show the constraint at intersection of Baver and Pullen Road.	Record	
3.0	JP reviewed the concept plans. Discussion / comments on the options are described as follows: • Page 14 - LJ asked that show light rail station vs. commuter rail in document for now. • Page 15 - BD suggested relocation 6 to between 3 & 4.... • Page 17 - LJ indicated that Mann Hall would be reconfigured possibly removing the center section. LJ asked to show a Phase 1 and 2 on how the tunnel functions initially and how paths work when removed. • Page 18 AD wants a turn out for the tanker truck at the SW corner of the future parking deck and relocate the gate to the parking garage entrance. AD asked for the overhead door shown and associated paving on the SE side of the Plant. • LJ asked for an overlay of the concept plan showing the overall light rail location to plans. JP will send to team through BD as a followup.	Record	
4.0	Lisa instructed O/A to include Phased Construction break-out in the Cost Estimate and Isit the cost estimate assumptions.		
5.0	JP reviewed the project schedule. The following are the future work session dates and times: • Draft Cycle 1 PDFGT send to NCSU 1-25-13 • Work session 6 Feb 11 1:00 – 2:30 to reviews Draft Cycle 1	Record	
6.0	The meeting was concluded	Record	

Please Make any corrections or edits to the writer as soon as possible

Attachments:

PDF - Plans presented at meeting.

Meeting Minutes

Project: **NCSU Yarbrough Drive MP** Project Number: 2010057.01
Work Session #6
Purpose: Report draft review
Meeting Location: NCSU
Meeting Date: 2/11/13
Prepared By: Jay W. Smith RLA, ASLA

Attendees:					
Name	*Company*	*Initials*	*Name*	*Company*	*Initials*
Robert Mathes, Jr	NCSU	RM	Alan Daeke	NCSU	AD
Dave Josephus	NCSU	DJ	Jeff Hightower	NCSU	JH
Bill Davis	NCSU	BD	Tom Skolnicki	NCSU	TS
Nessa Stone	NCSU	NS	Pete Fraccaroli	NCSU	PF
Lisa Johnson	NCSU	LJ	Carolyn Axtman	NCSU	CA
Sara Ketchum	NCSU	SK	Jonathan Parsons	O/A	JP
Tom Kendig	NCSU	TK	Jay Smith	O/A	JS

Distribution:			
Name	*Company*	*Name*	*Company*
All Attendees			
O/A File 201057.01			
Rick Erickson	O/A		

Bold type initials below indicates action items that need to be addressed at next meeting.

ITEMS	NOTES/ ISSUES/ ACTION	RESP	DUE DATE
1.0	JS welcomed everyone and the meeting's agenda was reviewed.	Record	
2.0	Prior to this work session – O/A was asked to prepare a plan that illustrated what Yarbrough Drive would look like if the RxR expanded their tracks, as once planned, to the north. O/A prepared this 'contingency' plan and the group reviewed it. The following reflects the discussion: • The exhibit shows that a substantial amount of parking would be eliminated. • A two way road condition could be maintained for most all the Yarbrough Drive area – though a single lane will be behind the plant. • This plan will not be part of the report. • Many critical utilities and associated equipment would be impacted.	Record	
3.0	A page by page review of the report draft was conducted. General discussion included the following: • Be consistent in naming campus buildings and elements • Add bldg names and road names • Add north arrow and scales to plans • Add text about grading transitions and grade challenges • Add captions to all photos • Improve legibility of some of the maps – improve contrast • Reference the parking study – show parking figures / numbers • Be sure to follow reg's on the NCSU logo use • Crate an appendix – bind in mtg min's, staff comments etc.…		
3.1	Nessa Stone indicated she had revisions to our exhibit showing the campus waste collection sites –Nessa to forward this plan to us.	**NS**	**asap**
4.0	Next steps are as follows: • O/A to produce next cycle of report draft and label it 'final draft' • NCSU staff will review the final draft and will need a 2-3 week time frame • O/A will pick up edits and submit finished copies of the document to Bill Davis	Record	
6.0	Everyone was thanked for their comments and the meeting was concluded	Record	

Please Make any corrections or edits to the writer as soon as possible

Attachments:

PDF – draft report

NCSU Yarbrough Drive MP – meeting minutes

3.1	The group agreed that Option 2 was the preferred option / approach in terms of flow and meeting the many needs of the surrounding buildings and campus at large. O/A will refine / edit Option 2	**JP/JS**	**12-14-12**
4.0	JS informed the team that the next work session will include a review of 'hybrid option 2' concept and its further refinement	Record	
5.0	JS reviewed the project schedule. The following are the future work session dates and times: • Work session 5 Jan 10 1:00 – 3:30 • Work session 6 Feb 11 1:00 – 2:30	Record	
6.0	The meeting was concluded	Record	

Make any corrections or edits to the writer as soon as possible

Attachments:

PDF - Plans presented at meeting including – Constraints overview plan, options 1, 2 and 3

PDF - Option 2 hybrid marked up per the discussion

Capital Project Management
Box 7520 Raleigh, North Carolina 27695-7520

DESIGN REVIEW COMMENTS
NORTH CAROLINA STATE UNIVERSITY

Project Number: 2008 20026
Project Name: Yarbrough Drive Master Plan
Project Manager: Bill Davis
Design Phase: Planning Study
Discipline:
Consultant: O'Brien Atkins
Reviewed by: Bill Davis

Date of Comments: **March 13, 2013** **Date of Response: April 5, 2013**

COMMENTS	RESPONSES
1. Page 5: Provide more context to the view area. The page should allow from Hillsboro to Western. Add general labels	1. Will comply
2. Existing parking and proposed parking needs to be addressed, with quantities of different types of parking identified (service, staff, residential, etc.).	2. On Nov 27, 2012 we rec'd parking info we had requested – NCSU reported to us that 379 spaces exist in the study area. No breakdown of spaces was given. A parking study was not part of our scope of services. We will note the 379 spaces in the study area – and the number of spaces impacted by the recommendations.
3. Page 19: lines for railroad ROW are difficult to see compared to the utility lines	3. We will highlight the RxR Rails
4. Page 24: More context could show the steam plant in the background	4. We will show - as accurate as possible - the steam plant outline
5. Page 25: Box under plinth looks like it might be the steam tunnel – label as such or remove. Page 24 shows the retaining wall and rail. Is the ewall/rail missing at this location.	5. This is the steam tunnel and has been labeled as such. Rail added
6. Page 27: No more field house. Review for existing conditions. One of the student presentations showed the possibility of grade access at the Fieldhouse tunnel – north side. Is this possible?	6. We reference it's scheduled demolition – 'on grade' access would be difficult on the north side.
7. Pages 30-35: Show building names	7. Will comply
8. Append comments and responses to the appendix.	8. Will comply

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NORTH CAROLINA STATE UNIVERSITY

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Project Manager: Bill Davis
Design Phase: Planning Study
Discipline:
Consultant: O'Brien Atkins
Reviewed by: Facilities Operations

Date of Comments: **April 9, 2013 Date of Response: April, 2013**

COMMENTS	RESPONSES
9. What is the net change in parking spaces for the SV vehicles for the Yarbrough Plant and the BM&O zone workshop at SAS? JH	9. See response to comment #2 page 1.
10. Also did you include the possible additional space requirement for the future emergency generator for the Yarbrough Plant? It is labeled in the report, however, there is not a footprint shown on the drawing indicating that the future generator will fit with the site constraints. JH	10. We were not directed to accommodate an additional emergency generator – if this new requirement is intended - this will need to be studied further.

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Project Manager: Bill Davis
Design Phase: Planning Study
Discipline:
Consultant: O'Brien Atkins
Reviewed by: Tara Lanier, Tom K., Brian O'Sullivan - Transportation

Date of Comments: **March 13, 2013** **Date of Response: April 5, 2013**

COMMENTS	**RESPONSES**
11. On page 7, the legend transposes labels for one-way and two-way circulations.	11. We will correct this
12. On page 8, Dan Allen is closed "9"am until 5pm, not 8am until 5pm.	12. We will make this edit
13. On page 10, there is a partial sentence "only be accessible from …."	13. We will edit the sentence and overall paragraph
14. On page 14, Dan Allen "drive", not road (check this throughout set).	14. Will comply
15. On page 16, Court of "North" Carolina ….. pick trucks??	15. We will edit & correct
16. On page 17, on Photo 12, the Riddick lot is now Boney Lot.	16. We will edit the caption
17. On page 21, Dan Allen "Drive"	17. We will edit
18. On page 28, what is "Cart Path"? On photo 28, it's Baver "Drive", not Street.	18. Cart path is the drive ailses – we will use a better term
19. On page 33, the light rail would not diverge from existing tracks as depicted.	19. We were not aware of an alternative rail alignment – no plans were shared with us showing otherwise. Provide plans and we will attempt to edit the plan.

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20. On pages 39-41, the parking impacts need to be identified and should include a cost of $17,500 for each space lost due to improvements.	20. See response to comment # 2 – page 1. We will show impacted parking spaces and extend the math at $17,500.00 per space impacted.
21. Transportation notes that the design scenario is shorter term that the 20-year planning horizon of the CMP, but it is unclear what that "foreseeable" future timeframe is. While considerable uncertainty about future funding for light rail track (LRT) placement and campus station siting does exist, the university's ongoing planning consultations for regional rail infrastructure have consistently affirmed a preliminary design and engineering scenario that would displace much of NC State's use of Yarbrough now located in the 200 foot rail right of way. This design assumes no LRT trackage whatsoever and no adverse displacement impacts on this section of campus. The station location as shown is tentative, and somewhat irrelevant.	21. Agreed - but no other station location has been provided or is known. The NCSU improvements in the RxR ROW are noted and are subject to removal or adverse impact by the operating RxR authority.
22. At the very least Transportation suggests that the design effort generate a Yarbrough alternative that reflects a longer-term scenario incorporating LRT and associated displacement impacts. This would force the issue, useful in the CMP context, of what the adverse mobility effects would look like and how some could be mitigated.	22. The team agreed at the beginning of this process that the plan recommendations would continue to be sited in the RxR ROW and not to develop - an alternative suggesting otherwise.

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Reviewed by:

Date of Comments: **March 13, 2013** **Date of Response: April 9, 2013**

COMMENTS	**RESPONSES**
23. Elimination of parking spaces. There is not enough parking on this part of campus as is. It is not a pedestrian area so the gain is little, but loss is a lot.	23. No comment by designer
24. Elimination of coliseum tunnel. Makes it a longer walk to get to the other side of campus, Talley, gym, etc.	24. The Tally Center Ped bridge is anticipated to improve this issue.
25. Plantings near the greenhouses can't block the sunlight.	25. Agreed – final planting designs will address this

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Consultant: O'Brien Atkins
Reviewed by: Mark Michaelson – CPM CM

Date of Comments: **April 9, 2013** **Date of Response:**

COMMENTS	**RESPONSES**
26. p.7 – Traffic circulation colors appear to be "reversed" on legend. Diagram appears to use pink for two-way and purple for one-way, rather than vice versa as on legend.	26. We edit & fix this
27. p.9 – Photo 7 caption may be incorrect. If I'm not mistaken, this appears to be a view of Yarbrough Drive looking north, rather than Stinson Drive looking west (Riddick to the left, Language & Computer Lab to the right)…?	27. We believe it to be accurate – will confirm with others
28. p.10 – First paragraph, third and fourth sentences do not make sense.	28. Agreed – we will edit
29. p.10 – Legend appears to be "reversed" here as well, relative to the diagram (i.e. primary / secondary service roads). Or, perhaps I am misunderstanding. First paragraph, first sentence seems to indicate that Yarbrough Drive is a primary service road.	29. We will edit
30. p.11 – Paragraph states that Yarbrough Drive is a major pedestrian corridor and that Coliseum Tunnel has highest volume of pedestrian movement. Diagram appears to indicate that these are secondary paths. This seems contradictory.	30. Agreed – we will edit text to read 'secondary path' to resolve any confusion – the map shows this correctly.
31. p.31 – Curious about concept plan for east end of Yarbrough Chiller Plant and how access to large roll-up doors would be addressed. Plan appears to not maintain any access to these openings.	31. Access would be maintained - we will confirm
32. p.41 – Figure 31 appears to be mislabeled; should be Area C, not Area B.	32. We will edit

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Discipline:
Consultant: O'Brien Atkins
Reviewed by:

Date of Comments: **March 13, 2013** **Date of Response: April 5, 2013**

COMMENTS	RESPONSES
33. Please place NCSU Project Number on your Review Document? On the first page will be sufficient... Thank You	33. Will comply

DESIGN REVIEW COMMENTS
NORTH CAROLINA STATE UNIVERSITY
Project Number: 2008 20026
Project Name: Yarbrough Drive Master Plan
Project Manager: Bill Davis
Design Phase: Planning Study
Discipline:
Consultant: O'Brien Atkins
Reviewed by: Steven R. Bostian
Date of Comments: **April 8, 2013**
Date of Response:

COMMENTS	RESPONSES
34. Page 6 – Paragraph 2 – Reference is made to the Riddick Tunnel located directly south of the field house. Since the field house has been demolished, a new landmark may need to be identified instead of the field house.	34. Agreed – we will need direction from NCSU team on this though
35. Page 10 – Paragraph 1, Sentence 3 – Sentence 3 needs to be rewritten. As it is currently written, it does not make good sense.	35. Agreed – we will edit
36. Page 35 – Area C Concepts – If I understand the concept correctly, then it appears that there is only 1 lane of traffic in Yarbrough Drive south of the Yarbrough Utility Plant. Has the design team thought about making Yarbrough Drive 2 way along the entire distance between Dan Allen Drive and Pullen Road? I think that 2-way traffic would make for better circulation. Just curious.	36. The bridge abutment at Pullen Drive 'pinches' the width and thus ability for a 2 way movement

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Design Phase: Planning Study
Discipline:
Consultant: O'Brien Atkins
Reviewed by: Utilities & Engineering (Shanna Harwell (sh))

Date of Comments: **March 13, 2013** **Date of Response: April 5, 2013**

COMMENTS	RESPONSES
37. No comments from Utilities & Engineering. /sh	37. thanks

DESIGN REVIEW COMMENTS
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Consultant: O'Brien Atkins
Reviewed by:

Date of Comments: **April 8, 2013** **Date of Response:**
Comments Provided by: Wolfpack Campus Solutions (Senior Design CE400 Firm 1)

Tunnel Section Comments: Provided by Team 1

COMMENTS	RESPONSES
38. Under pedestrian circulation the Free Expression is mentioned but it doesn't not even impact Yarbrough because the intersection is not at grade (pg. 14)	38. Agreed - will edit the paragraph to note this and eliminate any confusion
39. LOS for tunnels should be provided as well as volumes	39. 'Level of Service' is not a part of this study?? Need to clarify this question.
40. Tunnels were expressed as traffic only traveling North, but that same traffic must travel south on the return trips	40. Agreed – we will edit any reference to 'one way' tunnels.

41. The plan does not account for a proper station length (the platform must be ~400 ft. long to accommodate 3-4 commuter rail cars)	41. We have shown the platform as given to us from NCSU – only conceptual plans were available.
42. The station requires rail switches, which would not be feasible for a commuter rail project.	42. Agreed - Not sure if this pertains to this study
43. The station is in a good area to minimize impact on utilities	43. Agreed – we might need clarification on this comment
44. The station has good pedestrian access	44. OK
45. The rail station located at Dan Allen seems to use the existing track – so it is assumed that this station is a commuter rail station.	45. The latest plans we understand is that commuter rail is the intention – however light rail was also discussed

46. No space has been allotted for future construction of a light rail station.	46. Agreed - - but this is concept only
47. Triangle Transit has specified future development of light rail corridor on the north side of the existing heavy-rail tracks.	47. Perhaps - but we are not fully aware of their plans
48. The heavy-rail commuter station is located to the north of the existing tracks. This creates a conflict with the light rail station.	48. Perhaps - but we are not fully aware of their plans
49. Switches are present on this Master Plan and the North Carolina Railroad will not allow switches unless absolutely necessary.	49. Perhaps - but we are not fully aware of their plans
50. There is not room for light rail tracks which will cut into Yarbrough when developed.	50. Perhaps - but we are not fully aware of their plans
51. Recommendation: place light rail station to the north of the tracks. Adjustments will have to be made to Yarbrough to fit the tracks.	51. We are hesitant to modify this as we are not fully aware of their plans

52. Will this plan still work if new light rail tracks need to be laid down on the north side of the current tracks?	52. No that impact would disrupt the plans. The team agreed not to depict this possibility.

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53. Will all parking along Yarbrough Dr. be demolished?	53. No - only a portion – we will estimate the qty.
54. What are the benefits of Yarbrough becoming 2-way behind Broughton, Mann, and Riddick Halls?	54. Better all-around mobility and freedom of movement to Dan Allen or Stinson
55. Will the Coliseum Tunnel be demolished when the sky bridge is constructed?	55. NCSU will need to reply to this comment

56. Page 29/34: Would there be enough room for two directions of travel on Yarbrough Drive if the Light Rail tracks are put in?	56. No that impact would disrupt the plans. The team agreed not to depict this possibility.
57. Page 35: Point 4 -- what type of access control? Just to keep vehicles out, or also peds/bikes?	58. Control in from of a gates
59. Page 35: Point 9 -- How are the fuel trucks expected to reach the filling point (e.g., up Yarbrough from Dan Allen, down Baver/Yarbrough from Pullen, down	60. Dan Allen to the rear of Plant
61. Page 35: Point 10 -- what kind of barrier? As it is, students climb/jump down the ~15 foot wall between SAS Hall and the Language/Computer Lab.	62. A barrier type railing with pickets - to prevent the action you mention
63. General: Is there a rough estimate of the construction scheduling for the phases (start/end dates, assuming all goes as is planned)?	64. No forecast regarding const schedule were made
65. You have miss-labeled a photo that is not even an intersection of students crossing, the intersection labeled is further down Stinson Dr. – pg. 8 photo 5 (Team 1)	66. We will edit the caption
67. You have a miss-labeled a photo as “looking West” when it is really looking east. – pg. 9 photo 7 (Team 1)	67 We will confirm and edit if needed
68 Names of building are commonly incorrect (Team 1)	68. We will confirm and edit if needed

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69 Looking direction (East or West) should be provided for cross-sections (Team 1)	69 We will add this note
70 There are no considerations for a light rail system and how that system would interact with both the commuter rail station (located at Dan Allen) as well as the alignments of Yarbrough (Team 2)	70. Perhaps - but we are not fully aware of their plans
71 The legend on page 7 has the "one-way" and "two-way" terms mislabeled (Team 4)	71. we will edit this
72 Page 18-19: Although marked in Figure 8, no mention of plans for working around the natural gas lines is made in the utilities section. (Team 5)	72. we will add language to that effect
73 Page 24: Photo 21 is of Mann Hall, not Riddick Hall. (Team 5)	73. we will edit
74 Have there been any specific considerations for bikes? (Team 5)	74. not specifically – though the plan does not exclude them