

ISAAC BEAR EARLY COLLEGE HIGH SCHOOL

UNCW + New Hanover County Schools

ADVANCED PLANNING REPORT

July 24, 2023



CMTA

SCO # 22-25774-01, CODE: 42128, ITEM: 306

THIS PAGE IS INTENTIONALLY LEFT BLANK.

TABLE OF CONTENTS

Project Scope + Program	1.0
Executive Summary	1.1
Design Team	1.2
Steering Committee	1.3
Process	1.4
Community Engagement Discoveries	1.5
Program	1.6
Concept Design	2.0
Site Analysis	2.1
Site Design	2.2
Building Layout	2.3
Concept Plans	2.4
Inspiration Imagery	2.5
Engineering Design	3.0
Structural	3.1
MEP	3.2
Daylighting Design	3.3
Preliminary Project Budget + Schedule	4.0
Schedule	4.1
Program Validation	4.2
Cost Estimate	4.3
Appendix	5.0
Input Process and Programming	5.1
Teacher Feedback Results	5.2

THIS PAGE IS INTENTIONALLY LEFT BLANK.

I.0

PROJECT SCOPE + PROGRAM

Executive summary	1.1
Design Team	1.2
Steering Committee	1.3
Process	1.4
Community Engagement Discoveries	1.5
Program	1.6

THIS PAGE IS INTENTIONALLY LEFT BLANK.

I.I EXECUTIVE SUMMARY

The Isaac Bear Early College High School facility design is a collaborative effort between the North Carolina Department of Public Instruction, New Hanover County Schools, and UNCW's College of Education.

The scope of the project is the design of a new facility for the Isaac Bear Early College High School, which is currently located in modular units along MacMillan Avenue. The predetermined site on UNCW campus has been analyzed for constraints and opportunities, utilities, vegetation, solar orientation, traffic flow, pedestrian paths, connection to adjacent buildings and pathways on campus, and other elements that may impact the functionality of the site and building. The following design studies illustrate these features.

IBEC currently has 200 students with a goal to eventually reach a population of 400 students. A previously developed preliminary program anticipated the area of the building as 44,300 SF. The preferred design identified during the planning studies includes additional informal study spaces and mechanical and electrical spaces for a total of 45,000 - 50,000 SF. This design document includes a complete programming phase confirming the program and square footage. The programming phase included the development of custom questionnaires for students, parents, and staff as well as a full-day interactive Visioning Session with students and staff. Data collected from the questionnaires and Visioning Session guided the development of the final building program.

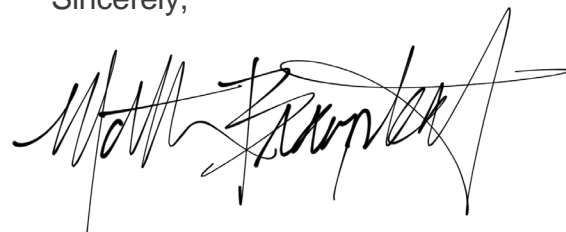
Based on the program approved by UNCW and NHCS, the design team has developed conceptual building designs at the bubble-diagram level of detail to study building orientation, energy efficiency, daylighting, and other sustainable, energy efficient design strategies.

The building will be designed to UNCW and NHCS design guidelines. If a discrepancy is found between the two sets of guidelines, it will be brought to the attention of UNCW and NHCS by the design team so that direction can be given regarding the standard to which the design team should adhere.

The program and preliminary building studies have been referenced to create a project budget and schedule. Barnhill has been selected as the CMaR and has provided input on design options, constructability, phasing, information regarding market trends, and estimated construction costs.

The following document is a compilation of the discoveries and outcomes of the advanced planning phase. We look forward to the opportunity in sharing these design documents and thank you for the opportunity for our design team to assist in this process.

Sincerely,



Matt Bramstedt, AIA
LS3P | K12 Sector Leader

I.2 DESIGN TEAM



Architectural
LS3P

Laura Miller, AIA, LEED AP, Vice President, Principal
Matt Bramstedt, AIA
Mary Beth Branham, AIA, Vice President, Principal



Civil Engineering
Paramounte Engineering, Inc.

Rob Balland, PE, LEED AP, President
Allison Engebretson, RLA



Landscape Architecture
CLH Design

Zak Pierce, ASLA, PLA, Vice President
Heather Rhymes, PLA



STEWART

Structural Engineering
Stewart Engineering

Charles Lewis, PE, Vice President
Tom McClane, PE



MEP Engineering
CMTA

Zac Schneider, PE, Principal
Stephen Robey, PE



Wetland Services
ECS Southeast

Brandon Fulton, LSS, PSC, PWS
Jonathan Grubb

I.3 STEERING COMMITTEE



Faculty & Staff
Isaac Bear Early College

Ronald Villines, IBEC Principal
Teachers & Staff



Faculty & Staff
UNCW

Mark Morgan, Associate Vice Chancellor Business Affairs
Rachel Patrick, Director of Architectural and Construction Services
Zachary Manfredi, Project Manager
David Holsinger, Project Manager
Van Dempsey, Watson College of Education Dean
Nic Troutman, Institutional Research and Planning
Frances Carter, Watson College of Education & UNCW Liaison with Isaac Bear
Candace Thompson, Watson College of Education
David Cook, Interim Associate Director Parking & Transportation
Gino Galutera, Associate Vice Chancellor for Business Services
Feletia Lee, Chief Sustainability Officer
Natalie Lucero, Executive Assistant to the Assistant Dean for Community Engagement



Faculty & Staff
NHCS

Eddie Anderson, Assistant Superintendent of Operations
Leanne Lawrence, Director of Facility Planning and Construction
Chuck Silverstein, School Safety Executive Director
Dr. Lo DeWalt, Director of Curriculum & Instruction

I.4 PROCESS

PROJECT INTRODUCTION

Steering Committee Success Factors + Big Picture Goals

COMMUNITY ENGAGEMENT

IBEC Parent + Student Survey + UNCW + NHCS Survey

IBEC Teacher + Staff Survey

All-Day Visioning Session

Morning Session - Students

Afternoon Session - Teachers

INPUT SYNTHESIS + PROGRAM DEVELOPMENT

Survey + Visioning Session Takeaways

Program Validation

PROGRAMMING + DESIGN

Site Analysis + Design Studies

Building Program Diagrams

Engineering Systems

COST

Concept Cost Estimate

1 INNOVATION + CONNECTIVITY

CREATE SENSE OF COMMUNITY + CONNECTION OPPORTUNITIES

2 DESIGN PROCESS

COLLABORATIVE, ENGAGING, THOROUGH DESIGN

3 NEEDS AND PROGRAM

CREATE A DESIGN THAT IS "MORE THAN A BUILDING", INNOVATIVE

4 VISION

STATE-OF-THE-ART FACILITY | MODEL SCHOOL FOR EARLY COLLEGE



I.5 COMMUNITY ENGAGEMENT

INDOOR SPACES - STAFF COMMENTS

- Outdoor connections
- Designated lab spaces
- Variety of learning spaces
- Quiet study areas
- Flex classroom space

KEY DESIGN DRIVERS

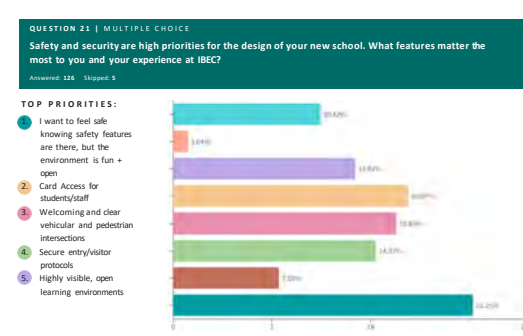
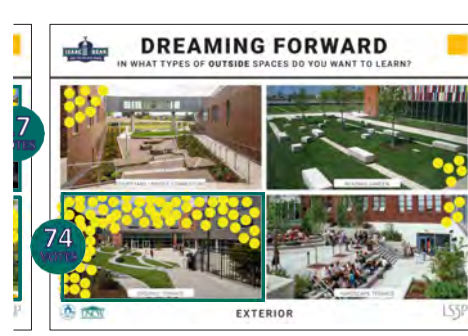
- Student collaboration within and outside of classroom
- Flexibility of spaces
- Holistic approach to health
- Visibility for lighting, supervision, and safety
- Have technology incorporated into spaces
- Storage
- Staff accessibility to HVAC/Utilities

OUTDOOR SPACES - STAFF COMMENTS

- Open, simplistic design would be best
- Students seemed drawn to aesthetic spaces

KEY DESIGN DRIVERS

- High visibility spaces
- Create spaces for individual relaxation or group collaboration
- Opportunities for sports
- Limited space, need to focus on return of value on outdoor spaces
- Georgian façade on front with private courtyard at back of school
- Blacktop for basketball other recreational games
- Parking at UNCW would leave more room for Outside spaces



I.6 PROGRAM

ISAAC BEAR EARLY COLLEGE HIGH SCHOOL

400 STUDENTS - 9th - 12th

200 9th + 10th Grade Student Core (including growth), 11th + 12th to use shared spaces only

19-Jan-23

CLASSROOMS						
SPACE	Number of Students (in each)	Number of Spaces	Student Capacity	S.F. @	S.F.	NOTES
Core Academic Areas						
9th Grade Classrooms						
Social Studies	25	1	25	850	850	Currently only 1 teacher per curriculum
English	25	1	25	850	850	
Science Classroom/Lab A	25	1	25	1,200	1,200	Earth/Env and Marine Science & Biology
Shared Prep Area		1		250	250	
Math	25	1	25	850	850	
CTE (Word, PowerPoint, Excel)	25	1	25	850	850	Project management or other curriculum to teach software
10th Grade Classrooms						
Social Studies	25	1	25	850	850	Currently only 1 teacher per curriculum
English	25	1	25	850	850	
Science Classroom/Lab B	25	1	25	1,500	1,500	Chemistry and Physics
Shared Prep Area		1		250	250	
Math	25	1	25	850	850	
Spanish	25	1	25	850	850	
Shared by 9th and 10th Grade						
Health Classes & PE		0	0	-	0	3 UNCW Student teachers/each classroom to teach IBEC students (Typically 25 student teachers)
Subtotal Freshman and Sophomores			200			80% Utilization

SPACE	Number of Students (in each)	Number of Spaces	Student Capacity	S.F. @	S.F.	NOTES
11th and 12th Grade						
Touch Down Between Classes at UNCW		2		400	800	dispersed)
All Grade Levels Shared Spaces						
Tutoring Spaces		6		150	900	Shared and accessible by all grade levels
Distance Learning / Zoom Meetings		1		300	300	Visibility into room, 5 students max
Outdoor Classrooms		2		-	0	Shared and accessible by all grade levels
Shared Collaboration Space		1		1,700	1,700	Potential Space; Subdivideable into 2 typ classrooms
Student Maker Space		1		400	400	Science Olympiad, copier, work area
Teacher Spaces						
Teacher Center - Workroom		2		300	600	1 room/floor
Break Room		2		150	300	coffee, vending
Conference/Small Group Collaboration		2		150	300	
Large Teacher Collaboration Room		1		600	600	group collab, shared by all 20 teachers
Grade Level Storage		2		200	400	
Staff Toilets		2		60	120	
Other						
Book Room		1		400	400	locked closet within room for testing storage
Subtotal Core Academic					16,820	
Other Spaces/Technology/Storage						
SPACE	Number of Students (in each)	Number of Spaces	Student Capacity	S.F. @	S.F.	NOTES
AV/Equipment Storage		1		300	300	Laptop storage
Head-In Room		1		250	250	
Subtotal Other					550	

Administration & Health Services						
SPACE	Number of Students (in each)	Number of Spaces	Student Capacity	S.F. @	S.F.	NOTES
Secure Entry Vestibule		1		300	300	
Receptionist/Waiting		1		400	400	Support Associate is Receptionist
Visitor Toilets		2		60	120	
Conference Room (8-10)		1		250	250	
Principal		1		250	250	
Toilet		1		64	64	
UNCW/IBEC Liaison/Coordinator		1		150	150	
Assistant Principal/Flex Space		1		175	175	
Bookkeeper/Treasurer/Data Mgr		1		150	150	
SRO		1		120	120	more details TBD
Workroom/Mail Room		1		300	300	
Admin. Toilets		2		60	120	
Storage		1		100	100	
Flex Offices		1		120	120	
Nurse/Health Room		1		500	500	
Cots		2		0	0	2 cots
Toilets		1		0	0	with shower
Nurse's Office		1		0	0	
Subtotal Administration & Health Services					3,119	

Guidance and Student Support Services						
SPACE	Number of Students (in each)	Number of Spaces	Student Capacity	S.F. @	S.F.	NOTES
Records		1		300	300	Secure and fireproof
Conference Room/Small Group		1		200	200	
Counselor's Office		1		150	150	
Career Development Coordinator		1		150	150	
Social Worker		1		150	150	
Staff Toilets		2		60	120	If needed and not nearby
Storage/Work Area		1		150	150	
Subtotal Guidance & Student Support Services					1,220	

Student Dining & Food Service						
SPACE	Number of Students (in each)	Number of Spaces	Student Capacity	S.F. @	S.F.	NOTES
Student Dining Area		1		3,700	3,700	200 students X 21 SF / Student
Stair-a-torium		1		500	500	also for dining
Outdoor dining						
Outdoor Equipment Storage		1		150	150	1 basketball goal, space near outdoor dining
Kitchen						
Serving		1		800	800	How many serving lines?
Prep/Cooking area		1		800	800	
Lockers/Restrooms		1		200	200	
Manager's Office		1		100	100	
Freezer/Cooler ???		1		0	0	
Dry Storage		1		200	200	
Dish Wash/Recycling		1		200	200	
Subtotal Student Dining & Food Service					6,650	
Maintenance & Custodial						
SPACE	Number of Students (in each)	Number of Spaces	Student Capacity	S.F. @	S.F.	NOTES
Supply/Receiving/Stor/Loading dock		1		500	500	
Restrooms/Locker Area		1		150	150	
Subtotal Maintenance & Custodial					650	
Total Net SF					29,009	

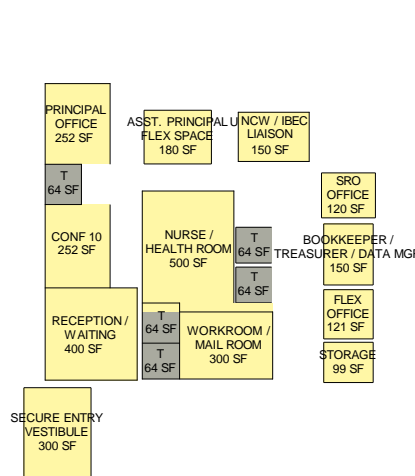
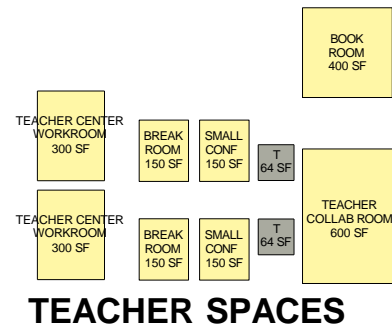
Non-Assignable Gross Factor						
SPACE	Number of Students (in each)	Number of Spaces	Student Capacity	S.F. @	S.F.	NOTES
Corridors, Lobbies					Varies	
Group Toilets					Varies	
Stairways					Varies	
Elevators					Varies	
Mechanical Rooms					Varies	
Custodial Closets					Varies	
Total Gross SF (40%)					11,604	
TOTAL NEW HIGH SCHOOL			200		40,613	200 Student Goal (Freshman and Sophomores) + 200 Juniors & Seniors

TOTAL SQUARE FOOTAGE IS DEPENDANT ON ACTUAL LAYOUT, NON-ASSIGNABLE SPACES, AND DESIGN SPECIFIC FEATURES THAT MAY INCLUDE ADDITIONAL INFORMAL LEARNING SPACES

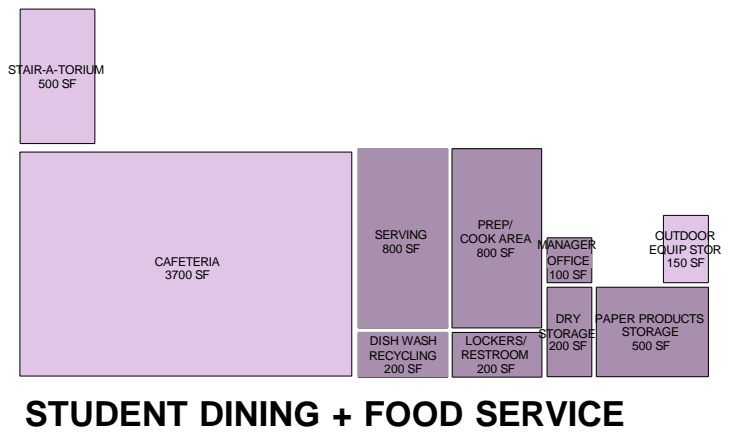
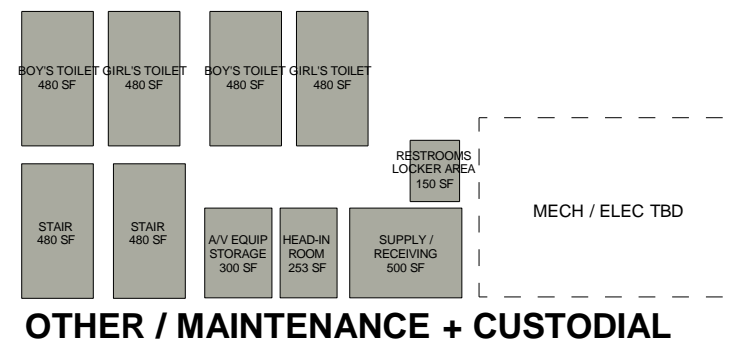
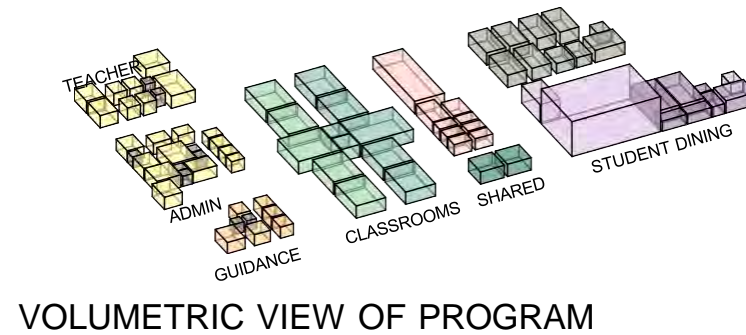
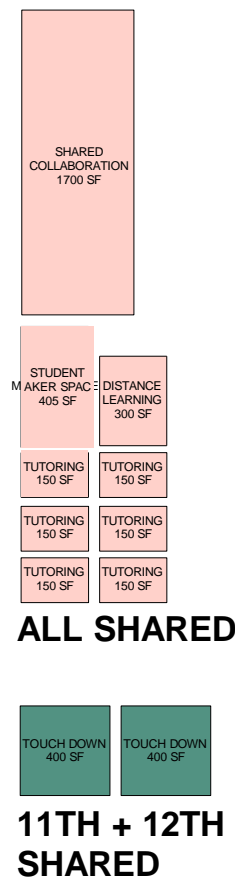
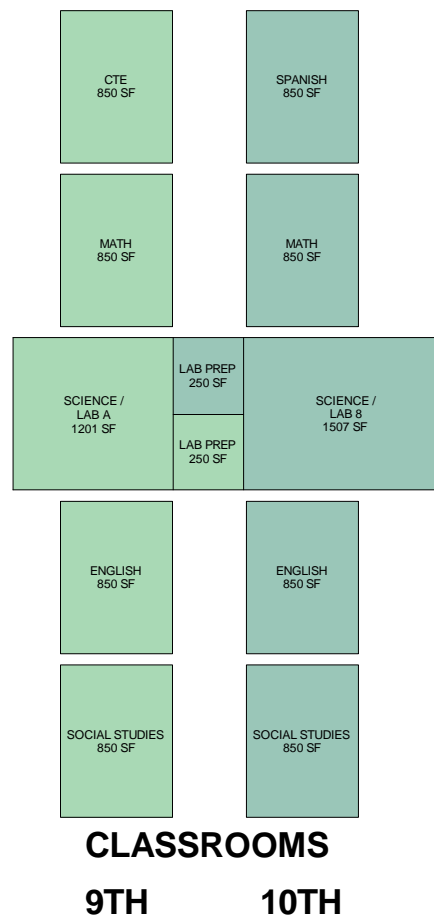
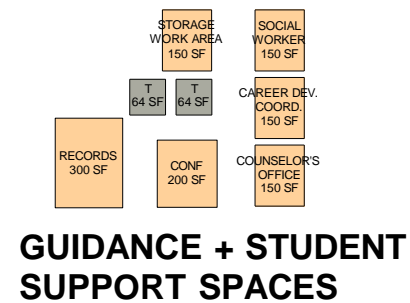
REFER TO SECTION 4.2

BUILDING PROGRAM

SPACE NEEDS



ADMINISTRATION



STATS

2 STORY | 45,000 - 50,000 SF
 200 9TH + 10TH GRADERS
 200 10TH + 12TH GRADERS
 K-12 PARTNERSHIP WITH UNIVERSITY
 CM PROJECT

THIS PAGE IS INTENTIONALLY LEFT BLANK.

2.0

CONCEPT DESIGN

- Site Analysis 2.1
- Site Design 2.2
- Building Layout 2.3
- Concept Plans 2.4
- Inspiration Imagery 2.5

2.1 SITE ANALYSIS

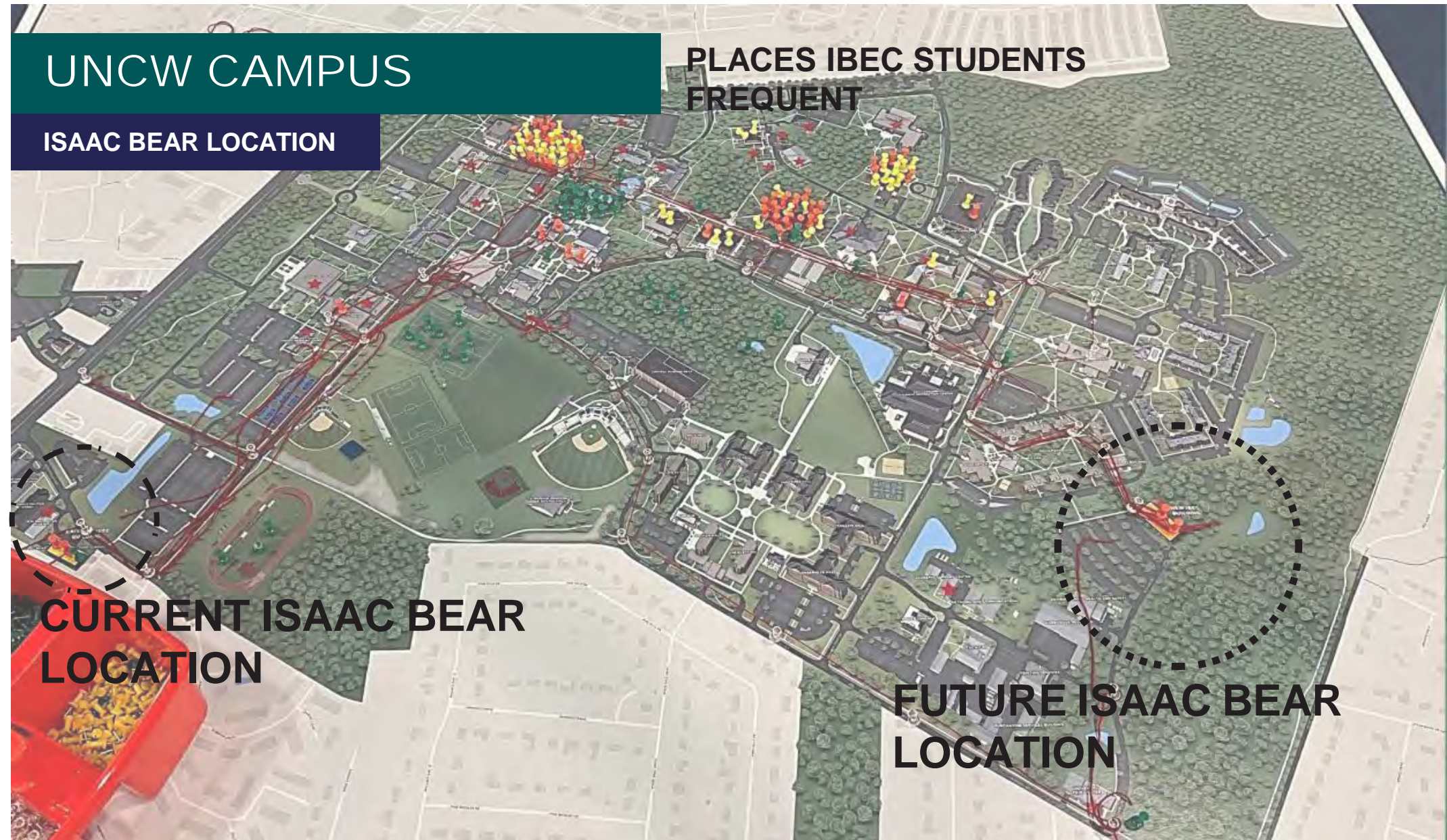
SITE ASSESSMENT

Existing Conditions: The proposed Isaac Bear Early College site is located adjacent to Lot EE, or Suites Parking Lot, at the end of Plyler Drive. This and all adjacent land is owned by University of North Carolina Wilmington (UNCW). The property and adjacent land is currently all zoned O&I – Office and Institutional in the City of Wilmington, NC. The site is bound to the east by wetlands, to the north by a creek, to the west by parking lot and Plyler Drive, and to the south by undeveloped land.

The site is +/-1.0 acres with the east boundary being determined by a final wetland delineation. It is currently accessible by vehicle and by pedestrian walks. The existing parking lot, Suites Parking Lot, is immediately accessible by Plyler Drive. The site is also accessible from Suites Service Loop by pedestrian bridges over the creek and accessible along Plyler Drive.

The site slopes toward the wetlands from the parking lot. An existing stormwater facility is located to the east of the wetlands. A dirt access road crosses the wetland, loops around the pond and returns to Plyler Drive.

This site as well as some nearby developed and undeveloped sites, are located in a “Natural Heritage Resource Area” according to the most recent CAMA Land Use Plan for New Hanover County and City of Wilmington. These areas are further described on the enclosed maps, figures, and supplemental reports provided for description, area identification, and general reference. In summary, the area has been identified to potentially include rare plants or animals. In discussing these findings with the City of Wilmington Planning and Zoning Staff, it was requested to have an environmental consultant/specialist report any findings of unique habitats that warrant special attention and protection on site. The initial step in this effort is performing a Threatened and Endangered species study.



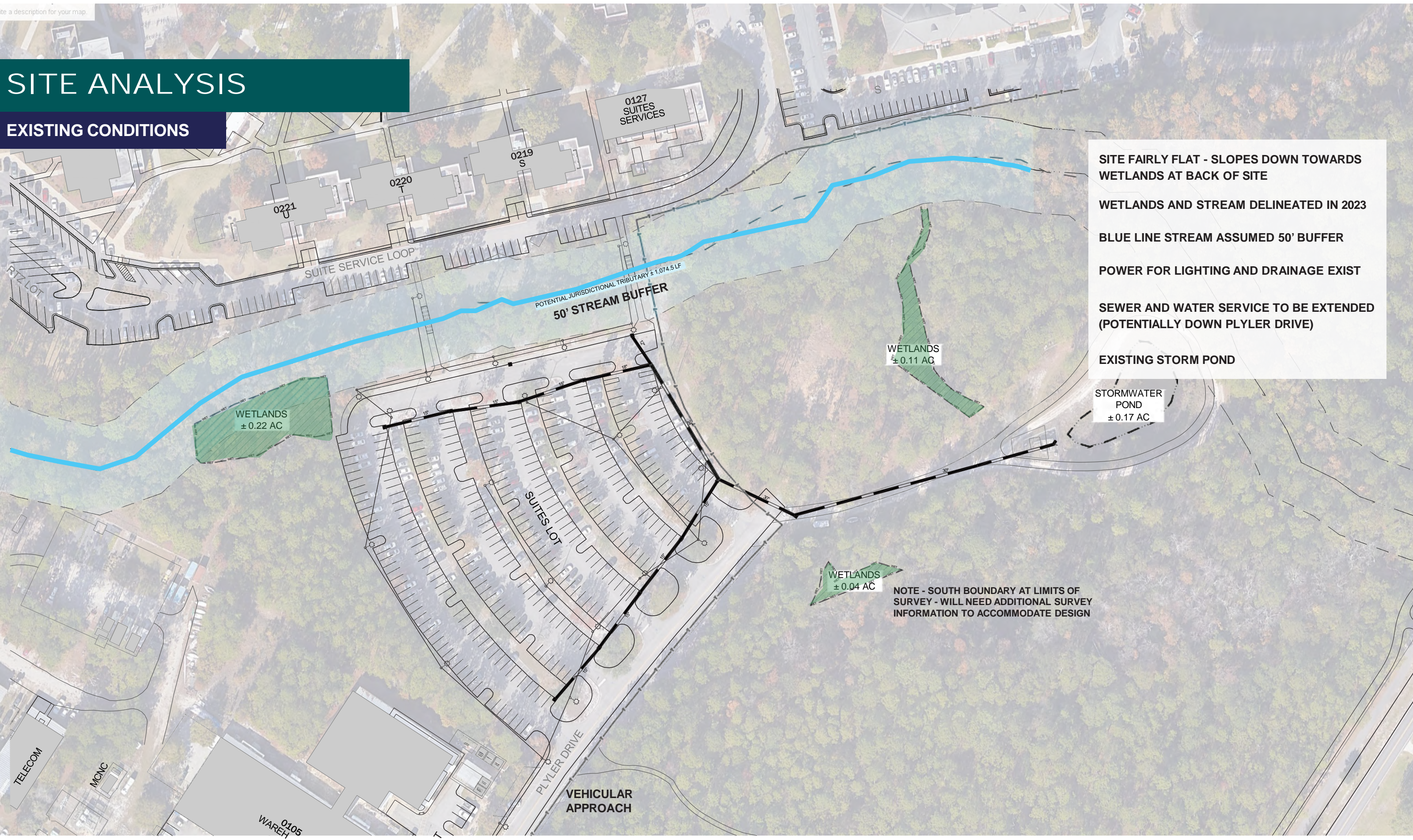
EXISTING SITE

ISAAC BEAR LOCATION



SITE ANALYSIS

EXISTING CONDITIONS



SITE FAIRLY FLAT - SLOPES DOWN TOWARDS WETLANDS AT BACK OF SITE

WETLANDS AND STREAM DELINEATED IN 2023

BLUE LINE STREAM ASSUMED 50' BUFFER

POWER FOR LIGHTING AND DRAINAGE EXIST

SEWER AND WATER SERVICE TO BE EXTENDED (POTENTIALLY DOWN PLYLER DRIVE)

EXISTING STORM POND

STORMWATER POND ± 0.17 AC

NOTE - SOUTH BOUNDARY AT LIMITS OF SURVEY - WILL NEED ADDITIONAL SURVEY INFORMATION TO ACCOMMODATE DESIGN

SITE DATA

ZONING CONDITIONS:

Zoning information is taken from the New Hanover County GIS.

PIN: R05511-003-001-000

Address: 601 S College Road

Land Use Code: 821 (School)

Campus Acreage: 649.13

Site Acreage: +/- 1.0 acres

While the project site target area was about an acre, the proposed design of the building footprint, courtyard area/green space, additional parking adjacent to the high school, replacement parking for UNCW, and the potential area for expansion of the existing stormwater pond puts the project closer to five acres of disturbance.

City: Wilmington

County: New Hanover

Zoning: Office & Institutional (O&I) with College or University as a permitted use in this zoning.

Watershed: Bradley Creek in the White Oak Watershed, classification: SC; HQW.

Floodplain: The site area is not within a floodplain according to FEMA map number 3720314700K effective on 8/28/2018.

Streams and Wetlands: An existing stream divides the existing parking lot and the residence halls to the north. Wetlands are present on the site and there will be wetland impacts with the current site plan.

Zoning Minimum Lot Size: 15,000 sf, 80' wide min.

Zoning Building Setbacks: Front: 20', Side (street):20', Side (interior): 0, Rear: 20'

Zoning Building Height: 45' Maximum, optional height increase: up to 96'

Zoning Maximum Building Footprint (percent of total lot area): 40%

City Parking Standards: Required for College/University: 1 per classroom and 1 per 2 students based on the maximum number of students attending classes at any one time.

NCDOT MSTA On-Site Queue Recommendation: 400 HS students, 761 LF high demand

Traffic Impact Analysis: At the time of this narrative, a traffic impact analysis has not been performed.

Parking Requirements: from UNC Wilmington and IBEC
UNCW – Generally, would like to maintain as least as many spaces as is currently in the Suites lot, and potentially add more for future growth.

IBEC – Need 33 staff spaces and plan on bringing 67 student parking spaces from the Hamilton lot, resulting in 99 additional spaces needed at the new campus site.

The plan currently shows a total gain of 13 spaces dedicated to UNCW residents, and a total of 97 IBEC dedicated parking spaces.

Zoning Note: State land may have exemption from some requirements but, based on discussions to date, it is assumed the project still requires submittal to the City Zoning Staff.

STORMWATER MANAGEMENT

Topography:

The site ranges between 30 and 35 feet above sea level. The high point of the site is at the narrowest point of the existing parking lot, where the main core of the building is proposed. The site slopes from there to the north and east.

Design Approach:

Since the final site plan has not been chosen at this time, we cannot speak to the exact location or type of Best Management Practices (BMP) this project will utilize, but we anticipate either expanding the existing stormwater basin that is located to the east of the proposed site location and/or creating new BMP's that are located around the proposed school site which may include rain gardens, bio-retention areas, wet detention basins, etc. If it's chosen to proceed with expanding the existing BMP, it will likely need to be brought into compliance with current NCDEQ stormwater management rules and regulations. It's currently not clear if there is adequate capacity in the existing basin on-site to treat and detain proposed stormwater runoff. We will need to conduct a file review at NCDEQ to determine if it's a permitted stormwater BMP. If permitted, we will need to further investigate if there is enough capacity in the current State permit or if we need to add a new storm water control device or just expand the existing wet detention basin.

Permitting on the UNCW campus is regulated by NCDEQ only and there are no reviews or requirements from the City of Wilmington other than zoning issues. The requirements for NCDEQ fall within the 2017 Coastal Rules and require water quality controls for the first 1.5 inches of runoff be collected and conveyed to a BMP for storage and treatment.

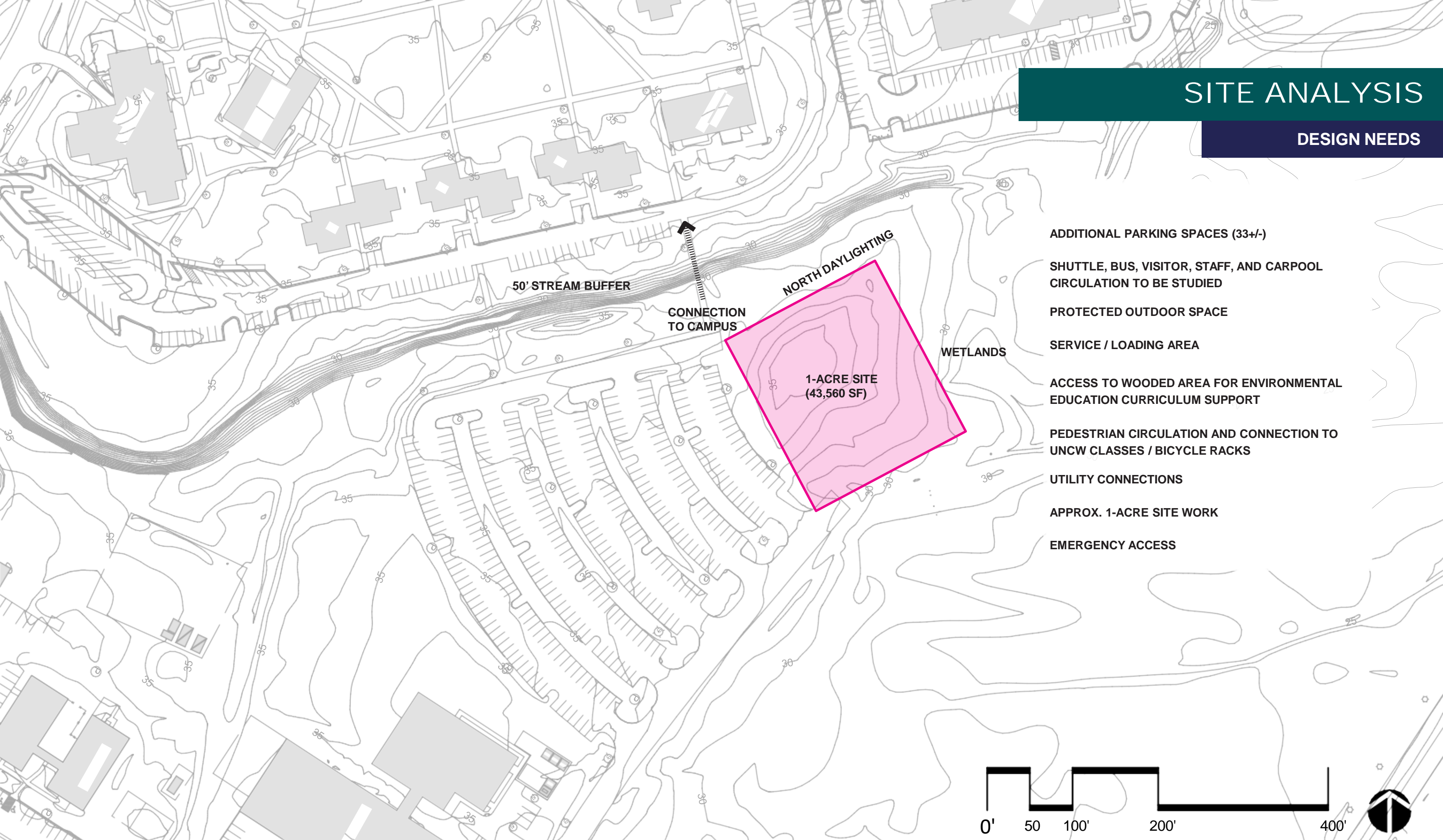
PROPOSED UTILITIES

The site will be served by existing Cape Fear Public Utility Authority (CFPUA) sanitary sewer and water lines located within the Rose Avenue public right of way. All utilities are required to meet current CFPUA standards and specifications. All site utilities will be specified in accordance with CFPUA Standard Specifications and Details. A fire protection line will need to be extended to cover all new construction and potentially an additional fire hydrant. There is currently no water or sanitary sewer service at the proposed building site and UNCW has requested that the proposed building be serviced by existing CFPUA infrastructure in Rose Avenue. It's assumed the proposed building will utilize a 3-inch water meter, a 6-inch fire service, and a 6-inch sanitary sewer service. It's assumed a grease interceptor will be installed on the proposed site and connected to the proposed sewer service. There will also be a utility connection made to Rose Avenue for Duke Progress utilities.

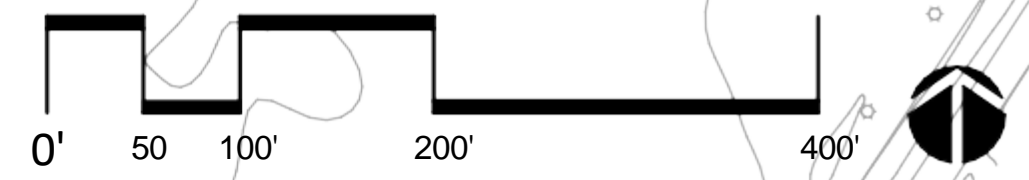
UNCW has requested infrastructure ie. conduit to connect to the Isaac Bear Early College High School, and has acknowledged that IBEC is allowed to connect to the UNCW HUT.

SITE ANALYSIS

DESIGN NEEDS



- ADDITIONAL PARKING SPACES (33+/-)
- SHUTTLE, BUS, VISITOR, STAFF, AND CARPOOL CIRCULATION TO BE STUDIED
- PROTECTED OUTDOOR SPACE
- SERVICE / LOADING AREA
- ACCESS TO WOODED AREA FOR ENVIRONMENTAL EDUCATION CURRICULUM SUPPORT
- PEDESTRIAN CIRCULATION AND CONNECTION TO UNCW CLASSES / BICYCLE RACKS
- UTILITY CONNECTIONS
- APPROX. 1-ACRE SITE WORK
- EMERGENCY ACCESS



2.2 SITE DESIGN

PROPOSED SITE PLAN

The advanced planning design is based on a 400-student core capacity.

Building placement on the site was studied extensively through the advanced planning phase in relation to solar orientation, minimizing environmental and existing infrastructure impacts, and in relation to overall campus design. The advanced planning location and rotation places the main entry façade in line with the residence halls to the north across the stream. The classroom bar is angled slightly off East-West and is facing north to take advantage of diffused northern light throughout the day. The building is placed so that only the first bay of existing parking is impacted for the main entry experience.

Circulation:

Sidewalks are placed to tie the high school campus to main campus. The existing pedestrian bridge over the stream to the north ties to a new sidewalk that functions as the loading area for drop-off and pickup and ties to the main entry. Students that are walking to classes on main campus may utilize this sidewalk with a direct pedestrian path. This main sidewalk is connected around the south side of the building, where the secondary loading zone is, past the service area and high school courtyard, and leads to the stormwater access drive. These connections allow for opportunities to engage with the environmental features of the site on the east side of the new high school building.

The site will be accessed from Plyler Drive, with the drive accommodating (4) student buses, a campus shuttle, UNCW resident drivers, IBEC staff, parents, visitors, and student drivers. Internal circulation and stacking to accommodate 761 linear feet is to be determined. The AP design document provides three diagrams with circulation options as follows:

- Parents drop off at main entry and queue through existing parking lot, providing free-flowing circulation along Plyler, to the high school student and staff parking, and bus and shuttle services. Service and access to the mechanical yard is off the bus loop. UNCW residents may freely enter and exit the last three bays at all times (recommended).
- Parents drop off at main entry and a lane is added to Plyler drive for

approx. 550 LF to accommodate the queue length. This allows buses, UNCW student residents, student drivers, and staff to free-flow without temporarily blocking any Suites Lot parking spaces.

- Buses drop off at main entry and parents queue through lot to south of building in a double queue. This allows buses and UNCW residents to have free-flowing access to the entire Suites Lot, but blocks access to student and staff parking, as well as the service and mechanical areas, during pickup and drop off times.

Space for five vehicles to load or unload is provided at the main entry. Parents may then exit through the Suites Lot or have the option of parking.

Emergency access is provided to all site program elements. The bus loop and new parking lot serve as emergency vehicle access and turnaround. A fire lane stub is also provided on the north side of the building from the parking lot. This 150-foot stub provides access from the north side around the classroom bar. The required pavement will be incorporated in the outdoor programming as part of the linear outdoor classroom and stream overlook on the north side of the building.

Outdoor Amenities:

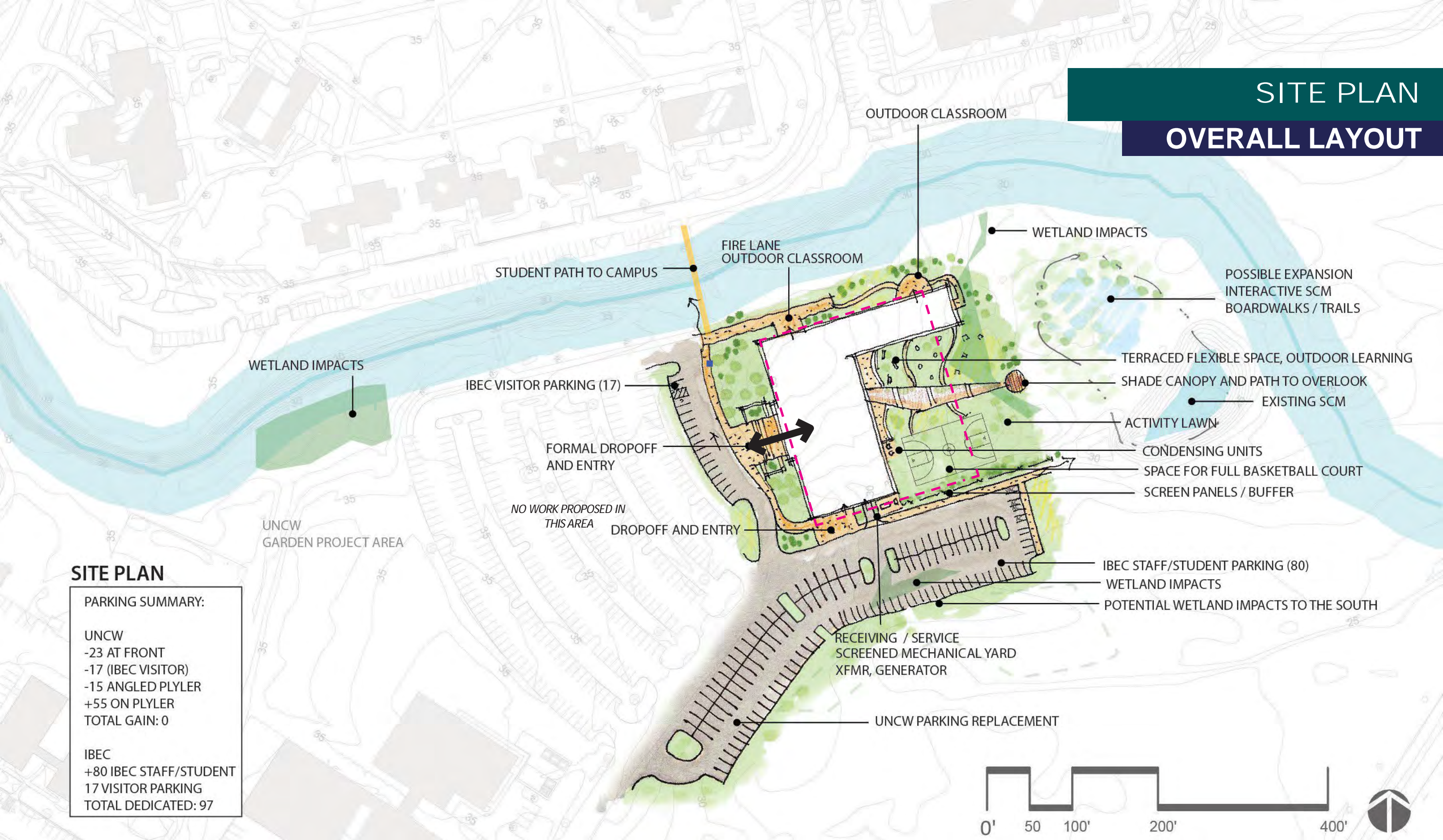
Isaac Bear's outdoor environment is an integral component of the learning experience. The "L" shape of the building creates the opportunity for a semi-enclosed courtyard space on the southeast side of the building and site. The space is visible and accessible from both the main core and from the south side of the classroom bar, and the intent is to create an extension of the architecture visually and physically into the landscape. The courtyard provides the opportunity for flexibility and choice in the exterior learning spaces. A main path will connect the interior dining and commons space through the courtyard to a boardwalk element on the east side. This path provides access to the terraced flexible space, a mixture of both hard and softscape elements with seating, and a lawn space that may be used for activities such as games or gardening. Screening will be provided between the south parking lot and the courtyard. The screen may be perforated paneling in combination with plantings.

Future Action Items:

- Jurisdictional environmental features – the stream and wetlands have been delineated with a preliminary report, but additional scope will need to be obtained as the proposed design extends beyond the limits of study
- Geotechnical Report – soil boring and testing
- Site survey
- Permitting research
- Fire flow testing

SITE PLAN

OVERALL LAYOUT



SITE PLAN

PARKING SUMMARY:

UNCW
 -23 AT FRONT
 -17 (IBEC VISITOR)
 -15 ANGLED PLYLER
 +55 ON PLYLER
 TOTAL GAIN: 0

IBEC
 +80 IBEC STAFF/STUDENT
 17 VISITOR PARKING
 TOTAL DEDICATED: 97

2.3 BUILDING LAYOUT

BUILDING CONCEPT

Building Arrangement:

The building arrangement is an L-shape with the classrooms facing to the north and the main entry facing to the west towards the existing parking lot. The main entry is symmetrically placed on the west facade and provides a visual connection through the interior to the outdoor courtyard to the east. The large 2 story Dining/Gather space is central to the plan with views to the east courtyard and connections to collaborative student spaces. An open stair within the Dining/Gather space provides seating and views to the courtyard.

The North/South bar of the L-shape is organized with staff + support spaces on the south moving to more student focused spaces to north. The staff spaces on the south create a visual connection to the parking lot to the south. A second floor guidance area provides a secondary visual connection to the main student/site connection area to the northwest where students access the campus. At the hinge point of the L-shape is a restroom core, centrally located between the North/South bar and the East/West classroom wing.

The East/West bar of the L-shape includes stacked classrooms with interspersed student study areas and collaborative staff areas. The classrooms are north facing with tutoring rooms and open study areas facing to the south.

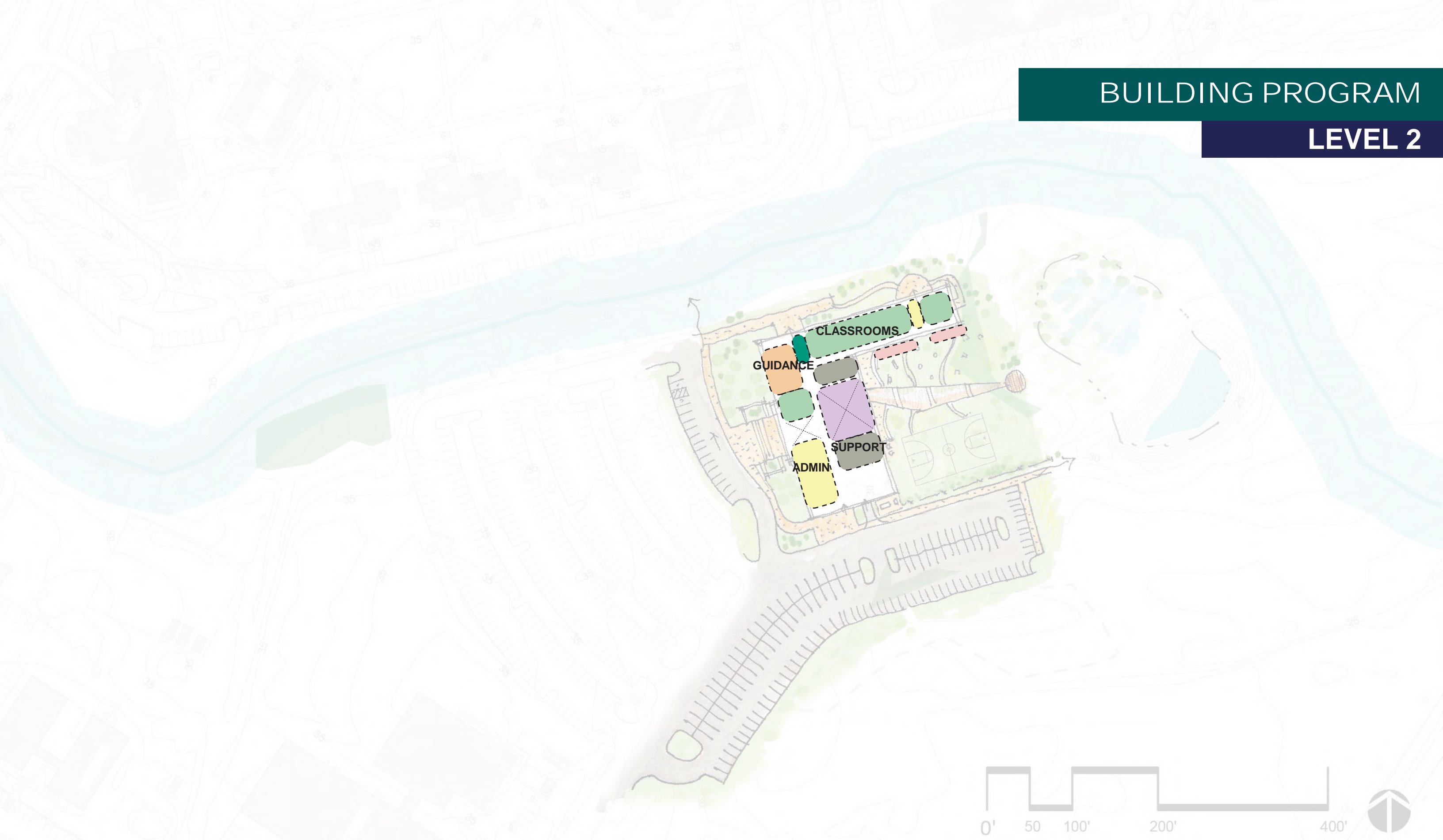
Materials:

The proposed exterior wall materials are comprised of brick and glass with architectural details that respond to the UNCW Georgian style in a more casual way per UNCW's input. The north, west, and south facades will include punched window openings while the east and south facade will have larger expanses of curtain wall. The main roof form will be a hip roof with asphalt shingles. In select areas there may be a flat roof over portions of the dining/gather space. Interior materials will include a mix of painted cmu walls in the corridor and painted gyp walls separating classrooms. Wood is proposed as an accent wall and ceiling material at key locations.

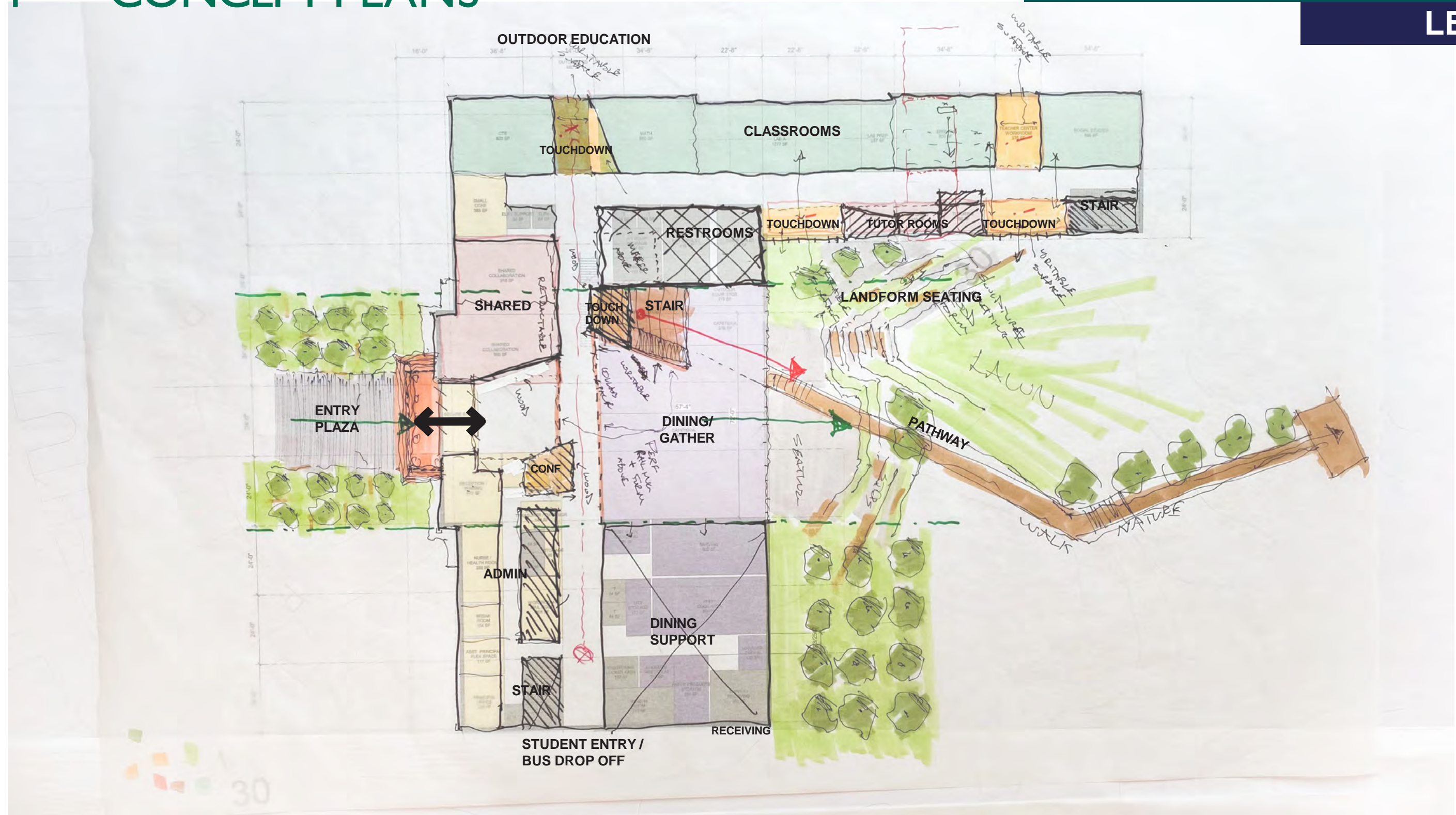


BUILDING PROGRAM

LEVEL 2

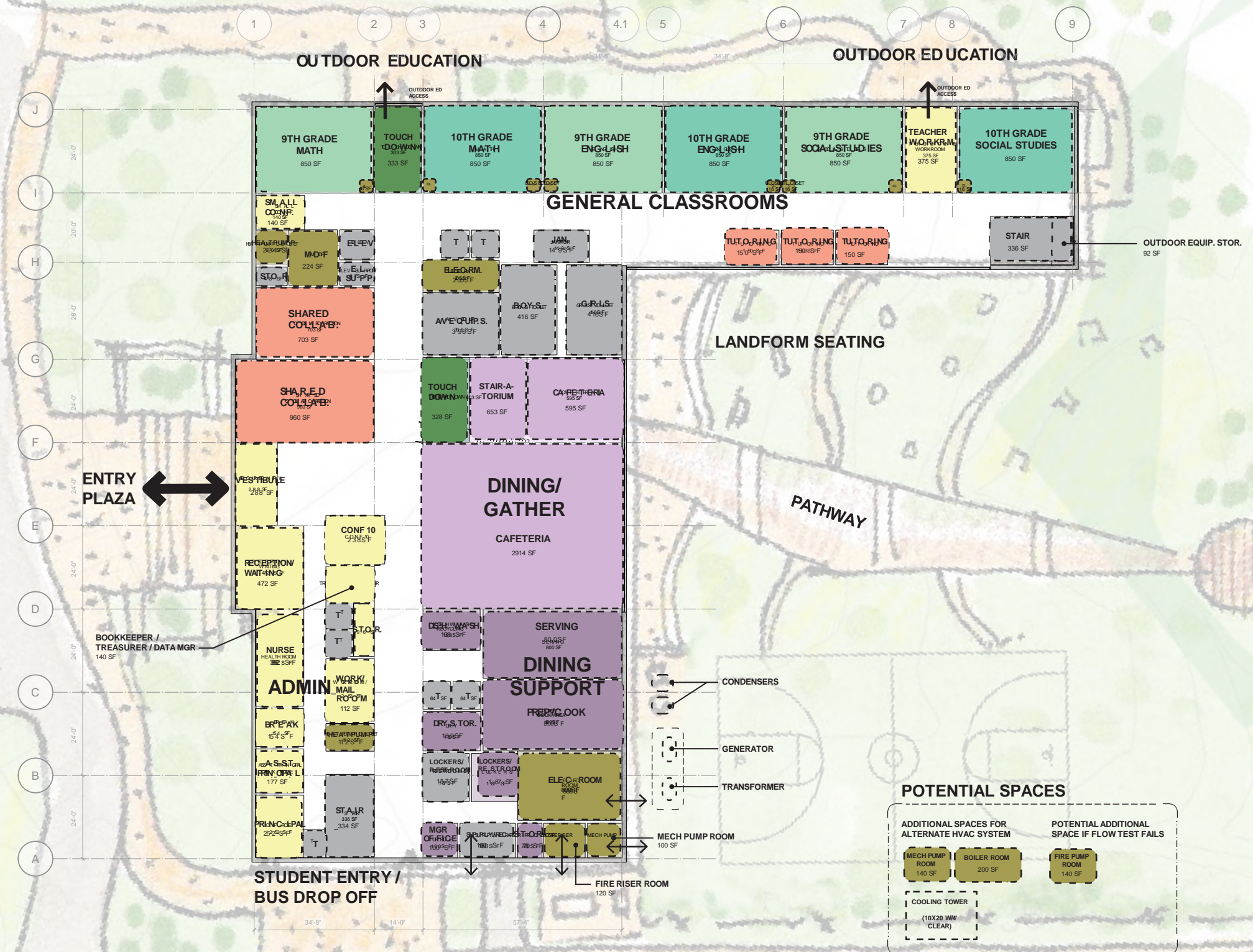


2.4 CONCEPT PLANS



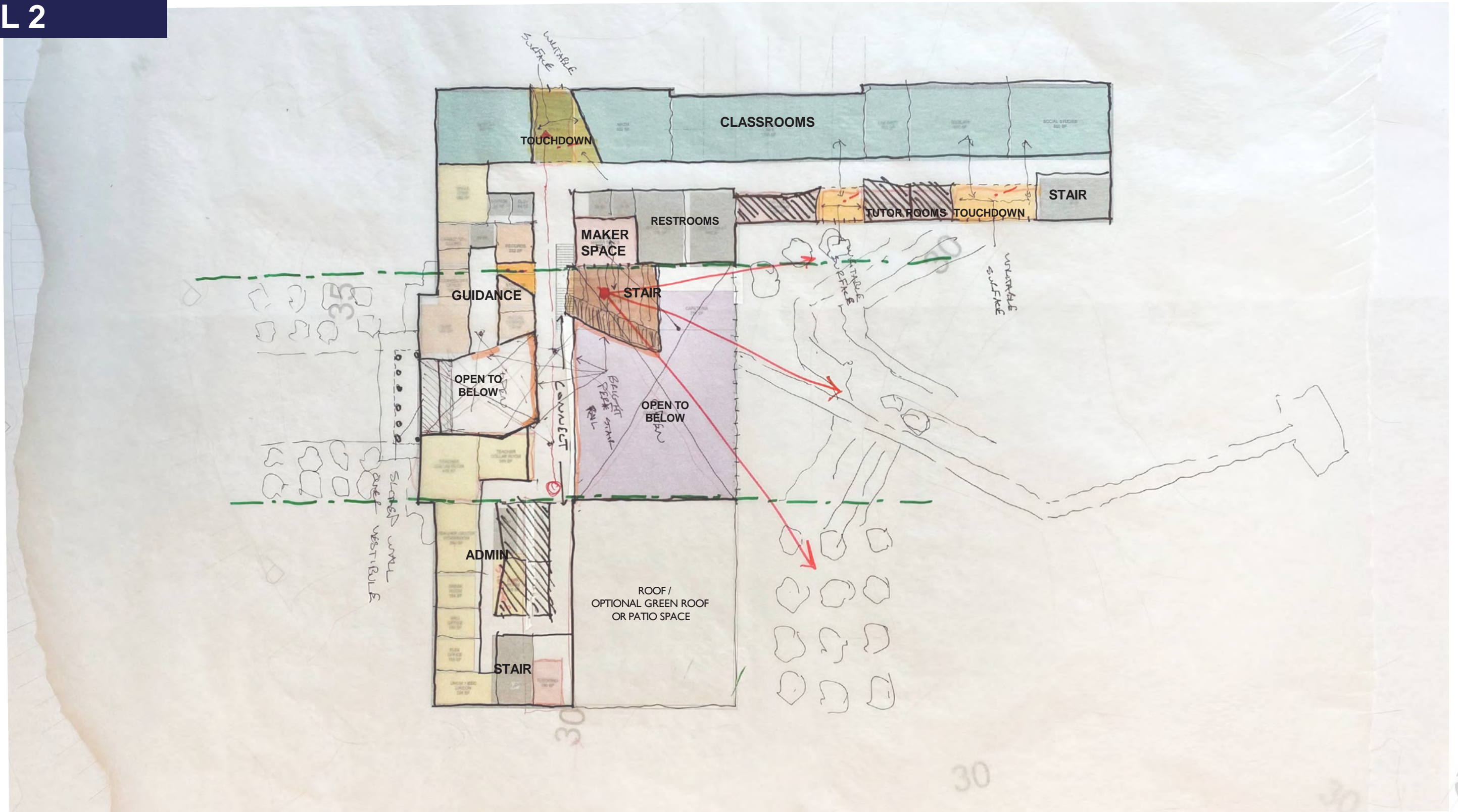
PLAN DIAGRAM

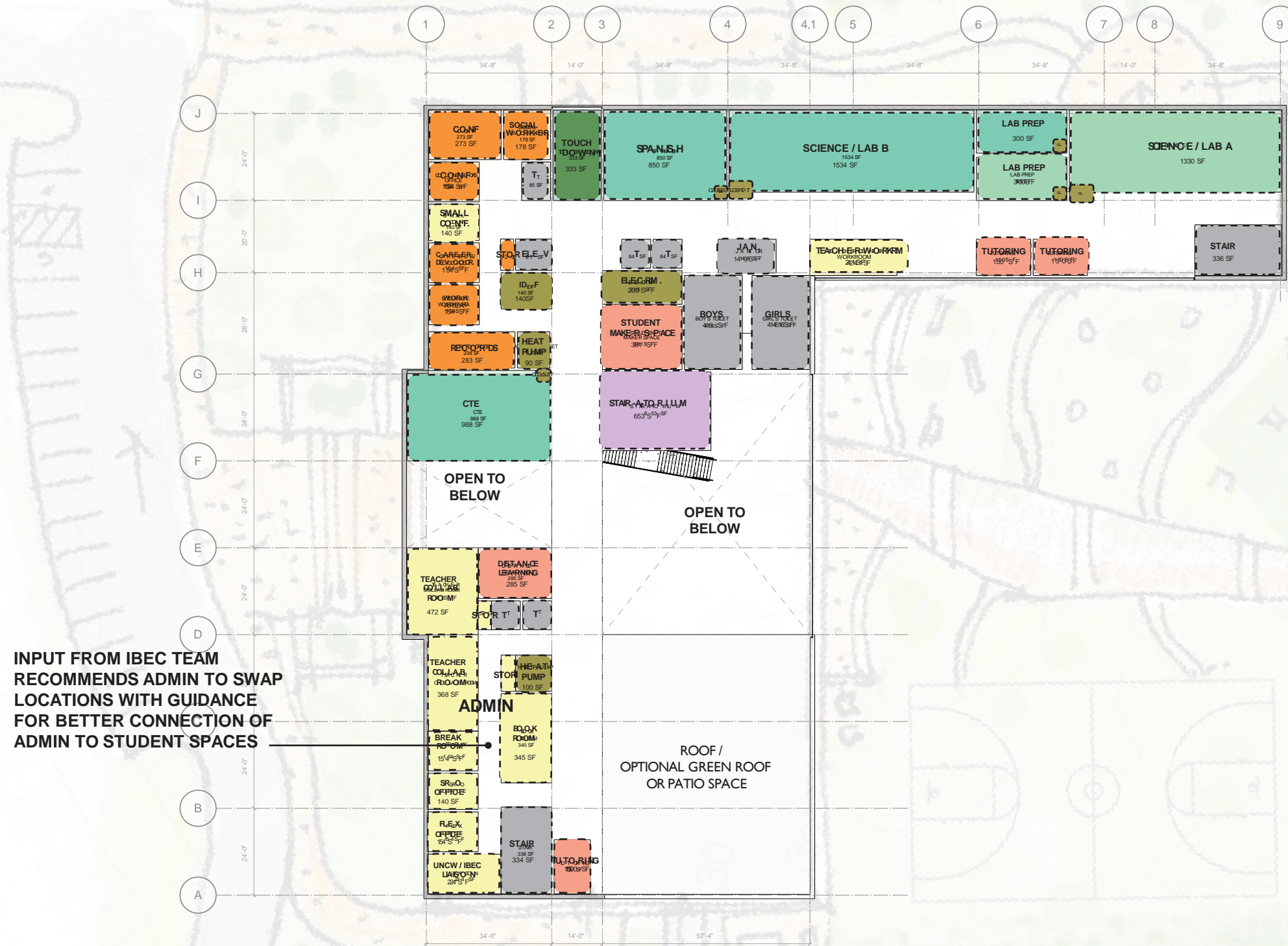
LEVEL 1



CONCEPT PLAN

LEVEL 2

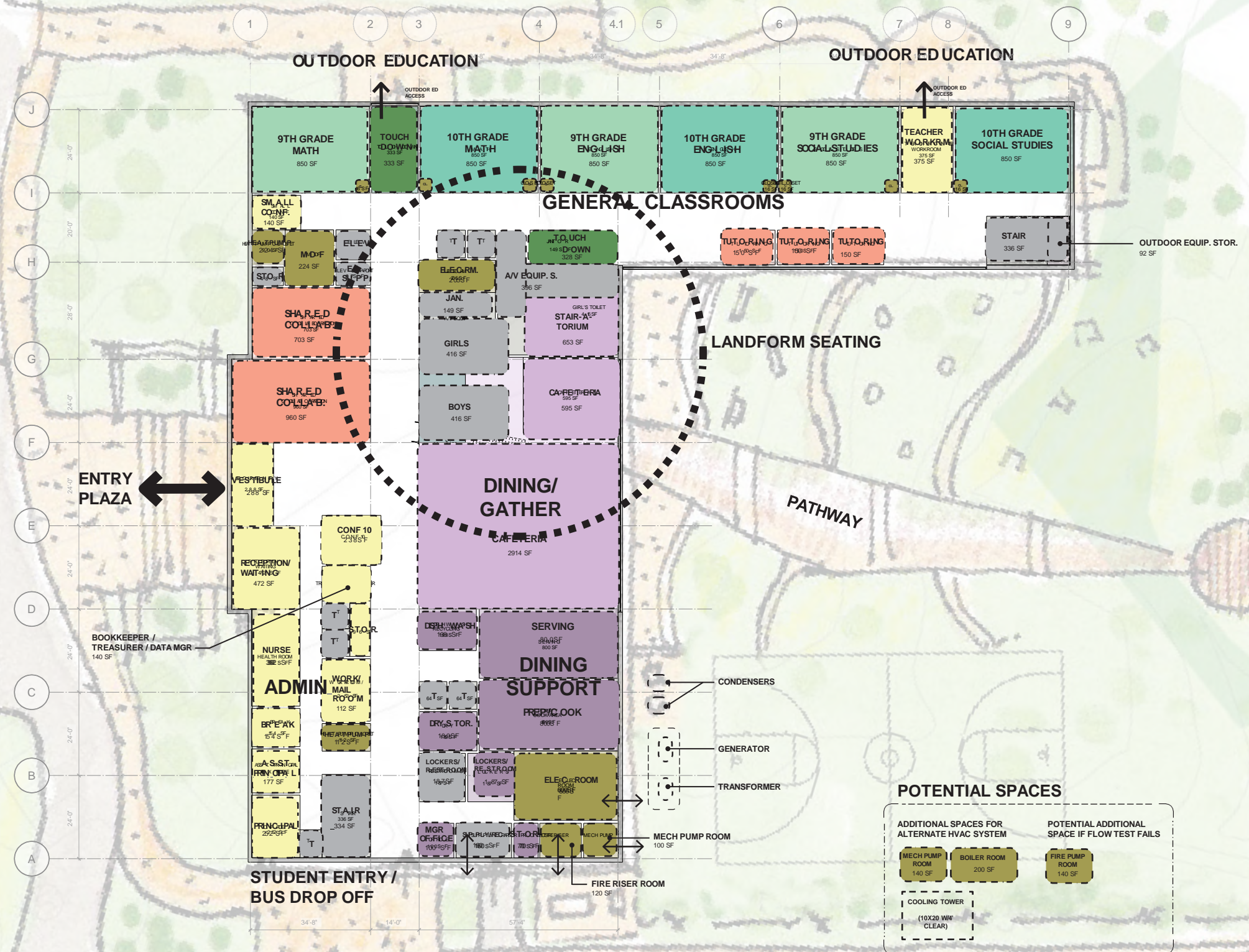




INPUT FROM IBEC TEAM RECOMMENDS ADMIN TO SWAP LOCATIONS WITH GUIDANCE FOR BETTER CONNECTION OF ADMIN TO STUDENT SPACES

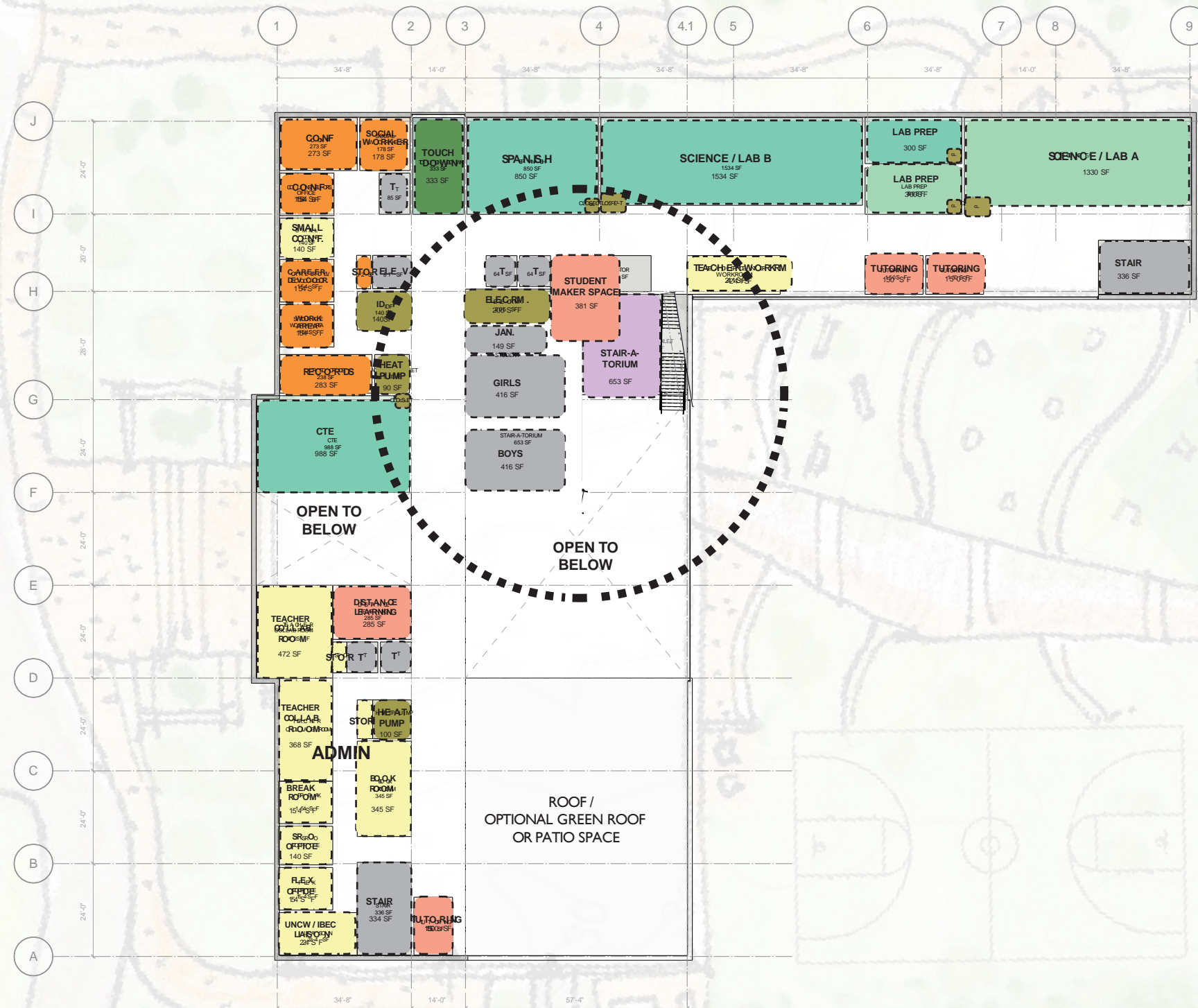
ALT. PLAN DIAGRAM

LEVEL 1



ALT. PLAN DIAGRAM

LEVEL 2



BLOCK DIAGRAM

ENTRY VIEW



2.5 INSPIRATION IMAGERY

The following images represent some of the materiality and spatial relationships that capture the vision around the new Isaac Bear Early College High School. The various site and building images demonstrate the range of experiences that students can have throughout the facility. The proposed design includes a semi-formal entry with a more casual and organic rear courtyard. Views to nature, connections to the outdoors, and the integration of natural materials are key design components that will help drive the design. To respond to the Isaac Bear student feedback, the design will need to include a sense of scale, flexibility, and comfort to create spaces that are calming yet fun and spaces that provide a feeling of community and home.

SITE INSPIRATION

APPROACH

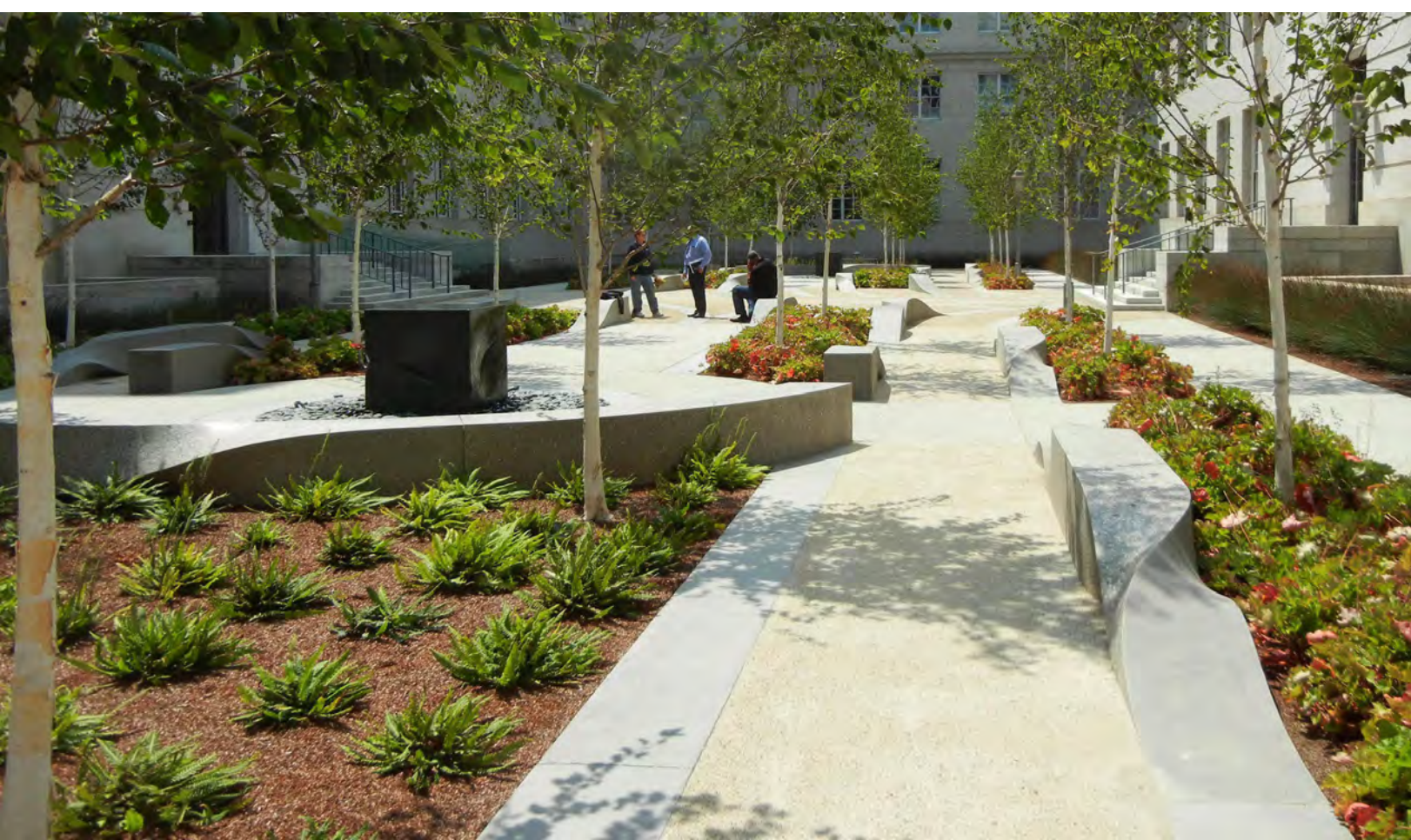


SITE INSPIRATION
LANDFORMS



SITE INSPIRATION

INTERSECTIONS



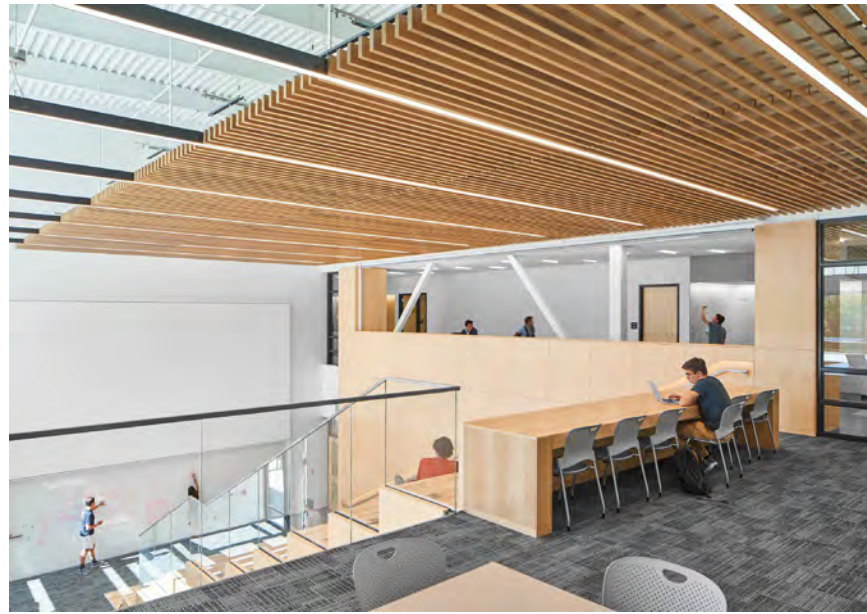
BUILDING INSPIRATION

GATHERING SPACE



BUILDING INSPIRATION

INFORMAL LEARNING





THIS PAGE IS INTENTIONALLY LEFT BLANK.

3.0

ENGINEERING DESIGN

- Structural 3.1
- MEP 3.2
- Daylighting Design 3.3

3.1 STRUCTURAL DESIGN

NARRATIVE OBJECTIVE

The purpose of this document is to define structural design considerations and provide commentary describing the structural systems anticipated for use in satisfying those considerations.

The expectation is that the structural narrative will be the basis for a collaborative interaction between design and construction entities to the extent necessary for refinement and informed selection of the structural framing systems.

NEW BUILDING SCOPE

General

The new building will consist of two stories of offices, classrooms, dining space, mechanical/electrical systems, and collaboration spaces.

Structural steel is being used for as the primary structural frame of this building due to its positive characteristics including:

- Lighter construction which will result in a more economical foundation design.
- Structural steel will provide long clear spans required over the column free rooms; however, for bays greater than 30 feet, vibration performance decreases considerably so steel tonnage would increase.
- Structural steel rolled shapes are currently made from recycled steel and will benefit the environment.
- Steel can be salvaged and recycled or reused.

Foundations

A geotechnical report has not been completed at this time but will be required for the design of the building. The report will provide us with foundation recommendations and seismic information required for the design.

The foundations will likely consist of shallow rectangular reinforced concrete footings at the individual columns. A reinforced CMU wall will be required around the entire perimeter and will be supported by a continuously reinforced concrete strip footing.

Slab on Grade

Typical slab on grade will be 4" thick (minimum) reinforced concrete slab. Slabs will be placed over a 15 mil vapor barrier over 6" of compacted clean sand. The slab will have saw cut control joints spaced at approximately 12 feet in both directions and at all columns.

Elevated Floor Framing

Elevated floor slab will consist of a 3 ¼" light weight concrete reinforced slab on 2" 18 Ga metal deck (total slab thickness = 5 ¼"). Slab will be supported by composite steel beams and girders.

Roof Framing

Roof construction will consist of a 1 ½" 20 Ga metal deck. Metal deck will be supported by structural steel beams forming the sloped or flat roof areas.

Lateral Design

The lateral system of the building will be designed to meet the strength and deflection criteria specified in the design criteria section and will be designed to support the lateral forces imparted by the wind and seismic loads indicated in the building code.

This building will incorporate the use of steel vertical braced frames if the Architectural concepts can allow it. Steel vertical braced frames are the most efficient structural steel lateral system. If concepts will not allow braced frames, steel moment frames will be the lateral system.

Special Inspections

Special Inspections will be required for this project based on the building classification. The construction documents will include a Statement of Special Inspections which will outline the inspection types required for the project.

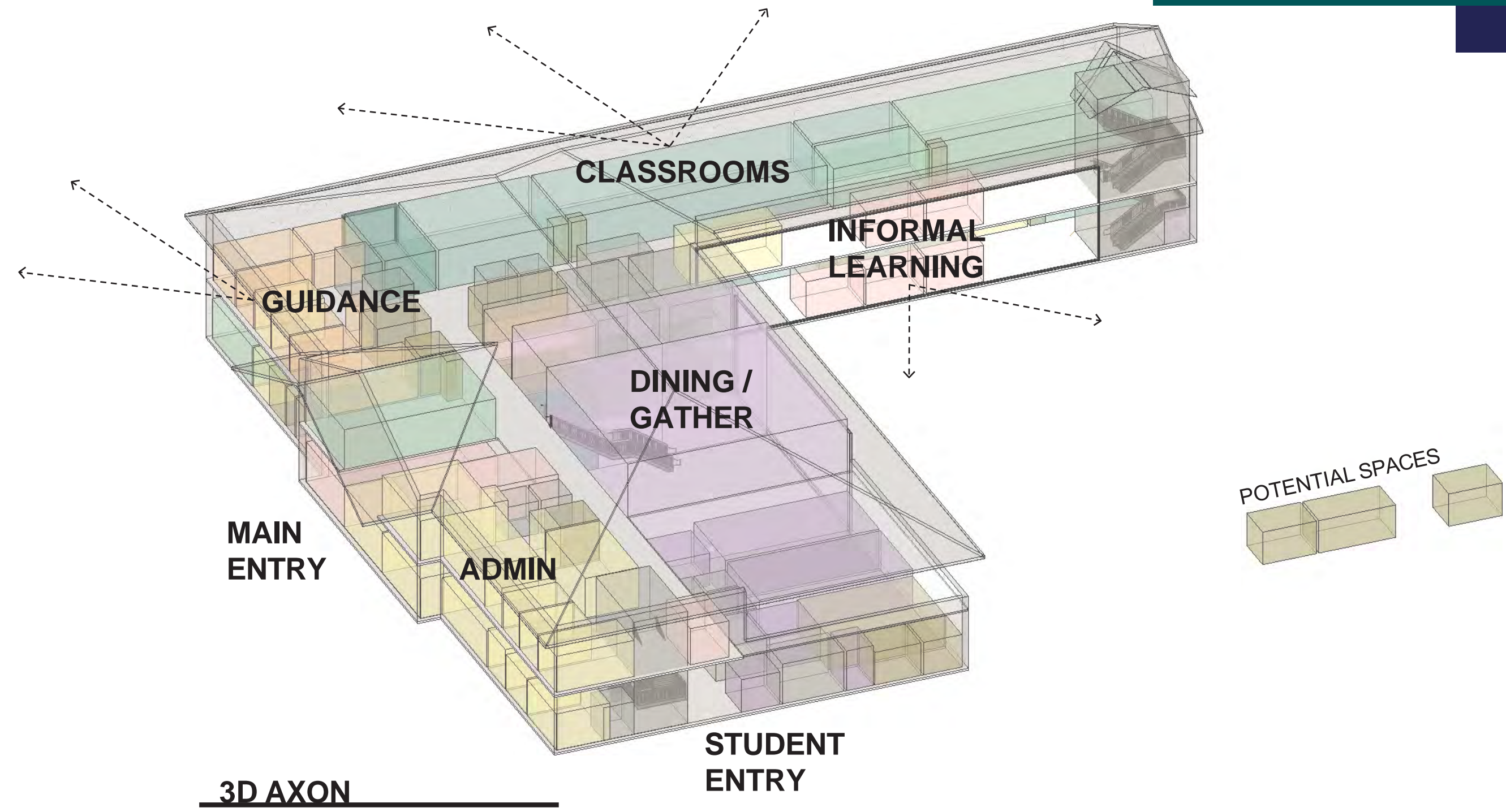
Vibration

Elevated floor structures in the building will require further study and discussion with the owner and vibration consultant to provide the most efficient floor thickness and beam spacing.

Alternate Materials

Timber/Wood

The structure will be framed from a steel frame with composite metal deck but a potential alternative to steel framing has been discussed in the high traffic/visibility areas such as the dining space and the classroom corridors. The steel beams in the basis of design could potentially be replaced with Glulam at the typical classroom corridors. The beams above the dining space are almost 60ft long and would require a flitch beam, which is a hybrid system of wood and steel beams. Further coordination with the design team will be required to determine if wood framing can meet the load, span, deflection, budget, and fireproofing requirements for the building. The lateral system of the building would still be a steel frame with braced or moment frames and the wood portion would be replacing other "gravity" members.



STRUCTURAL DESIGN LOADS

Gravity loading is comprised primarily of dead loads and live loads. Dead loading is simply weight associated with permanent building features and structural components, while design live loads are code-prescribed and are representative of transient human occupancy and space usage subject to adjustment or change. For this project, anticipated live load magnitudes are as follows:

All Levels, UNO	100 psf
Mechanical	150 psf*
Roof	20 psf (minimum)

Design Criteria: Codes and Standards

- North Carolina State Building Code- 2018 Edition based on IBC 2015
 - North Carolina State Construction Manual
 - ASCE 7-10 Minimum Design Loads for Buildings and Other Structures*
 - ACI318-14 Building Code for Reinforced Concrete
 - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings (AISC 360-16)
 - ACI 530|530.1-13 Building Code Requirements for Masonry Structures
 - AISI S100-12 Cold Formed Steel Design Specification
 - National design specification for wood construction (ANSI/AWC NDS-2018)
- * ASCE7-16 may be used if the seismic values reduce the Seismic Design Category from C to B.

Serviceability Criteria:

- Deflection
- | | |
|----------------------------|--------------------------|
| Dead plus Live Load | L/240 |
| Live Load | L/360 |
| Members Supporting Masonry | L/600 not to exceed 0.3" |

- Drift

Due to wind	H/400
Due to seismic	0.015 * Story Height
- Vibration

Walking	a < .5 %g
---------	-----------
- Snow Load

Ground Snow Load	10 psf
Snow Importance Factor	IS=1.1
Roof Snow Load	11 psf
- Wind Load

Basic Wind Speed	155 mph
Wind Importance Factor	IW=1.15
Wind Exposure Category	Exposure C
- Seismic Load

Basic Seismic Force Resisting System	Steel Systems
Not Specifically Detailed for Seismic Resistance;	
Response Modification Coefficient	3
Deflection Amplification Factor	3
Seismic Site Class	TBD
Spectral Response Coefficient (short)	Ss TBD
Spectral Response Coefficient (1-sec)	S1=TBD
Seismic Design Category	TBD
Seismic Importance Factor	IE=1.25

Items TBD will be determined after reviewing geotechnical recommendations.

Materials

- Concrete

Elevated Slab	4,000 psi, normal weight
Elevated Slab at exterior	4,500 psi, normal weight
Walls	5,000 psi, normal weight
Footings	3,000 psi, normal weight
Slab on Grade	4,000 psi, normal weight
Reinforcement: all	ASTM A615 Grade 60

- Structural Steel

W Shapes	ASTM A992
Plates, Channels, Angles	ASTM A36
Hollow Structural Sections	ASTM A500, Grade B
Pipe	ASTM A501, Grade E
Miscellaneous Steel	ASTM A36, Fy=36 ksi
- Steel Deck

Floor	2"-18 Ga Composite (Galv)
Roof	1-1/2"-20 Ga Type B (Galv)
- Masonry

CMU	f'm= 1,500 psi
Mortar	Type S - ASTM C270 28 day
Compressive strength	1,900 psi
- Cold Formed Steel

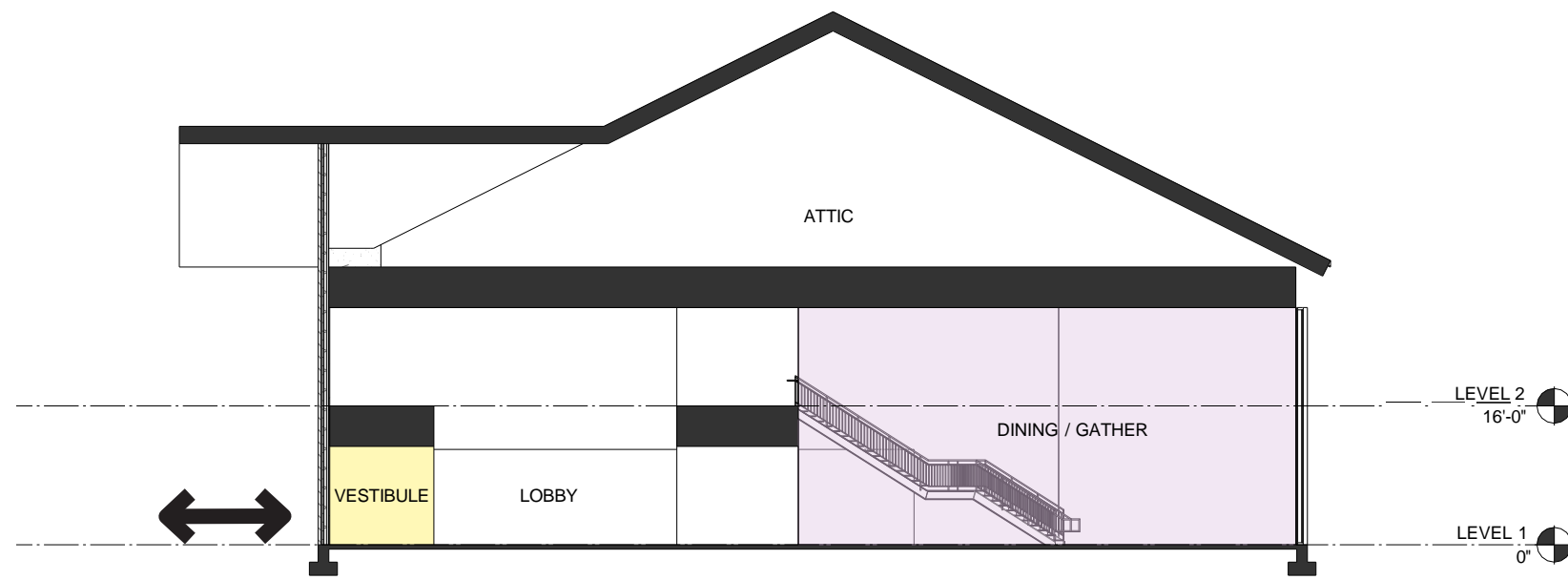
Metal Studs	Manufacturer's standard shaped steel
Per ASTM	C955
- Timber/Wood

Beams	Glulam
Flitch Beams	Southern Yellow Pine/Steel

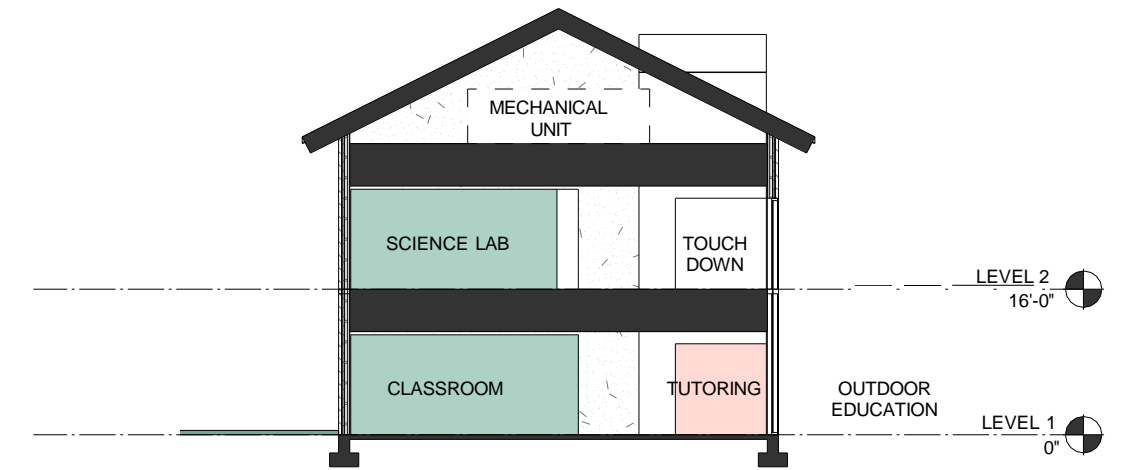
CONCLUSIONS

Stewart is looking forward to collaborating with other design and construction entities engaged on the project. Through this collaboration, we expect to work towards a level of refinement of the information herein that represents a solution to the owner that balances aesthetics, function, constructability, and structural performance.

SECTION DIAGRAMS



EAST/WEST BUILDING SECTION



NORTH/SOUTH BUILDING SECTION

3.2 MEP DESIGN

GENERAL

The following Project Narrative describes Mechanical, Plumbing, Fire Protection, Electrical, Electronic Safety and Security (ESS) and Technology scope associated with the new, 60,000 square feet, Isaac Bear Early College High School Building.

Codes and Standards

The design of the New Early College shall meet the requirements of the following:

- 2018 North Carolina Existing Building Code
- 2018 North Carolina Building Code
- ANSI A117.1, 2017 edition
- 2018 North Carolina Energy Conservation Code
- 2018 North Carolina Mechanical Code
- 2018 North Carolina Plumbing Code
- 2018 North Carolina Fire Prevention Code
- 2018 North Carolina Administrative Code
- 2020 National Electrical Code with NC Amendments
- North Carolina Department of Public Instruction (NCDPI)

HEATING + AIR CONDITIONING SYSTEMS

The HVAC system for this project consists of unitary geothermal heat pumps for zone control and zoned outside air handling units with energy recovery. Zoning and quantity will be determined as the floor plan design progresses. In general, the schools will be zoned with one heat pump per classroom. The ventilation (outside) air is de-coupled from the HVAC heating and cooling with each space (or zone) receiving outside air separately utilizing demand control ventilation.

Each heat pump will be a high efficiency, two-stage or single stage heat pump unit with an ECM fan motor. Most of the units will be floor mounted and installed in distributed mechanical closet spaces located throughout the facility. Each heat pump unit will utilize refrigerant R-410A and will have an ozone depleting potential (ODP) of 0.05 or less.

Each zone will have a heat pump with a thermostat (adjustable) and associated space temperature sensors. For demand control ventilation, appropriate spaces will also include CO2 and occupancy sensors. The thermostat/sensors, CO2 and occupancy sensors are to interface to the building automation system. The CO2 and occupancy sensor inputs will be utilized to control the space ventilation terminal unit and space temperature set points.

All heat pump units shall have fully ducted supply and return sheet metal ductwork with flexible runouts to diffuser and grilles. All supply air ductwork shall be insulated with 2.2" thick, ¾ pcf duct wrap with vapor barrier (installed R-value R>6). Return air ductwork will not be insulated. Each heat pump unit will include a duct-mounted pre-filter rack. The pre-filters shall be 24"x24" Flanders/FFI PrePleat 40. Each heat pump shall include integral disconnect. Condensate for each unit will be disposed of through a floor drain. Each heat pump will have a bi-polar ionization device. All heat pumps sizes 3 tons and smaller shall be installed on 12" stands (applicable to units located in mechanical closets only). Heat pumps serving the following spaces shall have hot-gas reheat for direct humidity control: Media Center, Shared Area, Dining, Kitchen..

The system will utilize a central pumping system. The system will consist of two (2) base-mounted end-suction variable speed pumps. Each pump will be sized at 100% of the building's block load or roughly 500 gpm each. Flexible stainless-steel braided hoses shall be used at the connection of each heat pump. The hose kits shall include shut-off valves on each the supply and return and a strainer on the supply hose. The return hose kit shall also contain a two-way, two-position control valve and flow control device.

The high electrical load IT (MDF) and electrical (central) room will be conditioned utilizing geothermal air conditioning equipment. Smaller IDF/electrical rooms will be ventilated with cabinet exhaust fans connected into the central exhaust system.

All science labs will have a dedicated exhaust fan to be controlled via a timer switch located in the space.

VENTILATION SYSTEMS

The outside air systems for the facility shall be de-coupled. In general, the outside air shall be provided directly to the occupied space. The dedicated outside air handling unit for the indoor shall include dual supply/exhaust plenum fans and utilize double wall construction. The units shall be variable volume energy recovery type units utilizing building exhaust and general exhaust air to precondition the outside air through a total energy recovery wheel. All conditioned outside air ductwork and building exhaust air ductwork will not be insulated – this applies to positive pressure outside air ductwork and negative pressure exhaust air ductwork. All un-conditioned air ducts shall be insulated with 3" thick, ¾ pcf duct wrap with vapor barrier – this applies to negative pressure outside air ductwork and positive pressure exhaust air ductwork.

The indoor type outside air unit will consist of the following sections/components: on one side and in the direction of air flow will be an inlet filter, energy recovery wheel, and plenum type, dual, exhaust air fan on the other side will be an inlet filter, energy recovery wheel, access, Dx cooling/heating coil, access, plenum type, dual, supply air fan. The fan will be controlled by a VFD for varying airflow conditions. The dedicated outside air units are sized to maintain positive pressurization in the building. These units are sized based on worst case of ventilation or exhaust requirements. The supply fans will track 15% higher than the exhaust fans. The supply air distribution system will supply outside air to VAV terminal units for distribution of outside air to each zone. Reference attached cutsheet of DOAS unit for details.

Each variable occupied area will contain a high quality CO2 measuring sensor. The VAV terminal will modulate in accordance with the CO2 measurements. The Classroom VAV terminal will be interlocked with room occupancy sensor. The ventilation rate will be modulated based on occupied and vacant spaces conditions. The total space by space occupancy count is expected to exceed actual building occupancy; however, the building occupancy is 300 students. Designing a variable ventilation system based on actual building occupancy reduces the central ventilation system by ~50 percent, thus reducing the HVAC load.

The outside air conditioning system for the new building will be provided with water to water, geothermal heat pump system internal to each unit and provided with supplementary heat in the pipe cabinet to prevent against freezing.

The geothermal pipe loop will consist HDPE piping with butt-fused fittings and joints, without propylene glycol, but with chemical treatment. The 2-pipe loop will be insulated with 3/4" thick plenum rated elastomeric insulation.

NO WORK PROPOSED IN THIS AREA

GEOTHERMAL WELL AREA IN NEW PARKING LOT: 100' X 260' - SPACED ON A 20' GRID



The basis of the heat gain and heat loss calculations will be based on the following criteria:

	Outdoor Air Conditions	Indoor Air Conditions
Summer	94F db / 74F wb	75F db + 2F db / + 50% RH
Winter	20F db	70F db + 2F db

The Building Envelope Criteria used is as follows:

Building Envelope Criteria	
Roof U Factor	0.043
Wall U Factor	0.0555
Window U Factor	0.28
Window Shading Coefficient	0.28
Standard Door U Factor	0.3

KITCHEN SYSTEMS

The kitchen hood design will be sized as needed to support the kitchen equipment installed. The airflows will be determined based on UL methodology, thus reducing the overall airflow design. The kitchen hood also utilizes a makeup air unit with direct gas fired furnace sized to provide tempered makeup air (60°F) during winter operation (no supplemental cooling).

A dedicated upblast exhaust will be connected to a conveyor type dishwasher machine and interlocked for operation.

OPTION 1 - GEOTHERMAL WALL FIELD AND PIPING SYSTEM

Sizing of the well field is based on block/diversified internal loads and designed for 78°F geothermal summer supply water temperature. The wellfield will be preliminarily sized for 160 tons of capacity requiring ~90 wells (6 circuits with 15 wells each). This tonnage is broken down to approximate 125 tons for building internal loads (occupants, lighting, equipment, outside air conditioning), and 35 tons for building envelope. The well field is designed with one spare additional well per circuit (6), the shutdown of one circuit would still allow building operation with

geothermal supply water temperature rising approximately +7°F, which results in loss of energy efficiency in the heat pumps of approximately 0.08-0.12 kW/Ton.

The geothermal well field will consist of 400 feet deep wells. The bores will be 6" in diameter and will include a factory-made DR-9, 1-1/4" U-tube, fully grouted well. Central distribution header is located in the pump room (thus eliminating geothermal vault). The wells shall be installed on a 20' by 20' grid system. All horizontal mains shall be a minimum of three to five feet below grade and the trenches shall be 100% back filled with rock or other suitable materials.

All geothermal piping exterior of the building shall be HDPE butt-fused joints and fittings. All geothermal piping mains interior of the building shall also be HDPE butt-fused joints and fittings so as to eliminate steel piping in this geothermal/hydronic loop. Heat pump run outs shall be PEX or HDPE. The well field piping and building piping will be purged to remove dirt, debris and air. The system will include side stream filtration, air elimination equipment, isolation zone/valves, central chemical treatment and fill, and a purge pump.

With typical geothermal supply water temperatures operating higher than the space dew point, only concealed geothermal piping (HDPE) will be insulated with ½" thick fiberglass. Startup of the system shall be initiated and operated as required to prevent below dew point distribution water temperatures until steady state operating temperatures are achieved and maintained. However, concealed, non-accessible geothermal piping interior of the building may be insulated with 1" thick fiberglass insulation.

OPTION 2 - WATER SOURCE HEAT PUMP SYSTEM

Water Source Heat Pump System with Dedicated Outside Air and Closed Cooling Tower.

This system will provide heating and cooling to all areas of the building:

- Administration / Guidance / Shares Areas
- All Classroom Areas

- Main Entry and Corridors
- Dining Areas

This system will control temperature utilizing individual water source heat pumps in each zone and rooftop mounted dedicated outside air preconditioning units.

It may be possible to combine several rooms on a single heat pumps, however due to the scale of this building we would not recommend.

We would recommend the following: -

- Dedicated Outside Air Ventilation direct to individual classroom and corridor spaces.
- Individual room failures of heating and cooling.
- Walk-up access to individual units in mechanical closets for servicing.
- A failure of one unit, does not shut down a full wing of the building, only one room.
- Energy Savings due to operating nature of the heat pump units.
- Demand control ventilation and off hour direct humidity control without chiller/boiler operating.

This system shall utilize one (1) 200 ton closed circuit cooling tower for purposes of heat rejection. Sized to reject 70% of the heat produced by the building equipment.

The water source heat loop temperature shall be limited to not less than 55F and provided with supplemental heat from a modular boiler selected to handle 55F return water directly without damage to the boiler. Two 1000 MBH condensing boilers shall be provided for N+1 redundancy.

We estimate Five (5) Dedicated Outside Air units of a nominal 15,000 CFM be provided to deliver outside air to the classroom and admin wings. Classroom units must be sized to provide 15 CFM per student per classroom or 360 CFM per room.

TEMPERATURE CONTROL

A web-based Building Automation and Control (BAC-Net) Direct

Digital Control (DDC) controls system shall be provided for the entire building and associated systems. The controls system will also include a JACE panel to communicate (wired/wireless) over the web-based area network. The Building Automation System (BAS) shall also interface with the building lighting, exterior lighting, and switch gear / electric metering. The system shall be ASHRAE 135 BACnet compliant using BACnet Testing Laboratories (BTL) listed components (to the extent possible).

FIRE PROTECTION SYSTEMS

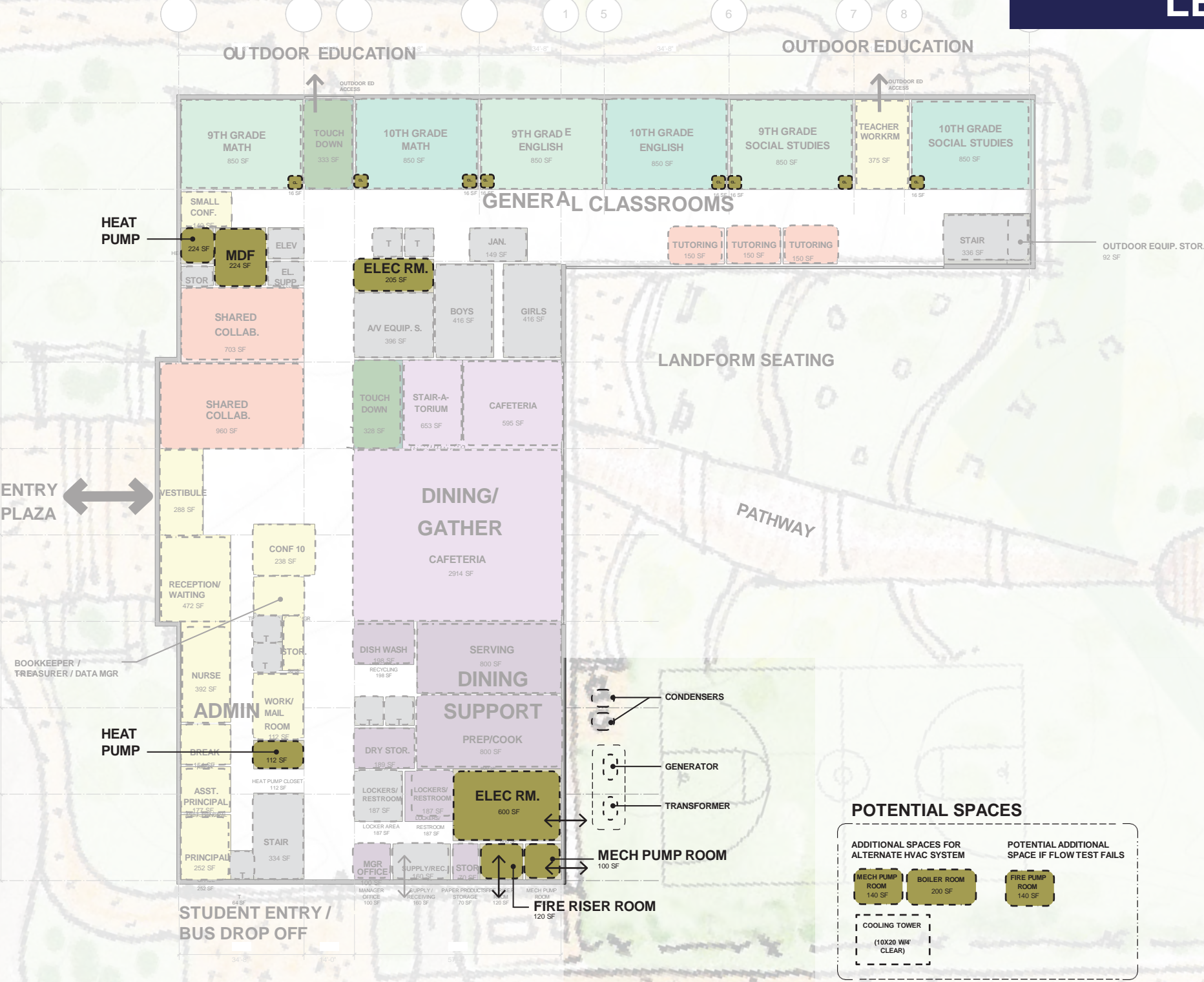
A new metered fire service line will be supplied to the new High School via underground supply from the local utility service. Incoming fire service shall include a post indicator valve and a double detector check valve assembly. Installation shall meet or exceed all applicable requirements of NFPA, state, and local codes.

The entire building shall be provided with a new fire suppression system designed in accordance with all applicable standards of NFPA including but not limited to NFPA 13. Piping 2" and smaller shall be schedule 40 steel pipes with threaded fittings, and 2-1/2" and larger shall be schedule 10 steel pipes with grooved type fittings.

Sprinklers shall be recessed, quick response, pendant type sprinklers in areas containing ceilings. Upright sprinklers shall be used in areas containing no ceilings, such as mechanical rooms, etc. Dry pendant/upright type sprinklers shall be utilized in the areas subject to freezing temperatures such as the loading dock and all freezer/cooler boxes.

Sprinkler drain risers will be provided to allow system to be fully drained. Sprinkler drain piping shall be routed and spilled to grade or to a drain capable of handling the discharge flow.

A fire hydrant flow test is required (and a final must be performed within 12 months of code approval) to determine available static pressure, residual pressure, and flow.

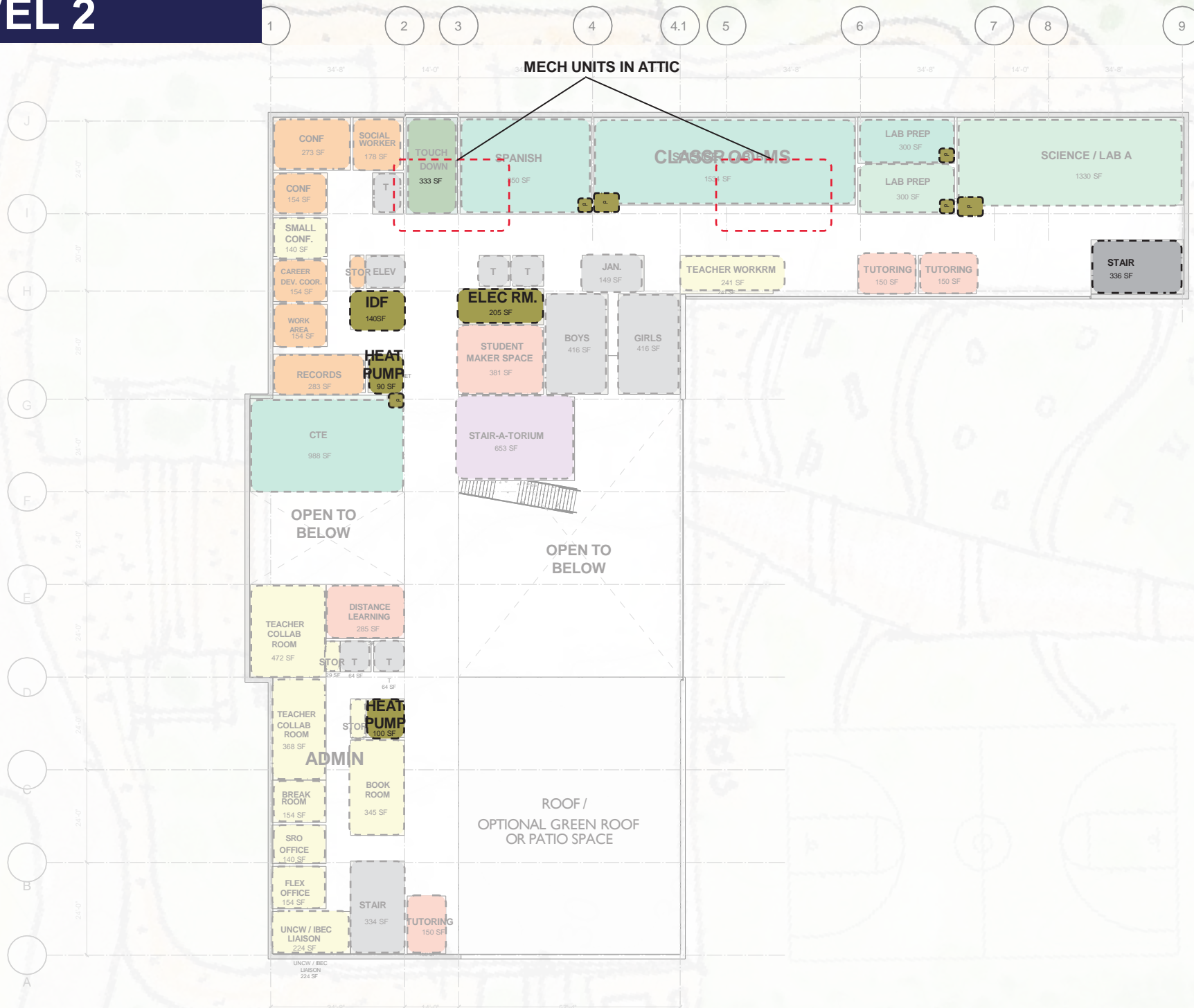


POTENTIAL SPACES

ADDITIONAL SPACES FOR ALTERNATE HVAC SYSTEM		POTENTIAL ADDITIONAL SPACE IF FLOW TEST FAILS
MECH PUMP ROOM	BOILER ROOM	FIRE PUMP ROOM
140 SF	200 SF	140 SF
COOLING TOWER (10x20 W4' CLEAR)		

MECH / ELEC SPACES

LEVEL 2



PLUMBING SYSTEMS

Sanitary Service:

The building sanitary sewer will be 6 inch in size and drain by gravity to exterior manhole(s). A 1,000 gallon grease trap will be included to service the kitchen per local requirements.

Water Service

A new three inch (3") metered water service line will be supplied to the new High School via underground supply from the local utility into the Main Mechanical Room, routed through one full size 3" backflow preventer, with a 3" bypass backflow preventer.

A fire hydrant flow test is still to be performed.

Domestic Water Heating System:

The domestic hot water production for the kitchen utilizes a high efficiency heat pump heater with electric booster in an adjacent 280 gallon storage tank with (2) 12kw supplemental electric elements. This will provide 120°F domestic hot water for distribution to the kitchen sinks, dishwasher, pot washing, etc. Local booster heaters (only as necessary for the dishwasher) are utilized at the kitchen equipment to increase the hot water temperature to 140°F. A similar and dedicated system with 80 gallon storage and 12 kw electric elements will be utilized to provide the domestic water needs throughout the facility and include hot water recirculation piping, balancing valves, and pumps, which allow re-circulation pump operation only as necessary.

Plumbing Waste and Vent Piping:

- PVC with solvent welded joints below grade and in walls.
- Service weight cast iron with no hub bands in all ceilings and stud walls.

Interior Roof Drains and Piping:

- All below ground and piping for the primary and overflow roof drainage systems will be PVC with solvent welded joints. Above

ground will be service weight cast iron with heavy duty banding.

- All above ground horizontal piping will be insulated with 1" glass fiber insulation.
- The typical roof drains will be dual outlet type drains. Zurn Z103-45 or equal.

Domestic Water Piping:

- Underground (only where required)– Type K copper piping with no joints.
- Above ground - Type L Hard Copper with lead free solder. 150 lb, flanged or screwed, gate or ball, bronze valves.

ELECTRICAL SYSTEMS

Electrical Site Work:

A new primary service will be brought underground from the nearest overhead lines to serve the new facility. A new three phase utility company pad-mounted transformer will be provided by Duke Energy. The secondary side of the transformer will feed underground from the transformer, into the building, to a new main distribution switchboard in the main electrical room. Primary and Secondary duct banks will be encased in concrete. A meeting will be scheduled on site with all parties to review the site and plans as the design progresses.

Building mounted site lighting will be provided for the main building entrances and other entry/exit doors. This lighting will be mainly recessed in the canopy utilizing LED fixtures. All wall mounted fixtures will be vandal resistant, and surface mounted.

Site lighting along drives and parking lots will utilize LED fixture heads on 25ft poles. Roadway lighting will be provided, need to confirm whether to be included as part of the project or installed by Duke Energy, as a minimum the electrical contractor will provide conduit and wiring. Pathway and accent lighting will be specified by the architect and engineers and installed by the electrical contractor. All new lighting will be served from a separate electrical service and utility

transformer. Illumination levels will be designed to meet IESNA G-1-16 recommendations for security lighting at entrance/exit drives, and within parking areas. All existing utility company owned site lighting in the area of work will be removed and replaced with new LED fixtures served from the new facilities electrical distribution system.

All building signage, either located on the building or identification sign located on site, will be provided with illumination to a level of 10 fc if they are not illuminated signs. All site lighting will have full cutoff to comply with the Dark Sky Compliant and Green Globes requirements.

POWER SYSTEMS

Normal Power Systems:

The building will be served with a new normal power distribution system, consisting of a new main switchboard with an estimated 1600A/277/480V/3Ø/4W service main.

This switchboard will be front accessible with SPD protection on full-function, electronic trip, 100% rated main. Distribution sections will be circuit breaker type. Zone selective interlocking will be provided between the main and distribution breakers in the Main Distribution Panel. The electrical service equipment will be sized based on lighting, devices, HVAC, and miscellaneous loads associated with the building.

Sub-metering will be provided for all utility connections to the facility, and for all branch panelboards. Metering will be provided at each panel to allow for individual metering of each load (lighting, receptacles, mechanical equipment, kitchen, etc.) in addition to allowing for metering of each classroom wing. This system will be monitored by the Building Automation System (BAS).

In general, power distribution panels will be located in the main electrical room serving branch panels of specific loads (Mechanical/Lighting/Plug Loads).

Distribution panelboards, branch circuit panelboards, and dry type transformers shall be provided to serve loads throughout the facility as required by the design criteria. All lighting and appliance panelboards shall be hinged cover (door-in-door) construction. All panelboards shall be surface mounted and installed in dedicated electrical rooms and combined mechanical/electrical rooms accessible only to qualified personnel. All dry-type transformers to be energy efficient type EE. All feeders and exposed branch circuits shall be insulated copper conductors routed in EMT conduit. In areas subject to mechanical injury (i.e. mechanical rooms) rigid or intermediate metallic conduit will be used. Minimum wire size shall be #12 AWG. Conductors sized #10 AWG and smaller shall be solid copper conductors. A green insulated grounding conductor(s) shall be installed in each raceway. Independent dedicated neutrals (no multi-wire) shall be used for all circuits. Receptacles shall be specification grade NEMA 5-20R, side wired with high impact thermoplastic faceplates throughout the facility.

Surge Protection Devices (SPD's) will be provided on the main distribution panel, emergency distribution panels, and any panel serving dedicated electronic equipment.

Preliminary Fault Current Analysis will be performed to determine electrical equipment SCCR and AIC ratings. A final Fault Current, Coordination, and Arc Flash Study will be provided by the electrical equipment supplier.

Equipment Connections:

Power connections and code required disconnecting means will be provided for all HVAC, Plumbing, and kitchen equipment in the facility and on the site. Combination starter/fusible disconnects and variable frequency drives (VFD's) will be provided for selected equipment as required.

Grounding:

The secondary electrical distribution system shall be the solidly grounded neutral type with no intentionally introduced grounding impedance. Grounding and bonding shall be in accordance with Article 250, National Electrical Code and shall conform to UL 467. A green insulated grounding conductor shall be provided with the branch and feeder wiring. Driven grounding electrodes shall be 3/4-inch diameter solid rods of copper or copper-clad steel.

Emergency Power Systems:

An approximate 150kw diesel generator will be provided outdoors in the mechanical yard to provide emergency power to optional emergency and life-safety emergency loads. The generator annunciator will be located in the main office.

The following items will be connected to the emergency power system:

- Code required exit signs/egress lighting in assembly spaces and paths of egress.
- Fire Alarm System
- Intercom Console
- Phone System
- Two Way Communication systems
- General lighting throughout all public areas
- Lighting in classrooms with window/wall ratio less than 8%
- Additional optional emergency loads per direction of the owner

All fire alarm systems, security systems, telecommunications rooms, telephone systems, paging systems, and misc. equipment throughout the facility that need back up will be provided with battery packs/UPS.

A permanent switching means will be provided on the generator to meet NEC 700 requirements.

LIGHTING SYSTEMS

Normal Power Lighting Systems:

Lighting will be mainly recessed, high performance LED flat panels or indirect recessed LED center-basket troffers, with specialized lighting in some select spaces. Lighting will be designed in accordance with the lighting levels as recommended by the IESNA and North Carolina public schools' guidelines. See attached light fixture cutsheets at the end of this narrative for examples of LED troffers.

All LED lighting in classrooms shall utilize dimming controls via manual dimmers that will allow for multiple levels of lighting. Automatic daylight harvesting controls will be provided only in areas required by energy code.

Classrooms, offices, conference rooms, storage rooms, and other similar spaces will have occupancy and/or vacancy sensors for automatic shutdown of lights.

All exterior lighting will be controlled by an independent controller. This system will have a photocell and time clock for additional control. See "Electrical Site Work" above for additional site lighting requirements.

Lightning Protection (If requested by New Hanover County Schools): See attached Lightning Risk Assessment per NFPA 780 guidelines: this calculation deems a lightning protection system is recommended for this building. However, the installation of the system is still subject to the owner's discretion and is not required. The building shall feature a complete Lightning Protection System certified to NFPA 780. System shall comply with UL #96A. Building steel shall not be used as a down conductor. Down conductors shall be concealed within the building. Each down conductor shall be terminated to a dedicated ground rod. Provide surge protective devices for all systems identified in NFPA 780. A Lightning Risk Assessment will be provided to help recommend if a system is to be provided.

TECHNOLOGY SYSTEMS

Paging/Sound System:

A 25V zoned paging system shall be provided to serve the entire building. Paging speakers will be provided in all occupied spaces such as classrooms, offices, corridors, stairwells, lobbies, and public locations in the building. All wiring shall be run as data communications. The system headend equipment shall be located in the main office area and interface with the building VOIP phone system. Offices, tutor rooms, science prep rooms and all conference rooms less than 160 SF shall have wall mounted speaker volume control. The system will also have a master clock to generate schedule tones.

The gyms, cafeteria, and any other assembly area will have a local sound system for specific use in those areas. Local sound systems with installed loud speakers, wall mounted rack (with amplifier, mixer, equalizer, etc.), wireless microphone system and hardwired microphone inputs. Areas with fixed seating shall be provided with assisted listening systems.

Data System (conduits, pull wires, and backboxes only):

Two (2) 4" and one (1) 2" conduits will be provided from the property line to the new Main Communications (MDF) Room for new service provider cabling. A central main communication room (MDF) and intermediate telecommunications rooms (IDF) will be provided throughout the school to support data/voice drop requirements. MDF and IDF rooms will be centrally located and pathways between rooms and to work area outlets will be provided with 18" ladder style cable tray and sleeves. Each MDF and IDF will be provided with fire rated plywood backboard, dedicated power circuits, and ground bars that are fully integrated with building grounding system and building steel.

Back boxes, conduits, sleeves, and j-hooks will be provided for work area outlets at locations throughout the facility at locations discussed with the owner's technology staff.

The 18" cable tray shall be provided with a divider to segment the tray into 12" and 6" sections. The 12" section will be used for Fiber and data cabling. The 6" section will be used for Access Control, security, and other misc. cabling.

All data requirements will be closely reviewed with the owner's technology staff on the design team.

Re-penetrable fire sleeves will be provided where pathways are routed through fire walls.

Fire Alarm Systems:

A new addressable, Voice Evacuation Fire Alarm System shall be provided throughout the building per NFPA and local Building Codes for occupant notification. All required HVAC shall also be connected to the new fire alarm system. The main Fire Alarm Control Panel (FACP) will be located in the main electrical room. New Fire Alarm Annunciator panels (FAA) will be provided for remote identification at the main entrance, main office, and any other locations as directed by the local Fire Marshall. The new panel shall be set up to monitor all points throughout the building. The system will be designed around the manufacturer of the districts choice. The system will be monitored through a cellular dialer with external antenna.

Clock System:

A digital clock system shall be integrated into the paging/sound system throughout the building at locations determined with Owner.

Classroom Technology:

Classroom technology will support displays, connected computer devices, tablets as well as wireless devices.

ELECTRONIC SAFETY AND SECURITY (ESS) SYSTEMS

Electronic Safety and Security Systems (conduits, pull wires, and backboxes only) shall be designed and provided by the Security Design Consultant / School vendor. We assume this system to be a fully Integrated, enterprise grade Video Management Systems and Security Management Systems (VMS / SMS) with central management capabilities. The system should be a network browser-based platform that inter-operates with multiple manufacturer's IP Cameras and Access Control devices. The system will be based on open platform industry security standards with open APIs. It will also help ensure that future changes in hardware and software will not lock the Owner into a single vendor or sales team. This allows the Owner to reassess needs and quality of service at renewal intervals allowing changes of software as required. This also allows the chosen vendors to continue to earn their respective business instead of being locked in.

We anticipate access control readers on every perimeter door. This will include all exterior doors to facilitate perimeter security and provide lock-down capability without having to rely on the human element to make sure all doors are locked in an emergency lock-down scenario. These doors will also have position switch indicators to report door position and detect any door prop or forced entry. Additional access control doors will be provided to aid in compartmentalization. All access-controlled doors will be able to be scheduled open or closed at predetermined times. This is software definable and can be changed at any time by those with ESS programming authorization.

The VMS will provide event-based monitoring of the building, site, and situational awareness through IP cameras centrally from the any designated operation center or location.

The VMS utilizes computer analytics to perform computerized processing and analysis of the various video streams. This information is then used to potentially identify situations in the building or on site and report those based on pre-defined rules programmed into the system while bookmarking them for future evidence review and retrieval or export. The VMS should provide the HTML capability to be securely monitored remotely through mobile devices or off-campus locations.

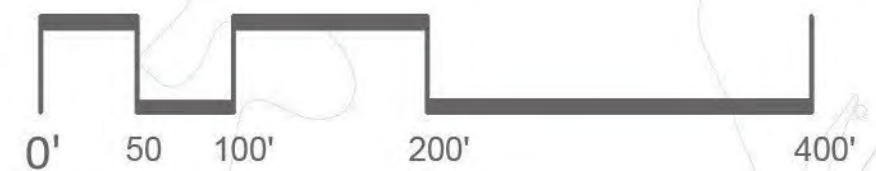
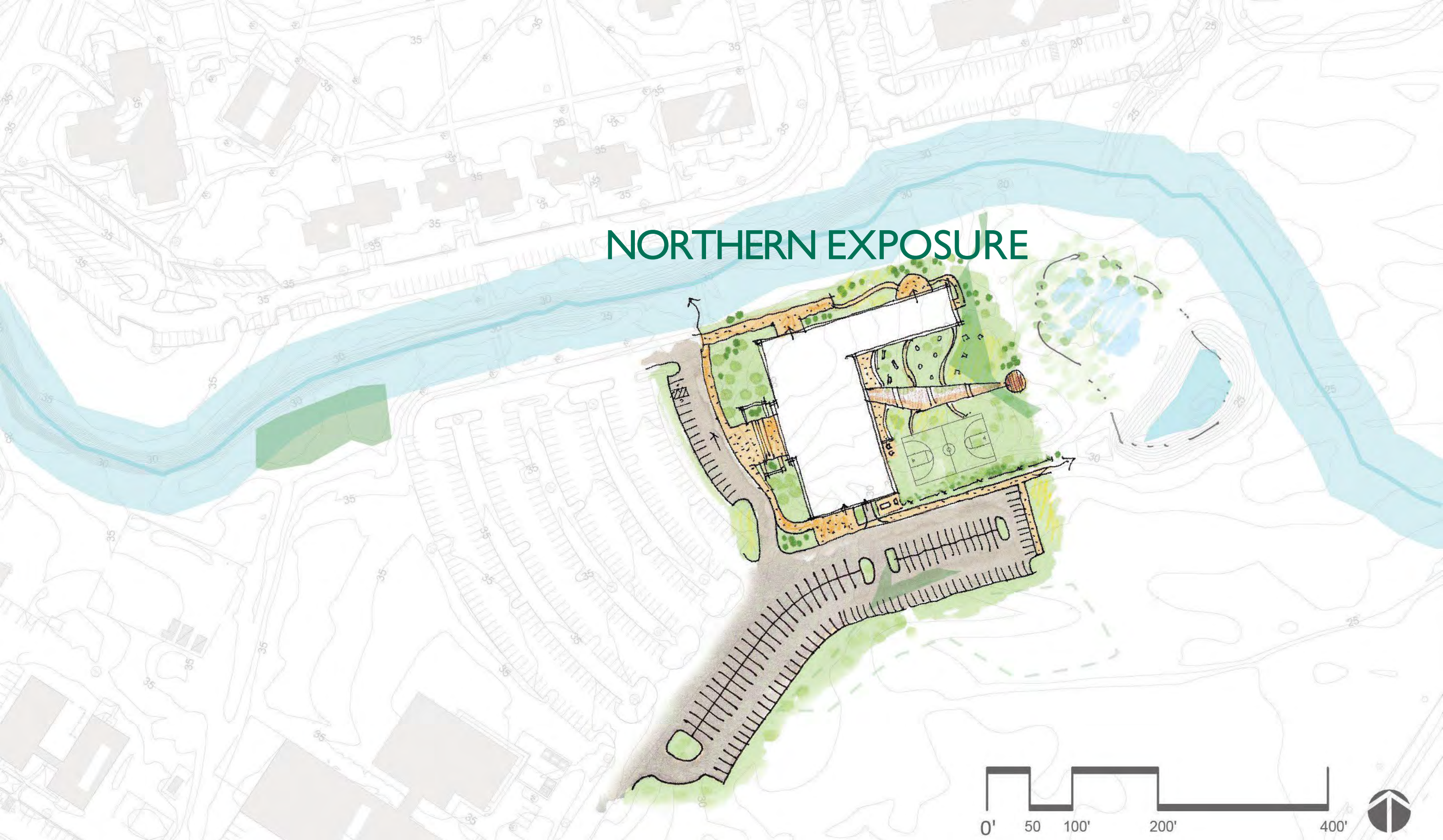
This feature also aids in resource sharing with outside public safety organizations and other first responder or governmental agencies if the need arises. Access Control and Video Surveillance equipment should be standardized for maintenance and serviceability across the entire campus. Centralized storage can be used to protect data and ensure that all video and log retention policies are being enforced. The SMS central campus access control systems should provide the ability to limit or stop ingress to buildings and immediately lock all or selected doors in real time if necessary.

3.3 DAYLIGHTING DESIGN

During the Advance Planning process, the design team studied multiple building configurations and orientations for the Isaac Bear Early College High School building, relative to solar orientation and cut and fill of the site. The proposed orientation parallel to the site topography provides an ideal east-west axis orientation, utilizing north and south facing glazing, for daylight control and thermal loading in addition to minimizing cut and fill. A goal of the design team in this process was to provide daylight to the classrooms. The introduction of daylight into the classrooms will not only serve to supplement the artificial lighting, but also create a direct connection to the outdoors for the students.

The design team will continue to study the placement and expanse of the glazing to control the effect of daylighting on thermal loading.

NORTHERN EXPOSURE



THIS PAGE IS INTENTIONALLY LEFT BLANK.

4.0 PRELIMINARY PROJECT BUDGET + SCHEDULE

Schedule	4.1
Program Validation	4.2
Cost Estimate	4.3

THIS PAGE IS INTENTIONALLY LEFT BLANK.

4.2 PROGRAM VALIDATION

ACTUAL VS PROGRAMMED

REFER TO PROPOSED DESIGN PLAN DIAGRAMS

PROGRAM - 01 CORE ACADEMIC AREAS						
ROOM	NAME	PROGRAM AREA	ACTUAL AREA	ACTUAL AREA VS PROGRAM AREA	LEVEL	DEPARTMENT
01 CORE ACADEMIC AREAS - 9TH						
9TH GRADE	SOCIAL STUDIES	850	850 SF	1.00	LEVEL 1	01 CORE ACADEMIC AREAS - 9TH
9TH GRADE	ENGLISH	850	850 SF	1.00	LEVEL 1	01 CORE ACADEMIC AREAS - 9TH
9TH GRADE	MATH	850	850 SF	1.00	LEVEL 1	01 CORE ACADEMIC AREAS - 9TH
CTE						
		850	988 SF	1.16	LEVEL 2	01 CORE ACADEMIC AREAS - 9TH
LAB PREP						
		250	300 SF	1.20	LEVEL 2	01 CORE ACADEMIC AREAS - 9TH
SCIENCE / LAB A						
		1200	1,330 SF	1.11	LEVEL 2	01 CORE ACADEMIC AREAS - 9TH
		4850	5,167 SF			
01 CORE ACADEMIC AREAS - 10TH						
10TH GRADE	MATH	850	850 SF	1.00	LEVEL 1	01 CORE ACADEMIC AREAS - 10TH
10TH GRADE	ENGLISH	850	850 SF	1.00	LEVEL 1	01 CORE ACADEMIC AREAS - 10TH
10TH GRADE	SOCIAL STUDIES	850	850 SF	1.00	LEVEL 1	01 CORE ACADEMIC AREAS - 10TH
LAB PREP						
		250	300 SF	1.20	LEVEL 2	01 CORE ACADEMIC AREAS - 10TH
SCIENCE / LAB 8						
		1500	1,534 SF	1.02	LEVEL 2	01 CORE ACADEMIC AREAS - 10TH
SPANISH						
		850	850 SF	1.00	LEVEL 2	01 CORE ACADEMIC AREAS - 10TH
		5150	5,234 SF			
01 SHARED SPACES						
SHARED	COLLABORATION	1700	960 SF	0.56	LEVEL 1	01 SHARED SPACES
SHARED	COLLABORATION	1	703 SF	703.48	LEVEL 1	01 SHARED SPACES
STOR		1	48 SF	48.00	LEVEL 1	01 SHARED SPACES
TOUCH DOWN		400	333 SF	0.83	LEVEL 1	01 SHARED SPACES
TOUCH DOWN		400	290 SF	0.73	LEVEL 1	01 SHARED SPACES
TUTORING		150	150 SF	1.00	LEVEL 1	01 SHARED SPACES
TUTORING		150	150 SF	1.00	LEVEL 1	01 SHARED SPACES
TUTORING		150	150 SF	1.00	LEVEL 1	01 SHARED SPACES
		4502	4,234 SF			
01 TEACHER SPACES						
BREAK	ROOM	150	154 SF	1.03	LEVEL 1	01 TEACHER SPACES
SMALL	CONF	150	140 SF	0.93	LEVEL 1	01 TEACHER SPACES
T	STAFF	60	64 SF	1.07	LEVEL 1	01 TEACHER SPACES
T	STAFF	1	64 SF	64.00	LEVEL 1	01 TEACHER SPACES
TEACHER CENTER	WORKROOM	300	375 SF	1.25	LEVEL 1	01 TEACHER SPACES
BOOK						
		400	345 SF	0.86	LEVEL 2	01 TEACHER SPACES
BREAK						
		150	154 SF	1.03	LEVEL 2	01 TEACHER SPACES
SMALL						
		150	140 SF	0.93	LEVEL 2	01 TEACHER SPACES
T		60	64 SF	1.07	LEVEL 2	01 TEACHER SPACES
T		1	64 SF	64.00	LEVEL 2	01 TEACHER SPACES
TEACHER	COLLAB ROOM	600	472 SF	0.79	LEVEL 2	01 TEACHER SPACES
TEACHER	COLLAB ROOM	1	368 SF	367.50	LEVEL 2	01 TEACHER SPACES
TEACHER CENTER	WORKROOM	300	241 SF	0.80	LEVEL 2	01 TEACHER SPACES
		2323	2,644 SF			
Grand total		16825	17,280 SF			

PROGRAM - 02 OTHER SPACES						
ROOM	NAME	PROGRAM AREA	ACTUAL AREA	ACTUAL AREA VS PROGRAM AREA	LEVEL	DEPARTMENT
02 OTHER SPACES						
A/V EQUIP	STORAGE	300	396 SF	1.32	LEVEL 1	02 OTHER SPACES
MDF		250	224 SF	0.90	LEVEL 1	02 OTHER SPACES
		550	620 SF			

PROGRAM - 03 ADMINISTRATION & HEALTH SERVICES						
ROOM	NAME	PROGRAM AREA	ACTUAL AREA	ACTUAL AREA VS PROGRAM AREA	LEVEL	DEPARTMENT
03 ADMINISTRATION & HEALTH SERVICES						
ASST. PRINCIPAL	FLEX SPACE	175	177 SF	1.01	LEVEL 1	03 ADMINISTRATION & HEALTH SERVICES
BOOKKEEPER /	TREASURER / DATA MGR	150	140 SF	0.93	LEVEL 1	03 ADMINISTRATION & HEALTH SERVICES
CONF 10		250	238 SF	0.95	LEVEL 1	03 ADMINISTRATION & HEALTH SERVICES
NURSE /	HEALTH ROOM	500	392 SF	0.78	LEVEL 1	03 ADMINISTRATION & HEALTH SERVICES
PRINCIPAL	OFFICE	250	252 SF	1.01	LEVEL 1	03 ADMINISTRATION & HEALTH SERVICES
RECEPTION /	WAITING	400	472 SF	1.18	LEVEL 1	03 ADMINISTRATION & HEALTH SERVICES
SECURE ENTRY	VESTIBULE	300	288 SF	0.96	LEVEL 1	03 ADMINISTRATION & HEALTH SERVICES
STORAGE		100	96 SF	0.96	LEVEL 1	03 ADMINISTRATION & HEALTH SERVICES
T	VISITOR	60	64 SF	1.07	LEVEL 1	03 ADMINISTRATION & HEALTH SERVICES
T	P OFC	64	64 SF	1.00	LEVEL 1	03 ADMINISTRATION & HEALTH SERVICES
T	STAFF	60	64 SF	1.07	LEVEL 1	03 ADMINISTRATION & HEALTH SERVICES
T	VISITOR	60	64 SF	1.07	LEVEL 1	03 ADMINISTRATION & HEALTH SERVICES
T	STAFF	60	64 SF	1.07	LEVEL 1	03 ADMINISTRATION & HEALTH SERVICES
WORKROOM /	MAIL ROOM	300	252 SF	0.84	LEVEL 1	03 ADMINISTRATION & HEALTH SERVICES
FLEX						
	OFFICE	120	154 SF	1.28	LEVEL 2	03 ADMINISTRATION & HEALTH SERVICES
SRO						
	OFFICE	120	140 SF	1.17	LEVEL 2	03 ADMINISTRATION & HEALTH SERVICES
STOR						
		1	40 SF	40.00	LEVEL 2	03 ADMINISTRATION & HEALTH SERVICES
STOR						
		1	29 SF	29.33	LEVEL 2	03 ADMINISTRATION & HEALTH SERVICES
T	STAFF	64	64 SF	1.00	LEVEL 2	03 ADMINISTRATION & HEALTH SERVICES
T	STAFF	64	64 SF	1.00	LEVEL 2	03 ADMINISTRATION & HEALTH SERVICES
UNCW / IBEC	LIAISON	150	224 SF	1.49	LEVEL 2	03 ADMINISTRATION & HEALTH SERVICES
Grand total		3249	3,342 SF			

PROGRAM - 04 GUIDANCE & STUDENT SUPPORT SERVICES						
ROOM	NAME	PROGRAM AREA	ACTUAL AREA	ACTUAL AREA VS PROGRAM AREA	LEVEL	DEPARTMENT
04 GUIDANCE & STUDENT SUPPORT SERVICES						
CAREER DEV.	COORD.	150	154 SF	1.03	LEVEL 2	04 GUIDANCE & STUDENT SUPPORT SERVICES
CONF		200	273 SF	1.37	LEVEL 2	04 GUIDANCE & STUDENT SUPPORT SERVICES
COUNSELOR'S	OFFICE	150	154 SF	1.03	LEVEL 2	04 GUIDANCE & STUDENT SUPPORT SERVICES
RECORDS		300	238 SF	0.79	LEVEL 2	04 GUIDANCE & STUDENT SUPPORT SERVICES
SOCIAL	WORKER	150	178 SF	1.18	LEVEL 2	04 GUIDANCE & STUDENT SUPPORT SERVICES
STOR			32 SF		LEVEL 2	04 GUIDANCE & STUDENT SUPPORT SERVICES
STORAGE	WORK AREA	150	154 SF	1.03	LEVEL 2	04 GUIDANCE & STUDENT SUPPORT SERVICES
T	STAFF	60	85 SF	1.42	LEVEL 2	04 GUIDANCE & STUDENT SUPPORT SERVICES
Grand total		1160	1,268 SF			

PROGRAM - 05 STUDENT DINING & FOOD SERVICE						
ROOM	NAME	PROGRAM AREA	ACTUAL AREA	ACTUAL AREA VS PROGRAM AREA	LEVEL	DEPARTMENT
05 STUDENT DINING & FOOD SERVICE						
CAFETERIA		3105	2,914 SF	0.94	LEVEL 1	05 STUDENT DINING & FOOD SERVICE
CAFETERIA		595	595 SF	1.00	LEVEL 1	05 STUDENT DINING & FOOD SERVICE
DISH WASH	RECYCLING	200	198 SF	0.99	LEVEL 1	05 STUDENT DINING & FOOD SERVICE
DRY	STORAGE	200	189 SF	0.94	LEVEL 1	05 STUDENT DINING & FOOD SERVICE
MANAGER	OFFICE	100	100 SF	1.00	LEVEL 1	05 STUDENT DINING & FOOD SERVICE
OUTDOOR	EQUIP STOR	150	92 SF	0.61	LEVEL 1	05 STUDENT DINING & FOOD SERVICE
PAPER PRODUCTS	STORAGE	1	70 SF	70.00	LEVEL 1	05 STUDENT DINING & FOOD SERVICE
PREP/	COOK AREA	800	800 SF	1.00	LEVEL 1	05 STUDENT DINING & FOOD SERVICE
RESTROOMS	LOCKER AREA	200	187 SF	0.93	LEVEL 1	05 STUDENT DINING & FOOD SERVICE
SERVING		800	800 SF	1.00	LEVEL 1	05 STUDENT DINING & FOOD SERVICE
STAIR-A-TORIUM		500	653 SF	1.31	LEVEL 1	05 STUDENT DINING & FOOD SERVICE
Grand total		6651	6,597 SF			

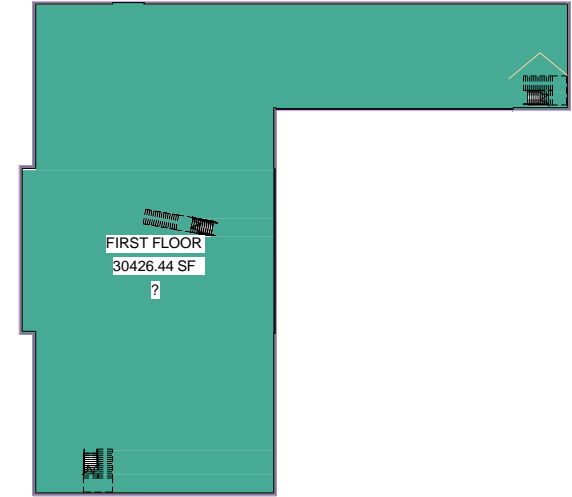
SUMMARY	
PROGRAM AREA	ACTUAL AREA
29,085	29,454 SF

TOTAL PROGRAM AREA

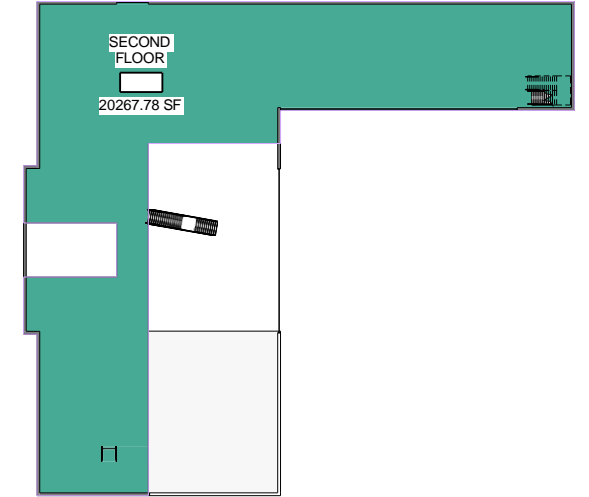
PROGRAM - 06 MAINTENANCE & CUSTODIAL						
ROOM	NAME	PROGRAM AREA	ACTUAL AREA	ACTUAL AREA VS PROGRAM AREA	LEVEL	DEPARTMENT
06 MAINTENANCE & CUSTODIAL						
LOCKERS/	RESTROOM	150	187 SF	1.24	LEVEL 1	06 MAINTENANCE & CUSTODIAL
SUPPLY /	RECEIVING	500	160 SF	0.32	LEVEL 1	06 MAINTENANCE & CUSTODIAL
Grand total		650	347 SF			

PROGRAM - 07 NON ASSIGNABLE						
ROOM	NAME	PROGRAM AREA	ACTUAL AREA	ACTUAL AREA VS PROGRAM AREA	LEVEL	DEPARTMENT
07 NON-ASSIGNABLE						
BOILER	ROOM		200 SF		LEVEL 1	07 NON-ASSIGNABLE
BOY'S TOILET			416 SF		LEVEL 1	07 NON-ASSIGNABLE
CLOSET			16 SF		LEVEL 1	07 NON-ASSIGNABLE
CLOSET			16 SF		LEVEL 1	07 NON-ASSIGNABLE
CLOSET			16 SF		LEVEL 1	07 NON-ASSIGNABLE
CLOSET			16 SF		LEVEL 1	07 NON-ASSIGNABLE
CLOSET			16 SF		LEVEL 1	07 NON-ASSIGNABLE
CLOSET			16 SF		LEVEL 1	07 NON-ASSIGNABLE
CLOSET			16 SF		LEVEL 1	07 NON-ASSIGNABLE
ELEC	ROOM		600 SF		LEVEL 1	07 NON-ASSIGNABLE
ELEC RM.			205 SF		LEVEL 1	07 NON-ASSIGNABLE
ELEV			87 SF		LEVEL 1	07 NON-ASSIGNABLE
ELEV SUPPORT			67 SF		LEVEL 1	07 NON-ASSIGNABLE
FIRE PUMP	ROOM		140 SF		LEVEL 1	07 NON-ASSIGNABLE
FIRE RISER	ROOM		120 SF		LEVEL 1	07 NON-ASSIGNABLE
GIRL'S TOILET			416 SF		LEVEL 1	07 NON-ASSIGNABLE
HEAT PUMP	CLOSET		90 SF		LEVEL 1	07 NON-ASSIGNABLE
HEAT PUMP	CLOSET		112 SF		LEVEL 1	07 NON-ASSIGNABLE
JANITOR			149 SF		LEVEL 1	07 NON-ASSIGNABLE
MECH PUMP	ROOM		100 SF		LEVEL 1	07 NON-ASSIGNABLE
MECH PUMP	ROOM		140 SF		LEVEL 1	07 NON-ASSIGNABLE
STAIR			336 SF		LEVEL 1	07 NON-ASSIGNABLE
STAIR			336 SF		LEVEL 1	07 NON-ASSIGNABLE
BOY'S TOILET			416 SF		LEVEL 2	07 NON-ASSIGNABLE
CLOSET			16 SF		LEVEL 2	07 NON-ASSIGNABLE
CLOSET			16 SF		LEVEL 2	07 NON-ASSIGNABLE
CLOSET			16 SF		LEVEL 2	07 NON-ASSIGNABLE
CLOSET			16 SF		LEVEL 2	07 NON-ASSIGNABLE
ELEC RM.			205 SF		LEVEL 2	07 NON-ASSIGNABLE
GIRL'S TOILET			416 SF		LEVEL 2	07 NON-ASSIGNABLE
HEAT PUMP	CLOSET		90 SF		LEVEL 2	07 NON-ASSIGNABLE
HEAT PUMP	CLOSET		100 SF		LEVEL 2	07 NON-ASSIGNABLE
IDF			140 SF		LEVEL 2	07 NON-ASSIGNABLE
JANITOR			149 SF		LEVEL 2	07 NON-ASSIGNABLE
Grand total		0	5,191 SF			

TOTAL BUILDING AREAS



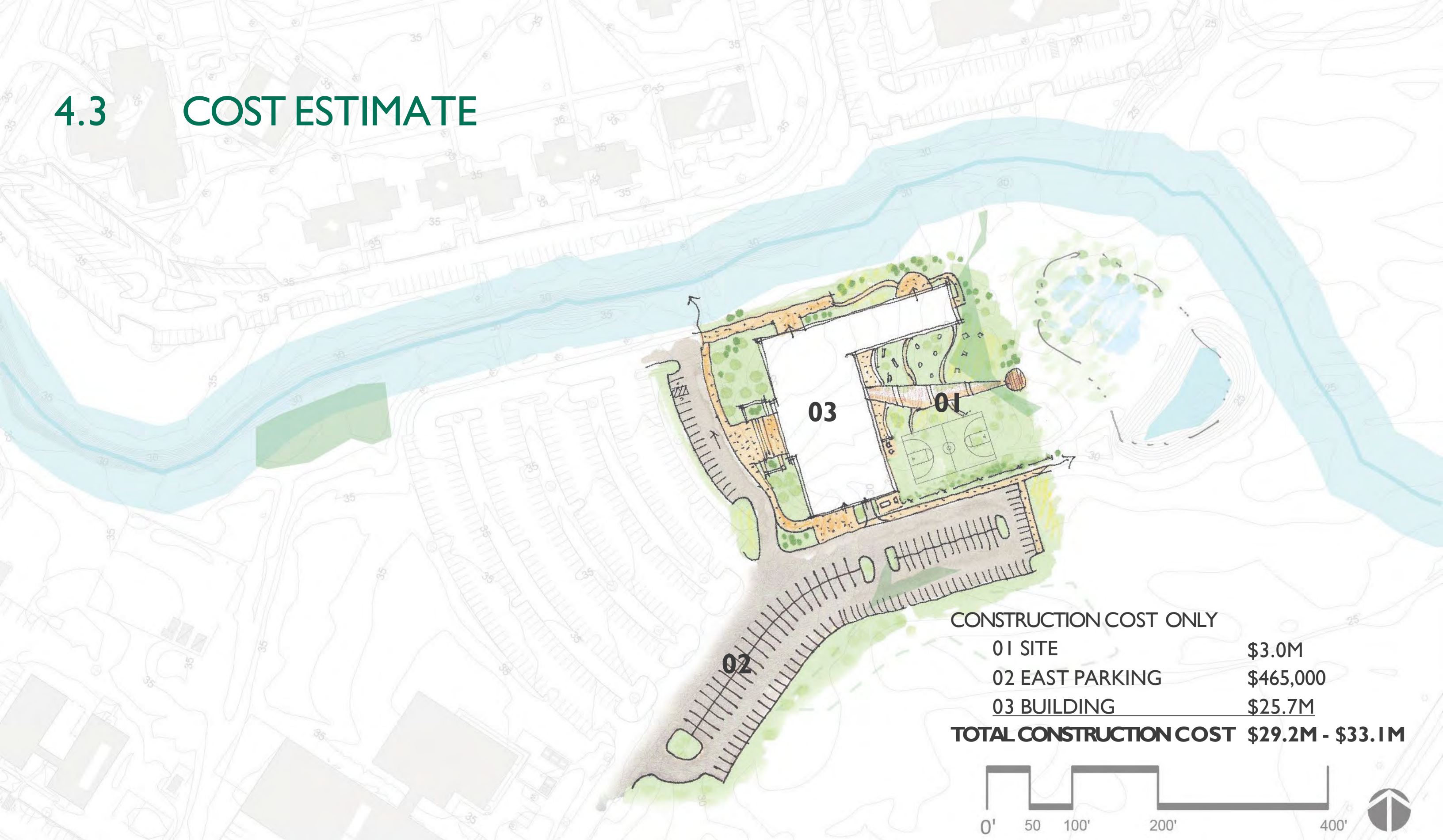
AREA PLAN - LEVEL 1



AREA PLAN - LEVEL 2

OVERALL BUILDING AREA	
Level	Area
LEVEL 1	30,426 SF
LEVEL 2	20,268 SF
Grand total	50,694 SF

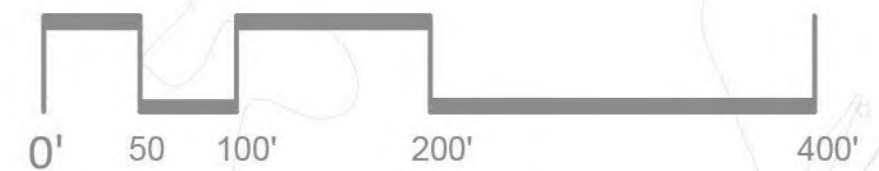
4.3 COST ESTIMATE



CONSTRUCTION COST ONLY

01 SITE	\$3.0M
02 EAST PARKING	\$465,000
03 BUILDING	\$25.7M

TOTAL CONSTRUCTION COST \$29.2M - \$33.1M





Advanced Planning Estimate

Isaac Bear Early College High School

Wilmington, NC

June 30, 2023

	01 - Site		02 - Site (East Parking)		03 - Building		Total Project	
	Costs	Cost / ACRE	Costs	Cost / ACRE	Costs	Cost / SQFT	Costs	Cost / GSF
Division 1: General Work								
BP0001 - Administrative	\$ -	\$ -	\$ -	\$ -	\$ 30,000	\$ 0.59	\$ 30,000	\$ 0.59
BP0100 - General Trades	\$ -	\$ -	\$ -	\$ -	\$ 240,000	\$ 4.73	\$ 240,000	\$ 4.73
BP0105 - Final Cleaning	\$ -	\$ -	\$ -	\$ -	\$ 25,347	\$ 0.50	\$ 25,347	\$ 0.50
Division 3: Concrete								
BP0390 - Turnkey Concrete	\$ -	\$ -	\$ -	\$ -	\$ 844,523	\$ 16.66	\$ 844,523	\$ 16.66
Division 4: Masonry								
BP0400 - Turnkey Masonry	\$ -	\$ -	\$ -	\$ -	\$ 1,716,343	\$ 33.86	\$ 1,716,343	\$ 33.86
Division 5: Steel								
BP0500 - Structural Steel	\$ -	\$ -	\$ -	\$ -	\$ 1,664,863	\$ 32.84	\$ 1,664,863	\$ 32.84
Division 6: Wood & Plastics								
BP0640 - Finish Carpentry	\$ 60,000	\$ 16,129.03	\$ -	\$ -	\$ -	\$ -	\$ 60,000	\$ 1.18
BP0642 - Millwork & Casework	\$ -	\$ -	\$ -	\$ -	\$ 456,520	\$ 9.01	\$ 456,520	\$ 9.01
Division 7: Thermal & Moisture								
BP0740 - Roofing	\$ -	\$ -	\$ -	\$ -	\$ 536,865	\$ 10.59	\$ 536,865	\$ 10.59
BP0742 - Green Roofing	\$ -	\$ -	\$ -	\$ -	\$ 159,940	\$ 3.16	\$ 159,940	\$ 3.16
BP0790 - Caulking / Sealants / Air Barrier	\$ -	\$ -	\$ -	\$ -	\$ 336,099	\$ 6.63	\$ 336,099	\$ 6.63
Division 8: Doors & Glass								
BP0800 - Doors, Frames, & Hardware	\$ -	\$ -	\$ -	\$ -	\$ 367,440	\$ 7.25	\$ 367,440	\$ 7.25
BP0840 - Glass & Glazing	\$ -	\$ -	\$ -	\$ -	\$ 1,739,737	\$ 34.32	\$ 1,739,737	\$ 34.32
Division 9: Finishes								
BP0925 - Drywall	\$ -	\$ -	\$ -	\$ -	\$ 1,027,190	\$ 20.26	\$ 1,027,190	\$ 20.26
BP0930 - Ceramic Tile	\$ -	\$ -	\$ -	\$ -	\$ 129,055	\$ 2.55	\$ 129,055	\$ 2.55
BP0960 - Resilient Flooring	\$ -	\$ -	\$ -	\$ -	\$ 293,969	\$ 5.80	\$ 293,969	\$ 5.80
BP0980 - Acoustical Ceilings	\$ -	\$ -	\$ -	\$ -	\$ 682,038	\$ 13.45	\$ 682,038	\$ 13.45
BP0990 - Painting And Wallcoverings	\$ -	\$ -	\$ -	\$ -	\$ 152,437	\$ 3.01	\$ 152,437	\$ 3.01
Division 10: Specialties								
BP1005 - Toilet Specialties / Accessories / Div 10	\$ -	\$ -	\$ -	\$ -	\$ 158,720	\$ 3.13	\$ 158,720	\$ 3.13
BP1010 - Signage	\$ -	\$ -	\$ -	\$ -	\$ 31,325	\$ 0.62	\$ 31,325	\$ 0.62
BP1015 - Markerboards	\$ -	\$ -	\$ -	\$ -	\$ 183,320	\$ 3.62	\$ 183,320	\$ 3.62
BP1050 - Lockers	\$ -	\$ -	\$ -	\$ -	\$ 33,600	\$ 0.66	\$ 33,600	\$ 0.66
BP1065 - Operable Partitions	\$ -	\$ -	\$ -	\$ -	\$ 49,200	\$ 0.97	\$ 49,200	\$ 0.97

	01 - Site		02 - Site (East Parking)		03 - Building		Total Project	
	Costs	Cost / ACRE	Costs	Cost / ACRE	Costs	Cost / SQFT	Costs	Cost / GSF
Division 11: Equipment								
BP1140 - Food Service Equipment	\$ -	\$ -	\$ -	\$ -	\$ 390,000	\$ 7.69	\$ 390,000	\$ 7.69
Division 12: Furnishings								
BP1232 - Laboratory Casework	\$ -	\$ -	\$ -	\$ -	\$ 173,200	\$ 3.42	\$ 173,200	\$ 3.42
BP1250 - Window Treatments	\$ -	\$ -	\$ -	\$ -	\$ 27,000	\$ 0.53	\$ 27,000	\$ 0.53
Division 14: Conveying Systems								
BP1400 - Elevators	\$ -	\$ -	\$ -	\$ -	\$ 139,000	\$ 2.74	\$ 139,000	\$ 2.74
Division 21: Fire Suppression								
BP2100 - Fire Protection	\$ -	\$ -	\$ -	\$ -	\$ 500,352	\$ 9.87	\$ 500,352	\$ 9.87
Division 22: Plumbing								
BP2200 - Plumbing	\$ -	\$ -	\$ -	\$ -	\$ 937,839	\$ 18.50	\$ 937,839	\$ 18.50
Division 23: Heating, Ventilating, Air Conditioning								
BP2300 - HVAC	\$ -	\$ -	\$ -	\$ -	\$ 3,011,790	\$ 59.41	\$ 3,011,790	\$ 59.41
Division 26: Electrical								
BP2600 - Turnkey Electrical	\$ 120,000	\$ 32,258.06	\$ 20,000	\$ 27,397.26	\$ 3,230,405	\$ 63.72	\$ 3,370,405	\$ 66.49
Division 31: Earthwork								
BP3100 - Earthwork	\$ 1,171,351	\$ 314,879.32	\$ 208,775	\$ 285,992.71	\$ -	\$ -	\$ 1,380,126	\$ 27.22
Division 32: Exterior Improvements								
BP3200 - Asphalt Paving	\$ 252,786	\$ 67,953.27	\$ 108,556	\$ 148,707.42	\$ -	\$ -	\$ 361,343	\$ 7.13
BP3213 - Site Concrete	\$ 208,872	\$ 56,148.39	\$ -	\$ -	\$ -	\$ -	\$ 208,872	\$ 4.12
BP3231 - Fences & Gates	\$ 20,764	\$ 5,581.76	\$ 10,098	\$ 13,832.82	\$ -	\$ -	\$ 30,862	\$ 0.61
BP3290 - Landscaping	\$ 119,621	\$ 32,156.10	\$ 1,260	\$ 1,726.03	\$ -	\$ -	\$ 120,881	\$ 2.38
Division 33: Site Utilities								
BP3300 - Site Utilities	\$ 314,455	\$ 84,530.91	\$ -	\$ -	\$ -	\$ -	\$ 314,455	\$ 6.20
Subtotal Subcontract Costs	\$ 2,267,849	\$ 609,636.86	\$ 348,689	\$ 477,656.25	\$ 19,268,116	\$ 380.09	\$ 21,884,654	\$ 431.70
1.40% Subcontractor Default Insurance	\$ 31,750	\$ 8,534.92	\$ 4,882	\$ 6,687.19	\$ 269,754	\$ 5.32	\$ 306,385	\$ 6.04
Subcontract Costs with Bonds	\$ 2,299,599	\$ 618,171.77	\$ 353,571	\$ 484,343.44	\$ 19,537,869	\$ 385.41	\$ 22,191,039	\$ 437.74
3.00% Construction Contingency	\$ 68,988	\$ 18,545.15	\$ 10,607	\$ 14,530.30	\$ 586,136	\$ 11.56	\$ 665,731	\$ 13.13
0.00% Preconstruction Contingency	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
10.50% Escalation	\$ 241,458	\$ 64,908.04	\$ 37,125	\$ 50,856.06	\$ 2,051,476	\$ 40.47	\$ 2,330,059	\$ 45.96
Cost of Work Subtotal	\$ 2,610,045	\$ 701,624.96	\$ 401,303	\$ 549,729.80	\$ 22,175,482	\$ 437.44	\$ 25,186,829	\$ 496.84
9.00% General Conditions	\$ 234,904	\$ 63,146.25	\$ 36,117	\$ 49,475.68	\$ 1,995,793	\$ 39.37	\$ 2,266,815	\$ 44.72
4.00% Fee	\$ 104,402	\$ 28,065.00	\$ 16,052	\$ 21,989.19	\$ 887,019	\$ 17.50	\$ 1,007,473	\$ 19.87
2.50% Insurances and Bonds	\$ 75,624.38	\$ 20,329.13	\$ 11,627.49	\$ 15,928.07	\$ 642,520.37	\$ 12.67	\$ 729,772	\$ 14.40
Totals	\$ 3,024,975	\$ 813,165.34	\$ 465,100	\$ 637,122.74	\$ 25,700,815	\$ 506.98	\$ 29,190,889	\$ 575.83
		3.72 ACRE		0.73 ACRE		50,694 SQFT		50,694 GSF



Advanced Planning Estimate - Escalation Study

Isaac Bear Early College High School

Wilmington, NC

June 30, 2023

	Total Project (Escalated to January 2025)		Total Project (Escalated to January 2026)		Total Project (Escalated to January 2027)		Total Project (Escalated to January 2028)	
	Costs	Cost / GSF	Costs	Cost / GSF	Costs	Cost / GSF	Costs	Cost / GSF
Subtotal Subcontract Costs	\$ 21,884,654	\$ 431.70	\$ 21,884,654	\$ 431.70	\$ 21,884,654	\$ 431.70	\$ 21,884,654	\$ 431.70
Subcontractor Default Insurance	1.40% \$ 306,385	\$ 6.04	1.40% \$ 306,385	\$ 6.04	1.40% \$ 306,385	\$ 6.04	1.40% \$ 306,385	\$ 6.04
Subcontract Costs with Bonds	\$ 22,191,039	\$ 437.74	\$ 22,191,039	\$ 437.74	\$ 22,191,039	\$ 437.74	\$ 22,191,039	\$ 437.74
Construction Contingency	3.00% \$ 665,731	\$ 13.13	3.00% \$ 665,731	\$ 13.13	3.00% \$ 665,731	\$ 13.13	3.00% \$ 665,731	\$ 13.13
Escalation	10.50% \$ 2,330,059	\$ 45.96	15.50% \$ 3,439,611	\$ 45.96	20.50% \$ 4,549,163	\$ 45.96	25.50% \$ 5,658,715	\$ 45.96
Cost of Work Subtotal	\$ 25,186,829	\$ 496.84	\$ 26,296,381	\$ 496.84	\$ 27,405,933	\$ 496.84	\$ 28,515,485	\$ 496.84
General Conditions	9.00% \$ 2,266,815	\$ 44.72	9.00% \$ 2,366,674	\$ 44.72	9.00% \$ 2,466,534	\$ 44.72	9.00% \$ 2,566,394	\$ 44.72
Fee	4.00% \$ 1,007,473	\$ 19.87	4.00% \$ 1,051,855	\$ 19.87	4.00% \$ 1,096,237	\$ 19.87	4.00% \$ 1,140,619	\$ 19.87
Insurances and Bonds	2.50% \$ 729,772	\$ 14.40	2.50% \$ 761,921	\$ 14.40	2.50% \$ 794,069	\$ 14.40	2.50% \$ 826,218	\$ 14.40
Totals	\$ 29,190,889	\$ 575.83	\$ 30,476,832	\$ 601.19	\$ 31,762,774	\$ 626.56	\$ 33,048,716	\$ 651.93

TOTAL CONSTRUCTION COST \$29.2M

\$30.5M

\$31.8M

\$33.1M

SOFT COSTS (THE FOLLOWING ITEMS MAY BE INCLUDED; ADDITIONAL LINE ITEMS MAY BE REQUIRED)

- DESIGN FEES
- ADDITIONAL SERVICES
- FFE + TECHNOLOGY
- COMMISSIONING
- OWNER CONTINGENCY
- GEOTECHNICAL
- THIRD PARTY MATERIAL TESTING + SPECIAL INSPECTIONS
- TAP FEES, ENVIRONMENTAL + IMPACT FEES

TOTAL PROJECT COST

\$45M



\$50M

THIS PAGE IS INTENTIONALLY LEFT BLANK.

5.0

APPENDIX

Input Process and Programming 5.1
Teacher Feedback Results 5.2

5.1 Input Process and Programming

REFER TO ADDITIONAL BOOKLET FOR DETAILED PROCESS AND PROGRAMMING INFORMATION



5.2 Teacher Feedback Results

REFER TO ADDITIONAL BOOKLET FOR DETAILED TEACHER FEEDBACK INFORMATION

