OFFICE OF PUBLIC RECORDS AND ARCHIVES

DISTRICT OF COLUMBIA DEPARTMENT OF GENERAL SERVICES





Contract No.: DCAM-15-AE-00091 PO No.: 522881

December 15, 2015

HARTMAN-COX ARCHITECTS WITH EYP/

OFFICE OF PUBLIC RECORDS AND ARCHIVES

DISTRICT OF COLUMBIA DEPARTMENT OF GENERAL SERVICES

PARTNERS & CONSULTANTS

DISTRICT OF COLUMBIA DEPARTMENT OF GENERAL SERVICES

1250 U Street Northwe	st
4th Floor	
Washington, DC 20009	
eff Bonvechio *	202.671.2397
Solomon Ikotun *	202.741.0422
Gbolohan Williams	202.689.4109

DISTRICT OF COLUMBIA REPRESENTATION

OFFICE OF THE SENIOR ADVISOR

Beverly Perry * 202.724.5392

OFFICE OF THE SECRETARY

Lauren Vaughan * 202.727.6306

OFFICE OF PUBLIC RECORDS AND ARCHIVES

Rebecca Katz ***** 202.671.1105

DC PUBLIC LIBRARY

Richard Reyes-Gavilan	202.727.1101
David Saulter	202.727.1101
Rauzia Ally *	202.727.4913
Kimberly Zablud *	202.727.1101

ARCHITECT HARTMAN-COX ARCHITECTS

1074 Thomas Jefferson Street, NW Washington, DC 20007 202.333.6446 Lee Becker, FAIA Scott Teixeira, AIA * Tonyel Stewart, AIA

ARCHIVAL FACILITIES ARCHITECTS EYP

1000 Potomac Street NW Washington, D.C. 20007 202.471.5000 Charles Enos, AIA * Sean Lyons, AIA * David Hofmann, AIA

CONSULTING ARCHIVIST

Michele Pacifico * Washington, DC 301.908.8720

COST CONSULTANT TCT COST

1090 Vermont Avenue NW Suite 230 Washington, DC 20005 202.315.8944 Martin Miller Nicholas Maiorana

STRUCTURAL ENGINEERING EYP

1000 Potomac Street NW Washington, D.C. 20007 202.471.5000 Frank Lancaster

MECHANICAL, ELECTRICAL, & PLUMBING ENGINEERING SETTY & ASSOCIATES INTERNATIONAL

5185 MacArthur Blvd. Suite 106 Washington, DC 20016 Raj Setty Scott Pegler Pankaj Hoogan Madhu Jalakam Davor Hrescak

FIRE PROTECTION & SECURITY JENSEN HUGHES

3610 Commerce Drive Suite 817 Baltimore, MD 21227 Brian Rhodes Chris Moran Donald Hopkins, Jr.

TELECOMMUNICATIONS & DATA INFRASTRUCTURE DESIGN EYP

1000 Potomac Street NW Washington, D.C. 20007 202.471.5000 James Boyle

LIGHTING DESIGN MCLA

1000 Potomac Street NW Suite 121 Washington, D.C. 20007 202.298.8062 Maureen Moran

ACOUSTICS & A/V INFRASTRUCTURE DESIGN MILLER, BEAM & PAGANELLI

12040 South Lakes Drive Suite 104 Reston, VA 20191 703.506.0005 Martin Beam John Paganelli

EXHIBIT DESIGN MFM DESIGN

4550 Montgomery Avenue Suite 325N Bethesda, MD 20814 240.477.1400 Richard Molinaroli David Fridberg

SUSTAINABLE DESIGN & LEED GREENSHAPE

5335 Wisconsin Avenue NW Suite 440 Washington, DC 20015 202.544.1400 Iris Amdur Jake Bebee

HAZARDOUS MATERIALS

ECS MidAtlantic 14026 Thunderbolt Place Suite 100 Chantilly,VA 20151 703.471.8400 Stephen Geraci

* Team representatives who attended the facility tour of the Ottawa City Archives. Special acknowledgement is given to:

CITY OF OTTAWA ARCHIVES

100 Tallwood Drive Nepean, ON K2G 4R7, Canada 613.580.2424 Paul J. Henry, CA City Archivist

Table of Contents

- 1 Executive Summary \17
 - **1.1 Purpose** \ 17
 - **1.2 Project Overview & Goals** \ 17
 - **1.3 Findings** \ 18
- 2 Background \23
- 3 Evaluation of Current Holdings \27
 - **3.1 Documentation of Naylor Court Holdings** \ 27
 - 3.2 Documentation of Off-Site Storage Holdings \ 28
 - 3.3 Documentation of Off-Site Records Held by Agencies \ 28
 - **3.4 Calculation of Storage Capacity** \ 30
- 4 Records Storage Options \ 35
 - 4.1 General Requirements \ 35
 - 4.2 Shelving Density Analysis \ 36
 - **4.3 Building Size Implications** \ 37
 - **4.4 Cost Implications** \ 39
 - 4.5 Assessment & Comparison \ 39
- 5 Program Summary \43
 - 5.1 Tabular Program \ 43
 - 5.2 Graphic Program \ 50
- 6 Detailed Space Requirements \ 53
 - **6.1 Reception** \ 53
 - 6.2 Research Center \ 71
 - 6.3 Records Storage \ 91
 - **6.4 Records Receiving** \ 107
 - 6.5 Staff Work Areas \ 127
 - 6.6 DC Public Library Operations Center \ 159

- 7 Design Narrative \161
 - 7.1 Sustainability \ 161
 - **7.2 Landscape** \ 161
 - **7.3 Site** \ 161
 - 7.4 Structural \ 163
 - 7.5 Exterior Closure \ 166
 - 7.6 Interior Construction \ 167
 - 7.7 Materials & Finishes \ 168
 - 7.8 Equipment & Furnishings \ 171
 - 7.9 Conveying Systems \ 172
 - 7.10 Plumbing Systems \ 172
 - 7.11 Heating, Ventilating, & Air Conditioning (HVAC) \ 175
 - 7.12 Fire Protection \ 189
 - **7.13 Electrical** \ 191
 - **7.14 Lighting** \ 193
 - **7.15 Security** \ 195
- 8 Co-Location Opportunities \ 205
 - **8.1 Background** \ 205
 - 8.2 Co-Location Opportunities for Archives and Library \ 205
 - 8.3 Assessment Criteria \ 206
 - 8.4 Evaluation of Co-Location Opportunities \ 207
 - 8.5 Recommendations \ 208
- 9 Preliminary Site Evaluation \211
 - 9.1 General Requirements \ 211
 - 9.2 Overview of Sites \ 212
 - 9.3 Preliminary Evaluation Criteria \ 213
 - 9.4 Site Analysis: Thurgood Marshall Elementary School \ 214
 - 9.5 Site Analysis: Fletcher Johnson Middle School \ 216
 - 9.6 Site Analysis: The Penn Center \ 218
 - 9.7 Site Comparison \ 220
 - 9.8 Preliminary Site Evaluation \ 220

10 - Cost & Budget \ 221

10.1 - Estimated Construction Costs \ 221

10.2 - Cost Management Options \ 222

11 - Recommendations & Next Steps \ 223

11.1 - Recommendations \ 223

11.2 - Next Steps \ 224

Appendices \ 231

Appendix A - Glossary of Terms \ 233

Appendix B - Prohibited Materials \ 237

Appendix C - NEH Preservation Assessment \ 239

Appendix D - Hunter Vision Report \ 263

Appendix E - DC/OPR – Estimates of Records, August 3, 2015 \ 301

Appendix F - Naylor Court Documentation \ 309

Appendix G - DC/OPR Project – Programming, Inventories, and Future Planning \317

Appendix H - Full Records Tabulation \ 325

Appendix I - Typical Shelving Configurations \ 329

Appendix J - Expanded Option Descriptions & Cost Estimates \ 343

List of Tables & Figures

- 1 Executive Summary \17 Table 1.1 - OPR's Archives and Records Center Storage Requirements \18
- 2 Background \23
- 3 Evaluation of Current Holdings \27

Table 3.1 - Volume of Naylor Court Holdings \ 28
Table 3.2 - Summary of Records Held at NARA Facilities \ 28
Table 3.3 - Summary of Surveyed Records Held by Various DC Agencies \ 29
Table 3.4 - Summary of Non-Surveyed Records Held by Various DC Agencies \ 29
Table 3.5 - Aggregation of Current Holdings \ 30
Table 3.6 - Estimated Transfer of Permanent Holdings \ 31
Table 3.7 - Estimated Purge of Temporary Holdings \ 32
Table 3.8 - Estimated Holdings for Move & Space Planning – DC Archives \ 32
Table 3.9 - Estimated Holdings for Move & Space Planning – DC Records Center \ 33
Table 3.10 - Growth Allowance for Space Planning – DC Archives & Records Center \ 33

4 - Records Storage Options \ 35

Table 4.1 - Comparison Between Shelving Types \37 Table 4.2 - Stand-Alone Building Options (New & Renovation) \38 Table 4.3 - Construction Cost, Options 1 through 4 \39 Figure 4.1 - Evaluation of Stand-Alone OPR Facility Options \40

5 - Program Summary \43

Table 5.1 - New Stand-Alone Archives Building Space Requirements \43 Table 5.2 - Tabular Program - Reception Area \44 Table 5.3 - Tabular Program - Research Center \45 Table 5.4 - Tabular Program - Archives & Records Center Storage \46 Table 5.5 - Tabular Program - Records Receiving \47 Table 5.6 - Tabular Program - Staff Work Areas \48 Table 5.7 - Tabular Program - DC Public Library Operations Center \49 Figure 5.1 - Graphic Program (1" = 50'-0") \51 6 - Detailed Space Requirements \ 53

```
Figure 6.1 - Reception Program and Key Adjacencies (1" = 40'-0") \setminus 53
Figure 6.2 - Lobby Space Examples \ 54
Figure 6.3 - Lobby Space Layout (1/8" = 1'-0") \setminus 55
Figure 6.4 - Patron Lounge Space Example \ 56
Figure 6.5 - Patron Lounge Space Layout (1/8" = 1'-0") \setminus 57
Figure 6.6 - Lobby Exhibit Space Example \ 58
Figure 6.7 - Lobby Exhibit Space Layout (1/8" = 1'-0") \setminus 59
Figure 6.8 - Exhibit Gallery Space Example \ 60
Figure 6.9 - Exhibit Gallery Space Layout (1/16" = 1'-0") \setminus 61
Figure 6.10 - Event Support Space Examples \ 62
Figure 6.11 - Event Support Space Layout (1/8" = 1'-0") \setminus 63
Figure 6.12 - Vending Space Example \ 64
Figure 6.13 - Vending Space Layout (1/8" = 1'-0") \ 65
Figure 6.14 - Security Space Example \ 66
Figure 6.15 - Security Space Layout (1/8" = 1'-0") \setminus 67
Figure 6.16 - Multi-Use/Meeting Space Example \ 68
Figure 6.17 - Multi-Use/Meeting Space Layout (1/16" = 1'-0") \setminus 69
Figure 6.18 - Research Center Program and Adjacencies (1" = 40'-0") \setminus 71
Figure 6.19 - Registration/Consultation Space Examples \ 72
Figure 6.20 - Registration/Consultation Space Layout (1/8" = 1'-0") \setminus 73
Figure 6.21 - Research Room Space Examples \ 74
Figure 6.22 - Research Room Space Layout (1/16" = 1'-0") \setminus 75
Figure 6.23 - Central Desk Space Examples \ 76
Figure 6.24 - Central Desk Space Layout (1/8" = 1'-0") \setminus 77
Figure 6.25 - Reference Library Space Example \ 78
Figure 6.26 - Reference Library Space Layout (1/8" = 1' - 0") \setminus 79
Figure 6.27 - Computers Space Example \ 80
Figure 6.28 - Computers Space Layout (1/8" = 1'-0") \setminus 81
Figure 6.29 - Microfilm Research/AV Research Space Example \82
Figure 6.30 - Microfilm Research/AV Research Space Layout (1/8" = 1' - 0") \setminus 83
Figure 6.31 - Scanners & Photocopiers Space Example \ 84
```

Figure 6.32 - Scanners & Photocopiers Space Layout $(1/8" = 1'-0") \setminus 85$ Figure 6.33 - Holding Area Space Example \ 86 Figure 6.34 - Holding Area Space Layout $(1/8" = 1'-0") \setminus 87$ Figure 6.35 - Coin-Operated Lockers Space Example \88 Figure 6.36 - Coin-Operated Lockers Space Layout $(1/8" = 1'-0") \setminus 89$ Figure 6.37 - Textual Storage Space Examples \ 92 Figure 6.38 - Textual Storage Two-Bay Space Layout $(1/16" = 1'-0") \setminus 93$ Figure 6.39 - Cool Storage Space Examples \ 94 Figure 6.40 - Cool Storage Two-Bay Space Layout $(1/16" = 1'-0") \setminus 95$ Figure 6.41 - Cold Storage Space Examples \ 96 Figure 6.42 - Cold Storage Two-Bay Space Layout (1/16" = 1'-0") \ 97 Figure 6.43 - Digital Archives Storage Room Space Example \ 98 Figure 6.44 - Digital Archives Storage Room Two-Bay Space Layout (1/16" = 1'-0") \ 99 Figure 6.45 - Art/Artifacts Space Examples \ 100 Figure 6.46 - Art/Artifacts Two-Bay Space Layout (1/16" = 1'-0") \ 101 Figure 6.47 - Library of Government Space Examples \ 102 Figure 6.48 - Library of Government Two-Bay Space Layout (1/16" = 1'-0") \ 103 Figure 6.49 - Ladder and Lift Storage Space Example \ 104 Figure 6.50 - Ladder and Lift Storage Space Layout (1/8" = 1'-0") \ 105 Figure 6.51 - Records Receiving Program and Adjacencies $(1" = 40'-0") \setminus 107$ Figure 6.52 - Records Dock Space Examples \ 108 Figure 6.53 - Records Dock Space Layout $(1/8" = 1'-0") \setminus 109$ Figure 6.54 - Service Dock Space Example \ 110 Figure 6.55 - Service Dock Space Layout $(1/8" = 1'-0") \setminus 111$ Figure 6.56 - Trash/Recycling Room Space Example \112 Figure 6.57 - Trash/Recycling Room Space Layout (1/8" = 1'-0") \ 113 Figure 6.58 - Building Supply Storage Space Example \ 114 Figure 6.59 - Building Supply Storage Space Layout (1/8" = 1'-0") \ 115 Figure 6.60 - Covered Loading Dock(s) Space Example \ 116 Figure 6.61 - Covered Loading Dock(s) Space Layout (1/8" = 1'-0") \ 117 Figure 6.62 - Typical Freight Elevator \ 118 Figure 6.63 - Typical Freight Elevator $(1/8" = 1'-0") \setminus 119$

```
Figure 6.64 - Secure Receiving Room Space Example \ 120
Figure 6.65 - Secure Receiving Room Space Layout (1/8" = 1'-0") \setminus 121
Figure 6.66 - Quarantine Room Space Example \ 122
Figure 6.67 - Quarantine Room Space Layout (1/8" = 1' - 0") \setminus 123
Figure 6.68 - Toilets Space Example \ 124
Figure 6.69 - Toilets Space Layout (1/8" = 1'-0") \ 125
Figure 6.70 - Staff Work Areas Program and Adjacencies (1" = 40'-0") \ 127
Figure 6.71 - Processing Room(s) Space Example \ 128
Figure 6.72 - Processing Room(s) Space Layout (1/16" = 1'-0") \setminus 129
Figure 6.73 - Archival Supply Storage Space Example \ 130
Figure 6.74 - Archival Supply Storage Space Layout (1/8" = 1'-0") \ 131
Figure 6.75 - Imaging Lab Space Example \ 132
Figure 6.76 - Imaging Lab Space Layout (1/8" = 1'-0") \ 133
Figure 6.77 - Conservation/Preservation Lab Space Example \ 134
Figure 6.78 - Conservation/Preservation Lab Space Layout (1/16" = 1'-0") \setminus 135
Figure 6.79 - Electronic Records Processing Space Example \ 136
Figure 6.80 - Electronic Records Processing Space Layout (1/8" = 1'-0") \ 137
Figure 6.81 - Exhibit Prep Shop Space Example \ 138
Figure 6.82 - Exhibit Prep Shop Space Layout (1/16" = 1'-0") \setminus 139
Figure 6.83 - Exhibit Staging Area Space Examples \ 140
Figure 6.84 - Exhibit Staging Area Space Layout (1/8" = 1'-0") \ 141
Figure 6.85 - Director's Office Space Example \ 142
Figure 6.86 - Director's Office Space Layout (1/8" = 1'-0") \setminus 143
Figure 6.87 - Archivist Offices Space Example \ 144
Figure 6.88 - Archivist Offices Space Layout (1/8" = 1'-0") \ 145
Figure 6.89 - Workstations Space Example \ 146
Figure 6.90 - Workstations Space Layout (1/8" = 1'-0") \setminus 147
Figure 6.91 - Quiet Room Space Example \ 148
Figure 6.92 - Quiet Room Space Layout (1/8" = 1'-0") \ 149
Figure 6.93 - Multi-Use Room Large Space Example \ 150
Figure 6.94 - Multi-Use Room Large Space Layout (1/8" = 1'-0") \setminus 151
Figure 6.95 - Project Room Space Example \ 152
```

Figure 6.96 - Project Room Space Layout $(1/8" = 1'-0") \setminus 153$ Figure 6.97 - Staff Lounge Space Example $\setminus 154$ Figure 6.98 - Staff Lounge Space Layout $(1/8" = 1'-0") \setminus 155$ Figure 6.99 - Office Supplies Space Example $\setminus 156$ Figure 6.100 - Office Supplies Space Layout $(1/8" = 1'-0") \setminus 157$ Figure 6.101 - DC Public Library Operations Center Program $(1" = 40'-0") \setminus 159$ Figure 6.102 - Possible Space Needs, DCPL Operations Center $\setminus 159$

7 - Design Narrative \ 161

Figure 7.1 - Sample Exterior Closures Satisfying Thermal, Moisture, and Durability Requirements \167

Figure 7.2 - Materials and Finishes for Records Storage Areas \ 170

Figure 7.3 - Compact Mobile Shelving (15-high) \ 171

Figure 7.4 - Typical Archival Plumbing System \ 173

Figure 7.5 - Primary Elements of Preservation Environment HVAC System, Figure 6 (Lull 1990)- ASHRAE HVAC Applications \177

Figure 7.6 - Sample Archival Cooling and Heating Systems \ 178

Figure 7.7 - Packaged Desiccant Dehumidification Unit (Setty 2006) \ 179

Figure 7.8 - Sample Emergency/Standby Generator \ 192

Figure 7.9 - Sample Lighting Controls System \ 195

Figure 7.10 - Sample Electronic Lockset and Logic Digital Key \ 202

8 - Co-Location Opportunities \ 205

Figure 8.1 - Evaluation of Co-Location Strategies \ 207

- 9 Preliminary Site Evaluation \211
 - Figure 9.1 Thurgood Marshall Elementary School Site Plan (1" = 250'-0") \ 214
 - Figure 9.2 Thurgood Marshall Elementary School Site Context (1" = 1,250'-0") \ 214

Figure 9.3 - Thurgood Marshall Elementary School Distance to

Metro (1" = 10,000'-0") \ 214

Figure 9.4 - Thurgood Marshall Elementary School Exterior \ 215

Figure 9.5 - Fletcher Johnson Middle School Site Plan (1" = 250'-0") \ 216

- Figure 9.6 Fletcher Johnson Middle School Site Context (1" = 1,250'-0") \ 216
- Figure 9.7 Fletcher Johnson Middle School Distance to Metro (1" = 5,000'-0") \ 216

Figure 9.8 - Fletcher Johnson Middle School Exterior \ 217

Figure 9.9 - The Penn Center Site Plan (1" = 250'-0") \ 218 Figure 9.10 - The Penn Center Site Context (1" = 1,250'-0") \ 218 Figure 9.11 - The Penn Center Distance to Metro (1" = 5,000'-0") \ 218 Figure 9.12 - The Penn Center Exterior \ 219 Figure 9.13 - Preliminary Comparison of DGS-Provided Sites \ 220

10 - Cost & Budget \ 221

Table 10.1 - Estimated Project Costs \ 221

11 - Recommendations & Next Steps \ 223

Appendices \ 231

Appendix A - Glossary of Terms \233

Appendix B - Prohibited Materials \ 237

Appendix C - NEH Preservation Assessment \ 239

Appendix D - Hunter Vision Report \ 263

Appendix E - DC/OPR – Estimates of Records, August 3, 2015 \ 301

Appendix F - Naylor Court Documentation \ 309 Figure F.1 - Naylor Court Level 1 (1/16" = 1'-0") \ 311 Figure F.2 - Naylor Court Level 2 (1/16" = 1'-0") \ 313 Figure F.3 - Naylor Court Level 3 (1/16" = 1'-0") \ 315

Appendix G - DC/OPR Project - Programming, Inventories, and Future $Planning \setminus 317$

Appendix H - Full Records Tabulation \ 325 Table H.1 - Complete Assessment of OPR Permanent and Temporary Holdings \ 327

Appendix I - Typical Shelving Configurations \ 329 Figure I.1 - Fixed Shelving / Low Density (7 Shelves High) Typical Shelving Configuration $(3/64" = 1'-0") \setminus 331$

Figure I.2 - Compact Mobile Shelving / Low Density (7 Shelves High) Typical Shelving Configuration $(3/64" = 1' \cdot 0")$ \ 333

Figure I.3 - Fixed Shelving / Medium Density (15 Shelves High) Typical Shelving **Configuration (3/64" = 1'-0")** \ 335

Figure I.4 - Compact Mobile Shelving / Medium Density (15 Shelves High) Typical Shelving Configuration $(3/64" = 1'-0") \setminus 337$

Figure I.5 - Fixed Shelving / High Density (25 Shelves High) Typical Shelving Configuration $(3/64" = 1'-0") \setminus 339$

Figure I.6 - Compact Mobile Shelving / High Density (25 Shelves High) Typical Shelving Configuration $(3/64" = 1'-0") \setminus 341$

Appendix J - Expanded Option Descriptions & Cost Estimates \343 Table J.1 - Complete Overview of Building Size Options & Co-Location Options \345 Table J.2 - Complete Cost Implications of Building Size Options & Co-Location Options \347

1 EXECUTIVE SUMMARY

1.1 Purpose

Architectural programming is a process for uncovering and prioritizing the underlying goals of a design project. Managing the myriad of interests is crucial in creating consensus among user groups and communicating critical decisions and project priorities. The clarity presented in a complete and robust program allows subsequent design phases to proceed more efficiently, saving time and money for the client. The conclusion of the programming process is a clear road map for the design team to follow as the project design is developed.

1.2 Project Overview & Goals

The Office of Public Records (OPR) is a division under the District of Columbia's Office of the Secretary. OPR currently operates an Archives and Records Center facility at Naylor Court. This facility is supplemented by other city and Federal facilities to store public records. The Naylor Court facility has reached its storage capacity and its physical and mechanical deficiencies make it inadequate for the long-term preservation of the city's archival records.

In June 2015, the Department of General Services (DGS) hired Hartman Cox Architects and EYP Architects (HC/EYP) to develop a program of requirements for a new OPR facility and its Archives and Records Center operations. Key project goals include:

- Create a state-of-the-art archival facility.
- Provide mission-critical services to all DC agencies including records management, education, and resource sharing.
- Optimize facility and space for centralized records storage, offices, services, and public access.
- Maintain a cost-effective, secure, environmentally controlled central storage facility.
- Optimize temperature and humidity performance and control; eliminate air-infiltration issues.
- Achieve LEED Gold Certification.

To achieve these goals, HC/EYP facilitated the programming process with DGS and OPR and:

- Reviewed all available background information.
- Evaluated the City's current holdings and estimated records volumes where necessary.
- Explored different storage systems and density options to establish the required amount of records storage space.
- Developed a comprehensive space program capturing
 - Quantitative and qualitative functional requirements.
 - A detailed and multidisciplinary review of relevant technical considerations.
- Analyzed the feasibility of various co-location scenarios for sharing services between the DC Archives and the DC Public Library (DCPL).
- Conducted a preliminary evaluation of potential sites to determine their suitability for further study.
- Prepared cost estimates to assist the City's leadership with the budgeting and decision-making process.

1.3 Findings

Chapter 2, Background

The need for a new DC Archives is well established and has been the subject of prior studies, including a Preservation Needs Assessment prepared by Lyrasis Digital and Preservation Services in 2012 and a visioning report produced by Dr. Gregory S. Hunter in 2014. Rather than seeking to revalidate these prior assessments or to further justify the need for a new facility, this report focuses solely on the task of defining the design requirements for the new facility.

Chapter 3, Evaluation Of Current Holdings

The Archives of the District of Columbia holds a variety of materials, including textual records, architectural drawings, maps, photographs, posters, recordings, films, microfilms, and artifacts. DC's archival records date from the 1700's and document the history of the city and its government and citizens. Included are Wills and Probate records; slave registers; land records; birth, marriage, and death certificates; Board of Commission records; Mayor and City Council records; maps and surveys of the city; and photographs and films of historical city events. The programming report estimates that OPR's Archives and Records Center requires total storage for just over 500,000 cubic feet of records, with Figure 1.1 providing the breakdown of Archives storage and Records Center storage.

	ESTIMATED
SUMMARY OF DC/OPR SPATIAL NEEDS	RECORDS
FOR RECORDS STORAGE	VOLUME*
ARCHIVES STORAGE	185,309
RECORDS CENTER STORAGE	321,424
TOTAL REQUIRMENTS	506,733

*Measured in cubic feet (CF) of records

Chapter 4, Records Storage Options

Selection of a records storage option must balance protection of the collections and researcher access. To achieve this balance, careful planning of the shelving and accompanying storage equipment, including cases, cabinets, racks, and other furniture is required to maximize the long-term investment of the archival facility. Selecting a shelving system or combination of systems depends on a number of factors, including the size and quantity of the collections, buildings' size and structure, budget, operations, and technical considerations. An analysis of shelving densities in conjunction with the proposed building program yielded several building size options for a new or renovated stand-alone OPR facility:

- 1: New stand-alone OPR facility with 15 shelves high compact shelving.
- 2: Retrofit OPR into an existing building with 7 shelves high fixed shelving.
- 3: New stand-alone OPR facility with 25 shelves high fixed shelving.
- 4: New stand-alone OPR facility with 25 shelves high compact shelving.

In consideration of operational preferences expressed by OPR, HC/EYP recommends Option 1 that specifies medium height compact mobile systems for the facility's archival storage needs. Depending on budget and site constraints, higher density systems may be explored during the design phases for the Records Center component of the project.

Chapter 5, Program Summary

The major program spaces required for the new stand-alone Archives building include Reception, Research, Archival Storage, Records Center Storage, Records Receiving, Staff Work Areas, and the recommended co-location of the proposed DCPL Operations Center. Square footages have been presented based on best practices, knowledge of similar archival facilities, and review of peer institutions, including the City of Ottawa Archives Building and the Georgia State Archives Building. The programming report expands on the composition, function, and characteristics of these spaces and recommends a total of **135,665 gross square feet** of space for OPR's facility.

Chapter 6, Detailed Space Requirements

In addition to the facility's <u>quantitative</u> requirements, thoughtful consideration of the <u>qualitative</u> characteristics of the spaces is necessary for a complete program of requirements. The detailed space requirements present the special requirements for acoustics; lighting; power; furniture and equipment needs; essential and desirable adjacencies; and work flow. Prototypical floor plans and precedent examples of each space are provided to illustrate the character of each space.

Chapter 7, Design Narrative

The design narrative details the technical criteria for the design of an Archives and Records Center for DC, and is based on the archival facility standards and guidelines published by the National Archives and Records Administration (NARA) and the Society of American Archivists (SAA) in combination with best industry practices and the past experiences of the AE team. Criteria are given for the major design disciplines: Sustainability; Landscape; Site; Structure; Exterior Closure (thermal and moisture envelope); Interior Construction; Materials & Finishes; Equipment & Furnishings; Conveying Systems; Plumbing Systems; HVAC Systems; Fire Protection; Electrical; Lighting; and Security.

Chapter 8, Co-Location Opportunities

Concurrent to the development of this program, the DC Public Library (DCPL) had embarked on planning a renovation of the Martin Luther King Library (MLK) at 901 G Street, NW. At the request of the Mayor's Office, the MLK Library and DC Archives teams conducted a joint study in August 2015 to review opportunities for mutually supportive operations and co-location for MLK and OPR.

The OPR/MLK study concluded that OPR is best served by a permanent, purpose-built facility optimized for the functional requirements and best practices for archives and records center storage. The DC Archives and Library co-location options within the MLK Library building are <u>not</u> recommended, primarily due to space constraints, structural limitations, operational duplication and ineffectiveness, building system inefficiencies, and increased costs.

Benefits of a stand-alone facility include:

- Ability to house all the collections of the city in appropriate and environmentally sound storage spaces.
- Ability to carry out conservation, processing, and digital operations to preserve and access the city's records.
- Significant expanded services to city agencies in records management and records storage services.
- Reduced costs to store city records.
- Significantly expanded archival services and programs to the community.
- Optimization of functional requirements, first costs, and value to the city.

Co-locating the DCPL Library Operations Center with the new DC Archives building is recommended, has tangible benefits to both agencies, and should be further explored. Benefits of Co-Location of a new OPR facility and the DCPL Operations Center include:

- Because OPR and the Library Operations center will form one building project, rather than two separate projects, it is reasonable to expect considerable savings in site development, site servicing, and project administration costs.
- This option allows for synergy between some of the supportive services of OPR and DCPL: shared meeting spaces, and shared and reduced building operations and maintenance functions.
- Reduction in spatial requirements for operations and maintenance within DCPL's facilities.
- Location of the OPR facility and the DCPL Operations Center outside the downtown core, adjacent to major routes, will allow for more streamlined library distribution services that will accommodate increases in volume without significant increases in cost.

Chapter 9, Preliminary Site Evaluation

In October 2015, the Department of General Services (DGS) identified three potential sites for the new OPR Archives and Records Center Building and asked the AE team to prescreen the sites to determine suitability for further study. The three potential sites are the following DC Government owned properties, each previously supporting DC Public Schools:

- Thurgood Marshall Elementary School located at 3100 Fort Lincoln Drive NE, Washington, DC 20018
- Fletcher Johnson Middle School located at 4650 Benning Rd SE, Washington, DC 20019
- The Penn Center located at 1709 3rd St NE, Washington, DC 20002

The preliminary site evaluation analyzes these sites in regards to public transportation access, vehicular access, community access, facility conditions, zoning constraints, flood and other hazards, and site development issues. The evaluation concludes that none of the sites are ideal but that the Penn Center site is the least disadvantageous of the three. The site has favorable site access and connection to the central core of the city but also close proximity to a known hazard: a major rail corridor that will generate added pollution and have the risk of a potential rail accident.

Chapter 10, Cost & Budget

A preliminary construction cost estimate is presented for the DGS's and the Secretary's preferred option, utilizing historic cost data, benchmarks, escalation, and design contingency. The shelving systems were priced using feedback from shelving manufacturers. DGS advises a 20% factor as an allowance for soft costs such as FF&E and design fees. No site development costs were included, as a site selection remains undetermined. The intent of the estimate is to provide the District with rough cost data to make the necessary project scope decisions and to formulate the project budget.

The preliminary construction costs are comprised of the following:

•	OPR Building Costs (Option 1):	\$40,402,023.00
•	DCPL Operations Center Costs (Option C):	\$7,080,621.00
•	Compact Shelving (Medium Density) Costs	\$14,845,882.00
•	Other Project Costs (Soft Costs)	<u>\$12,465,705.00</u>
•	The preliminary project cost estimate is	\$74,794,232.00

Cost reduction strategies are identified to give some flexibility in the scope and cost of the project; however, these cost savings concepts have an impact on OPR's operations and provisions for future growth. Care should be given to deciding which strategies to pursue, if any.

Chapter 11, Recommendations And Next Steps

We recommend that the new DC Archives project should move forward based upon the following conclusions:

- <u>Storage System</u> Select medium density compact mobile shelving systems at 15 shelves high.
- <u>Building Size</u> OPR requires approximately **135,665 gross square feet (GSF)**.
- <u>Co-Location</u> Co-locate the DCPL Operations Center with the new OPR facility at an approximately 18% cost increase. Do <u>not</u> co-locate any of the Archives functions at MLK library to minimize initial and recurring costs.
- <u>Adaptive Reuse of Existing Buildings</u> Only the non-storage spaces are suitable for accommodation in a renovated existing building. Archival storage spaces must be accommodated in purpose-built new construction.
- <u>Site</u> Of the sites studied, only the Penn Center site is deserving of further study. The City should work to identify other potential sites that might be more suitable.
- <u>Budget</u> The rough order of magnitude cost for the building and the storage shelving, in round numbers, is **\$62,350,000**. We recommend **\$75,000,000** of funding commitment to cover the full cost of the project.

A series of important next steps are necessary for the successful implementation of the project. These include:

- <u>Records Survey and Appraisal Estimates</u> Further survey work and appraisal by a qualified archival appraising firm or by trained records management personnel is needed to finalize the design of the storage spaces and shelving systems. The City needs to allocate temporary resources to OPR to undertake this process.
- <u>Move Planning</u> Peer institutions required 2–3 years for the move planning process; the City should engage a move consultant as soon as possible.
- <u>Co-Location Determination</u> The City needs to weigh the conclusions and recommendations offered by the DC Archives project team and the MLK project team and decide whether the DC Archives functions will be housed at MLK Library or at the new OPR Facility.
- <u>Site Selection</u> The City needs to establish the site. We recommend engaging the AE team to assist with identification of other candidate sites and to determine the necessary scope for a detailed conditions assessment, feasibility study, and test fit for the existing building, or buildings, being considered.
- <u>Budget Determination</u> A firm "design-to" budget for the project should be established and clearly differentiate between the portion of the budget that is allocated to cover the cost of the construction contract, the "construction cost", and the portion of the budget that is intended to cover other project costs. If the project is to be undertaken with a smaller budget that recommended in this report, the City needs to identify which of the cost reduction strategies they want to implement.
- <u>Programming & Design</u> A follow-on programming phase will reconcile this program of requirements with the outcomes of the above actions so that design may begin. Coordination with other agencies such as the DC Office of the Chief Technology Officer will be required to finalize some program criteria.

2 BACKGROUND

The District of Columbia's Office of Public Records (OPR) was established in the Office of the Secretary on February 11, 1986, by Mayor's Order 86-28 to collect and preserve the history of the District government. By law:

The Office of Public Records is mandated by DC Law 6-19 and the District of Columbia Municipal Regulations, Title 1, Chapter 15, to review and approve agency records retention schedules; train records officers in implementing the policies, procedures, and guidelines of managing records; collect, store, preserve, conserve and service historical records in the custody of the Archives; collect, store and service temporary records in the custody of the Records Center; and collect, store and service publications in the custody of the Library of Government Information.

The Office of Public Records provides this mission with three services.

- District of Columbia Archives holds the permanently valuable records of the city.
- District of Columbia Records Center stores both historical, permanently valuable records and temporary disposable records still in the custody of DC agencies.
- Library of Government Information publications and other published materials on or about the District Government.

The Office of Public Records is currently located at Naylor Court, which serves as both an Archives and Records Center facility. The Naylor Court facility is supplemented by other city and Federal facilities to store public records. The Naylor Court facility has reached its storage capacity and has numerous deficiencies that make it inadequate for the long-term preservation of the city's archival records.

Built in the late 1880's and modified in 1989, the Naylor Court facility does not have the appropriate spaces or systems to preserve and service the District's historical records. The current space is severely limited. Every available space is being used for storage, including space formerly used by researchers and for processing records. It is not possible to carry out preservation activities or provide appropriate public reference services.

Consequently, city records are being stored at least 13 other facilities in the District and Maryland, resulting in significant storage costs and the inability of OPR to access the records for processing, preservation and research. In its current situation, the OPR is unable to carry out its mandate and unable to engage the community by developing programs and services that would promote public interaction with the Archives collections.

The holdings of the DC Archives include a variety of materials, including land records, architectural drawings, maps, photographs, posters, recordings, films, microfilms, and artifacts. DC agencies and researchers consult these records either in person or through contact with Archives staff. Their interests include legal research, real estate business, DC history, family history, and a host of other issues that can only be addressed in DC's public records.

In 2012, the National Endowment for the Humanities (NEH) funded a Preservation Needs Assessment of OPR's Naylor Court facility. Completed by Lyrasis Digital and Preservation Services in June 2012, the report summarized the preservation needs of the DC Archives and provided a long-range preservation plan for its facility and collections. (Refer to Appendix C - NEH Preservation Assessment (pg 239) for further information.)

On August 14, 2014, Dr. Gregory S. Hunter submitted a report: "Vision for the District of Columbia Archives." Hunter's Vision report reviewed OPR's challenges of space and program, and recommended that DC identify its facility requirements, identify best archival practices, define the scope of future operations, and explore the role that the Archives could play in the life of the District community. (Refer to Appendix D – HunterVision Report (pg 263) for further information.)

2 - BACKGROUND

Both the Preservation Assessment and the Vision report concluded that DC urgently needs an appropriate permanent, purpose-built archival facility. Prior assessments of the existing Archives confirm the infeasibility of the existing facility to accommodate necessary growth. Physical and mechanical deficiencies prevent proper care and preservation of the historical records. Hunter also recommended that the District address the Records Center storage needs of the city and that it provide a facility that meets the standards for records centers.

A new archival facility should consolidate current collections in one location and anticipate ongoing needs for space and support services. Archives require facilities with highly specialized technical building systems that provide the controlled and secure environments necessary to ensure the long-term safety of the collections. Future planning and facilities solutions must address the standards determined by best archival practices. A new facility will provide better security for the collections and enhanced access for the public, while allowing for future expansion.

In June 2015, the Department of General Services (DGS) hired Hartman Cox Architects and EYP Architects (HC/EYP) to develop a program of requirements for a new OPR facility and its Archives and Records Center operations.

From June to October 2015, HC/EYP began a systematic evaluation of the holdings and programs of the Office of Public Records to determine the best approach for addressing the future facility needs of the District of Columbia. This programming report will discuss the analyses and findings prepared and presented throughout the programming process. Copies of HC/EYP presentations and reports are provided in the Appendices of this report.

As part of the programming process, Hartman Cox/EYP:

- Conducted working meetings with the Mayor's Senior Advisor, the Secretary, and OPR staff.
- Took several tours of Naylor Court.
- Surveyed, mapped and evaluated Naylor's holdings and work processes.
- Previewed Axaem, OPR's new software program.
- Reviewed OPR and consultant reports and summaries on Naylor's holdings and public records stored in city and Federal off-site facilities. Reports consulted include:
 - DC Archives Accession Register
 - National Archives Federal Records Center 01 Report
 - National Archives, Inventory of RG 351, Records of the District of Columbia
 - Partial inventory of the Library of Government Information Holdings
 - Survey Reports of 7 off-site storage centers completed by Logistics Support Incorporated, 2014-2015
 - Summary list of off-site records storage sites
- Prepared and presented an "Estimate of Records" report estimating the archival, permanent, and temporary records held by the DC Archives, records held in records centers and in off-site storage locations, and records still held by DC agencies.
- Prepared and presented a "Programming, Inventories, and Future Planning" report that summarized the records
 holdings, the inventory work necessary to reconcile the assumptions and planning premises developed in the early
 stages of programming, and the future work necessary to continue the District's efforts to manage the city's records.

2 - BACKGROUND

- Met with representatives from Document Managers on August 3, 2015, and conducted telephone conversations with other companies, to learn more about opportunities for inventorying, scheduling, and digitizing DC's records.
- Identified similar sized, state-of-the-art, state and city archival facilities to illustrate archival facility standards, current and future trends, and issues critical to the planning and design of a new Archives/Records Center facility for DC.
- Toured the Ottawa City Archives on September 9, 2015, to see a new state-of-the-art archives/records center facility that also included a Library distribution operations center.
 - Tour included the Mayor's Senior Advisor, the Secretary, the Public Records Administrator, representatives from DGS, representatives from the MLK Library, and HC/EYP team members.
- Met with David Carmicheal, State Archivist of Pennsylvania, on October 7, 2015 to learn about his past experiences with the design of the Georgia State Archives and his current experience designing the new Pennsylvania State Archives.
 - Meeting included the Mayor's Senior Advisor, the Secretary, the Public Records Administrator, and HC/EYP's archives consultant.
- Prepared and presented size and cost analyses for different shelving options for Archives and Records Center storage.
- Prepared and presented draft space and adjacency requirements for a new Archives/Records Center facility and an accompanying DC Public Library Operations Center.
- Met with DC stakeholders to review draft program including Friends of DC Archives, researchers, and interested citizens (forthcoming).

In August 2015, the Mayor's Office requested that the Office of the Secretary and the DC Public Library (DCPL) review opportunities for mutually supportive operations and for co-location opportunities for both institutions. Hartman Cox/ EYP, in cooperation with the Martin Luther King (MLK) renovation team, evaluated potential synergies between the two services and identified the impact those synergies could have on MLK's renovation building and the new facility proposed for OPR. The OPR/MLK Co-Location report, issued on October 5, 2015, documents these investigations of potential synergies between the Archives and Library and identifies space and cost implications. (Refer to Chapter 8, Co-Location Opportunities, pg 205)

2 - BACKGROUND

3 EVALUATION OF CURRENT HOLDINGS

The HC/EYP team undertook an evaluation of the DC Archive's current holdings of archival records, Permanent records (records with historical value to be transferred to the Archives) and Temporary records (records that can be destroyed after a specified period of time) stored at Naylor Court, NARA, NARA Federal Records Centers, and off-site city storage facilities.

The team interviewed OPR staff and reviewed all available reports, surveys and lists for District records. For records held by DC agencies in other locations (i.e. in commercial records centers, agency spaces, or in their own agency archives), the AE team worked with DGS to identify a process for estimating their quantity and diversity.

Reports on DC records holdings that were referenced include:

- DC Archives Accession Register
- National Archives Federal Records Center 01 Report
- National Archives, Inventory of RG 351, Records of the District of Columbia
- Partial inventory of the Library of Government Information Holdings
- Survey Reports of 7 off-site storage centers completed by Logistics Support Incorporated, 2014-2015
- Summary list of off-site records storage sites provided by OPR staff

Some reports for off-site storage give only gross estimates without any detailed information about quantities or locations. These reports present a particular challenge for the quantification process, as the potential for duplication in the records data cannot be definitively ruled out. In these cases, the team worked with DGS's project management representatives to determine the quantities that should be assumed for storage planning.

OPR's normal business operations were ongoing during the research period. During this time, some records reached their scheduled disposition dates and were removed from OPR's holdings for destruction. The DC Archives accessioned records during this period as well. Similar is true for the continuing accumulation of agency records held in off site locations. In light of the reality that the actual quantity of records is constantly fluctuating, it is important to note that the estimated quantities recorded by the AE team are based on available information as of August 30, 2015.

Refer to Appendix E - DC/OPR - Estimates of Records, August 3, 2015 (pg 301).

Refer to Appendix F - Naylor Court Documentation (pg 309).

Refer to Appendix G - DC/OPR Project - Programming, Inventories, and Future Planning (pg 317).

3.1 Documentation of Naylor Court Holdings

The Naylor Court facility serves as both an Archives and a Records Center for DC. Past estimates have shown that Naylor Court stores approximately 52,000 cubic feet of records with the majority of these being Records Center records. As noted above, some temporary records have recently been destroyed, and other records continue to arrive. The quantity of records listed on the next page were calculated and recorded on August 4, 2015.

3 - EVALUATION OF CURRENT HOLDINGS \ DOCUMENTATION OF OFF-SITE STORAGE HOLDINGS

Navlar Court Holdings	Records		
Nayior Court Holdings	Volume*		
Archival Holdings	19,103		
Permanent Records Center Records	20,000		
Temporary Records Center Records	8,500		
	47,603		

Table 3.1 Volume of Naylor Court Holdings

*Measured in cubic feet (CF) of records

Currently there are approximately 19,103 cubic feet of archival records stored in Naylor. In addition, there are 20,000 cubic feet of Records Center records that are estimated to be Permanent records that in time will be transferred to the Archives.

• Total Archival Records at Naylor = 39,103 cubic feet

There are 8,500 cubic feet of records estimated to be Temporary records stored at Naylor. These records will eventually be destroyed.

3.2 Documentation of Off-Site Storage Holdings

Records of the District of Columbia are stored in at least 13 off-site facilities. These include archival records and a large quantity of records that have not been appraised. At some point this large quantity of records needs to be inventoried and appraised.

Table 2.2	Cummany	of	Decorde	Lold	at NIADA Facilities
IdDIE 5.2	Summary	01	Records	пеіи	at NAKA Facilities

	Current Off-Site Holdings per Data Provided by DGS & OPR*				
	Total	Archival	Scheduled Permanent	Scheduled Temporary	Unscheduled
Archives II					
8601 Adelphi Rd, College Park, MD	1,594	1,594			
Suitland, MD and					
Various Other FRC Sites	154,848		20,877	119,320	14,651
	156,442	1,594	20,877	119,320	14,651

*Measured in cubic feet (CF) of records

The 1,594 cubic feet of archival records at Archives II belong to Record Group 351. The remainder of the records summarized above is being stored within NARA's Federal Records Centers at facilities located in Suitland, Maryland; Philadelphia, Pennsylvania; and St. Louis, Missouri.

3.3 Documentation of Off-Site Records Held by Agencies

Additional records of the District of Columbia are stored at DC agency sites. Some of these records have been surveyed, but none have been appraised. Survey information is recorded in Dr. Hunter's report and in a survey performed by Logistics Support, Inc.

3 - EVALUATION OF CURRENT HOLDINGS \ DOCUMENTATION OF OFF-SITE RECORDS HELD BY AGENCIES

SURVEYED RECORDS (Hunter / Logistics)	Records Volume*
1100 Alabama Ave SE	1,965
1900 Massachusetts Ave SE	1,572
1900 Massachusetts Ave SE	5,658
2000 14th Street NW	5,010
441 4 th Street NW	1,430
4 DC Village Lane SW	23,999
8400 River Rd, Laurel, MD	1,045
1709 3rd Street NE	4,224
	44,903

Table 3.3 Summary of Surveyed Records Held by Various DC Agencies

*Measured in cubic feet (CF) of records

There are approximately 44,903 cubic feet of surveyed records being held at the locations identified above. This figure will continue to increase over time as it is assumed that the agencies from which these records originate are continuing to generate new records.

NON-SURVEYED RECORDS	Records
[Per Lists Received from OPR on 7/31/15]	Volume*
Iron Mountain	12,484
Bldg 6 - DC General Hospital	25,000
Bldg 11 - DC General Hospital	10,000
441 4 th Street NW	500
1100 4 th Street SW	13,000
Iron Mountain	30,000
Record Storage Site (?)	5,000
1101 4 th Street NW	2,000
DC General Hospital	400
Reeves Center	5,010
441 4 th Street NW	5,000
810 1 st Street NE	500
1709 3 rd Street NE	500
1830 Constitution Ave NE	1,000
8400 River Rd, Laurel, MD	1,500
St. Elizabeth's Campus (Various Sites)	80,000
64 New York Ave NE	600
645 H Street NE	700
33 rd Street NE	7,500
	200.694

Table 3.4 Summary of Non-Surveyed Records Held by Various DC Agencies

*Measured in cubic feet (CF) of records

There are approximately 200,694 cubic feet of non-surveyed records being held at the locations identified above. This figure will continue to increase over time as it is assumed that the agencies from which these records originate are continuing to generate new records. In addition to these off-site storage facilities, there are also DC records housed in the DC Police Archives, the Sumner School Museum and Archives, and the Fire Department Museum.

3.4 Calculation of Storage Capacity

It is necessary for a realistic program of requirements for OPR to know and understand the quantity and type of archival records that the District has now and what they can expect to receive in the future – the next 10, 20, and 30 years. It is also important for the District to know the quantity of Temporary records that are being stored so that they can begin to make decisions about their future Records Center storage costs and requirements.

In a separate report, HC/EYP outlined recommendations for inventories and appraisals of the District's records stored in offsite facilities and in agency custody. Future inventories and appraisals are necessary to reconcile the assumptions and planning premises outlined in this programming report. Refer to Appendix G, DC/OPR Project – Programming, Inventories, and Future Planning, August 3, 2015. OPR has acknowledged the need for conducting this inventory, as effective move planning will require it.

In the absence of accurate survey data for DC's records, HC/EYP analyzed the current available records information, and in consultation with OPR staff, they applied statistical assumptions to determine a reasonable estimate of the working number of Archival, Permanent and Temporary records. The AE's assumptions can be reviewed, updated and reconciled with the programming assumptions after a preliminary inventory is completed.

Diversity of Unscheduled Records

In order to estimate the storage requirements for archival holdings, the team had to first address the process of estimating the disposition of the large quantity of unscheduled records. It was necessary to approximate the portion that, when appraised, are likely to be scheduled as Permanent and Temporary records. Analysis of NARA's reports for the records in the FRC system showed that 18% of the District's scheduled records are Permanent. This ratio was considered, but the team opted for a more conservative ratio of 33% based on the fact that unscheduled records historically have a higher than average concentration of Permanent records. The outcome of this assumed segregation is tabulated below:

	Current Holdings per Data Provided by DGS & OPR*							
			Records Center Records					
			Sche	duled		Unscheduled		
	Total	Archival		Assumed Division of Unscheduled Records (Based Upon 1/3 v. 2/3 Split)			duled Records 3 Split)	
			Permanent	Permanent Temporary	Total Unscheduled	Estimated Permanent	Estimated Temporary	
Naylor Court	19,103	19,103						
Naylor Court	28,500		20,000	8,500				
Archives II 8601 Adelphi Rd, College Park, MD	1,594	1,594						
Suitland, MD and Various Other FRC Sites	154,848		20,877	119,320	14,651	4,879	9,772	
Subtotal - Surveyed Records	44,903				44,903	14,957	29,946	
Subtotal - Non-Surveyed Records	200,694				200,694	66,837	133,857	
	449,642	20,697	40,877	127,820	260,248	86,673	173,575	

Table 3.5	Aggregation	of Current	Holdings
-----------	-------------	------------	----------

*Measured in cubic feet (CF) of records

Of the 260,248 cubic feet of unscheduled records being tracked by the team, approximately 86,673 are assumed to be Permanent and will in time be accessioned into the DC Archives, and approximately 173,575 are assumed to be temporary and will ultimately be destroyed.

Allowances for Anticipated Appraisal and Disposition

The next consideration that required analysis is the degree to which the estimates for Permanent and Temporary records might be impacted by the eventual disposition of both Permanent and Temporary records that have reached their disposition dates, but that remain in the Records Center holdings. NARA reports were sorted to establish ratios that could be applied to the working tabulations to further refine the estimates.

Analysis of NARA's FRC 01 Reports indicates that there is a likelihood that 20% of the estimated Permanent Records have reached maturity and are overdue for being accessioned into the DC Archives.

Similar analysis shows that 28% of the estimated Temporary Records have reached their expiration date and are overdue for destruction.

	Estimated Transfer of Permanent Holdings*					
	Assumed Division of Permanent Records (Based Upon 20% Split Per Analyis of NARA FRC 01 Reports)					
	Permanent (Scheduled)	Permanent (Estimated)	Subtotal of Permanent Holdings		Estimate of "NONTRANSFERABLE" Holdings	Estimate of "TRANSFERABLE" Holdings
Naylor Court	20,000	_	20,000		16,000	4,000
Suitland, MD and Various Other FRC Sites	20,877	4,879	25,756		20,605	5,151
Unscheduled Records / Surveyed	-	14,957	14,957		11,966	2,991
Unscheduled Records / Non-Surveyed	-	66,837	66,837		53,470	13,367
	40,877	86,673	127,550	Γ	102,040	25,510

Table 3.6 Estimated Transfer of Permanent Holdings

*Measured in cubic feet (CF) of records

Of the 127,550 cubic feet of estimated Permanent FRC Records Center Holdings, approximately 25,510 are assumed to be ready for transfer to the DC Archives, and approximately 102,040 are assumed to be not yet scheduled for transfer to the custody of the Archives, or nontransferable, and will be remain with (or be moved into) the DC Records Center.

	Estimated Purge of Temporary Holdings*				
	Assumed Division of temporary Records (Based Upon 28% Split Per Analysis of NARA FRC 01 Reports)				
	Temporary (Scheduled)	Temporary (Estimated)	Subtotal of Temporary Holdings	Estimate of Expired Holdings	Estimate of Unexpired Holdings
Naylor Court	8,500	-	8,500		8,500
Suitland, MD and Various Other FRC Sites	119,320	9,772	129,092	36,146	92,946
Unscheduled Records / Surveyed	-	29,946	29,946	8,385	21,561
Unscheduled Records / Non-Surveyed	-	133,857	133,857	37,480	96,377
	127,820	173,575	301,395	82,011	219,384

Table 3.7 Estimated Purge of Temporary Holdings

*Measured in cubic feet (CF) of records

Of the 301,395 cubic feet of estimated Temporary Records Center Holdings, approximately 82,011 are assumed to be expired, having reached their disposition dates, and are overdue for destruction. Approximately 219,384 are assumed to still be active agency records and will be remain with (or be moved into) the DC Records Center.

Table 3.8 Estimated Holdings for Move & Space Planning – DC Archives

	ESTIMATED HOLDINGS FOR MOVE AND SPACE PLANNING* ["Day 1" Requirement]			
	ARCHIVES			
	Archival Holdings	Estimate of "TRANSFERABLE" Permanent Holdings	Total Anticipated Archival Holdings	
Naylor Court	19,103	4,000	23,103	
Archives II	1,594	0	1,594	
Suitland, MD and Various Other FRC Sites	0	5,151	5,151	
Unscheduled Records / Surveyed		2,991	2,991	
Unscheduled Records / Non-Surveyed		13,367	13,367	
	20,697	25,510	46,207	

*Measured in cubic feet (CF) of records

Approximately 321,424 cubic feet of Records Center records are anticipated on Day 1: 102,040 Permanent and 219,384 Temporary.

	ESTIMATED HOLDINGS FOR MOVE AND SPACE PLANNING* ["Day 1" Requirement]			
	Estimate of "NONTRANSFERABLE" Permanent Holdings	Estimate of "UNEXPIRED" Temporary Holdings	Total Anticipated Records Center Holdings	
Naylor Court	16,000	8500	24,500	
Suitland, MD and Various Other FRC Sites	20,605	92,946	113,551	
Unscheduled Records / Surveyed	11,966	21,561	33,527	
Unscheduled Records / Non-Surveyed	53,470	96,377	149,847	
	102,040	219,384	321,424	

Table 3.9 Estimated Holdings for Move & Space Planning – DC Records Center

*Measured in cubic feet (CF) of records

Growth Allowance

Beyond the 46,207 cubic feet of archival records anticipated on Day 1, archival storage areas will need to be sized to accommodate the 102,040 cubic feet of Permanent Records that will eventually be accessioned into the DC Records Center. In addition to this known growth, a recommended 37,062 cubic feet (25%) of additional growth should be planned. This extends to a total of 185,309 cubic feet of archival storage space. Expansion space should also be reserved on the site to accommodate continued growth.

Table 3.10 Growth Allowance for Space Planning – DC Archives & Records Center

	ESTIMATED
SUMMARY OF DC/OPR SPATIAL NEEDS FOR RECORDS	RECORDS
STORAGE	VOLUME*
ARCHIVAL STORAGE	
Existing Archival Records	46,207
Growth Allowance for <i>Existing</i> Permanent DCRC Records	102,040
Growth Allowance for <i>Future</i> Permanent DCRC Records	37,062
Subtotal	185,309
RECORDS CENTER STORAGE	
Existing Temporary Records	219,384
Growth Allowance for Future Temporary Records	
	0
Existing Permanent Records	102,040
Growth Allowance for Future Permanent Records	
	0
Subtotal	321,424
TOTAL REQUIRMENTS	506,733

*Measured in cubic feet (CF) of records

Summary Conclusion

The RFP estimated that a new DC Archives facility should be planned for 90,000 cubic feet of records storage space in a 110,000 square foot building. This early estimate was based on Dr. Hunter's Vision study along with other data gathered by DGS and, based on discussion with DGS representatives, presumes a building with compact mobile shelving at a medium degree of density.

The programming report uncovered additional DC records that are currently stored and unscheduled. The HC/EYP team also took a closer examination of the records stored in NARA's Records Centers and those surveyed by Logistics in 2014-2015.

Accounting for all known Archives and Records Center records and adding a growth allowance, OPR requires 185,309 CF of Archives and 321,414 CF of Records Center storage, for a total of 506,733 CF of storage. Chapter 4, Records Storage Options (pg 35) will outline the shelving options and square footage needed to store DC's Archives and Records Center records.

4 RECORDS STORAGE OPTIONS

4.1 General Requirements

The majority of space in an archival facility is dedicated to the safe storage of the records. The challenge is to store and protect the collections while still making the records accessible to researchers. A key component in this strategy is careful planning of the shelving and accompanying storage equipment, including cases, cabinets, racks, and other furniture that supports the collections.

The general requirements also apply to records center shelving. However, records centers traditionally aim for increased density of storage and are often more likely to go with higher shelving heights and denser storage within the shelving system.

Shelving is a long-term investment for an archives building and must be planned to meet the specific needs of the archival facility and reflect the size and quantity of its collections. The choice of a shelving system or combination of systems depends on a number of factors, including the buildings' size and structure, budget, operations, and technical considerations.

Shelving Types

Archival shelving can be either fixed or mobile shelving of various densities, with mobile systems being either manual or electrically operated. Static or fixed shelving is less expensive to purchase and install but requires a larger floor area than mobile shelving. Compact mobile shelving can store more records in a smaller space resulting in savings on land costs, building size, construction costs, building operations costs, and the long-term costs for conditioning the storage spaces. An advantage of electrically operated mobile shelving is the ability to connect it to the fire protection system and its potential to enhance security by locking mobile units. Mobile shelving requires a heavier floor load than static shelving and may not be feasible in existing buildings.

Shelving Heights

The height of the shelving can vary depending on desired retrieval of the records along with the building's structure, footprint and ceiling height. Traditionally the standard shelving height has been 84 to 90 inches providing 7 shelves that are 12 inches apart. This allows access to all the shelves with a ladder. However higher shelving systems and increased density heights are increasingly more common to offset the increased costs for archival storage. Current fire protection standards allow mobile electric high bay shelving to go as high as 30 feet without in-rack sprinkler installations, as long as the materials are stored in boxes. Shelving taller than 8 feet requires the use of rolling ladders, lifts, or a mechanical retrieval system.

Shelving Aisles

The maximum length of the storage room aisles are dictated by the footprint of the room, the location of doors, the type of shelving system, preferred retrieval and access time, and life safety codes.

The width of the aisles between ranges of shelving is different depending on the footprint of the room, the shelving system, and if ladders or lifts is needed. In general, aisles between rows of shelving should be minimum of 36 inches, although 42 inches is preferable; that distance will increase with lifts. Often a main aisle is provided for each room that can range in size from 4 feet to 8 feet wide depending on cart, ladder and lift use.

4 - RECORDS STORAGE OPTIONS \ SHELVING DENSITY ANALYSIS

Shelf Size

Archives should maximize their storage capacity with a standard sized shelf that accommodates the use of archive boxes, records center type boxes, and some special media records. Specialized shelving sizes are required for oversized and special sized records.

Storage can be designed using single or double-sided deep shelving units. Generally, archives shelve boxes using single sided shelving units. Records centers often increase the density and shelve using double-sided, double deep shelving units.

Standard archival shelves measure 16 inches x 40 inches. However, there are other effective shelf size options.

The bottom shelf should be at least 4 inches off the floor; 6 inches is preferred.

Materials

All shelving should be all steel and finished with an electrostatically applied powder coated finish. Each shelving unit must have solid steel shelves.

Aluminum shelving is acceptable for artifacts.

Open style chrome-plated stainless steel wire racks are recommended for cold storage rooms.

Since a site has not been selected for this project, this programming report considered several shelving options, including both fixed and mobile shelving.

4.2 Shelving Density Analysis

Chapter 3, Evaluation of Current Holdings (pg 27) established the City's storage need as 506,733 cubic feet of materials, 185,309 cubic feet of Archives storage and 321,424 cubic feet of Records Center storage. These materials are to be stored in controlled conditions on a shelving system that best suits the needs of each material type. The primary concerns for selecting a storage option are:

- 1. Storage Efficiency
- 2. Records Access
- 3. Shelving and Building Construction Costs
- 4. Operating Costs

Storage efficiency is determined by the type of shelving and the number of shelves per unit. Compact mobile shelving units house records more efficiently than fixed shelving types.

This analysis considers fixed and compact mobile shelving types at three storage densities: low (7 shelves), medium (15 shelves), and high (25 shelves). To account for building structure, aisle widths, and separation distances of closed compact mobile stacks, typical storage configurations have been created for each storage option in Appendix F – Naylor Court Documentation (pg 309). The total cubic feet of storage has been divided by the shelving type density factor to determine the room square footage required. Considering the 507,000 cubic feet of materials calculated previously, the square footage required for records storage has been determined and presented in Table 4.1.
4 - RECORDS STORAGE OPTIONS \ BUILDING SIZE IMPLICATIONS

CE to SE Ratios for Shelving Types	CE-SE*	CF of	SF Footprint
	01.01	Otorugo	Noodod for Otorago
Ratio for 7 High Fixed Shelving	2:1	507,000	253,500
Ratio for 7 High Compact Mobile Shelving	3.8:1	507,000	133,421
Ratio for 15 High Fixed Shelving	4.4:1	507,000	115,227
Ratio for 15 High Compact Mobile Shelving	8:1	507,000	63,375
Ratio for 25 High Fixed Shelving	11:1	507,000	46,091
Ratio for 25 High Compact Mobile Shelving	17:1	507,000	29,824

Table 4.1 Comparison Between Shelving Types

*Uses 80% efficiency allowing for shelving superstructure and voids

4.3 Building Size Implications

Utilizing these density factors, building area requirements were calculated for the various shelving types; a denser high bay compact mobile shelving requires the least area (29,824 SF), while a fixed shelving of low density requires the most area (253,500 SF) to house the same quantity of Archives and Records Center records. It is important to note that the Archives storage and Records Center storage, including the associated building systems, account for sixty-three percent of the new DC Archives building program.

Utilizing the various shelving densities and the balance of the proposed building program for the new DC Archives facility, building size options were generated for a new or renovated stand-alone Office of Public Records (OPR) facility. These options consider the impact of building type (new versus retrofit) and storage type (low, medium, or high density shelving).

Options considered (refer also to Appendix J - Expanded Option Descriptions & Cost Estimates, pg 343):

• 1: New stand-alone OPR facility with 15 shelves high compact shelving.

This option describes a stand-alone and purpose-built Archives building as outlined in the city's original RFP. The area of the DCPL Operations Center is addressed, but is shown to be accommodated as part of a separate DCPL project. (Refer to Chapter 8, Co-Location Opportunities, pg 205 for further information on the opportunity to include the DCPL Operations Center with the new Archives and Records Center facility.)

2: Retrofit OPR into an existing building with 7 shelves high fixed shelving.

This option describes a stand-alone OPR facility that is retrofit into a renovated existing typical DC office building. Storage areas expand dramatically as a result of the assumption that only 7-high fixed shelving can be used due to limited structural load capacities and floor-to-floor heights. The DCPL Operations Center is addressed as a separate DCPL project.

• 3: New stand-alone OPR facility with 25 shelves high fixed shelving.

This option shows the space-saving benefits of utilizing a fixed high bay shelving system. The DCPL Operations Center is assumed to be co-located with the OPR facility.

4 - RECORDS STORAGE OPTIONS \ COST IMPLICATIONS

• 4: New stand-alone OPR facility with 25 shelves high compact shelving.

Option 4 shows the further space-saving benefits of utilizing a compact mobile high bay shelving system. The DCPL Operations Center is assumed to be co-located with the OPR facility.

The resulting program sizes of each storage option is presented in Table 4.2. In comparing these options, Option 2 requires the largest building footprint. If OPR is to retrofit an existing facility, then it is likely that this building was not originally designed for archives storage. The archival material and shelving together form a substantial live load that most existing buildings could not withstand unless low density (7 shelves high) units are used. Additionally, most existing buildings in DC lack the ceiling height required for 15 high or 25 high units. As a result, it is anticipated that only the least efficient storage systems can be used in a retrofit, resulting in a larger building.

Comparing options 1, 3, and 4, the benefits of higher density storage can be seen not only in the usable square feet, whose footprint was calculated in the previous section, but also in the gross square feet. Since this building size is scaled proportionally to incorporate circulation and building system space, there is an even greater benefit to minimizing the overall scope of the storage.

It is important to note that an efficient building like Option 4 could have higher operational costs due to the staffing and equipment required to pull records from high-density storage solutions. Consideration of likely operating procedures for the facility would be necessary to determine if staffing or software solutions could be used to offset these challenges.

Additional options for synergies with the DC Public Library Operations Center are presented in Chapter 8, Co-Location Opportunities (pg 205). Recent archival facilities, including the City of Ottawa Archives, have taken advantage of the benefits of co-location of Archives with library operations, such as a distribution center, and both benefit from shared spaces and costs.

	Stand-Alone OPR Facility				
	Purpose-Built New Building Compact Mobile Shelving / Medium Density 15 Shelves High DCPL Operations Center Not in OPR	Retrofit into Converted Existing Building Fixed Shelving / Low Density 7 Shelves High DCPL Operations Center Not in OPR	Purpose-Built New Building <u>Fixed</u> Shelving / High Density 25 Shelves High DCPL Operations Center Co-Located at New OPR Facility	Purpose-Built New Building <u>Compact</u> Mobile Shelving / High Density 25 Shelves High DCPL Operations Center Co-Located at New OPR Facility	
	Option 1	Option 2	Option 3	Option 4	
eception Area	4,450	4,450	4,450	4,450	
esearch Area	4,740	4,740	4,740	4,740	
aff Work Areas	9,590	9,590	9,590	9,590	
ecords Receiving	3,410	3,410	3,410	3,410	
chival Storage	23,200	92,700	16,900	10,800	
ecords Center Storage	40,200	160,700	29,200	18,900	
CPL Operations Center	15,000*	15,000*	15,000	15,000	
	100,590	290,590	83,290	66,890	

Table 4.2 Stand-Alone Building Options (New & Renovation)

	Total	Total	Total	Total
Total Net Square Feet (NSF)	100,590	290,590	83,290	66,890
Total Gross Square Feet (GSF)	135,665	391,916	112,332	90,214

*In this option, the DCPL Operations Center would be located in a separate DCPL facility, but the area is included here to equalize the comparisons.

R

Re Re Re D

4 - RECORDS STORAGE OPTIONS \ ASSESSMENT & COMPARISON

4.4 **Cost Implications**

After the building area numbers (square feet) were tabulated, cost data was calculated. The cost data for the shelving types, new construction, and renovation was calculated using shelving vendor pricing and benchmark cost data for similar archival buildings. A summary compares the various options for both gross square footage requirements and estimated construction costs (including shelving costs). Each of the options, 1 through 4, can be found in Table 4.3 with its corresponding construction cost.

Option 4 has the lowest overall construction cost but the highest cost per square foot. Efficient shelving systems are costly and result in higher costs per square feet, but the reduction in building footprint more than offsets this expense. Option 2, even using an existing building, is the most expensive due to the required large footprint. Options 1 and 3 are the moderate cost options with similar costs per square foot.

-					
	Stand-Alone OPR Facility				
	Option 1	Option 2	Option 3	Option 4	
	Compact 15	Fixed 7	Fixed 25	Compact 25	
	New Building	Retrofit Building	New Building	New Building	
Building Footprint	135,665	391,916	112,332	90,214	
Total Cost	\$62.328.526	\$123,935,179	\$51,599,190	\$47,373,763	

\$316.23

\$459.34

\$525.13

Table 4.3 Construction	Cost, Options	1 through 4
------------------------	---------------	-------------

4.5 **Assessment & Comparison**

We assessed the options based on the following criteria:

Evaluation Criteria

Overall Cost / SF

Building Footprint

This objective minimizes the building square footage required to house known Archives and records storage needs. More compact shelving reduces the building area required.

Building Cost This criterion seeks to minimize total building construction costs.

\$459.43

- Ease of Retrieval
 - The goal is to optimize the time of records retrieval.
- Retrieval Safety

Safety is paramount when accessing records stored in shelving systems. This criterion assesses retrieval safety based on ready access, ladder access, or lift access.

Operational Flexibility

Some shelving systems require ladder or lift access. OSHA requirements limit the types of employees that can operate retrieval equipment, which normally prohibits an archives facility from utilizing interns or volunteers to pull records above a certain height. The goal of this criterion is to maximize OPR's staffing options.

<u>Maximize Records Access</u>

This objective measures the quantity of records that are readily accessible within the first seven feet of shelving.

<u>Shelving Cost</u>

This criterion seeks to minimize the total shelving costs. Shelving cost is impacted by the cost of the system itself and the footprint of shelving required based on the storage density.

<u>User Preference</u>

This criterion records the user preference for the shelving system that best meets OPR's needs.

L	egend
=	Excellent
=	Fair
=	Poor

	Option 1 Purpose-Built New Building Compact Mobile Shelving/ Medium Density 15 Shelves High	Option 2 Retrofit into Converted Existing Building Fixed Shelving/Low Density 7 Shelves High	Option 3 Purpose-Built New Building Fixed Shelving/ High Density 25 Shelves High	Option 4 Purpose-Built New Building Compact Mobile Shelving/ High Density 25 Shelves High
Building Footprint		×	Ø	Ø
Building Cost		$\overline{\mathbf{X}}$		
Ease of Retrieval			×	×
Employee Safety				
Operational Flexibility			×	$\mathbf{\overline{X}}$
Maximize Record Access			×	×
Shelving Cost	×			
User Preference		$\overline{\mathbf{x}}$	$\overline{\mathbf{x}}$	×

Figure 4.1 Evaluation of Stand-Alone OPR Facility Options

The resulting chart shows that Option 1, which provides a new purpose-built facility with medium density (15-high) compact mobile shelving, qualitatively has the highest scores. This is followed by Options 3 & 4, which provide a new purpose-built facility with high bay fixed or compact mobile shelving. Due to the limitations to be found in retrofitting an existing building, Option 2 is limited to low density (7-high) shelving which is inefficient and takes a large footprint.

Whereas the high bay options are valid for a new clean site, additional considerations arise which point to Option 1 as most likely being the optimal candidate for the DC Archives:

- It offers a good balance between the cost and space benefits of higher density while not pushing the operational impact to the full maximum.
- It is consistent (albeit coincidentally) with the density assumption of the RFP.
- High bay shelving requires very specialized shelving access equipment, whereas the 15 shelf system provides easier access.
- If DC budgets for this option which has a slightly higher cost than Option 3, there could be some contingency for having some of the record storage portion of the facility be high bay fixed shelving.

4 - RECORDS STORAGE OPTIONS \ ASSESSMENT & COMPARISON

- Within this option, we also offer the following operational recommendations:
 - Organize the shelving locations for the most frequently retrieved records on the lower 7 shelves that are reachable without using a ladder or lift.
 - Organize the shelving locations for less frequently retrieved records on the middle tiers of shelves (say 8 thru 11) for retrieval using a rolling ladder.
 - Organize the shelving locations for the least frequently retrieved records on the upper tiers of shelves (12 thru 15) for retrieval using a lift.

In discussing these options with the DC OPR, they place a higher value on using a 15-high shelving system as compared to a specialized high bay system and believe that the operational and program efficiencies achieved with Option 1 are most desirable. In other words, though the building footprint is shown as fair and the shelving cost is shown as poor in Option 1, these ratings are within the bounds of acceptability for DC. Furthermore, Option 1 rates higher than Options 3 & 4 in ease of retrieval and maximize record access and would thus be preferred to a facility using a high bay system. However, if the appropriate site is found — such as a new clean site — Option 3 could be considered for all or a portion of the facility.

For planning purposes, DC OPR has elected to move forward with a program that is based on medium density compact mobile density shelving (refer to Table 4.1 Comparison Between Shelving Types, pg 37, Option 1) and includes the co-location of the DCPL Operations Center (refer to Chapter 8, Co-Location Opportunities, pg 205, Option C).

4 - RECORDS STORAGE OPTIONS \ ASSESSMENT & COMPARISON

5 PROGRAM SUMMARY

5.1 Tabular Program

The project scope of work defined the major program spaces required for the new stand-alone Archives building:

- 1. Reception Area
- 2. Reference / Reading Area
- 3. Records (Permanent and Temporary Collections)
- 4. Records Receiving
- 5. Staff Work Areas

During the programming phase, space needs were established within each of these categories. A summary of these values is provided in Table 5.1. These square footages have been proposed with the knowledge of past archival projects and review of peer institutions, including the City of Ottawa Archives Building and Georgia State Archives Building. The result of this programming process is the following program:

Totals	SQUARE FOOTAGE	NOTES	
RECEPTION AREA	4,450	Lobby and Public Spaces	
RESEARCH CENTER	4,740	Research Library	
ARCHIVES STORAGE	23,200	Based on Option 1	
RECORDS CENTER STORAGE	40,200	Based on Option 1	
RECORDS RECEIVING	3,410	Loading and Receiving Functions	
STAFF WORK AREAS	9,590	Offices, Conf. Rooms, and Labs	
OPERATIONS CENTER	15,000	Placeholder until DCPL Provides	
Net Usable SF	100,590	NSF	
Walls & Circulation 9%	9,053	SF	
Building Systems (Building Support) 26%	26,022	SF	
Gross Square Feet	135,665	GSF	

Table 5.1 New Stand-Alone Archives Building Space Requirements

Lobby / Reception Area

The Lobby is the visitor's first impression of the Archives facility and the main transitional point to public and secure spaces. The reception area includes all of the functions associated with facility arrival and the public face of the facility. It is the least secure area of the facility. Additionally, this space provides exhibits, event space, and classroom space. It can also provide a patron lounge with seating and lockers. The reception/lobby area is the portion of the building where food and beverages should be served and consumed, keeping food, its preparation, and trash the greatest distance from archival storage, archival processing, and the lab. OPR expressed a desire for a strong exhibit component within the lobby space; the resulting exhibit gallery will require lighting, systems, and security at a greater level than the surrounding lobby space to protect and display the archival materials. Spaces added to the RFP program include a vending area, an exhibit gallery, an event support facility, and a security screening area. The spatial needs of the reception area are shown in Table 5.2.

SPECIFIC REQUIREMENT	PUBLIC	PRIVATE	SQUARE FOOTAGE
Lobby - Reception & Info	•		500
Patron Lounge/Lockers	•		400
Lobby Exhibit Space	•		300
Exhibit Gallery	•		1,500
Event Support		•	200
Vending	•		150
Security		•	200
Multi-Use/Meeting Space	•		1,200
RECEPTION AREA			4,450

Table 5.2 Tabular Program - Reception Area

Research Center

The research center is a secure area used by the public to review records in the Archives facility. The core of the research center is a monitored reading room that is used by patrons to research records that have been pulled from the archival storage. It consists of desks for reviewing paper and oversized documents and an area for microfilm/audio-visual research. There should be enough circulation surrounding the desks so that each researcher can have a cart of records. Researchers make requests and are monitored from a staffed central desk. The central desk monitors and ensures that records are properly handled and not removed from the room and should have few visual barriers. Photocopiers and scanners are located near the central desk and may be operated by staff or researchers depending on research policies. In addition, a registration and researcher consultation area is available for researchers to register, be briefed on Archives' rules, make verbal and computer requests for records, check computers for finding aids and digital records, and to consult with staff on their research. Some repositories show a film as part of their orientation process. Computer terminals and paper finding aids/indexes are available in the registration/consultation area. In addition, a larger reference library is available in the research center. Lockers are available outside the reading room for patrons to store their bags and belongings. A secure holding room for carts is necessary to store pulled records until they can be returned to the records storage rooms; the holding room can also be used as a secure staff entrance. Spaces added since the RFP include the registration desk, research consultation, central desk, reference library, and patron lockers. The spatial needs of the research center are shown in Table 5.3.

SPECIFIC REQUIREMENT	PUBLIC	PRIVATE	SQUARE FOOTAGE
Registration/Consultation	•		300
Research Room (Main Reading Room)	•		2,500
Research Room Central Desk	•		300
Reference Library	•		500
Computers (Terminals for Finding Aids and Digital Records)	•		240
Microfilm Research/AV Research	•		300
Digitizing Photocopiers		•	150
Holding Area (for Carts of Records)		•	300
Patron Lockers (Coin-Operated)	•		150
RESEARCH CENTER			4,740

Table 5.3 Tabular Program - Research Center

Archives & Records Center Storage

The records storage program has changed in scale due to the results of the records tabulation presented in Chapter 3, Evaluation of Current Holdings (pg 27). This chapter determined that there are 507,000 CF of Archives and Records Center records, not 90,000 CF of records. As a result, the storage program has increased substantially from the RFP. It should be noted that the quantities of cool storage, cold storage, digital media storage, art/artifact storage, and Library of Government Information are based upon preliminary assumptions drawn from past experience and the requirements found in similar facilities serving similar collections. Space allocations will be adjusted as needed based on information provided by OPR as it becomes available. The spatial needs shown in Table 5.4 are based on Option 1 presented in Chapter 4, Records Storage Options (pg 35). (Refer to Appendix J – Expanded Option Descriptions & Cost Estimates (pg 343) for program square footages of other storage options.)

SPECIFIC REQUIREMENT	PUBLIC	PRIVATE	SQUARE FOOTAGE
Textual Storage (Paper)		•	45,000
Cool Storage (Photographs, Film, Magnetic Tape, Glass Plates, DVDs, X-rays)		•	4,500
Cold Storage (Color Film, Slides, Prints)		•	4,200
Digital Archives Storage Room		•	4,000
Art/Artifacts		•	2,500
Library of Government Information		•	3,000
Ladder and Lift storage		•	200
ARCHIVES & RECORDS CENTER STORAGE			63,400

Table 5.4 Tabular Program - Archives & Records Center Storage

Records Receiving

Records receiving is dedicated to providing a secure environment for receiving archival materials and for non-archival deliveries into the building. The RFP asked for a loading dock, a freight elevator to service all levels, and a quarantine room for dirty records. The program has been expanded substantially to include two loading docks – a covered, conditioned one for archival materials and a second one for equipment, supplies, mail, food and trash. Two docks separate building services from archival materials, thereby protecting the records from theft, pests and rodents, mold, dirt, and polluted air. Additional spaces include a receiving room, supply storage, a trash/recycle room, and a restroom to isolate this program component from the remainder of the building. The spatial needs of this department are found in Table 5.5.

SPECIFIC REQUIREMENT	PUBLIC	PRIVATE	SQUARE FOOTAGE
Records Dock		•	700
Service Dock		•	700
Trash/ Recycling Room		•	200
Building Supply Storage		•	250
Covered Loading Dock(s)		•	300
Freight Elevators to Reach All Floors		•	n/a
Secure Receiving Room		•	800
Quarantine Room for "Dirty" Records		•	400
Toilets for Receiving Area		•	60
RECORDS RECEIVING			3,410

Table 5.5 Tabular Program - Records Receiving

Staff Work Areas

Back of house staff spaces can be divided into four key functions: secure records processing, digital preservation, conservation, and staff office space. The RFP included a processing room, a conservation lab, a preservation imaging lab, a meeting/ conference room, and a staff lounge. These requirements have been augmented to include office space, workstations, a quiet room, a project room, electronic records processing, an exhibit prep shop, an exhibit staging area, and storage, and where appropriate, the District of Columbia Workplace Design Guidelines have been applied. The spatial requirements of this department are shown in Table 5.6.

SPECIFIC REQUIREMENT	PUBLIC	PRIVATE	SQUARE FOOTAGE
Processing Room (s)		•	3,500
Archival Supply Storage		•	600
Preservation Imaging Lab		•	450
Conservation/ Preservation Lab		•	1,000
Electronic Records Processing		•	400
Exhibit Prep Shop		•	800
Exhibit Staging Area		•	500
Director Office		•	150
Archivist Offices		•	240
Workstations		•	640
Quiet Room		•	120
Multi-Use Room Large		•	240
Project Room		•	400
Staff Lounge		•	400
Office Supplies		•	150
STAFF WORK AREAS			9,590

Table 5.6 Tabular Program - Staff Work Areas

DC Public Library Operations Center

Added to the scope of the archival project is the DC Public Library Operations Center, a function that can capitalize on a joint site, shared building resources, and operational efficiencies. No program for the individual spaces has been provided; Table 5.7 provides an estimation of the spaces that would be required, totaling to the requested overall footprint of 15,000 NSF. These spaces include distribution, acquisitions, receiving, and storage. Note that the DC Operations Center will not share the Archives' loading dock. Library materials have a greater likelihood of exposure to bugs, lice, and mold; these contaminants must be kept away from both archival materials and processing spaces, including the loading dock.

SPECIFIC REQUIREMENT	PUBLIC	PRIVATE	SQUARE FOOTAGE
DISTRIBUTION CENTER		•	11,000
ACQUISITIONS		•	2,500
LOADING DOCK		•	700
RECEIVING ROOM		•	400
STORAGE		•	400
OPERATIONS CENTER			15,000

Table 5.7 Tabular Program - DC Public Library Operations Center

5 - PROGRAM SUMMARY \ GRAPHIC PROGRAM

Other

Building support spaces will be required for the proper functioning of the building. Included are public restrooms, shower/ changing room(s), telecommunications, and other spaces to support systems. Telecommunications spaces will be sized in collaboration with the DC Office of the Chief Technology Officer (OCTO) after site selection during the follow-on programming phase. All building support space areas are included in the gross square footage.

5.2 Graphic Program

The facing page provides a graphic representation of the building program to show the relative sizes of the program elements in Section 5.1. As can be seen in Figure 5.1, storage accounts for 63% of the net square footage of the building.

5 - PROGRAM SUMMARY \ GRAPHIC PROGRAM



ARCHIVES AND RECORDS CENTER STORAGE

TEXTUAL STORAGE 45000 SF

Figure 5.1 Graphic Program (1" = 50'-0")

COOL STORAGE 4500 SF	
COLD STORAGE 4200 SF	
DIGITAL ARCHIVES STORAGE ROOM 4000 SF	
ART/ ARTIFACTS 2500 SF	
COVERNMENT INFORMATION 3000 SF	
LADDER AND LIFT STORAGE 200 SF	
7	SPACES = 63,400 NSF

100,590 Total NSF

6 DETAILED SPACE REQUIREMENTS

The previous chapter provided an overview of the types of spaces that are included in the program. This chapter will expand upon the detailed requirements of each space. This content will serve as the basis for room data sheets in the design process of the building. As such, each space is provided with a potential room layout, a list of furniture and equipment, and key systems requirements.

6.1 Reception

As presented in Chapter 5, Program Summary (pg 43), the spaces included in the reception area are:

- 1. Lobby Reception & Info
- 2. Patron Lounge/Lockers
- 3. Lobby Exhibit Space
- 4. Exhibit Gallery
- 5. Event Support
- 6. Vending Area
- 7. Security
- 8. Multi-Use/Meeting Space

These spaces can be represented graphically by the figure:



Figure 6.1 Reception Program and Key Adjacencies (1" = 40'-0")

Lobby - Reception & Info

The lobby is the public face of the building. The front door of the building will enter into this space. It will be the primary entry for all visitors and may be the primary entrance for staff too. The project team has expressed a desire to make this a flexible space that can be used for a variety of events through reconfiguration, allowing the Archives to become a hub of activity surrounding DC history.

Space Criteria:

Nominal Floor Area: 500 SF Occupants: TBD Daylight: Desirable Sound Attenuation: In Room

Special Considerations:

Ideally entrance should be through 2 sets of doors separated by a vestibule that provides energy savings and serves as airlock to keep out unconditioned air

Shoe cleaning mats





Figure 6.2 Lobby Space Examples

Lobby - Reception & Info

Furniture List:

- 1. Front Desk/Security Desk
- 2. Seating
- Equipment List
 - 1. Security Devices



Figure 6.3 Lobby Space Layout (1/8" = 1'-0")

Patron Lounge/Lockers

The patron lounge provides a space outside the secure reading room for patrons to gather, eat their lunches, conduct conversations, and perform other tasks that are not allowed in the reading room. This space would also feature coin-operated lockers for researchers to store their belongings during a visit to the Archives.

Space Criteria:

Nominal Floor Area: 400 SF Occupants: TBD Daylight: Desirable Sound Attenuation: In Room

Special Considerations:

Food/Beverage



Figure 6.4 Patron Lounge Space Example

Patron Lounge/Lockers

Furniture List:

- 1. Tables
- 2. Chairs
- 3. Trash Receptacles

4. Bench and Counter or Flat table near Lockers

Equipment List

1. Coin-Operated Lockers – variety of sizes to include large lockers for traveling researchers with luggage



Figure 6.5 Patron Lounge Space Layout (1/8" = 1'-0")

Lobby Exhibit Space

The lobby exhibit space expands the lobby to include a small area for rotating features and wayfinding.

<u>Space Criteria:</u> Nominal Floor Area: 300 SF Occupants: TBD Daylight: Not Acceptable Sound Attenuation: In Room

Special Considerations:

UV Exposure at Exhibit Walls

Security

Materials and Finishes for exhibit of archival materials



Figure 6.6 Lobby Exhibit Space Example

Lobby Exhibit Space

Furniture List:

1. Exhibit Walls or Cases

Equipment List

- 1. Exhibit Lighting
- 2. CCTV / Security



Figure 6.7 Lobby Exhibit Space Layout (1/8" = 1'-0")

Exhibit Gallery

The Office of the Secretary, the Office of Public Records, and the Department of General Services have expressed interest in incorporating exhibits of relevant historic content at the Archives. These exhibits would generate foot traffic to the archive, inform the public, and provide positive synergies with both the content and mission of the Office for Public Records. The primary gallery space will include climate and security controls sufficient for display of permanent collections on a rotating basis.

Space Criteria: Nominal Floor Area: 1,500 SF Occupants: TBD Daylight: Not Acceptable Sound Attenuation: In Room

Special Considerations:

If displaying original materials – no natural light

Ceiling height of at least 12 feet

Display walls must be constructed of materials that permit use of nails and can be changed by paint

Filtered and dimmable two-circuit busway or track lighting

Secondary filtered maintenance lighting system to be used for afterhours exhibit maintenance and cleaning

Ceiling and floor to provide j-boxes to meet exhibit power requirements





Figure 6.8 Exhibit Gallery Space Example

Exhibit Gallery

Special Considerations (cont.):

Ceiling to support point loads of 20 pounds per square foot

Integrated sound system

Acoustical treatment of base building to have background noise level of NC 25 to 30 with reverberation time of 1.0 second or less

Wall mounted items must not obstruct or hinder usefulness of walls for exhibits

"Good Quality" particulate and gas filtration

Materials and Finishes for exhibit of archival materials

Security

Furniture List:

1. Exhibit Walls or Cases

Equipment List

- 1. Exhibit Lighting
- 2. CCTV / Security



Figure 6.9 Exhibit Gallery Space Layout (1/16" = 1'-0")

Event Support

The catering kitchen provides support for larger events at the Archives building. This space provides facilities for the staging of food prepared offsite, as well as dishwashing facilities.

Space Criteria:

Nominal Floor Area: 200 SF

Occupants: TBD

Daylight: Not Required

Sound Attenuation: In Room

Special Considerations:

Overhead and wall power to accommodate a variety of equipment setups



Figure 6.10 Event Support Space Examples

Event Support

Furniture List:

- 1. Casework
- 2. Work Counter
- 3. Trash Receptacles

Equipment List

- 1. Dishwasher
- 2. Sink



Figure 6.11 Event Support Space Layout (1/8" = 1'-0")

Vending

Since many archivists and researchers spend several hours in the facility, the vending area provides access to snacks and beverages. Food items should be consumed in the reception area, patron lounge, staff lounge or offices. Food/Drinks are not permitted in the research center, processing rooms, the lab, and records storage areas.

Space Criteria: Nominal Floor Area: 150 SF Occupants: TBD Daylight: Not Required Sound Attenuation: None

Special Considerations:

If food service area is provided, vent directly to outside rather than general building return air system.



Figure 6.12 Vending Space Example

Vending

Furniture List:

- 1. Trash receptacles
- 2. Recycling

<u>Equipment List</u>

1. Two (2) Vending Machines



Figure 6.13 Vending Space Layout (1/8" = 1'-0")

Security

Security can either be a separate space or be incorporated into the lobby. Security must be able to monitor the entrance and document those individuals who enter the building. Equipment and camera monitors can be combined with the fire control room.

<u>Space Criteria:</u> Nominal Floor Area: 200 SF Occupants: TBD Daylight: Not Required Sound Attenuation: None

Special Considerations:

Must accommodate all equipment described in security narrative



Figure 6.14 Security Space Example

Security

Furniture List:

- 1. Desk
- 2. Chairs

Equipment List

1. Security Equipment



Figure 6.15 Security Space Layout (1/8" = 1'-0")

Multi-Use/Meeting Space

This space is a flexible space that can be used by either staff or the public for events. There should be an option to subdivide the space into two smaller meeting spaces. Optionally, it can be adjacent to the lobby, increasing the available space during large events.

Space Criteria:

Nominal Floor Area: 1,200 SF Occupants: TBD Daylight: Desirable Sound Attenuation: Between Rooms

Special Considerations:

Shades for light/glare control

Flexible furniture system with stacking chairs and folding tables or similar to allow for multiple configurations

Demountable/movable wall opens to expand lobby space



Figure 6.16 Multi-Use/Meeting Space Example

Multi-Use/Meeting Space

Base Layout \ Single Meeting Space

Furniture List:

- 1. Meeting Table(s)
- 2. Chairs

Equipment List

- 1. AV Equipment
- 2. Furniture Storage





Figure 6.17 Multi-Use/Meeting Space Layout (1/16" = 1'-0")

6 - DETAILED SPACE REQUIREMENTS \ RESEARCH CENTER

6.2 Research Center

As presented in Chapter 5, Program Summary (pg 43), the spaces included in the research center are:

- 1. Registration/Consultation
- 2. Research Room Main Reading Room
- 3. Research Room Central Desk
- 4. Reference Library
- 5. Computer Terminals for Finding Aids and Digital Records
- 6. Microfilm Research/AV Research
- 7. Scanners & Photocopiers
- 8. Holding Area for Carts of Records
- 9. Coin-Operated Lockers for Patrons

These spaces can be represented graphically by the diagram below.



Figure 6.18 Research Center Program and Adjacencies (1" = 40'-0")

6 - DETAILED SPACE REQUIREMENTS \ RESEARCH CENTER

Registration/Consultation

The registration/consultation area is the first checkpoint for the reading room. Patrons will sign in, be briefed on the rules, consult computers and paper finding aids, and consult with staff on individual research requirements. Computer terminals are located adjacent to or within the registration/consultation space to facilitate online registration and allow patrons to request records, review finding aids, and view digital records. The computers can also be used to show orientation materials to new researchers.

Space Criteria: Nominal Floor Area: 300 SF Occupants: TBD Daylight: Desirable Sound Attenuation: In Room

Special Considerations:

Sound insulation to prevent disrupting other researchers

If in separate space from reading room, use glass to allow staff to visually monitor reading room







Figure 6.19 Registration/Consultation Space Examples
Registration/Consultation

Furniture List:

- 1. Desk(s)
- 2. Chairs
- 3. Shelving for paper finding aids, brochures, etc.

Equipment List

- 1. Computer(s)
- 2. Security Devices



Figure 6.20 Registration/Consultation Space Layout (1/8" = 1'-0")

Research Room

The main reading room will be the designated space for viewing archival records. As both a public-serving space and a secure space, security and records preservation needs must be balanced against an inviting and transparent feel. This space must serve all types of records including paper, oversized records, photographs, and audiovisual records. Space for one research group should be provided, that is sound proof but visible to the central desk (i.e. glass walls). There were discussions about including a self-service land record section in this space, which would require space for large ledgers, microfilm, and index cards. Space for a land record research section has not been factored into the current space requirements for the research room.

<u>Space Criteria:</u> Nominal Floor Area: 2,500 SF Occupants: TBD Daylight: Desirable Sound Attenuation: In Room

<u>Special Considerations:</u> UV Filtration and Shades Controlled Access





Figure 6.21 Research Room Space Examples

Research Room

Furniture List:

1. Tables – can be one size to accommodate multiple researchers or one researcher viewing oversized records like maps. Consider adjustable height for standing review of records.

2. Oversized Record Tables – needed if other tables are not large enough for one researcher to view oversized materials.

3. Chairs

Equipment List

1. Record Carts

2. Task Lighting – if needed; must not block line of sight of central desk or exceed light levels cited in Section 7.13

3. Security Devices





Central Desk

The central desk is the staff operated reference desk centrally located in the room so that the staff have a clear sight line to all areas where researchers are using archival materials. It can include copying and scanning depending on the security direction taken. The central desk could also be combined with registration/consultation depending on staffing levels and operations. This space provides a checkpoint for records circulation (records only circulate within the reading room).

Space Criteria:

Nominal Floor Area: 300 SF Occupants: TBD Daylight: Desirable Sound Attenuation: In Room

Special Considerations:

UV Filtration and Shades

Automatic door openers for transport of carts

Double doors preferred for oversized materials

Central desk may have silent alarm that links it to security

Desk to be located on 6" raised platform with ramped access

Multi-height access to Central Desk (ADA)

Separate staff entrance (may be thru holding area)







Figure 6.23 Central Desk Space Examples

Central Desk



4. Security Devices



Reference Library

The reference library is self-service and provides secondary research materials that complement the holdings of the DC Archives. It does not include records of archival value. This space should be easily accessible from the reading room.

Space Criteria:

Nominal Floor Area: 500 SF Occupants: TBD Daylight: Desirable Sound Attenuation: In Room

Special Considerations: AV Filtration and Shades



Figure 6.25 Reference Library Space Example

Reference Library

Equipment List

1. Security Devices

Figure 6.26 Reference Library Space Layout (1/8" = 1'-0")

Computers

Computer research space can be used either to assist patrons in locating records or to display born digital and/ or digitized records. This space should have some computer access, but space for patrons to plug in their own laptops or tablets is also desirable. The space provided here allows for four computer terminals; connections for patron technology could be provided in the main reading room.

Space Criteria:

Nominal Floor Area: 240 SF Occupants: 4 Occupants Daylight: Not Required Sound Attenuation: In Room

Special Considerations:



Figure 6.27 Computers Space Example

Computers

Furniture List:

- 1. Four (4) Computer Desks
- 2. Four (4) Task Chairs

Equipment List

- 1. Four (4) Computers
- 2. Security Devices





Microfilm Research/AV Research

In order to access records stored on microfilm or alternative media, research space and specialized equipment must be provided. This space must also include a self-service copier for preparing prints or other types of copies of these materials.

Space Criteria:

Nominal Floor Area: 300 SF Occupants: TBD Daylight: Not Acceptable Sound Attenuation: In Room

Special Considerations: Dimmable lighting



Figure 6.29 Microfilm Research/AV Research Space Example

Microfilm Research/AV Research

Furniture List:

1. AV Desks - some with headphones for listening to audio materials

2. Task Chairs

Equipment List

1. Microfilm/microfiche machines

2. Additional AV Support Equipment As Needed

3. Cabinets to store public use copies of microfilm/fiche

- 4. Copiers
- 5. Security Devices





Scanners & Photocopiers

This space may or may not be accessible to the public, depending on the security model used. If it is not accessible, staff will photocopy and scan for patrons. This space should allow both scanning to files and copying to paper. There should be sufficient area for carts in this space.

<u>Space Criteria:</u> Nominal Floor Area: 150 SF Occupants: TBD Daylight: Not Desirable Sound Attenuation: Between Rooms

Special Considerations:



Figure 6.31 Scanners & Photocopiers Space Example

Scanners & Photocopiers

Furniture List:

- 1. Counter for Collecting Prints
- 2. Chair

Equipment List

- 1. Copiers/Scanners
- 2. Security Devices



Figure 6.32 Scanners & Photocopiers Space Layout (1/8" = 1'-0")

Holding Area for Carts of Records

Many patrons will request substantial pulls of records from the Archives. If a system is provided for requesting records in advance, this space can serve as a staging area for those records. This space will also house records that need to be returned to the records storage room. This space is staff access only and should be secure from the reading room.

Space Criteria:

Nominal Floor Area: 300 SF Occupants: TBD Daylight: Not Required Sound Attenuation: None

Special Considerations:

Entrance from main corridor or records storage corridor

Can serve as staff entrance to research room

Automatic doors

Double doors

Same security as records storage rooms and processing



Figure 6.33 Holding Area Space Example

Holding Area for Carts of Records

Furniture List:

1. Some shelving for individual boxes/ledgers that do not need to be transported by a cart. It may be wall mounted shelving that is high enough off the floor for carts to be parked underneath it.

Equipment List

- 1. Record Carts
- 2. Security Devices



Figure 6.34 Holding Area Space Layout (1/8" = 1'-0")

Coin-Operated Lockers for Patrons

This space should provide at least 20 lockers for patrons to store their belongings. Lockers must be outside of the reading room. Some researchers prefer the ability to see their belongings from the research space or have them close by, but there should be no access to these lockers from any space within the reading room. The lockers could also be located within the reception/lobby area. There should be a bench and a flat area to organize belongings.

<u>Space Criteria:</u> Nominal Floor Area: 150 SF Occupants: TBD Daylight: Desirable Sound Attenuation: None

Special Considerations:

Variety of sizes to include large lockers for traveling researchers with luggage



Figure 6.35 Coin-Operated Lockers Space Example

Coin-Operated Lockers for Patrons

Furniture List:

- 1. Bench
- 2. Counter or Table

Equipment List

- 1. 20+ Lockers
- 2. Security Devices



Figure 6.36 Coin-Operated Lockers Space Layout (1/8" = 1'-0")

6.3 Records Storage

As presented in Chapter 5, Program Summary (pg 43), the spaces included in the records storage area are:

- 1. Textual Storage (Paper)
- 2. Cool Storage (Photographs Film, Magnetic Tape, Glass Plates, DVDs, X-rays)
- 3. Cold Storage (Color Film, Slides, Prints)
- 4. Digital Archives Storage Room
- 5. Art/Artifacts
- 6. Library of Government Information
- 7. Ladder and Lift Storage

Records storage spaces are organized in storage bays sized to accommodate the selected shelving system. They must only be used for the storage of collections. Staff work areas must be located outside the storage rooms to reduce fluctuations in climate conditions and pollutants. Ideally, records should be stored according to their media type and the environmental conditions recommended for each kind of record. However, some repositories combine materials in one records storage area and adjust the environmental conditions accordingly. The following requirements provide an overview of these criteria. For additional information see Chapter 4, Records Storage Options (pg 35).

Textual Storage (Paper)

This is the largest archival storage space(s) in the building. The required square feet of space depends on the type of shelving used. See Chapter 4, Records Storage Options (pg 35) for additional information on the configuration of the space based on the type of shelving used.

Space Criteria:

Nominal Floor Area: 45,000 SF Occupants: TBD Daylight: Not Acceptable Sound Attenuation: None

Special Considerations:

See Chapter 7, Design Narrative (pg 161) for archival storage and space standards





Figure 6.37 Textual Storage Space Examples

Textual Storage (Paper)

Furniture List:

1. Shelving

Equipment List

1. Security Devices



Figure 6.38 Textual Storage Two-Bay Space Layout (1/16" = 1'-0")

Cool Storage (Photographs, Film, Magnetic Tape, Glass Plates, DVDs, X-rays)

Cool Storage houses materials that need to be stored at a different temperature and relative humidity from the main textual storage.

Space Criteria:

Nominal Floor Area: 4,500 SF Occupants: TBD Daylight: Not Acceptable

Sound Attenuation: None

Special Considerations:

See Chapter 7, Design Narrative (pg 161) for archival storage and space standards





Figure 6.39 Cool Storage Space Examples

Cool Storage (Photographs, Film, Magnetic Tape, Glass Plates, DVDs, X-rays)

Furniture List:

1. Shelving

Equipment List

1. Security Devices



Figure 6.40 Cool Storage Two-Bay Space Layout (1/16" = 1'-0")

Cold Storage (Color Film, Slides, Prints)

Cold storage houses materials that need to be stored at a different temperature and relative humidity from the main textual storage.

<u>Space Criteria:</u> Nominal Floor Area: 4,200 SF Occupants: TBD Daylight: Not Acceptable Sound Attenuation: None

Special Considerations:

See Chapter 7, Design Narrative (pg 161) for archival storage and space standards





Figure 6.41 Cold Storage Space Examples

Cold Storage (Color Film, Slides, Prints)

Furniture List:

1. Shelving – for temperatures below 50 degrees F, open style chrome plated stainless steel wire racks are recommended.

Equipment List

1. Security Devices



Figure 6.42 Cold Storage Two-Bay Space Layout (1/16" = 1'-0")

Digital Archives Storage Room

This space houses digital records; as a result, this space will house computer equipment.

<u>Space Criteria:</u> Nominal Floor Area: 4,000 SF Occupants: TBD Daylight: Not Acceptable Sound Attenuation: None

Special Considerations:

See Chapter 7, Design Narrative (pg 161) for archival storage and space standards



Figure 6.43 Digital Archives Storage Room Space Example

Digital Archives Storage Room

Furniture List:

1. Digital equipment

Equipment List

1. Security Devices



Figure 6.44 Digital Archives Storage Room Two-Bay Space Layout (1/16" = 1'-0")

Art/Artifacts

The space for art and artifacts provides storage for those items that require storage conditions that differ from paper – whether those requirements are due to temperature/relative humidity, size, shape, or media type.

Space Criteria:

Nominal Floor Area: 2,500 SF Occupants: TBD Daylight: Not Acceptable Sound Attenuation: None

Special Considerations:

See Chapter 7, Design Narrative (pg 161) for archival storage and space standards





Figure 6.45 Art/Artifacts Space Examples

Art/Artifacts



Figure 6.46 Art/Artifacts Two-Bay Space Layout (1/16" = 1'-0")

I

I

Library of Government Information

This space houses the Library of Government. This space features the same design criteria as textual storage.

<u>Space Criteria:</u> Nominal Floor Area: 3,000 SF Occupants: TBD Daylight: Not Acceptable Sound Attenuation: None

Special Considerations:

See Chapter 7, Design Narrative (pg 161) for archival storage and space standards



Figure 6.47 Library of Government Space Examples

Library of Government Information

Furniture List:

1. Shelving

Equipment List

1. Security Devices



Figure 6.48 Library of Government Two-Bay Space Layout (1/16" = 1'-0")

Ladder and Lift Storage

This space is required for all mediumand high-density shelving options in order to store the equipment necessary to access records stored on upper shelves. This space should also store extra carts used for transporting records. It should be located near the records storage areas. More than one storage area may be needed depending on the design, size and location of the records storage areas.

Space Criteria:

Nominal Floor Area: 200 SF Occupants: TBD Daylight: Not Required Sound Attenuation: None

Special Considerations:



Figure 6.49 Ladder and Lift Storage Space Example

Ladder and Lift Storage

Furniture List:

1. N/A

Equipment List

- 1. Ladders and/or Lifts as Needed
- 2. Record Carts



Figure 6.50 Ladder and Lift Storage Space Layout (1/8" = 1'-0")

6 - DETAILED SPACE REQUIREMENTS \ RECORDS RECEIVING

6.4 Records Receiving

As presented in Chapter 5, Program Summary (pg 43), the spaces included in the records storage area are:

- 1. Records Dock
- 2. Service Dock
- 3. Trash/Recycling Room
- 4. Building Supply Storage
- 5. Covered Loading Dock(s)
- 6. Freight Elevators to Reach All Floors
- 7. Secure Receiving Room
- 8. Quarantine Room for "Dirty" Records
- 9. Toilets for Receiving Area

The following is a graphic summary of these spaces:



Figure 6.51 Records Receiving Program and Adjacencies (1" = 40'-0")

6 - DETAILED SPACE REQUIREMENTS \ RECORDS RECEIVING

Records Dock

The records dock, a separate secure loading dock from the service dock, provides a place for trucks to drop off deliveries of archival records. This dock can also be used for Records Center materials. It is not to be used for equipment, supplies, mail, food, trash, or other items that could contaminate the records or the dock. This dock is not to be used by the Library Distribution operation because of the risk of pests, rodents, mold, lice, and other contaminants.

Space Criteria: Nominal Floor Area: 700 SF Occupants: TBD Daylight: Not Required Sound Attenuation: None

Special Considerations:

Covered concrete platform that can service various sizes of trucks

Covers or Canopies over the loading dock platform that extends at least 4 feet

Sloped ramp that drains sufficiently to prevent water from collection near, or migrating into, the building

Positive air pressure

Separate handling system vented directly to outside

Secure doors





Figure 6.52 Records Dock Space Examples


Figure 6.53 Records Dock Space Layout (1/8" = 1'-0")

Service Dock

The service dock, a separate loading dock from the records dock, provides a place for building support functions. This dock is used for equipment, supplies, mail, food, trash, and other "dirty" items, to ensure that these items do not contaminate archival materials. Records should not be processed through this dock.

Space Criteria: Nominal Floor Area: 700 SF Occupants: TBD Daylight: Not Required Sound Attenuation: None

Special Considerations:



Figure 6.54 Service Dock Space Example



Figure 6.55 Service Dock Space Layout (1/8" = 1'-0")

Trash/Recycling Room

This room is to be used for holding of trash and recycling, pending pickup at the service dock. It should be accessible to the service dock but not the records dock.

Space Criteria:

Nominal Floor Area: 200 SF

Occupants: TBD

Daylight: Not Required

Sound Attenuation: None

Special Considerations:



Figure 6.56 Trash/Recycling Room Space Example

Trash/Recycling Room

Furniture List:

1. N/A

Equipment List

1. Dumpster / Bins



Figure 6.57 Trash/Recycling Room Space Layout (1/8" = 1'-0")

Building Supply Storage

Building supply storage can store general supplies, HVAC filters, equipment, furniture, and extra shelves. It should be accessed through the service dock.

<u>Space Criteria:</u> Nominal Floor Area: 250 SF Occupants: TBD Daylight: Not Required Sound Attenuation: None

Special Considerations:



Figure 6.58 Building Supply Storage Space Example



Figure 6.59 Building Supply Storage Space Layout (1/8" = 1'-0")

16' - 8"

Covered Loading Dock(s)

Loading docks should be covered. Ideally, both the records dock and the service dock should be covered.

<u>Space Criteria:</u> Nominal Floor Area: 300 SF Occupants: TBD Daylight: Not Required Sound Attenuation: None

Special Considerations:



Figure 6.60 Covered Loading Dock(s) Space Example

Covered Loading Dock(s)

Furniture List:

1. N/A

Equipment List

1. Security Devices



Figure 6.61 Covered Loading Dock(s) Space Layout (1/8" = 1'-0")

Freight Elevators to Reach All Floors

For a multi-level configuration of the Archives, a freight elevator accessible from the records receiving area must be provided.

Space Criteria: Nominal Floor Area: N/A Occupants: TBD Daylight: Not Required Sound Attenuation: None

Special Considerations:

Class A traction elevator, 5,000 lb capacity, pending evaluation of site selection and design configuration



Figure 6.62 Typical Freight Elevator

Freight Elevators to Reach All Floors

Furniture List:

1. N/A

Equipment List

1. Freight Elevator



Figure 6.63 Typical Freight Elevator (1/8" = 1'-0")

Secure Receiving Room

The secure receiving room provides a lockable space for processing new records that have recently been delivered. Space must be provided for inspection and storage. This space is the temporary storage location for records, pending distribution to the proper records storage location in the facility.

Space Criteria:

Nominal Floor Area: 800 SF Occupants: TBD Daylight: Not Acceptable

Sound Attenuation: None

Special Considerations:

Doors wide enough to allow palletized records to enter

Floor drain

Washable floors

Fire protection systems similar to records storage areas

Separate air handling system from records storage areas

Insulation to prevent migration of pests and mold



Figure 6.64 Secure Receiving Room Space Example

Secure Receiving Room

Furniture List:

Equipment List



Figure 6.65 Secure Receiving Room Space Layout (1/8" = 1'-0")

Quarantine Room

This space is similar to the receiving room but provides a biological safety cabinet. This room allows the facility to treat mold and other contaminants that have been found during initial receiving inspection.

Space Criteria:

Nominal Floor Area: 400 SF Occupants: TBD Daylight: Not Acceptable Sound Attenuation: None

Special Considerations:

Floor drain

Safety shower

Washable floors

Doors wide enough to allow palletized records to enter

Fire protection systems similar to records storage areas

Separate air handling system from records storage areas

Insulation to prevent migration of pests and mold



Figure 6.66 Quarantine Room Space Example

Quarantine Room

Furniture List:

- 1. Shelving
- 2. Moveable tables
- 3. Clearly marked trash cans

Equipment List

- 1. Biological Safety Cabinet
- 2. Security Devices



Figure 6.67 Quarantine Room Space Layout (1/8" = 1'-0")

Toilets

A small toilet room shall be provided adjacent to the docks. This will separate the functions of records receiving from the front-of-house operations, which also have toilets.

<u>Space Criteria:</u> Nominal Floor Area: 60 SF Occupants: 1 Daylight: Not Required Sound Attenuation: Between Rooms

Special Considerations:



Figure 6.68 Toilets Space Example

Toilets

Furniture List:

1. N/A

Equipment List

1. Toilet Room Fixtures and Accessories



Figure 6.69 Toilets Space Layout (1/8" = 1'-0")

6.5 Staff Work Areas

As presented in Chapter 5, Program Summary (pg 43), the spaces included in the staff work areas are:

- 1. Processing Room(s)
- 2. Archival Supply Storage
- 3. Imaging Lab
- 4. Conservation/Preservation Lab
- 5. Electronic Records Processing
- 6. Exhibit Prep Shop
- 7. Exhibit Staging Area
- 8. Director's Office

The following is a graphic summary of these spaces:

- 9. Archivist Offices
- 10. Workstations
- 11. Quiet Room
- 12. Multi-Use Room Large
- 13. Project Room
- 14. Staff Lounge
- 15. Office Supplies



Figure 6.70 Staff Work Areas Program and Adjacencies (1" = 40'-0")

Processing Room(s)

Processing rooms provide separate workspace from stacks and office areas where staff can work individually or in groups to examine, sort, arrange, describe and rehouse archival materials. Some records may be stored in processing rooms for extended periods of time. This programmatic element requires different spaces to handle paper records, oversized records, photos, film, and electronic records. Room for carts must be provided to allow records to circulate between processing, the lab, and the records storage rooms.

Space Criteria:

Nominal Floor Area: 3,500 SF Occupants: 2-4 People Daylight: Not Required Sound Attenuation: None

Special Considerations:

Environmental conditions should match or closely approximate conditions in the records storage rooms.

Adequate open space for parking carts





Figure 6.71 Processing Room(s) Space Example

Processing Room(s)



Figure 6.72 Processing Room(s) Space Layout (1/16" = 1'-0")

Archival Supply Storage

The archival supply storage room provides space for storing additional boxes, containers, processing supplies, and exhibit supplies.

<u>Space Criteria:</u> Nominal Floor Area: 600 SF Occupants: TBD Daylight: Not Desirable Sound Attenuation: None

Special Considerations:





Figure 6.73 Archival Supply Storage Space Example



Figure 6.74 Archival Supply Storage Space Layout (1/8" = 1'-0")

Imaging Lab

The preservation imaging lab provides space for staff to digitize records for preservation, researcher access, and use over the Internet.

<u>Space Criteria:</u> Nominal Floor Area: 450 SF Occupants: 2-3 People Daylight: Not Acceptable Sound Attenuation: None

<u>Special Considerations:</u> Dimmable lighting





Figure 6.75 Imaging Lab Space Example

Imaging Lab

Furniture List:

- 1. Moveable Tables
- 2. Computer Workstations
- 3. Chairs

Equipment List

1. Computers for Digital Record Processing

2. Digitizing/scanning Equipment for Microfilm and Paper Records

3. Shelving for short term storage of records being reformatted

4. Security Devices



Figure 6.76 Imaging Lab Space Layout (1/8" = 1'-0")

Conservation/Preservation Lab

This is a wet lab space for archival conservation and restoration.

Space Criteria:

Nominal Floor Area: 1,000 SF Occupants: 1-2 People Daylight: Some Daylight Desired Sound Attenuation: None

Special Considerations:

AV Filtration and Shades

Lab safety precautions for chemical storage

Separate air handling system

Environmental conditions should match or closely approximate conditions in the records storage rooms

Natural sunlight – but ultraviolet filtration on windows with shades or blinds

Floor load can accommodate heavy equipment

Waterproof and skid-resistant floors

Floor drains

Separate spaces for wet and dry work

Filtered and/or deionized water; may want 150 degree F water

220-volt power for special equipment

Ceiling mounted outlets or flexible cables

Adequate storage and open space for moving and storing large and bulky materials



Figure 6.77 Conservation/Preservation Lab Space Example

Conservation/Preservation Lab

Special Considerations (cont.):

Consider observation window for public observation

Labs should not be located over records storage areas – design to prevent leaks

Furniture List:

- 1. Lab Casework
- 2. Moveable Tables
- 3. Lab Stools
- 4. Computer station

Equipment List - can include:

- 1. Sinks one oversized
- 2. Chemical Storage cabinets
- 3. Fume Hood
- 4. Microscope
- 5. Elephant trunks
- 6. Humidification chamber
- 7. Drying racks
- 8. Book Press

9. Racks for rolled conservation supplies such as mylar

- 10. Paper cutter
- 11. Suction table
- 12. Mat cutters
- 13. Environmental monitoring equipment
- 14. Lab Safety Equipment eyewash

15. Shelving for books and supplies

16. Security Devices



Figure 6.78 Conservation/Preservation Lab Space Layout (1/16" = 1'-0")

Electronic Records Processing

This space provides facilities for digitization and electronic records operations. This space will house the necessary equipment for record reformatting and electronic record forensics.

Space Criteria:

Nominal Floor Area: 400 SF Occupants: 2-3 People Daylight: Not Required Sound Attenuation: None

Special Considerations: Dimmable lighting





Figure 6.79 Electronic Records Processing Space Example

Electronic Records Processing

Furniture List:

- 1. Moveable Tables
- 2. Computer stations

Equipment List - can include:

1. Media drives to recover data

2. Shelving for equipment, records, books and supplies

3. Security Devices



Figure 6.80 Electronic Records Processing Space Layout (1/8" = 1'-0")

Exhibit Prep Shop

The exhibit prep shop provides space and equipment for fabrication of displays.

<u>Space Criteria:</u> Nominal Floor Area: 800 SF Occupants: TBD Daylight: Not Acceptable Sound Attenuation: Between Rooms

Special Considerations:

Large, flexible space that includes space for planning, layout work, matcutting, exhibit construction, graphics presentation, and storage.

Should be adjacent to exhibit staging area and connected with either an overhead door or demountable partition

Double doors

Moveable furniture

Security to archival storage standards

Materials and finishes to archival storage standards

Clear path to accommodate objects up to 10'-0" x 10'-0" x 10'-0"





Figure 6.81 Exhibit Prep Shop Space Example

Exhibit Prep Shop

Furniture List:

- 1. Work Counters
- 2. Casework
- 3. Tables
- 4. Lateral Files
- 5. Shelving for Tool and Supply Storage

Equipment List

- 1. Fume Extractor Arm
- 2. Radial Arm Saw
- 3. Table Saw
- 4. Mitre Saw
- 5. Drill Press
- 6. Stainless Steel Sink
- 7. Scroll Saw
- 8. Dust Collection System
- 9. Carts
- 10. CCTV / Security



Figure 6.82 Exhibit Prep Shop Space Layout (1/16" = 1'-0")

Exhibit Staging Area

The exhibit staging area provides space for the final assembly of finished exhibits, to be placed in the exhibit gallery. This space opens up to the exhibit prep shop to allow larger exhibit materials to be assembled.

Space Criteria:

Nominal Floor Area: 500 SF Occupants: TBD Daylight: Not Acceptable Sound Attenuation: Between Rooms

Special Considerations:

Large, flexible space that includes space for planning, layout work, matcutting, exhibit construction, graphics presentation, and storage.

Should be adjacent to exhibit prep shop and connected with either an overhead door or demountable partition

Double doors

Moveable furniture

Security to archival storage standards

Materials and finishes to archival storage standards

Clear path to accommodate objects up to 10'-0" x 10'-0" x 10'-0"



Figure 6.83 Exhibit Staging Area Space Examples

Exhibit Staging Area



Figure 6.84 Exhibit Staging Area Space Layout (1/8" = 1'-0")

Director's Office

A single Type E office has been provided for the director of the facility in accordance with the District of Columbia Workplace Design Guidelines.

<u>Space Criteria:</u> Nominal Floor Area: 150 SF Occupants: 1 Person Daylight: Desirable Sound Attenuation: None

Special Considerations:



Figure 6.85 Director's Office Space Example

Director's Office

Furniture List:

1. Furniture per District of Columbia Workplace Design Guidelines

Equipment List

1. Equipment per District of Columbia Workplace Design Guidelines



Figure 6.86 Director's Office Space Layout (1/8" = 1'-0")

Archivist Offices

Two Type D offices have been provided for the head archivists for (1) Archives management and (2) records management, in accordance with the District of Columbia Workplace Design Guidelines.

Space Criteria:

Nominal Floor Area: 240 SF Occupants: 2 People Daylight: Desirable Sound Attenuation: None

Special Considerations:



Figure 6.87 Archivist Offices Space Example
Archivist Offices

Furniture List:

1. Furniture per District of Columbia Workplace Design Guidelines

Equipment List

1. Equipment per District of Columbia Workplace Design Guidelines



Figure 6.88 Archivist Offices Space Layout (1/8" = 1'-0")

Workstations

Workstations have provided in accordance with the District of Columbia Workplace Design Guidelines. Ten Type B workstations will be provided in this space. Additionally, the office should include space for copying, printing, faxing, and storage.

Space Criteria:

Nominal Floor Area: 640 SF Occupants: 10 People Daylight: Desirable Sound Attenuation: None

Special Considerations:



Figure 6.89 Workstations Space Example

Workstations

Furniture List:
1. Workstations per District
of Columbia Workplace Design
Guidelines
Equipment List

Equipment per District of
Columbia Workplace Design
Guidelines
Printer/Copier/Fax



Figure 6.90 Workstations Space Layout (1/8" = 1'-0")

Quiet Room

A quiet room has been provided in accordance with the District of Columbia Workplace Design Guidelines.

<u>Space Criteria:</u> Nominal Floor Area: 120 SF Occupants: 1 Person Daylight: Desirable Sound Attenuation: None

Special Considerations:



Figure 6.91 Quiet Room Space Example

Quiet Room

Furniture List:

1. Furniture per District of Columbia Workplace Design Guidelines

Equipment List

1. Equipment per District of Columbia Workplace Design Guidelines



Figure 6.92 Quiet Room Space Layout (1/8" = 1'-0")

Multi-Use Room Large

This is a conference room for back of house use. The space has been allocated based on the District of Columbia Workplace Design Guidelines.

Space Criteria:

Nominal Floor Area: 240 SF Occupants: 6-8 People Daylight: Desirable Sound Attenuation: Between Rooms

Special Considerations:



Figure 6.93 Multi-Use Room Large Space Example

Multi-Use Room Large

Furniture List:

1. Furniture per District of Columbia Workplace Design Guidelines

Equipment List

1. Equipment per District of Columbia Workplace Design Guidelines



Figure 6.94 Multi-Use Room Large Space Layout (1/8" = 1'-0")

Project Room

This space is intended to be reserved for specific projects in the pursuit of the Archives' missions. The space has been allocated based on the District of Columbia Workplace Design Guidelines.

<u>Space Criteria:</u> Nominal Floor Area: 400 SF Occupants: 10-12 People Daylight: Desirable Sound Attenuation: Between Rooms

Figure 6.95 Project Room Space Example

Special Considerations:

Project Room

Furniture List:

1. Furniture per District of Columbia Workplace Design Guidelines

Equipment List

1. Equipment per District of Columbia Workplace Design Guidelines



Figure 6.96 Project Room Space Layout (1/8" = 1'-0")

Staff Lounge

This is the staff break area, to be designed to meet District of Columbia Workplace Design Guidelines. This space must be separate from records storage, processing, and labs; staff working in areas with archival records will eat in the Staff Lounge.

Space Criteria:

Nominal Floor Area: 400 SF Occupants: TBD Daylight: Desirable Sound Attenuation: None

Special Considerations:



Figure 6.97 Staff Lounge Space Example

Staff Lounge

Furniture List:

- 1. Built-In Storage
- 2. Tables or Counters
- 3. Seating

Equipment List

- 1. Sink
- 2. Refrigerator
- 3. Microwave
- 4. Lockers for Interns
- 5. Security Devices



Figure 6.98 Staff Lounge Space Layout (1/8" = 1'-0")

Office Supplies

This is a storage space for office supplies. This would include anything from paper to spare computer terminals. This would not include supplies used for archival work.

Space Criteria:

Nominal Floor Area: 150 SF Occupants: TBD Daylight: Not Required Sound Attenuation: None

Special Considerations:



Figure 6.99 Office Supplies Space Example

Office Supplies

Furniture List:

1. Shelving

Equipment List

1. Security Devices



Figure 6.100 Office Supplies Space Layout (1/8" = 1'-0")

6 - DETAILED SPACE REQUIREMENTS \ DC PUBLIC LIBRARY OPERATIONS CENTER

6.6 DC Public Library Operations Center

As of the writing of this report, the DC Public Library has not provided the project team with their spatial requirements. As a result, a list of detailed space requirements cannot be included.



Figure 6.101 DC Public Library Operations Center Program (1" = 40'-0")



Figure 6.102 Possible Space Needs, DCPL Operations Center

159

6 - DETAILED SPACE REQUIREMENTS \ DC PUBLIC LIBRARY OPERATIONS CENTER

7 DESIGN NARRATIVE

7.1 Sustainability

To support the District of Columbia's sustainability objectives and building code requirements, this project will pursue LEED Gold Certification through USGBC. The building is eligible for certification under LEED v4 Building Design and Construction. Should the design phase and LEED Online registration commence prior to October 31, 2016, this project will also have the option to elect the LEED v2009 New Construction rating system.

At the beginning of the design phase, a kickoff charrette will identify appropriate sustainability measures to achieve this objective. Should a particular sustainability goal run contrary to an archival design guideline or standard, priority will be given to adhering to the archival design standards and the team will work with DGS to identify alternative approaches that will achieve the LEED project goals without negatively impacting the archival functions of the project.

7.2 Landscape

The landscape of an archival facility should be designed for water control, integrated pest management, and low maintenance. General requirements for the landscape design include:

- Omit vegetation within 18 inches of the exterior wall.
- Vegetation free zone must be sloped away from the foundation and consist of gravel or decorative aggregate with appropriate drainage.
- Trees and shrubs should not obstruct pedestrian lighting
 - Include under story plants no higher than 3 feet.
 - Include a tree canopy with limbs at least 7 feet above the ground.
 - Maintain a minimum of 15 feet between building and the drip-line of trees at full maturity.
- Omit pools, fountains and their related equipment.
 - If present, additional protection must be taken. If present, locate a minimum of 75 feet from the facility and 10 feet below the lowest level where archival records are stored.

7.3 Site

General Requirements

The DC Archives facility first and foremost needs to be located in Washington DC. Driving factors in site selection include: location, cost, availability.

Specific criteria for site selection for the DC Archives include:

- Located within short response time for emergency services.
- Quick evacuation.
- Protected from dangers from neighboring spaces and buildings.

7 - DESIGN NARRATIVE \ SITE

- Accessible to visitors
- Accessible to related agencies and to other cultural institutions.
- Accessible by main roads and public transportation
- Eligibility for site-related LEED credits

Many of the dangers that threaten an archival facility can be avoided by careful site selection and site work. In addition to location, cost, and availability, the site selection must consider other potential risks, including:

- Vandalism, terrorism, and intrusion.
- Natural disasters, such as earthquakes, landslides, etc.
- Fire and explosions
- Hazardous locations or materials
- Flooding from natural sources or water mains.
- Ground and air pollution
- Rodents and insects

The entire site and ancillary structures on the site should be a minimum of 5 feet above and 100 feet away from any 100-year floodplain area.

Site Size

The site for an archives/records center facility must be large enough to accommodate:

- Building footprint
- Site access and service roads
 - Roads, fire lanes, and parking areas should be designed to permit unrestricted access for emergency vehicles
- Sufficient parking
- Space for storm water management
- Separation between drop off areas, parking, loading, and the building
- Turning radii for large delivery and trash vehicles
 - 53 foot truck is recommended

In addition, the site should accommodate future growth.

Site Evaluation

Conduct a site survey and consider the adequacy of the site using the above listed criteria (see Chapter 9 for Preliminary Site Evaluation, pg 211). Also complete a geotechnical investigation and a security risk assessment. If needed, conduct an archeological assessment.

7 - DESIGN NARRATIVE \ STRUCTURAL

Special Utility Requirements

The water supply, sewer, and storm drainage systems should all be readily available and meet the requirements outlined by codes and NARA 1571's requirements.

The primary electric power from the network to the building must run underground in conduit. All conduits for the primary power must have at least 50% spare conduit capacity. Consideration should be given to a redundant primary feeder.

7.4 Structural

1. Structural Systems

a. General

Architectural design and programming for this project is at an incipient stage, and therefore a selection on the structural systems of the proposed Archives Facility has yet to be determined. A variety of occupancies are anticipated and include reception, research, storage, and other work and operations related spaces. Storage spaces may include shelving that ranges from low density fixed static shelving to high density compact mobile shelving. These spaces may require long spans with column free zones.

New building construction is envisioned as either a steel beam and column structure with concentrically braced frames, or a conventional cast-in-place concrete structure with ordinary reinforced concrete shear walls. Different variables such as site restrictions, the proposed building floor plate and geometry, proposed building height, adjacent structures, or a number of other design considerations may help to inform the practicality and economy of one structural system over another.

Lateral overall building deflection due to wind will be limited to H/500, while inter-story drift ratios will be limited to H/400. The allowable story drift due to seismic load will be limited to H/250.

While a site has yet to be selected for this project, for the purposes of determining structural design criteria, the project is located in Washington, DC, Zip Code 20003, Latitude 38.8898, Longitude -77.0035.

b. Foundations

A comprehensive geotechnical study will be performed for this project, and will form the basis for the design of the proposed new building's foundations. The soil conditions in the Washington DC area are highly variable, so until site-specific geotechnical information is established, a recommended foundation system cannot be determined. Due to the typically less than favorable soil conditions and the nature of the heavy loading imposed by archive-type structures, either a deep foundation system, a heavy mat slab foundation, or conventional shallow spread footing foundations with a soil improvement system may be anticipated.

c. Slab-on-Ground

The typical building slab-on-ground will consist of a 5-inch thick slab reinforced with #5 bars at 18" on center each way. Where especially heavy storage areas or high density shelving units occupy space on the slab-on-ground, construction will consist of a 7-inch thick slab reinforced with #6 bars at 18" on center each way.

Slabs-on-ground will be designed according to the floor flatness and levelness numbers described in ASTM E 1155. Typical slabs must meet overall Ff and Fl values of 25/20, and local Ff and Fl values of 17/13, respectively. Slabs with specialty flooring materials, and slabs with sensitive shelving units may need to meet more stringent flatness and levelness specifications.

7 - DESIGN NARRATIVE \ STRUCTURAL

A vapor retarder will be installed under all slabs-on-ground to prevent vapor drive through the slabs.

d. Typical Floor Construction

While the floor construction has yet to be determined, the structural systems will be designed to accommodate a Class 9 superflat floor surface as defined in the ACI 302.1R, Guide to Concrete Floor and Slab Construction. A Class 9 floor will be required to achieve the anticipated surface tolerances, which will be specified by the high density shelving equipment suppliers. Overall Ff and Fl values of 60/40 is the minimum flatness/levelness for Class 9 floors, and a bonded topping slab is anticipated in order to accommodate this criteria.

2. Structural Design Criteria

a. Codes and Standards

- 1. District of Columbia Building Code, 2013 (based on the 2012 International Building Code)
- 2. Minimum Design Loads for Buildings and Other Structures (ASCE 7-10)
- 3. Building Code Requirements for Structural Concrete (ACI 318-11)
- 4. Building Code Requirements for Masonry Structures (ACI 530-11)
- 5. Specifications for Structural Steel Buildings (AISC 360-10)
- 6. Seismic Provisions for Structural Steel Buildings (AISC 341-10)
- 7. Structural Welding Code—Steel (AWS D1.1-10)

b. Materials

1.	Cast-in-place concrete (general):	f'c = 4,000 psi
2.	Concrete, footings	f'c = 3,000 psi
3.	Concrete, frost walls:	f'c = 4,000 psi
4.	Concrete, slabs-on-ground:	f'c = 3,500 psi
5.	Concrete, slabs on metal deck:	f'c = 3,500 psi
6.	Reinforcing steel:	ASTM A 615, Grade 60
7.	Structural steel:	ASTM A 992, SQ
8.	Steel tubes:	ASTM A 500, Grade B
9.	Steel plates and angles:	ASTM A36
10.	Anchor rods:	ASTM F1554, Grade 36
11.	High strength bolts:	ASTM A 325
12.	Vapor retarder:	15 mil reinforced

7 - DESIGN NARRATIVE \ STRUCTURAL

c. Live Loads

	1.	Classrooms:	40 psf +15 psf partition (use 80)		
	2.	Offices:	50 psf +15 psf partition (use 80)		
	3.	Library Reading Rooms:	60 psf + 15 psf partition (use 80)		
	4.	Lobbies, First Floor corridors:	100 psf		
	5.	Corridors above First Floor:	80 psf		
	6.	Stairs and exits:	100 psf		
	7.	Assembly areas:	100 psf		
	8.	Mechanical rooms:	150 psf (or weight of equip)		
	9.	Storage rooms:	125 psf		
	10.	Library Stack rooms:	150 psf		
d. Snow Loads					
	1.	Ground snow load, Pg:	25 psf		
	2.	Uniform flat roof snow load, Pf:	30 psf		
	3.	Snow Importance factor, Is:	1.0		
	4.	Snow exposure factor, Ce:	0.9		
	5.	Thermal factor, Ct:	1.0		
	6.	Terrain Category:	B (Fully Exposed)		
	7.	Risk Category:	II		
e.	. Wind Loads				
	1.	Ultimate Design Wind Speed (V3s ULT):	115 mph		
	2.	Nominal Design Wind Speed (V3s ASD):	90 mph		
	3.	Wind Importance Factor, Iw:	1.0		
	4.	Exposure:	В		
	5.	Risk Category:	II		
	6.	Internal pressure coefficient:	+/-0.18		
	7.	Wind analysis procedure:	ASCE 7 Analytical Procedure		
f.	Seismic	eismic Loads			
	1.	Analysis Procedure:	Equivalent Lateral Force		
	2.	Site Class:	D (assumed)		
	3.	Risk Category:	II		

7 - DESIGN NARRATIVE \ EXTERIOR CLOSURE

4.	Seismic Design Category	В
5.	Seismic Importance Factor, Ie:	1.0
6.	Mapped Spectral Response Acceleration, Short Periods:	$S_s = 0.118$
7.	Mapped Spectral Response Acceleration, 1-Second:	$S_1 = 0.051$
8.	Design Spectral Response Acceleration at Short Periods:	$S_{DS} = 0.126g$
9.	Design Spectral Response Acceleration at 1-Second:	$S_{D1} = 0.081g$

g. Live Load Reductions

1. Live Load reductions will be used per the 2013 District of Columbia Building Code, and applied to the columns, where applicable. However, the maximum live load reduction for columns will be limited to 50% of tabulated live load capacity, L_0 .

7.5 Exterior Closure

The new DC Archives and Records Center facility shall provide an attractive building, constructed of durable materials, that is economical and easily maintained. Should a partial or complete retrofit option be selected, any additions to the existing facility will be complimentary and coordinated with the site and any adjacent uses.

The envelope design will contain the following key features:

- Wall and insulation system shall exceed required R-values provided by code. The exact R-value will be optimized in conjunction with an energy analysis to provide energy efficiency and temperature stability in a loss of power event.
- Vapor barrier and insulation system shall maintain the individual climate requirements in the archival and records center facilities without producing condensation inside these facilities.
- Building materials shall be provided to reduce the off-gassing of volatile organic compounds (VOC's), especially materials used in archival and records center storage areas.
- All exposed concrete slabs should be sealed or coated to prevent moisture migration and dust.
- Membrane roofing system shall be designed such that roofing penetrations over the archival and records center storage facilities are minimized. Roofing material to be high-SRI to minimize heat gain.
- Accessible, lockable, weather tight roof hatch will be provided in mechanical room for access to the roof. Provide access from roof of mechanical room to all adjoining roofs as needed; provide fall protection and anchorage points at ladders and roofs.
- Provide a dedicated walking surface on all roofs with guardrails to facilitate maintenance and inspections.
- Expansion capabilities will be incorporated into the design of the archival storage, records center storage, and key service corridors. One example is the inclusion of knock out panels for doors to a future expansion.

Envelope Commissioning

Envelope commissioning will include all archival and records center storage facilities. Ancillary spaces including the access corridor and the mechanical rooms will not be commissioned. Archival facilities require an envelope that minimizes air

7 - DESIGN NARRATIVE \INTERIOR CONSTRUCTION

leakage into and out of the storage facilities to protect the collection and minimize the energy required to maintain the specified interior environmental conditions. Provide envelope commissioning in accordance with ASHRAE 189.110.3.1.2.4 b & c.

A continuous vapor retarder with a minimum of openings in the vapor retarder shall be provided to protect the collections and minimize the energy required to maintain the specified interior environmental construction. The vapor retarder shall be provided on all six sides of archival and records center storage facilities.

Smoke vents in the roof of the archival and records center facilities shall be provided to allow for the release of smoke should a fire event occur within the storage facilities. Air leakage and the transfer of water vapor through the smoke vent should be minimized consistent with commercially available products.

Thermal Imaging of the archival and records center storage facilities will be done to identify thermal short circuits through the building envelope.

An OSHA fall protection system for the building shall be provided in compliance with OSHA, Appendix C to 1910 Subpart F, Personal Fall Arrest Systems.



Figure 7.1 Sample Exterior Closures Satisfying Thermal, Moisture, and Durability Requirements

7.6 Interior Construction

Interior construction shall include the following features:

- Steel bollards, guards, and bases will be designed to protect the interior finishes from impacts by the order pickers in the archival and records center storage facilities and the circulation corridor.
- In general, office spaces and reading rooms will have low pile carpet flooring, acoustical ceilings and painted walls.
- Public spaces such as lobby/reception and exhibit gallery may have a more durable harder floor finish such as terrazzo.
- Storage areas require low VOC content and as such finishes will be determined that are hard, durable, and low VOC such as concrete.
- Loading dock areas will have sealed concrete floors.

7 - DESIGN NARRATIVE \ MATERIALS & FINISHES

- Other special spaces such as Processing Rooms and Labs will have finishes conducive to the function, such as low VOC and easy to clean flooring, walls, and ceilings.
- Formaldehyde-based insulation and foam in place insulation are not acceptable for records storage, processing, labs, and exhibit galleries.

7.7 Materials & Finishes

In addition to proper climate and filtration conditions, archival collections require storage environments that contain materials and finishes that minimize the off gassing of volatile organic compounds (VOC) and other chemicals that can contaminate the air and degrade the records. Materials that contain biological contaminants or might invite mold must also be avoided in records storage environments. All materials and finishes used in archival facilities must meet the requirements of the building life safety and fire codes. Furthermore, because archival facilities are usually constructed to last decades, if not centuries, the materials and finishes selected should be of the highest quality and both durable and attractive.

Off gassing should be a major consideration when carrying out building planning, especially for records storage rooms. Release of harmful substances from building materials and finishes should be minimized in the areas where records are handled or displayed, including processing areas, exhibit areas, laboratories, and research rooms. In reality, most adhesives and coatings, including those labeled "green," do not dry, or cure, instantaneously; moreover, nearly all give off some gas or vapor while curing. The goal for selecting materials and finishes for archival facilities is to avoid unstable or slow curing materials. As much as possible, paints, sealants, caulks, wood products, foams, and other materials selected for archival facilities should have low or no VOC emissions.

Prohibited Materials

Certain materials must be prohibited from archival storage rooms and exhibit cases where original documents are displayed. Prohibited materials should also be avoided in processing, records holding, laboratories, and exhibit spaces. Materials and finishes deemed "prohibited" have been identified by conservators, chemists and archivists as such because of their deleterious properties that are known to rapidly degrade records. Prohibited materials include:

- asbestos
- cellulose nitrate
- lacquers and adhesives
- acid-curing silicone sealants and adhesives
- materials containing sulfur
- pressure sensitive adhesives
- formaldehyde
- unstable chlorine polymers (PVC).

Refer to Appendix B – Prohibited Materials (pg 237) for a complete list of prohibited materials for archival facilities. It should be noted that some materials listed as prohibited are currently unavoidable in some building materials but every attempt should be made to substitute safer materials as they become available. For example, electrical cables are common construction materials that often contain PVC, which is listed as a prohibited material.

7 - DESIGN NARRATIVE \ MATERIALS & FINISHES

Selection and Testing

Within the last twenty years, much new information has been developed about the types and use of materials and finishes in archival facilities. Archives, museums, conservation laboratories, and related industries share information about dangerous or questionable building materials through technical publications and their websites. Specifically, institutions such as the National Archives and Records Administration (NARA) and the Canadian Conservation Institute (CCI) provide guidance on a variety of materials and finishes. NARA cites its facility standards and outlines test methods for certain products in the specifications for their archival facilities. For example, NARA has standard test methods for painted or powder coated finished metal surfaces. A list of the products that have been tested by NARA's Research and Testing Lab, such as tapes, inks, and boxes is published on its website, www.archives.gov. The Canadian Conservation Institute has a wide variety of useful publications including those on the nature and use of coatings and on the acidity of wood species.

Unfortunately, it is not possible to identify all of the materials and products that should be avoided or used in archival facilities and even tested materials change formulas and ingredients and must be continually checked and monitored. Evaluation and testing is needed as new and reformulated products are proposed for the archival facilities. There has been a sizeable growth in "Green" products being marketed over the last five years. However products labeled "green" or "sustainable" may be better for the environment but are not necessarily safer for archival collections. These newer materials and finishes must be tested and evaluated with the same care as older products.

Institutions that are considering using new or untested products in areas where records are stored, exhibited or used should review the Material Safety Data Sheets (MSDS) for these products. One place to start is checking the items against those substances listed on the Prohibited Material list in Appendix B (pg 237) or discussed in NARA and other standards. Further consultation with certified laboratories, conservators, chemists, and experts in this field should be considered, especially for new products to be used in records storage areas.

Building Materials

The external building materials for an archives facility should ensure the permanence of the records and meet the storage and public demands of the building. Materials must be durable, provide appropriate protection from fire, heat, cold, humidity and moisture, be easy to maintain and keep clean, and meet the facility's program requirements. Whenever possible, the external building materials should be limited to those known to be stable and inert, and that will minimize the emission of harmful substances such as smoke and soot in the event of a fire. Particular attention should be paid to insulation, adhesives, epoxy materials and caulks. All exposed concrete walls and slabs, including spaces beneath raised floor systems, should be sealed or coated to prevent moisture migration and dust.

Internal building materials also must be selected with care. In particular, formaldehyde-based insulation and foam in place insulation are not acceptable for records storage, processing, labs, and exhibit galleries.

Building Acclimatization

In newly constructed or renovated facilities, time should be allotted for the building materials to dry, or cure before staff or collections move into the building. This allows the internal environments to stabilize and vapors from off gassing to dissipate before any archival records move into the building. A minimum of four weeks is recommended to acclimatize an area within the building, although a longer time period is preferred for the stacks.

All building air handlers should be in continuous exhaust mode during the acclimatization period to reduce the level of pollutants. Air filters should be changed before archival material is moved into the building. Air filters, ducts, and other

7 - DESIGN NARRATIVE \ MATERIALS & FINISHES

equipment should be checked and adjusted after moving in archival materials because the move will create new dirt and dust.

Records Storage Areas

The records storage areas should have the highest level of cleanliness and best environmental conditions in the archival facility. Stacks must be limited to the storage of the archival collections. Consequently, they should contain only the components necessary to house and store the collections. Equipment typically used in records storage rooms include shelving; cabinets; boxes or containers housing the collections; and mechanical lifts, book trucks and carts used to move and transport records. Staff workstations, copiers, excess equipment, and unnecessary furniture must never be located in records storage rooms.

Carpet, vinyl tiles, and wall coverings must not be used in records storage areas. General requirements include sealed concrete floors and water based latex paint. Specific requirements are detailed in the SAA Standard for Archival Facilities and in NARA 1571.



Figure 7.2 Materials and Finishes for Records Storage Areas

Other Facility Areas

Processing areas, the holding room, labs, and exhibit galleries will be occupied by staff and temporarily by archival records. Floor materials and finishes should be durable, attractive, and easy to clean and maintain. As much as possible, care should be taken to develop an environment that is identical to the records storage areas.

In particular products that should be avoided in processing rooms, holding, labs, and exhibit galleries include:

- plywood and other wood composites
- woods and oil based finishes
- bamboo with formaldehyde binders

Other products for these areas are recommended with reservations.

Staff and visitors will occupy research rooms while they temporarily review the collections. As much as possible, care should be taken to develop an environment that is similar to the stacks understanding that the area also needs warmth, inviting

7 - DESIGN NARRATIVE \ EQUIPMENT & FURNISHINGS

décor, and sound absorption. The guidelines are not as stringent for research rooms since the archival materials are out for a short time.

In particular:

- Wood floors should be avoided.
- Low or no VOC low pile carpet or carpet tiles with non-wet, acrylic adhesive are recommended if carpet is used. Book trucks and carts should be able to easily travel across the floor.
- Solid wood and composite wood products are not recommended. However, it is often used for furniture because it is readily available and attractive. If used, select wood that is low in harmful emissions. See NARA and SAA guidelines for specific details.

Materials and finishes used in the remaining areas of the archival facility should also be carefully considered. At a minimum, all materials proposed for the archival facility should be checked against the prohibited materials list and current archival facility standards.

7.8 Equipment & Furnishings

Equipment and furnishing shall include:

- Mobile Compact Metal shelving (15 high) by a vendor such as "Spacesaver" will be required.
- Normal office furniture will be needed along with specialized equipment for the Archival facility. Chapter 6, Detailed Space Requirements (pg 53) indicates the program use and equipment that will be needed in those rooms to properly function. In addition to operating costs, DC will need to budget for the equipment and furnishing based on those requirements.



Figure 7.3 Compact Mobile Shelving (15-high)

7 - DESIGN NARRATIVE \ CONVEYING SYSTEMS

7.9 Conveying Systems

It is assumed that the facility will have more than one floor. Therefore elevators will be required. We will assume for early programming that 1 passenger elevator and 1 service elevator will be required. The passenger elevator should provide easy access of the patrons to the reading rooms. The service elevator should provide easy access from the loading docks, processing areas and storage areas and will need to be heavy duty and oversized to accommodate the loads.

7.10 Plumbing Systems

The design of the plumbing systems will accommodate the entire building and will be in accordance with the 2013 District of Columbia Building Code.

Site Utility Coordination

The plumbing systems design shall include the coordination of sanitary drainage and storm drainage laterals, domestic water and fire services, and natural gas service with the available utility locations indicated on the civil site utilities plan. All utilities will be coordinated with the civil engineer to include systems, sizes, and inverts. The systems will be shown on the plumbing drawings leaving the building to a point 5 feet outside the building envelope and indicated to continue on the civil plans.

Coordination with Archival Spaces

The design of the plumbing systems serving the facility shall be closely coordinated with the architect to ensure that no roof drains, storm drainage piping, sanitary drainage piping, or natural gas distribution or vent piping is located above or within spaces containing archival holdings. In instances where this program requirement cannot be met, a containment piping system shall be designed for the portions of the systems that present a hazard to the collections.

Domestic Water Systems

An entrance room shall be provided adjacent to the exterior wall of the building to accommodate the domestic water service entering the building from municipal water supply in the street. The water supply shall enter the building through the wall of the water service room into a reduced pressure zone backflow preventer, and a water meter. All portions of the building plumbing fixtures and equipment shall be protected from static pressures greater than 80 psi by the installation of pressure reducing valves.

The water service piping material shall be ductile iron.

1. Domestic Cold Water Distribution

- Domestic cold water shall be extended to all plumbing systems within the building that require water. The distribution system shall consist of vertical risers at various locations to serve the upper floors. Shut-off valves shall be provided at all floor levels and service stops at all plumbing fixtures. The domestic water distribution system shall be sized in accordance with the recommendations of the International Plumbing Code.
- Potable water piping will be sized to maintain a minimum pressure of 30 psig at the furthest flush valve and at the hydraulically most remote safety shower or equipment requiring these pressures for operation. Provisions will be made to reduce any water hammer with water hammer arresters and hydroneumatic tank.
- All above grade piping shall be type "L" copper tubing with wrought copper fittings. All domestic cold-water piping shall be insulated.

7 - DESIGN NARRATIVE \ PLUMBING SYSTEMS

2. Domestic Water Heater

- The water heater shall be a central storage type water heater. Hot water shall be piped to all the plumbing fixtures requiring hot water. A hot water circulating pump shall be installed if the overall distance to the fixtures from the tank exceeds 50 feet. The hot water circulating pump shall operate from an aquastat.
- The water heater tank shall be equipped with heat trap, expansion tanks, vacuum relief valves, and pressure and temperature relief valves.
- Water heater efficiency shall comply with ASHRAE 90.1

3. Domestic Hot Water Distribution System

- The domestic hot water system shall serve all plumbing fixtures requiring hot water within the building. Hand washing facilities at all common area public lavatories shall be equipped with tempering valves in accordance with ASSE1070 and shall limit the tempered water to a maximum of 110 degrees F.
- All domestic hot water piping shall be type "L" copper tubing with wrought copper fittings. All hot water piping shall be insulated with fiberglass insulation and factory applied jacket.



Figure 7.4 Typical Archival Plumbing System

Storm Drainage System

Roof Drains

The roof drainage system shall consist of roof drains, gutters and downspouts. The roof shall slope at 1/4 inch per foot slope toward roof drains. No roof drains or storm drainage piping shall be located above archival records storage spaces. The roof drains shall be cast-iron bodies with sump receivers and dome strainers. Overflow roof drains shall be elevated 3 inches above the roof deck at the low point or shall have 3-inch high water dams.

Drainage System

The storm water drainage system shall serve all roof drains, area drains, and planter drains within the building. The system risers shall be routed from the upper floor to the lowest floor with as few offsets as possible. A base clean-out shall be installed at the bottom of all vertical risers. The drainage pipe shall be sized based on the square footage of water collection, and based on 3.2 inches of rainfall per hour. The pipe material shall be cast iron. All storm drainage piping shall be insulated to protect against condensate drip.

7 - DESIGN NARRATIVE \ PLUMBING SYSTEMS

Sanitary Drainage System

The sanitary drainage and vent system shall serve all plumbing fixtures with integral drains. The sanitary system shall be designed to limit the length of horizontal runs above grade. Multiple risers shall be installed to drain the upper floor systems. A cleanout shall be installed at the base of all risers. The sanitary drainage system material shall be no-hub cast iron for systems above grade. Systems below grade shall be schedule 40 PVC. All drainage piping less than 3 inches in diameter shall be installed at 1/4 inch slope per foot of run. All piping 3 inches in diameter and larger shall be installed at 1/8-inch slope per foot of run.

The vent system shall run vertically through the building at each sanitary riser and connect at the base. The vent risers shall terminate on the roof. Common venting shall connect horizontally to the risers. The vent material shall be no-hub Cast-iron, PVC, or DWV copper.

All emergency floor drains shall be equipped with trap primers to maintain the trap seal.

Plumbing Fixtures

- Water closets, flush valve wall mounted with elongated front, open seat with handle and no cover.
- Lavatories, wall mounted vitreous china with single handle chrome plated faucet and grid drain.
- Pantry sinks, 304 stainless steel with gooseneck chrome plated faucet, disposer, and dishwasher connection.
- Other specialty fixtures as needed to support laboratory or other specialized process operations will be identified during the schematic design phase of the project.

Natural Gas System

The natural gas system shall be served from the house gas meter. The gas system shall serve the water heater boilers and HVAC equipment. The natural gas piping shall be schedule 40 black steel with threaded and/or welded fittings. The gas system shall be 2 psi from the gas meter to the secondary PRV at each appliance.

A separate gas meter and system shall be provided to serve the emergency generator.

Water Conservation

All plumbing fixtures shall be "water-sense" type or comply with the following:

PLUMBING FIXTURE RATE OR	MAXIMUM FLOW OR	
QUANTITY	FIXTURE FITTING	
Lavatory, public, (metering)	0.25 gallon per metering cycle	
Lavatory, public (other than metering)	0.5 gpm at 60 psi	
Shower head	1.5 gpm at 80 psi	
Sink faucet	2.2 gpm at 60 psi	
Urinal	0.5 gallon per flushing cycle	
Water closet	1.28 gallons per flushing cycle	

7.11 Heating, Ventilating, & Air Conditioning (HVAC)

Overview

The purpose of the HVAC systems in DC new archival and records center facility is to provide a safe, clean, comfortable, and healthy environment for the occupants and to ensure the preservation of the collections. Initial design strategies are provided and will be further developed after site selection.

1. Reference Codes & Standards

- 2013 D.C. Building Code, based on the 2012 IBC, International Building Code.
- SAA Archival and Special Collections Facilities Guidelines, 2009.
- NARA 1571 and 1571S, Design Standard for Presidential Libraries (Archival Requirements), 2014.
- 36 CFR 1234, Facility Standards for Records Storage Facilities
- NFPA 232, Standard for the Protection of Records, 2012.+
- NFPA 90A, NFPA 10, NFPA 13, NFPA 20, NFPA 30, and NFPA 70
- ASHRAE Standard 15-1994, Safety Code for Mechanical Refrigeration
- ASHRAE Standard 34-1992, Number Designation and Safety Classification of Refrigerants
- ASHRAE Standard 55-2010, Thermal Environmental Conditions for Human Occupancy
- ASHRAE Standard 62.1-2010, Ventilation for Acceptable Indoor Air Quality
- ASHRAE Standard 129-1997: Measuring Air-Change Effectiveness
- ASHRAE Standard 90.1-2010, Energy Efficient Design of New Buildings Except Low-Rise Residential
 Buildings
- American Society of Testing and Materials (ASTM) Standard
- ASHRAE Handbooks: Fundamentals 2013, HVAC Systems and Equipment 2012, HVAC Applications 2015 & Refrigeration 2014
- 2013 International Mechanical Code
- 2013 International Energy Conservation Code
- Sheet Metal and Air Conditioning Contractors National Association (SMACNA).

2. Construction

Required Features

The Building Codes and Energy conservation codes have determinate requirements for construction. The specific construction, orientation, materials, insulation, fenestration, shading and other construction parameters can have significant impact on mechanical system and energy efficiency. Comprehensive HVAC requirements and guidelines are detailed in NARA's Design Standards and in the SAA's Archival Facility Standards. Certain assumptions can be made about the design criteria about DC's new facility, but specific details will be determined once a site is selected. Below is an overview of the HVAC requirements for a new DC Archives/Records Center.

3. Design Issues

The Archives/Records Center facility must be designed to so that the specified environmental criteria is met and sustained. Maintaining an effective preservation environment for archival records depends on the building's basic architectural design (e.g., windows, vapor retardants), use of appropriate building materials, and the building's operation (e.g., hours of operation, availability of tempering sources). Proper and robust temperature, relative humidity, and air filtration systems are critical to protecting the collections and offering a safe and healthy environment for the staff and visitors.

In a building of the size proposed for DC, records storage, processing rooms, and other critical areas such as labs and exhibit gallery should be served from a separate, dedicated HVAC system than those serving the rest of the building. Separate systems for collection and noncollection areas allow isolation of environments and can reduce project costs for noncollection areas.

The environmental criteria for records storage should not be compromised at any time. The HVAC engineer should be involved early in project planning to ensure that space layout does not present unnecessary problems or costs.

4. Building Envelope

The building envelope must be designed to be airtight, with fresh air, outside air, and make-up air intake achieved through a deliberate system. A building-wide air filtration system must be installed to provided particulate filtration in all public and staff areas. Additional filtration will be required for records storage areas. The envelope must be humidity tolerant, allowing the relative humidity standards to be maintained without damage to the structure. A new building must be designed to be humidity-tolerant. The ability of an existing building to withstand the relative humidity standards must be carefully considered. An existing building may require specialized weatherproofing or insulation products and design. The records storage areas must be provided with sufficient insulation to support a stable, continuous level of relative humidity and temperature.

5. Loads.

Certain load characteristics of collection buildings should be considered in system design. The HVAC system should be designed to operate 24 h/day, but with flexibility for adjustment. Some rooms tend to have high occupancy only at certain times. The system should be designed to handle this load as well as the more common part-loads. Many engineers design to 20 ft² per person because part of the room is never occupied. In other facilities, where the space is extensively used for receptions, openings, and other high-traffic activities, even higher density assumptions may be justified.

Lighting loads vary widely from space to space and at different times of the day. The lighting loads, as input for mechanical load calculations, will be taken from electrical designer.

6. Mechanical Systems

In designing the HVAC system, it is important to establish a cooperative relationship among the mechanical engineer, architect, other discipline designers, and owner, especially the staff responsible for preserving the collection. The mechanical systems in an archival facility provide a safe, clean, and healthy environment for the building's occupants and ensure the preservation of its collections. The systems should be durable, designed for energy efficiency, and allow for ease of maintenance. The Mechanical system, along with the structure, design and other building systems must address the nine types of threats for collections:

- a. Light damage
- b. Relative humidity
- c. Temperature
- d. Air pollution
- e. Pest infestation
- f. Shock and vibration
- g. Natural disasters
- h. Theft and Vandalism

7. Primary Elements and Features

The following primary HVAC elements and features provide a good preservation environment for an archival facility, as in Figure 6 (Lull 1990)- ASHRAE HVAC APPLICATIONS:



Figure 7.5 Primary Elements of Preservation Environment HVAC System, Figure 6 (Lull 1990)- ASHRAE HVAC Applications

8. Constant Air Volume

Air should be constantly circulated at sufficient volume, regardless of tempering needs, to ensure good circulation throughout the records storage space. In general, perimeter radiation and other sensible-only heating or cooling elements should be avoided, because they can create local humidity extremes near collections. The conditions need to be maintained in all parts of the records storage spaces. Effective air circulation is critical.

9. Cooling System

Several systems are available, including direct expansion (DX) cooling, glycol, and central chilled water. Screw compressors are recommended to generate chilled water at 36°F for use in chilled-water coils, which generally have copper fins and tubes. Conventional, DX, and chilled-water systems have a limitation in producing 36°F chilled water; therefore, desiccant systems may be considered instead. Ice storage systems with glycol also could be used.

10. Heating System

Several systems are available to generate heat, including steam and oil with converter, modular boilers, and scotch marine boilers. Hot water is circulated through heating and reheat coils for temperature and humidity control in the space.



Figure 7.6 Sample Archival Cooling and Heating Systems

11. Humidification

Humidification should be provided by steam or deionized water introduced in the air system. Evaluate the moisture source for risks of pollutants. Often heating steam is treated with compounds (especially amines) that can pose a risk to the collection (Volent and Baer 1985). Systems should be selected and designed to prevent standing pools of water, and should follow good humidification design as per 2012 ASHRAE Handbook—HVAC Systems and Equipment. Humidification methods include electronic steam humidifiers, clean steam humidifiers, evaporative pan humidifiers, spray-coil wetted element systems, and ultrasonic humidification. All materials in humidification equipment should be selected to minimize microbial growth and degradation of system components.

Unlike most other applications, HVAC design for this building type is often more concerned with humidity control than temperature control. The averaging effect of a common mixed return air and common humidifier on a central system is preferred, but sometimes zone humidifiers have been necessary to recover from unsatisfactory conditions, even when the same humidity level is desired in each zone on the same system.

Maintaining widely different conditions in zones using the same air handler can be difficult to achieve and wastes energy. If possible, different zone conditions should have the same absolute moisture content, using zone reheat to modify space humidity for different relative humidity requirements.

12. Dehumidification

The most common problem in archival facilities is inadequate or ineffective dehumidification. Modest dehumidification can be achieved with most cooling systems, limited by the apparatus dew point at the cooling coil, and requiring adequate reheat. Most problems derive from compromises in the cooling medium temperature or lack of reheat. Some chilled-water systems may not reliably deliver water that is cold enough, or may have chilled-water temperature reset or cooling coils that are too shallow for dehumidification to occur. Zone reheat is essential to maintaining necessary conditions in the spaces.

Sebor (1995) suggests the following typical approaches to more aggressive dehumidification:

- a. Low-temperature chilled water, usually based on a glycol solution, offers familiar operation and stable control but requires glycol management.
- b. DX refrigeration tends to be better for small systems and has lower capital costs, but generally is less reliable, requires more energy, and may require a defrost cycle.
- c. Desiccant dehumidifiers can be quite effective if properly designed, installed, and maintained. Economy of operation is very sensitive to the cost of the regeneration heat source. Liquid desiccant systems eliminate (1) the need to cool the air below the dew point, and (2) reheat, both of which are very important cost factors for sustainability.

Desiccant systems (Figure-7 right - ASHRAE HVAC APPLICATIONS) may be a good solution in many cases that require humidity between 30 and 35% RH year-round. Desiccant regeneration is required. Silica gel and rotary wheel dehumidifiers are commonly used. For libraries or archives requiring cool, dry conditions, a desiccant system may be required.



Figure 7.7 Packaged Desiccant Dehumidification Unit (Setty 2006)

13. Mechanical Environmental Control

- a. Temperature Control
 - i. Heating, cooling, air circulation and ventilation equipment
 - ii. Mechanical Ventilation
 - iii. Insulation in building envelope
 - iv. Minimized solar load during cooling season
 - v. Lighting controls
 - vi. Regularly scheduled inspections and maintenance for building and environmental control systems
 - vii. Operational controls
- b. Relative Humidity Control
 - i. Humidification, dehumidification, and air circulation equipment

- ii. Air conditioning (cooling) equipment
- iii. Temperature control
- iv. Vapor barrier in building envelope
- v. Regularly scheduled inspections and maintenance for building, plumbing, environmental control systems
- vi. Operational controls
- c. Pollutant Control
 - i. Filters in the HVAC system
 - ii. Non transferring Energy recovery systems
 - iii. Careful selection of materials and finishes used inside the building
 - iv. Separate ventilation for kitchen
 - v. Operational controls

14. Design Criteria

The mechanical systems for an archival facility should be designed so that the environmental criteria are achieved and not compromised at any time.

- a. In larger facilities, stacks and other critical areas should be served from a separate, dedicated Heating, Ventilation, and Air-Conditioning (HVAC) system(s) than those serving the rest of the facility.
- b. Records storage rooms, processing areas, and exhibits must be isolated from sources of pollutants, such as the loading dock, machine rooms, or spaces where cooking, painting, exhibit production, and other such activities take place.
- c. The entire building should be under positive air pressure. In particular, records storage areas should be kept under positive air pressure.
- d. Areas such as the loading dock, food preparation areas, and exhibit production areas should be kept under negative pressure in relation to adjacent spaces.
- e. The building envelope should be airtight with fresh air, outside air, and make-up air controlled through the mechanical system.
- f. Climate control for the records storage areas must be accomplished by fixed systems. Portable heating, air conditioning, or humidity control equipment must not be used in stacks.

15. Location

Mechanical equipment should not be placed on the roof. Equipment on roofs can damage the roofing system. In addition, the necessary maintenance activity, including the walking to and from roof equipment locations, stresses the roofing system. If equipment must be placed on the roof, it should not be located over stacks, processing, exhibition, or laboratory areas. If mechanical rooms are provided, then these rooms shall be separate from other rooms in the building.
Boilers, furnaces, humidification, dehumidification, air conditioning, and other climate conditioning equipment that serve the stack must not be located within the stack enclosure. In addition, all controls for utilities that serve stacks must be located outside of the stack so that access to the controls does not require entry to the stack.

Ducts and pipes that do not serve the stack must not enter or pass through the stack. Any pipe that serves a stack must have its point of penetration through the wall completely filled with cement or other approved grouting.

Mechanical spaces and water piping should not be located above or adjacent to records storage areas. Leaks in mechanical spaces are common, and even with optimum waterproofing, liquids can enter adjacent areas. If a mechanical room must be located above a stack, then additional water proofing measures must be installed, up to and including a "roofing" system with appropriate drains under the mechanical room that removes any water that leaks through the mechanical room floor. Install water sensors in the records storage rooms to detect leaks that might originate from the roof, mechanical spaces, or bathrooms. If appropriate, consider installing water sensors in mechanical spaces for early leak detection.

Ductwork inside records storage and processing rooms must be kept at a minimum, while supplying the required critical environments. Ductwork must not pass through a records storage room to supply another area. Location of the vents and return ducts must provide air mixing and a constant environment throughout the space while maintaining and maximizing usable space for shelving and storage equipment.

Holdings must not be housed directly adjacent to vents or returns. This necessitates coordination between the HVAC system design and the layout of the shelving.

When mechanical rooms are located adjacent to stacks, special precautions should be taken to guard against water infiltration through walls. Walls should be water proofed and additional floor drains installed to rapidly remove any accumulation of water within the mechanical spaces. In addition, depending on the type of mechanical room, vapor barriers in the walls may also be necessary to maintain appropriate environmental conditions in adjacent archival storage areas.

Access for service and replacement parts for the mechanical systems must be designed so that its components are accessible without entering archival storage spaces, except for those specifically located within the archival space (e.g. lighting, fire and smoke alarm components, sprinkler piping, etc.)

16. Equipment Redundancy

HVAC system redundancy in stacks should be considered for archival facilities. This can be accomplished through cross-feeding from chillers, installing additional ducts, or allowing air to be circulated from multiple air handlers. In all cases, spare parts should be stocked to permit more rapid repairs in the event of equipment failure. Redundancy will be provided in accordance with owner's requirements.

17. Access and Maintenance

Sufficient space should be allocated to allow easy access for expeditious replacement of major components of the systems.

18. Exterior Air Intakes

Exterior air intakes should be located to ensure that pollutants do not enter the building air supply. They should be at least 10 feet [3 meters] above grade level. In addition to gaseous pollutants from vehicles and industries, designers should consider that significant pollution from fertilizers, insecticides, and dust can occur from farm or landscaping activities.

19. Piping

With the exception of fire protection sprinklers, no water, condensate supply or return lines, plumbing, or other water pipes should be run through archival spaces, especially stacks.

20. Loading Dock and Garage Mechanical Systems

A major source of airborne pollutants comes from trucks and vehicle engines idling in garages and loading docks. Whenever these areas are placed within the building, they should be under negative air pressure to prevent combustion gases from entering the building.

21. Floor Drains

Screening should be added to all floor drains to prevent insects and vermin from entering the building.

22. Mechanical Ducts

All mechanical ducts serving the stack must be provided with an automatic, combined fire and smoke damper that is equipped to completely close the duct opening and shut down fans that serve the duct in the event of fire. The individual damper or combination thereof must provide equivalent fire resistance rating to the stack wall.

Duct smoke detectors should be provided in the supply and return ducts of the air handling systems and be designed to shut down the individual air handler unit if smoke is detected in the system.

There should be a main shut-off of the air handling systems. It should be possible to shut down the air handling system manually and override the automatic controls during a fire emergency. This shut-off switch should be located in the fire control panel.

23. ENVIRONMENTAL MECHANICAL SYSTEMS (HVAC)

a. Large Records Storage Areas

Records Center Storage: Climate control for large stacks measuring over 25,000 square feet [2,323 square meters] is generally achieved with HVAC systems that use chilled water for cooling and hot water for heating. In general, these systems can produce environments of about 70°F [21.1°C] and 55% RH in summer and heating climates and about 70°F [21.1°C] and 45% RH in winter. These environmental conditions are generally satisfactory for records center storage for periods under 10 years and when the records are paper-based or the modern more-stable films and polyesters. Preferred temperature is 65 -70°F and 45% RH for paper records in records centers. Preferred temperatures for special media, including film and electronic media is 55-68°F and 30-40% RH. For additional information about criteria for records center storage, see 36 CFR 1234, Facility Standards for Records Storage Facilities.

<u>Archives Storage</u>: HVAC systems using glycol solutions for chilled water can achieve the lower temperature and relative humidity conditions of 60°F [15.6°C] and 40% RH, which support the long-term storage of paper-based records as well as many of the film-based records.

b. Small Records Storage Areas

<u>Archives Storage</u>: Climate control for stacks measuring less than 25,000 square feet [2,323 square meters] can use HVAC systems that use direct expansion cooling (dx) and either hot water or electricity for heating. These systems are available in the commercial market and are reasonably economical to operate. They can produce environments of about 65°F [18.3°C] and 45% RH in summer and heating climates up to 70°F [21.2°C] and 50% RH in winter. These HVAC systems can also produce colder and drier environments in the winter. These

environmental conditions are generally satisfactory for the long-term storage of paper-based records as well as many of the modern more-stable films and polyesters.

Archives Storage: The HVAC systems designed to achieve a cold storage environment of 50°F [10°C] and 30%RH require special refrigeration equipment. The most common methods employ the use of desiccants in conjunction with dx refrigeration equipment or special dx refrigeration equipment in pre-engineered commercial food grade walk-in coolers or vaults. On a small scale, a commercial grade refrigerator can be used to achieve the 50°F [10°C]; however, the stored records need to be kept in sealed containers with preconditioned silica gel in order to maintain a stable 30% RH.

c. Types of Systems

The type of HVAC system used is critical to achieving project environmental goals. Proper airflow filters the air, controls humidity, and suppresses mold growth. Minimum airflow criteria vary from 6 to 8 air changes per hour. These needs are usually best met with a constant-volume system.

Central air-handling stations keep filtration, dehumidification, humidification, maintenance, and monitoring away from the collection. The investment in added space and the expense of the more elaborate duct system provide major returns in reduced disruption to the collection spaces and a dramatically extended service life for the distribution system. Renovating the old system is economical, with most renovations confined entirely to the mechanical rooms. This is in comparison to common duct distribution systems (e.g., terminal reheat, dual-duct, and variable-air-volume), where renovations often require a new duct system and terminal equipment, involving major expense from demolishing the old ducts, installing the new duct system, and reinstalling architectural finishes.

Overhead and decentralized air handling systems are not recommended for archival facilities. The problems most often overlooked are maintenance access and risk to the collection from disruptions and leaks from overhead or decentralized equipment. Water or steam pipes over and in collection areas present the possibility of leaks, as do air-handling units. Some systems can provide full control without running any pipes to the zones, but others require two to six pipes to each zone, which often must be run over or in collection areas and are, unfortunately, the pipes most likely to leak. Leaks and maintenance can prevent effective use of spaces and result in lost space efficiency.

For further specifics about the standards for HVAC systems for archival facilities, see NARA's 1571 Standards for Presidential Libraries.

d. Constant-Volume Reheat

A constant-volume reheat system can present problems if improperly applied. In many institutions, terminal reheat with steam or hot-water coils located near or over collection spaces cause chronic problems from steam and water leaks. Efficient zone-level humidification often suggests placing the humidifier downstream from the reheat coil; if the reheat coil is located near or over collection spaces, preventive maintenance on humidifiers further complicates maintenance problems. Constant volume reheat systems are very effective when reheat coils and humidifiers are installed entirely within the mechanical space, instead of at the terminal, feeding through what is effectively a multi-zone distribution system.

e. Multi-zone System

A multi-zone air handler with zone reheat and zone humidification can be a stable and relatively energy efficient solution. However, multi-zone systems without individual zone reheat and individual zone

humidification have proved problematic in many institutions, requiring retrofit of zone equipment for stable humidity control. With proper layout and equipment complement, a multi-zone system can reduce the amount of reheat and be very energy efficient.

When air handlers are outside collection areas (as recommended), the best choices are constant-volume and multi-zone with bypass, and dual-duct. When other systems are used, the client must be made fully aware of the possible compromises in performance, cost, and serviceability.

f. Dehumidification Coil

An important feature of multi-zone and dual-duct air handlers is a separate dehumidification coil up-stream of both the hot and cold decks. This separate cooling coil, distinct from the one in the cold deck, is used during dehumidification demand. Air can be cooled to dew point even if it eventually flows through the hot deck. Without this feature, moist return air could be warmed in the hot deck and delivered back to the room without being dehumidified. An alternative is to locate a single cooling coil upstream of both decks, where the cold deck simply bypasses the hot deck, although this configuration can increase energy use.

g. Fan-Coil Units

Fan-coil units should not be placed in or above records storage areas. Fan-coil units create problems when placed in and above collection areas. Fan-coil units expand and decentralize maintenance, requiring maintenance in collection areas and a net increase in overall facility maintenance. Because they cool locally, they need condensate drains, which can leak or back up over time. As all-water systems, they require four pressurized water pipes to each unit, increasing the chance of piping leaks in collection areas.

h. Variable Air Volume (VAV)

VAV, though appropriate for other types of buildings, tends to be inappropriate for collection housing because of poor humidity control, inadequate airflow, maintenance disruption, leaks in the collection spaces, and inflexibility to meet environmental needs.VAV systems can save energy compared to constant-volume systems, but usually at the collection's expense.

If used, a VAV system should look much like a constant-volume reheat system, with the minimum airflow to prevent mold growth, contamination buildup, and uneven conditions in the conditioned space. Terminal equipment should include reheat for each zone and be located in mechanical rooms or other spaces where access and service do not endanger a collection.

i. Fan-Powered Mixing Boxes

These are usually inappropriate for archival facilities. Although fan-powered mixing boxes can help ensure air circulation to suppress mold growth, they do not allow effective air filtration for particles and gases. These fans also increase local maintenance requirements and present an added fire risk. If they include reheat, there is an added risk from water (with water or steam reheat) or fire (with electric reheat).

j. HVAC system Controls

HVAC control system is critical for maintaining precise temperature and humidity control. The control system should be able to monitor and control humidity, temperatures, airflow, filter pressure drops, water alarms, capacity alarms and failure scenario. See NARA 1571 for specific details on monitoring and controls.

Sensors, thermostats and humidistats must be located in the collection spaces, not in the return airstream. It is important to specify a control system that is matched to the user's complexity of requirements. In general, it is

best to propose a system that is industry generic so that it can be serviced by any knowledgeable technician. The control system should be user friendly with good graphic displays; able to track and measure all system functions for at least one year; and be web based for remote access and diagnostics.

Units shall have their own factory-installed self-contained control systems with independent DDC and associated controllers contained in a unit-mounted control panel. Programs and logic required for the functions and sequence of operations (SOO) shall reside within the unit-mounted controllers. Controllers and associated programs shall operate completely independently, and shall also be connected to and interoperating with the facility's building automation system (BAS) using bacnet protocol or an open-source non-proprietary DDC protocol appropriate for the existing systems, and approved by the GSA prior to project implementation. No specialized or proprietary hardware, software, firmware, or middleware shall be required to accomplish set-point adjustments, to fulfill the SOO, to alter the programmed SOO, or to expand the HVAC systems or controls by the end user after project turn-over. Performance of the self-contained control systems shall be totally integrated with the BAS for full and seamless operation, including capability to read, trend, and archive all data points and change all set points from the controls station.

24. TEMPERATURE and RELATIVE HUMIDITY SPECIFICATIONS

a. Temperature and Humidity

All archival materials are subject to deterioration over time due to heat, humidity, harmful particulates and fumes, and frequency of handling. The materials are fragile and subject to biological, chemical, and physical damage. It is critical to provide stable and constant temperature and relative humidity levels and removing damaging particulates and gases from the air.

25. Fluctuations in climate conditions

In general we know that high temperatures, relative humidity that is either too high, too low, or fluctuates beyond a material's ability to harmlessly accommodate the changes, and particulate and gaseous pollutants all threaten these irreplaceable materials.

There currently are a variety of storage preservation standards and guidelines for archival records. Some of these standards speak to mixed collections while others specify different storage conditions for each type of media. Ongoing research into the effects of environment on these fragile materials continually leads to new information and revised recommendations.

The general conclusion is that large fluctuations in temperature or relative humidity can cause irreversible damage to sensitive records, and that climate conditions must be kept constant. The standards for preservation do not necessarily take into account the building and records storage room's design and location, its building materials and finishes, its mechanical and lighting systems, the local climate, and how the materials are used and handled. The targets and ranges specified for archival storage should be analyzed in conjunction with the design and operation of the new facility.

The following list shows the current consensus of the recommended temperatures and relative humidity for archival records storage and the allowable fluctuations in relative humidity from a set point over a 24-hour period. Fluctuations in temperature are generally easily controlled to $+/- 2^{\circ}F$ [+/-1.1°C].

26. TEMPERATURE AND RELATIVE HUMIDITY Criteria

The following page lists the current standards of the National Archives and Records Administration (NARA).

- Paper textual records
 65°F max/[18.3°C]
 35-45% RH +/- 5%
- Black & white, non acetate photograph and film, microforms, audio tapes and other special media 65°F max/[18.3°C]
 35% RH +/- 5%
- Black & white acetate photographic and film media 35°F max/[1.7°C]
 35% RH +/- 5%
- Color Photo and film media 35°F max/[1.7°C] 35% RH +/- 5%
- Magnetic/electronic media 46-65°F/[7.2-18.3 °C] 35% RH +/- 5%

27. AIR FILTRATION

Air filtration measures of particulates and gaseous pollutants must be considered for archival facilities, particularly for records storage and other records holding spaces. Filtration is accomplished by introducing filter media into the HVAC system air handler that serves the stack(s). Filtration technology is complex and continues to change. Designers must consider the archival facility's location, size, budget, and design when planning an air filtration system for the preservation of archival materials.

Filtration to remove gaseous pollutants from stacks is especially important in dense urban locations. The majority of the gaseous pollutants are emissions from vehicle exhausts, stationary combustion sources, and other pollution-generating sources consisting of unburned hydrocarbons, elemental carbon, ozone, sulphur dioxide, and nitrogen dioxide. Other gaseous pollutants are a result of the off gassing of building construction materials, furniture, carpeting, and the collections themselves. All gaseous pollutants are very damaging to records and when possible should be filtered.

Special filtration systems are required for collections that off gas volatile organic compounds (VOC) such as cellulose nitrate, cellulose acetate microfilm, negatives or film, and some types of paper and plastics. Often these kinds of collections are isolated or stored off site. If collections off-gassing VOCs are stored in an archival facility, then the air filtration system must be designed to manage the measured quantities of VOCs produced by these records.

Below are the filtration criteria for particulate and gaseous in archival storage rooms, processing rooms, labs, and exhibit cases.

- Particulates: MERV 14 or higher
- Sulfur Dioxide: 1 ppb; 2.7 micrograms per cubic meter
- Nitrogen Dioxide: 2.6 ppb; 5.0 micrograms per cubic meter
- Ozone: 2.0 ppb; 4.0 micrograms per cubic meter
- Formaldehyde: 4.0 ppb; 5.0 micrograms per cubic meter
- Acetic Acid: 4.0 ppb; 10.0 micrograms per cubic meter

28. Types of Filtration.

a. Particulate Filtration

Particulate filtration is essential for removal of contaminants that could foul the HVAC system, as well as particles that might degrade or deface artifacts being preserved. Particulate filtration is addressed here in two steps: pre-filtration and fine-particulate filtration.

b. Pre-filtration

Pre-filtration is required to prevent fouling in cooling coils and build-up of dust in the fan, ductwork, or other HVAC components. It is also required to protect and prolong the functional service life of gas-phase filters and fine-particulate filters. These fouling-sized particles are generally considered to be the MERV E-3 (ASHRAE Standard 52.2) range particles or the 3 to 10 µm size range. Achieving at least 50% removal of the E-3 particle size range requires MERV 7 filtration.

Higher efficiencies may be possible with media configurations that operate at lower pressure loss. MERV 11 or higher pre-filters can operate at similar or lower pressure drop and provide more protection for HVAC components and gas-phase filters.

c. Fine-particulate filtration

Fine particulate filtration protects artifacts and collections in the facility. This particle size is commonly referred to as the "accumulation" size and falls in the MERV E-1 range of particles (0.3 to 1 μ m). Removal efficiencies of a minimum of 85% of the E-1 range are sufficient for preservation of most collections. MERV 15 filters are minimum 85% in the E-1 range, and minimum 90% in both the E-2 (1 to 3 μ m) and E-3 (3 to 10 μ m) ranges.

Some collections may require higher efficiencies than MERV 15 for long-term preservation. Options include microenclosures with minimal airflow and separate filtration, or HEPA (99.97% at 0.3 μ m) filtration for the entire common area. Whenever HEPA filtration is used as the final filtration, serious consideration should be given to upgrading the pre-filtration to protect the life of the HEPA filters.

d. Gas-Phase Filtration

Gas-Phase Filtration. Outdoor air infiltration of gaseous pollutants, materials off gassing in new construction, and similar off gassing of furnishings and cleaning agents may threaten the stability of some collections. Sensitive collections of valuable holdings (e.g., low-fire ceramics, some metals and alloys, film, rare books) should use active control of gas-phase pollutants.

The primary compounds of concern include acetic acid, formaldehyde, hydrogen sulfide, nitrogen dioxide, ozone, and sulfur dioxide, all of which are removable with molecular filtration. The specific sorbent must be chosen for the various gaseous contaminants indigenous to the facility, because removal and retention properties are not all the same. Some gases are easily removed with activated carbon, whereas others may require treated carbon or potassium permanganate beds.

29. RECORDS STORAGE AREAS

Air filtration measures must be considered for archival storage stacks.

a. Airborne particulates

To filter airborne particulates, including ordinary dusts and fibers, the air handler should contain a pre-filter with a Minimum Efficiency Reporting Rating (MERV) of at least 7 (previous filtration system 30% efficient) and a final filter of at least MERV 14 (previous 95% efficient). These pre-filters are usually an inexpensive throwaway filter measuring 2 to 4 inches [5 to 10 centimeters] deep. Depending on the geographical location

of the archives facility and the levels of pollutants, the air handler should also contain a gas phase contaminate filter located downstream from the pre-filter followed by a special high efficiency particulate filter (HEPA).

b. Gaseous pollutants

To filter gaseous pollutants, the current research shows that a mixed media gas-phase filter bed of activated carbon and potassium permanganate provides the best removal of these pollutants. These gas-phase filters are approximately 24 inches [61 centimeters] deep and require a larger amount of space within the HVAC system. The gas-phase filters are more costly than the pre-filters to replace and it can be difficult to know when they need replacement. Some suppliers offer a service that can test these filters to determine their useful life.

Downstream from the gas-phase filter, there should then be a final particulate filter with an efficiency of at least MERV 18 (previous system 99.97% efficient or HEPA). This filter is used to remove fine particles from the gas-phase filter and very small particles, such as mold spores and bacteria, from the stack air. These filters are approximately 12 inches [30.5 centimeters] deep and like the gas-phase filters, take up a large amount of space and are more costly to replace. Sometimes a less expensive second pre-filter, with an efficiency of MERV 12 or 14 (previous system 70% to 90%), is placed in the air handler to remove intermediate-sized particulates first and thereby extend the life of the more costly final HEPA filter.

30. MIXED USE AREAS

Good quality particulate and gas-phase filtration are important elements in the preservation of archival materials and should be used in areas where records are temporarily stored and used by staff. A reasonable particulate filtration level in mixed-use spaces is MERV 12 (previous system 70%). Using particulate filters with higher efficiency such as the HEPA filters is not practical and does not give much value in occupied spaces.

It is good practice to reserve space in the HVAC system air handler design for future filtration measures as the local pollutant conditions may change.

31. EXHIBITS

In exhibit spaces the best way to control airborne particulates and gaseous pollutants is to keep the exhibited records in an enclosed case or vitrine. Otherwise, the space should be considered to be the same as an open stack space and incorporate good quality particulate filtration with, at a minimum, activated carbon gas-phase filtration.

Exhibit cases should be designed to protect the collection from environmental extremes. Sealed or vented cases are typically used. Sealed cases rely on isolation from the ambient environment in the exhibition room and usually require passive or special conditioning systems independent of regular room air. Because sealed cases are subject to build-up of contaminants, they should be made of inert or low-emission materials, or those that emit gases benign to objects in the case. In a properly conditioned space, exhibit cases that are within, built into, or back up to this space can be vented.

These systems are not configured like typical HVAC systems and have additional features, such as desiccant beds to stabilize supply air humidity. Lights should always be housed in a separate ventilated compartment from the one housing the artifacts.

High spaces are prone to thermal stratification. Appropriate return and supply air may be required to ensure air motion across the entire space. Supply air should not blow directly onto collections. If collections are on

7 - DESIGN NARRATIVE \ FIRE PROTECTION

the wall, diffusing supply air along a wall should be avoided. Floor supply should also be avoided because particles at foot level become entrained.

REFERENCES:

Archival and Special Collections Facilities: Guidelines for Archivists, Librarians, Architects, and Engineers, Edited by Michele F Pacifico and Thomas P.Wilsted, 2009 by the Society of American Archivists

Architectural and Design Standards for Presidential Libraries, National Archives and Records Administration, NARA 1571, July 2014

ASHRAE Handbook - HVAC Application, Chapter 23, 2015.

Airborne Pollutants in Museums, Galleries and Archives (2003), p. 33. Jean Tétreault.

Facility Standards for Records Storage Facilities, 36 CFR 1234

Sustainable Preservation Practices. University of Texas, September 2010, James M. Reilly, Image Permanence Institute

7.12 Fire Protection

1. REFERENCE CODES & STANDARDS

- 2013 D.C. Building Code, based on the 2012 ICC, International Building Code.
- SAA Archival and Special Collections Facilities Guidelines, 2009.
- NARA 1571 and 1571S: Architectural and Design Standards for Presidential Libraries, 2014.
- 36 CFR 1234, Facility Standards for Records Storage Facilities
- NFPA 232, Standard for the Protection of Records, 2012.

2. CONSTRUCTION

Archival facilities, because of their unique, irreplaceable holdings, require a higher level of fire safety than is normally required for commercial buildings. In particular, records storage rooms and other areas housing archival materials must be constructed to resist the entry of fire, smoke, water and toxic gases.

Comprehensive fire protection requirements and guidelines are detailed in NARA 1571, NARA's Design Standards and in the SAA's Archival Facility Standards.

Required Features

The Building Code has limited requirements for construction of an archival storage facility. The specific construction type and structural fire resistance ratings depend on the height and area of the building. Based on the program area, a range of construction types including both noncombustible and combustible construction could be permitted.

There are no code requirements for compartmentation or fire separation for archival storage areas. Fire separation of specific spaces, such as exit stairs, vertical openings, and high hazard areas, may be required.

7 - DESIGN NARRATIVE \ FIRE PROTECTION

Recommended Features

Construction Type: Non-combustible construction, minimum Type IIB (not less than required by IBC based on height/area).

Structural Fire Resistance: Minimum 2-hour fire rating for structural columns within archival areas. Spray-applied fireproofing not permitted.

Compartmentation: To prevent migration of fire, the quantity of archival holdings stored in a single fire compartment must not exceed 125,000 cubic feet.

A records center facility may not store more than 250,000 cubic feet in a single storage area.

Fire Separations: Minimum 2-hour fire rating between compartments to adjacent spaces. Fire/smoke dampers for all duct & air transfer openings.

Optional Features

Higher levels of protection are preferred for archival storage where design constraints allow. If possible, improve upon the recommended construction featured above.

- increase construction type
- structural fire resistance ratings
- fire separations decrease compartment sizes

3. FIRE PROTECTION

Required Features

The Building Code requires an automatic sprinkler system and manual fire alarm system for the building.

Recommended Features

Sprinkler Protection: Automatic Wet-pipe sprinkler protection must be provided throughout the building.

- Engineered sprinkler system design based on conservative NFPA, FM and NARA requirements for specific storage configuration (e.g., rack, shelves, compact storage).
- Performance goal to limit fire event loss in archival storage areas to 300 cubic feet maximum per NARA criteria.
- Electric compact mobile systems require wet pipe sprinkler system with 165° F quick response sprinklers although consideration should be given to using lower temperature (135° or 155° F) sprinkler heads.
 - Shelving must have ability to separate to create minimum 5 inch aisles upon activation of a smoke detector, water flow alarm, or manual alarm.

Hose Systems: Fire department hose connections (2.5-in., 1.5-in.) located outside of stack areas.

Fire Alarm: Automatic fire alarm system throughout with manual activation devices, sprinkler flow monitoring, and audible/visible notification.

Fire Detection: Automatic smoke detection throughout; high-sensitivity smoke detection (e.g., VESDA) for archival storage areas. Duct detectors in all supply / return ducts of air handling systems with controls at central fire panel.

7 - DESIGN NARRATIVE \ ELECTRICAL

Smoke Exhaust: Engineered smoke control system for archival storage areas greater than 500 SF.

Cold Storage Rooms: Clean agent systems that comply with NFPA 2001 or pre-action sprinkler systems.

Optional Features*

Gaseous Suppression: Clean agent suppression system in addition to automatic sprinkler protection for "high value" archival storage areas.

Water Mist Suppression: High-pressure water mist system in lieu of automatic sprinkler protection for "high value" archival storage areas where exposure to water is significant concern.

Low Oxygen System: Potential application for archival storage areas with automatic retrieval systems and limited / no occupancy.

* The feasibility and appropriateness of these systems would require further study based on selected building and design approach.

4. LIFE SAFETY

Required Features

The Building Code requires minimum life safety requirements for means of egress, emergency lighting, exit signage, etc.

Recommended Features

The recommended fire protection features will have an allied effect of increasing the level of fire safety in the building. No additional improvements are deemed necessary.

7.13 Electrical

This summary addresses the fundamental electrical design requirements and considerations for a New Archives facility located in Washington DC. Only initial design strategies are discussed in support of establishing a program of electrical requirements for the project.

1. Power Distribution Systems

- The electrical utility service to the facility is recommended to be a 460Y/265 volt, 3-phase, 4-wire system routed via an underground concrete encased duct bank from the PEPCO utility transformer, to serve the electrical needs of the building. The local utility will provide the conductors and the project construction scope will provide the underground duct bank from the property line to the C/T Cabinet and Switchboard, located in the main electrical room of the facility, consistent with the power company requirements.
- The facility should have a main electric room located along an exterior wall at grade level or at the floor immediately below grade. The room shall be sized to house the main electrical service equipment and carry a minimum 2-hour fire rating.
- The main electrical room shall house the Main Switchboard with an integral C/T Cabinet, emergency tap sections, main breaker disconnect and branch distribution sections. The 460/265V, 3-phase, 4-wire service and switchboard size shall be determined as design progresses and additional programming information is made available. The Switchboard will also be specified to have transient voltage surge suppression. The power distribution system shall serve all of the HVAC, plumbing, lighting, receptacle, elevator and miscellaneous electrical loads of the facility.

7 - DESIGN NARRATIVE \ ELECTRICAL

- A step-down transformer also installed within the main electrical room and fed via the Switchboard shall serve the 120/208V loads in the building via a Low-voltage Main Distribution Panel "LMDP". Additional branch distribution panels installed within supplementary electrical closets shall serve the local loads in each respective area.
- The electrical power distribution system shall include all the elements necessary to conduct electricity in an approved, safe manner to all lighting fixtures, receptacles, HVAC equipment, plumbing equipment, and signal and communication equipment serving the facility.

2. Emergency Power Distribution Systems

- An emergency/standby generator is recommended to serve the emergency power distribution system for the facility. The generator can utilize natural gas or diesel as a fuel source and sized as the design progresses and additional programming information is made available.
- If the generator is located outdoors, it shall be housed in a minimum Level 2 weatherproof enclosure. The generator will be sized to provide emergency power to life safety systems including egress lighting, alarm systems, telecom equipment, elevator, fire pump and mechanical service equipment whose failure to function will cause hazard to life or property. Additionally, the generator shall also support standby loads that are critical to maintaining the operating standards of the Archives facility.
- Automatic transfer switches shall be strategically configured along with distribution equipment to maintain the emergency power distribution to the various emergency and standby systems. All emergency distribution equipment shall be housed in a dedicated room that shall carry a minimum 2-hour fire rating.



Figure 7.8 Sample Emergency/Standby Generator

3. Wiring Devices

• Duplex convenience receptacles will be provided throughout the building as required to comply with the requirements of each space. All corridors shall have duplex outlets at a minimum of 50 feet on center and a minimum of one duplex receptacle will be provided in each typical utility and storage room space. Additionally, convenience outlets will be provided within 25 feet of all mechanical equipment mounted either on the roof or outside the building. All receptacles exposed to the elements will be in NEMA 3R enclosures

7 - DESIGN NARRATIVE \LIGHTING

and protected via Ground Fault Interrupter (GFI) type breakers. GFI type receptacles will be also be provided within 6 feet of all sink areas, in the pantry, restrooms, and where required by code.

- Receptacle and telecom outlets shall also be provided in all public and large assembly areas in compliance with all owner guidelines to meet the intent of each space. In each of the administrative offices and at each of the workstations, power and telecom outlets will be provided as needed per owners requirements.
- All the motors will be provided with motor controllers and disconnect switches. All major equipment will
 be provided with either fused or non-fused safety switches, based on equipment name plate data. All motor
 controllers/starters will be at minimum NEMA Size 1, unless required otherwise due to environmental
 conditions. All disconnect switches will be heavy duty, either NEMA Type 1 or 3R, depending on the
 conditions of the installed location. All fans with fractional horsepower motors will be wired via motor rated
 switches provided with thermal overload protection.
- All branch circuit wiring will be with 600 volt rated copper conductors, type THWN or THHN, minimum #12 AWG in minimum 3/4-inch conduits. All interior conduits will be Electrical Metallic Tubing (EMT) unless required otherwise by the code. All exterior exposed conduits will be Galvanized Rigid Steel (GRS) and all exterior underground conduits will be PVC Schedule 40, except where required otherwise by the code.

7.14 Lighting

Natural Lighting

The design shall seek to minimize lighting costs and energy use by providing natural lighting in spaces that will not contain archival holdings such as the lobby, offices (if non records-containing offices), conference rooms, break rooms.

Natural lighting is not recommended for the spaces in the facility that will occasionally contain records, or that always contain a rotating flow of records such that the records present in the space are only in the space temporarily. However, if appropriate measures for diffusing and filtering UV and IR radiation are implemented in accordance with the guidelines and standards for archival facilities design, natural lighting in these types of spaces can potentially be considered.

Natural sunlight for some treatment work is preferred in labs. However the windows must be ultraviolet filtered and outfitted with shades or blinds.

Archival storage spaces must not have windows, skylights, or clerestories. In the case of a renovation, any existing sources of natural light must be completely blocked.

Electrical Lighting

The lighting system for the building shall be designed to conserve energy and minimize glare while providing a pleasant, comfortable and functional environment. The guidelines set forth by the Illuminating Engineering Society (IESNA) shall be used in conjunction with the NARA standards and SAA guidelines to establish target-maintained illumination levels throughout all spaces. Specific influences of glare, task complexity, surface reflectance characteristics, ceiling brightness, and usage shall be addressed with this procedure.

7 - DESIGN NARRATIVE \LIGHTING

1. Energy Conservation

- To enhance energy savings, LED lighting will be considered as the basis of design for all fixtures. The fixtures may be pendant, surface or recessed mounted into ceilings as applicable. Selected areas may also be equipped with downlights, or supplemented with other specialty luminaires to address functional requirements and create visual elements in the space. Each workstation shall further be specified task lighting integrated with occupant sensing and dimming capability to allow the user to adjust light levels specific to their task.
- It is recommended that the typical interior lighting LED modules shall be field serviceable from below in non-accessible ceilings. LED's shall be RoHS compliant, 80 CRI (minimum), with a maximum of 2.5 step McAdam ellipse color consistency. LED data shall be tested in compliance with IESNA LM-70, LM-80 and TM-21 protocol. Lamp life shall carry a minimum rating of 50,000 hours at L70. Intended LED current (mA) and driver shall be fully compatible, as stated so by both manufacturers.

2. Emergency Lighting

- Emergency lighting shall be provided throughout all interior areas of egress and accomplished by installing select light fixtures fed via the emergency power distribution panels for generator backup. Emergency lighting systems serving spaces that always or sometimes contain records shall be designed such that the emergency fixtures are not always on. In these instances, the emergency lights shall only illuminate when there is a loss of regular power.
- Exit sign fixtures shall be strategically located and provided throughout all interior areas of egress as well. The exit signs shall be specified with a LED light source and red or green color lettering.

3. Lighting Control

- An occupancy sensor control system will be used with manual override switches to control all interior nonemergency lighting in the facility.
- Occupancy sensors shall be specified for open and common area spaces for auto-on, auto-off functionality, whereas vacancy sensors shall be specified for all enclosed spaces such as administrative offices, conference rooms, single occupant restrooms, utility and storage closets for manual-on, auto-off functionality.
- Additionally, daylight sensors shall be specified in all perimeter spaces to help reduce the average watts per square foot value and in turn improve energy efficiency for the building.
- Additionally, with the intent to pursue LEED certification and further enhance energy savings, a central digital lighting management system is proposed to allow increased controllability of the light fixtures in the facility. The occupancy and day light harvesting systems shall be directly compatible with the central system, and each light fixture shall be installed with a digital dimmable ballast to allow the ability to program the light fixtures to the requirements of each individual space while maintaining an evenly illuminated plane throughout. Furthermore, the system shall be wireless in nature and have time clock functionality. The digital dimmable ballasts shall further provide flexibility to program for a specific after-hours control strategy and also provide the ability to tune the high and low end output of each fixture thereby further enhancing the energy savings.



Figure 7.9 Sample Lighting Controls System

4. Exterior Lighting

- Similar to the interior space, all exterior lighting fixtures shall be specified with a LED light source. Additionally, all exterior fixtures shall be of full cut-off type. The site may be illuminated via a combination of pole-mounted light fixtures of varying height, bollard fixtures, recessed step lights, recessed in-ground fixtures and wall-pack fixtures attached to the building. The height of the poles shall be finalized as design progresses after a review of the local ordinances to determine if pole height restrictions exist.
- All exterior building mounted light fixtures shall be controlled via a photocell and time clock. The photocell shall be located on the roof of the building, facing north. All site lighting shall be designed in accordance with the IESNA guidelines to eliminate spillover and light pollution to properties adjacent to the site.

7.15 Security

The information below summarizes the various security aspects typical for archival facilities. Both the recommended minimum features and optional features are derived from the SAA Archival and Special Collections Facilities Guidelines and the NARA Design Standards for Presidential Libraries. Because the referenced NARA Design Standard is intended to address the unique security issues of a Presidential Library, many of the NARA mandated requirements exceed what would be typical of a Federal, State or Municipal archival facility. Thus, the NARA requirements are listed in a separate section of this document.

Where appropriate, options are provided for consideration. Because little is known of the proposed facility or its location at this time, the options vary widely. Generally, options are listed in ascending order of security effectiveness and cost. Options can, and in some cases should, be combined for optimal security and cost effectiveness.

Both of the referenced documents require that a security risk assessment be conducted prior to the design phase for any archival facility. The risk assessment will establish the Design Basis Threat (DBT) against which all security features will be determined. It is assumed the District has evaluated the various options for the construction and location for this facility and has conducted and documented such an assessment.

1. Reference Guides & Standards

- SAA ARCHIVAL AND SPECIAL COLLECTIONS FACILITIES GUIDELINES, 2009.
- NARA 1571, DESIGN STANDARD FOR PRESIDENTIAL LIBRARIES (ARCHIVAL REQUIREMENTS), 2014.

- 36 CFR §1228, SUBPART K, FACILITY STANDARDS FOR RECORDS STORAGE FACILITIES
- ANSI/ASIS PAP.1-2012 PHYSICAL ASSET PROTECTION
- ASIS GDL FPSM-2009 PHYSICAL SECURITY MEASURES GUIDELINE
- NFPA 730 GUIDE FOR PREMISES SECURITY
- NFPA 731 STANDARD FOR THE INSTALLATION OF ELECTRONIC PREMISES SECURITY SYSTEMS
- ILLUMINATING ENGINEERS SOCIETY OF NORTH AMERICA, PUBLICATION #IESNA G-1-03, GUIDELINE FOR SECURITY LIGHTING.

2. Perimeter Security

a. Recommended Minimum Features

- i. If Site layout permits:
 - 1. Provide a 100 foot set back around all portions of the building. Design vehicle approaches to limit speed and direct access to the facility.
 - 2. Provide a credential based parking access system with electrically controlled gates within the setback for employee and authorized vehicle parking.
 - 3. Provide a physical barrier system (fencing, wall or natural barrier) to limit pedestrian access to the facility's parking area.
 - 4. Provide a separate Visitor parking area outside of the set back zone.
 - 5. Provide a screening area for all delivery and Vendor vehicles.
- ii. If Site layout does not permit for a 100 foot set back, provide as much set back as possible, items 2, 4 and 5 above and:
 - 1. Limit close vehicle access to the building to authorized vehicles only.
 - 2. If the building has a street exposure, designate such exposures as no parking areas.
- iii. Provide lighting levels as recommended in IESNA G-1-03 Guideline for Security Lighting, for parking areas and pedestrian walkways.
- iv. Provide a physical barrier system (fencing, wall or natural barrier) to limit pedestrian access to the facility's parking area.

b. Optional Features

- i. Provide monitored and recorded video surveillance for the parking area and pedestrian walkways.
- ii. Provide emergency power backup for all security lighting fixtures.
- iii. Provide a manned security booth with full control of the parking access, intrusion detection and video surveillance systems.
- iv. Provide electronic perimeter intrusion system to alert security personnel in the event a person or persons breach the perimeter boundary.

- v. Provide retractable vehicle barriers which may be deployed locally at the security booth and remotely at the on-site security control center
- vi. Reinforce all openings for blast and ballistic penetration.
- vii. If the building has a street exposure, designate such exposures as no parking areas, provide security bollards along exposure and reinforce exterior, street facing walls.

3. Entry Security

a. Recommended Minimum Features

- i. Manually inspect all mail and packages once received at the facility.
- ii. Provide high security mechanical locks on all doors.
- iii. Provide a dedicated public entrance separated from all archives storage, research rooms, processing and lab areas, and shipping/receiving areas.
- iv. Provide Security Guard(s) to monitor public entrances during public hours.
- v. Provide an intrusion detection system, covering all doors, windows, and other openings monitored by a Central Monitoring Station.
- vi. Provide individual component battery backup for any electronic security system provided.
- vii. Provide monitored and recorded video surveillance of public entrances.

b. Optional Features

- i. Provide electronic screening of all mail and packages received.
- ii. Provide an on-site security command center.
- iii. Provide an electronic access control system on select exterior entrance doors.
- iv. Provide electronic locks and access readers on all exterior doors that are openable from the outside. This will provide the ability to "lock-down" the facility should the need arise.
- v. Provide an electronic access control system, utilizing a single technology (access card, key fob etc.) on select interior doors.
- vi. Provide electronic visitor screening (X-ray, magnetometer) at public entrances.
- vii. Provide emergency generator feed to any security systems provided.

4. Interior Security

a. Recommended Minimum Features

- i. Provide a visitor control and screening system (sign-in/out log, photo ID check).
- ii. Provide paper stick-on self-expiring visitor passes to be worn by visitors at all times.
- iii. Provide employee photo ID's to be worn by employees at all times.
- iv. Provide roving Guard patrols during public hours.

b. Optional Features

- i. Provide photo ID's for long term vendor and contractors to be worn at all times when on site.
- ii. Provide roving Guard patrols 24/7.
- iii. Establish an asset value, or mission critical ranking of interior spaces. Provide increasing levels of security for the doors, windows and other non-window openings to these spaces as deemed appropriate for each ranking.
- iv. Provide a video surveillance system (recorded) covering all publicly accessible areas.
- v. Provide recorded video surveillance at shipping and receiving areas.
- vi. Establish an asset value, or mission critical ranking of all interior spaces. Provide video surveillance at the entrance/exits and within these spaces as deemed appropriate for each ranking.

5. Should the District decide to provide a facility meeting the NARA Architectural and Design Standards for Presidential Libraries, the following features are considered mandatory:

a. NARA Mandatory Features

The following categories of general mitigation approaches include blast and ballistic protection, intrusion detection systems (IDS), closed-circuit television systems (CCTV), physical access control systems (PACS), door security hardware, utility security, general building security and other mitigation, protection of project documentation, background investigations, and guard service coverage. Much of the minimum mitigation indicated below is derived from the ISC Standard, "Physical Security Criteria for Federal Facilities," Facility Security Level (FSL) IV, requirements. The following security features must be provided:

b. General blast and ballistic protection.

i. Exclusive security stand-off zone.

- 1. Exclusive security stand-off (buffer) zone of at least 100 feet around all portions of the building.
- 2. Stand-off zone must be capable of excluding a 15,000 pound vehicle traveling at 30 miles per hour and protection against a 220 pound bomb outside the 100 foot stand-off zone.
- 3. Blast resistant construction and window glazing or treatment.
- 4. Controlled employee parking and handicapped and ceremonial drop-off areas may be located within the exclusive security stand-off zone provided the access point(s) are controlled by active vehicle barrier systems. Vehicle barriers must be controllable from the access point and also remotely (on-site) from the security control center.

ii. Control of Parking.

- 1. Limit the number of vehicle access points.
- 2. Control vehicle access to underground/in-building parking and on-site surface or structured parking.
- 3. Post "No Parking" signage where parking is restricted. All parking within the setback distance must be controlled.

- 4. Limit authorized parking within the setback distance to employee vehicles, screened visitor vehicles, and approved government vehicles. Unscreened visitor parking should be located as far from the facility as practical using assigned employee and government parking to establish a "buffer zone."
- 5. Provide vehicle barriers to protect parking entrances from penetration.

iii. Site Circulation.

- 1. Design to prevent high-speed approaches by vehicles.
- 2. Provide a vehicle screening area with adequate lighting to illuminate the vehicle exterior and undercarriage.
- 3. Provide CCTV coverage of the screening area.
- 4. Use barrier systems to ensure vehicles cannot pass beyond the screening checkpoint (if designated) until cleared.
- 5. Site configuration permitting, vehicle inspection areas should be located beyond the setback distance.
- 6. Provide pedestrian barriers around controlled parking areas designed to prevent casual access and increase the visibility of unauthorized access attempts.

iv. Full Personnel and Package Screening.

- 1. Provide a security vestibule prior to the facility entrance. The security vestibule cannot be part of a code-required emergency exit path.
- 2. Provide a visitor screening area within the vestibule. Provide a ballistic protective barrier in the utilization of guard booths, desks, or podiums where armed guards and other security personnel are stationed when interacting with unscreened personnel.
- 3. Screen all mail and packages using X-ray in a dedicated mail receiving facility located away from the facility's main entrances, areas containing critical services, utilities, distribution systems, and important assets. Provide an outside wall, door, or window of the mail receiving facility designed and constructed to relieve blast pressures. Physically inspect items that cannot be passed through screening equipment.

v. Blast resistant design features.

- Exterior walls (including glazing and doors) and structure must provide a "medium" level of protection (LOP) in accordance with the current Interagency Security Committee Design Basis Threat (DBT). The LOP must be able to protect against a 15 pound man-portable device placed against the exterior structure at the closest possible point to the protected setback.
- 2. Provide tempered or high strength glass on interior windows unless the DBT device for vehicle born or hand carried IEDs would not create pressures greater than 1 psi on interior windows (due to setback and other protective measures).
- 3. The lobby queuing area shall also be protected in accordance with blast resistance for windows in critical vulnerable areas. The boundaries between the lobby and the remainder of the facility must be constructed to protect the building from the air blast occurring on the unsecured side of the lobby.

- 4. The Security Control Center must be located within the building core (i.e., not adjacent to any exterior wall) and must be protected against ballistic attack. Any Security Control Center glazing to an interior corridor must be ballistic rated.
- 5. Locate critical systems and areas at least 25 feet away from loading docks, entrances, mailrooms, personnel and package screening locations, and uncontrolled parking, or implement standoff, hardening, and venting methods to protect critical areas from the DBT at these locations. Critical systems and equipment may include security and life-safety systems, power distribution, communications and data, and other mission-critical equipment.
- 6. Position publicly accessible trash containers, mailboxes, vending machines away from building entrances. Trash containers must be a minimum of 30 feet away from entrances and be removable for periods of heightened alert.

c. General Intrusion Detection System (IDS)

- i. The specific intrusion detection devices and access control features will be as determined by the risk assessment.
 - 1. The general IDS must:
 - a. Monitor all exterior doors, windows, and designated interior spaces.
 - Be a high-quality, commercial system meeting the requirements of UL Standard 1076, Proprietary Burglar Alarm Systems, UL Standard 639, Intrusion Detection Units, and UL Standard 634, Connectors and Switches for Use with Burglar Alarm Systems at the Grade/Class "A" level.
 - c. Alarms and trouble/tamper indicators must be displayed on a terminal capable of displaying graphically the location of the alarm. The terminal must also be capable of displaying pre-programmed response instructions specific to the individual alarm condition.
 - d. All intrusion alarms must be interfaced with the CCTV system to provide automatic call up and display of cameras in proximity of the alarm.
 - e. All alarm and trouble transactions must be logged to a printer and be maintained in system memory for a minimum period of seven days.
 - f. Two terminals are required:
 - One terminal located in the Security Control Center which must be capable of displaying all alarm and trouble conditions, and provide for guard acknowledgement (comment capability is highly recommended but not required), but must not be capable of reprogramming system parameters (inclusive of date, time, and secure/access mode changes) or shunting alarm points;
 - ii. A second, supervisory, terminal must be located in the facility manager's office, and must be capable of producing event logging reports and reprogramming system parameters and shunting alarm points. The supervisory terminal must be protected by a physical access barrier (e.g. high security key lock or "token" access control), in addition to having password access protection.

- g. The system must be capable of sending alarms and supervisory signals by reliable and secure (128-bit encryption) communication to an off-site central monitoring station.
- h. The system will be integrated with the buildings Physical Access Control System (PACS).

d. General Closed Circuit Television (CCTV) System

- i. State-of-the-art digital CCTV monitoring system must be provided. Closed circuit television monitoring of the entire exclusive security stand-off zone, with additional coverage of exterior public parking areas, access drives, loading and building exits and at other locations, as determined by the risk assessment.
 - 1. All cameras are to be high resolution, network (IP video) cameras either fixed with electronic pantilt-zoom (PTZ) or traditional PTZ design.
 - 2. The CCTV system shall be an enterprise class client/server based video management system and TCP/IP networked video recorder(s).
 - 3. A console must be provided in the Security Control center with access to all features of the CCTV system. The system must be supported by an Uninterruptible Power Supply (UPS), capable of supporting all systems and monitors for at least 10 minutes.
 - 4. The CCTV system must be integrated with the IDS and PACS.

e. General Physical Access Control (PACS) System

- i. Provide a state-of-the-art physical access control system utilizing "proximity smart card" and contactless based access system capable of being integrated with the IDS and CCTV systems.
- ii. A console must be provided in the Security Control center with access to all features of the PACS. The system must be supported by an Uniteruptable Power Supply (UPS) capable of supporting all systems and monitors for at least 10 minutes.
- iii. For new construction, entrance to the Security Control Center must be via a "man-lock" vestibule, with both doors controlled by the building access control system.
- iv. For existing/renovated facilities, NARA recommends that entrance to the Security Control Center be via a "man-lock" vestibule, with both doors controlled by the building access control system.

f. General Door Security Hardware

- i. Doors.
 - 1. Door hardware must be security type and heavy duty for maximum wear resistance and must also comply with all applicable Americans with Disabilities Act and Rehabilitation Act requirements.
 - 2. Mechanical and electronic locking hardware (including magnetic locking systems) must be capable of withstanding a pull of over 1,200 pounds at the door handle without failure of the electronic lock.
 - 3. Doors with electronic locks will lock upon closure.
 - 4. Door locking arrangement must be coordinated with Building Code requirements.
 - 5. All single-leaf exterior doors must have externally mounted security astragals.

- 6. Doors designed solely for emergency exit use must have non-removable hinges and no external hardware.
- 7. Multiple leaf external doors equipped with panic hardware must be monitored by CCTV and be alarmed during secure mode.
- 8. Electronic locks must "fail safe" only for exterior emergency exit doors. All other access system controlled electronic locks must "fail secure", if such measures do not conflict with applicable fire and building codes.
- 9. Secure emergency exit doors using an automatic door closer and exit hardware that are compliant with applicable fire and building codes and standards.
- 10. Use delayed egress hardware at emergency exits from critical or sensitive areas, if fire and building codes allows.
- 11. Forced entry resistance of all doors will be as determined by the risk assessment and based on response time for security and local law enforcement personnel.
- ii. Locks.
 - 1. All the building locksets must be high security mechanical or electronic locks. Logic digital keys and cylinders shall be used.



Figure 7.10 Sample Electronic Lockset and Logic Digital Key

g. General Utility System Security

- i. Utility Power Systems.
 - Locate utility power systems at least 25 feet away from loading docks, entrances, mailrooms, personnel and package screening locations, and uncontrolled parking, or implement standoff, hardening and venting methods to protect utilities from the Design Basis Threat (DBT) at these locations. All access points to the power service must be controlled. If utility systems cannot be located away from high-risk areas, service feeds, equipment, or equipment rooms must be hardened.

- 2. Install emergency and normal power distribution systems (including electric panels, conduits, and switchgears) at least 25 feet apart.
- 3. Emergency generator shall be secured against unauthorized access.
 - a. Locate the emergency generator and fuel tank at least 25 feet away from loading docks, entrances, parking, or implement standoff, hardening, and venting methods to protect utilities from the DBT at these locations.
 - b. If the emergency generator is installed outdoors at grade, it must be protected by perimeter walls and locked entrances.
 - c. The generator must not be located in any areas that are prone to flooding.
 - d. Provisions for securing refueling and shut-off valves in fuel lines within or in close proximity to the building must be addressed.
- ii. HVAC Systems.
 - 1. Provide separate isolated HVAC systems for lobbies, loading docks, mailrooms and other locations susceptible to Chemical, Biological, and Radiological attack that are isolated from other building areas.
 - 2. Provide emergency shutdown switch in the facility security control center for air intakes. Install a one-step shut-off for air handlers.
 - 3. Control movement of elevators, and close applicable doors and dampers to seal building.
- iii. Water Supply.
 - 1. Secure handles, control mechanisms, and service connections at on-site publicly accessible locations with locks or other anti-tamper devices.
- iv. Perimeter Lighting.
 - 1. Install exterior lighting at entrances, exits, parking lots, garages, and walkways from parking areas to entrances.
 - 2. Minimum lighting levels shall be in accordance with Illuminating Engineers Society of North America, Publication #IESNA G-1-03, Guideline for Security Lighting.

h. General Building Security and other Special Mitigation

- i. Walls and non-window openings.
 - 1. Protect non-window openings such as mechanical vents and exposed plenums to resist forcible entry.
 - a. The degree of penetration resistance must be commensurate with the delay necessary to protect assets while security and law enforcement personnel are notified and respond.
 - 2. All non-window openings greater than 96 square inches in perimeter walls must be secured with grilles, bars, or alarms.
- ii. Security Control Center.

- 1. A Security Control Center console must be provided in the Security Control Center with access to all features of the security and building systems.
 - a. The console shall be designed such that a single operator must be able to clearly view the CCTV monitors, the intrusion detection system graphic display, access control system display, HVAC control system display, fire control panel and annunciation graphic display, and emergency generator and stand-by power status.
 - b. The console must be supported by an Uninterruptible Power Supply (UPS), capable of supporting all systems and monitors for at least 10 minutes.
 - c. The Security Control Center shall also be equipped with communications equipment for the guard force and building emergency communications systems (public address system).
- iii. Research Room Monitoring Station.
 - 1. Provide at least a 6" elevated platform upon which a desk will be placed to provide staff a clear view of customers in all monitored rooms.
 - a. The desk shall be of sufficient size to house a CCTV monitoring station, desktop computer, and telephone.
 - b. The desk must be equipped with a duress button.
 - c. All elevated surfaces must comply with applicable ADA and Rehabilitation Act access requirements.
- iv. Entry screening equipment.
 - 1. Entry screening equipment shall be provided and located in the main entry lobby and loading dock for screening personnel, bags, packages, and other belongings.
 - a. X-ray equipment will be provided to screen packages during personnel building entry.
 - b. A façade will be designed matching the entry lobby décor to encase the x-ray equipment.
 - c. Magnetometers will be provided to screen personnel during building entry.
- v. Exit screening station.
 - 1. An exit-screening device for random selection of searches and furniture (table) shall be provided at the employee exit to permit exit screening.
 - 2. Furniture shall also be provided at the research exit to permit exit-screening searches.
 - 3. Sufficient space must be provided at both locations for the furniture and exit-screening device as appropriate.
 - 4. All elevated surfaces must comply with ADA access requirements.
- vi. Exhibit Glass.
 - 1. Cases in the permanent exhibit gallery, including case fronts and smaller case bonnets, shall be glazed with safety glass.
 - 2. Glazing shall meet the blunt force resistance requirements of either ASTM F1233, or EN 356-P5A.

8 CO-LOCATION OPPORTUNITIES

8.1 Background

Concurrent to the development of this program of requirements for a new Office of Public Records (OPR) facility for Archives and Records Center operations, the DC Public Library (DCPL) began the process of planning a renovation of the Martin Luther King Library (MLK) at 901 G Street, NW. This study originates with a request from the Mayor's Office to review opportunities for mutually supportive operations and for co-location opportunities for both institutions.

The Office of Public Records is currently located at Naylor Court and houses both the District's archival records and some Records Center records. The Naylor Court facility has reached its storage capacity and is inadequate for the long-term preservation of the city's archival records. In June 2015, the Department of General Services (DGS) initiated the development of a program of requirements for a new Archives facility.

Additionally, library services are evolving dramatically and a design program for the District's historic central library, the Martin Luther King Library, was developed in 2014. The District is now completing the design concept for a major renovation of the Library that will result in a welcoming, flexible, state-of-the-art library for the residents of DC.

Detailed planning for both the Archives and the MLK projects was paused in August 2015 in order to evaluate potential synergies between the two services, and to identify the impact those synergies could have on the functional composition of the two facility projects. The MLK Library and the DC Archives teams subsequently held joint meetings to discuss and brainstorm potential synergies. This chapter documents the investigations of potential synergies between the Archives and the Library and identifies space and cost implications.

8.2 Co-Location Opportunities for Archives and Library

In this study, the Archives and the Library have been considered as two aspects of public information services. There are a variety of ways the Archives and the Library can share resources and programs. This study reviewed three different options for synergy and co-location.

Full Co-Location

Locate all of the Archives collections and programs at the MLK Library.

Partial Co-Location

Locate part of the Archives collections and its public service operations at the MLK Library.

• Operational Co-Location

Locate the Library's operations and distribution center at a new Archives facility.

The following questions were considered:

- What do these services have in common?
- How are they different?
- Can their collections be combined in the renovated MLK Library?
- Can their public services functions be combined?
- Are there other functions that could be shared or co-located together?

8 - CO-LOCATION OPPORTUNITIES \ ASSESSMENT CRITERIA

Examination of these programs has led to an understanding of how the Archives and Library are each functionally unique as well as how they might work together in complementary fashion.

8.3 Assessment Criteria

To evaluate these options, quantitative and qualitative assessments were prepared.

Quantitative Assessment

The quantitative assessment uses previously established figures for archival storage collections and fixed and mobile storage capacities. Chapter 3, Evaluation of Current Holdings (pg 27), provides the preliminary inventory of the permanent archival records and temporary records collections and concludes that the City needs to store 507,000 cubic feet of materials.

The quantitative assessment expands upon Options 1 through 4, presented in Chapter 4, Records Storage Options (pg 35). In the same way, this assessment tabulates the size and construction costs for each option. Utilizing the various shelving densities explained in Chapter 4 and the balance of the proposed building program for the new DC Archives facility, building size options were generated for the scenarios including co-location with the MLK Library.

Options first presented in Chapter 4:

- 1: New stand-alone OPR facility with 15 shelves high compact shelving.
- 2: Retrofit OPR into an existing building with 7 shelves high fixed shelving.
- 3: New stand-alone OPR facility with 25 shelves high fixed shelving.
- 4: New stand-alone OPR facility with 25 shelves high compact shelving.

Co-location options considered:

- A: All archival holdings and OPR functions located in MLK Library with 7 shelves high fixed shelving + new OPR facility for Records Center functions and DCPL Operations Center.
- B: Some archival holdings and OPR functions located in MLK Library + new OPR facility with DCPL Operations Center.
- C: New stand-alone OPR facility with 15 shelves high compact shelving + DCPL Operations Center.

A comparison of Options A, B, & C demonstrates the efficiencies of each of the OPR/MLK co-location scenarios. (Refer to Appendix J - Expanded Option Descriptions & Cost Estimates (pg 343) for a complete presentation of the space allocations).

Qualitative Assessment

The qualitative assessment applied evaluation criteria of key issues, as identified by OPR and DCPL. Criteria included: building size, estimated cost, public access, shelving access, program efficiency, and operational efficiency. A scale of effectiveness was identified (excellent, fair, poor) for each option that was based on an objective assessment, thus allowing the options to be compared as summarized in Figure 8.1.

Given the floor-to-floor height limitations of the MLK Library and many existing city buildings, low-density shelving would need to be used. Low-density shelving generates greater space needs (square feet) that in turn yields higher construction costs, making the renovation options less effective and less efficient. Operational efficiency was scored high when agency

8 - CO-LOCATION OPPORTUNITIES \ EVALUATION OF CO-LOCATION OPPORTUNITIES

functions are housed in one location, and marked fair when agency functions have multiple locations. Similarly, program efficiency was marked down when program duplication was necessary in some co-location options.

8.4 Evaluation of Co-Location Opportunities

The data in the quantitative and qualitative assessments provide an objective evaluation of the various co-location options between OPR and the MLK Library.

Option A

Option B

ILK &

Option C All Archival Holdings & OPR Public

Functions at New OPR Facility DCPL Operations Center at New OPR Facility

Legend		All Archival Holdings at MLK OPR Public Functions at MLK DCPL Operations Center at New OPR Facility	Some Archival Holdings at OPR Public Functions Dup DCPL Operations Cent at New OPR Facility
Excellent	Building Footprint	×	
Fair	Building Cost	×	×
Poor	Public Access		
	Shelving Access		
	Operational Efficiency		
	Program Efficiency		

Figure 8.1 Evaluation of Co-Location Strategies

• **Full Co-Location** (All Archives programs housed at the MLK Library)

Given the archival storage space needs and the limitations of the existing structural load capacity and floor-tofloor height at the MLK library, the Archives program would require 148,483 SF, which is approximately 1/3 of the MLK library facility. From initial discussions with the MLK Library team, this space requirement appears to greatly exceed available space within the MLK Library renovation program. In addition, because of the existing building limitations, this option is the most expensive to house the Archives collections. It is double the cost of a new high bay stand-alone building. Furthermore, because of Archives environmental storage requirements, the building systems for the archival storage vaults must run independent of the library's mechanical, emergency, and fire protection systems. This option is space prohibitive, as it would severely reduce the space available at MLK for the Library program. It is the least effective option.

• **Partial Co-Location** (Some Archival holdings and OPR Public Functions at the MLK Library)

In working with the MLK Library renovation team, they identified a dedicated 9,000 SF area for archival storage, 3,000 SF area for associated building systems and space for OPR public functions. This scenario appears to infill available space at the MLK Library. In this option, archival collections as well as the associated public functions must be divided between two locations (MLK and the planned new OPR DC Archives facility). This duplication results in both operational and programmatic inefficiencies as well as in higher costs. The cost premium for this option adds \$15-\$20 million in total project construction costs to the DC Archives project. This option has not been endorsed by either agency due to its operational inefficiencies and higher costs.

8 - CO-LOCATION OPPORTUNITIES \ RECOMMENDATIONS

• **Operational Co-Location** (DCPL operations & distribution center at a new Archives facility)

This co-location option considers housing DCPL's operations and distribution center at the new DC Archives facility. Similar space types for material handling creates space efficiencies and allows vehicular and truck traffic to be located out of the downtown corridor. Site selection for a shared new Archives facility and DCPL operations center will need to carefully evaluate traffic flow for this concept to be effective. In addition, library operations would be able to take advantage of resources within the Archives facility for book processing, particularly in acquisitions. Similar models have been adapted at peer institutions and have allowed greater operational efficiencies for public library systems. This option has validity and value to the City, but requires project-funding allocation to move forward.

8.5 Recommendations

OPR requires an appropriate, permanent, purpose-built facility that is designed to meet the functional requirements for Archives and records storage using best practices and that optimizes the spaces for these purposes. This report concludes that the most efficient and cost effective plan for OPR is to design and construct a stand-alone building that supports archival best practices, develops operations and programs that preserve the records of the city, and that serves and involves the community.

Benefits of a stand-alone OPR facility include:

- Ability to house all the collections of the city in appropriate and environmentally sound storage spaces.
- Ability to carry out conservation, processing and digital operations to preserve and access the city's records.
- Significant expanded services to city agencies in records management and records storage services.
- Reduced costs to store city records.
- Significantly expanded archival services and programs to the community.
- Optimization of functional requirements, first costs, and value to the city.

The DC Archives and Library co-location options within the MLK Library building are not recommended, primarily due to space constraints, structural limitations, operational duplication and ineffectiveness, building system inefficiencies, and increased costs.

Co-locating the DCPL Library Operations Center with the new DC Archives building is recommended and has tangible benefits to both agencies. This option should be further explored.

Benefits of Co-Location of a new OPR facility and the DCPL Operations Center include:

- Because OPR and the Library Operations center will form one building project, rather than two separate projects, it is reasonable to expect considerable savings in site development, site servicing, and project administration costs.
- This option allows for synergy between some of the supportive services of OPR and DCPL: shared meeting spaces, and shared and reduced building operations and maintenance functions.
- Reduction in spatial requirements for operations and maintenance within DCPL's facilities.
- Location of the OPR facility and the DCPL Operations center outside the downtown core, adjacent to major routes, will allow for more streamlined library distribution services that will accommodate increases in volume without significant increases in cost.

8 - CO-LOCATION OPPORTUNITIES \ RECOMMENDATIONS

Additional OPR/DC Archives and DCPL/MLK Synergies

During the joint DC Archives and MLK team brainstorming sessions other synergies were discussed that could benefit and enhance both institutions. It is recommended that these and other ideas for partnerships, shared resources, and collaborative programs be further explored.

Exhibits

MLK and DC Archives should each have exhibit space to educate and enhance the public's experience. The two institutions should explore coordinated and joint exhibitions and rotating individual exhibits to emphasize to the public the community resources of both city institutions. Exhibit designers require the appropriate space and equipment to prepare the exhibits. The exhibit preparation space could be shared and could be located at either facility.

Laboratories

Both institutions have conservation requirements for their collections and should explore cooperative preservation. OPR and MLK could share a conservation laboratory. Alternatively, each institution could develop unique labs that do not duplicate preservation functions and share the resources of both labs.

Digital Programs

Both institutions will be developing digitization programs. Digital preservation and digital access go hand-in-hand. OPR and MLK should explore ways to share and blend digitization programs for preserving their collections and for coordinated online public access and outreach.

Integrated Access to Collections

With shared online catalogs, finding aids, and exhibits, OPR and MLK can create a single point of access to their collections for their users. Converging systems offers a coherent and broader base of user services. Online access means both institutions can reach out to populations previously neglected and expand their services beyond the walls of their institutions.

Joint Public Programs

With a shared focus and interest in the District's rich history, the DC Archives and the MLK Library should explore the development of collaborative public programs.

8 - CO-LOCATION OPPORTUNITIES \ RECOMMENDATIONS

9 PRELIMINARY SITE EVALUATION

In October 2015, the Department of General Services (DGS) identified three potential sites for the new Office of Public Records Archives Building. The preliminary site evaluation analyzes these sites in regards to public transportation access, vehicular access, community access, facility conditions, zoning constraints, and site development issues.

9.1 General Requirements

The DC Archives facility first and foremost needs to be located in Washington DC. Driving factors in site selection include: location, cost, availability.

Specific criteria for site selection for the DC Archives include:

- Located within short response time for emergency services.
- Quick evacuation.
- Protected from dangers from neighboring spaces and buildings.
- Accessible to visitors
- Accessible to related agencies and to other cultural institutions.
- Accessible by main roads and public transportation
- Eligibility for site-related LEED credits

Many of the dangers that threaten an archival facility can be avoided by careful site selection and site work. In addition to location, cost, and availability, the site selection must consider other potential risks, including:

- Vandalism, terrorism, and intrusion.
- Natural disasters, such as earthquakes, landslides, etc.
- Fire and explosions
- Hazardous locations or materials
- Flooding from natural sources or water mains.
- Ground and air pollution
- Rodents and insects

The entire site and ancillary structures on the site should be a minimum of 5 feet above and 100 feet away from any 100-year floodplain area.

Site Size

The site for an archives/records center facility must be large enough to accommodate:

- Building footprint
- Site access and service roads
 - · Roads, fire lanes, and parking areas should be designed to permit unrestricted access for emergency vehicles

9 - PRELIMINARY SITE EVALUATION \ OVERVIEW OF SITES

- Sufficient parking
- Space for storm water management
- Separation between drop off areas, parking, loading, and the building
- Turning radii for large delivery and trash vehicles
 - 53 foot truck is recommended

In addition, the site should accommodate future growth.

Site Evaluation

Conduct a site survey and consider the adequacy of the site using the above listed criteria. Also complete a geotechnical investigation and a security risk assessment. If needed, conduct an archeological assessment.

Special Utility Requirements

The water supply, sewer, and storm drainage systems should all be readily available and meet the requirements outlined by codes and NARA 1571's requirements.

The primary electric power from the network to the building must run underground in conduit. All conduits for the primary power must have at least 50% spare conduit capacity. Consideration should be given to a redundant primary feeder.

9.2 Overview of Sites

The three potential sites are DC Government owned properties. Each of these properties has been vacated and each site contains existing buildings, previously supporting DC Public Schools. The properties for consideration are:

1. Thurgood Marshall Elementary School

3100 Fort Lincoln Drive NE, Washington, DC 20018

2. Fletcher Johnson Middle School

4650 Benning Rd SE, Washington, DC 20019

3. The Penn Center

1709 3rd St NE, Washington, DC 20002

In addition, the Department of General Services made available drawings and condition assessment reports for these properties. The remainder of the chapter summarizes the existing knowledge on each of these properties.

9 - PRELIMINARY SITE EVALUATION \ PRELIMINARY EVALUATION CRITERIA

9.3 Preliminary Evaluation Criteria

The following five criteria have been used in the analysis and comparison for the remainder of the chapter.

Public Transportation (Metro) Access

Public transportation access is critical to the success and use of the Archives by local residents and traveling researchers. For each site, the three closest rail stations are identified. Tabulated distances are calculated by the Washington Metropolitan Transportation Authority's online tool. Mapped distances are acceptable walking routes from the site to the stations. Bus routes that connect the site to major stations are also listed.

Vehicular Access

Vehicular access is essential to provide archival material deliveries, Records Center record deliveries, and parking for those building users that will access the site by car. The street frontage and major nearby arteries have been considered and identified.

Community Access

Promoting local community use and growth is a key site consideration for the new Archives building. Understanding current community uses and points of site access will allow DGS to select a site with synergies between the OPR public programs and the local neighborhood.

Zoning

Zoning constraints can limit the flexibility of building design and, in some cases, so restrict a site that there is insufficient buildable area for an archival facility.

Known Hazards

The general requirements in Section 9.1 list many known hazards that must be avoided in site selection. Additionally, since these sites include existing buildings, there may be hazards or costs associated with remediating the site to the design standards presented in Chapter 7.

9 - PRELIMINARY SITE EVALUATION \ SITE ANALYSIS: THURGOOD MARSHALL ELEMENTARY SCHOOL

9.4 Site Analysis: Thurgood Marshall Elementary School

The Thurgood Marshall Elementary School is the most remote of the three sites to downtown and Metro stops. The Department of General Services produced a 2010 Master Facilities Plan assessing the condition of the building, which provides key facility information.

Basic Information:

Ward: 5

Building Size: 103,800 GSF

Construction Year: 1980

FEMA Floodplain: Zone X (Areas determined to be outside 500-year floodplain.)

Public Transportation (Metro) Access:

Nearest Station: Deanwood

Distance to Metro: 1.8 miles

Additional Stations:

- 1. Brookland-CUA (1.99 miles)
- 2. West Hyattsville (2 miles)

Lines: Orange, Red, Green

Bus Routes: B8, B9, H6, B2 with service to Brookland Station, Rhode Island Avenue Station, and Stadium Armory Station

Vehicular Access:

Street Frontage: Fort Lincoln Dr. NE, Commodore Joshua Barney Dr. NE

Major Nearby Arteries: US-1, US-50, Anacostia Fwy



Figure 9.1 Thurgood Marshall Elementary School Site Plan (1" = 250'-0")



Figure 9.2 Thurgood Marshall Elementary School Site Context (1" = 1,250'-0")



Figure 9.3 Thurgood Marshall Elementary School Distance to Metro (1" = 10,000'-0")

9 - PRELIMINARY SITE EVALUATION \ SITE ANALYSIS: THURGOOD MARSHALL ELEMENTARY SCHOOL

Zoning:

Zone: R-5-D, no overlays Maximum Occupancy: 75% Maximum Height: 90 FT Maximum FAR (Other): 3.5 Maximum FAR (Public Library): 3.5

Adjacent Community Use:

1. Fort Lincoln Park

2. Fort Lincoln Recreational Center (Basketball Court, Gymnasium)

3. Theodore Hagans Cultural Center (Park, Multipurpose Room, Swimming Pool, Pottery Room, Tennis Courts)

Context:

The area is predominantly residential. There are dining options nearby, including Popeye's, New Centry Carry Out, and Fish & Chicken House. Additional services include a Costco and DC Brau, a local brewery.

Known Hazards:

- 1. Elevator replacement
- 2. Electrical service replacement

3. Poor envelope condition: walls, doors, windows, roof

- 4. HVAC replacement
- 5. Water damage
- 6. Plumbing fixture and pipe replacement
- 7. ADA compliance







Figure 9.4 Thurgood Marshall Elementary School Exterior

9 - PRELIMINARY SITE EVALUATION \ SITE ANALYSIS: FLETCHER JOHNSON MIDDLE SCHOOL

9.5 Site Analysis: Fletcher Johnson Middle School

Benbassat & Sporidis Company provided the District of Columbia with a Condition Assessment Report in January 2006. In this report, the building has received a facility condition index (FCI) of 0.10; this metric is measured from 0 to 1 where 0 is prime condition and 1 is complete replacement needed.

Basic Information:

Ward: 7

Building Size: 310,975 GSF

Construction Year: 1975

FEMA Floodplain: Zone X (Areas determined to be outside 500-year floodplain.)

Public Transportation (Metro) Access: Nearest Station: Benning Road

Distance to Metro: 0.52 miles

Additional Stations:

- 1. Capitol Heights (1.16 miles)
- 2. Minnesota Ave (1.26 miles)

Lines: Silver, Blue, Orange

Bus Routes: U8, W4, U5, U6 with service to Minnesota Ave Station and Deanwood Station

Vehicular Access:

Street Frontage: Benning Rd. SE, St Louis St.. SE

Major Nearby Arteries: Anacostia Fwy



Figure 9.5 Fletcher Johnson Middle School Site Plan (1" = 250'-0")



Figure 9.6 Fletcher Johnson Middle School Site Context (1" = 1,250'-0")



Figure 9.7 Fletcher Johnson Middle School Distance to Metro (1" = 5,000'-0")
9 - PRELIMINARY SITE EVALUATION \ SITE ANALYSIS: FLETCHER JOHNSON MIDDLE SCHOOL

Zoning:

Zone: R-5-A, no overlays Maximum Occupancy: 40% Maximum Height: 40 FT Maximum FAR (Other): 0.9 Maximum FAR (Public Library): 2

Adjacent Community Use:

1. Fletcher-Johnson Recreational Center / Fletcher-Johnson Field

Context:

The area is predominantly residential. Adjacent uses include schools (KIPP DC LEAP Academy, Nalle Elementary School), Jones Memorial Methodist Church, the Woodlawn Cemetery, and Dollar Plus Food Store. The closest food options are near Benning Road Station and include America's Best Wings, Subway, Yum's Carryout, Shrimp Boar, Real Halal, Denny's, and 7-Eleven.

Known Hazards:

- 1. Asbestos remediation
- 2. Fire damage
- 3. Vandalism
- 4. Elevator replacement
- 5. HVAC system replacement
- 6. Code and ADA compliance







Figure 9.8 Fletcher Johnson Middle School Exterior

9 - PRELIMINARY SITE EVALUATION \ SITE ANALYSIS: THE PENN CENTER

9.6 Site Analysis: The Penn Center

The following site analysis is derived from publicly available information. Further consideration of The Penn Center as a site will require a detailed facility assessment.

Basic Information:

Ward: 5

Building Size: Not Available

Construction Year: Not Available

FEMA Floodplain: Zone X (Areas determined to be outside 500-year floodplain.)

Public Transportation (Metro) Access:

Nearest Station: NoMa-Gallaudet U

Distance to Metro: 0.41 miles

Additional Stations:

1. Rhode Island Ave-Brentwood (0.61 miles)

2. Shaw-Howard U (1.09 miles)

Lines: Red, Green, Yellow

Bus Routes: P6, 80, 90, 92, 93, X3 with service to Union Station, U St Station, Anacostia Station, and Tenleytown Station

Vehicular Access:

Street Frontage: 3rd St. NE, R St. NE, Randolph Pl. NE

Major Nearby Arteries: US-1, US-50



Figure 9.9 The Penn Center Site Plan (1" = 250'-0")



Figure 9.10 The Penn Center Site Context (1" = 1,250'-0")



Figure 9.11 The Penn Center Distance to Metro (1" = 5,000'-0")

9 - PRELIMINARY SITE EVALUATION \ SITE ANALYSIS: THE PENN CENTER

Zoning:

Zone: C-M-2, no overlays Maximum Occupancy: N/A Maximum Height: 60 FT Maximum FAR (All): 4

Adjacent Community Use:

1. Metropolitan Branch Trail is directly east of the site.

Context:

The site is in a commercial district that is directly adjacent to a residential district. Adjacent uses include a bicycle shop (Gearin' Up Bicycles), houses of worship (James Memorial Baptist Church, First Jericho Baptist Church, First New Hope Baptist Church), bulk commercial (Washington Air Compressor Rental, Delta Produce), lodging (Haus of Seaton), supermarket (McKinley Market), and storage (CubeSmart Self Storage). McKinley Technological High School is within walking distance.

Known Hazards:

- 1. Detailed facility assessment required to determine site development issues
- 2. Adjacent to railroad







Figure 9.12 The Penn Center Exterior

9 - PRELIMINARY SITE EVALUATION \ SITE COMPARISON

9.7 Site Comparison

A qualitative comparative evaluation of the sites, based on the criteria explained in Section 9.3, is shown below.

Legend		Thurgood Marshall Elementary School	Fletcher Johnson Middle School	The Penn Center
Excellent	Public Transportation (Metro) Access	×		
= Fair	Vehicular Access			\bigcirc
Poor	Community Access	\mathbf{x}		\bigcirc
	Zoning Constraints		×	\bigcirc
	Known Hazards			\mathbf{x}

Figure 9.13 Preliminary Comparison of DGS-Provided Sites

9.8 Preliminary Site Evaluation

- None of the preliminary sites are ideal.
- In light of the City's commitment to pursuing adaptive reuse, we recommend that only the non-storage functions of the program are suitable for accommodation in a renovated existing building.
- The archival storage spaces must be accommodated in purpose-built new construction.
- The Penn Center site is worth studying further and the District should explore the potential for other sites.

10 COST & BUDGET

During the evaluation of building footprint and records storage options, preliminary construction cost estimates were prepared, utilizing historic cost data for this building type, benchmarks, escalation, and design contingency. In addition, the various shelving system types were priced, utilizing feedback from shelving manufacturers. No site development costs were factored into the preliminary construction cost estimates, as a site selection remains undetermined at this time. The intent of this costing exercise is to provide the District with cost data to make the necessary project scope decisions and to formulate the project budget.

10.1 Estimated Construction Costs

Based on feedback from the Department of General Services and the Secretary, building size Option 1 and co-location Option C were selected as the preferred scheme, and the detailed program reflects this decision. Included in this option is the DCPL Operations Center, which was not part of the original scope envisioned in the programming RFP. Preliminary construction cost estimates are broken out into three components: building costs, shelving costs, and the co-located DCPL Operations Center building costs. In addition, other project costs, notably FF+E costs, architectural and engineering design fees, and general development costs are estimated by DGS to determine the total estimated project cost. Site-specific costs are not included in the preliminary construction cost estimate.

The preliminary construction costs are comprised of the following costs:

•	OPR Archives Building:	\$40,402,023.00
•	DCPL Operations Center:	\$7,080,621.00
•	Compact Shelving (Medium Density)	\$14,845,882.00
The pre	liminary construction cost estimate is:	\$62,328,526.00

A total preliminary project cost estimate can be found in the table below.

Table 10.1 Estimated Project Costs

Building Footprint (GSF)	135,665
Total Construction Cost	\$62,328,526.00
Overall Cost / SF	\$459.43

Other Project Costs (Design, FF&E, Permits)	\$12,465,705.00
Total Estimated Project Cost	\$74,794,232.00

10 - COST & BUDGET \ COST MANAGEMENT OPTIONS

10.2 Cost Management Options

To be fiscally responsible, the project team has identified a number of cost saving options for the District's consideration. These cost management options are enumerated as follows:

Cost Savings Strategy #01

Utilize high density compact mobile shelving in lieu of medium density compact mobile shelving. Reduces building size by 45,451 GSF. Estimated Savings: **<\$15,900,000>**.

• Cost Savings Strategy #02

Reduce Records Center storage by housing permanent Records Center records in the archival storage growth space. Reduces building size by 8,085 GSE Conversely, reduce projected growth space by similar percentage, and plan for growth to be addressed by future archival expansion. Can be combined with the above. Estimated Savings: **<\$2,800,000>**.

• Cost Savings Strategy #03

Divide archival vault into two vaults, with the growth vault built to Records Center Standards, but designed to be easily convertible to archival standards. Can be combined with the above. Estimated Savings: **<\$1,200,000>**.

• Cost Savings Strategy #04

In lieu of cost savings strategy #02, reduce the quantity of compact mobile medium density shelving, eliminating shelving planned for future growth. Plan for shelving growth to be addressed by future capital project limited to shelving costs only. This approach can consider installing rails, but omitting selected banks of carriages and shelves, but this results in the appearance of underutilized space. Another approach that is gaining popularity is to have the shelving manufacturer design the shelving systems to accommodate a future upward expansion that entails adding shelves on top of the originally furnished banks of shelving. In this approach, the initial build needs to provide the additional vertical clearance for the future shelving growth, but the storage spaces are fully equipped with all the carriages and shelving banks on Day 1.

Estimated Savings, based on 90% build-out: **<\$1,450,000>**. Estimated Savings, based on 80% build-out: **<\$2,950,000>**.

Cost Savings Strategy #05

In lieu of cost savings strategy #02, reduce the size of Records Center storage space. Utilize off-site storage for temporary records. In this example, a 25% reduction is considered and reduces building size by 13,000 GSF and requires operational costs for storing temporary records.

Estimated Savings: **<\$3,250,000>**.

Cost Savings Strategy #06

Plan for double-shelving of records. This strategy yields a higher cost savings when fixed shelving is being considered, as it doubles the storage efficiency without utilizing compact mobile systems resulting in a reduced building size. In the case of compact mobile systems, the savings comes from fewer mobile carriages, shelving components, and controls. The same general amount of shelving materials are requires, but there's a reduction in the installation effort. This strategy requires added operating costs for removing and handling boxes that are not being retrieved but that are blocking the box that is being retrieved. Estimated Savings: **<\$1,250,000>**.

11 RECOMMENDATIONS & NEXT STEPS

11.1 Recommendations

Records Storage

In consideration of prevailing operational preferences that were reinforced and endorsed by OPR, this report recommends medium density/height compact mobile shelving systems at 15 shelves high (approximately 16-feet of system height) for the facility's archival storage needs.

Depending on budget and site constraints, higher density systems may be explored during the design phases for the Records Center component of the project.

Functional Space Program

As noted in Chapter 5 of this report, 100,590 net square feet (NSF) of usable programmatic area is recommended. Circulation and grossing factors for archival facilities are much higher than for typical office or storage facilities and this net area extends to **135,665 gross square feet (GSF)** when these efficiency factors are applied.

Co-Location with DCPL Services

The study performed by this project team concludes that OPR is best served by a permanent, purpose-built and stand-alone facility that is designed and built to meet the functional requirements for archives and records center storage using best archival practices and that optimizes the spaces for the development of operational programs that preserve the records of the city, and that serve and involve the community.

The DC Archives and Library co-location options within the MLK Library building are not recommended, primarily due to space constraints, structural limitations, operational duplication and ineffectiveness, building system inefficiencies and increased costs. However, other synergies could be developed that benefit and enhance both institutions, including laboratories, digital programs, integrated access to the collections, and joint public programs. It is recommended that ideas for partnerships, shared resources, and collaborative programs be further explored.

Co-locating the DCPL Library Operations center with the new DC Archives building is recommended and has tangible benefits to both agencies. This option should be further explored.

Preliminary Site Evaluation

In response to the City's consideration of reusing an existing building to accommodate the DC Archives and Records Center, we recommend that only the non-storage functions of the program are suitable for accommodation in a renovated existing building. The archival storage spaces must be accommodated in purpose-built new construction.

Of the three potential DC Government owned properties identified in Chapter 9 of this report, only the Penn Center site appears deserving of further study. We recommend that the City continue to work to identify other potential sites that might be more suitable.

11 - RECOMMENDATIONS & NEXT STEPS \ NEXT STEPS

Budget

The rough order of magnitude cost for the building and the storage shelving (rounded for ease of reference) is **\$62,350,000** as detailed in Chapter 10. Based upon guidance from DGS with respect to customary project administration costs and other project costs for recent capital projects in the City, **\$75,000,000** of funding commitment should be sought to cover the full cost of the project.

11.2 Next Steps

Records Survey and Appraisal Estimates

- Further survey work and appraisal is needed in order to finalize designs for storage spaces and shelving systems.
- In order to be of value for the design process, this survey work needs to be performed by a qualified archival appraising firm or by trained records management personnel.
- DC needs to allocate temporary resources to OPR to undertake this process. OPR does not have the space, staff, or other necessary resources to complete this work.

Move Planning

- Peer institutions report that the move planning process can take between 2 and 3 years, and that's from institutions that had a stronger baseline handle on their holdings and operations.
- We recommend that the City engage a move consultant as soon as possible.

Co-Location Determination

- As of the date of this report, the DCPL project team has undertaken the task of exploring the full incorporation of the DC Archives functions into the design program for the Modernization of the MLK Library.
- The City needs to reconcile that pursuit with the recommendations outlined in this report and decide whether the DC Archives functions will be housed at MLK Library or at the new OPR Facility.
- This decision needs to be made before the final program for the OPR facility can be completed.

Site Selection

- In order for the programming process to be completed and design to begin, the City needs to establish the site.
- We recommend engaging the AE team to assist with identification of other candidate sites and to determine the necessary scope for a detailed conditions assessment, feasibility study, and test fit for the existing building, or buildings, being considered.

11 - RECOMMENDATIONS & NEXT STEPS \ NEXT STEPS

Budget Determination

- A firm "design-to" budget for the project needs to be established.
- The budget determination needs to clearly differentiate between the portion of the budget that is allocated to cover the cost of the construction contract, the "construction cost", and the portion of the budget that is intended to cover other project costs.
- If the project is to be undertaken with a smaller budget that recommended in this report, the City needs to identify which of the cost reduction strategies they want to implement.

Programming & Design

- A follow-on programming phase will account for the information gathered from the records survey and appraisal, the co-location decision, the selected site, and the established "design-to" budget.
- A meeting with the DC Office of the ChiefTechnology Officer (OCTO) will be scheduled during the follow-on programming phase to determine the technology program of the building.