

PULLEN ARTS CENTER AND NORTH PULLEN PARK IMPROVEMENTS PROJECT



EXISTING CONDITIONS REPORT

September 2015

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ENGINEERED SOLUTIONS



DHM DESIGN

CLEARSCAPES
ARCHITECTURE + ART

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I. SITE ANALYSIS

A. SITE CONTEXT

The Pullen Arts Center is in north Pullen Park located along the east side of Pullen Road near the intersection of Pullen Road and Hillsborough Street. To the west of the center are the future Gregg Museum of Art and Design and the existing Theater in the Park buildings. Together, these three buildings form a cluster that occupies the north end of the park and creates a destination for arts and cultural activities. NC State's College of Design is directly to the west, accessible through both vehicular and pedestrian connections, which further enhances the strength of this cultural amenity.

B. EXISTING AMENITIES AND VIEWS

The key exterior amenities for the arts center are the exterior spaces. While not fully utilized in the current iteration of the property, several programs do benefit from the exterior access. The pottery classes use kiln space that is housed in the detached loading dock and use the exterior space at times to apply specialty glazes and paints. The art camps use the exterior spaces as an extension of the classroom space for the programs they host for children. All of the painting and print classes located on the eastern edge of the building appreciate the light given by the western exposure.

To date, only one large sculpture is on display near the arts center. While this piece does set the tone of the area for cultural and artistic enrichment, there is potential for further sites to display artwork.

During the site visit conducted with center staff, dedicated exterior program space was also of interest, especially for painting and drawing classes. How these areas are developed would depend on further discussion with the current class staff and students.

The Theater in the Park building has a small intimate garden located to the north of its main patron entry. This garden includes a small formal lawn for setting up event tents to host small receptions and fundraisers. There are also intimate seating areas located throughout the peripheral edges of the garden.

Figure 1 depicts the locations of existing amenity areas around the existing buildings.

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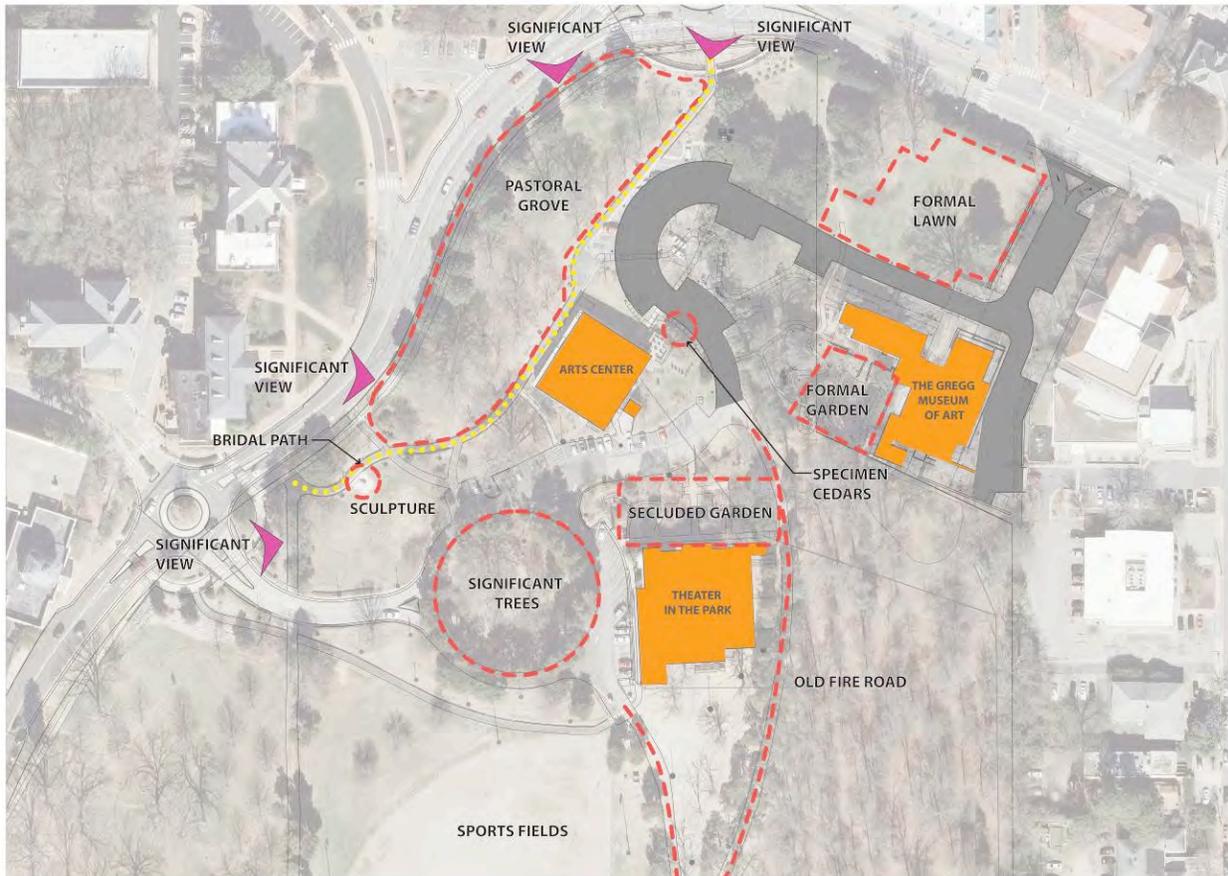


Figure 1 Diagram depicting significant views and amenities

Finding the arts building can prove challenging for first time users. The existing building is located behind a large established grove of trees. While, these trees are part of the historical character of the park and define its cultural significance, the center is only visible through brief glances between the trees along Pullen Road. Opportunities for enhancing user wayfinding may be possible through the expansion of building uses to the exterior, whether through outdoor teaching environments or long-term display spaces for artwork. Once entering the site from the traffic circle on Pullen Road, visitors have a brief view of the building to the north by way of the sculpture lawn before entering the second traffic rotary interior to the park. However this view is very brief and is quickly overwhelmed by the traffic circle and the need for focus as users work to decipher where they should drive to park and enter the desired location. Signage for the theater building is hidden behind the garden, a temporary vinyl banner has been installed to help rectify. The signage for the art building is only present on the Pullen Road façade, which is not visible from Pullen Road or from the access drives. See **Figure 2 depicting the building sign**



Figure 2 View of building signage

North Pullen Park is framed by a large formal brick entry sign that was constructed as part of the Hillsborough Street traffic circle. From Hillsborough Street, the arts center is visible through a brick archway, but only as a glancing view. Once users have entered the park via this gateway, the building is more visible, but a clear demarcation towards the entry is not apparent. See **Figure 3**.



Figure 3 View of gateway at Hillsborough Street, Pullen Arts Center is barely visible to left of the entryway

C. EXISTING VEGETATION

The landscape around the existing arts building is well maintained. The vegetation is predominately mature shrubbery and ornamental trees. The surrounding site has a mature pastoral landscape with large oaks providing a broad overhead canopy. Unique to north Pullen Park is the grove of magnolias located adjacent to the entrance at Hillsborough Street and Pullen Road. Signature trees around the building include a grouping of cedars at the mechanical area, several specimen flowering magnolias, and a large ornamental maple.

As plans aim at unifying the three building spaces, the entry garden located at the front of the theater will need to be assessed for which components can and should be preserved. Significant plantings of specimen trees and rare perennials are located around the Theater building and may serve as a starting place for developing a unifying palette of plantings for the overall space. Existing specimens include large *cryptomeria*, mature Japanese maples, and *ginkgo biloba* found within the entry garden. The theater pathways are brick paths with brick edging. Lawn areas are limited and kept framed, similar to the aesthetic being proposed at the Gregg museum



Figure 4 View of landscape at the theater building

D. PEDESTRIAN CIRCULATION

Pullen Park is located in a highly developed area of Raleigh that receives a high volume of pedestrian traffic; however it is also a driving park where most of the users drive to and from residential areas within the city context. Figure 5 shows the parking area located at the rear of Pullen Arts Center, this is one of the main parking areas and is not directly related to the building entries.



Figure 5 Parking area between theater building and art center

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Within the park, the existing sidewalk network provides pedestrian circulation around the arts center building to the main entries from the parking areas. How these networks cross and interact with vehicular circulation routes should be examined for further improvement, specifically in the areas between the Gregg Museum, Theater, and Arts Center. See Figure 6 for a typical pathway crossroad.

The provided diagram shows how users currently navigate the site. Once the Gregg development is complete, as noted in the wayfinding section, providing clarity in how users locate the respective entries will be critical to the success of this portion of the park. The Theater in the Park entry is hidden by the existing garden. While the garden provides a lush private space, this level of seclusion has the dual effect of creating a psychological barrier to park users not associated with the theater hiding it from the general public not familiar with the location. Similar private-public space concerns may be possible with the Gregg and its planned landscape, the main entry for the Gregg Museum is oriented to Hillsborough Street and the rear of the site is landscaped to create a buffer away from the remainder of the park. How these environments are linked to the greater public spaces, or better defined in terms of what is truly public and what is private will also need to be reviewed throughout the design process.



Figure 6 View of crossing at main entry drive, pedestrian traffic is secondary to vehicular

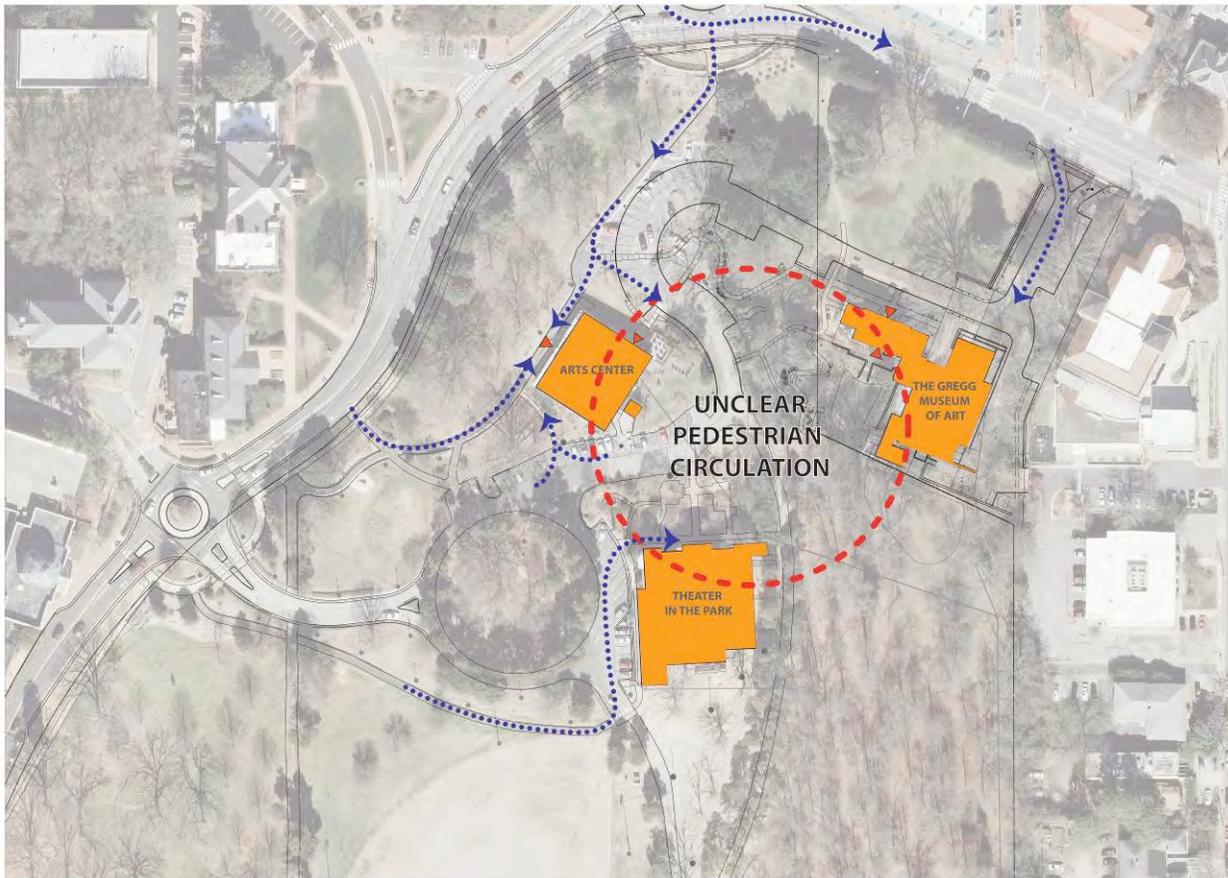


Figure 7 Pedestrian circulation diagram, central court is not pedestrian centric, pathways are focused around perimeter spaces.

E. VEHICULAR CIRCULATION

The Pullen Art Center is currently accessed from Pullen Road using the main traffic circle. At the completion of the Gregg Museum of Art and Design, it will also be possible for art center users to access the park from Hillsborough Street via a right-in right-out configuration.

The conflicts of the existing circulation network are readily apparent when two or more facilities have events at the same time. Parking congestion, pedestrian conflicts, and wayfinding issues all create frustrating bottlenecks for users. The use of traffic circles at both the entry and then immediately interior to the site creates a series of decision points for park users to navigate. Signage at both the Pullen Road roundabout and the Pullen Park roundabout is too small for drivers to read at posted speeds. This requires drivers to slow down or run the risk of not reading the signs.



Figure 8 View of main roundabout within North Pullen Park, Theater is visible through trees, signage is undersized



Figure 9 View of loading dock for the Arts Center. This loading dock must serve 67 foot long interstate tractor trailers.

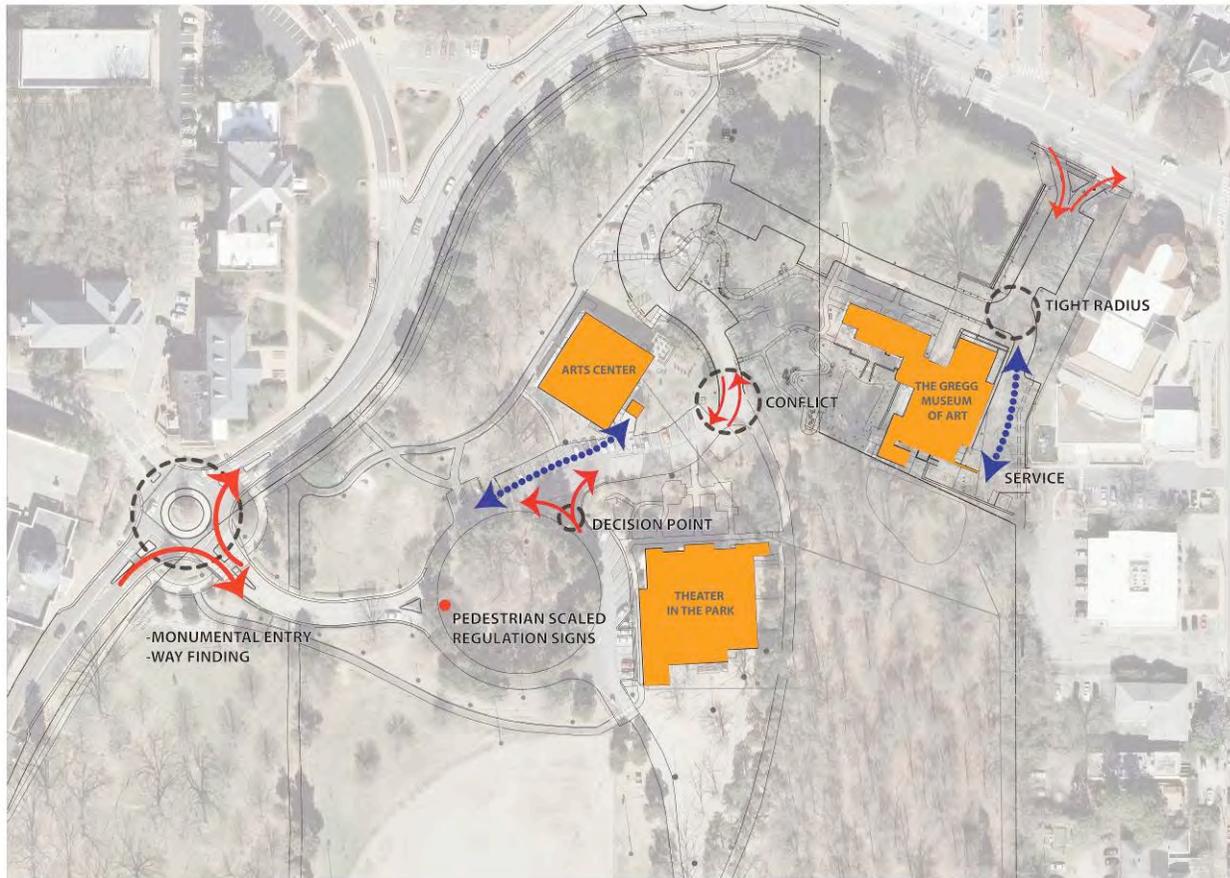


Figure 10 depicts the vehicular circulation of North Pullen Park, documenting service areas and where conflicts in circulation occur.

F. TOPOGRAPHY AND LANDFORM

The Pullen Arts Center site is located at-grade with Pullen Road. As one travels west across the site, the topography quickly drops in elevation until the exit of site. This allows for the design of the original building to have an at-grade entry at the upper level as well as at the lower level, with side walls of the building maintaining the grade. This technique has created issues within the building in terms of daylighting, egress points, as well as existing drainage issues due to where the land is banked-up against the basement walls.

Connecting the Art Center to the adjacent buildings will need to account for this sloping topography. Currently, there is not a direct connection between the center and the future Gregg Museum of Art and Design. Once the Gregg Museum is complete, a formal garden and pathway system will be located to the east of the building, and art center users will desire to access this space. Creating an accessible route that does not feel contrived or overly articulated will be a challenge. Figure 11 provides an overview of the site topography related to the Pullen Arts Center.

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Grade changes also have an impact on storm drainage, with ability to route storm lines routing east to west marginally well, as compared to pipes running north to south to get around the existing structures and development. The drainage at the southeast corner of the Pullen Arts Center exit stairwell is an existing concern as it consistently clogs and collects a large amount of surface water from the landscape above. The natural topography will limit areas of the site to the types of development that can be accomplished with minimal site manipulation.

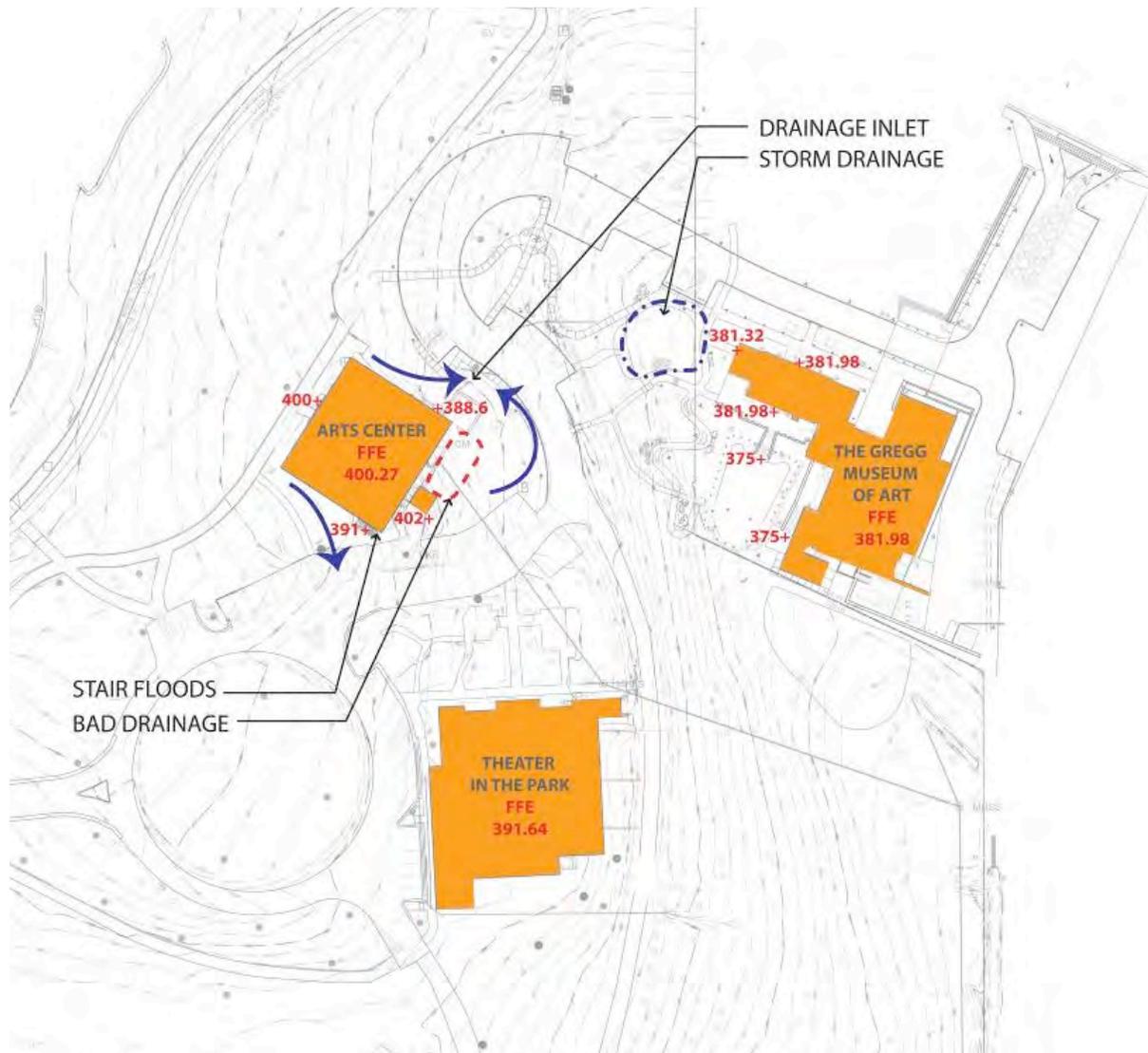


Figure 11 Provides topographic information regarding the site and the existing buildings. The existing building embraces the existing landform.

G. PARKING ASSESSMENT

Parking has been assessed using the proposed parking design of the Gregg Museum of Art and Design and the existing parking immediately accessible around the theater building and the art center. The required parking is calculated per the Raleigh Unified Development Ordinance per the proposed and existing building uses. Square footages are based on total gross square footages with exception to auditoriums which are based on the fixed seats provided.

Table 1 provides a summary of the required parking per building area and/or seating provided.

Building	Ratio used	Required parking per code	Parking needed
Pullen Arts Center	1 per 400 sf	19	75 (3 classes concurrently)
Gregg Museum	1 per 500 sf	57	50
Theater	1 space per 5 seats 218 seats	42	100
Bike Parking	5%	6	11
TOTAL		118	225*

*Assumes that there are classes running concurrently with a presentation.

At the completion of the Gregg renovations, there will a total of 96 parking spaces available to all buildings.

H. POTABLE WATER (DOMESTIC AND FIRE PROTECTION)

An existing 16-inch potable water main is located to the east of the existing Arts Center. From this existing main, the existing building is served by a 1 ½-inch domestic water connection. Currently, no fire protection (fire sprinkler) is provided to the building. The current domestic service would not be capable of serving any additional expansion, therefore a new 2” domestic service would be needed from the existing 16-inch potable water main. A new backflow preventer (RPZ) will be required in accordance with City of Raleigh code. The need for a fire service to the building would be based on Building Code Requirements but if necessary, the fire main could also be extended from the 16-inch water main. If the building is expanded, the need for an additional fire hydrant will be reviewed to ensure that fire protection coverage is provided. Any waterlines or

services in conflict with a proposed building expansion will be required to be relocated. The City of Raleigh provides potable water service to the building and would be involved in any permitting of new or relocated services.

I. SANITARY SEWER

The existing Arts Center is serviced by a 6-inch sanitary sewer system that is connected to the sewer main located to the east of the building. This existing sanitary sewer system flows to the southeast behind the Gregg Museum and then continues south towards Western Boulevard. The existing sewer service should be able to handle any additional building expansion. In addition, an additional service could be extended from the existing manhole. Any sanitary sewer or services in conflict with a proposed building expansion will be required to be relocated. The City of Raleigh provides sanitary sewer service to the building and would be involved in any permitting of new or relocated services.

J. STORMWATER

Any increases in impervious area above the current site layout will require stormwater controls to be incorporated into the project. This would include any new parking, sidewalks, or building expansions. All stormwater management shall be designed in accordance with the City of Raleigh Stormwater Guidelines and the Neuse River Basin Regulations. The stormwater controls will address both stormwater quantity and stormwater quality requirements. To address stormwater quantity, the peak stormwater runoff leaving the site for the 2-year and 10-year storms cannot be greater in the post-development condition than the pre-development condition. To address stormwater quality, any new impervious area must treat the nitrogen leaving the site. Stormwater Best Management Practices (BMP), will be incorporated into the site address both stormwater quantity and quality control.



Figure 12 View of the existing parking at the northeast corner of the art center building. This is a storm collection point in the proposed design.

During the redevelopment of the NCSU Gregg Museum site adjacent to the Pullen Arts Center, the stormwater BMPs designed for the museum were sized to provide treatment for the future expansion of the Arts Center. Approximately 1.06 acres of additional impervious area was allocated to the Arts Center and the surrounding site. As long as the proposed improvements for the Arts Center does not increase the amount of impervious by 1.06 acres, no additional stormwater BMPs will be required.

K. EROSION CONTROL

The erosion control measures for the proposed site will be designed, constructed, and maintained to ensure compliance with the North Carolina Sedimentation Pollution Control Act of 1973. Permitting requirements, regulations and design criteria can be found in 15A North Carolina Administrative Code (NCAC) 04B .0100. Temporary diversions may be required to divert sediment-laden water from the construction site to a temporary sediment skimmer basins. The skimmer basin will be sized to control the ten-year storm event. Check dams will be placed in the temporary diversions to restrict the velocity of flow in these channels thereby minimizing erosion. Silt fence will be installed between the diversion berms and adjacent areas to further ensure that silt does not impact offsite properties. All inlets into the proposed storm drainage system

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will be protected to prevent sediment from entering the pipe system and being conveyed downstream. Construction entrances will be installed at any entry points into the site to provide a buffer area where construction traffic can drop their mud and sediment to avoid transporting this material onto private and public roads, to control erosion from surface runoff, and to help control dust. The proposed erosion control measures will be installed at the beginning of the construction, prior to any land disturbance. All disturbed areas brought to final grade will be stabilized with permanent vegetation within fifteen days. Once disturbed areas are stabilized and the site is approved by the Land Quality Section, then the erosion control measures will be removed.

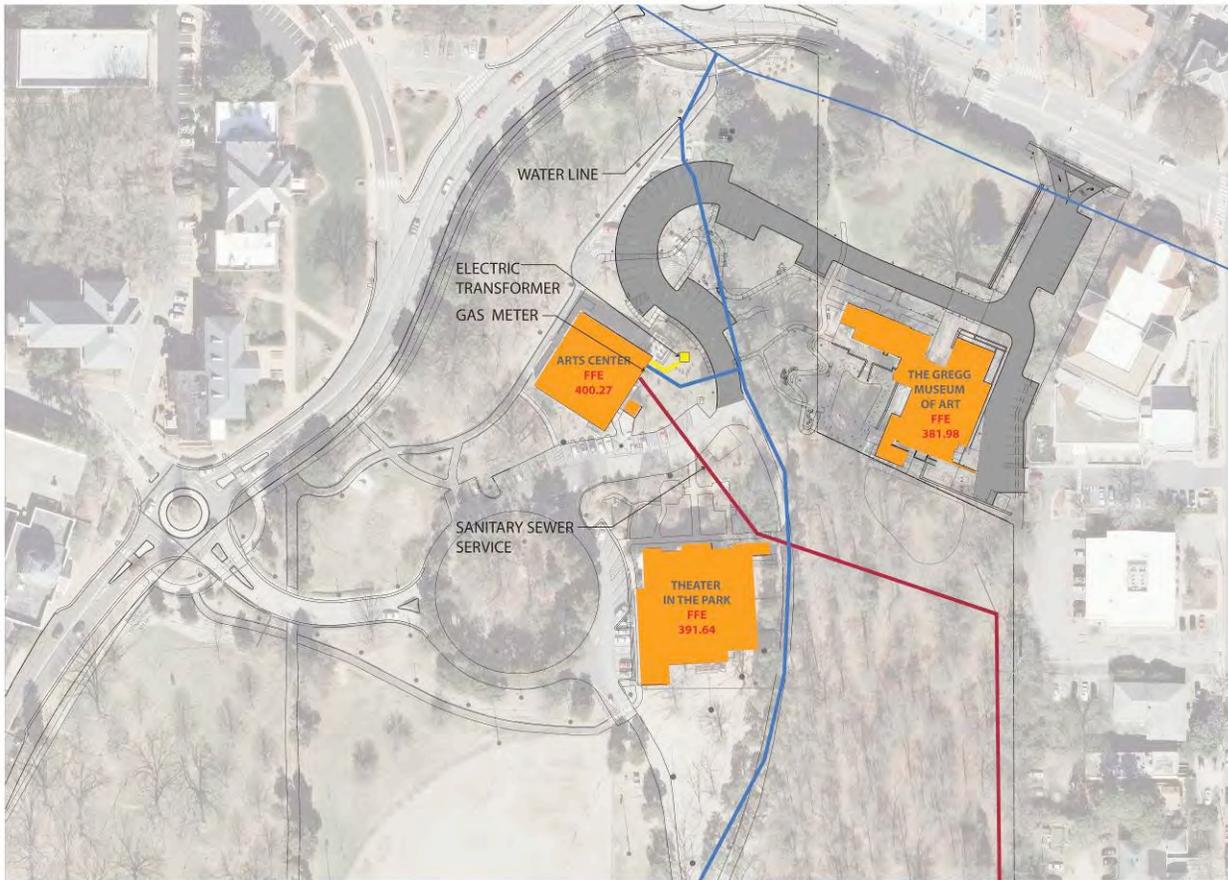


Figure 13 Existing utility diagram

L. BUILDABLE AREA AND CONSTRAINTS

The development pattern of the north Pullen Park that has matriculated over the years is the result of function over arrangement. Structures have developed as need has arisen which in turn have been loosely held together by the circulation paths. With the revised master plan now in place for the North Pullen Park, work on the Gregg Museum of Art and Design underway, it is crucial for the arts building to consider expansion and relocation strategies with delicacy.

Once the Gregg Museum is complete and the associated parking revision is constructed, a large area of buildable land will be available to the north of the existing arts building. While this site will allow some economies in construction, how it impacts the ability for the architecture to have natural daylight will need exploration. An advantage to a northern expansion is in the ability to construct two stories in the same vertical alignment as the existing structure.

Expansion to the south is also possible, but will require significant study regarding daylighting. The disadvantage to the southern approach is the topography and the need to consider either basement construction or construction of an elevated second floor. Areas for construction also exist behind the existing theater building. The existing area is utilized as overflow parking for the ballfields and has controlled access via a card reader. The area immediately to the southeast of the theater may serve as a potential site for additional parking lot.



Figure 14 View of gravel parking area at rear of the existing theater, this is an area that is potentially suited for development and or parking.



Figure 15 View of the North facade of the Pullen Arts Center, this side yard may be suitable for a mid-sized expansion that meets up with the existing structure.

II. BUILDING ELEMENTS

A. BUILDING SHELL

1. Roof

a. Roofing Membrane

The roofing membrane on the main building is a modified bitumen single-ply that is in excellent condition. It appears to have been installed fairly recently and has been maintained well. No deferred maintenance issues were identified. The roof membrane on the freestanding support building is a single-ply EPDM that is in good condition.



b. Roof Penetrations / Rooftop Equipment

The roof has multiple penetrations including plumbing vents, exhaust fan release vents, flue for the gas boiler and numerous skylights. All of the curbs and flashing around these penetrations have been completed properly and no deferred maintenance issues were noted.



c. Roof Flashings

The perimeter of both the main building and the freestanding smaller structure have aluminum edge flashing/fascia that is in very good condition.



d. Roof Drainage

The main roof is drained by a series of internal roof drains – all of which appear to be installed and functioning properly. We did not note an overflow drain system since none were required when this building was built. Given the modest vertical dimension of the edge flashing, the lack of overflow drainage is not serious in that any buildup of water on the roof would easily drain off the perimeter. There is no roof drain on the small freestanding structure and all water from that roof simply flows across the edge flashing.



2. Exterior Walls

a. Exterior Walls

The exterior walls on the building are masonry with an exposed face brick on the concrete masonry backup. We found no evidence of cracking in the masonry and all mortar joints appear sound.



b. Storefront

Much of the exterior is a single-glazed aluminum storefront with metal panels and aluminum doors. The storefront is original and is in good condition. The single glazing, however, does not meet today's energy codes and is a source of significant heat loss and heat gain.



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c. Doors

The main entry doors are part of the storefront system. Other doors include hollow metal doors in hollow metal frames at the lower entry and service side as well as (2) manual coiling metal doors on the freestanding surface building. All the doors are in good condition given their age.



d. Metal Panels

There is a minor use of metal panels on the main front elevation. These appear to be in reasonable condition.



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e. Foundation Walls

Foundation walls are poured-in-place concrete that have been painted. These appear to be in good condition.



3. Building Access

a. Stairs

Access to the main level at both the front door and the rear service door are via concrete stairs with metal painted rails. These are in fair condition.



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b. Ramp

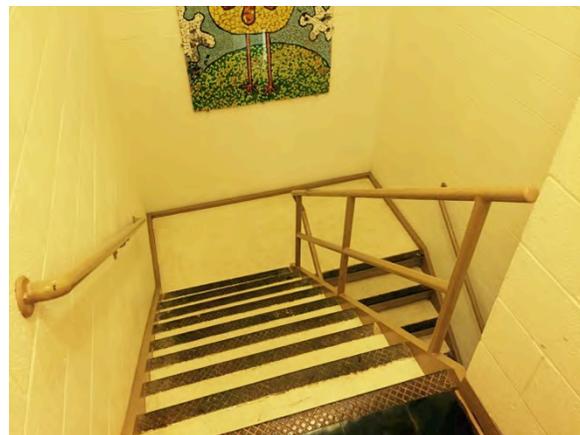
A concrete ramp was added at the main front entry to provide handicap accessibility. This ramp has a painted metal rail. This access meets current accessibility codes, but does communicate visually that it was a later built accommodation.



B. VERTICAL CIRCULATION

1. Stairs

- a. The building contains (1) set of interior stairs that provides vertical connection between the first and basement levels. This stairs does not egress directly to the outside.



2. Elevator

- a. The building contains no elevator. Because there is full accessibility from the exterior to both floors, an elevator is not required. It does make access between floors by anyone who is mobility impaired not possible, requiring that they exit the building, and go around the exterior to gain access to another level in an accessible manner.



C. EGRESS AND ACCESSIBILITY

1. Egress

- a. Each floor has (2) means of egress directly to the outdoors. The main front door leads to the exterior and to the site via the stair and ramp. The rear door leads to the exterior via a stair. The ground floor also has (2) means of egress to the exterior – one via the lower level entry door facing east and the other a fire stair that exits to an exterior stairwell. There is an internal stair which provides another means of egress, but this stair is not part of the official egress path since it does not lead to the exterior.



2. Accessibility

- a. The main level is accessible via the ramp and the lower level is accessible via the on-grade lower entry.



b. Restrooms

- i. The lower level restrooms have been renovated to meet the contemporary ADA Accessibility Guidelines. They appear to be fully compliant except for the recently required vertical grab bar in the toilet partitions. The main floor men and women's restrooms are not accessible. However, there is a single-occupant restroom on this level which is accessible.



c. Doors

- i. The majority of the doors within the facility meet the required minimum width. However, many of them do not have the required clearance on the door handle side.



d. Sinks and Counters

- i. None of the sinks in the classrooms, nor the counter space, have the required legroom or dimensional limitations to meet accessibility requirements.



D. ENVIRONMENTAL ISSUES

1. Asbestos

- a. We noticed 9" square vinyl floor tile which typically is asbestos containing. We did not see any evidence of asbestos at the boiler or in pipe insulation. The 12" square acoustical tile ceiling in one of the classrooms is the type that often is asbestos containing. If this has not yet been tested, we recommend that samples be taken and tested.



2. Lead Based Paint

- a. Given the age of this facility, there is no question that it contains lead based paint in some areas. Once again, testing – if not already done – should be commissioned to identify locations.

E. INTERIOR PLAN

1. Classroom / Studios

- a. The majority of the building consists of large art classroom / studios including flexible multi-purpose spaces as well as those uniquely fit-up for single art media types (painting, pottery, etc.)



2. Offices

- a. There are several single-occupant offices directly off of studios as well as an office suite on the lower level that is used by multiple staff in open workstation environment.



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3. Storage

- a. Storage for art supplies is spread throughout the building in a series of closets off of the main studios, in larger storage rooms, and in storage racks that have been installed in studios themselves. These tend to be well organized and located conveniently. However, additional storage is likely needed.



4. Support Spaces

- a. The building contains mechanical rooms, electrical rooms, janitor's closets, kiln rooms, and pipe chases.



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5. Food Support

- a. There is a small kitchen area on the main floor and a staff breakroom on the lower floor which provides some support for food preparation.



6. Public Spaces

- a. There are minimal public spaces within this facility. There is a reception area on the main floor just inside the front door with a reception desk and small seating area. There is also a small reception desk area at the lower level entry. In both cases, there are some display cabinets, but the facility, in general, lacks the type of public spaces and display areas normally associated with art centers.



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FLOOR PLAN - BASEMENT



OVERALL BASEMENT AREA 7,500 SF

	STUDIO / EDUCATION SPACES	3,690 SF	49.2%
	STAFF / ADMINISTRATION SPACES	1,075 SF	14.3%
	SUPPORT SPACES	1,020 SF	13.6%
	CIRCULATION / STAIRS	840 SF	11.2%

FLOOR PLAN – 1ST FLOOR



OVERALL 1ST FLOOR AREA 7,500 SF

	STUDIO / EDUCATION SPACES	4,570 SF	61.0%
	STAFF / ADMINISTRATION SPACES	455 SF	6.1%
	SUPPORT SPACES	710 SF	9.5%
	CIRCULATION / STAIRS	940 SF	12.5%

III. STRUCTURAL SYSTEM

A. DESCRIPTION OF STRUCTURE

The building was constructed in 1961. The existing structure consists of CMU walls and brick veneer on the exterior. The interior structural system consists of four rows of continuous steel columns (except for two columns in the basement) with beams spanning east to west (Picture 2). The roof framing is constructed of a bar joist system at nearly 6' o.c. (Picture 1). The roof deck was concealed; therefore, it is unknown. There were no signs of any roof leaks. The first floor framing is similar to the roof framing with a bar joist system. The floor joists are approximately 2' o.c. with a corrugated metal deck with an assumed 3" thick concrete slab (Picture 3). The basement has a poured concrete retaining wall on front, rear, right wall of the building. Left basement wall is a partial height concrete retaining wall with windows above because the grade is sloping away. After sizing the existing steel and running the calculations, the existing structure meets the current building code and all interior walls can be removed except those which are a part of the stairwell to the basement. The roof joist, roof beams, floor joists, floor beams, and columns indicated the existing structure is independent of any interior walls. Calculations and structural drawings will be provided with this report.

B. DESIGN LOADS

The design loads were as following: Roof Dead Load (RDL) = 20 psf, Roof Live Load (RLL) = 20 psf, Floor Dead Load (FDL) = 65 psf which includes 15 psf for interior partitions, Floor Live Load (FLL) = 50 psf, and a basic wind speed of 95 mph.

C. LATERAL BRACING SYSTEM

The building was not checked for wind or seismic loads which is in accordance with chapter 34 of the Code. If the existing structure is modified then lateral reinforcement will probably be required to bring the building up to current code requirements for wind and seismic.

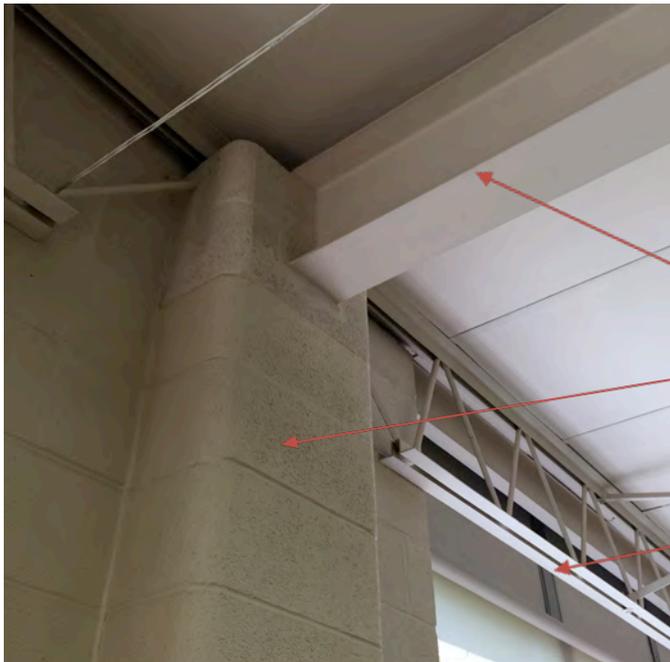
D. GENERAL CONDITION OF STRUCTURE

The current general condition of the structure is good with no evidence of roof leaks that would deteriorate the existing framing.

E. STRUCTURAL ADEQUACY OF FRAMING FOR RENOVATION

Based on our assumptions, our calculations confirmed that the existing structure is adequate for the gravity loads required by the current code. The existing structure also meets the requirements for wind and seismic per chapter 34 of the code provided that there are not any major structural renovations to the building.

Site Pictures

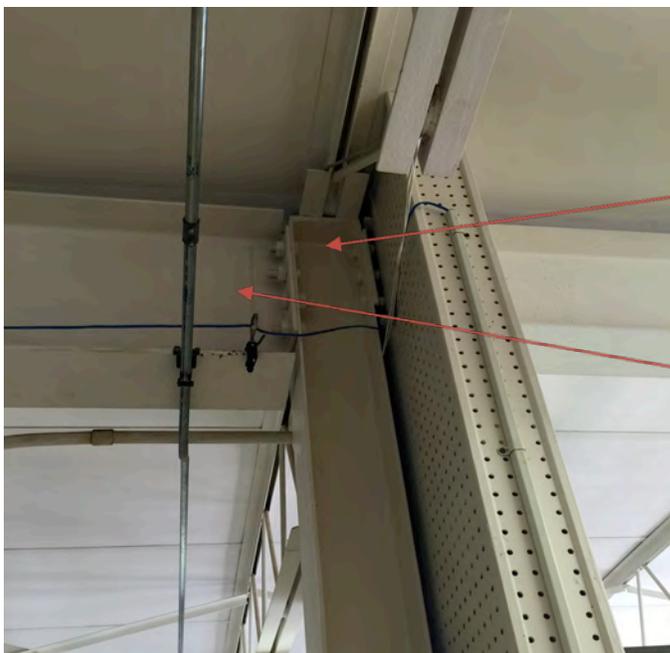


Picture 1

Roof Beam (RB4 - 12 WF 27 assumed)

CMU built up column filled with concrete or possible steel column inside

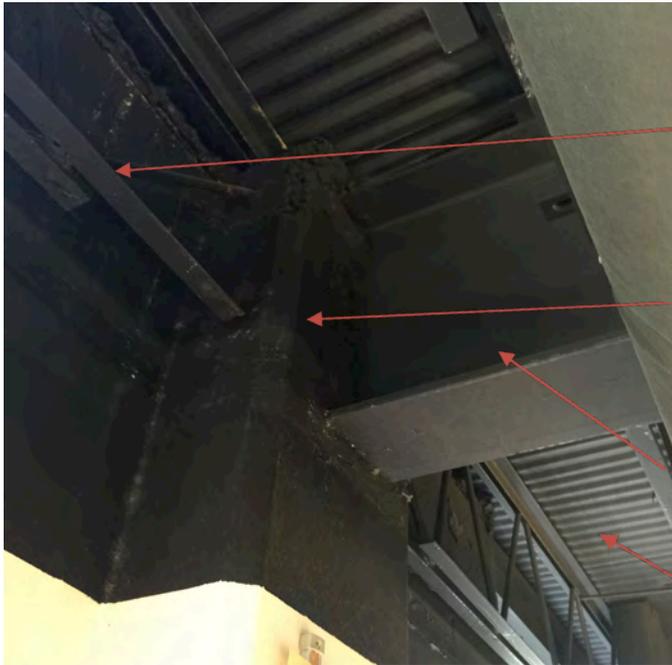
Roof Joist (RJ1 - 20 J 6 assumed)



Picture 2

Steel Column (C1 - 6 WF 25 assumed)

Roof Beam (RB 3 - 16 WF 36 assumed)



Picture3

Floor Joist (FJ1 - 20 J 5 assumed)

CMU built up column

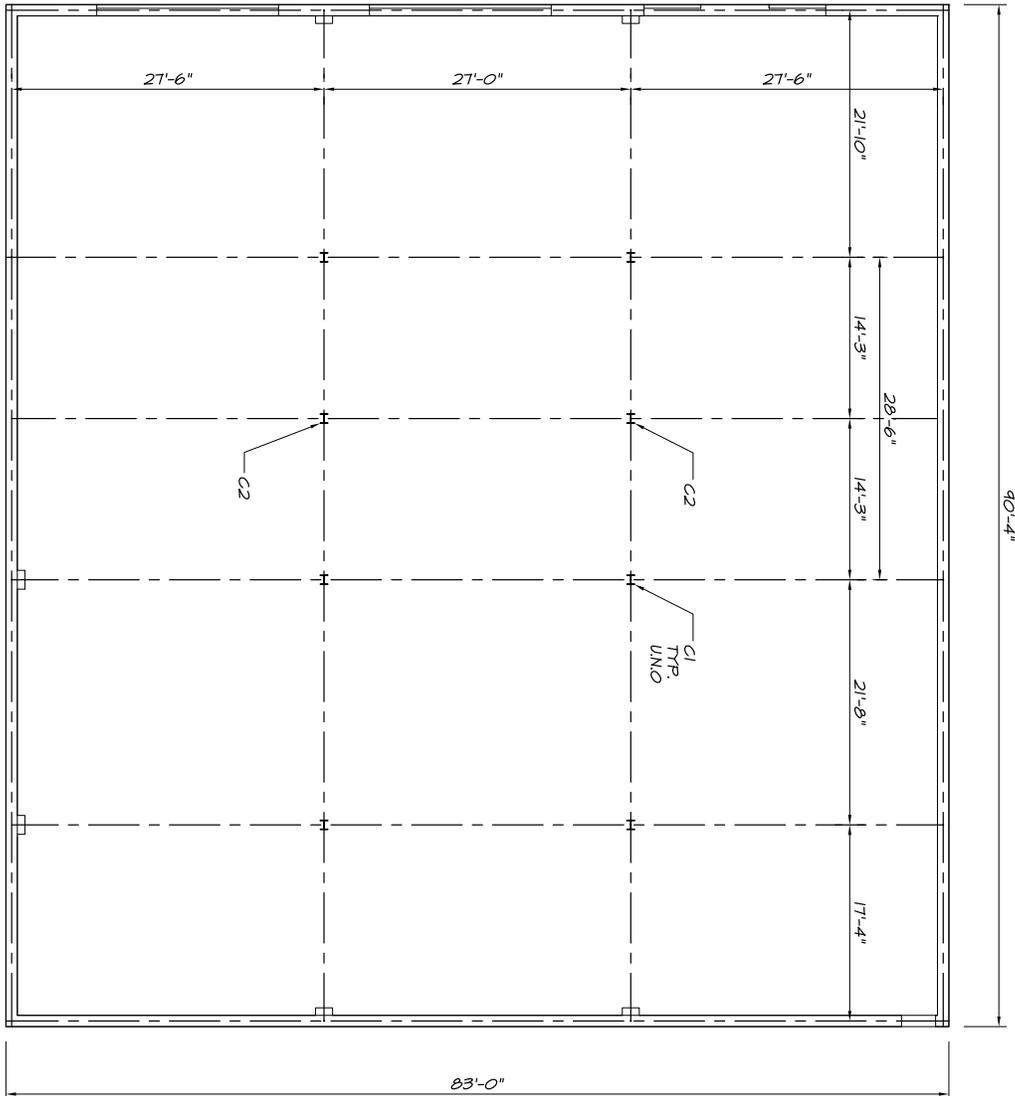
Floor steel beam (FLB1 - 21 WF 55 assumed)

Corrugated Metal Deck - 3" concrete slab above assumed

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COLUMN SCHEDULE		
NK#	COLUMN SIZE	NOTES
C1	6 WF 25	1, 2
C2	6 WF 25	1, 3

NOTES
 1 WF COLUMNS ARE ASTM A36 (F_y = 36 KSI)
 2 CONTINUOUS TO ROOF
 3 CONTINUOUS TO FIRST FLOOR



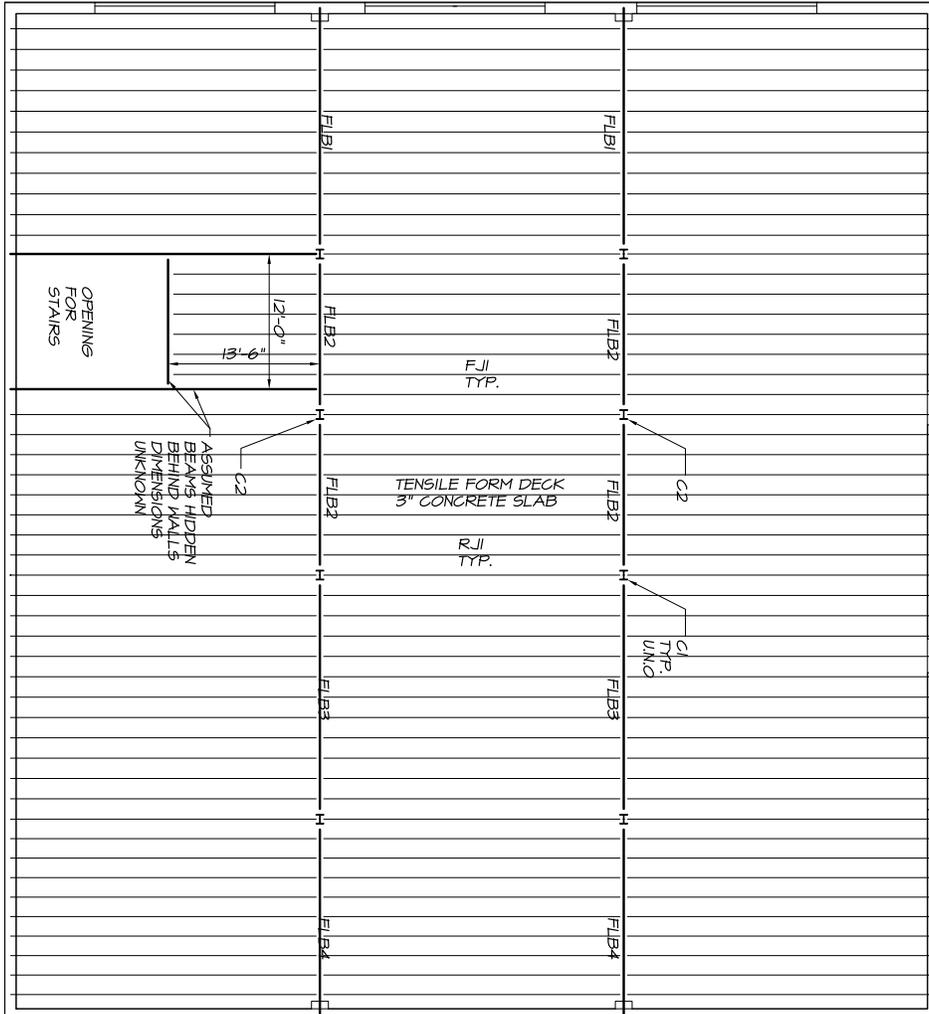
Ⓞ EXISTING BASEMENT
 FOUNDATION PLAN
 $\frac{3}{8}" = 1'-0"$ SCALE

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MK#	Ry	Span	Spacing	TL	Size
FJ1	4.1 K	21.5 FT	2.0 FT	230 PLF	20 J 5

ALLOWABLE LOAD = 231 PLF 50 OK

MK#	FLB1	FLB2	FLB3	FLB4
Ry, kips	211	193	210	227
Size	21 WF 55	16 WF 36	21 WF 62	18 WF 50
Sx, in ³	1094.7	56.3	1094.7	78.9
Ix, in ⁴	1140.7	446.3	1140.7	704.5
Span, ft	21.8	14.3	21.7	17.3
Spacing, ft	27.3	27.3	27.3	27.3
Dead Load psf	65.0	65.0	65.0	65.0
Live Load psf	50.0	50.0	50.0	50.0
LL Reduction, %	47.6	31.1	47.2	37.8
Total Load, plf	2485	2710	2490	2619
Mmax, ft-kips	148.1	68.8	146.1	98.3
Deflection, in	0.4	0.2	0.4	0.3
Actual Defl Ratio	682	880	647	744
Fy, ksi	36.0	36.0	36.0	36.0
M _r , ft-kips	197.5	101.3	197.5	142.0
Allow Defl Ratio	360	360	360	360
Status	OK	OK	OK	OK



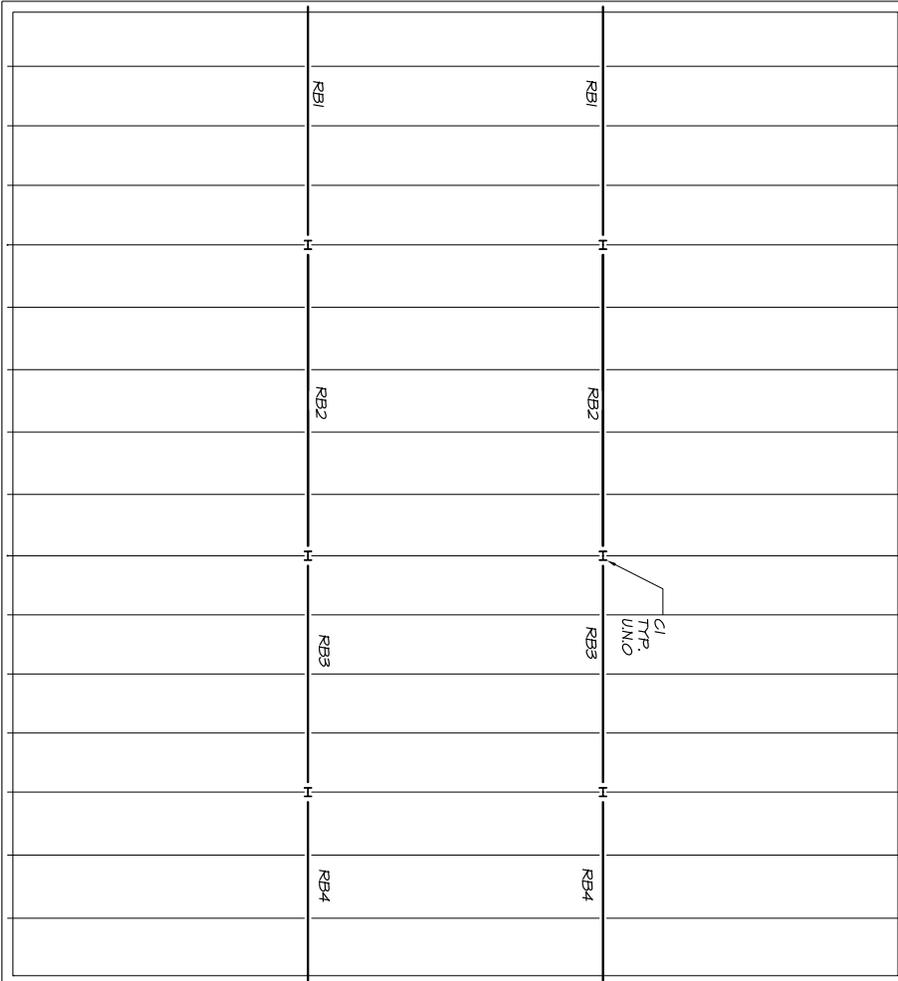
EXISTING FIRST FLOOR FRAMING PLAN
 $\frac{3}{8}$ " = 1'-0" SCALE

PULLEN ARTS CENTER AND NORTH PULLEN PARK EXISTING CONDITIONS REPORT

JK#	Ry	Span	Spacing	TL	Size
RJ1	3.2 K	21.5 FT	5.8 FT	231 PLF	20 J 6

ALLOWABLE LOAD = 289 PLF THEREFORE OK

JK#	RB1	RB2	RB3	RB4
Ry, kips	11.9	15.6	11.8	4.5
Size	16 WF 36	18 WF 45	16 WF 36	12 WF 27
Sx, in ³	56.3	78.9	56.3	34.1
Ix, in ⁴	446.3	704.5	446.3	204.1
Span, ft	21.8	28.5	21.7	17.3
Spacing, ft	27.3	27.3	27.3	27.3
Dead Load, psf	20.0	20.0	20.0	20.0
Live Load, psf	20.0	20.0	20.0	20.0
Total Load, pif	1092	1092	1092	1092
Mmax, ft-kips	65.1	110.9	64.1	41.0
Deflection, in	0.4	0.8	0.4	0.4
Actual Defl Ratio	607	431	621	555
Fy, ksi	36.0	36.0	36.0	36.0
Mt, ft-kips	1013	1420	1013	614
Allow. Defl Ratio	240	240	240	240
Status	OK	OK	OK	OK



EXISTING ROOF FRAMING PLAN
 $\frac{3}{8}$ " = 1'-0" SCALE

IV. BUILDING SYSTEMS

A. MECHANICAL

1. Major Equipment

The building is served by constant speed 5 split system A/C units with hot water reheat. These units are in excellent condition. Air handlers 1, 2, 3, and 5 each have 2 separate cooling coils, and condensing units. AHU-4 is a standard single coil/single condensing unit. This arrangement allows for good part load control of the space, however, without variable speed drives on the fans, activating a single coil can result in higher discharge air temperatures and less dehumidification.



Condensing Units

The Building cooling load is approximately 31 tons with 41 tons provided with these 5 units, so there may be some capacity for additional square footage.

The hot water is generated by a Lochinvar Copper Fin II boiler that appears to be in excellent condition and appropriately sized for the building heating load.



Lochinvar HW Boiler

The Building heating load is approximately 200MBH tons with 500MBH being provided by the boiler, so there is likely some capacity for additional square footage.

2. Zoning

The building is split into 5 zones, one air handler per zone. Further zoning is provided via zone dampers to keep the spaces from over cooling. Zoning seems appropriate for the size and use of the spaces.



Existing Zone Damper

3. Controls

A Vykon JACE-6 has been installed by Envirocon and appears to be in compliance with current Parks and Rec requirements. Systems appears to be in good condition

and functioning properly. Additional points could be added to this system, as needed.



Existing VYKON Jace



Existing Air Handler

Air Distribution

All ductwork is routed in the lower level and is routed exposed overhead to serve lower level rooms, and feeds floor diffusers on the floor above. The supply ductwork is externally insulated, return ducts are uninsulated.. Both Ductwork and insulation appear to be in excellent condition and appropriately sized for the airflows.

Airflow Issues

The first issue that should be addressed is the non-code compliant return air pathway. On the first floor, the Painting room and Break Rooms all transfer their return air into the corridor, before going to AHU-2 return grill open to the hallway. This creates a smoke hazard, because if there was a smoke or fire event in either of these spaces, it would be carried into the exit corridor and into the path of other evacuees. This condition should be fixed in any renovation project.



Transfer Grille in Door

Another air distribution issue is related to the size and location of the floor grilles. Where placed, these floor distribution devices are often covered up with shelving or equipment and fail to properly provide airflows into the space. These supply grilles are original to the building and are very undersized for the new airflows. They are creating high supply airflow velocities, that are not only loud, but also the “wind” generated is disrupting activities in the spaces. Any renovation project should plan to address this nuisance issue.



Floor diffuser covered with shelving



Undersized floor diffuser.

4. Recommendations

- a. Most of the Mechanical systems in the building are in excellent condition and should be salvaged or reused in any planned renovation project.
- b. AHU-2 return air needs to be re-worked so that the exit corridor is not used a return air pathway.
- c. Air distribution devices in the floor should be located to the ceiling and increased in size.
- d. Both of these items might be corrected by replacing AHU-2 with a Roof Top Unit instead.

B. PLUMBING

1. Plumbing

The building contains public restrooms on both floors, classroom sinks / counters and a series of large stainless steel double-bowl sinks. There are (2) water heaters in the Mechanical Room and a backflow preventer. There are also mop basins in both janitors' closets.



The building has an existing 6" Sanitary Sewer connection and a 1 ½ domestic water connection. The domestic water service connection is protected with an RPZ, however it is not in compliance with current City of Raleigh backflow requirements and so any renovation will need to address this. Additionally, the incoming 1 ½ is just large enough to serve the fixture count of the existing building but will likely need to be upsized if the supply water demand fixture count is increased.

Clay traps installed in the pottery room have been reported to drain very slowly or not at all, indicative of many years of material collecting in the traps. These traps could be replaced or cleaned.



Domestic Water incoming service.

1. Recommendations

- a. Clay traps should all be cleaned or replaced.
- b. Domestic water tap may need to be upsized to 2" if any more fixtures are added

C. ELECTRICAL

1. Service Entrance and Distribution

The building is served from a Duke/Progress utility transformer sited at the NE corner of the building. Power is delivered at 208Y/120 volts and terminates in a 1200 ampere ILINE style panelboard in the main mechanical room in the first level.



Electrical Distribution



Service Transformer

The main electrical panel feeds five (5) panels; four (4) are installed in the main electrical room and one (1) is installed in the HVAC service yard.



Electrical Panels-Basement



Electrical Panel-HVAC Service Yard

The electrical panels are all in good condition and wiring methods appear to be safe and Code compliant. The main electrical panel appears to have two (2) Code related issues: issue #1-the Code mandated working space required in front of the panel is not present; issue #2-the panel has space for additional breakers which would violate the National Electrical Code.

2. Emergency Power

The building has no emergency generation. Egress lighting is provided via battery powered lighting.



3. Interior Lighting

Lighting in most spaces is provided by 4'-0" fluorescent light sources. Fixtures are relatively new and house T8 lamps. Lighting levels appear more than adequate for the programming needs.

One area that should be addressed in any renovation is the entry lobby. The fixtures in this area appear to be original to the building and should be replaced with a more energy efficient lamp source.

Building lighting control appears to be handled at a bank of switches in the basement electrical room. This may not meet current Energy Code depending on how Code officials view building operations. This arrangement is only allowed under situations where control in the individual spaces could lead to a unsafe condition.



Lighting Pictures (Clockwise from bottom left: 1st Floor Installation, 2nd Floor Installation, Lighting Control in basement, Lobby Installation)

4. Exterior Lighting

Building mounted lighting is a combination of original fixtures, new LED wall mounted fixtures and new exit egress lighting.

PULLEN ARTS CENTER AND NORTH PULLEN PARK EXISTING CONDITIONS REPORT



Building Mounted LED Lighting Original Lighting and New Exit Egress Lighting

Sigma would recommend that any original lighting be removed or upgraded as part of any renovation project but the newer lighting sources that have been installed are in good condition and no complaints were noted by Staff.

Lighting on roads and in parking lots is provided by a combination of sources. Parking lot lighting is installed as decorative pole mounted “lanterns” with HID lighting sources. Lighting on the roadways into the site consists of newer LED “cobra” head style fixtures on wooden poles. They appear to be Duke/Progress leased fixtures.



Decorative Exterior Lighting



Duke/Progress Lighting

Staff made note of exterior lighting deficiencies especially on the roadways.

5. Recommendations

- a. Provide new service entrance switch on exterior of building or add main service disconnect in MDP. This will allow extra breakers to be added to the panel.
- b. Move the existing HVAC controls equipment from its current location to allow Code mandated clearances in front of the MDP.
- c. Provide new lighting in the lobby areas.
- d. Provide new lighting along the roadway areas.
- e. Update lighting controls to meet current Energy Codes.
- f. Add additional receptacles throughout the program areas and re-wire existing devices. Staff complained of “tripping” issues with breakers due to overloading circuits.

D. FIRE ALARM & SECURITY SYSTEM

The building has a relatively new fire alarm and security system. The Fire Control Panel is located in the front office. Detection and notification is provided throughout the building per current fire codes. Both fire alarm and security systems are monitored by ASG.



Main Fire Control Panel



Zone Map with Device Layout

E. SUMMARY

Overall, the building is in good condition given its age. It is well maintained and heavily used. Clearly it lacks sufficient size to meet the programmatic demands that are being placed on it, but the staff is to be commended for maintaining this important public facility in such a high manner.