



## Purple Cherry Architects

January 2010

Feasibility Study:

Expansion of the Maryland State Archives facility

Prepared By:

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**A. Introduction**

The Maryland State Archives has performed an analysis of their current facility requirements at their Rowe Boulevard site and accessory sites throughout Maryland as described in the June 30, 2008 document titled "Maryland State Archives Program". This document catalogs the current storage requirements of 258,109 cubic feet of permanent record material stored in five main facilities. It also calculates the growth in permanent storage and staff over the next 10-15 years. Finally, there is a request for a single facility that would combine all of these storage needs (present and future) in a single location and make the collection more accessible to the public by creating a building with a museum component that displays archive artifacts.

Purple Cherry Architects was contracted by The Department of General Services to perform a feasibility study to demonstrate the ability of the state-owned property located at the intersection of Rowe Boulevard and Taylor Avenue in Annapolis to house a future addition to the existing building that would address the needs of the State Archives through the next fifteen years and beyond.

This study includes City of Annapolis zoning and critical area assessments, program assessment and parking analysis, compact storage requirement calculations, and massing building studies. The final massing options were estimated in a general cost per square foot manner to provide order of magnitude information for each scheme.

**B. Summary**

It is the conclusion of this Feasibility Study performed by Purple Cherry Architects that the Facility Program requested by the Maryland State Archives can be accommodated on the current Annapolis state-owned property. The three site options presented assume an expansion of approximately 200,000 square feet with variations in the number of stories below and above grade. An area reserved for a possible Memorial Park is included as a buffer and amenity to the City of Annapolis and West Annapolis business and residential community.

**C. Recommendations**

This Feasibility was performed without the benefit of an accurate property survey and geotechnical soil borings for the determination of the water table and soil compaction for bearing capacity. The AutoCAD base site plan drawing used was provided to our office by the City of Annapolis Department of Public Works. The existing utility map was created from various documents obtained by PCA and requires formal verification by a Civil Engineer.

A formal survey would provide the necessary accuracy regarding existing lot coverage, property line setbacks and location of the mean high water line and 100' critical area buffer. Further, site borings would assist in determining the extent of dewatering required for each of the concepts as well as possibly indicate unforeseen soil conditions that could contribute to increased construction costs.

## Site Plan: Area and Lot Coverage

(All calculations are approximate only pending formal civil survey)

Gross Property Area: 382,900 sf

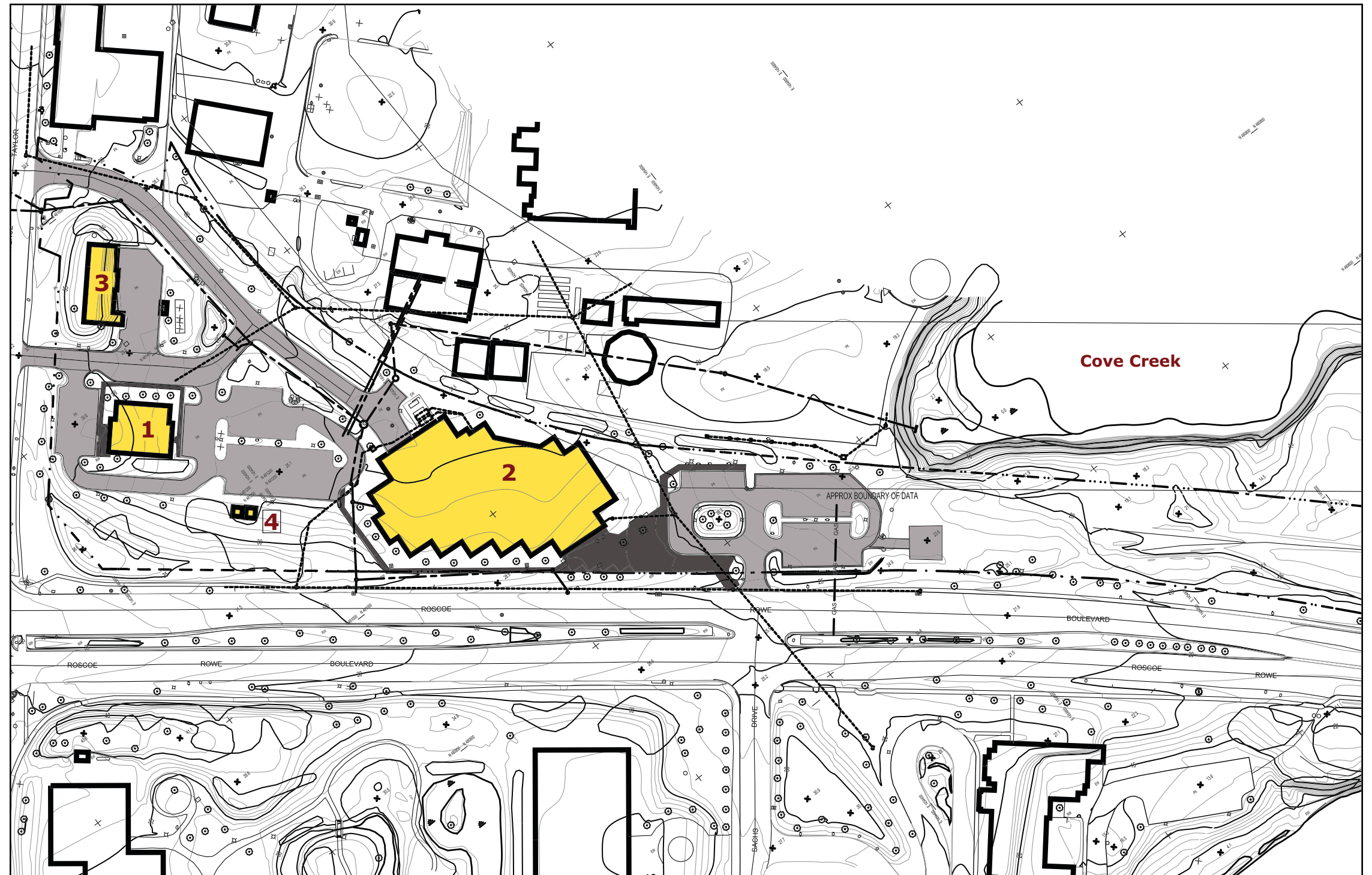
Total Existing Lot Coverage as defined by Critical Area: 136,097 sf

### Breakdown of Lot Coverage :

- Building 1: 4,069 sf
- Building 2: 33,860 sf
- Building 3: 3,230 sf
- Building 4: 490 sf
- Sidewalk Area: 13,416 sf
- Parking Area: 61,032 sf
- Driveway Area: 20,000 sf

Base Drawing provided by the City of Annapolis Department of Public Works. All information contained is accurate as of the date of the original survey.

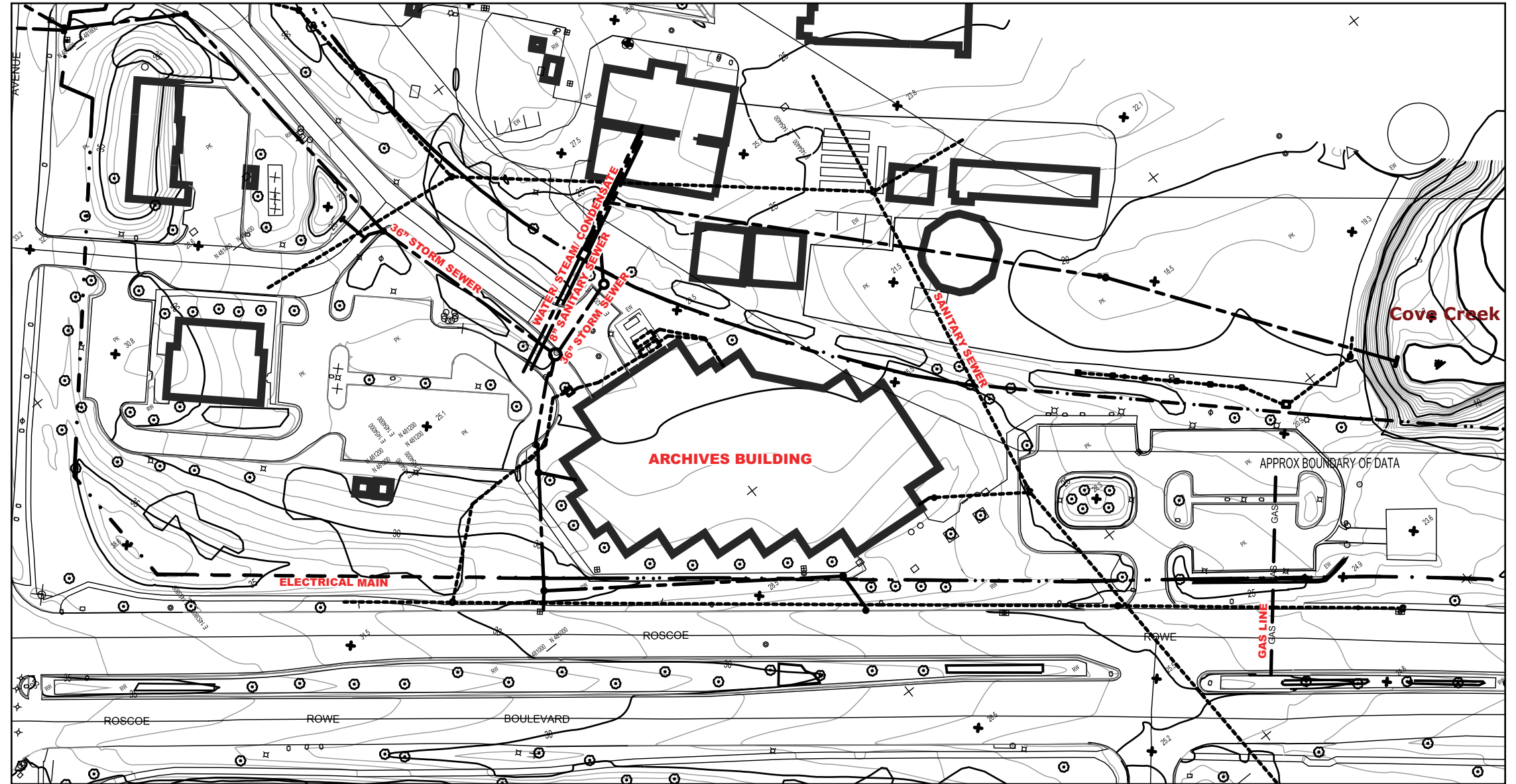
Lot Coverage area is calculated based on the data provided.



### Site Plan: Known Utility Lines



(Pending formal civil survey)

Base Drawing provided by the City of Annapolis Department of Public Works. All information contained is accurate as of the date of the original survey.



### Site Plan: 1000' Critical Area & 100' Buffer

(Graphics represent approximate locations pending formal civil survey)

-  Critical Area: 1000'
-  Buffer: 100'

Base Drawing provided by the City of Annapolis Department of Public Works. All information contained is accurate as of the date of the original survey.



City of Annapolis Zoning

Zoning Designation: P-Professional Office  
Critical Area Designation: IDA

Summary

The table to the right indicates that Design Requirements for Governmental uses in the P-District are "as specified by the decision-making body or official through the zoning decision-making process set forth in Division II, Administration."

Our meeting with the Zoning Director indicates that the project will gain the greatest support if it is in compliance with the general guidelines of the Professional Office District and the Annapolis Comprehensive Plan adopted in 2009. Therefore, the massing concepts developed in this feasibility are generally sensitive to the setbacks and height regulations.

The P-District Bulk regulations for Educational, Institutional, Non-profit, Cultural or Civic use of this site are also listed to the right.

NOTE: As a general rule the State is not subject to local zoning laws unless the General Assembly has clearly indicated it's intention that the State be bound. For the purpose of this study, every attempt has been made to accommodate the City of Annapolis regulations.

1.50.240 Bulk Regulations Table P District.

Important. The notes at the end of the table are as much a part of the law as the table itself.

Permitted uses, special exception uses, and uses subject to specific standards	Density (minimum sq. ft. lot area per dwelling unit)	Lot Dimensions (minimum) Area (sq. ft. or acres)	Lot Dimensions (minimum) Width (ft)	Yards (minimum) Front (ft) <sup>3</sup>	Yards (minimum) Interior Side (ft)	Yards (minimum) Corner Side (ft)	Yards (minimum) Rear (ft)	Height, Floor Area Ratio (maximum) <sup>1</sup>
Clubs, recreational and social		5,400	50	25 <sup>3</sup>	10	20	30	1.8
Day care centers, group		5,400	50	25	6	15	30	2.4
Dwellings, multifamily	1 bedroom: 1,400 <sup>2</sup> 2 or more bedrooms: 1,800 <sup>2</sup>		50	20 <sup>3</sup>	5 <sup>4</sup>	15	30	2.4
Dwellings, single-family attached	3,600 <sup>2</sup>		16	20 <sup>3</sup>	5 <sup>4</sup>	15	30	2.4
Dwellings, single-family detached	3,600 <sup>2</sup>		50	20 <sup>3</sup>	5 <sup>4</sup>	15	30	
Dwellings, two-family	3,600 <sup>2</sup>		50 <sup>10</sup>	20 <sup>3</sup>	5 <sup>4</sup>	15	30	
Educational institutions		20,000	90	25 <sup>3</sup>	10	20	30	1.8
<b>Governmental uses</b>		<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>
Group homes		3,600 <sup>2</sup>	50					2.4
Health and medical institutions		10,000	70	25 <sup>3</sup>	10 <sup>5</sup>	20	35	1.8
Offices, business and professional, and nonprofit, educational, cultural, or civic			40	15 <sup>3</sup>	10 <sup>4,6</sup>	10	30	2.4 <sup>7</sup>
Planned developments		20,000	Bulk regulations shall be determined through the planned development, process, pursuant to Chapter 21.24.	Bulk regulations shall be determined through the planned development, process, pursuant to Chapter 21.24.	Bulk regulations shall be determined through the planned development, process, pursuant to Chapter 21.24.	Bulk regulations shall be determined through the planned development, process, pursuant to Chapter 21.24.	Bulk regulations shall be determined through the planned development, process, pursuant to Chapter 21.24.	Bulk regulations shall be determined through the planned development, process, pursuant to Chapter 21.24.
Religious institutions		10,000	70	25 <sup>3</sup>	10 <sup>5</sup>	20	35	1.8
Undertaking establishments and funeral parlors	Requirements shall be determined through the special exception and site plan design review process	Requirements shall be determined through the special exception and site plan design review process	Requirements shall be determined through the special exception and site plan design review process	Requirements shall be determined through the special exception and site plan design review process	Requirements shall be determined through the special exception and site plan design review process	Requirements shall be determined through the special exception and site plan design review process	Requirements shall be determined through the special exception and site plan design review process	2.0
Other uses	Bulk regulations shall be determined through the site design plan review, or special exception processes, pursuant to Chapters 21.22, and 21.26.	Bulk regulations shall be determined through the site design plan review, or special exception processes, pursuant to Chapters 21.22, and 21.26.	Bulk regulations shall be determined through the site design plan review, or special exception processes, pursuant to Chapters 21.22, and 21.26.	Bulk regulations shall be determined through the site design plan review, or special exception processes, pursuant to Chapters 21.22, and 21.26.	Bulk regulations shall be determined through the site design plan review, or special exception processes, pursuant to Chapters 21.22, and 21.26.	Bulk regulations shall be determined through the site design plan review, or special exception processes, pursuant to Chapters 21.22, and 21.26.	Bulk regulations shall be determined through the site design plan review, or special exception processes, pursuant to Chapters 21.22, and 21.26.	Bulk regulations shall be determined through the site design plan review, or special exception processes, pursuant to Chapters 21.22, and 21.26.

Table Notes

- In the historic district, special height measurement and limits requirements apply, see Chapter 21.56.
- The minimum total zoning lot area is 5,400 square feet.
- Plus one foot for each three feet by which the building width exceeds 40 feet.
- Unless the building height exceeds 25 feet, in which case the interior side yards shall equal one-fifth the building height. Buildings 50 feet or more in overall width, as projected upon the front lot line shall have side yards not less than ten percent of the building width or 20 percent of the building height, whichever is greater.
- Plus one foot for each two feet by which the building height exceeds 15 feet.
- Subject to Table Note 4, one interior side yard may be less than 10 feet, provided the sum of both side yards is at least 10 feet.
- If 75 percent or more of the required off-street parking spaces are provided underground or in a structure, the maximum allowable floor area ratio is 3.0.
- The front yard for principal uses shall be the minimum specified in the table or the established front yard pursuant to Chapter 21.38.
- As specified by the decision-making body or official through the zoning decision-making process set forth in Division II, Administration.
- If the lot is to be subdivided, a minimum lot width of 30 feet per dwelling unit shall be provided.



*City of Annapolis*  
DEPARTMENT OF PLANNING AND ZONING

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JON ARASON, AICP  
DIRECTOR

December 17, 2009

Purple Cherry Architects  
1 Melvin Avenue  
Annapolis, MD 21401

VIA Email only: Cathyc@purplecherry.com

**Re: Your 12/17/09 email concerning zoning at State Archives site (However, content of email appears to refer to the State Police Barracks site, rather than the archives site).**

Cathy,

Based on the limited information that you have provided concerning what type of educational use, or other use, that you would be proposing, I have responded to the points of your email as follows. Please note that the bulk regulations vary greatly depending on the use. Also note, that the following does not constitute a complete zoning analysis and any proposed development is subject Site Design Plan Review.

Zoning for the property located east of the intersection of Rowe Blvd and Taylor Ave (formerly MD State Police Barracks):

P, Professional Office District

As per Section 21.48.030 – Tables of Uses;

Educational Institutions as follows:

- Public Schools and Colleges – Permitted
- Private Schools; Elementary, Middle, or High – Permitted
- Commercial Schools; Trade, Vocational, Music, Dance, or Art – NOT Permitted

Offices; business and professional, and nonprofit, educational, cultural, or civic:

- P-Std – Permitted on lots of greater than 5,400 sf
- S-Std – Special Exception on lots less than 5,400 sf

Bulk Regulations for Educational Institutions and Offices located within the P district:

As per Section 21.50.240 – Bulk Regulations Table P District;

Educational Institutions as follows:

- Minimum Lot Area = 20,000 sf
- Minimum Lot Width = 90 ft
- Minimum Front Yard = 25 ft or the Established Front Yard pursuant to Chapter 21.38, plus one foot for each three feet by which the building width exceeds 40 feet.
- Minimum Interior Side Yard = 10 ft
- Minimum Corner-Side Yard = 20 ft

State Police Barracks site  
December 17, 2009  
Page 2

- Minimum Rear Yard = 30 ft
- Maximum F.A.R. = 1.8

Offices as follows:

- Minimum Lot Area = Greater than 5,400 sf as permitted use
- Minimum Lot Width = 40 ft
- Minimum Front Yard = 15 ft or the Established Front Yard pursuant to Chapter 21.38, plus one foot for each three feet by which the building width exceeds 40 feet.
- Minimum Interior Side Yard = 10 ft, unless the bldg height exceeds 25 ft, in which case the interior side yards shall equal 1/5 the bldg height. Buildings 50 ft or more in overall width as projected upon the front lot line, shall have side yards not less than 10% of the bldg width or 20% of the bldg height, whichever is greater.
- Minimum Corner-Side Yard = 10 ft
- Minimum Rear Yard = 30 ft
- Maximum allowable F.A.R. = 2.4, unless 75% or more of the required off-street parking is provided underground or in a structure, in which case the maximum allowable F.A.R. is 3.0.

75' Setback off Rowe Blvd:

*21.38.030.H. Setback Along Roscoe Rowe Boulevard. To protect the scenic approach to Annapolis, all buildings, structures and uses established along Roscoe Rowe Boulevard shall observe a setback of not less than seventy-five feet from the right-of-way line of the boulevard.*

Height/F.A.R. (regarding buildings over 45' and/or F.A.R. over 2.0):

*21.38.030.E. Planned Development Required For Buildings Over Forty-Five Feet and/or Floor Area Ratio Over Two. Unless otherwise specified in the development standards for an individual zoning district, no new building or existing building which is later altered, shall have a height in excess of forty-five feet or contribute to a floor area ratio on its zoning lot greater than two unless the building is approved as a planned development in accordance with Chapter 21.24. As used in this section, "floor area ratio" shall be calculated by dividing the total floor area of the building or buildings on any zoning lot (including the area of any above-grade off-street parking or loading facilities included in the building or buildings) by the area of the zoning lot and without regard to "net site area" or "gross development area" as those terms are used in connection with planned developments and Chapter 21.24.*

All uses in the P district are subject to this provision.

Critical Area:


IDA, Intensely Developed Areas\*

- Maximum Lot Coverage = 60% (Section 21.54.080.B.)

\*A portion of the site at the front of the property is outside the Critical Area boundary. Refer to the Critical Area map in P&Z office.

Please call or email me if you have any questions.

Sincerely,

  
Kevin Scott, ASLA  
Senior Land Use & Development Planner  
[KCScott@annapolis.gov](mailto:KCScott@annapolis.gov)



**Opportunity Areas: West Annapolis**

The West Annapolis Opportunity Area encompasses the intersection of Rowe Boulevard and Taylor Avenue and the commercial sections of West Annapolis along Ridgely and Melvin. It is a major gateway into Annapolis with good highway and transit accessibility to U.S. Route 50, MD Route 450, and downtown.

Annapolis Comprehensive Plan

The adjacent report was adopted in the fall of 2009. The plan identifies the Police Barracks and State Archives site at the corner of Rowe Boulevard and Taylor Avenue as "Special Use". The Comprehensive Plan further defines that "the future use should bring substantial recognition and prestige to the City of Annapolis while conferring direct benefits to the City's residents". It also defines that "higher buildings along Rowe are inappropriate".



*Annapolis Comprehensive Plan  
Chapter 3 - Land Use and Economic Development*

The purpose of designating the West Annapolis Opportunity Area is to:

- ▶ Acknowledge the development potential of this area, anticipate likely development pressure, and articulate the desired future character of the West Annapolis “Village”.
- ▶ Set the stage for detailed area planning that allows more stakeholder and community input and more thorough consideration of the issues important to the area’s future character and economic viability.
- ▶ Acknowledge that Rowe Boulevard is a primary gateway and entry point into Annapolis that defines visitors’ first impression of the city. Rowe Boulevard has more of a ceremonial character than other gateways, and future development along Rowe should reflect and enhance the character of this corridor.
- ▶ Acknowledge that careful planning is needed to ensure the sensitive transition between the quiet neighborhoods of Wardour and West Annapolis, the neighborhood-scale commercial areas abutting the residential neighborhoods, and the larger office buildings on the blocks closest to Rowe Boulevard.
- ▶ Acknowledge that the widening of Rowe Boulevard created an awkward intersection at Forbes and Melvin and created very narrow lots between Forbes and Rowe. A reconfiguration of the intersection and parcels could benefit the function of the area as a whole.
- ▶ Acknowledge that the current zoning of the area may not enact the desired character for West Annapolis and should be reviewed for its appropriateness. Review of, and change to zoning could be done as part of an area planning effort.
- ▶ Facilitate the comprehensive treatment of features important to the area’s future character and identity, circulation and economic viability: pedestrian and bicycle facilities, in particular those that enhance pedestrian and bicycle safety; a parking strategy; signage; streetscape improvements; road alignment; access management; transit service; and connections to the bicycle network.
- ▶ Acknowledge the regionally significant role of Rowe Blvd. and Taylor Avenue/MD450 as an overflow route to US 50. A balance must be found between regional transportation needs and local circulation and mobility.

Recommendations for the West Annapolis Opportunity Area are:

- ▶ The area shown in figure 3-7 should transition over time to the Urban Center Low character to enhance the “Village” quality and function of West Annapolis. In West Annapolis, the Urban Center Low designation directs redevelopment to achieve a mix of retail, offices, restaurants, and housing, and preserve essential neighborhood services.
- ▶ As part of the redevelopment of the opportunity area, a park should be created to serve as a community gathering place that creates a recognizable focal point for the West Annapolis Village. Such a park could encompass both “green” and hardscape features.
- ▶ The form of development - articulated by building massing and height, site coverage, relationship of buildings to streets, building setbacks, architectural detailing - should enhance the urban “village” character. New development along Rowe should be designed within the context of Rowe Boulevard being the ceremonial gateway into Annapolis, along which other prominent buildings are located– the District Court building, DNR building, and State Archives building. As such, higher buildings along Rowe are inappropriate.

- ▶ Views and sight lines should be taken into consideration in the redevelopment of this area, in particular the protection of scenic viewsheds into downtown. Environmental features in the area should be preserved, with special attention to preserving mature trees.
- ▶ Two portions of the West Annapolis Opportunity Area are designated “Special Use.” These are public use sites and there is one principal guideline for their development and/or redevelopment: the future use should bring substantial recognition and prestige to the City of Annapolis while conferring direct benefits to the City’s residents.
- ▶ Urban design amenities (pedestrian and bicycle facilities, planting, signage, streetscape treatments, public spaces) should be implemented throughout the opportunity area and serve to create cohesion and enhance the West Annapolis Village as a recognizable “place”. Measures to enhance pedestrian and bicycle safety should be implemented.
- ▶ Parking should be located in structures or underground to allow the most efficient use of space for commercial activity.
- ▶ The Transportation chapter of this Plan recommends an engineering feasibility study to address the goals of alleviating peak period traffic congestion, handling Route 50 overflow traffic, improving transit efficiency, and enhancing access to and circulation within West Annapolis.

## Building Heights

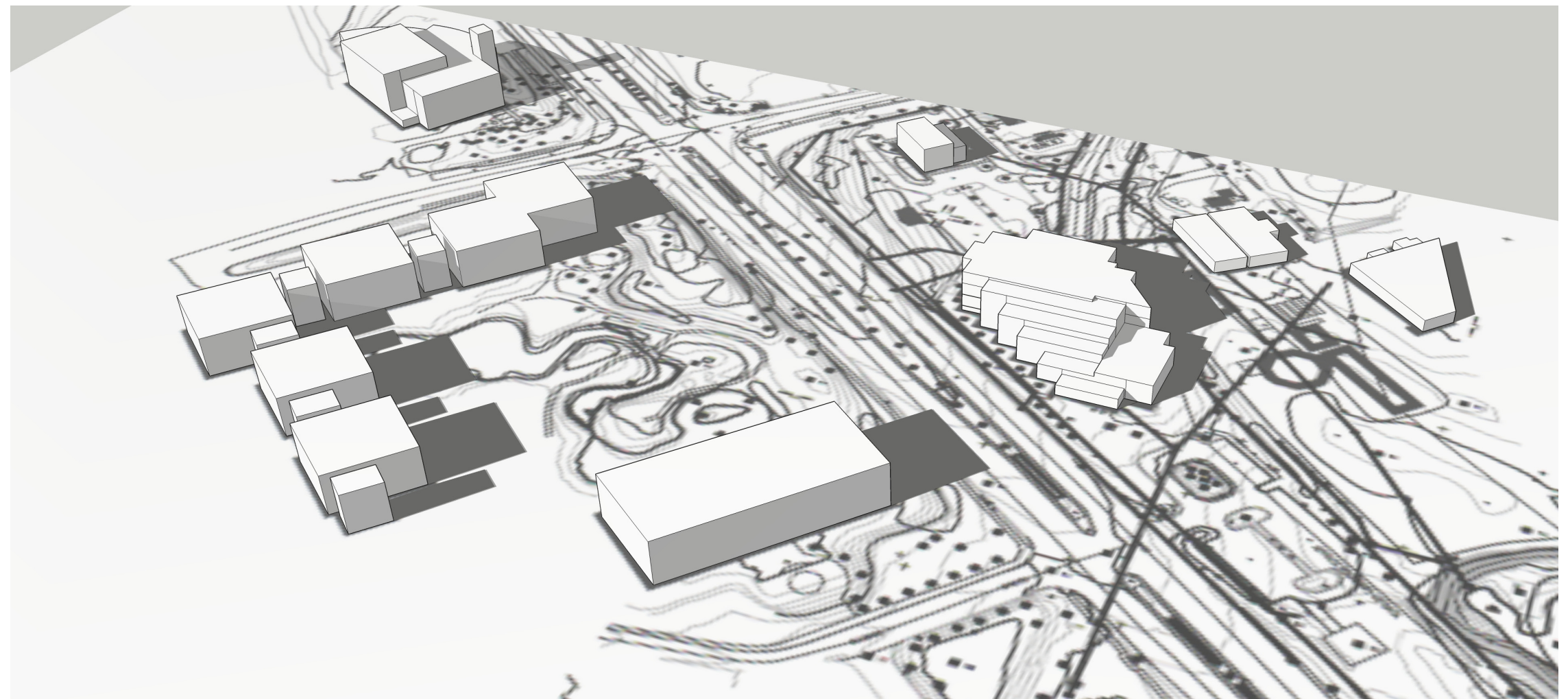
### Along Rowe Boulevard

The tallest height of the current Maryland State Archives building is 45' according to the construction drawings. The Department of Natural Resources buildings across the street are approximately 55'. The Courthouse located diagonally from the Archives site is approximately 60' at its highest point not including the tower element. The zoning code supports 45' currently. Therefore, the massing concepts developed in this feasibility are at or below 45' (not including any possible mechanical units and screening elements).

Base Drawing provided by the City of Annapolis Department of Public Works. All information contained is accurate as of the date of the original survey.



Satellite Imagery Provided by Google Earth



## Parking Assessment

The Parking requirements for the site calculated to the right may be further reduced by the City of Annapolis Zoning Director by the use of the "Alternative Parking Standards" section of the City of Annapolis Zoning Code 21.66.040.

The existing parking space count is grandfathered to the existing building so no further parking spaces for this existing structure are required. The massing concepts developed in this feasibility indicate parking at grade or below grade but always on the site. The parking count indicated can be reduced by the code through approvals and will result in cost savings.

### Parking Requirements per City of Annapolis Zoning Code

**Conference Facilities** - Spaces sufficient to serve 30% of capacity of persons

**Museums - 1:800 SF**

**Offices - 1:300 SF**

**Printing Establishments - 1:3 employees**

**Storage - 1:3 employees**

### New Addition

**Storage:** 115,221 NSF • 1:3 Employees

$$0 \text{ Employees} \div 3 = 0 \text{ Parking Spaces}$$

**Printing:** 7,000 NSF • 1:3 Employees

$$0 \text{ Employees} \div 3 = 0 \text{ Parking Spaces}$$

**Office:** 2,352 NSF • 1:300 SF

$$2,352 \text{ SF} \div 300 = 7.84 = 8 \text{ Parking Spaces}$$

**Conference:** 2,500 NSF • 15 SF per occupant • 30% capacity of persons

$$2,500 \div 15 = 166.66 = 167 \text{ persons} \times 0.30 = 50.1 = 51 \text{ Parking Spaces}$$

**Museum:** 8,000 NSF • 1:800 SF

$$8,000 \div 800 = 10 = 10 \text{ Parking Spaces}$$

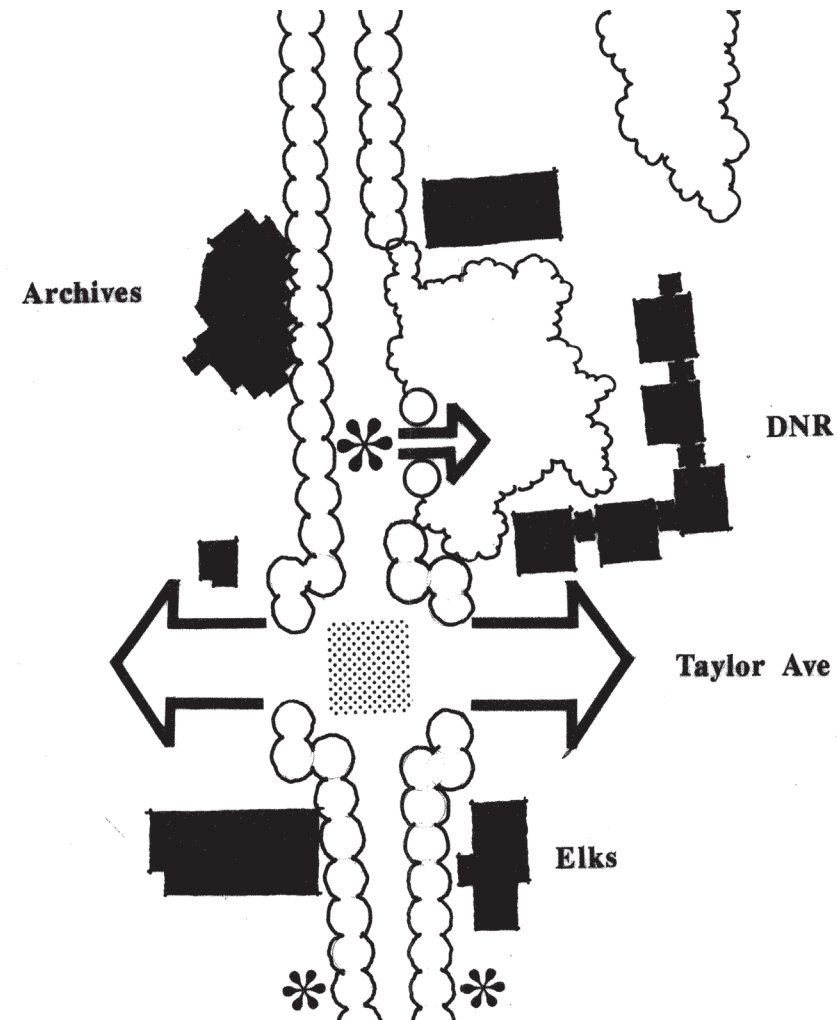
**Sub-Total:** = 69 Parking Spaces

**Grandfathered Parking:** = 49 Parking Spaces

**Total:** = 118 Parking Spaces

## Rowe Boulevard Conceptual Design

To the right is a portion of the Conceptual Master Plan prepared by Graham Landscape Architects in 1993 for the beautification of Rowe Boulevard. This master plan document was never officially adopted.



### **URBAN NEIGHBORHOOD:**

- Streetscape is "Green Link" from entrance to capital
- Enhance commercial character
- Improve pedestrian cross circulation
- Improve directional/informational signs
- Sculpture strategically located for future development

### Program Requirements

The calculations and assessments to the right indicate the total storage needs for the next 15.5 years. The formerly submitted program was revised to incorporate this new storage requirement figure. The "staff" program number was also modified per meetings during the preparation of this feasibility. In addition, the net area was increased by the calculated efficiency number of 1.47.

#### Space Requirements Calculations for storage shelving

▶	<b>15,000 CF</b>	-Estimated average annual new materials intake
x	15,000 CF 15.5 Years	
=	<b>232,500 CF</b>	-Total new materials accumulated (NM)
▶	<b>258, 109 CF</b>	- Existing offsite storage in warehouse facilities (ES)
+	232,500 CF (NM) 258,109 CF (ES)	
=	<b>490,609 CF</b>	-Design Requirement for Record Storage for 2010-2025.5 (DR)

#### Montel Mobile Shelving System Calculations

▶	<b>50 CF in 10 SF</b>	-Storage Capacity of Each Shelving Unit
▶	<b>5:1</b>	-Ratio of Storage Capacity per Square Foot
÷	490,609 CF (DR) 5	
=	<b>98,122 SF</b>	-Net Floor Area Required for Shelving (FA)

#### Revised Program

Records Storage (Net)	<b>98,122 SF</b>
Records Processing Space (Typ)	<b>2,500 SF</b>
Electronic Archives	<b>10,000 SF</b>
Cold Storage	<b>1,000 SF</b>
Conference Space	<b>2,500 SF</b>
Exhibits Space	<b>8,000 SF</b>
Large Object Storage	<b>3,000 SF</b>
Paintings Storage	<b>2,500 SF</b>
Works on Paper Storage	<b>2,500 SF</b>
Fine Arts Conservation Lab	<b>1,000 SF</b>
Fine Arts Processing Space	<b>1,000 SF</b>
Staff	<b>2,352 SF</b>
Bathrooms	<b>750 SF</b>
Scanning Storage	<b>600 SF</b>
<b>Subtotal Program Area (SPA):</b>	<b>135,824 SF</b>

**Calculation of Gross Area:** 135,824 SF • 1.47 Efficiency Factor  
 135,823 x 1.47 = 199,661.28 = **199,661 SF**

**Existing State Archives Building Circulation / Core / Mechanical Assessment**

	Basement	Ground Level	2nd Floor	3rd Floor	Total	% of Gross
Mechanical	2,278	413	261	3,525	6,477	5.96%
Core/ Stair	796	1,336	1,336	1,062	4,530	4.17%
Bathroom	0	1,195	325	0	1,520	1.40%
Loading Dock	0	232	0	0	232	0.21%
Circulation	471	8,707	4,234	492	13,904	12.79%
Estimated Walls	2,000	2,000	2,000	2,000	8,000	7.36%
Sum Misc	5,545	13,883	8,156	7,079	34,663	
<b>Gross Area</b>	<b>20,135</b>	<b>36,657</b>	<b>32,864</b>	<b>19,019</b>	<b>108,675</b>	
<b>Net Area</b>	<b>14,590</b>	<b>22,774</b>	<b>24,708</b>	<b>11,940</b>	<b>74,012</b>	<b>68.10%</b>

**Building Efficiency**

The table immediately to the right calculates the approximate efficiency factor for the existing Maryland State Archives building. This factor was calculated from an assessment of the current building. Coincidentally, this factor of 1.47 or 68% is the same percentage as shown on the 1981 Program for the current building.

The current DGS Building Efficiency Factors chart has also been provided for reference.

**Efficiency Factor:**  $108,675 \div 74,012 = 1.46834 = 1.47$

**CHAPTER IV  
POLICIES and STANDARDS**

**5 BUILDING EFFICIENCY FACTORS** (Facility Program Manual, DGS/DBM, latest edition)

Building Type	Efficiency Factor Range	Mid-Point
Office (Non-University)	1.35 (75%) - 1.50 (67%)	1.42 (70%)
Administration/Office (University)	1.67 (60%) - 1.82 (55%)	1.74 (57%)
Library	1.52 (66%) - 1.67 (60%)	1.60 (62%)
Classroom	1.65 (61%) - 1.85 (54%)	1.75 (57%)
Science (Undergraduate)	1.65 (61%) - 1.85 (54%)	1.75 (57%)
Science (Research)	1.72 (58%) - 1.92 (52%)	1.82 (55%)
Medical (Teaching)	1.75 (57%) - 1.95 (51%)	1.85 (54%)
Dormitory	1.33 (75%) - 1.54 (65%)	1.43 (70%)
Dining Hall (Kitchen)	1.40 (71%) - 1.60 (62%)	1.50 (67%)
Student Union	1.60 (62%) - 1.75 (57%)	1.67 (60%)
Performing Arts Fine Arts	1.75 (57%) - 1.95 (51%)	1.85 (54%)
Theater, Auditorium, Concert Hall	1.45 (69%) - 1.60 (62%)	1.52 (66%)
Gymnasium	1.40 (71%) - 1.50 (67%)	1.45 (69%)
Patient Health Facility	1.70 (59%) - 1.85 (54%)	1.77 (56%)
Armory	1.25 (80%) - 1.35 (75%)	1.30 (77%)
District Court, MSC	1.70 (59%) - 1.85 (54%)	1.77 (56%)
State Police Barrack	1.50 (67%) - 1.60 (62%)	1.55 (64%)
Detention Facility	1.70 (59%) - 1.85 (54%)	1.77 (56%)
Maintenance Shop	1.25 (80%) - 1.35 (75%)	1.30 (77%)
Garage (Vehicle Support)	1.15 (85%) - 1.25 (80%)	1.20 (83%)
Park Comfort Station, Shower Building	1.30 (77%) - 1.40 (71%)	1.35 (75%)
Visitor's Center Concession	1.40 (71%) - 1.50 (67%)	1.45 (69%)

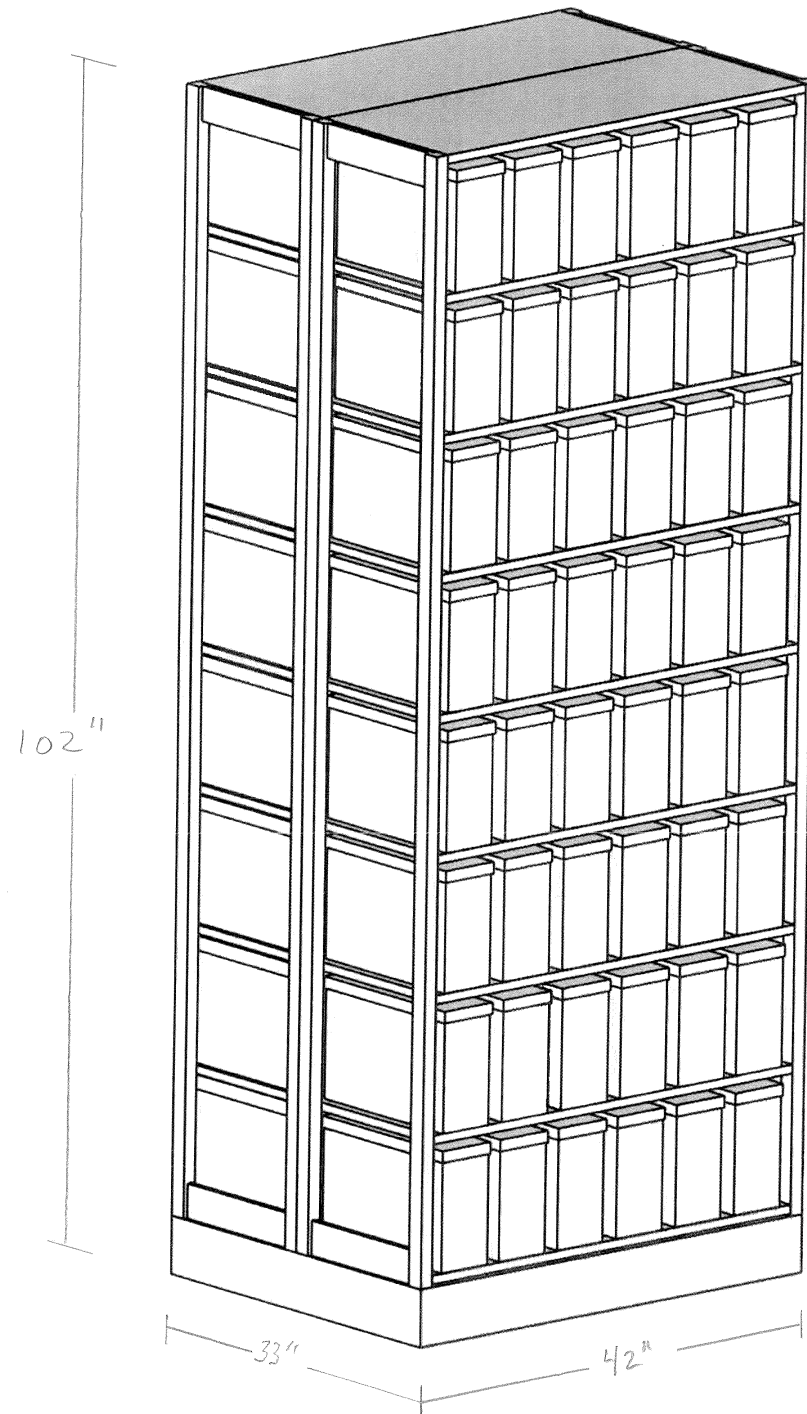
## Shelving Diagrams

### Compact Shelving Calculations

The following calculations and diagrams indicate that approximately 47 to 55.2 CF of storage fits in 9.625 SF of floor area. For an average, Purple Cherry Architects estimated 50 CF of storage per 10 SF of floor area or 5 CF of storage per 1 SF. The Design Requirements for record storage for 2010 - 2025.5 (15.5 years) is 490,609 requiring 98,122 SF of net floor area for shelving only.

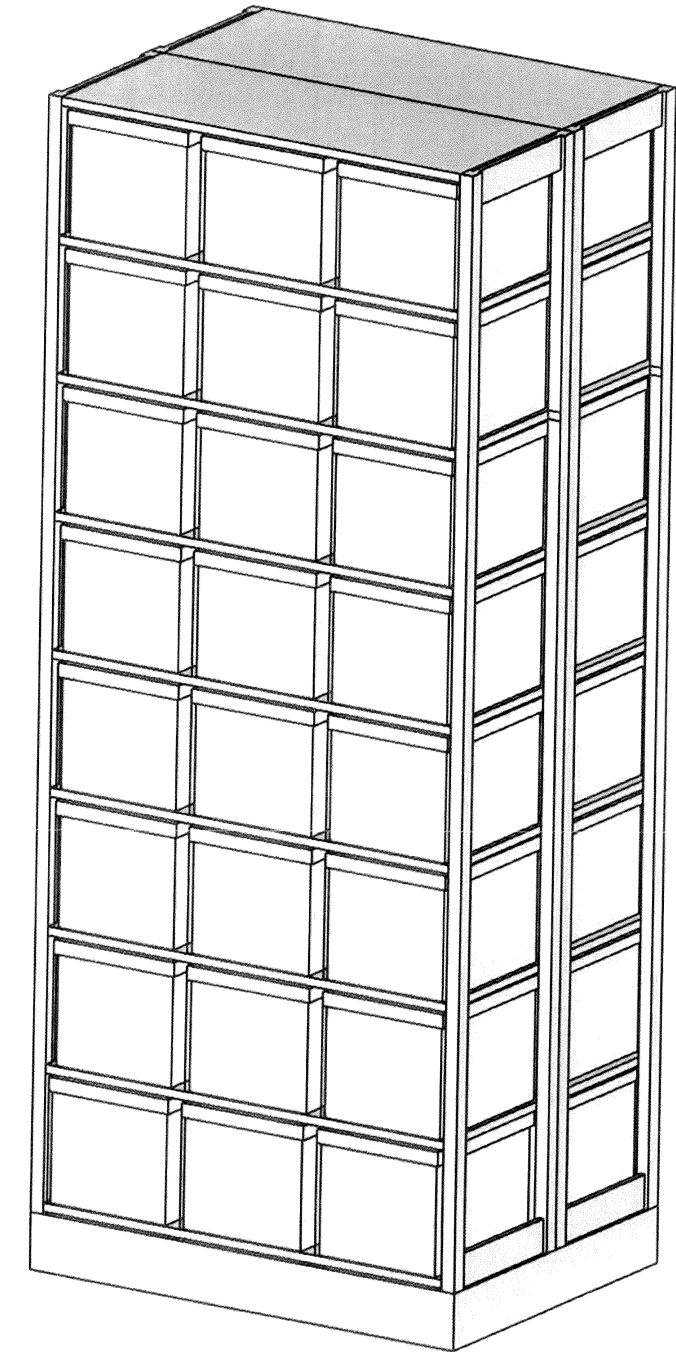
Adjacent are 3D drawings showing two shelving configurations, one for each type of box to be stored (Box A: 5.25" w x 15.5" l x 10.5" h and Box B: 13" w x 15" l x 11" h). The configurations were provided to Purple Cherry Architects in an e-mail dated December 29, 2009 from Montel Shelving. The shelving unit is 42" w to allow for the proper air flow required to maintain a climate controlled environment. (Note: the shelving unit could hold (7) boxes of the 5.25" w size per shelf; however, the air flow would be restricted. Therefore, only (6) boxes per shelf are included.) The proposed overall system height of 102", which accommodates 8 shelves, is 18" below the ceiling height of 10' to meet the sprinkler requirement. Note that (1) aisle a minimum of 36" will be necessary for every 30' of shelving.

The next two pages are the original storage calculations and configurations prepared by Montel for the original existing building.



#### Storage Calculation: Box A

- ▶ **Box Size:** 5.25" width x 15.5" length x 10.5" height  
 $0.4375' \text{ width} \times 1.291667' \text{ length} \times 0.875' \text{ height} = .494467 = .49 \text{ CF}$
- ▶ **Unit Capacity:** 6 boxes per shelf (width) • 2 boxes per shelf (length) • 8 shelves (height)  
 $6 \text{ (width)} \times 2 \text{ (length)} \times 8 \text{ (height)} = 96 \text{ Boxes}$   
 $96 \times .49 \text{ CF} = 47.04 = 47 \text{ CF}$
- ▶ **Unit Floor Area:** 42" Width • 33" Length  
 $2.75' \text{ width} \times 3.5' \text{ length} = 9.625 \text{ SF}$



#### Storage Calculation: Box B

- ▶ **Box Size:** 12" width x 15" length x 11" height  
 $1' \text{ width} \times 1.25' \text{ length} \times 0.9167' \text{ height} = 1.1458 = 1.15 \text{ CF}$
- ▶ **Unit Capacity:** 3 boxes per shelf (width) • 2 boxes per shelf (length) • 8 shelves (height)  
 $3 \text{ (width)} \times 2 \text{ (length)} \times 8 \text{ (height)} = 48 \text{ Boxes}$   
 $48 \times 1.15 \text{ CF} = 55.2 \text{ CF}$
- ▶ **Unit Floor Area:** 42" Width • 33" Length  
 $2.75' \text{ width} \times 3.5' \text{ length} = 9.625 \text{ SF}$



CASE STUDY - ARCHIVES APPLICATION

# MARYLAND STATE ARCHIVES

## Responsible for Preserving a Heritage



The Maryland State Archives are located in the Hall of Records building at the corner of College Avenue and St-John Street, at the center of Annapolis.

### The Institution

The Maryland State Archives is the prime institution concerned with archival storage and conservation in the State of Maryland. Its role is to gather and preserve all official documents generated at all levels of State government agencies, counties and municipalities, from colonial time to present. It must also organize and manage the use of these archives by thousands of readers every year.

### The Collections

The Hall of Record's materials include the most extensive and most complete archival collection of Maryland. Under the law, official documents from before 28 April 1788, date of the ratification of the Constitution of the United States by the State of Maryland, must be preserved there. Many public records created since then are on deposit, in their original format or on microfilm. Moreover, the Hall of Records accepts pri-

vate collections of manuscripts and diverse documents relating the history of Maryland. Over the years a large number of archives belonging to religious groups or other private bodies have come to augment its collections.



### The New Hall of Records

The preservation of archives has a long tradition in Maryland. Indeed, the *Repository for Old Records* was built in the State capital of Annapolis as early as 1729, "for the benefit of posterity". Thereafter the institution was known under several different names and housed in several loca-

tions. In the early 1970's, a new building has become essential for dealing with the growing amounts of information to preserve, and the needs of the ever-growing number of users. The project of a brand-new Hall of Records to replace the old one built in 1935 became the major feature of the festivities celebrating the 350th anniversary of the State.

### Mobilex High Density Storage Systems

At the planning stage for the new building high density storage systems were envisaged as a way to maximize the storage capacity of the rooms designated for this purpose, reduce the total floor space of the building, and insure maximum quality storage.

Since September 1986, the new structure allows for a better use of the archives as a whole, and it will meet the new needs for space as they arise in the next decade.

# MONTEL The Solution: An Integrated System

To meet the challenge of a multitude of specific needs, Montel Inc. conceived an entire integrated system of storage equipment. 4 interrelated elements: the Mobilex high density mobile storage system, the QuadraVista shelving unit, the 62" X 16" QR shelf, and the flat drawer cabinets for maps, form a package that turned out to be the optimal solution for storing the collections of the Hall of Records.

### 1 Mobilex High-Density Mobile Storage and Filing Systems

The Mobilex high density mobile storage systems solve problems of space management. Mobilex doubles the storage capacity of any given space by eliminating aisle space. The 400 mobile shelves of the mechanical-assist Mobilex in the Hall of Records are configured in different manners depending on their use.

Width: 33, 39, 78"  
Length: 12, 19, 21, 24, 26, 31, 4'  
Height: 99, 104"

The Mobilex system in room 216 is equipped with perforated lateral panels in order to permit the use of halon fire suppression equipment.

### 2 QuadraVista Shelving

A 4-post type shelving unit, the shelves are not bolted but supported on all four corners, it meets the multiple needs of storage and archive management.

The profile of the structure has been designed to maximize the storage space and facilitate access to and protection of the materials stored.

### 3 QR 62" x 16" Shelves

One of the most definite specifications of the project planners concerned a shelf capable of holding the particular type of box used by the Maryland State Archives and at the same time eliminating any wasted space. Montel Inc. therefore conceived a 62" by 16" shelf that adapts perfectly to the QuadraVista shelving which can be adjusted at every inch and responds perfectly to the desired specifications.

### 4 Drawer Cabinets

A special edition of Montel's flat drawer cabinet for maps has been conceived for the Hall of Records. Manufactured in the specified dimensions (48"/60"/39"), each unit has 22 drawers used for the storage of large-size documents such as plans, maps, architectural drawings, etc. There are 2 types: mobile units integrated into the Mobilex systems and fixed units with counter tops for consultation.

In this undertaking, furnishing storage equipment that combines high quality and maximum capacity was the responsibility of Montel Inc. and its distributor, Brunswick National Inc. This involved more than 38,000 shelves (62" X 16"), high density Mobilex systems combining almost 400 mobile units and 100 fixed units (most of them longer than 21'), miles of rails, and 47 flat drawer cabinets for maps. But in order to fully appreciate the scope of the project and the size of the task...

let us discover the "Maryland Archives Hall of Records" floor by floor.

**Room 300**  
Newspaper collections  
County Records

Storage systems:  
Mechanical Mobilex with Quadra Vista shelving  
2 single fixed ranges (16"x21')  
4 single fixed ranges (16"x26')  
5 double fixed ranges (33"x21')  
10 double fixed ranges (33"x26')  
30 double mobile ranges (33"x21')  
60 double mobile ranges (33"x26')

Total amount of shelves: 8224

**Room 200**  
Original copies of state laws  
Records of counties and municipalities

Storage systems:  
Mechanical Mobilex with Quadra Vista shelving  
2 single fixed ranges (16"x21')  
4 single fixed ranges (16"x26')  
5 double fixed ranges (33"x21')  
10 double fixed ranges (33"x26')  
30 double mobile ranges (33"x21')  
60 double mobile ranges (33"x26')

Total amount of shelves: 8224

**Room 145**  
Records related to the colonial courts  
Documents of the American Revolution

Storage systems:  
Mechanical Mobilex with Quadra Vista shelving  
2 single fixed ranges (16"x21')  
4 single fixed ranges (16"x26')  
5 double fixed ranges (33"x21')  
10 double fixed ranges (33"x26')  
30 double mobile ranges (33"x21')  
60 double mobile ranges (33"x26')

Total amount of shelves: 10749

**Room 301**  
Storage for microfilm

Storage systems:  
Mechanical Mobilex with Quadra Vista shelving  
1 single fixed range (16"x24')  
5 double mobile ranges (33"x21')

Total amount of shelves: 352

**Room 303**  
Photography collections

Storage systems:  
Mechanical Mobilex with Quadra Vista shelving  
1 single fixed range (16"x19')  
5 double mobile ranges (33"x19')

Total amount of shelves: 352

**Room 201**  
Storage for microfilm

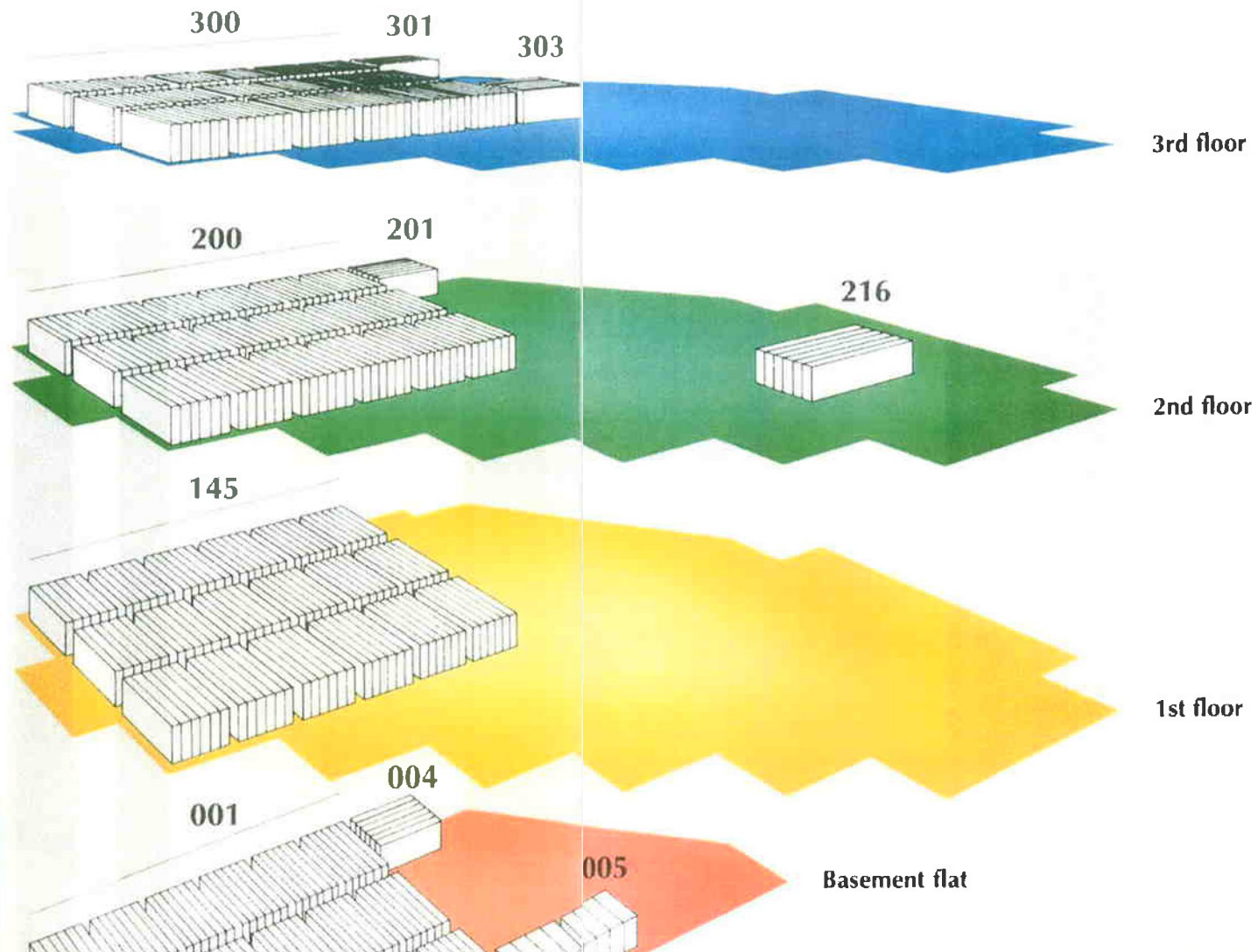
Storage systems:  
Mechanical Mobilex with Quadra Vista shelving  
1 single fixed range (16"x24')  
5 double mobile ranges (33"x21')

Total amount of shelves: 352

**Room 216**  
Storage of the most precious materials:  
old books, original manuscript copies  
of the Constitutions of the United States of  
America and the State of Maryland.

Storage systems:  
Mechanical Mobilex with Quadra Vista shelving  
2 single fixed ranges (16"x40')  
4 double mobile ranges (33"x43')

Total amount of shelves: 80  
2 fixed drawer cabinets with 22 drawers  
and laminated counter tops.



**Room 004**  
Storage of works of art,  
mainly paintings.

Storage systems:  
Mechanical Mobilex with Quadra Vista shelving  
1 single fixed range (16"x24')  
5 double mobile ranges (33"x21')

Total amount of shelves: 352

**Room 005**  
Storage of large size documents,  
maps, architectural drawings, flags, etc...

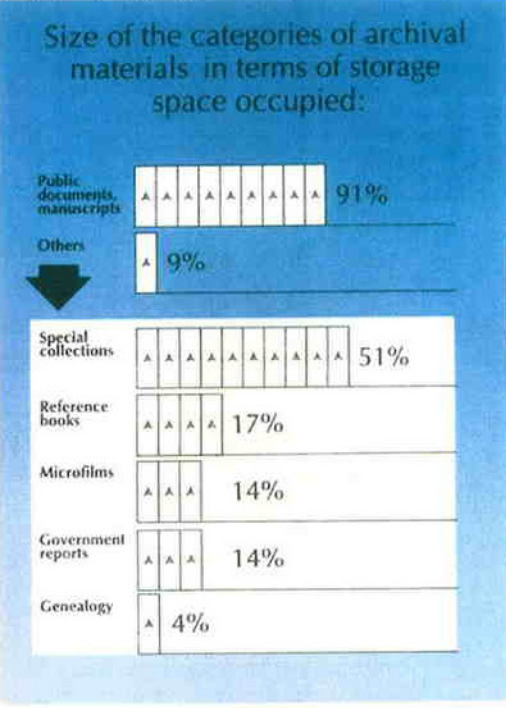
Storage systems:  
Mechanical Mobilex with Quadra Vista shelving,  
incorporating drawer cabinets with 22 drawers each  
1 single fixed range (39"x12')  
2 double mobile ranges (78"x12')  
6 double mobile ranges (78"x12')

Total amount of shelves: 1071  
Total amount of drawer cabinets: 27  
22 fixed drawer cabinets with 22 drawers each  
and laminated counter tops.

**Room 001**  
Records related to the district courts  
of the states, manuscripts, summaries,  
books, blueprints, films, etc. Contains a  
certain amount of empty ranges to provide  
for future storage needs.

Storage systems:  
Mechanical Mobilex with Quadra Vista shelving  
2 single fixed ranges (16"x21')  
4 single fixed ranges (16"x26')  
5 double fixed ranges (33"x21')  
10 double fixed ranges (33"x26')  
30 double mobile ranges (33"x21')  
60 double mobile ranges (33"x26')

Total amount of shelves: 8224



## Proposed Building Massing A

5 Floors Below Grade  
 Green Roof Memorial Park At Grade  
 Exhibit / Stairwell Above Grade  
 Administration/Museum/Conference  
 Above Grade

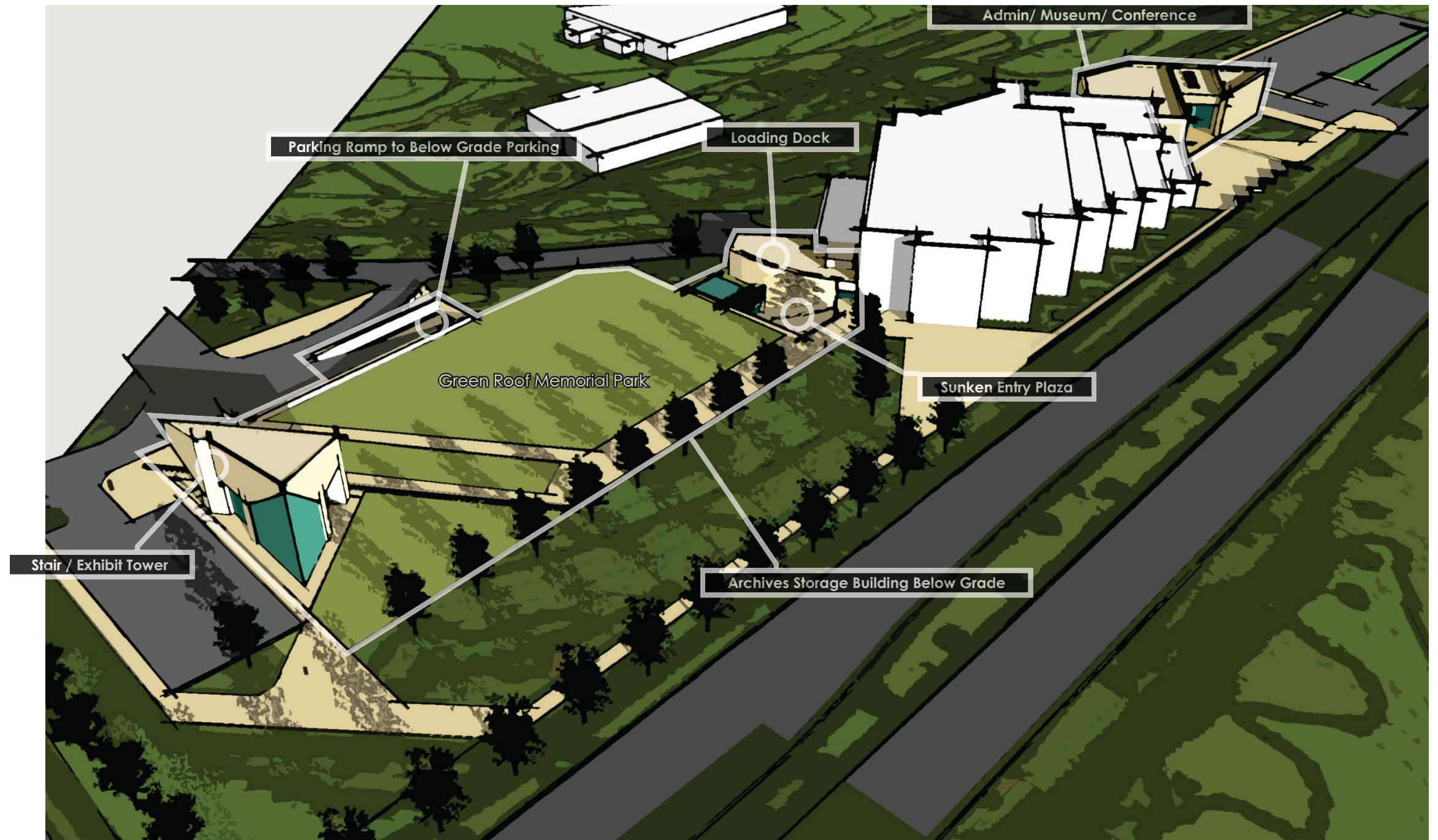
### Dimensions (approx.):

Height Above Grade: 0' or 45'  
 Depth Under Grade: 56'  
 Length: 390'  
 Depth: 155'

180,000 SF Below Grade  
 20,000 SF Above Grade  
 69 Parking Spaces Below Grade

### Guesstimated Cost Breakdown:

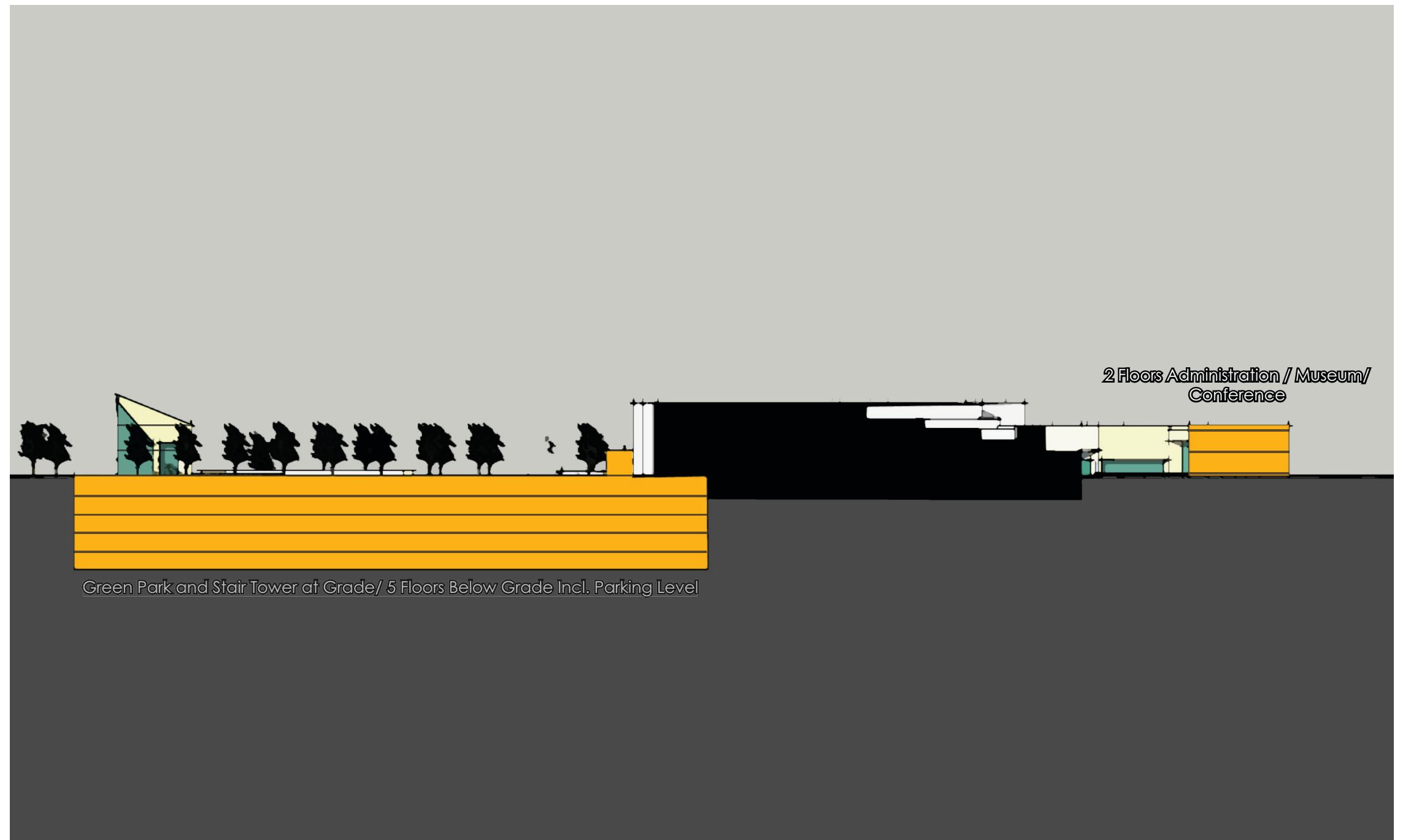
Parking Below Grade:	\$ 3,450,000
Dewatering:	\$ 500,000
20,000 Above Grade	\$ 5,000,000
180,000 Below Grade	\$54,000,000
Green Roof/Misc	\$ 500,000
Design Fees ( 10%)	\$ 6,345,000
TOTAL	\$69,795,000



Proposed Building Massing A:  
Site Plan



Proposed Building Massing A:  
Section



Cove Creek

### Proposed Building Massing B

4 Floors Below Grade  
Parking at Grade  
Administration/Museum/Conference  
Above Grade

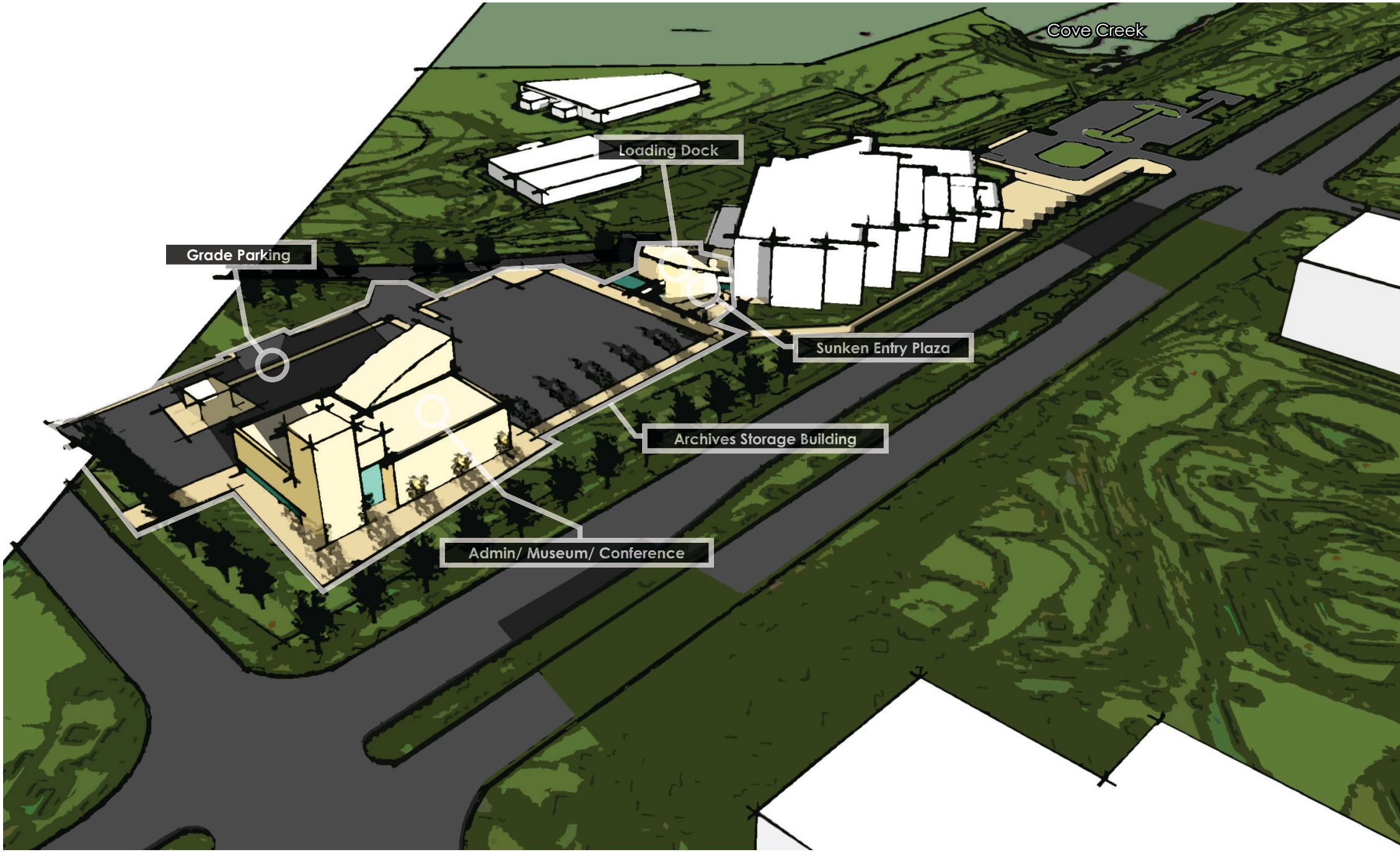
#### Dimensions (approx.):

Height Above Grade: 0' or 45'  
Depth Under Grade: 56'  
Length: 390'  
Depth: 155'

180,000 SF Below Grade  
20,000 SF Above Grade  
69 new At Grade parking spaces

#### Guesstimated Cost Breakdown:

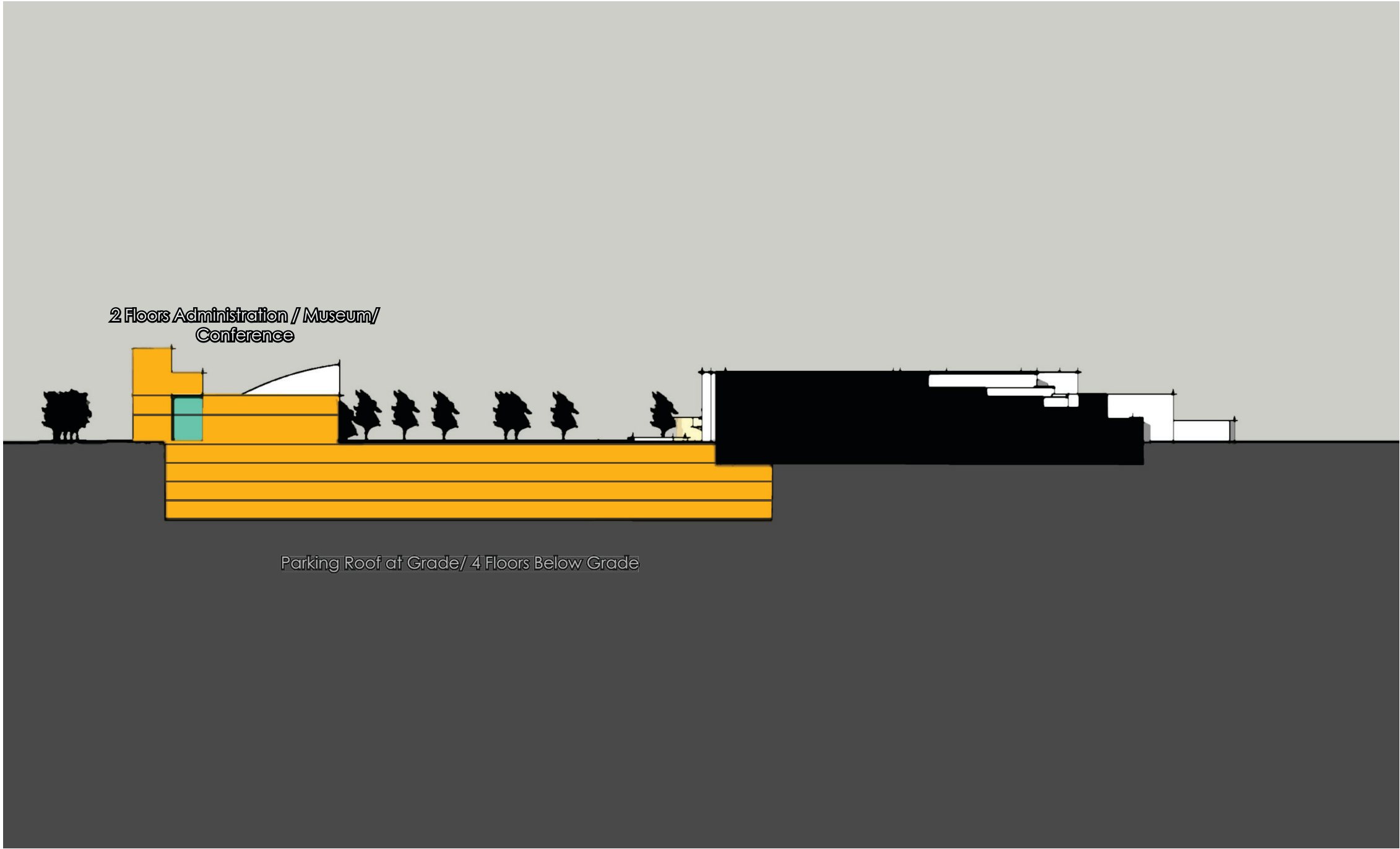
Dewatering:	\$ 500,000
20,000 Above Grade	\$ 5,000,000
180,000 Below Grade	\$54,000,000
At grade Parking/Misc	\$ 550,000
Design Fees ( 10%)	\$ 6,005,000
TOTAL	\$66,055,000



Proposed Building Massing B:  
Site Plan



Proposed Building Massing B:  
Section





### Proposed Building Massing C

3 Floors Above Grade  
1 Floor Below Grade  
69 Parking Spaces Below Grade

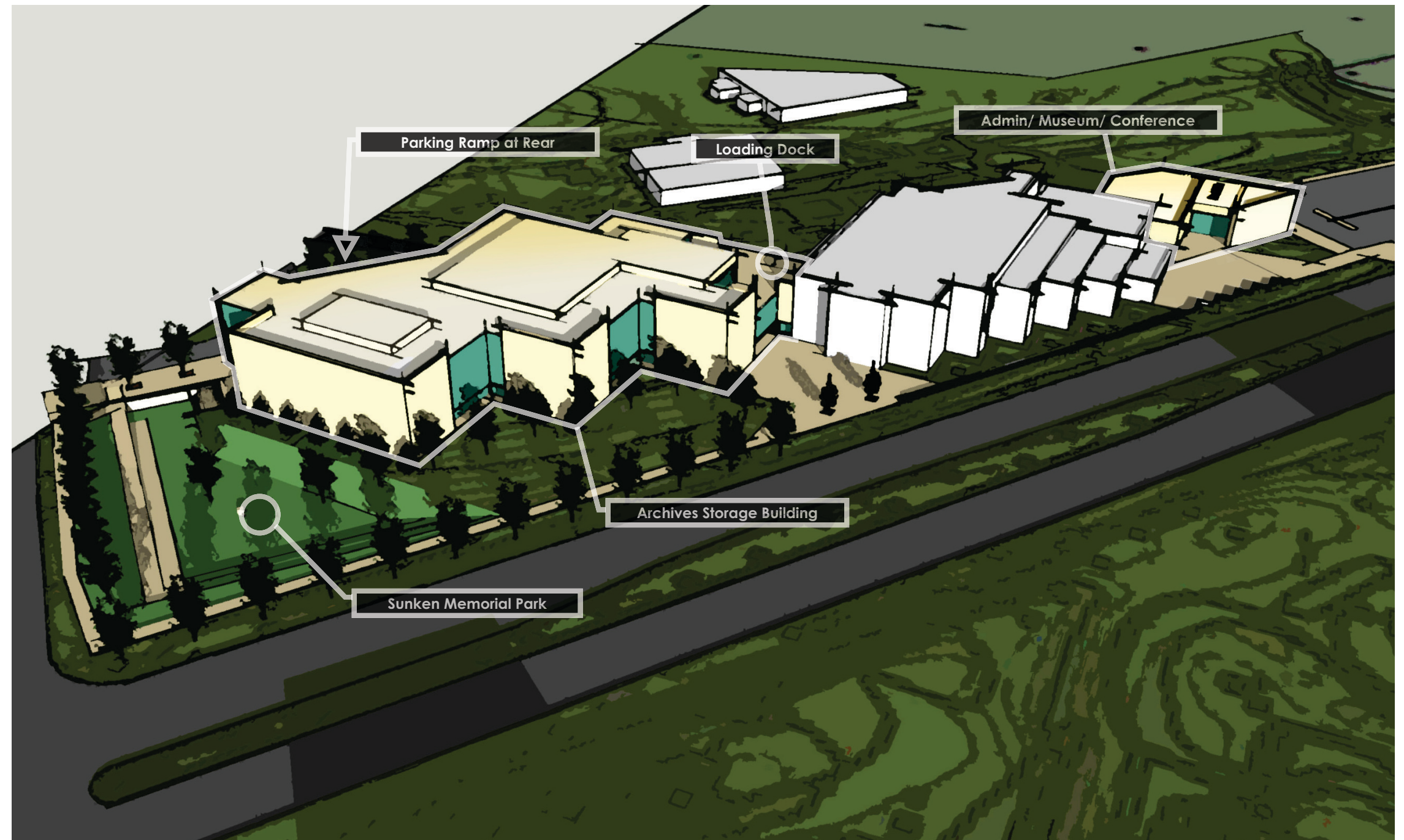
#### Dimensions (approx.):

Height Above Grade: 45'  
Depth Below Grade: 28'  
Length: 70'  
Depth: 280'

155,000 SF Above Grade  
45,000 SF Below Grade  
1 Parking Level Below Grade

#### Guesstimated Cost Breakdown:

Parking Below Grade:	\$ 3,450,000
Dewatering:	\$ 500,000
155,000 Above Grade	\$38,750,000
45,000 Below Grade	\$13,500,000
Sunken Garden/Misc	\$ 500,000
Design Fees ( 10%)	\$ 5,670,000
TOTAL	\$62,370,000



Proposed Building Massing C:  
Site Plan



Proposed Building Massing C:  
Section

