INTRODUCED: September 13, 2021

A RESOLUTION No. 2021-R072

To support the application for an evaluation of the John Marshall Courts Building located at 400 North 9th Street by the Virginia Department of General Services for noncompliance with the Virginia Courthouse Facilities Guidelines.

Patron – Mayor Stoney

Approved as to form and legality
by the City Attorney

A TRUE COPY:
TESTE:
Candice D. Reid
City Clerk

PUBLIC HEARING: SEP 27 2021 AT 6 P.M.

WHEREAS, the City of Richmond desires to submit an application for an evaluation of the John Marshall Courts Building located at 400 North 9th Street by the Virginia Department of General Services for noncompliance with the Virginia Courthouse Facilities Guidelines pursuant to section 17.1-281 of the Code of Virginia (1950), as amended; and

NOW, THEREFORE,

BE IT RESOLVED BY THE COUNCIL OF THE CITY OF RICHMOND;

That the Council of the City of Richmond hereby supports an application for an evaluation of the John Marshall Courts Building located at 400 North 9th Street by the Virginia Department of General Services for noncompliance with the Virginia Courthouse Facilities Guidelines pursuant to section 17.1-281 of the Code of Virginia (1950), as amended.

AYES:	9	NOES:	0	ABSTAIN:	
ADOPTED:	SEP 27 2021	REJECTED:		STRICKEN:	

RECEIVED
By City Attorney's Office at 3:27 pm, Sep 09, 2021

CITY OF RICHMOND
INTRACITY CORRESPONDENCE

Received
AUG 06 2021
Office of the
Chief Administrative Officer

O&R REQUEST

DATE: August 5, 2021 **EDITION:** 1

TO: The Honorable Members of City Council

THROUGH: Levar M. Stoney, Mayor

THROUGH: Lincoln Saunders, Acting Chief Administrative Officer

THROUGH: Robert Steidel, Deputy Chief Administrative Officer- Operations

FROM: Bobby Vincent, Director of Public Works

RE: **JOHN MARSHALL COURTS BUILDING EVAULATION APPLICATION**

ORD. OR RES. No. ______________________

PURPOSE: For City Council, in accordance with COV §17.1-281, to request the Virginia Department of General Services evaluate the John Marshall Courts Building located at 400 N. 9th Street, Richmond, VA courthouse facility for noncompliance with the Virginia Courthouse Facilities Guidelines.

REASON: The John Marshal Courts Building functionality is outdated. ADA requirements have not been kept up with newer requirements, technology is not state of the art and the infrastructure has numerous deficiencies.

RECOMMENDATION: The Administration recommends approval.

BACKGROUND: The John Marshal Courts Building was designed and constructed in 1975 and the first floor was expanded in 2008. The building consist of 4 stories and each story is approximately 33,000 s.f. In 2017, Peck & Peck Associates Architects initial assessment of the building felt the building was in fair condition. There have been no major improvements to the building since it was built with the exception of the expansion of the first floor office, and the replacement of the existing chilled water system, including the chillers, cooling tower and related equipment. The existing building mechanical systems are original to the construction of the building and are at the end of their useful life.

In 2017, the total cost to address deficiencies was $11,211, 339. Concerns mentioned by the building users are:

1. Lack of control and inefficiency of the heating and cooling system
2. Leaks for the existing curtail wall system
3. The seasonal heat gain./loss form the curtail wall system
4. The age and condition of the toilet rooms
5. Handicap-accessibility
6. Other building deficiencies

A Planning Oversight Advisory Committee has been formed, as recommend in the Virginia Courthouse Facility Guidelines to provide advice and guidance throughout the planning process. The Committee consists of Judges of the circuit court, general district court and juvenile and domestic relations district court and their clerks, the Commonwealth Attorney, representatives from the City's Department of Public Works, the Sheriff, and the president of the Virginia Bar Association.

FISCAL IMPACT / COST: None

FISCAL IMPLICATIONS: None

BUDGET AMENDMENT NECESSARY: None

REVENUE TO CITY: None

DESIRED EFFECTIVE DATE: Upon Adoption

REQUESTED INTRODUCTION DATE: September 13, 2021

CITY COUNCIL PUBLIC HEARING DATE: September 27, 2021

REQUESTED AGENDA: Consent

RECOMMENDED COUNCIL COMMITTEE: Government Operations (September 23, 2021)

CONSIDERATION BY OTHER GOVERNMENTAL ENTITIES: None

AFFECTED AGENCIES: None

RELATIONSHIP TO EXISTING ORD. OR RES.: None

REQUIRED CHANGES TO WORK PROGRAM(S): None

ATTACHMENTS: Peck & Peck Associates Architects Deficiency Summary, VA Dept. of General Services Evaluation Application

STAFF:
Lynne Lancaster, DPW (646-6006)
Jeannie Welliver, DPW (646-7322)

Application
Department of General Services Evaluation
Code of Virginia §17.1-281
Virginia Courthouse Facility Guidelines

In accord with COV §17.1-281, I request that the Department of General Services evaluate the following courthouse facility for noncompliance with the Virginia Courthouse Facilities Guidelines.

Building Name	John Marshall Courts Building
Building Function	Courthouse
Street Address	400 N. 9th Street
City/County, VA, Zip	Richmond, VA 23219

(If multiple buildings are used for the courthouse function, complete <u>one application per building</u> and include a site plan or map that identifies the location of the facility in the courthouse complex.)

<u>Applicant</u> (The only acceptable applicants are the County/City Administrator or the County/City Attorney)

Name	J.E. Lincoln Saunders
Title	Acting Chief Administrative Officer
Street Address	900 E. Broad Street, 2nd Floor
City/County, VA, Zip	Richmond, VA 23219
Telephone	804-646-7970
Email	lincoln.saunders@richmondgov.com
FEIN	54-6001556

<u>Facility Management Contact</u>

Name	Kenneth Hill
Street Address	900 E. Broad Street, G Level
City/County, VA, Zip Code	Richmond, VA 23219
Telephone	804-646-2787
Email	kenneth.hill@richmondgov.com

<u>Billing Contact</u>

Name	Lynne Lancaster
Street Address	900 E. Broad Street, 7th Floor
City/County, VA, Zip Code	Richmond, VA 23219
Telephone	804-646-6006
Email	lynne.lancaster@richmondgov.com

I certify that to the best of my knowledge and belief all information on this form and on the attached Facility Evaluation that identifies the same building is correct. By applying for this evaluation, the City/County agrees to reimburse the Department of General Services for costs incurred.

By and on behalf of the County/City of: Richmond

JE Lincoln Saunders 7-8-21

County/City Administrator or County/City Attorney Date

Attachments: Application; Evaluation; Site Plan / Map; Supporting Documents: Facility Assessment, ADA Survey and Energy and Environmental Study

Instructions
Department of General Services Evaluation
Code of Virginia §17.1-281
Virginia Courthouse Facility Guidelines

Upon determination by the County Board of Supervisors or City Council that an evaluation of the local courthouse facilities for noncompliance with Virginia Courthouse Facilities Guidelines in accord with COV §17.1-281 is desired, complete the Application and Facility Evaluation forms and submit them to the Department of General Services.

Application and Facility Evaluation forms may be obtained by:

Following the link for *Courthouse Evaluation Program* at www.dgs.virginia.gov/DEB or
Sending a request to Capout@dgs.virginia.gov reference *Courthouse Evaluation Program* in the header or
Calling the Division of Engineering and Buildings office at 804-786-0402

Virginia Courthouse Facilities Guidelines, Second Edition as published by the Department of Judicial Services is basis for the Facility Evaluation form. This guideline provides details of the evaluation criteria and should be used as resource to complete the evaluation. Guidelines may be obtained at http://www.courts.state.va.us/courts/vacourtfacility/complete.pdf

Include the complete signed Application, Facility Evaluation, and site plan or map as applicable. Provide other supporting documentation, if available, including: facility condition reports, facility safety or security evaluations, special safety or security operating procedures, or any other information pertinent to the evaluation. Submit complete packages.

By US Mail to:

Courthouse Evaluation Program
Division of Engineering and Buildings
1100 Bank Street, 6th Floor
Richmond, VA 23219

By Email to:

capout@dgs.virginia.gov

By Fax to:

804-225-4709

Upon receipt of the Evaluation Form by the Department of General Services, the applicant will be contacted to arrange a site visit.

Upon receipt of the certification of noncompliance and enactment of the ordinance by the applicant, the Clerk of the Court shall send a copy of the certification of noncompliance and the ordinance by US Mail to:

Department of Judicial Services
100 North 9th Street, 5th Floor
Richmond, VA 23219

Contact the Division of Engineering and Buildings by Email at capout@dgs.virginia.gov or by calling 804-786-0402 if you have any questions.

Survey Form
Department of General Services Evaluation
Code of Virginia §17.1-281
Virginia Courthouse Facility Guidelines

Refer to *Virginia Courthouse Facility Guidelines* , *Second Edition* , for detailed descriptions.

Guidelines may be obtained at: http://www.courts.state.va.us/courts/vacourtfacility/complete.pdf

Please enter an "X" in the "Yes" or "No" boxes. Include information in "Remarks" as clarification, if desired.

Item Number	Description	Yes	No	Remarks
2.1	**GENERAL CONSIDERATIONS** City of Richmond, Courts - Attached ADA Survey, Energy and Facility Assessments.			
2.1.1	**Location**			
	Main business district; near jail		X	Not near Jail
2.1.2	**Architecture and Design**			
	Maximum use of energy saving features		X	Old Building with limited energy savings (See attached report)
	Robust construction to last 50+ years		X	
2.1.3	**Parking**			
	Adequate for staff, juries, general public	X		Limited public parking
	Separate reserved but unmarked parking for judges		X	
	Clearly marked parking for jurors		X	
2.1.4	**Circulation Patterns**			
	Public circulation	X		Public intermingled
	Restricted circulation for judges, staff & support (controlled access)		X	
	Secure circulation for prisoners		X	

Item Number	Description	Yes	No	Remarks
2.1.5	**Handicapped Access** Americans with Disabilities Act, 1990 Architectural Barriers Act, 1968 (Barrier Removal)			
2.1.5.1	Courtrooms		X	Door not accessible, no hearing and visual impairment equipment
2.1.5.2	Jury Boxes & Witness Stands		X	
2.1.5.3	Judges' Benches & Courtroom Stations		X	
2.1.5.4	Court Reporter Station		X	
2.1.5.5	Jury Assembly Areas	X		Door not accessible, no hearing and visual impairment equipment
2.1.5.6	Jury Deliberation Areas	X		Door not accessible, no hearing and visual impairment equipment
2.1.5.7	Attorney Tables	X		Door not accessible, no hearing and visual impairment equipment
2.1.5.8	Assistive Listening Systems		X	
2.1.5.9	Communication Systems	X		
2.1.5.10	Courthouse Holding Facilities		X	
2.1.6	**Public Information and Signage**			
	Directional and informational signage	X		
	Staffed information desk (large courthouses)		X	
2.1.7	**Design for Ergonomics** Ergonomics Standard is ANSI/HFS 100-1988			
2.1.7.1	Workstation Seating		X	
2.1.7.2	Posture & Location of VDT		X	
2.1.7.3	Workstation Lighting		X	

Item Number	Description	Yes	No	Remarks
2.1.8	**Building Codes**			
	All applicable state and local building and health & safety codes	X		
	Applies to new construction and renovations	X		

Item Number	Description	Yes	No	Remarks
2.1.9	**Accommodating the Public**			
	Adequate waiting areas for the court's busiest days		X	
	Food service		X	
2.1.10	**Building Security**			
	High degree of security needed	X		New security front lobby renovation
	Structural elements: security glazing		X	Planning to install security glazing in FY22 $1M
	Traffic patterns: locked or monitored doors	X		
	Security devices: metal detectors, x-ray equipment	X		
	Staff: security personnel	X		Sheriff Deputies
	Closed circuit monitors (large courthouses)	X		
	Video conferencing (large courthouses)	X		
2.1.11	**Technology Standards**			
	Telecommunications and data connections			
	Flexibility for future upgrades; expect considerable growth in electrical demand			
	2.1.11.1 Workstations	X		
	2.1.11.2 Telecommunications		X	
	2.1.11.3 Telecomm & Data Entry Room		X	
	2.1.11.4 Technology Systems Room		X	
	2.1.11.5 "Building Backbone"		X	
	2.1.11.6 Telecomm Closets	X		
	2.1.11.7 Electrical Power & Electrical Closets	X		
	2.1.11.8 Assistive Listening Systems		X	
	2.1.11.9 Lobby	X		
	2.1.11.10 Public Address System		X	Broken
	2.1.11.11 Acoustics	X		
	2.1.11.12 Floor Systems		X	
	2.1.11.13 Lighting		X	

Item Number	Description	Yes	No	Remarks
2.1.12	**Cameras in the Courtroom** Code of Virginia §19.2-266 - describes conditions allowed			
2.1.12.1	Press or News Cameras		X	
2.1.12.2	Video Arraignment	X		
2.1.12.3	Video Recording		X	
2.1.12.4	Security Surveillance	X		Need upgrade

This space, prior to Section 2.2, is left intentionally blank.

Item Number **Description** **Yes** **No** **Remarks**

2.2 COURTHOUSE SPACES

2.2.1 Courtrooms

Item Number	Description	Yes	No	Remarks
2.2.1.1	Design and Furnishings		X	
2.2.1.2	Size and Shape		X	Poor
2.2.1.3	Circulation		X	Poor
2.2.1.4	Environmental Controls		X	Poor
2.2.1.5	Acoustics		X	Poor
2.2.1.6	Technology		X	Poor

Item Number	Description	Yes	No	Remarks
2.2.1.6.1	Video Conferencing	X		Time management- shared usage
2.2.1.6.2	Sound Reinforcement & Audio Recording Systems		X	Poor
2.2.1.6.3	Computer Workstations & Monitors		X	Need upgrades

Item Number	Description	Yes	No	Remarks
2.2.1.7	Courtroom Entrances	X		One in progress
2.2.1.8	Judge's Bench		X	
2.2.1.9	Clerk's Station		X	Limited aesthetic improvements made
2.2.1.10	Witness Stand		X	Limited aesthetic improvements made
2.2.1.11	Jury Box		X	Limited aesthetic improvements made
2.2.1.12	Counsel Tables		X	Limited aesthetic improvements made
2.2.1.13	Lectern		X	Limited aesthetic improvements made
2.2.1.14	Display Area		X	Limited aesthetic improvements made
2.2.1.15	Bailiff Station		X	Limited aesthetic improvements made
2.2.1.16	Court Reporter Station		X	Limited aesthetic improvements made
2.2.1.17	Defendant's Station		X	Limited aesthetic improvements made
2.2.1.18	Public Spectator Area		X	Limited aesthetic improvements made

Survey Form
Department of General Services Evaluation
Code of Virginia §17.1-281
Virginia Courthouse Facility Guidelines

Item Number **Description** **Yes** **No** **Remarks**

2.2.2 **General and Juvenile & Domestic Relations District Courtrooms - General District Court only**

These courts do not require jury boxes or jury deliberation rooms.
* Reference the items below in the *Virginia Courthouse Facility Guidelines, Second Edition*, in addition to 2.2.2, for further detailed information.

Item	Description	Yes	No	Remarks
* 2.2.1.1	Design and Furnishings		X	Need upgrades- Poor
* 2.2.1.2	Size and Shape		X	Need upgrades- Poor
* 2.2.1.3	Circulation		X	Need upgrades- Poor
* 2.2.1.4	Environmental Controls		X	Need upgrades- Poor
* 2.2.1.5	Acoustics		X	Need upgrades- Poor
* 2.2.1.6	Technology		X	Need upgrades- Poor
			X	
* 2.2.1.6.1	Video Conferencing		X	
* 2.2.1.6.2	Sound Reinforcement & Audio Recording Systems		X	
* 2.2.1.6.3	Computer Workstations & Monitors		X	
			X	
*2.2.1.7	Courtroom Entrances		X	
* 2.2.1.8	Judge's Bench		X	
* 2.2.1.9	Clerk's Station		X	
* 2.2.1.10	Witness Stand		X	
* 2.2.1.12	Counsel Tables		X	
*2.2.1.13	Lectern		X	
* 2.2.1.14	Display Area		X	
* 2.2.1.15	Bailiff Station		X	
* 2.2.1.16	Court Reporter Station		X	
* 2.2.1.17	Defendant's Station		X	
* 2.2.1.18	Public Spectator Area		X	

Item Number	Description	Yes	No	Remarks
2.2.3	**Hearing Rooms - NA** Same standards as courtrooms, but smaller & less formal * Reference the items below in the *Virginia Courthouse Facility Guidelines, Second Edition*, in addition to 2.2.3, for further detailed information.			

* 2.2.1.1	Design and Furnishings			
* 2.2.1.2	Size and Shape			
* 2.2.1.3	Circulation			
* 2.2.1.4	Environmental Controls			
* 2.2.1.5	Acoustics			
* 2.2.1.6	Technology			
* 2.2.1.6.1	Video Conferencing			
* 2.2.1.6.2	Sound Reinforcement & Audio Recording Systems			
* 2.2.1.6.3	Computer Workstations & Monitors			
*2.2.1.7	Courtroom Entrances			
* 2.2.1.8	Bench			
* 2.2.1.9	Clerk's Station			
* 2.2.1.10	Witness Stand			
* 2.2.1.11	Jury Box			
* 2.2.1.12	Counsel Tables			
*2.2.1.13	Lectern			
* 2.2.1.14	Display Area			
* 2.2.1.15	Bailiff Station			
* 2.2.1.16	Court Reporter Station			
* 2.2.1.17	Defendant's Station			
* 2.2.1.18	Public Spectator Area			

Item Number	Description	Yes	No	Remarks
2.2.4	**Conference Rooms**			
	Soundproofed		X	
2.2.5	**Witness Waiting Room - NA**			
	Two rooms required		X	
	Comfortable, secure, private		X	
2.2.6	**Attorney-Client Conference Room**			
	Two rooms required		X	Not adequate
	Soundproofed		X	Not adequate
2.2.7	**Judge's Chambers**			
	2.2.7.1 Judge's Private Office	X		Refurbished
	2.2.7.2 Proximity of Courtroom		X	
	2.2.7.3 Private Corridors	X		Glass windows
	2.2.7.4 Restroom	X		In poor condition
	2.2.7.5 Reception and Private Waiting Area		X	
	2.2.7.6 Secretarial Offices	X		Too small, two people in one open cubicle
	2.2.7.7 Environment		X	
	2.2.7.8 Other Spaces in Judge's Chambers		X	In adequate space for law clerks
2.2.8	**Court Reporter's Office**			
	Separate, private office for each reporter		X	Service contracted out

Item Number	Description		Yes	No	Remarks
2.2.9	**Clerk of Court**				
	2.2.9.1	Environmental Controls		X	
	2.2.9.2	Acoustics and Sound Control		X	
	2.2.9.3	Public Space and Counter		X	
	2.2.9.4	Records Review Areas for the Public		X	
	2.2.9.5	Signs and Directories		X	
	2.2.9.6	Clerk's Staff Work Areas		X	
	2.2.9.7	Cashier's Operations		X	
	2.2.9.8	Clerk's Private Office	X		
	2.2.9.9	Chief Deputy Clerk		X	Need improvement
	2.2.9.10	Active Filing System	X		
	2.2.9.11	Inactive Records Storage		X	Need better storage space
	2.2.9.12	Exhibit Storage	X		Too small
	2.2.9.13	In-House Microfilm Operations	X		Outdated
	2.2.9.14	Supply Room	X		Dual function with lunch room
	2.2.9.15	Staff Break Room	X		Too small
	2.2.9.16	Photocopy Equipment	X		No space to store
	2.2.9.17	Technology Considerations		X	
	2.2.9.18	Computer Facilities		X	
2.2.10	**Jury Deliberation Room**				
	Directly & privately accessible from the jury box		X		Aesthetic improvements made
2.2.11	**Jury Assembly**				
	Designated room or area (Large courthouses)		X		Not large enough- share with the Sheriff's Office
2.2.12	**Grand Jury Room**				
	Separate room (large courthouses)			X	

Item Number	Description	Yes	No	Remarks
2.2.13	**Law Library**			
	Central location; Computer stations and book stacks		X	At a separate location
2.2.14	**Press Room & Media Spaces**			
	Outside courtroom (large courthouses)		X	
2.2.15	**Prisoner Holding Facility** (Courtroom holding criminal trials)			
	Secure; vandal-resistant furniture		X	
	Gender separation; Sight, soundproof		X	
	Adult and juvenile separation		X	
	Secure corridor between holding and courtroom	X		Limited
	Observation window or closed circuit camera	X		
2.2.16	**Juvenile Holding Facility**			
	Private holding area separate from adults	X		
	Sight, soundproof; Gender separation	X		
	Secure with vandal-proof furnishings	X		
2.2.17	**Magistrate's Office - Located at City Jail**			
	Located in a public facility, near an outside entrance to building			
	Operational 24/7; on-duty or on-call			
	Private office, computer workstations			
	Separate soundproof room for magistrate conducting hearings through video conferencing system			
	Separate soundproof hearing room for complainants			
	Toilet and kitchenette if staff is present 24/7			
	Public hearing space, 3-4 persons; Public waiting area, 5-6 persons			
	Small holding area or access to a holding area			
	Duress alarms tied to main security station or sheriff/police dept.			
	Supply room and safe			
	Office equipment: fax, TV/VCR, copiers, shredders, video conferencing			

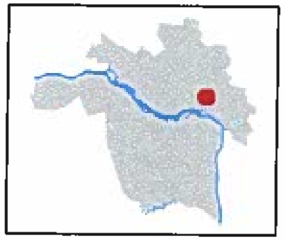
Survey Form
Department of General Services Evaluation
Code of Virginia §17.1-281
Virginia Courthouse Facility Guidelines

Item Number	Description	Yes	No	Remarks
2.2.18	**Probation and Court Services - NA**			
	Public waiting area accessible from main public entrance			
	Private interview rooms; Rest rooms			
	Staff private offices, computer workstations			
	Conference room; Records room			
	Temporary, secure holding facilities (soundproof)			
	Office equipment: fax, TV/VCR, copiers, shredders, video conferencing			
2.2.19	**Attorney Lounge**			
	Lounge for trial attorneys (large courthouses)		X	
	Comfortable furniture, work tables, telephones		X	
2.2.20	**Commonwealth's Attorney's Office**			
	Location in or close to courthouse building	X		
	Private offices, computer workstations (LAN)	X		
	Waiting areas; Interview rooms	X		
	Secure (tamper-proof) records and evidence storage		X	
	Office equipment: fax	X		

John Marshall Courthouse: 400 N 9th St, Richmond VA 23219

City of Richmond, VA
Geographic Information Systems

Location Reference



1 inch = 52,486 feet

Disclaimer
The City of Richmond assumes no liability either for any errors, omissions, or inaccuracies in the information provided regardless of the cause of such or for any decision made, action taken, or action not taken by the user in reliance upon any maps or information provided herein

FACILITY ASSESSMENT

DEFICIENCY SUMMARY (Top priorities are identified in **bold** type)

#	Category	Description	Cost
A01	Maintenance	Repaint exterior penthouse CMU/roof top equipment screens	$2,976
A02	Replace	Replace existing roofing system	$355,159
A03	Repair	Repair existing roof access ladder	$96
A04	Life Safety	Upgrade exit ramps to provide accessible emergency egress	$79,591
A05	Life Safety	Replace exterior railings	$22,659
A06	**Upgrade**	**Plaza stairs removed and reinstalled**	**$68,622**
A07	**Upgrade**	**Create accessible ramp and handrails**	**$60,827**
A08	Repair	Repair ramp to lower level loading dock	$67,359
A09	Repair	Clean and repair existing plaza pavers	$136,307
A10	Repair	Clean/tuck point exterior masonry joints/repair sealant at control joints	$15,257
A11	Maintenance	Repaint exterior railings	$1,215
A12	**Upgrade**	**Replace/repair exterior window system**	**$5,040,000**
A13	Life Safety	Replace guard and handrails at interior open stair	$35,645
A14	**Upgrade**	**Provide building accessible features**	**$1,239,914**
A15	**Life Safety**	**Remove obstructions from exit access corridors**	**$-**
A16	Replace	Replace carpeting with carpet tile	$797,364
A17	Replace	Replace existing bulletin boards	$2,218
A18	Maintenance	Repaint metal doors and frames	$60,298
A19	Upgrade	Install accessible handrails in exit stairs	$184,790
A20	Upgrade	Install accessible handrails in exit stairs	$311,425
M01	**Replace**	**Replace existing VAV system**	**$1,611,599**
M02	Replace	Replace existing boilers	$336,444
M03	Eng. Efficiency	Add economizer to mechanical system	$285,660
E01	Life Safety	Install annunciator panel	$79,350
E02	Eng .Efficiency	Replace fluorescent lamps with retrofit LED lamps	$133,308
E03	Eng .Efficiency	Replace emergency generator, in-kind	$119,025
E04	Eng .Efficiency	Add automatic lighting control systems/devices	$90,459
FP01	Life Safety	Expand sprinkler system to cover entire building	$214,245
		TOTAL	**$11,211,339**

FACILITY ASSESSMENT

FACILITY ASSESSMENT
CITY OF RICHMOND

John Marshall Courts Building
Richmond, Virginia

FINAL SUBMITTAL
June 6, 2017

Peck Peck & Associates
12506-C Lake Ridge Drive
Woodbridge, Virginia 22192

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

Contract No. 17000009244

FACILITY ASSESSMENT

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

Contract No. 17000009244

FACILITY ASSESSMENT

FACILITY ASSESSMENT
CITY OF RICHMOND

John Marshall Courts Building
Richmond, Virginia

Prepared by:
PECK PECK AND ASSOCIATES
12506 Lake Ridge Drive
Suite C
Woodbridge, Virginia 22192

FHC ENGINEERING, PC
4 Weems Lane
#277
Winchester, VA 22601

FINAL SUBMITTAL
June 6, 2017

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

Contract No. 17000009244

FACILITY ASSESSMENT

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

Contract No. 17000009244

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Appendix

SUMMARY

The purpose of this project is to assess the existing conditions of building elements and systems, identify deficiencies and make recommendations for repairs and improvements to the John Marshall Court Building, located at 400 N. Ninth Street, Richmond, Virginia.

This assessment covers the exterior plaza, the building envelope, and the building interior finishes, toilet facilities, mechanical, electrical, plumbing, fire alarm and fire suppression systems as well as handicap accessibility requirements. Our assessment is based on a visual inspection of the facility conducted during the first week of March, 2017.

The existing building was constructed in or around 1975 and the first floor was expanded around 2008. The building consists of 4 stories and each story is approximately 33,000 s.f. Based on our initial assessment, the building is in fair condition. There have been no major improvements to the building since it was built with the exception of the expansion of the first floor office, and the replacement of the existing chilled water system, including the chillers, cooling tower and related equipment. The existing building mechanical systems are original to the construction of the building and are at the end of their useful life.

Concerns that were mentioned by the building users were: the lack of control and inefficiency of the heating and cooling system; the leaks from the existing curtain wall system: the seasonal heat gain/loss from the curtain wall system; and the age and condition of the toilet rooms.

The building site as currently configured does not provide a handicap-accessible route into the building or handicap-accessible means of egress from the building.

The following section lists items identified as deficiencies that should be addressed in future improvement projects. The top priorities identified in bold text.

The total costs of all improvements identified are **$11,211,339**.

PROPOSED BUILDING IMPROVEMENTS

Life Safety Items

- **Remove obstructions from exit access corridors**
- Upgrade exit ramps to provide accessible emergency egress
- Replace exterior guardrails
- Replace guard and handrails at interior open stair
- Upgrade fire alarm system to include annunciator panel in main lobby
- Expand wet-pipe sprinkler system to include floors 1 through 3

Replace/Upgrade Items

- **Replace/repair exterior window system**
- **Replace VAV system (ongoing project)**
- **Provide accessible route to building**
  - Plaza stairs removed and reinstalled
  - Create accessible ramp and handrails to the main building entrance
- **Provide building accessible features**
  - Provide accessible public and employee toilets
  - Provide accessible drinking fountains
  - Install accessible door hardware
  - Install accessible egress stair handrails
  - Install accessible sign system and directory
- Install accessible railings at exit stairs
- Replace existing boilers
- Replace existing roofing system, parapet cap and install new overflow drains
- Replace existing bulletin boards

Energy Efficiency

- Replace fluorescent lamps with retrofit LED lamps.
- Add automatic lighting control systems/devices (i.e. occupancy sensors, etc.)
- Replace emergency generator, in-kind.
- Add economizer to mechanical system - consider either 100% outdoor air or water-side economizer.

Repair Items

- Repair existing roof access ladder
- Repair ramp to lower level loading dock
- Clean and tuck point exterior masonry joints and repair sealant at control joints
- Clean and repair existing plaza pavers

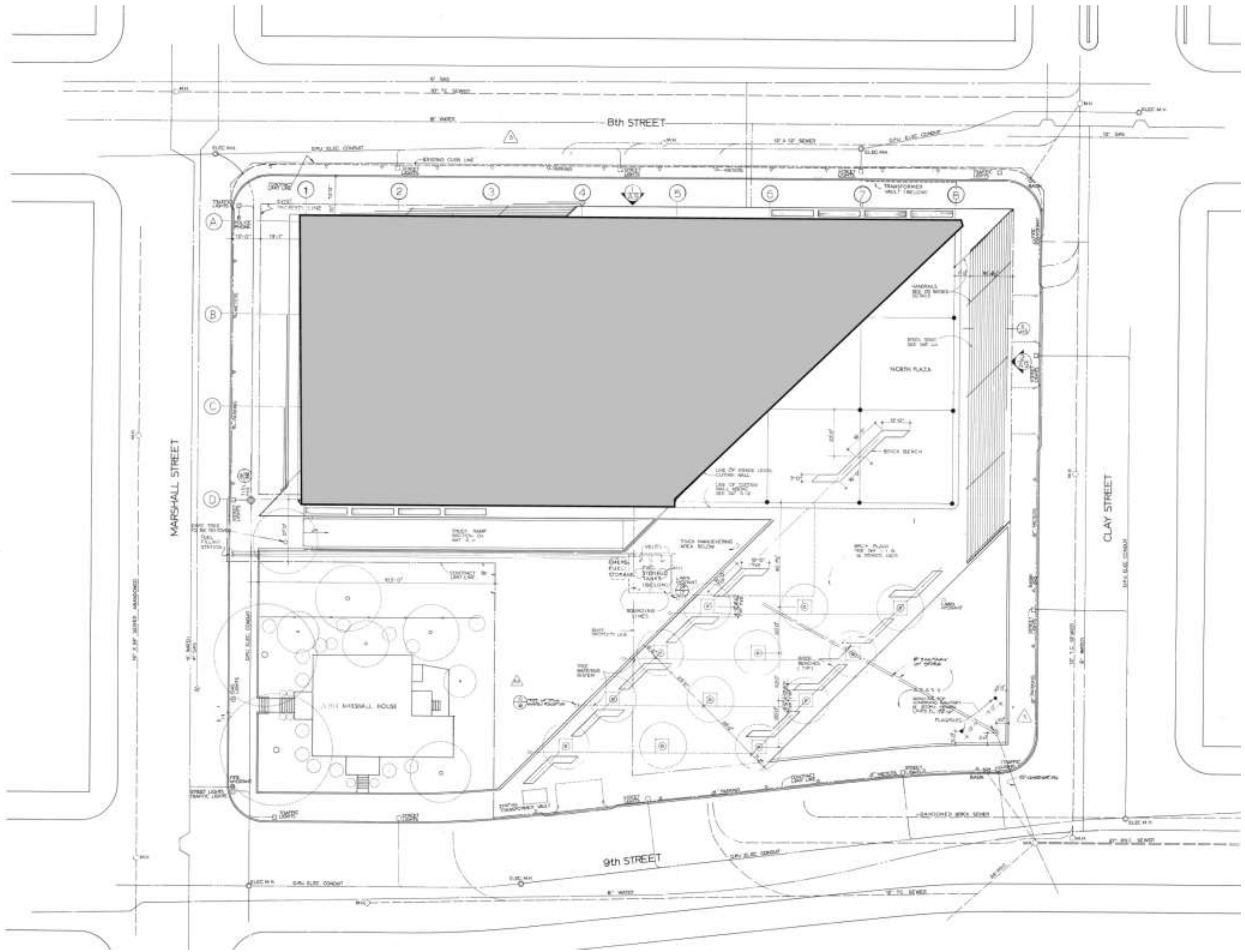
Maintenance

- Replace carpeting with carpet tile
    - Develop carpet tile maintenance and replacement plan
- Repaint exterior railings
- Repaint exterior penthouse CMU and roof top equipment screens
- Repaint metal doors and frames
- Add automatic chemical treatment system for heating hot water and closed loop chilled water systems.

Basis of Code Analysis include:

International Building Code (2012)
Virginia Code of Construction (2012)
National Electrical Code (2014)
International Plumbing Code (2012)
International Mechanical Code (2012)
ANSI A117.1

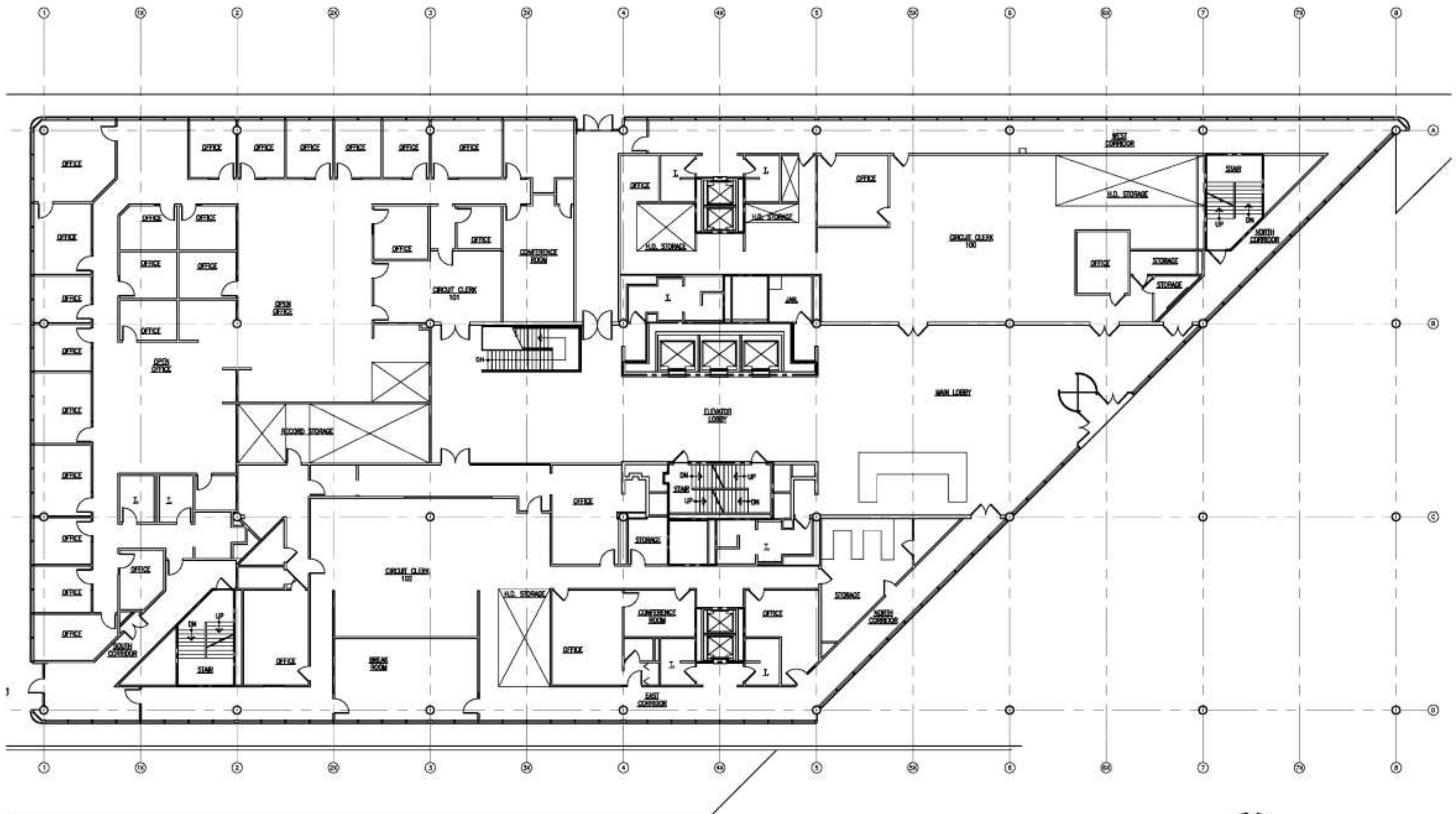
SITE PLAN



JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

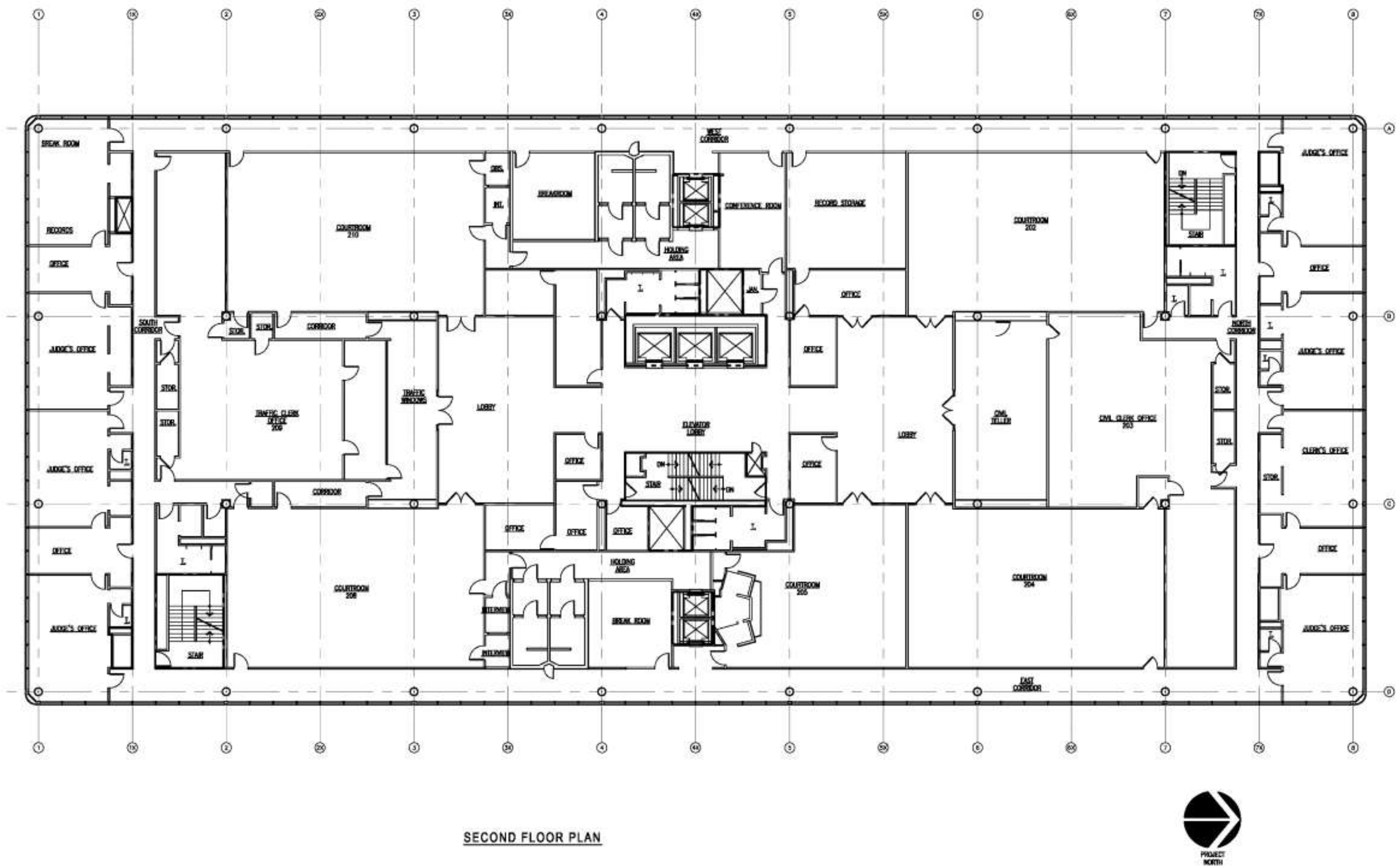
FLOOR PLAN – LOWER LEVEL

FLOOR PLAN – FIRST FLOOR

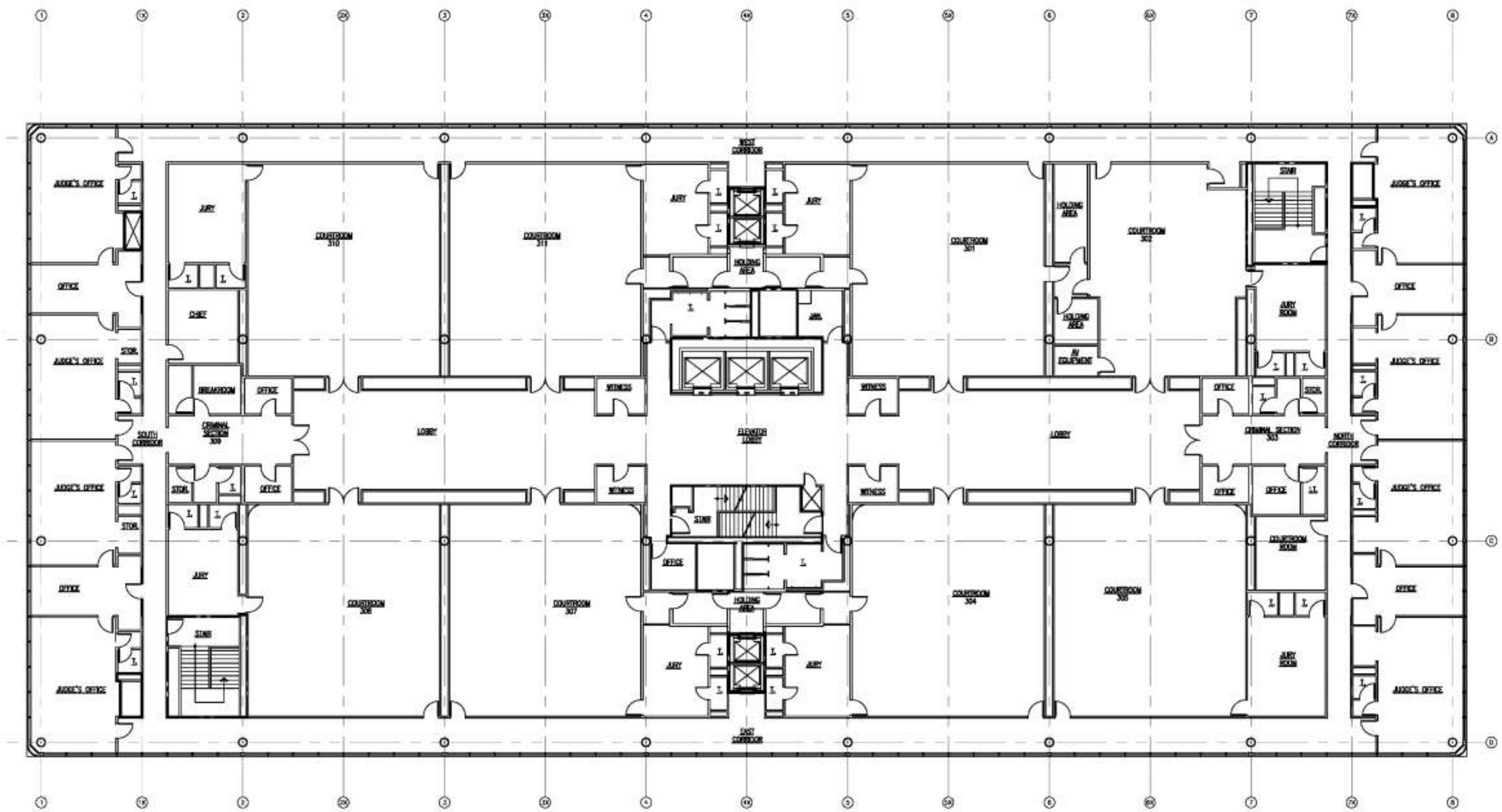


FIRST FLOOR PLAN

FLOOR PLAN – SECOND FLOOR



FLOOR PLAN – THIRD FLOOR



THIRD FLOOR PLAN

DEFICIENCY SUMMARY (Top priorities are identified in **bold** type)

#	Category	Description	Cost
A01	Maintenance	Repaint exterior penthouse CMU/roof top equipment screens	$2,976
A02	Replace	Replace existing roofing system	$355,159
A03	Repair	Repair existing roof access ladder	$96
A04	Life Safety	Upgrade exit ramps to provide accessible emergency egress	$79,591
A05	Life Safety	Replace exterior railings	$22,659
A06	**Upgrade**	**Plaza stairs removed and reinstalled**	**$68,622**
A07	**Upgrade**	**Create accessible ramp and handrails**	**$60,827**
A08	Repair	Repair ramp to lower level loading dock	$67,359
A09	Repair	Clean and repair existing plaza pavers	$136,307
A10	Repair	Clean/tuck point exterior masonry joints/repair sealant at control joints	$15,257
A11	Maintenance	Repaint exterior railings	$1,215
A12	**Upgrade**	**Replace/repair exterior window system**	**$5,040,000**
A13	Life Safety	Replace guard and handrails at interior open stair	$35,645
A14	**Upgrade**	**Provide building accessible features**	**$1,239,914**
A15	**Life Safety**	**Remove obstructions from exit access corridors**	**$-**
A16	Replace	Replace carpeting with carpet tile	$797,364
A17	Replace	Replace existing bulletin boards	$2,218
A18	Maintenance	Repaint metal doors and frames	$60,298
A19	Upgrade	Install accessible handrails in exit stairs	$184,790
A20	Upgrade	Install accessible handrails in exit stairs	$311,425
M01	**Replace**	**Replace existing VAV system**	**$1,611,599**
M02	Replace	Replace existing boilers	$336,444
M03	Eng. Efficiency	Add economizer to mechanical system	$285,660
E01	Life Safety	Install annunciator panel	$79,350
E02	Eng .Efficiency	Replace fluorescent lamps with retrofit LED lamps	$133,308
E03	Eng .Efficiency	Replace emergency generator, in-kind	$119,025
E04	Eng .Efficiency	Add automatic lighting control systems/devices	$90,459
FP01	Life Safety	Expand sprinkler system to cover entire building	$214,245
		TOTAL	**$11,211,339**

BUILDING SYSTEMS DESCRIPTIONS

ARCHITECTURAL

EXTERIOR PLAZA AND SITE

The exterior plaza and site were assessed to determine accessibility and general condition of the pavers and site features. Brick sidewalks that are assumed to be part of public sidewalks and the condition of the site landscaping were not reviewed.

The exterior site areas include plaza area under the building overhang, the stairs on the north side of the building, the sloped plaza at the northeast corner of the site, the exit ramp on the south side of the building, the loading dock access ramp and the exit ramp on the west side of the building.

The current public routes to the building entrance do not provide a handicap accessible route as defined by ANSI A117.1 2009 edition; the building is inaccessible.

The main stairs on the north side of the building have treads that vary in height from 7” to 7.5” lacking both dimensional uniformity and exceeding the maximum allowable height of 7” (ANSI A117.1 504. 2).

EXTERIOR STEPS - RISER HEIGHTS VARY

The exterior plaza on the north east side of the site slopes from the public sidewalk to the building overhang. Based on the grade elevations indicated on the existing drawings the primary slope of the plaza varies from 6.8% to 8.6%. The maximum allowable slope for a walking surface is 5% (ANSI A117.1 403.3) and the maximum allowable slope for a ramp is <5% to 8.33% (ANSI A117.1 405. 2). The maximum allowable cross slope of a ramp or walkway is 2%. There is insufficient information to determine the actual cross slope but it is assumed that the plaza cross slope exceeds 2%. The total rise from the sidewalk to the building entrance varies from 6'-7" to 8'-4". The maximum allowable rise in a ramp before a landing is 30" (2'-6") (ANSI A117.1 405.6).

EXTERIOR SLOPED PLAZA

<u>EXTERIOR RAMPS</u>

There are two exterior ramps located at emergency exits on the south and west sides of the building. The ramps were installed as part of the first floor expansion.

The ramp provided at the south exit of the building does not comply with ANSI A117.1 requirements. The handrails do not extend the full length of the ramp (ANSI A117.1 405.8) and the ramp changes direction during the run of the ramp without providing a landing (ANSI A117.1 405.7).

The ramp on west side of the building does not comply with ANSI A117.1 requirements. The rise of the ramp exceeds the maximum allowable rise for 30" in a ramp before a landing (ANSI A117.1 405.6). The brick surface of the ramp is heaved, joints are separating and a smooth continuous surface is not provided.

LOADING DOCK ACCESS RAMP

The brick pavers on the ramp down to the loading dock are in poor condition with significant sections of the brick missing. The brick appears to be set on a sand bed and is not mortared in place.

LOADING DOCK RAMP - UNEVEN AND MISSING PAVERS

BRICK PAVERS GENERAL

All exterior plaza areas, ramps and drives are finished with red brick pavers. The majority appear to be set in a sand bed with hairline sand swept joints. Pavers on the exterior steps and at the line of the building overhang appear to be set in a mortar bed with mortared joints.

The paver conditions vary from good to poor based on exposure and location. Significant portions of the brick, located primarily under the building overhang, have effloresced, discoloring the brick. Some efflorescence has also appeared on the steps along with what appears to be bleeding from the mortar joints.

PLAZA UNDER BUILDING OVERHANG

EFFLORESCENCE ON PAVERS

Brick pavers have also eroded, chipped and joints are separating, creating uneven walking surfaces and potential trip hazards.

BRICK JOINT SEPARATION

EXTERIOR BENCHES

The exterior plaza includes built-up brick benches. The benches are in poor condition with efflorescence, broken brick sections and missing mortar.

EXTERIOR RAILING

There are three types of exterior metal railing: square profile painted metal railings that are original to the building, round profile painted metal railings that were added when the building was expanded, and clear aluminum railings.

The square profile railings do not comply with the requirements for accessible handrails at ramps or stairs (ANSI A117.1 405.8 & 505). The railings at the upper plaza are less than 42” in height (VCC 1013.3) and have a picket spacing greater than 4” (VCC 1013.4) as required for guardrails. The paint finish is starting to peel.

The newer round profile railings are in fair condition but are starting to peel and rust.

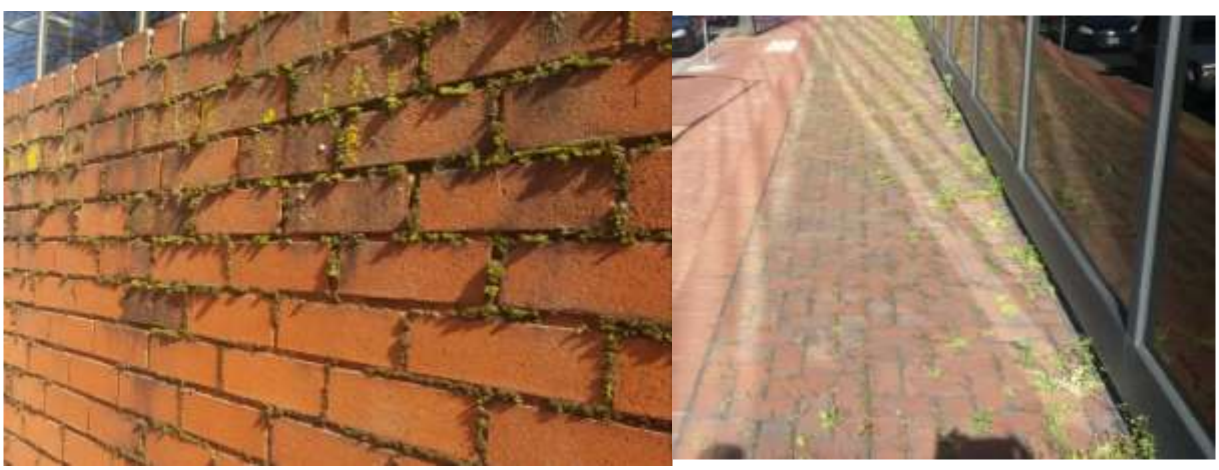
The aluminum handrails are in good condition.

BUILDING ENVELOPE

The existing building envelope consists of three different types of materials: brick masonry, a curtain wall glazing system and painted CMU. The condition of the existing roofing system can be found in the “Roof” section of this assessment.

The majority of the brick masonry is located on the west side of the building for the onsite retaining walls. There are signs of efflorescence and staining on the brick. There is also extensive organic material growing at the brick mortar joints. There are no major signs of cracks that may represent any major failures in the masonry.

EXTERIOR BRICK



PLANT GROWTH ON BRICK

Sealants at the control joints have been pushed out of the joint and have hardened. It appears that the control joints were not adequately sized for the movement of the masonry wall.

The majority of the building envelope is comprised of a prefinished aluminum curtain wall system with single pane uninsulated glazing. The building users have noted that the system has significant leak issues. The City previously completed a study to try and determine the source of the leaks (refer to the report included in the Appendix).

Based on the report, the sources of the leaks are assumed to be failure of the glazing gaskets, lack of internal weeps, leaks from the roof parapet and condensation on the glass and mullions. The curtain wall system is a major source of complaints from the building users.

In addition to the leaks, the existing curtain wall system is an inefficient building envelope system. The uninsulated glazing system is significant source of solar heat gain during the day and heat loss during evening hours. This impacts the comfort level and temperature controls for the perimeter corridors and offices. Current attempts have been made to control this with the installation of curtain and roller shades in select areas.

EXTERIOR CURTAIN WALL SYSTEM

The painted CMU walls are on the roof penthouse, please refer to the "Roof" section of this assessment for additional information.

ROOF

There are two roof levels, the main roof level and a small roof over the elevator penthouse. The existing roofing system appears to be the original built-up bituminous roofing with a gravel top coat. The extent of insulation under the roofing is unknown but is assumed to be 1”-2” as is typical to the era of construction of the building. The roof of the elevator penthouse was not visually accessible for inspection; this roof is assumed to be on the same material as the main roof.

EXISTING ROOFING SYSTEM

The main roof drainage is provided by 8 roof drains tied to 4” diameter drain leaders. There is sediment built up around the roof drains that will impede flow into the drains and cause potential ponding on the roof. The penthouse roof drains to a scupper and downspout that discharges directly to the main building roof, which then sheet drains to the nearest roof drain. In addition to the penthouse roof downspout, condensate drains from existing roof top equipment are directed to the existing roof drains via loose-laid PVC piping.

The quantity and capacity of the roof drains is adequate for the area that they are draining but the roof does not appear to slope towards the drains. The roof lacks overflow drains or scuppers; significant ponding can occur if the roof drains are plugged. The roof was inspected shortly after it had rained and there were signs of ponding on the roof. Per the user roof leaks are an ongoing problem.

PONDING ON ROOF

PATCH ON ROOF

The prefinished parapet cap is in good condition but at the parapet joints there is no sign of joint sealant between the parapet panel and the splice plate. This is a potential point of water intrusion.

EXISTING PARAPET CAP

The existing metal equipment screen on the building is in good condition but the paint finish is peeling and the metal is starting to show signs of rust. The paint finish on the penthouse is also peeling.

PEELING PAINT ON EQUIPMENT SCREEN AND PENTHOUSE

The roof is accessed via an internal ladder and roof access hatch. The middle anchor point for the roof access ladder is loose.

BUILDING INTERIOR

GENERAL

The overall building condition on the interior is fair to good considering the age and the buildings high volume of use. It is clear however, that some areas of the building have not been upgraded in many years and in some cases, not since the building was constructed. Many of the finishes are worn and at the end of their useful life.

FLOORING

The flooring in the building is a combination of broadloom carpet, carpet tile, VCT flooring, brick pavers, and ceramic tile. Maintenance and loading dock areas have exposed concrete.

The brick paver flooring is located on the first floor lobby. The pavers are in good condition and appear to be well maintained.

CARPET

The predominant floor finish in the building is broadloom carpet and carpet tile. The broadloom carpeting is used primarily in the courtrooms and adjacent lobbies as well as the judges' offices and the related clerk's offices and corridors. The carpet tile is installed primarily on the lower level and first floor areas and in miscellaneous offices throughout the building. The carpeting condition varies drastically throughout the building. Some areas still appear to have the original carpeting installed at the time of construction. In several locations there appears to be the original carpeting still in place. The carpeting in the 2nd floor west corridor was removed and not replaced when it failed due to moisture intrusion from the exterior windows.

BROADLOOM CARPETING BUCKLING

LOWER LEVEL RECORD STORAGE-ORIGINAL CARPETING

2ND FLOOR CORRIDOR – NO FLOORING (Exposed Concrete)

2ND FLOOR OFFICE

The existing carpet tile is in better condition than the broadloom carpet but significant areas are at the end of their useful life and should be replaced. The useful life of carpeting is 10-15 years. Broadloom carpeting is not recommended for commercial office and assembly spaces. Carpet tile is recommended for ease of maintenance.

VCT/VINYL FLOORING

Vinyl flooring is used sparingly in the building. The existing VCT and vinyl flooring are in good condition and appear to be well maintained.

CERAMIC TILE

The ceramic tile in the building is limited to the public and employee toilet rooms. The 1”x1” tiles appear to be original to the building construction. The tiles are in poor condition and appear stained and damaged by the installation and removal of accessories.

EXISTING CERAMIC TILE

WALLS

Wall finishes in the majority of the spaces is painted gypsum board. Ceramic tile is installed in all public and employee restrooms.

The gypsum board finish throughout the building is in good condition. The majority of the damage is cosmetic. A maintenance and repainting program should be developed, especially for the public corridors and lobbies which experience the most wear and tear.

The ceramic tile finish in the toilet rooms is in poor condition. The 1”x1” tiles are stained and damaged from the installation and removal of wall mounted accessories. The tile is at the end of its useful life and should be replaced.

The second floor bulletin boards are poor condition and have been previously repainted to try and extend their useful life and should be replaced.


SECOND FLOOR BULLETIN BOARDS

CEILINGS

There are three primary types of ceilings in the building, painted gypsum board ceilings, suspended acoustical tile (SAT) ceilings and 12x12 acoustical tile ceilings (ACT). The existing ACT is original to the building construction.

The gypsum board ceilings are in good condition with a few localized areas of water damage. The existing SAT ceiling system is located sporadically throughout the building where spaces have been renovated.

The existing ACT ceiling is in good condition in public spaces and office areas but in the storage and non-public areas portions have been removed and not replaced. The existing hidden suspension system makes it very difficult to access above ceiling areas when repairs or maintenance is required to above ceiling equipment. Significant portions of this ceiling will be replaced as part of the VAV replacement project that is currently under design.

DOORS

There are three types of doors in the building. The exterior doors are aluminum framed glass doors and are part of the curtain wall system. The interior doors are hollow metal doors and painted metal doors with full glass panels.

The doors appear to be operational and are in good condition. The paint on the doors in public areas are chipped and peeling. The majority of the door hardware does not comply with ANSI A117.1 requirements for accessibility hardware. Refer to section on Accessibility.

DAMAGED FINISH ON DOORS

STAIRS

The interior exit stairs are in good condition; however, the existing handrails do not comply with ANSI A117.1 505.10 and VCC 1012.6 for extension at the top and bottom of stairs.

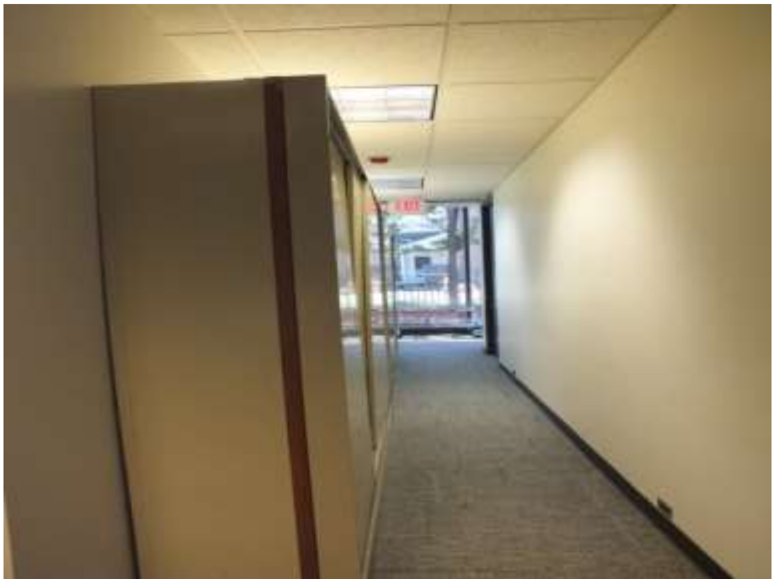
EXIT STAIRS

There is an open stair that connects the lower level to the first floor. The existing railings are less than 42” in height (VCC 1013.3) and have a picket spacing greater than 4” (VCC 1013.4) as required for guardrails. The handrails do not comply with the requirements for accessible handrails at stairs (ANSI A117.1 505).

GUARDRAILS AT INTERIOR STAIR

PERIMETER EXIT ACCESS CORRIDORS

The existing perimeter corridors in the building act as exit access corridors to the exit stairs. The exit access corridors are being used as additional file storage space. This has created conditions where the minimum corridor width has been reduced to less than 44” minimum as required by VCC 1018.2. In one location, the minimum clearance is 35”. This is a life safety hazard and cabinets creating this obstruction should be relocated.



2^{ND} FLOOR-INTERIOR EXIT CORRIDOR

FIRST FLOOR – EXIT CORRIDOR

ACCESSIBILITY

The city previously completed an accessibility survey for the in 2015; refer to the appendix for the full report. The items identified in the report include:

- Building Signage
- Door Closer Opening Force
- Door Handles/Latches
- Public Toilets
- Jury Room Toilets
- Staff Toilets
- Fire Alarm System

Additional study and evaluation will have to be completed to determine if the existing toilets can be made accessible and still meet the fixture count requirements based on use and occupant load of the building.

In addition to the items identified above we have also identified the following items that do not comply with accessibility requirements:

- Accessible route to site (refer to Exterior Plaza and Site section)
- Handrails at interior open stairs (refer to “Stair” description)
- Handrails at interior exit stairs (refer to “Stair” description)
- Front security desk does not have accessible work surface (ANSI A117.1 902.5)

Based on our evaluation the building does not meet the major requirements for an accessible building.

MECHANICAL

GENERAL

The building is cooled by a centralized chilled water plant with an open loop condenser water system. The building is heated by a centralized heating hot water plant. All mechanical plant equipment is located within the basement level.

CHILLED WATER PLANT

Chillers

CHILLERS, INSTALLED 2008

Two (2), Carrier model 30HXC-261, water-cooled centrifugal chillers each having a maximum cooling capacity of approximately 250 tons. It is estimated that the total cooling load of the building is approximately 400 tons. Therefore, each chiller can provide as much as 60% of the total required load. Each chiller is provided with manufacturer's BACNET compatible integrated microprocessor controller. The chillers are less than 10 years old; replaced in 2008 during the Chiller, Cooling Tower and Pump Replacement Project designed by Dewberry and Davis, Inc.

Cooling Towers

COOLING TOWERS, INSTALLED 2008

Two (2), Baltimore Aircoil, Series 3000 induced draft, cross-flow type with vertical air discharge. Each tower has a capacity of cooling 891 gallons per minute from 95^{O}F to 85^{O}F when the outdoor wet bulb temperature does not exceed 78^{O}F (approximately 297 tons). Towers appear to have been provided with variable speed fan motors, mechanical float type water make-up valve, fan vibration switch, basin freeze protection and service ladder with safety rails. The cooling towers are less than 10 years old; replaced in 2008 during the Chiller, Cooling Tower and Pump Replacement Project designed by Dewberry and Davis, Inc.

Chilled Water Pumps

CHILLED WATER & CONDENSER WATER PUMPS

Chilled water is circulated through the chiller evaporators to the various air handling units by two (2) base mounted, end suction pumps - one pump for each chiller. Each pump is capable of pumping 600 gallons per minute against a total maximum head pressure of 125 feet a 60 horsepower motor (460V,3ph). All pumps have variable frequency drives presumably controlled by system pressure in the chilled water piping distribution system. The chilled water pumps are less than 10 years; replaced in 2008 during the Chiller, Cooling Tower and Pump Replacement Project Designed by Dewberry and Davis, Inc.

Condenser Water Pumps

Condenser water is circulated through the open loop system by two (2) base mounted, end suction pumps - one pump for each chiller. Each pump is capable of pumping 750 gallons per minute against a total maximum head pressure of 90 feet using a 50 horsepower motor (460V,3ph). The condenser water pumps are constant volume and do not have variable frequency drives. The condenser water pumps are less than 10 years old; replaced in 2008 during the Chiller, Cooling Tower and Pump Replacement Project designed by Dewberry and Davis, Inc.

<u>HEATING HOT WATER PLANT</u>

Boilers

BOILERS, INSTALLED IN 1975

Two (2), Cleaver Brooks model CB-80 packaged firetube hot water boilers with combination gas/oil burners. Each boiler has an output capacity of approximately 2680 MBH which is roughly the entire required load to support the buildings heating needs (i.e. there is 100% heating redundancy in the heating system. If one boiler is inoperable the other boiler can maintain the building's heating needs). The boilers are original equipment, installed in 1975 and therefore, are 42 years old.

Heating Water Pumps

Heating water is circulated to the air handling units and throughout the building by a single base mounted end suction pump capable of pumping 260 gallons per minute against a total maximum system head pressure of 60 feet using a 7.5 horsepower motor (460V, 3ph). There is one redundant pump for backup use when the main pump is inoperable.

HEATING HOT WATER PUMPS

<u>AIR DISTRIBUTION</u>

Air Handling Units (AHU)

Total of six air handling units (AHU) all located on the basement level with supply and return air ducted in vertical shafts to the floors above.

AHU#1 & 2 - Serves Northwest and Southeast perimeters (of all floors) respectively. Built-up, horizontal unit consists of supply air fan section (with variable frequency drive), chilled water cooling coil section, hot water heating coil section and high capacity cartridge filter section. Minimum 1974 code required outdoor air - no 100% outdoor air economizer.

AHU#3 & 4 - Serves Southwest and Northeast perimeter (of all floors) respectively. Built-up, horizontal unit consists of supply air fan section (with variable frequency drive), chilled water cooling coil section and high capacity cartridge filter section. Minimum 1974 code required outdoor air - no 100% outdoor air economizer.

AHU#5 & 6 - Serves Northeast and Southwest interiors (of all floors) respectively. Built-up, horizontal unit consists of supply air fan section (with variable frequency drive), chilled water cooling coil section and high capacity cartridge filter section. Minimum 1974 code required outdoor air - no 100% outdoor air economizer.

Return air fans - located in the return air duct of each AHU is a centrifugal, in-line return fan.

HVAC CONTROLS

Original control system was pneumatic. Chiller controls were upgraded to Direct Digital Controls during the chiller replacement project in 2008. It is reported that there is a project pending (due to start in the summer of 2017) to completely upgrade the HVAC controls to from pneumatic to Direct Digital Controls (DDC). This includes all HVAC equipment, including but not limited to, variable air volume boxes (VAV), boilers, pumps, etc. The new control system will be accessible through a central master controller and will include a local area network (LAN).

LOWER LEVEL

The lower level consists of records storage rooms, multipurpose room, mechanical spaces and vehicle access areas.

Heating and cooling for the storage rooms and occupied spaces is provided by variable air volume air handling units number five and six. Air is distributed to the spaces via sheet metal supply air duct ductwork, variable air volume boxes and linear ceiling mounted slot diffusers.

It appears that the cavity above the ceiling is being used as a return air plenum.

Minimum outdoor ventilation air is provided (based on code requirement in 1974).

A project is pending (due to start in the summer of 2017) to replace all VAV boxes. The new boxes will include hot water heating coils and direct digital controllers.

FIRST FLOOR

The first floor consists of perimeter corridors all around the floor and open office configurations on the floor's interior

NW & W perimeter corridor - heating and cooling provided by constant air volume AHU #1. Air delivered to space via eleven (11), 24"x4" duct openings and five (5), 24"x4" duct openings all located in the ceiling lighting cove. Return air is ducted directly from the space.

SE & E perimeter corridor - heating and cooling provided by constant air volume AHU #2. Air delivered to space via eleven (11), 26"x4" duct openings and four (4), 16"x4" duct openings all located in the ceiling lighting cove. Return air is ducted directly from the space.

NW Interior & Lobby - variable air volume air distribution system for cooling (from cooling only AHU#5). The cavity above the ceiling is being used as a return air plenum.

SE Interior & Lobby - variable air volume air distribution system for cooling (air supplied from cooling only AHU#6). The cavity above the ceiling is being used as a return air plenum.

A project is pending (due to start in the summer of 2017) to replace all VAV boxes. The new boxes will include hot water heating coils and direct digital controllers.

SECOND FLOOR

The second floor consists of perimeter corridors on the northwest and southeast orientations, offices on the perimeters of the northeast and southwest orientations and courtrooms on the interior.

NW perimeter corridor - heating and cooling provided by constant air volume cooling/heating AHU #1. Air delivered to space via twenty three (23), 20"x4" duct opening located in the ceiling lighting cove. Return air is ducted directly from the space.

SE perimeter corridor - heating and cooling provided by constant air volume cooling/heating AHU #2. Air delivered to space via twenty three (23), 20"x4" duct opening located in the ceiling lighting cove. Return air is ducted directly from the space.

SW perimeter offices - variable air volume air distribution system for cooling (from cooling only AHU#3) with hot water fin-tube baseboard radiation for heating. Return air is ducted directly from the space.

NE perimeter offices - variable air volume air distribution system for cooling (air supplied from cooling only AHU#4) with hot water fin-tube baseboard radiation for heating. Return air is ducted directly from the space.

NE Interior - Variable air volume air distribution for cooling (from cooling only AHU#5). The cavity above the ceiling is being used as a return air plenum.

SW Interior - Variable air volume air distribution for cooling (from cooling only AHU#6). The cavity above the ceiling is being used as a return air plenum.

Floor above plaza - hot water fin-tube radiation to offset heat loss through the second floor.

A project is pending (due to start in the summer of 2017) to replace all VAV boxes. The new boxes will include hot water heating coils and direct digital controllers.

THIRD FLOOR

The third floor consists of perimeter corridors on the northwest and southeast orientations, offices on the perimeters of the northeast and southwest orientations and courtrooms on the interior.

NW perimeter corridor - heating and cooling provided by constant air volume cooling/heating AHU #1. Air delivered to space via twenty four (24), 20"x4" duct opening located in the ceiling lighting cove. Return air is ducted directly from the space.

SE perimeter corridor - heating and cooling provided by constant air volume cooling/heating AHU #2. Air delivered to space via twenty four (24), 20"x4" duct opening located in the ceiling lighting cove. Return air is ducted directly from the space.

SW perimeter offices - variable air volume air distribution system for cooling (from cooling only AHU#3) with hot water fin-tube baseboard radiation for heating. Return air is ducted directly from the space.

NE perimeter offices - variable air volume air distribution system for cooling (air supplied from cooling only AHU#4) with hot water fin-tube baseboard radiation for heating. Return air is ducted directly from the space.

NE Interior - Variable air volume air distribution for cooling (from cooling only AHU#5) with hot water fin-tube radiation located above the ceiling to offset heat loss through the roof. The cavity above the ceiling is being used as a return air plenum.

SW Interior - Variable air volume air distribution for cooling (from cooling only AHU#6) with hot water fin-tube radiation located above the ceiling to offset heat loss through the roof. The cavity above the ceiling is being used as a return air plenum.

A project is pending (due to start in the summer of 2017) to replace all VAV boxes. The new boxes will include hot water heating coils and direct digital controllers.

TYPICAL COOLING ONLY AIR
HANDLING UNIT

TYPICAL HEATING/COOLING AIR
HANDLING UNIT

ELECTRICAL

GENERAL

The building is adequately served by a 2000A, 480Y/277V electrical service. A 2000A Switchboard is located within the basement and provides power to three vertical power risers (one riser feeds panels on each floor of the NE wing, one feeds panels on each floor of the SW wing and one feeds emergency panels on each floor). In addition, power is fed from the switchboard to the motor control center (providing motor starters for all mechanical equipment in the lower level and elevator equipment in the elevator machine room on the roof.

EMERGENCY GENERATOR

Life safety loads (lighting and fire alarm) as well as miscellaneous non-life safety loads are adequately provided by a 175 KW (219 KW @ 0.8 PF) water cooled, oil-fired diesel generator. Power is transferred from the switchboard to the generator upon a loss of utility power by a 300A transfer switch. The generator and transfer switch are located in the lower level, northeast mechanical room. The generator appears to be original equipment, installed in 1975 and is reported to be in good operating condition.

EMERGENCY GENERATOR

LOWER LEVEL

SW wing served by high voltage panel "LM" (277/480V, 125A, 42 pole, 14K AIC rating) which handles predominantly lighting loads and feeds low voltage panel "RJ" (120/208V, 100A, 30 pole, 10K AIC rating) - serving lighting and receptacle circuits - via 30 KVA step down transformer T8.

NW wing served by high voltage panel "LN" (277/480V, 125A, 30 pole, 14K AIC rating) which handles predominantly lighting loads and feeds low voltage panel "RL"

(120/208V, 100A, 30 pole, 10K AIC rating) - serving lighting and receptacle circuits - via 30 KVA step down transformer T1.

Emergency power provided by high voltage panel "EMLC" (277/480V, 100A, 30 pole, 14K AIC rating) which handles emergency lighting and feeds low voltage panel "EMRM" (120/208V, 100A, 30 pole, 10K AIC rating) through 30KVA step down transformer, T5. Low voltage panel "EMRM" predominantly service receptacles in courtrooms.

General Lighting

In general, the entire floor is provided with recessed 48"long by 12" wide, fluorescent lighting fixtures with parabolic lenses and either one or two 40W, T12 lamps. All lighting appears to be controlled by manual switching, no automatic lighting systems or devices were observed.

Emergency lighting appears to be adequate for emergency egress.

<u>FIRST FLOOR</u>

General power in the SW wing is served by high voltage panel "LG" (277/480V, 125A, 42 pole, 14K AIC rating) which handles predominantly lighting loads and feeds low voltage panel "RG" (120/208V, 100A, 30 pole, 10K AIC rating) - serving lighting and receptacle circuits - via 30 KVA step down transformer T9.

General power in the NW wing is served by high voltage panel "LA" (277/480V, 125A, 30 pole, 14K AIC rating) which handles predominantly lighting loads and feeds low voltage panel "RA" (120/208V, 100A, 30 pole, 10K AIC rating) - serving lighting and receptacle circuits - via 30 KVA step down transformer T2.

Emergency power is provided by high voltage panel "EMLD" (277/480V, 100A, 30 pole, 14K AIC rating) which handles emergency lighting.

General Lighting

Lighting in the office areas is provided by recessed 48"long by 12" wide, fluorescent lighting fixtures with parabolic lenses and either one or two 40W, T12 lamps. The perimeter corridors are provided with single tube, 40W fluorescent lamps in a continuous lighting cove. The lobby is lighted by recessed, high intensity, 250 watt down lights. The north and south plaza areas are lighted by recessed, high intensity, 175 watt down lights. All office lighting appears to be controlled by manual switching, no automatic lighting systems or devices were observed. The plaza lighting appears to be controlled by a photocell through a lighting contactor. Control of lobby lighting appears to be by a switch rated breaker in panel LA.

There is currently a project pending (due to start in the summer of 2017) to replace the lamps in the main lobby and stairwells with retrofit type LED lamps.

Emergency Lighting

Lighting appears to be adequate for emergency egress in the lobby. Office areas, on the other hand, appear to not have a uniform lighting level throughout the path of egress, especially within the large open office spaces.

<u>SECOND FLOOR</u>

General power in the SW wing is served by high voltage panel "LH" (277/480V, 125A, 42 pole, 14K AIC rating) which handles predominantly lighting loads and feeds low voltage panel "RH" (120/208V, 100A, 30 pole, 10K AIC rating) - serving lighting and receptacle circuits - via 30 KVA step down transformer T10.

General power in the NW wing is served by high voltage panel "LB" (277/480V, 125A, 30 pole, 14K AIC rating) which handles predominantly lighting loads and feeds low voltage panel "RB" (120/208V, 100A, 30 pole, 10K AIC rating) - serving lighting and receptacle circuits - via 30 KVA step down transformer T3.

Emergency power is provided by high voltage panel "EMLE" (277/480V, 100A, 30 pole, 14K AIC rating) which handles emergency lighting and feeds low voltage panel "EMRE" (120/208V, 100A, 30 pole, 10K AIC rating) through 30KVA step down transformer, T6. Low voltage panel "EMRE" predominantly serves receptacles in the courtrooms.

General Lighting

In general, the entire floor is provided with recessed 48"long by 12" wide, fluorescent lighting fixtures with parabolic lenses and either one or two 40W, T12 lamps. Some luminaries have been upgraded to 32 watt T8 lamps in select courtrooms. The perimeter corridors are provided with single tube, 40W fluorescent lamps in a continuous lighting cove. All lighting appears to be controlled by manual switching, no automatic lighting systems or devices were observed.

Emergency lighting appears to be adequate for emergency egress. In addition, it appears that sufficient emergency lighting has been provided in the courtrooms to allow court to continue in the event of a temporary power outage.

THIRD FLOOR

General power in the SW wing is served by high voltage panel "LK" (277/480V, 125A, 42 pole, 14K AIC rating) which handles predominantly lighting loads and feeds low voltage panel "RK" (120/208V, 100A, 30 pole, 10K AIC rating) - serving lighting and receptacle circuits - via 30 KVA step down transformer T11.

General power in the NW wing is served by high voltage panel "LC" (277/480V, 125A, 30 pole, 14K AIC rating) which handles predominantly lighting loads and feeds low voltage panel "RC" (120/208V, 100A, 30 pole, 10K AIC rating) - serving lighting and receptacle circuits - via 30 KVA step down transformer T4.

Emergency power is provided by high voltage panel "EMLF" (277/480V, 100A, 30 pole, 14K AIC rating) which handles emergency lighting and feeds low voltage panel "EMRF" (120/208V, 100A, 30 pole, 10K AIC rating) through 30KVA step down transformer, T7. Low voltage panel "EMRF" predominantly serves receptacles in the courtrooms.

General Lighting

In general, the entire floor is provided with recessed 48"long by 12" wide, fluorescent lighting fixtures with parabolic lenses and either one or two 40W, T12 lamps. Some luminaries have been upgraded to 32 watt T8 lamps in select courtrooms The perimeter corridors are provided with single tube, 40W fluorescent lamps in a continuous lighting cove. All lighting appears to be controlled by manual switching, no automatic lighting systems or devices were observed.

THIRD FLOOR LIGHTING

Emergency lighting appears to be adequate for emergency egress. In addition, it appears that sufficient emergency lighting has been provided in the courtrooms to allow court to continue in the event of a temporary power outage.

PLUMBING

GENERAL

Plumbing services in the building consist of domestic cold and hot water, sanitary waste and vent piping, and storm water collection from roof drains.

All water closets appear to be wall mounted, vitreous china, elongated with manual flush valve. Urinals are wall mounted vitreous china with manual flush valves. Lavatories are wall mounted with hot and cold faucet handles.

All plumbing fixtures appear to be in functional condition.

DOMESTIC WATER SYSTEMS

The domestic water service size is 6" entering the building in the lower level mechanical room. The municipality water pressure appears to be adequate and, therefore, there is no domestic water booster pump required. From the service entrance to the building, domestic water is distributed to the many plumbing fixtures throughout the building by a complex piping system. Water is distributed to the upper levels by a single 4" cold water pipe riser.


ELECTRIC DOMESTIC WATER HEATER

Domestic hot water for the entire building is generated by a single, 120 gallon, electric water heater located on the lower level. From the water heater, hot water is distributed to the fixtures via the hot water piping system. Hot water is distributed to the upper levels by a single 2" pipe riser. The hot water system is provided with a recirculating pump and piping system to prevent long wait times for hot water at the most remote fixtures

Overall the domestic water systems appear to be in good condition and serving the building well. The piping appears to be entirely copper with both hot and cold water pipes insulated. The water heater appears to have been replaced in the 2006. However, the recirculating pump appears to be original equipment.

SANITARY WASTE AND VENT

Sanitary waste from plumbing fixtures is gravity system of collection on each floor and routed vertically down through the building in cast iron sanitary riser pipes.

STORM WATER

Rain water from eight roof drains (four on each wing of the building) are collected in piping above the ceiling of the third floor and drained vertically down through the building in two 8" pipe risers located in a pipe chase adjacent to the elevator shaft. The two 8" risers are combined below the lower level slab where they exit the building, as a 10" pipe, to the municipal storm sewer.

The entire storm drainage system appears to be adequately designed for the building and is in good condition. All piping appears to be cast iron with no hub fittings; no leaks from the roof drains and leaders were reported or observed.

FUEL OIL SYSTEM

Fuel oil is required primarily for the emergency generator and secondarily as an alternative fuel for the boiler burners. An above ground fuel oil storage tank with integral submersible fuel oil transfer pump(s) is located in the vehicle access area. This tank appears to have adequate capacity to run the generator through an appropriate time frame to support life safety events.

FUEL OIL STORAGE TANK

FIRE ALARM/FIRE SUPPRESSION

FIRE SUPPRESSION SYSTEMS

Only the basement of the building and a portion of the first floor is provided with a wet-pipe automatic sprinkler system. The coverage includes all records storage rooms, other occupied rooms and corridors. The vehicle access areas are covered with a dry pipe system. The sprinkler system does not cover the mechanical equipment areas. All other floors are provided only with fire hose cabinets (three per floor) fed from three 4" vertical standpipes.

The sprinkler system is served by an 8" main entering the building through a detector check valve. A fire department Siamese connection is provided.

FIRE DETECTION AND ALARM SYSTEMS

The building is protected by an addressable, automatic fire detection and alarm system that is remotely monitored by Richmond Alarm Company. All activation and notification devices appear to be adequate in both quantity and locality. Manual pull stations are provided at all building exits and at all entrances to stairwells. Smoke detectors are provided as required. Visual (strobes) and audible (horns) notification devices appear to be adequate to comply with applicable codes. No fire alarm annunciator panel was observed at the main entrance to the building.

FACILITY ASSESSMENT

Deficiency Evaluation		Deficiency No.	A01
Location: Roof		Category	Maintenance

Description	Recommended Action
Paint is peeling from the existing metal equipment screen and the exposed metal is starting to rust. Paint is pealing from the CMU walls of the elevator penthouse enclosure.	Remove loose paint from, prime and paint equipment screen and CMU walls.

Reference:	Estimated Cost: $2,976

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate		Deficiency No.	A01
		Category	Maintenance
	Description:	Repaint exterior penthouse CMU/roof top equipment screens	

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Pre existing metal	1,500	SF	$ 0.25	375
2	Prime existing metal	1,500	SF	$ 0.35	525
3	New Paint- 2 coats	1,500	SF	$ 0.65	975
4					0
5					0
6					0
7					0
8					0
9					0
10					0

Subtotal	1,875
General Conditions (15%)	281
Subtotal	2,156
Design Contingency (20%)	431
Subtotal	2,588
Contractor OH & P (15%)	388
TOTAL	$ 2,976

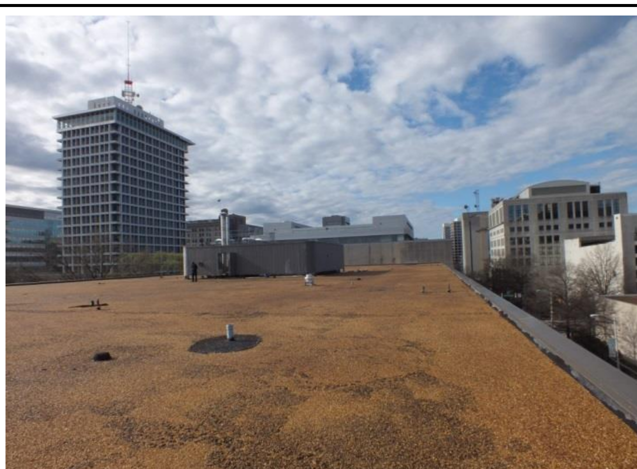
JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A02
Location: Roof	Category Replace

Description	Recommended Action
Existing rooing is 41+ years old and is at the end of it's useful life. There is evidence of and complaints about roof leaks and many apparent roofing patches. The gaps in the parapet may also be contributing to the water intusion issues noted for the exterior glazing system.	Replace existing, roofing, insulation, flashing and parapet cap. Install a new Modified Bitumen or single ply membrane system, install minimum of 2" of insulation, new penetration flashing and per-finished metal parapet cap. The height of the existing parapet precludes adding additional slope to the existing roofing system to provide better drainage.





Reference:	Estimated Cost: $355,159

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A02

Category Replace

Description: Replace existing roofing system

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Remove existing gravel	35,000	SF	$ 0.25	8,750
2	Remove existing roofing	36	SQ	$ 73.00	2,628
3	Remove existing insulation	35,000	SF	$ 0.39	13,650
4	Remove existing flashing	500	SF	$ 1.05	525
5	Remove existing parapet cap	823	LF	$ 1.94	1,597
6	Install new polyiso insulation (2")	35,000	SF	$ 1.30	45,500
7	Install new roofing	35,000	4	$ 4.06	142,100
8	Install new parapet cap	823	LF	$ 7.10	5,843
9	Install new flashing	500	SF	$ 5.40	2,700
10	New sealants	1	LS	$ 500.00	500

Subtotal	223,793
General Conditions (15%)	33,569
Subtotal	257,362
Design Contingency (20%)	51,472
Subtotal	308,834
Contractor OH & P (15%)	46,325
TOTAL	$ 355,159

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A03
Location: Roof	Category Repair
Description	**Recommended Action**
Existing roof access ladder loose.	Install new wood blocking and anchors

Reference:	Estimated Cost: $96

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate			Deficiency No.		A03
				Category	Repair
	Description:		Repair existing roof access ladder		

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	New wood blocking	1	LS	$ 25.00	25
2	New anchor bolts	6	EA	$ 5.95	36
3					
4					
5					
6					
7					
8					
9					
10					

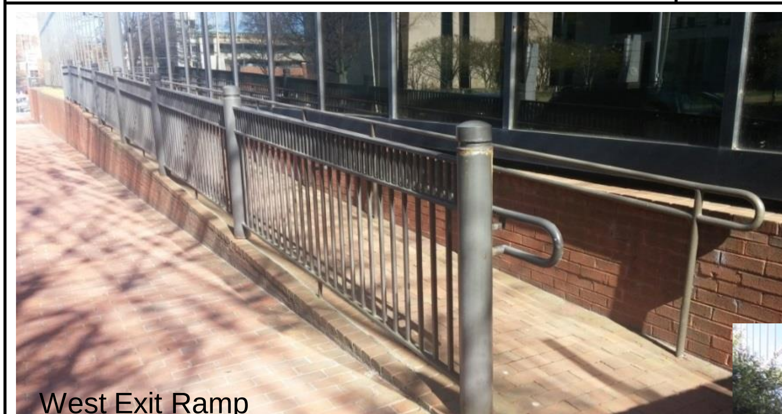
Subtotal	61
General Conditions (15%)	9
Subtotal	70
Design Contingency (20%)	14
Subtotal	84
Contractor OH & P (15%)	13
TOTAL	$ 96

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation Location: Exterior Ramps	Deficiency No. A04 Category Life Safety
Description	**Recommended Action**
The ramp provided at the south exit of the building does not comply with ANSI A117.1 requirements. The handrails do not extend the full length of the ramp (ANSI A117.1 405.8) and the ramp changes direction during the run of the ramp without providing a landing (ANSI A117.1 405.7). The ramp on west side of the building does not comply with ANSI A117.1 requirements. The rise of the ramp exceeds the maximum allowable rise for 30” in a ramp before a landing (ANSI A117.1 405.6). The brick surface of the ramp is heaved, joints are separating and a smooth continuous surface is not provided.	The existing ramps should be reconfigured and new handrails installed to comply with current ANSI A117.1 requirements. Additional site investigation will be required to ensure that the grades required can be achieved.


West Exit Ramp


South Exit Ramp

Reference:	Estimated Cost: $79,591

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A04

Category Life Safety

Description: Upgrade exit ramps to provide accessible emergency egress

Item	Description of Work	Qty.	Unit	Unit Cost	Total
	South Ramp				
1	Demo existing ramp	1	LS	$ 2,500.00	2,500
2	Demo existing railing	1	LS	$ 250.00	250
3	New masonry ramp and knee wall	150	SF	$ 35.00	5,250
4	New metal guardrail, painted	62	LF	$ 215.80	13,380
	West Ramp				
5	Demo existing ramp	1	LS	$ 2,500.00	2,500
6	Demo existing railing	1	LS	$ 250.00	250
7	New masonry ramp	375	SF	$ 15.02	5,633
8	New metal guardrail, painted	77	LF	$ 215.80	16,617
9	New metal handrail	77	LF	$ 49.00	3,773
10					

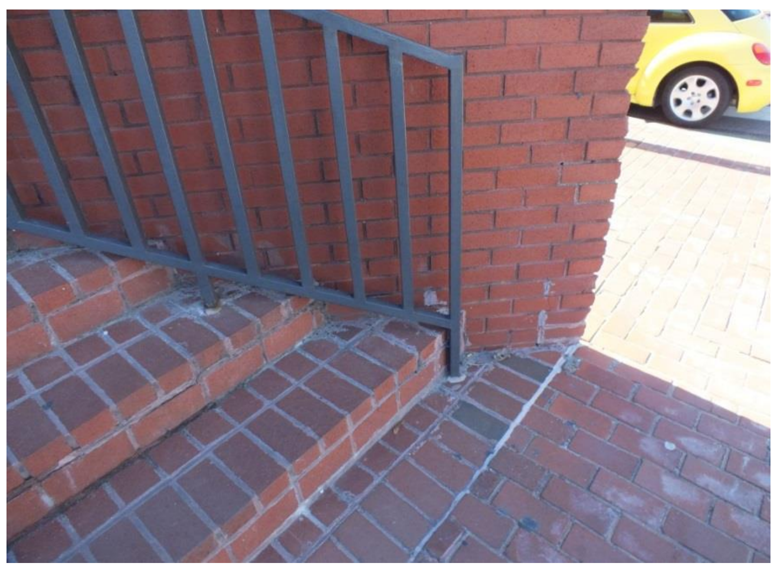
Subtotal	50,152
General Conditions (15%)	7,523
Subtotal	57,674
Design Contingency (20%)	11,535
Subtotal	69,209
Contractor OH & P (15%)	10,381
TOTAL	$ 79,591

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A05
Location: Exterior Plaza	Category Life Safety
Description	**Recommended Action**
The square profile railings do not comply with the requirements for accessible handrails at ramps or stairs (ANSI A117.1 405.8 & 505). The railings at the upper plaza are less than 42” in height (VCC 1013.3) and have a picket spacing greater than 4” (VCC 1013.4) as required for guardrails. The paint finish is starting to peel.	Remove existing rails at stairs and install new aluminum railings that match existing aluminum railings on steps. Remove existing guardrails and install new metal guardrails, minimum 42" high.



Reference:	Estimated Cost: $22,659

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A05

Category Life Safety

Description: Replace exterior railings

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Demo existing railing	1	LS	$ 3,500.00	3,500
2	New metal handrail	72	LF	$ 49.00	3,528
3	New metal guardrail, painted	35	LF	$ 200.00	7,000
4	Misc. sealants	1	LS	$ 250.00	250
5					
6					
7					
8					
9					
10					

Subtotal	14,278
General Conditions (15%)	2,142
Subtotal	16,420
Design Contingency (20%)	3,284
Subtotal	19,704
Contractor OH & P (15%)	2,956
TOTAL	$ 22,659

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A06
Location: Exterior Plaza	Category Upgrade

Description	Recommended Action
The main stairs on the north side of the building have treads that vary in height from 7” to 7.5” lacking both dimensional uniformity and exceeding the maximum allowable height of 7” (ANSI A117.1 504. 2).	The existing brick pavers should be removed and new pavers installed at the correct riser height of 7" maximum. Additional site investigation will be required to ensure that the heights required can be achieved

Reference:	Estimated Cost: $68,622

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A06

Category Upgrade

Description: Plaza stairs removed and reinstalled

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Remove existing brick pavers	2,600	SF	$ 2.50	6,500
2	Install new brick pavers-grouted	2,600	SF	$ 13.65	35,490
3	Misc. Sealant	1	LS	$ 500.00	500
4	Remove and reinstall handrails	5	EA	$ 150.00	750
5					
6					
7					
8					
9					
10					

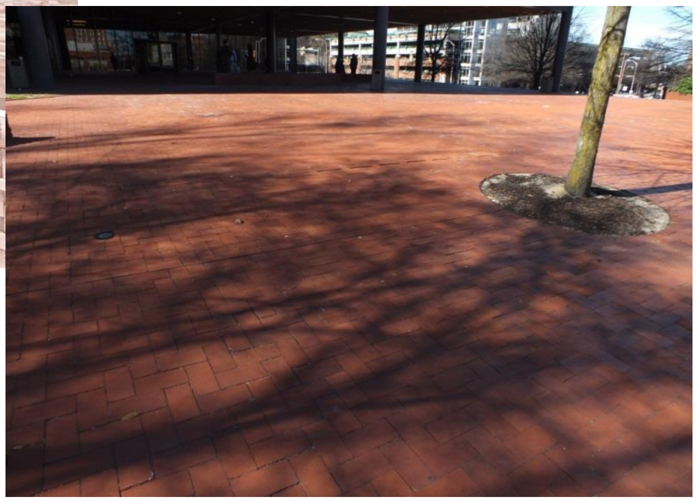
Subtotal	43,240
General Conditions (15%)	6,486
Subtotal	49,726
Design Contingency (20%)	9,945
Subtotal	59,671
Contractor OH & P (15%)	8,951
TOTAL	$ 68,622

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A07
Location: Exterior Plaza	Category Upgrade

Description	Recommended Action
The maximum allowable slope for a walking surface is 5% (ANSI A117.1 403.3) and the maximum allowable slope for a ramp is <5% to 8.33% (ANSI A117.1 405. 2). The maximum allowable cross slope of a ramp or walkway is 2%. Based on the grade elevations indicated on the existing drawings the primary slope of the plaza varies from 6.8% to 8.6%. There is insufficient information to determine the actual cross slope but it is assumed that the plaza cross slope exceeds 2%. The total rise from the sidewalk to the building entrance varies from 6'-7" to 8'-4". The maximum allowable rise in a ramp before a landing is 30" (2'-6") (ANSI	Create an accessible route from the sidewalk on 9th Street to the upper portion o the plaza. This will require regrading a section of the sloped plaza to act as an accessible ramp with a maximum slope 8%, intermediate landings for every 30" of rise in the run of the ramp and new handrail on each side of the ramp.



Reference:	Estimated Cost: $81,021

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A07

Category Upgrade

Description: Create accessible ramp and handrails to the main building

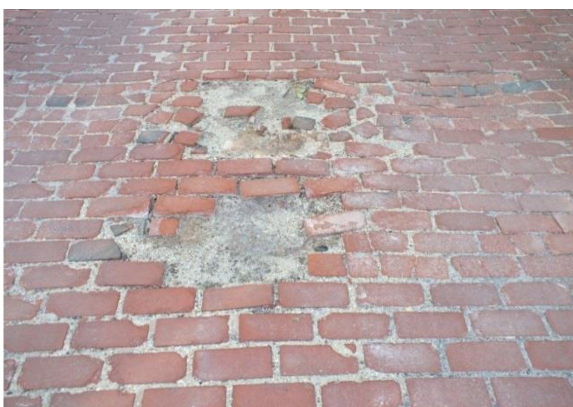
Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Remove existing pavers	1,500	SF	$ 4.00	6,000
2	Base grading	1	LS	$ 7,500.00	7,500
3	Install new pavers	1,500	SF	$ 13.45	20,175
4	Install new handrails	194	LF	$ 87.00	16,878
5	Misc. Sealant	1	LS	$ 500.00	500
6					0
7					0
8					0
9					0
10					0
Subtotal					51,053
General Conditions (15%)					7,658
Subtotal					58,711
Design Contingency (20%)					11,742
Subtotal					70,453
Contractor OH & P (15%)					10,568
				TOTAL	$ 81,021

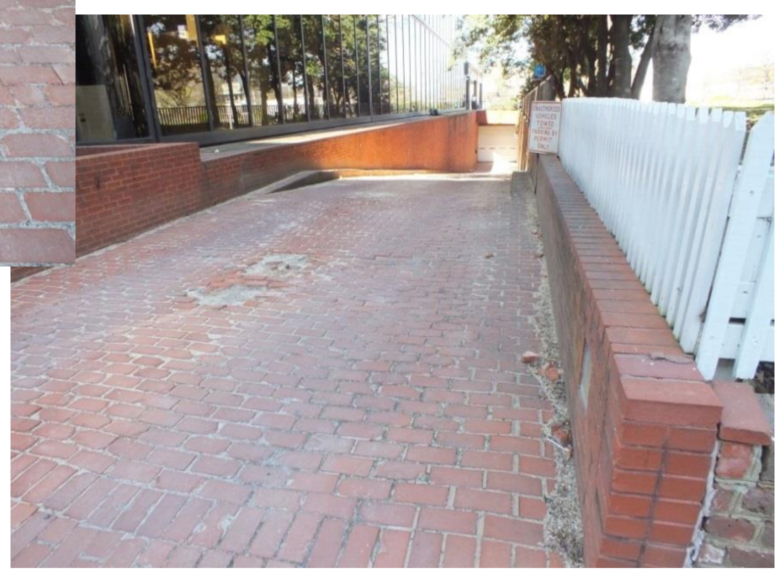
JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A08
Location:	Category Repair
Description	**Recommended Action**
The brick pavers on the ramp down to the loading dock are in poor condition with significant sections of the brick missing. The brick appears to be set on a sand bed and is not mortared in place	For long term repair, the existing paver should be removed, install a new concrete base, and install new price pavers mortared in place.





Reference:	Estimated Cost: $67,359

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A08

Category 2

Description: Repair ramp to lower level loading dock

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Remove pavers	2,200	SF	$ 2.00	4,400
2	New concrete base	2,200	SF	$ 3.12	6,864
3	New pavers	2,200	SF	$ 11.90	26,180
4	Regrading	1	LS	$ 5,000.00	5,000
5					0
6					0
7					0
8					0
9					0
10					0

Subtotal	42,444
General Conditions (15%)	6,367
Subtotal	48,811
Design Contingency (20%)	9,762
Subtotal	58,573
Contractor OH & P (15%)	8,786
TOTAL	$ 67,359

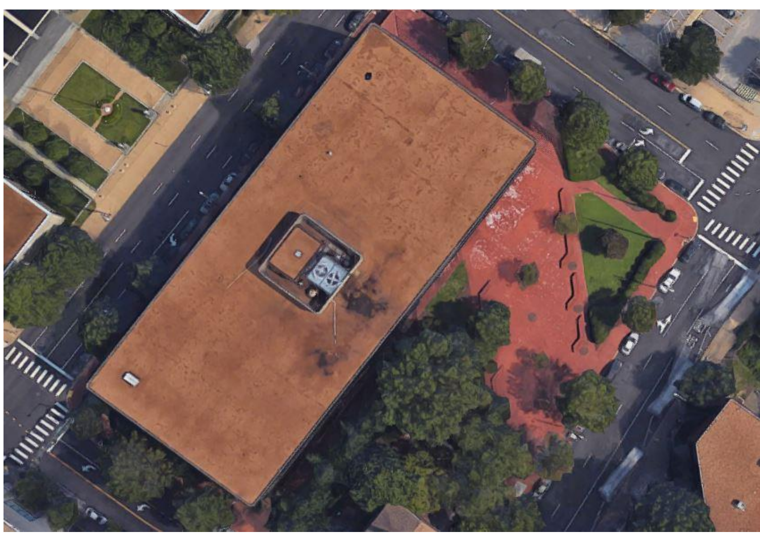
JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A09
Location: Exterior Plaza	Category Repair

Description	Recommended Action
The paver conditions vary from poor to good based on exposure and location. Significant portions of the brick, located primarily under the building overhang, have effloresced, discoloring the brick.	Clean plaza brick pavers and replace damaged pavers. A detailed survey of the plaza pavers would need to be conducted to determine the extent plaza repair and replacement. A/E has assumed 30% of pavers to be cleaned and 25% to be replaced.



Reference:	Estimated Cost: $136,307

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A09

Category Repair

Description: Clean and repair existing plaza pavers

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Clean brick pavers	6,500	SF	$ 1.44	9,360
2	Replace damaged pavers	5,200	SF	$ 13.90	72,280
3	New edging	500	LF	$ 8.50	4,250
4					0
5					0
6					0
7					0
8					0
9					0
10					0

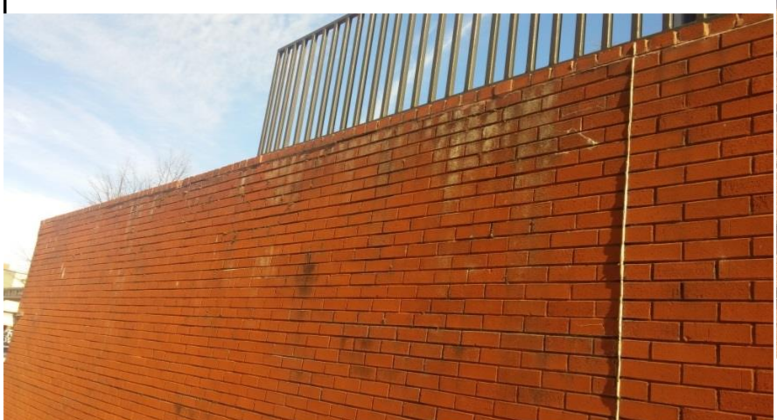
Subtotal	85,890
General Conditions (15%)	12,884
Subtotal	98,774
Design Contingency (20%)	19,755
Subtotal	118,528
Contractor OH & P (15%)	17,779
TOTAL	$ 136,307

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A10
Location: Exterior Walls	Category Repair
Description	**Recommended Action**
There are signs of efflorescence and staining on the brick. There is also extensive organic material growing at the brick mortar joints. There are no major signs of cracks that may represent any major failures in the masonry. Sealants at the control joints have been pushed out of the joint and have hardened. It appears that the control joints were not adequately sized for the movement of the masonry wall.	Clean existing brick and tuck point mortar deteriorated by the organic materials. Remove existing deteriorated sealant, route mortar joint and install new sealant.



Reference:	Estimated Cost: $15,257

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A10

Category Repair

Description: Clean/tuck point exterior masonry joints/repair sealant at control joint

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Clean masonry	1,500	SF	$ 3.42	5,130
2	Repoint Masonry	500	SF	$ 7.70	3,850
3	Remove sealants	80	LF	$ 1.00	80
4	Saw cut brick joint	80	LF	$ 4.48	358
5	New sealant	80	LF	$ 2.44	195
6					
7					
8					
9					
10					

Subtotal	9,614
General Conditions (15%)	1,442
Subtotal	11,056
Design Contingency (20%)	2,211
Subtotal	13,267
Contractor OH & P (15%)	1,990
TOTAL	$ 15,257

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A11
Location: Exterior Ramps	Category Maintenance
Description	**Recommended Action**
Paint finish on railings on the west and south sides of the building are pealing and showing signs of rust.	Remove loose paint and repaint existing railings.

Reference:	Estimated Cost: $1,215

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A11

Category Maintenance

Description: Repaint exterior railings

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Prep railings	139	LF	$ 1.50	209
2	Paint railings	139	LF	$ 4.01	557
3					0
4					0
5					0
6					0
7					0
8					0
9					0
10					0

Subtotal	766
General Conditions (15%)	115
Subtotal	881
Design Contingency (20%)	176
Subtotal	1,057
Contractor OH & P (15%)	159
TOTAL	$ 1,215

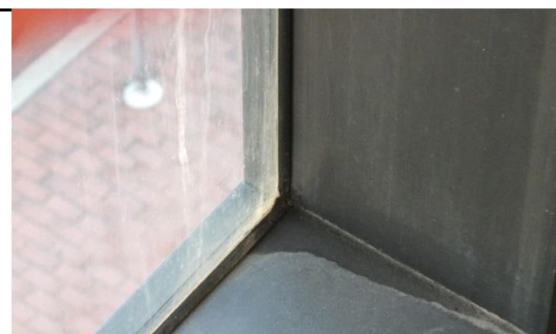
JOHN MARSHALL COURTS BUILDING

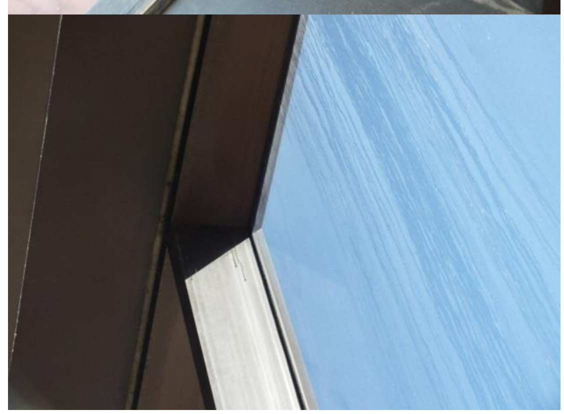
Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A12
Location: Exterior Walls	Category Upgrade

Description	Recommended Action
The majority of the building envelope is comprised of a prefinished aluminum curtain wall system with single pane uninsulated glazing. The building users have noted that the system has significant leak issues. The City previously completed a study to try and determine the source of the leaks (refer to the report included in the Appendix).	Replacement costs of the window system are based on information provided in the study the City previously completed (refer to the report included in the Appendix).





Reference:	Estimated Cost: $5,040,000

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A12

Category Upgrade

Description: Replace/repair exterior window system

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

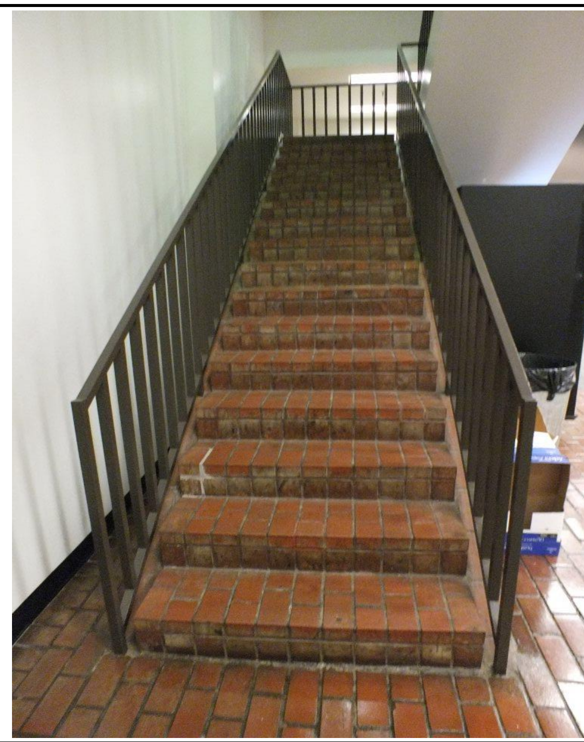
Subtotal	0
General Conditions (15%)	0
Subtotal	0
Design Contingency (20%)	0
Subtotal	0
Contractor OH & P (15%)	0
TOTAL	$ 5,040,000

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation Location: First Floor	Deficiency No. A13 Category Life Safety
Description	**Recommended Action**
The existing railings are less than 42” in height (VCC 1013.3) and have a picket spacing greater than 4” (VCC 1013.4) as required for guardrails. The handrails do not comply with the requirements for accessible handrails at stairs (ANSI A117.1 505).	Replace existing guard rail and stair handrail with new code compliant railing system.



Reference:	Estimated Cost: $35,645

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A13

Category Life Safety

Description: Replace guard and handrails at interior open stair

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Remove existing railings	1	LS	$ 250.00	250
2	New guardrail/handrail system	76	LF	$ 215.80	16,401
3	New guardrail	35	LF	$ 166.00	5,810
4					0
5					0
6					0
7					0
8					0
9					0
10					0

Subtotal	22,461
General Conditions (15%)	3,369
Subtotal	25,830
Design Contingency (20%)	5,166
Subtotal	30,996
Contractor OH & P (15%)	4,649
TOTAL	$ 35,645

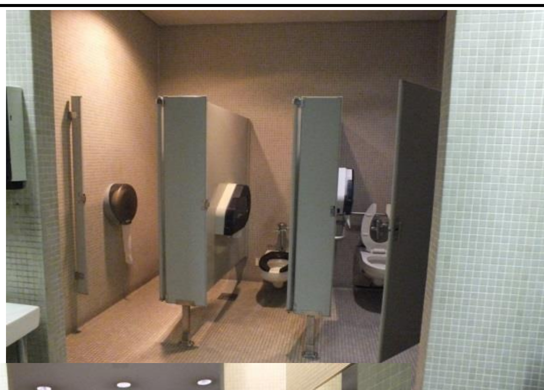
JOHN MARSHALL COURTS BUILDING

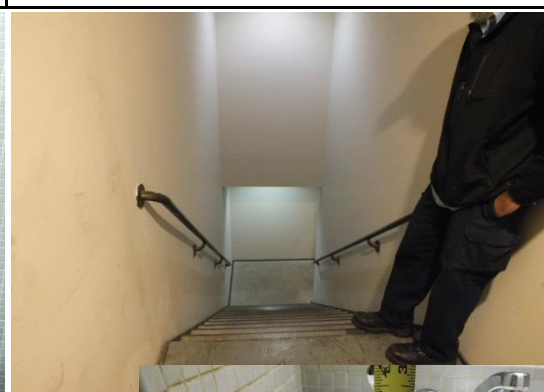
Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A14
Location: Building Interior- All Floors	Category Upgrade

Description	Recommended Action
The city previously completed an accessibility survey for the in 2015; refer to the appendix for the full report. The items identified in the report include: • Building Signage • Door Closer Opening Force • Door Handles/Latches • Public Toilets • Jury Room Toilets • Staff Toilets • Fire Alarm System	Upgrade existing feature to comply with current accessibility requirements. Current building is significantly out of compliance with the requirements of ANSI A117.1. Cost provided are based on accessibility report in the appendix.





Reference:	Estimated Cost: $1,239,914

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A14

Category 2

Description: Provide building accessible features

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	New interior signs	1	LS	$ 21,000	21,000
2	New door hardware	1	LS	$ 92,382	92,382
3	Public Toilets	1	LS	$ 92,382	160,000
4	Staff toilets	1	LS	$ 204,000	204,000
5	Fire Alarm System	1	LS	$ 302,400	302,400
6					0
7					0
8					0
9					0

Subtotal	779,782
General Conditions (15%)	116,967
Subtotal	896,749
Other Related Expenses	136,512
Subtotal	1,033,261
Design Contingency (20%)	206,652
TOTAL	$ 1,239,914

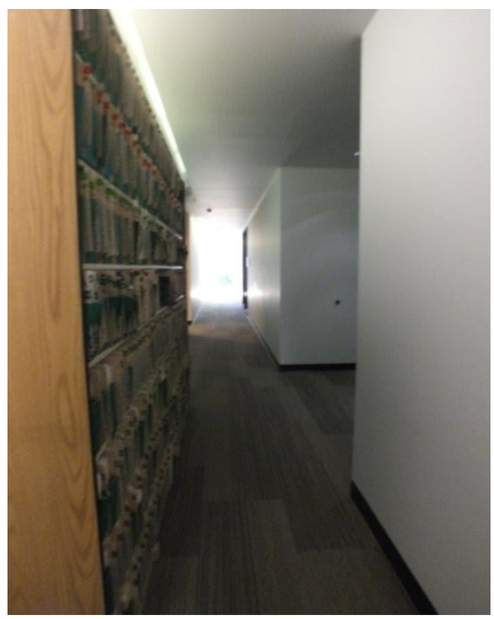
JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A15
Location: First Floor Corridors	Category Life Safety

Description	Recommended Action
The existing perimeter corridors in the building act as exit access corridors to the exit stairs. The exit access corridors are being used as additional file storage space. This has created conditions where the minimum corridor width has been reduced to less than 44” as required by VCC 1018.2. In one location, the minimum allowed clearance was 35”.	Remove excess equipment and filing cabinets as required to maintain minimum 44" clearance in exit corridors. It is apparent that there is insufficient storage for the existing files. A cost for this effort can not be determined at this time.



Reference:	Estimated Cost: $0

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A15

Category Life Safety

Description: Remove obstructions from exit access corridors

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1					0
2					0
3					0
4					0
5					0
6					0
7					0
8					0
9					0
10					0

Subtotal	0
General Conditions (15%)	0
Subtotal	0
Design Contingency (20%)	0
Subtotal	0
Contractor OH & P (15%)	0
TOTAL	$ -

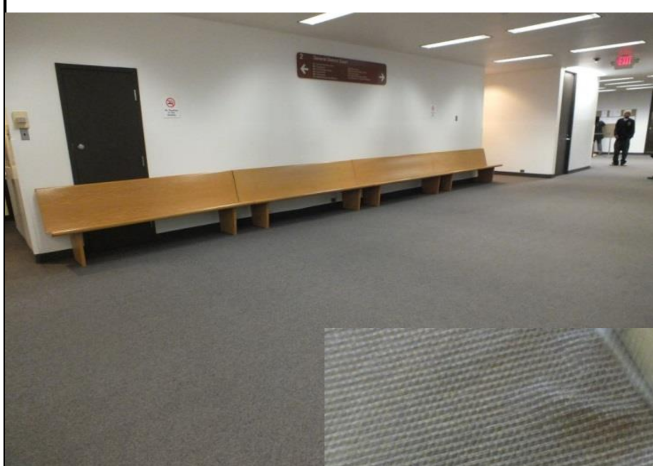
JOHN MARSHALL COURTS BUILDING

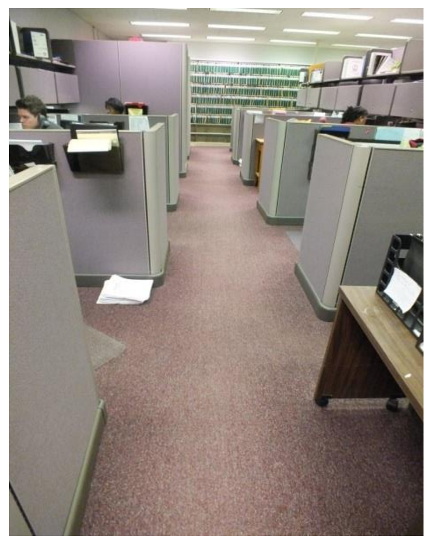
Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A16
Location: Building Interior- All floors	Category Replace

Description	Recommended Action
The carpeting condition varies drastically throughout the building. Some areas still appear to have the original carpeting installed at the time of building's construction. At least 50%-75% of the carpeting is at the end of it's useful life.	For the purposes of this report we are recommending all carpeting be replaced throughout the building.





Reference:	Estimated Cost: $797,364

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate			Deficiency No.		A16
				Category	Replace
	Description:		Replace carpeting with carpet tile		

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Remove carpeting-Basement	11,500	SF	$ 0.47	5,405
2	Install new carpet tile-Basement	1,278	SY	$ 45.50	58,139
3	Remove carpeting-First Floor	22,000	SF	$ 0.47	10,340
4	Install new carpet tile-First Floor	2,444	SY	$ 45.50	111,222
5	Remove carpeting-Second Floor	26,000	SF	$ 0.47	12,220
6	Install new carpet tile-Second Floor	2,889	SY	$ 45.50	131,444
7	Remove carpeting-Third Floor	26,000	SF	$ 0.47	12,220
8	Install new carpet tile-Third Floor	2,889	SY	$ 45.50	131,444
9	New wall base	10,000	LF	$ 3.00	30,000
10					

Subtotal	502,435
General Conditions (15%)	75,365
Subtotal	577,800
Design Contingency (20%)	115,560
Subtotal	693,360
Contractor OH & P (15%)	104,004
TOTAL	$ 797,364

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A17
Location: Second Floor Lobby	Category Replace
Description	**Recommended Action**
The second floor bulletin boards are poor condition and have been previously repainted to try and extend their useful life but are at the end of useful life	Install new bulletin boards.

Reference:	Estimated Cost: $2,218

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A17

Category Replace

Description: Replace existing bulletin boards

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Remove bulletin boards	1	LS	$ 100.00	100
2	Install new bulletin boards	150	SF	$ 8.65	1,298
3					0
4					0
5					0
6					0
7					0
8					0
9					0
10					0

Subtotal	1,398
General Conditions (15%)	210
Subtotal	1,607
Design Contingency (20%)	321
Subtotal	1,929
Contractor OH & P (15%)	289
TOTAL	$ 2,218

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A18
Location: Building interior-All floors	Category Maintenance
Description	**Recommended Action**
The paint on the doors in public areas are chipped and peeling.	Repaint existing doors and frames through out building

Reference:	Estimated Cost: $60,298

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A18

Category Maintenance

Description: Repaint metal doors and frames

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Prep doors & frames	447	EA	$ 5.00	2,235
2	Paint doors and frames	447	EA	$ 80.00	35,760
3					0
4					0
5					0
6					0
7					0
8					0
9					0
10					0

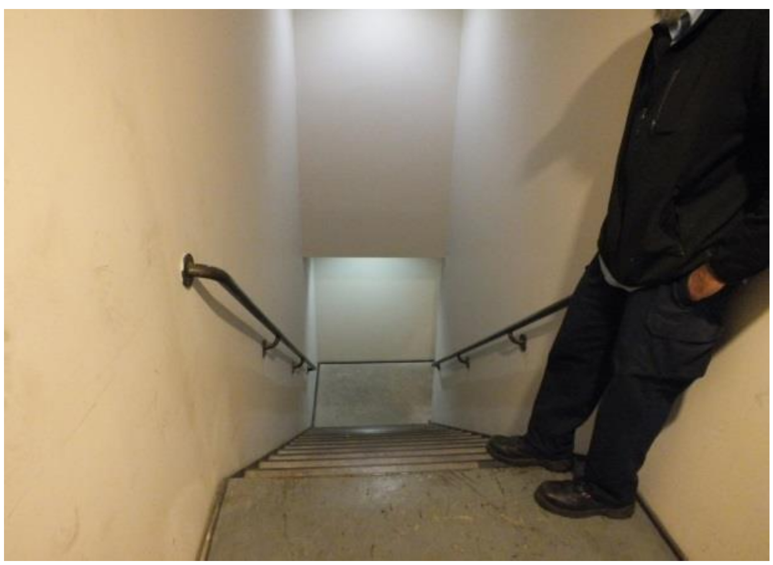
Subtotal	37,995
General Conditions (15%)	5,699
Subtotal	43,694
Design Contingency (20%)	8,739
Subtotal	52,433
Contractor OH & P (15%)	7,865
TOTAL	$ 60,298

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation Location: Building Interior- All Floors	Deficiency No. A19 Category Upgrade
Description	**Recommended Action**
The existing handrails do not comply with ANSI A117.1 505.10 and VCC 1012.6 for extension at the top and bottom of stairs.	Replace existing wall mounted hand rails.



Reference:	Estimated Cost: $24,122

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. A19

Category Upgrade

Description: Install accessible handrails in exit stairs

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Remove existing handrails	304	LF	$ 5	1,520
2	Install new wall mounted hanrails	304	LF	$ 45	13,680
3					
4					
5					
6					
7					
8					
9					

Subtotal	15,200
General Conditions (15%)	2,280
Subtotal	17,480
Design Contingency (20%)	3,496
Subtotal	20,976
Contractor OH & P (15%)	3,146
TOTAL	$ 24,122

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. A20
Location: Building Interior- All Floors	Category Upgrade

Description	Recommended Action
Existing ACT ceiling systems are old and appear dingy. The concealed suspension system prevent easy access to above ceiling areas.	Replace existing ACT ceiling systems with new SAT ceiling systems.

Reference:	Estimated Cost: $311,425

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate			Deficiency No.	A20
			Category	Upgrade
	Description:		Install accessible handrails in exit stairs	

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Remove existing ceilings	40,048	SF	$ 0.80	32,038
2	Install new SAT ceiling systems	40,048	SF	$ 4.10	164,197
3					
4					
5					
6					
7					
8					
9					

Subtotal	196,235
General Conditions (15%)	29,435
Subtotal	225,670
Design Contingency (20%)	45,134
Subtotal	270,805
Contractor OH & P (15%)	40,621
TOTAL	$ 311,425

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation Location: Entire Building	Deficiency No. M01 Category Replace
Description	**Recommended Action**
Replace VAV boxes throughout the building (ongoing project)	The recommendation is to replace the original VAV boxes that use pneumatic controls with new modern boxes that use DDC controls. However, this project is already pending and scheduled to begin in the summer of 2017.

NO PHOTO

Reference:	Estimated Cost: $1,611,599

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate			Deficiency No.	M01
			Category	Replace
	Description:		Replace existing VAV system	

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Remove existing VAV boxes	145	EA	$ 200	$ 29,000.00
2	New VAV boxes (installed)	145	EA	$ 6,500	$ 942,500.00
3	Modify heating hot water piping	145	EA	$ 200	$ 29,000.00
4	Electrical (disconnect/reconnect)	75	EA	$ 200	$ 15,000.00
5					
6					
7					
8					
9					
10					

Subtotal	$ 1,015,500.00
General Conditions (15%)	$ 152,325.00
Subtotal	$ 1,167,825.00
Design Contingency (20%)	$ 233,565.00
Subtotal	$ 1,401,390.00
Contractor OH & P (15%)	$ 210,208.50
TOTAL	$ 1,611,599

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation Location: Basement Mechanical Room	Deficiency No. M02 Category Replace
Description	Recommended Action
The existing boilers are original equipment, installed in 1975 and therefore, are 42 years old. Although they continue to perform reliably, they have exceeded their normal expected life. For continued reliability of the heating system and for improved energy efficiency, it is recommended that the boilers be replaced.	Replace the existing boilers with two, high efficiency hot water condensing boilers. Aerco Modulex boilers are recommended. Each boiler should be sized for approximately 65% of the total overall building heating capacity. Each boiler will be furnished with dual fuel source burners to allow for the continued used of either natural gas (primary) and oil (back-up) as fuel sources.

Reference:	Estimated Cost: $336,444

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate			Deficiency No.	M02
			Category	Replace
	Description:			Replace existing boilers

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Remove Existing Boilers, etc.	2	EA	$ 10,000	$ 20,000.00
2	New Boilers	2	EA	$ 65,000	$ 130,000.00
3	New expansion Tank & Air Separator	1	EA	$ 7,000	$ 7,000.00
4	Pipe Modifications	1	EA	$ 10,000	$ 10,000.00
5	Flue Modifications	1	EA	$ 10,000	$ 10,000.00
6	Gas & Oil piping modifications	1	EA	$ 10,000	$ 10,000.00
7	Miscellaneous materials & Equipment	1	EA	$ 25,000	$ 25,000.00
8					
9					
10					

Subtotal	$ 212,000.00
General Conditions (15%)	$ 31,800.00
Subtotal	$ 243,800.00
Design Contingency (20%)	$ 48,760.00
Subtotal	$ 292,560.00
Contractor OH & P (15%)	$ 43,884.00
TOTAL	$ 336,444

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation Location: Basement Mechanical Room	Deficiency No. M03 Category Energy Efficiency
Description	**Recommended Action**
Add air-side economizer to air handling units.	Add ductwork, dampers, exhaust fan and controls to each air handling unit to allow the use of 100% outdoor air to provide cooling for the building when outdoor conditions are suitable.

INSERT PHOTO

Reference:	Estimated Cost: $285,660

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. M03

Category Energy Efficiency

Description: Add economizer to mechanical system

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Ductwork for six AHU's	6	EA	$ 15,000	$ 90,000.00
2	Dampers/motors	6	EA	$ 2,500	$ 15,000.00
3	Louvers	6	EA	$ 2,500	$ 15,000.00
4	Controls	6	EA	$ 5,000	$ 30,000.00
5	Exhaust Fans/VFD's	6	EA	$ 5,000	$ 30,000.00
6					$ -
7					$ -
8					$ -
9					$ -
10					$ -

Subtotal	$ 180,000.00
General Conditions (15%)	$ 27,000.00
Subtotal	$ 207,000.00
Design Contingency (20%)	$ 41,400.00
Subtotal	$ 248,400.00
Contractor OH & P (15%)	$ 37,260.00
TOTAL	$ 285,660

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. E01
Location: First Floor	Category Life Safety
Description	**Recommended Action**
Upgrade fire alarm system to include annunciator panel in main lobby	Add annunciator panel in main lobby for fire department personnel use during alarm situation. The fire alarm panel will include a silk-screened graphic floor plan of each floor to identify the location of the device initiating the alarm.

NO PHOTO

Reference:	Estimated Cost: $79,350

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate			Deficiency No.		E01
			Category		Life Safety
	Description:		Install annunciator panel		

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Annunciator Panel	1	EA	$ 25,000	$ 25,000.00
2	Interface with existing alarm system	1	EA	$ 25,000	$ 25,000.00
3					
4					
5					
6					
7					
8					
9					
10					

Subtotal	$ 50,000.00
General Conditions (15%)	$ 7,500.00
Subtotal	$ 57,500.00
Design Contingency (20%)	$ 11,500.00
Subtotal	$ 69,000.00
Contractor OH & P (15%)	$ 10,350.00
TOTAL	$ 79,350

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. E02
Location: Entire Building	Category: Energy Efficiency
Description	**Recommended Action**
Replace existing 40 watt, T12 Fluorescent lamps with retrofit type LED lamps.	In general, the building lighting is provided by 48"x12" light fixtures with either one or two 40 watt, T12 fluorescent lamps. Replace lamps in all 48"x12" light fixtures with retrofit type LED lamps.

Reference:	Estimated Cost: $133,308

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. E02

Category Energy Efficiency

Description: Replace fluorescent lamps with retrofit LED lamps

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Remove & dispose of existing lamps	3500	EA	$ 2	$ 7,000.00
2	Install new LED lamps	3500	EA	$ 20	$ 70,000.00
3	Miscellaneous	3500	EA	$ 2	$ 7,000.00
4					
5					
6					
7					
8					
9					
10					

Subtotal	$ 84,000
General Conditions (15%)	$ 12,600
Subtotal	$ 96,600
Design Contingency (20%)	$ 19,320
Subtotal	$ 115,920
Contractor OH & P (15%)	$ 17,388
TOTAL	$ 133,308

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation	Deficiency No. E03
Location: Basement Mechanical Room	Category: Energy Efficiency
Description	**Recommended Action**
Replace emergency generator, in-kind	

Reference:	Estimated Cost: $119,025

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. E03

Category Energy Efficiency

Description: Replace emergency generator, in-kind

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Remove Existing Generator	1	EA	$ 10,000	$ 10,000.00
2	New Generator	1	EA	$ 50,000	$ 50,000.00
3	Oil Pipe Modifications	1	EA	$ 5,000	$ 5,000.00
4	Miscellaneous Materials & Equipment	1	EA	$ 10,000	$ 10,000.00
5					$ -
6					$ -
7					$ -
8					$ -
9					$ -
10					$ -

Subtotal	$ 75,000
General Conditions (15%)	$ 11,250
Subtotal	$ 86,250
Design Contingency (20%)	$ 17,250
Subtotal	$ 103,500
Contractor OH & P (15%)	$ 15,525
TOTAL	$ 119,025

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation Location: Entire Building	Deficiency No. E04 Category Energy Efficiency
Description	**Recommended Action**
Add automatic lighting control systems/devices (i.e. occupancy sensors, etc.)	Add wall or ceiling mounted dual technology occupancy sensors to all areas except common areas such as corridors and lobbies.

NO PHOTO

Reference:	Estimated Cost: $90,459

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. E04

Category Energy Efficiency

Description: Add automatic lighting control systems/devices

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Occupancy sensors	300	EA	$ 190	$ 57,000.00
2					
3					
4					
5					
6					
7					
8					
9					
10					

Subtotal	$ 57,000.00
General Conditions (15%)	$ 8,550.00
Subtotal	$ 65,550.00
Design Contingency (20%)	$ 13,110.00
Subtotal	$ 78,660.00
Contractor OH & P (15%)	$ 11,799.00
TOTAL	$ 90,459

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

FACILITY ASSESSMENT

Deficiency Evaluation Location: 1st, 2nd & 3rd Floors	Deficiency No. FP01 Category Life Safety
Description	Recommended Action
Expand Wet-pipe sprinkler system to include floors 1 through 3.	Extend wet-pipe sprinkler system from existing 4" pipe risers (currently serving fire hose connections) to a complete sprinkler distribution system on each floor. **The cost only includes the sprinkler system materials and installation. It does not include the wide ranging ceiling removal and replacement that will be required.**

NO PHOTO

Reference:	Estimated Cost: $214,245

JOHN MARSHALL COURTS BUILDING
Richmond, Virginia

FACILITY ASSESSMENT

Cost Estimate

Deficiency No. FP01

Category Life Safety

Description: Expand sprinkler system to cover entire building

Item	Description of Work	Qty.	Unit	Unit Cost	Total
1	Sprinkler system	135,000	SF	$ 1	$ 135,000.00
2					
3					
4					
5					
6					
7					
8					
9					
10					

Subtotal	$ 135,000.00
General Conditions (15%)	$ 20,250.00
Subtotal	$ 155,250.00
Design Contingency (20%)	$ 31,050.00
Subtotal	$ 186,300.00
Contractor OH & P (15%)	$ 27,945.00
TOTAL	$ 214,245

JOHN MARSHALL COURTS BUILDING

Richmond, Virginia

APPENDIX

ADA Survey for the John Marshall Courts Building

City of Richmond, Virginia

27 November 2015

HVC ● CHENAULT

Architecture ● Planning ● Interior Design

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1. Executive Summary

General:

The scope of the ADA Survey was to review the existing conditions within the building for compliance with the ADA. Per page 1 of the 2010 Standards for Accessible Design issued by the Department of Justice, see appendix, the 2010 standards are for “newly designed and constructed or altered State and local government facilities….”. Per the FAQ page from the ADA National Network, see appendix, “Public entities do not necessarily have to make each of their existing facilities accessible”. Therefore, the resulting recommendations from this survey are for bringing the facilities up to current requirements, which would appear to be optional unless the building were to undergo alterations. At the time of alteration, non-compliant items must be addressed as applicable. Alterations of public toilets do not necessitate the renovation of staff toilets.

The John Marshall Courts building was designed and constructed in the mid to late 1970’s. Therefore, the design of the facility preceded the development and initiation of the original American with Disabilities Act (ADA) by many years. Some ADA upgrades have been made to the building throughout the years in an attempt to comply with past ADA regulations.

Using the ADA survey checklists included in the appendix, HVCC identified thirteen major categories of items to be evaluated for compliance. Some items in the checklist were deemed not to be applicable to the building. An example would be food service or vending machines that are not provided in the building.

Based upon the field survey conducted by HVC ● CHENAULT in September of 2015, overall much of the building appears to be in general compliance with the ADA and to be brought into compliance with the current ADA would require relatively limited corrective actions on each floor of the building with the exception of the toilet rooms. The toilets serving the Jury assembly rooms are non-compliant and would require extensive renovation to provide the required clearances. Similarly, the Public group toilets spaces have a multitude of issues with light switches, mounting heights of toilet accessories, heights of grab bars and clearances at pulls for doors exiting the spaces. We will address that more specifically under the detailed findings of the survey.

Although it can be assumed that the original design was compliant with the regulatory environment during the time of its initial design, the building has multiple shortcomings under current regulations, most notably regarding the public and staff toilets. Handicapped stalls have been provided with grab bars. Not all of the toilets are consistent in size and the variations are relatively small. If measured, the variances would be in violation of the standards but not so large as to create major space issues.

Some signage has been installed after the ADA was first enacted. That signage was probably compliant under previous versions of the ADA but has not kept up with newer requirements for mounting height, raised text and Braille requirements. This is common throughout the building.

The building hardware in the older sections of the building is another common item throughout the building. Conversion of door handles to lever style and replacement of closers is recommended.

The replacement of the fire alarm system may be necessary to provide audible alarms for the blind. The existing system may not be able to be upgraded due to capacity or age (discontinued products) and should be reviewed by a qualified fire alarm system specialist. If the City has someone who is under annual contract to maintain the system they should be able to provide a quick analysis of the existing system.

Part 2 of the survey identifies the various areas of concern relative to ADA compliance. Of fourteen areas checked, we believe that nine do not justify corrective action at this time. The remaining five are either optional or subject to renovation of the space. Some of the items can be addressed by use of City employees to make the adjustments.

Copies of the field notes are included in the Appendix.

Summary of Costs

The detailed cost estimates are included in part 3. The broad summary of the anticipated costs are:

1.	Accessibility to Service Counters	$	0.00
2.	Building Signage	$	21,000.00
3.	Door Closer Opening Force / Door Handles	$	92,382.00
4.	Public Toilets (Primarily Jury Assembly Rooms)	$	160,000.00
5.	Staff Toilets	$	204,000.00
6.	Hearing assistance	$	0.00
7.	Judges Benches	$	0.00
8.	Public data access work stations (computer stations)	$	0.00
9.	Break Rooms	$	0.00
10.	Corridors	$	0.00
11.	Fire Alarm System	$	302,400.00
12.	Elevators	$	0.00
13.	Public Seating Areas	$	0.00
14.	Drinking Fountains	$	0.00
	15% General Conditions Costs	$	116,967.00
Total Estimated Cost (2015 Dollars) without escalation		$	896,749.00

In summary, if all items listed above are to be considered for corrective action, we are recommending a construction budget cost of Eight Hundred Ninety-Six Thousand Seven Hundred Forty-Nine Dollars plus escalation, contingency and soft costs for design and management of the projects. Some of the minor work can be performed with City personnel to contain the overall cost. The rest should be developed into a Capital Improvement Budget Item for approval by City Council.

2. **Compliant and Non-Compliant Elements**

The study identified fourteen major categories to check for compliance. Those categories of compliance are:

Category	Recommendation
1. Accessibility to Service Counters	No Changes
2. Building Signage	Replacement
3. Door Closer Opening Force / Door Handles	Replacement
4. Public Toilets	Renovation
5. Staff Toilets	Renovation
6. Hearing assistance	No Changes
7. Judges Benches	No Changes
8. Public data access work stations (computer stations)	No Changes
9. Break Rooms	No Changes
10. Corridors	No Changes
11. Fire Alarm System	Upgrade
12. Elevators	No Changes
13. Public Seating Areas	No Changes
14. Drinking Fountains	No Changes

Accessibility to Service Counters

Due to the size and scale of the building, and the number of occupants which it supports, accessible paths and access to goods and services are mostly in compliance. Some minor areas of non-compliance include public counters in office suite reception areas, and other public accessible work areas. Some of the counters have ADA required lower counters but those spaces have been usurped by the staff as additional countertop space for desktop items such as personal mementos, forms, interoffice mail trays, etc. Those areas merely need a change in the manner that the staff uses the space. This practice may stem from the infrequent nature of needing to serve wheel chair bound persons. The Lobby information desk is not compliant but, per the Sheriff's Office, is not in use. That station is actually not functionally usable for the staff and creates some security issues because it is too far from the magnetometers and x-ray equipment for the staff to use both areas. This station could be removed and the space reconfigured to allow more people to wait inside the building when queuing up to be processed through the security checkpoint. This is a functional deficiency and not an ADA related item. Since that station is not in use and recommended for removal, we have not considered it to be a cost related item for ADA compliance.

Building Signage

Building signage in the Public areas includes the Braille and pictographic requirements but not raised text. Much of the signage in the staff areas is not compliant. It does not have Braille, is mounted incorrectly as to height and location, has no raised text or does not contain pictograph symbols on toilets or stairs. The Public signage could simply be lowered to become more compliant but we recommend wholesale replacement throughout the building. The staff areas should be replaced with compliant materials, mounting locations corrected, raised text provided, Braille provided and mounting heights adjusted.

Door Closer Opening Force / Door Hardware

Of the doors with closers, which were randomly tested for opening force using a portable door pressure gauge manufactured by Gordon Glass, none complied with the 5 pounds of force opening requirement. HVCC tested doors in various applications on each floor and the consistency of high readings indicated to HVCC that the problem is likely occurring at all closer locations due to age and use.

This may be corrected with adjustments of the door closers but due to the age of the hardware, it might be that the units are worn out and need to be replaced. Door closers are not required for every location in the building so our estimate is based only on the doors we felt that are applicable. We did not include doors such as the elevator machine room where closers are required by Code but disabled persons would not be expected to be operating the doors.

However, we did observe instances where fire rated doors with closers were propped open. That is a staff training issue that is creating a life safety hazard if the doors cannot close in emergencies. This is not an accessibility issue and is therefore noted only for the Owner's information.

Nearly all doors had knobs instead of levers for operation. Doors in later renovations were provided with levers. These knobs should be replaced with lever handles due to the inability of persons with restricted hand control to twist the knobs. It may be necessary to change the whole lock or latch set for the hardware to be made compatible with mounting lever handles. We have assumed that the whole body will require replacement since the internal configuration of each unit would need to be known to determine if it could be converted from a knob to a lever handle. Some manufacturers are no longer available or conversion kits may not be available. We believe that wholesale replacement would be more uniform in style, function and more cost effective.

Public Toilets

The greatest area of non-compliance was found in the lack in accessible public group toilets and single user public toilets (primarily jury rooms). This is to be expected since the building was designed and constructed prior to the advent of the ADA. However, due to the heavy use of the facility by the public, the administrative assumption is that over time, building owners are expected to upgrade their facilities to maintain compliance with current requirements when possible. Toilets and restrooms have some of the most stringent requirements in the ADA. The lack of compliant elements is a considerable inconvenience to employees and visitors. We observed the following:

- At single user toilets the existing hardware is knob style instead of levers or pulls and therefore non-compliant with the ability of persons with limited hand control to operate the door hardware from either side.

- Single user toilets were typically less than 5 feet wide and therefore do not provide the specified turning space for a wheel chair bound person.
- Fixture clearances were non-compliant.
- Grab bars are not mounted at current height requirements.
- Light switches in group or single user toilets are mounted at incorrect height to comply with reach requirements.
- Group toilets do not have the required approach clearance at jambs when exiting the room.
- Various toilet accessories are mounted at incorrect height or do not have the required clearance for either front or side approaches. This is common with paper towel dispensers, hand sanitizers and similar items.
- The style of toilet paper dispenser does not provide specified pull resistance or continuous flow.
- Most faucet handles are not lever style and therefore are not usable by persons with hand control issues.
- Waste and hot water supply lines are not shielded to prevent injury to persons in wheelchairs, who may not feel the hot temperature against their legs and sustain burns. This is both an ADA deficiency and a liability concern.

To address these concerns requires the renovation of each space. Due to the high daily demand for most of these spaces, work would require phased construction and loss of use of each space for up to a month. For the Jury rooms, no jury proceedings could be scheduled for the associated courtroom while the renovations are in progress. Construction would need to be performed when court is not in session or the courtroom taken out of service. The noise level during construction would be disruptive to the use of adjacent courtrooms. For the Jury rooms, space would need to be taken from the Jury Room itself to expand the toilets.

Staff Toilets

Similar items of non-compliance were found in the staff toilets as to those found in the group public toilets. We observed the following common deficiencies in various locations:

- The existing hardware is knobs instead of levers and therefore non-compliant with the ability of persons with limited hand control to operate the door hardware from either side.
- Toilets were typically less than 5 feet wide and therefore do not provide the specified turning space for a wheel chair bound person.
- Fixture clearances were non-compliant.
- Grab bars are not mounted at current height requirements.
- Light switches are mounted at incorrect height to comply with reach requirements.
- Various toilet accessories are at incorrect height or do not have approach clearance.
- The style of toilet paper dispenser does not provide specified pull resistance or free flow.
- Most faucet handles are not lever style and therefore are not usable by persons with hand control issues.

- Waste and hot water supply lines are not shielded to prevent injury to persons in wheelchairs, who may not feel the possible hot temperature against their legs and sustain burns which can be a compliance matter as well as a potential liability issue.

To address these concerns require the renovation of each space. Work would require phased construction throughout the building and loss of use of each space for up to a month.

Hearing Assistance

The Sheriff's office confirmed that the courtrooms are equipped with hearing assistance equipment for the hearing impaired but they could not confirm if the equipment is still functional due to the infrequent usage of the equipment. For the purpose of the survey, we have considered the equipment to be functional but we recommend that a maintenance program be established to check the equipment on a routine schedule to verify that the equipment is indeed still functioning. Therefore, there is no estimated cost provided for this item.

Judges Benches

Currently there are no Judges assigned to the Courts Building that are disabled. If a substitute judge were to be disabled then special provisions would need to be made on a temporary basis for selected courtrooms. The judge's benches are currently set up with ramps in several courtrooms or portable ramps provided for access to the bench. Jury boxes have provisions for wheel chair spaces on the main floor level. We do not recommend any changes to the benches at this time.

Public Access Work Stations

Accessible work areas have been provided in the Clerk's offices on the lower level for public access to computers and microfilm readers. No changes are recommended for these areas.

Break Rooms

There are few of these spaces and they were largely provided with cabinets that are compliant as they were created during previous alterations performed after the implementation of the ADA.

Corridors

Public corridors in the building are typically large open areas serving as both corridor and waiting area. Projections into walking areas are very limited. By contrast, corridors in the staff areas are typically narrower and are often compromised by furniture in the corridors. On the upper perimeter corridors, there are some pinch points between file cabinets and building columns that require a slight change in travel as you walk through the spaces.

Fire Alarm System

Fire alarm strobes were observed in various locations but audible alarm devices were not observed. To add audible devices may require the total replacement of the existing system since the existing system might not support the newer devices and additional devices required to provide adequate audible levels. Therefore, a cost for a new system has been provided for budgetary purposes but the need for wholesale replacement should be confirmed by an electrical engineer or a firm that provides such systems.

Elevators

Public elevators are large and have large lobby spaces with them. Cars are provided with floor bells but not voice announcements for each floor. Elevators for movement of prisoners were not reviewed because they are intended for use by able bodied staff that would be assisting any disabled prisoners.

It would require input from the elevator manufacturer as to what modifications can be provided without totally replacing each elevator car and operating controls. There is no recommendation for changes to the elevators, public or secure, at this time.

Public Seating Areas

Public seating areas are provided outside of the courtrooms and have ample space to accommodate wheelchair bound persons. The Courtrooms also have designated spaces in the gallery for spectators or witnesses. The Jury rooms are large enough to accommodate jurors in wheelchairs around the jury conference table. There is no recommendation for changes to public seating areas at this time.

Drinking Fountains

Drinking fountains have been provided at the Public Toilets on each floor. As installed, the drinking fountains do not provide the knee clearances or other requirements for drinking fountains. These units are semi-recessed and located in corridors where conversion to projected units with knee space is not feasible. If the toilets are renovated in the future then consideration of changes to the drinking fountains should be included at that time. The same situation occurs in the jury rooms but supplemental bottled water dispensers have been provided. No changes are required at this time.

Hening-Vest-Covey-Chenault Architectural Corporation
Architecture • Planning • Interior Design
1710 East Franklin Street, Richmond, Virginia 23223

11/27/15

ADA SURVEY COST ANALYSIS
John Marshall Courts Building
Richmond, Virginia

This estimate does not include extended leases, IT wiring, moving expenses or escalation through the mid-point of construction.

	DESCRIPTION	QUANTITY	UNITS	UNIT COST	EST. COST (2015 $'s)
1.	**Accessibility to Service Counters**				
	Main Lobby	1	LS	0.00	0
	DA reception	1	LS	0.00	0
	Clerk's Office-1st Floor	1	LS	0.00	0
	Clerk's Office-Lower Level	1	LS	0.00	0
	Subtotal				**0**
2.	**Building Signage**				
	Remove existing signs	200	ea.	15.00	3,000
	Repair walls	200	ea.	15.00	3,000
	New signs	200	ea.	75.00	15,000
	Subtotal				**21,000**
3.	**Door Closers & Locksets**				
	Remove Existing Closers	25	ea.	25.00	625
	New Closers (installed)	25	ea.	225.00	5,625
	Remove Building Hardware	244	ea.	65.00	15,860
	New Building Hardware	244	ea.	288.00	70,272
	Subtotal				**92,382**
4.	**Public Toilets**				
	Demolition-Group	4	ea.	2,000.00	8,000
	Renovation-Group	4	ea.	10,000.00	40,000
	Demolition-Jury	16	ea.	2,000.00	32,000
	Renovation-Jury	16	ea.	5,000.00	80,000
	Subtotal				**160,000**
5.	**Staff (Private) Toilets**				
	Demolition	34	ea.	2,500.00	85,000
	Renovation	34	ea.	3,500.00	119,000
	Subtotal				**204,000**
6.	**Hearing Assistance**	1	LS	0.00	**0**
7.	**Judges Benches**	1	LS	0.00	**0**
8.	**Public Data Access Stations**	1	LS	0.00	**0**
9.	**Break Rooms**	1	LS	0.00	**0**
10	**Corridors**	1	LS	0.00	**0**
11.	**Fire Alarm System**	1	LS	302,400.00	**302,400**
12.	**Elevators**	1	LS	0.00	**0**
13.	**Public Seating Areas**	1	LS	0.00	**0**
	Subtotal				**779,782**
14.	General Conditions Costs	113,382	%	0.15	**116,967**

15.	**TOTAL ESTIMATED CONSTRUCTION COST**					**896,749**
16.	**Other Related Expenses**					
	Architect / Eng. Des. Serv.		1	LS	134,512	134,512
	Printing Permit Sets		1	LS	2,000	2,000
17.	**TOTAL RELATED EXPENSES**					**136,512**
18.	**SUBTOTAL**					**1,033,262**
19.	**PROJECT CONTINGENCY**	1,033,262		%	20%	**206,652**
20.	**ESTIMATED PROBABLE TOTAL PROJECT COST**					**$1,239,914**

Note: Contingency funds are intended to cover unanticipated costs. It also provides flexibility for changes in scope required to fulfill the final program for the building spaces.

John Marshall Courts Building

City of Richmond

Report on the Exterior Glazing

Prepared by Wiley | Wilson

December 5, 2016

Introduction:

Wiley|Wilson is providing this limited building assessment report at the City of Richmond's request. It addresses concerns about the water infiltration and moisture issues at the John Marshall Courts Building. This study focuses on the observed condition of the building's exterior curtain wall window systems and the probable conditions that may be causing this water/moisture infiltration. Based on the site conditions observed and noted during the November 22, 2016 site visit, we believe the building itself to be in sound condition and, at the time of the site visit, no apparent or significant water/moisture intrusion through the window systems was evident.

Based on our review, the following building systems may contribute to this water/moisture intrusion:

1. Water/moisture infiltration by leakage through the window assembly
2. Water/moisture infiltration by leakage through the coping and/or roof and roof flashing
3. Condensation of water caused by the cold window frames

Correcting these conditions will be required, as well as an additional assessment of the roof assemblies (see below for additional comments) and mechanical and heating systems.

Site Visit

On November 22, 2016, Wiley|Wilson Senior Architect Theodore Hendry visited the John Marshall Courts Building to observe and investigate possible causes for the source of the water intrusion ostensibly from the exterior windows into the building and the possible impact on building assemblies. Other building assemblies, including roof assemblies, may also contribute to this water intrusion; however, the roof appears to be in fairly good condition despite its age. Mr. Hendry arrived at the site at 9:00 AM, was on site for 3.5 hours, and his visit occurred before Able Glass Services re-installed the building's horizontal and vertical face caps. At the beginning of the site visit, the weather was partly sunny and the temperature was 40º. An articulating boom lift was already at the site.

Also present at this site visit were:

- Mr. William (Rob) Irby, Capital Projects Manager, City of Richmond
- Jack Eaton, W H Stovall
- Mark Morgan, Able Glass Services

Building

The John Marshall Courts Building, located at 400 North 9th Street, was constructed in the late 1970s according to some original drawings found at the site dated June 10, 1974. The architect of record was C F Murphy Associates, as listed in the drawings' title block. This firm may be the same as C F Murphy Associates, a well-known architectural firm that was once based in Chicago. After C F Murphy's death in 1985 and Helmut Jahn took control of the firm, it was renamed Murphy/Jahn before becoming just Jahn in 2012. According to the information on the title block, the associate architectural firm was Wright, Jones & Wilkerson, a local Richmond architectural firm at that time.

Based on discussions with the City of Richmond representative, the exterior window curtain-wall system is original to the construction of the building, as are the built-up roof and roof accessories. Both the roof and curtain wall windows with all its seals and gasketing are nearly 40 years old. Normally windows such as these require continual building maintenance and rehabilitation during their life cycles. The curtain wall window's life expectancy for weather-tightness is about 25 years. These systems are past their useful life expectancy.

The existing window frames are approximately 2.5 inches wide by 7.5 inches deep. It is an outside glazed system with an exterior concealed pressure (compression) plate with fasteners approximately 12 inches on-center covered by a prefinished metal face cap. Internal frame reinforcement is not evident. Assuming the given age of the window curtain-wall, the frames are not thermal break frames. If these are thermal break frames, the gasket separation would be very minimal and be marginal at best. The window frames are dark bronze color, although they are somewhat faded. There are no visible weeps evident, so it is assumed that drainage is achieved at the verticals.

The glazing is reportedly 3/8-inches thick, tinted annealed glass panels that are approximately 5.0 feet wide (center of mullion to center of mullion) by 16 feet high for each floor and within each structural bay. Because they are single-pane glass, these windows do not offer the thermal performance that new insulated windows do. New glass would have a very low U-Value (U-0.45 to 0.35 range) as compared to single-pane glass (U-0.90 to 0.80 range). The higher the U-Value of the glass, the less insulating qualities it has. The lower the U-Value of the glass, the better the insulating qualities the glass has. Based on visual observations, the window system frames appear to be framed and attached at each floor level and at the roof structure.

Scope of Work

The architectural services that Wiley|Wilson will provide to the City of Richmond include:

- Visiting the site
- Reviewing and assessing the existing exterior windows and their condition.
    - This assessment will include a visual observation of the existing windows and will determine, to the greatest extent feasible, the cause or causes of the water/moisture intrusion, without any building, non-invasive demolition, or exhaustive, in-depth inspections of all building assemblies.
- An articulating boom lift was provided and the partial removal of some of the window horizontal and vertical mullions and caps by Able Glass Services was provided.
- Summarizing the findings in a report that includes documentation of exterior window conditions related to moisture intrusion, an assessment of possible water intrusion, and their causes and remediation. This report will also include a potential cost estimate to complete remedial repairs.

Visual Inspections and Observations

Existing Conditions:

Before any of the exterior prefinished vertical and horizontal face caps and panels were removed, there was no major visible signs of glass breakage, damage, structural issues, water ponding, or water accumulation on the portion of the window curtain-wall system documented for this report. It was noted that caulking was applied and re-applied over the frames, caps, and trim in many locations over the years to try to alleviate water intrusion. However, this is a temporary fix.

After the articulating boom lift was in place, representatives from Able Glass Services removed portions of the horizontal and vertical face caps to expose the pressure plates, seals and gasketing, sealant, and frame assembly. Some of the pressure plates were unfastened to reveal the existing glazing edges, setting blocks, and seals. Aside from removing the exterior face caps and pressure caps, no additional destructive demolition was performed to reveal possible causes of water intrusion.

Exterior Window System:

It was noted at the outset that the rubber seals, butyl tapes and caulk/sealants, and gasketing were quite deteriorated at all locations that were exposed to view and observation. Additionally, the existing seals, gasketing, and sealants were very brittle and easily broken and were peeling away from the adjacent surfaces. End caps/plugs were not evident. It could not be determined if these were deteriorated to the point that they had disintegrated from weather and UV rays or were never installed. Again, weeps were not evident. The curtain wall assembly shows repeated attempts at caulking and re-caulking at the seams and joints for a temporary fix and/or remediation.

Interior Window System:

It was quite evident that water stains or streaks were on the inside mullions at several locations. Given the building construction above the windows, it was not evident where the water was coming from. Based on the conditions of the rubber and butyl tapes/seals, caulk/sealants and gasketing, the water infiltration into the interior may be from seals and gasket failure as described previously.

It was noted during the walk through inside the building that these streaks and stains may also be coming from condensation caused by the cold frames and the warm, moist interior temperatures. Condensation may also contribute to the water issues. Interior temperature and humidity seemed to be normal and set at standard levels; however, actual temperature or humidity readings were not taken.

Coping and Roofing:

Moisture or water intrusion was not evident from the roof, flashing or coping to the interior as observed from the lift. No representatives from Wiley|Wilson, Able Glass Services, or W H Stovall went on to roof for in-depth investigation there. The roof appears to be in fairly good condition despite its age. It was noted that the existing metal coping seams were not as tight as they should be. The metal coping as shown in the photos is typical for the perimeter of the building. Most coping comes in sections and lengths and are joined with attachments such as cleats or fasteners and various seams such as lock seams, lap seams, welded, etc. It was not evident that any other type of seam was used except a “butt” seam, with cleats and some surface through-fasteners.

Impact on the Existing Building Systems:

Moisture or water intrusion can have a detrimental effect on most of the building systems, including the steel structure, lintels/supports, interior finishes, and wood blocking present. Water or moisture can also have adverse effects on the building's inhabitants due to the possibility of mold growth in moist, warm, dark conditions.

Additional Research

Telephone calls to "Kawneer" and "Vista-Wall" (now "Old-Castle Building Envelope") were made to confirm several key points the architect made at the site.

Both suppliers stated that the existing curtain wall system is long past its life expectancy for weather tightness. From the photos sent to each supplier individually, both agreed that rubber and butyl tapes/seals, caulk/sealants, and gasketing are in very poor condition. Also, each supplier stated that retrofitting new, insulated glazing would not be feasible given the type of frames and their age. The original supplier could not be ascertained in the field, but based on the information supplied by the two suppliers contacted, the window system may be a Vista-Wall system.

Exterior Windows

Figure 1*:* The existing curtain wall window system is an outside glazed system with a prefinished metal face cap.

Exterior Windows and Lift

***Figure 2**:* An articulating boom lift was used at the site.

Exterior Window Frames

Figure 3: This close-up view of the exterior horizontal and vertical frames with one of the face caps removed provides a good view of the sealant. Note its condition: All the rubber and butyl tapes/seals and caulk/sealants are quite deteriorated.

Exterior Window Frames

Figure 4: This is another view of a window at the expansion joint with the exterior face caps removed. Note that all the rubber and butyl tapes/seals and caulk/sealants were quite deteriorated.

Exterior Window Seals/Gaskets

Figure 5: As this typical exterior picture reveals, the existing window gasketing/seals show deterioration, cracking, and exposure.

Interior Window Jamb

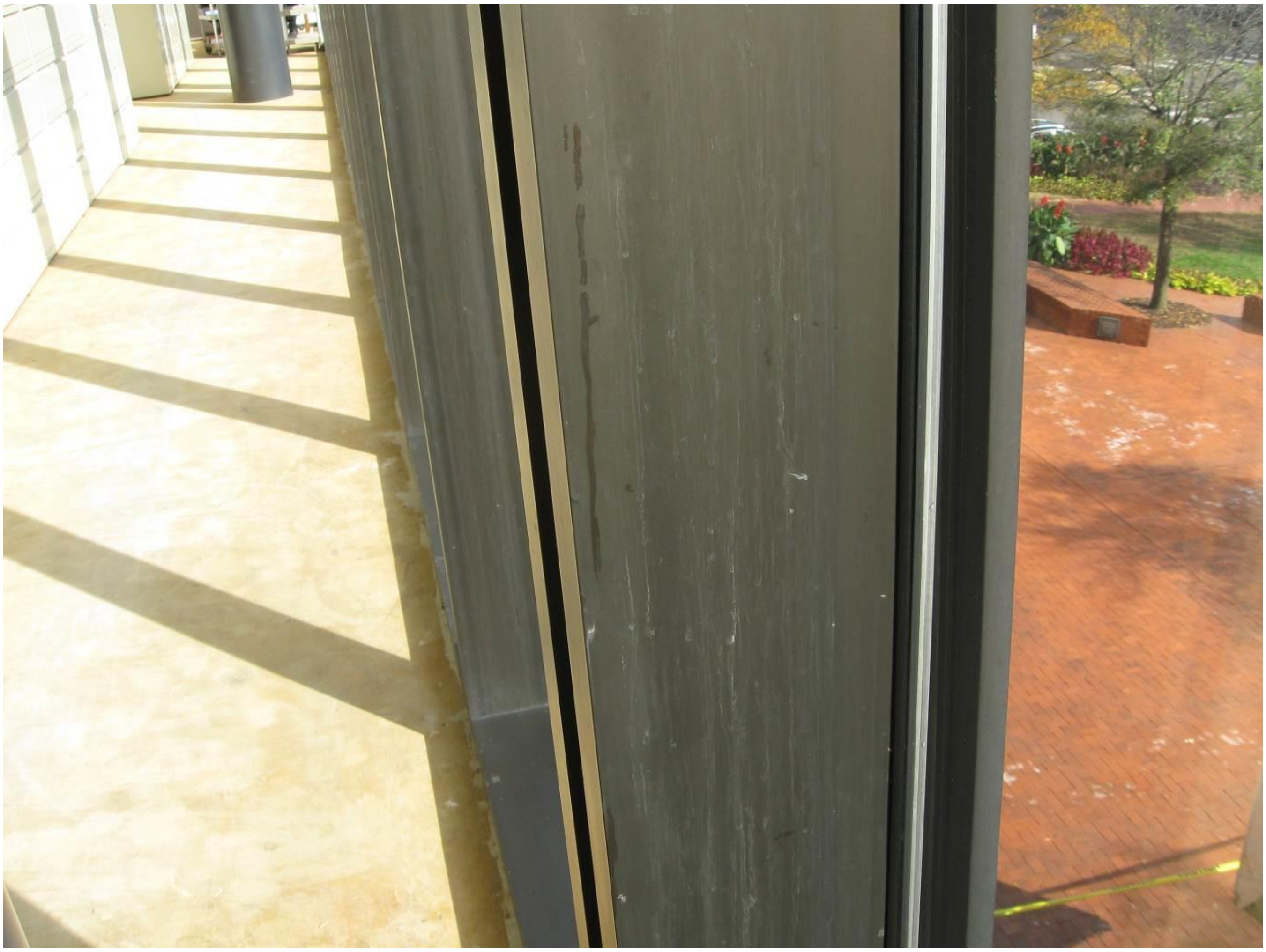

Figure 6*:* This interior picture shows that the existing window frames have water streaks and water stains.

Interior Water Damage

***Figure 7**:* This interior picture shows water stains and water spots on the floor.

Interior Window View at Sill

Figure 8 – This image shows the window sill at the floor slab as well as evidence of the structural member's rusting

Exterior Metal Coping

***Figure 9*:** The metal coping shown is typical for the perimeter of the building. The upper most band is the metal coping (vertical leg). The band below that coping is most likely a prefinished metal panel covering the structure, which may be part of the window system. Below that is a gap and then the window frame.

Exterior – Top of Metal Coping

Figure 10*:* The top of the coping is not as tight as it should be.

Exterior Metal Coping

Figure 11: This image shows the roof flashing and gravel.

Exterior Window Head and Joint

Figure 12: As shown in this photo, repeated attempts were made to caulk and patch the top-most window frame.

Existing Built-up Roof

Figure 13: The 40-year-old roof appears to be in fairly good condition despite its age.

Window Face Caps - Mullions

Figure 14: The face cap is pulled away from the window. The resulting gap exposes the interior to the elements, if the seals and flashing have failed underneath.

Exterior Window – Vertical Cap at Building Expansion Joint

Figure 15: The vertical face caps are dropping downward and it can be seen where repeated attempts at caulking may also be directing water into the interior space.

Summary and Recommendations

Correcting these poor conditions will require immediate attention in order to prevent any further deterioration of the existing building assemblies. We recommend:

- Full replacement of the existing curtain wall system to stop any future water/moisture infiltration and to improve the insulating properties of the window for significant energy savings.
- If full replacement is not feasible, we recommend replacing all the rubber seals/tapes and sealants and gasketing in the curtain wall window system. This would entail removing all the existing glazing and then re-installing the glazing as new construction with all new rubber seals/tapes and sealants and gasketing. Replacing the new rubber seals/tapes and sealants and gasketing should alleviate the water and moisture issues and stop any air infiltration. However, this will not alleviate the poor or cold conditions due to the low insulating qualities of using single-pane glass and no or minimal thermal break in the frames.
- We recommend water testing the roof and roof accessories in multiple areas. Fully drenching the roof in the surrounding areas of expected problem areas or leaks can possibly determine if the roof is the cause of the water infiltration. If the roof does not leak, we can possibly eliminate the roof as the cause.

Opinion of Probable Cost:

The approximate surface area of the existing curtain wall system is 36,000 SF over all three floors. Cost factors are approximate and are for an *order of magnitude* estimate.

- Demolition and full replacement ($100 to $140 per SF): $3.6 million to $5.04 million
- Removal and replacement of existing ($50 to $70 per SF): $1.8 million to $2.52 million
- Crane and lifts (one-year rental): $90,000 to $140,000

End of Report

ADA Survey for the John Marshall Courts Building

City of Richmond, Virginia

27 November 2015

HVC • CHENAULT

Architecture • Planning • Interior Design

HVC • CHENAULT

Architecture • Planning • Interior Design

27 November 2015

Mr. Robert Irby
Capital Projects Manager
City of Richmond, Department of Public Works
900 East Broad St.
Richmond, Virginia 23219

RE: ADA Survey for the
John Marshall Courts Building
Richmond, Virginia

Dear Mr. Irby:

HVC • CHENAULT is pleased to provide this ADA Survey for the John Marshall Courts Building in accordance with your request.

The Executive Summary of the report provides an overview of the existing building and changes required to comply with the current 2010 ADA requirements. Included in the study are field observations and a preliminary estimate of construction cost based on 2015 dollars.

We look appreciate the opportunity to provide assistance to City of Richmond in the review of the current building.

Respectfully,

HENING • VEST • COVEY • CHENAULT ARCHITECTURAL CORPORATION

Shane M. Rollison

Shane M. Rollison, AIA
President

smr

HENING • VEST • COVEY • CHENAULT ARCHITECTURAL CORPORATION
telephone 804-225-9900 • *fax* 804-225-7288 • *e-mail* hvc@hvcarchitects.com
1710 *east franklin street* • *suite* 100 • *richmond, virginia* 23223

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1. Executive Summary

General:

The scope of the ADA Survey was to review the existing conditions within the building for compliance with the ADA. Per page 1 of the 2010 Standards for Accessible Design issued by the Department of Justice, see appendix, the 2010 standards are for "newly designed and constructed or altered State and local government facilities....". Per the FAQ page from the ADA National Network, see appendix, "Public entities do not necessarily have to make each of their existing facilities accessible". Therefore, the resulting recommendations from this survey are for bringing the facilities up to current requirements, which would appear to be optional unless the building were to undergo alterations. At the time of alteration, non-compliant items must be addressed as applicable. Alterations of public toilets do not necessitate the renovation of staff toilets.

The John Marshall Courts building was designed and constructed in the mid to late 1970's. Therefore, the design of the facility preceded the development and initiation of the original American with Disabilities Act (ADA) by many years. Some ADA upgrades have been made to the building throughout the years in an attempt to comply with past ADA regulations.

Using the ADA survey checklists included in the appendix, HVCC identified thirteen major categories of items to be evaluated for compliance. Some items in the checklist were deemed not to be applicable to the building. An example would be food service or vending machines that are not provided in the building.

Based upon the field survey conducted by HVC • CHENAULT in September of 2015, overall much of the building appears to be in general compliance with the ADA and to be brought into compliance with the current ADA would require relatively limited corrective actions on each floor of the building with the exception of the toilet rooms. The toilets serving the Jury assembly rooms are non-compliant and would require extensive renovation to provide the required clearances. Similarly, the Public group toilets spaces have a multitude of issues with light switches, mounting heights of toilet accessories, heights of grab bars and clearances at pulls for doors exiting the spaces. We will address that more specifically under the detailed findings of the survey.

Although it can be assumed that the original design was compliant with the regulatory environment during the time of its initial design, the building has multiple shortcomings under current regulations, most notably regarding the public and staff toilets. Handicapped stalls have been provided with grab bars. Not all of the toilets are consistent in size and the variations are relatively small. If measured, the variances would be in violation of the standards but not so large as to create major space issues.

Some signage has been installed after the ADA was first enacted. That signage was probably compliant under previous versions of the ADA but has not kept up with newer requirements for mounting height, raised text and Braille requirements. This is common throughout the building.

The building hardware in the older sections of the building is another common item throughout the building. Conversion of door handles to lever style and replacement of closers is recommended.

The replacement of the fire alarm system may be necessary to provide audible alarms for the blind. The existing system may not be able to be upgraded due to capacity or age (discontinued products) and should be reviewed by a qualified fire alarm system specialist. If the City has someone who is under annual contract to maintain the system they should be able to provide a quick analysis of the existing system.

Part 2 of the survey identifies the various areas of concern relative to ADA compliance. Of fourteen areas checked, we believe that nine do not justify corrective action at this time. The remaining five are either optional or subject to renovation of the space. Some of the items can be addressed by use of City employees to make the adjustments.

Copies of the field notes are included in the Appendix.

Summary of Costs

The detailed cost estimates are included in part 3. The broad summary of the anticipated costs are:

1. Accessibility to Service Counters	$	0.00
2. Building Signage	$	21,000.00
3. Door Closer Opening Force / Door Handles	$	92,382.00
4. Public Toilets (Primarily Jury Assembly Rooms)	$	160,000.00
5. Staff Toilets	$	204,000.00
6. Hearing assistance	$	0.00
7. Judges Benches	$	0.00
8. Public data access work stations (computer stations)	$	0.00
9. Break Rooms	$	0.00
10. Corridors	$	0.00
11. Fire Alarm System	$	302,400.00
12. Elevators	$	0.00
13. Public Seating Areas	$	0.00
14. Drinking Fountains	$	0.00
15% General Conditions Costs	$	116,967.00
Total Estimated Cost (2015 Dollars) without escalation	$	896,749.00

In summary, if all items listed above are to be considered for corrective action, we are recommending a construction budget cost of Eight Hundred Ninety-Six Thousand Seven Hundred Forty-Nine Dollars plus escalation, contingency and soft costs for design and management of the projects. Some of the minor work can be performed with City personnel to contain the overall cost. The rest should be developed into a Capital Improvement Budget Item for approval by City Council.

2. Compliant and Non-Compliant Elements

The study identified fourteen major categories to check for compliance. Those categories of compliance are:

Category	Recommendation
1. Accessibility to Service Counters	No Changes
2. Building Signage	Replacement
3. Door Closer Opening Force / Door Handles	Replacement
4. Public Toilets	Renovation
5. Staff Toilets	Renovation
6. Hearing assistance	No Changes
7. Judges Benches	No Changes
8. Public data access work stations (computer stations)	No Changes
9. Break Rooms	No Changes
10. Corridors	No Changes
11. Fire Alarm System	Upgrade
12. Elevators	No Changes
13. Public Seating Areas	No Changes
14. Drinking Fountains	No Changes

Accessibility to Service Counters

Due to the size and scale of the building, and the number of occupants which it supports, accessible paths and access to goods and services are mostly in compliance. Some minor areas of non-compliance include public counters in office suite reception areas, and other public accessible work areas. Some of the counters have ADA required lower counters but those spaces have been usurped by the staff as additional countertop space for desktop items such as personal mementos, forms, interoffice mail trays, etc. Those areas merely need a change in the manner that the staff uses the space. This practice may stem from the infrequent nature of needing to serve wheel chair bound persons. The Lobby information desk is not compliant but, per the Sheriff's Office, is not in use. That station is actually not functionally usable for the staff and creates some security issues because it is too far from the magnetometers and x-ray equipment for the staff to use both areas. This station could be removed and the space reconfigured to allow more people to wait inside the building when queuing up to be processed through the security checkpoint. This is a functional deficiency and not an ADA related item. Since that station is not in use and recommended for removal, we have not considered it to be a cost related item for ADA compliance.

Building Signage

Building signage in the Public areas includes the Braille and pictographic requirements but not raised text. Much of the signage in the staff areas is not compliant. It does not have Braille, is mounted incorrectly as to height and location, has no raised text or does not contain pictograph symbols on toilets or stairs. The Public signage could simply be lowered to become more compliant but we recommend wholesale replacement throughout the building. The staff areas should be replaced with compliant materials, mounting locations corrected, raised text provided, Braille provided and mounting heights adjusted.

Door Closer Opening Force / Door Hardware

Of the doors with closers, which were randomly tested for opening force using a portable door pressure gauge manufactured by Gordon Glass, none complied with the 5 pounds of force opening requirement. HVCC tested doors in various applications on each floor and the consistency of high readings indicated to HVCC that the problem is likely occurring at all closer locations due to age and use.

This may be corrected with adjustments of the door closers but due to the age of the hardware, it might be that the units are worn out and need to be replaced. Door closers are not required for every location in the building so our estimate is based only on the doors we felt that are applicable. We did not include doors such as the elevator machine room where closers are required by Code but disabled persons would not be expected to be operating the doors.

However, we did observe instances where fire rated doors with closers were propped open. That is a staff training issue that is creating a life safety hazard if the doors cannot close in emergencies. This is not an accessibility issue and is therefore noted only for the Owner's information.

Nearly all doors had knobs instead of levers for operation. Doors in later renovations were provided with levers. These knobs should be replaced with lever handles due to the inability of persons with restricted hand control to twist the knobs. It may be necessary to change the whole lock or latch set for the hardware to be made compatible with mounting lever handles. We have assumed that the whole body will require replacement since the internal configuration of each unit would need to be known to determine if it could be converted from a knob to a lever handle. Some manufacturers are no longer available or conversion kits may not be available. We believe that wholesale replacement would be more uniform in style, function and more cost effective.

Public Toilets

The greatest area of non-compliance was found in the lack in accessible public group toilets and single user public toilets (primarily jury rooms). This is to be expected since the building was designed and constructed prior to the advent of the ADA. However, due to the heavy use of the facility by the public, the administrative assumption is that over time, building owners are expected to upgrade their facilities to maintain compliance with current requirements when possible. Toilets and restrooms have some of the most stringent requirements in the ADA. The lack of compliant elements is a considerable inconvenience to employees and visitors. We observed the following:

- At single user toilets the existing hardware is knob style instead of levers or pulls and therefore non-compliant with the ability of persons with limited hand control to operate the door hardware from either side.

- Single user toilets were typically less than 5 feet wide and therefore do not provide the specified turning space for a wheel chair bound person.
- Fixture clearances were non-compliant.
- Grab bars are not mounted at current height requirements.
- Light switches in group or single user toilets are mounted at incorrect height to comply with reach requirements.
- Group toilets do not have the required approach clearance at jambs when exiting the room.
- Various toilet accessories are mounted at incorrect height or do not have the required clearance for either front or side approaches. This is common with paper towel dispensers, hand sanitizers and similar items.
- The style of toilet paper dispenser does not provide specified pull resistance or continuous flow.
- Most faucet handles are not lever style and therefore are not usable by persons with hand control issues.
- Waste and hot water supply lines are not shielded to prevent injury to persons in wheelchairs, who may not feel the hot temperature against their legs and sustain burns. This is both an ADA deficiency and a liability concern.

To address these concerns requires the renovation of each space. Due to the high daily demand for most of these spaces, work would require phased construction and loss of use of each space for up to a month. For the Jury rooms, no jury proceedings could be scheduled for the associated courtroom while the renovations are in progress. Construction would need to be performed when court is not in session or the courtroom taken out of service. The noise level during construction would be disruptive to the use of adjacent courtrooms. For the Jury rooms, space would need to be taken from the Jury Room itself to expand the toilets.

Staff Toilets

Similar items of non-compliance were found in the staff toilets as to those found in the group public toilets. We observed the following common deficiencies in various locations:

- The existing hardware is knobs instead of levers and therefore non-compliant with the ability of persons with limited hand control to operate the door hardware from either side.
- Toilets were typically less than 5 feet wide and therefore do not provide the specified turning space for a wheel chair bound person.
- Fixture clearances were non-compliant.
- Grab bars are not mounted at current height requirements.
- Light switches are mounted at incorrect height to comply with reach requirements.
- Various toilet accessories are at incorrect height or do not have approach clearance.
- The style of toilet paper dispenser does not provide specified pull resistance or free flow.
- Most faucet handles are not lever style and therefore are not usable by persons with hand control issues.

- Waste and hot water supply lines are not shielded to prevent injury to persons in wheelchairs, who may not feel the possible hot temperature against their legs and sustain burns which can be a compliance matter as well as a potential liability issue.

To address these concerns require the renovation of each space. Work would require phased construction throughout the building and loss of use of each space for up to a month.

Hearing Assistance

The Sheriff's office confirmed that the courtrooms are equipped with hearing assistance equipment for the hearing impaired but they could not confirm if the equipment is still functional due to the infrequent usage of the equipment. For the purpose of the survey, we have considered the equipment to be functional but we recommend that a maintenance program be established to check the equipment on a routine schedule to verify that the equipment is indeed still functioning. Therefore, there is no estimated cost provided for this item.

Judges Benches

Currently there are no Judges assigned to the Courts Building that are disabled. If a substitute judge were to be disabled then special provisions would need to be made on a temporary basis for selected courtrooms. The judge's benches are currently set up with ramps in several courtrooms or portable ramps provided for access to the bench. Jury boxes have provisions for wheel chair spaces on the main floor level. We do not recommend any changes to the benches at this time.

Public Access Work Stations

Accessible work areas have been provided in the Clerk's offices on the lower level for public access to computers and microfilm readers. No changes are recommended for these areas.

Break Rooms

There are few of these spaces and they were largely provided with cabinets that are compliant as they were created during previous alterations performed after the implementation of the ADA.

Corridors

Public corridors in the building are typically large open areas serving as both corridor and waiting area. Projections into walking areas are very limited. By contrast, corridors in the staff areas are typically narrower and are often compromised by furniture in the corridors. On the upper perimeter corridors, there are some pinch points between file cabinets and building columns that require a slight change in travel as you walk through the spaces.

Fire Alarm System

Fire alarm strobes were observed in various locations but audible alarm devices were not observed. To add audible devices may require the total replacement of the existing system since the existing system might not support the newer devices and additional devices required to provide adequate audible levels. Therefore, a cost for a new system has been provided for budgetary purposes but the need for wholesale replacement should be confirmed by an electrical engineer or a firm that provides such systems.

Elevators

Public elevators are large and have large lobby spaces with them. Cars are provided with floor bells but not voice announcements for each floor. Elevators for movement of prisoners were not reviewed because they are intended for use by able bodied staff that would be assisting any disabled prisoners.

It would require input from the elevator manufacturer as to what modifications can be provided without totally replacing each elevator car and operating controls. There is no recommendation for changes to the elevators, public or secure, at this time.

Public Seating Areas

Public seating areas are provided outside of the courtrooms and have ample space to accommodate wheelchair bound persons. The Courtrooms also have designated spaces in the gallery for spectators or witnesses. The Jury rooms are large enough to accommodate jurors in wheelchairs around the jury conference table. There is no recommendation for changes to public seating areas at this time.

Drinking Fountains

Drinking fountains have been provided at the Public Toilets on each floor. As installed, the drinking fountains do not provide the knee clearances or other requirements for drinking fountains. These units are semi-recessed and located in corridors where conversion to projected units with knee space is not feasible. If the toilets are renovated in the future then consideration of changes to the drinking fountains should be included at that time. The same situation occurs in the jury rooms but supplemental bottled water dispensers have been provided. No changes are required at this time.

Hening-Vest-Covey-Chenault Architectural Corporation
Architecture • Planning • Interior Design
1710 East Franklin Street, Richmond, Virginia 23223

11/27/15

ADA SURVEY COST ANALYSIS
John Marshall Courts Building
Richmond, Virginia

This estimate does not include extended leases, IT wiring, moving expenses or escalation through the mid-point of construction.

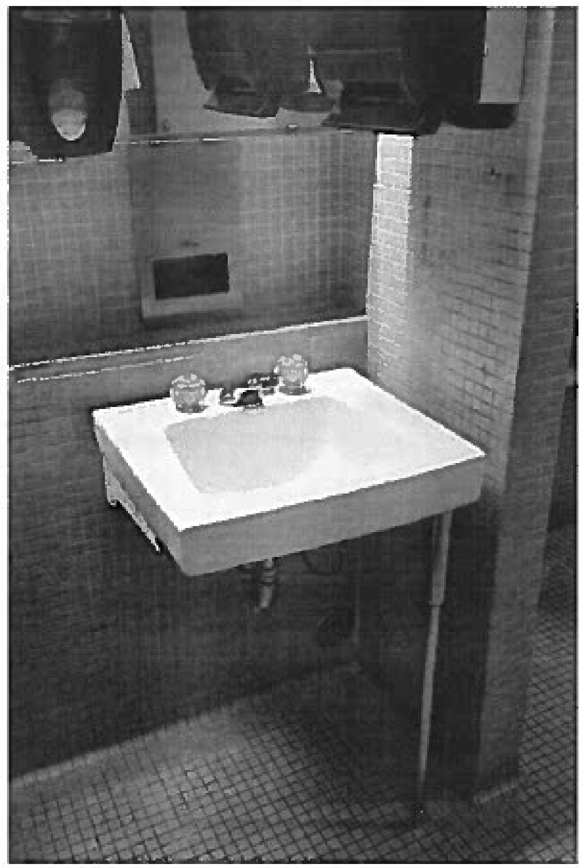
	DESCRIPTION	QUANTITY	UNITS	UNIT COST	EST. COST (2015 $'s)
1.	**Accessibility to Service Counters**				
	Main Lobby	1	LS	0.00	0
	DA reception	1	LS	0.00	0
	Clerk's Office-1st Floor	1	LS	0.00	0
	Clerk's Office-Lower Level	1	LS	0.00	0
	Subtotal				**0**
2.	**Building Signage**				
	Remove existing signs	200	ea.	15.00	3,000
	Repair walls	200	ea.	15.00	3,000
	New signs	200	ea.	75.00	15,000
	Subtotal				**21,000**
3.	**Door Closers & Locksets**				
	Remove Existing Closers	25	ea.	25.00	625
	New Closers (installed)	25	ea.	225.00	5,625
	Remove Building Hardware	244	ea.	65.00	15,860
	New Building Hardware	244	ea.	288.00	70,272
	Subtotal				**92,382**
4.	**Public Toilets**				
	Demolition-Group	4	ea.	2,000.00	8,000
	Renovation-Group	4	ea.	10,000.00	40,000
	Demolition-Jury	16	ea.	2,000.00	32,000
	Renovation-Jury	16	ea.	5,000.00	80,000
	Subtotal				**160,000**
5.	**Staff (Private) Toilets**				
	Demolition	34	ea.	2,500.00	85,000
	Renovation	34	ea.	3,500.00	119,000
	Subtotal				**204,000**
6.	**Hearing Assistance**	1	LS	0.00	**0**
7.	**Judges Benches**	1	LS	0.00	**0**
8.	**Public Data Access Stations**	1	LS	0.00	**0**
9.	**Break Rooms**	1	LS	0.00	**0**
10	**Corridors**	1	LS	0.00	**0**
11.	**Fire Alarm System**	1	LS	302,400.00	**302,400**
12.	**Elevators**	1	LS	0.00	**0**
13.	**Public Seating Areas**	1	LS	0.00	**0**
	Subtotal				**779,782**
14.	General Conditions Costs	113,382	%	0.15	**116,967**

15.	**TOTAL ESTIMATED CONSTRUCTION COST**					**896,749**
16.	**Other Related Expenses**					
	Architect / Eng. Des. Serv.		1	LS	134,512	134,512
	Printing Permit Sets		1	LS	2,000	2,000
17.	**TOTAL RELATED EXPENSES**					**136,512**
18.	**SUBTOTAL**					**1,033,262**
19.	**PROJECT CONTINGENCY**	1,033,262		%	20%	**206,652**
20.	**ESTIMATED PROBABLE TOTAL PROJECT COST**					**$1,239,914**

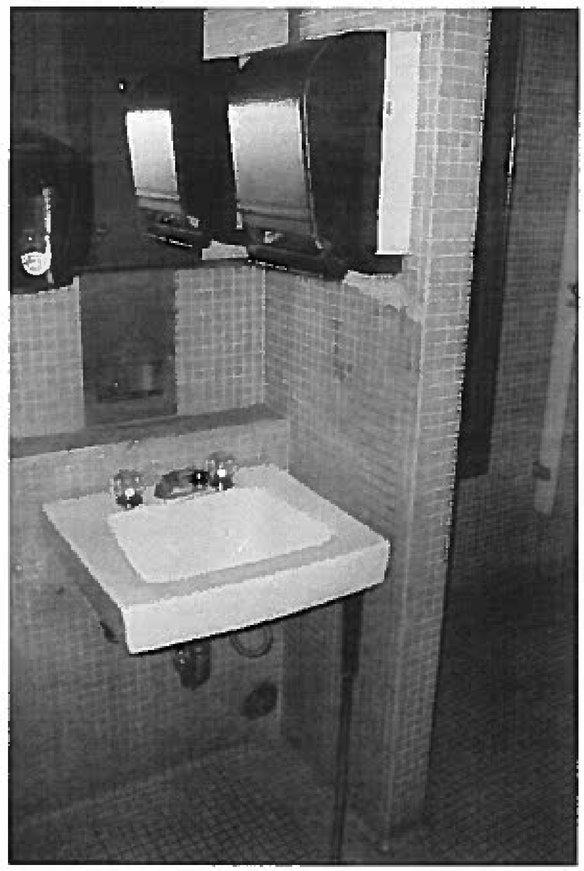
Note: Contingency funds are intended to cover unanticipated costs. It also provides flexibility for changes in scope required to fulfill the final program for the building spaces.

Public Toilet

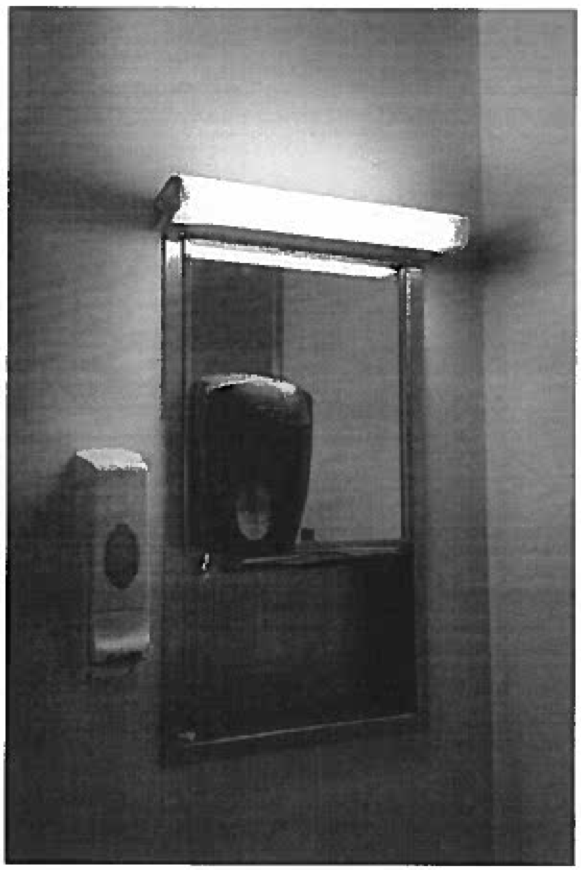
Stall too narrow, lack of clearance, mounting height for toilet paper dispenser, incorrect grab bars



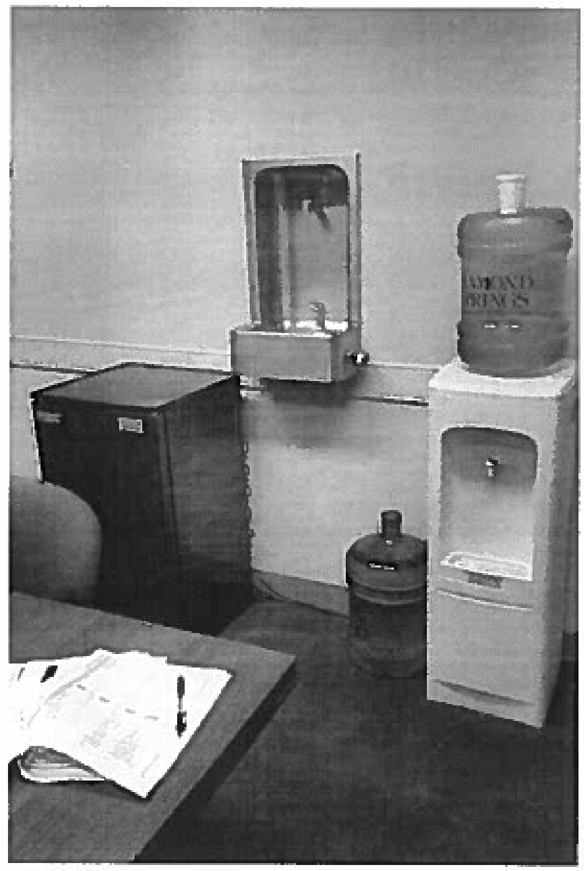
Clearance for sink approach, paper towel dispenser location and height, access to soap dispenser, uninsulated piping, faucet handles and sink support obstruction



Jury Room and Toilet

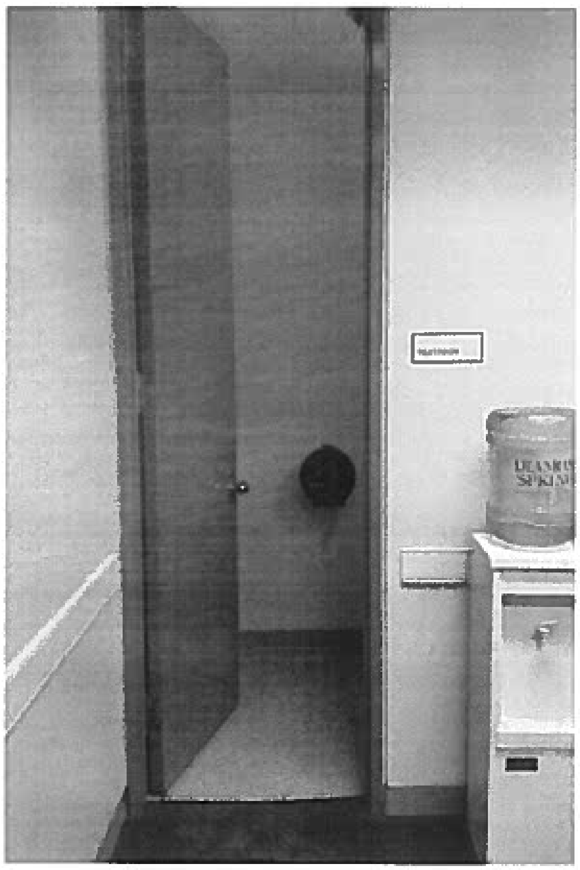


Mirror obstruction & dispenser height

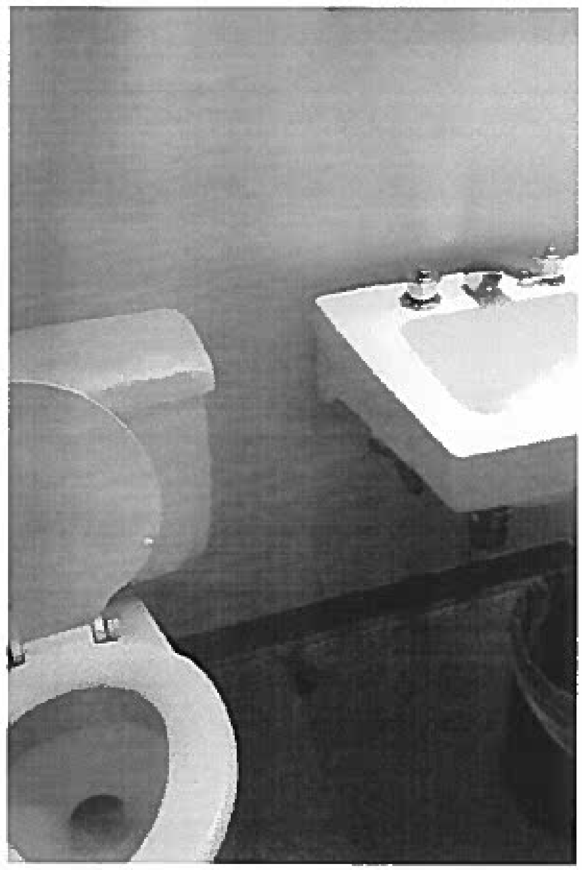


Inaccessible drinking fountain
(Lack of clearances or approach)

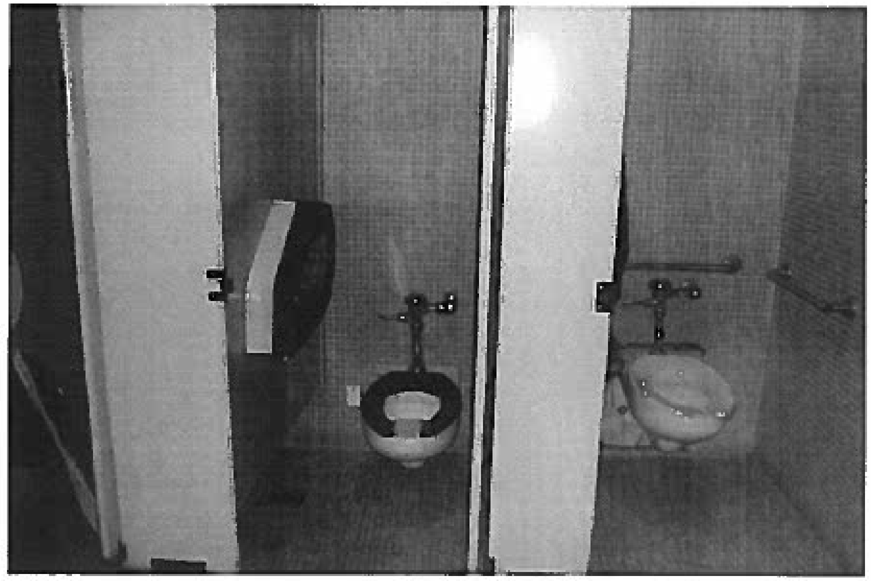
Jury Toilets



Door knob, signage incorrect, door clearance



Faucet handles incorrect, sink clearance violation, uninsulated Pipes, no grab bars.



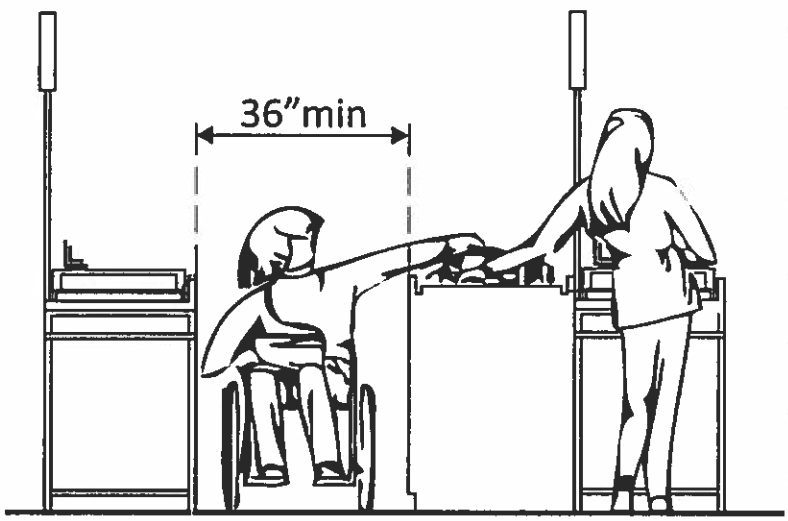
Public Toilet

Deficiencies include: stall door width, grab bars, toilet paper dispenser location, stall too narrow, clearance for flush valve and inability to transfer from wheelchair.

ADA Checklist for Existing Facilities

Priority 2 – Access to Goods & Services

Based on the 2010 ADA Standards for Accessible Design



Project ADA Survey

Building John Marshall Courts

Location 400 N. 9th St., Richmond, Va.

Typical Floor

Date September 2, 2015

Surveyors Shane Rollison, AIA

David Butler, AIA

Contact Information HVC CHENAULT Architectural Corp.

1710 East Franklin St., Suite 100, Richmond, Va. 23223

The layout of the building should allow people with disabilities to obtain goods and services and to participate in activities without assistance.

Institute for Human Centered Design
www.HumanCenteredDesign.org
2014

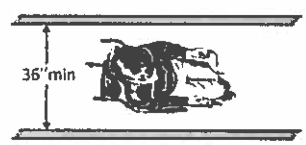
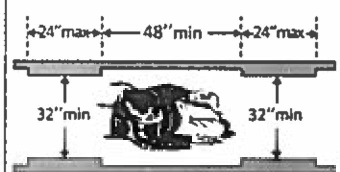
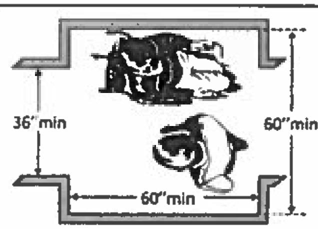
ADA National Network
Questions on the ADA 800-949-4232 voice/tty
www.ADAchecklist.org

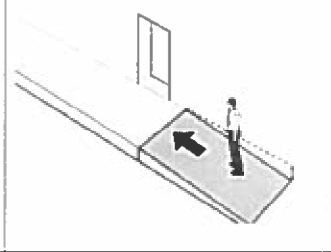
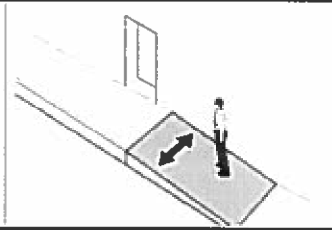
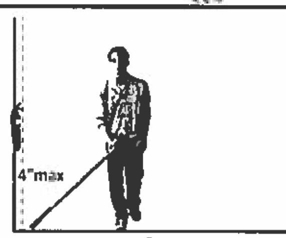
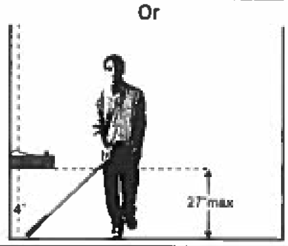
This checklist was produced by the New England ADA Center, a project of the Institute for Human Centered Design and a member of the ADA National Network. This checklist was developed under a grant from the Department of Education, NIDRR grant number H133A060092-09A. However the contents do not necessarily represent the policy of the Department of Education, and you should not assume endorsement by the Federal Government.

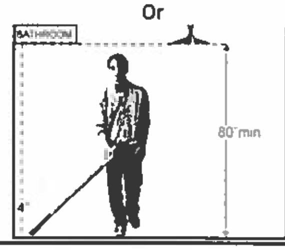
Questions or comments on the checklist contact the New England ADA Center at 617-695-0085 voice/tty or ADAinfo@NewEnglandADA.org

For the full set of checklists, including the checklists for recreation facilities visit www.ADAchecklist.org.

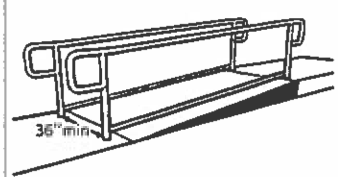
Priority 2 – Access to Goods & Services				Comments	Possible Solutions
2.1	Does the accessible entrance provide direct access to the main floor, lobby and elevator? [See 2010 ADA Standards for Accessible Design – 206.4]	☒Yes ☐No		Photo #:	• Create accessible route • •
Interior Accessible Route					

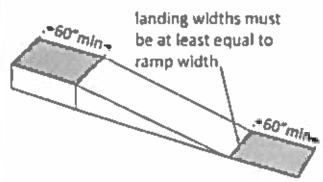
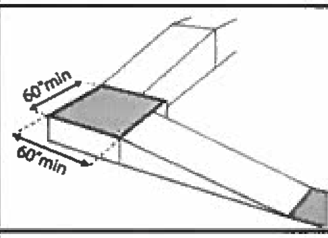
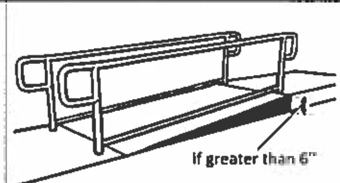
2.2	Are all public spaces on at least one accessible route? [206.2.4]	☒ Yes ☐ No		Photo #:	• Create accessible route • •
2.3	Is the route stable, firm and slip-resistant? [40.2, 302.1]	☒ Yes ☐ No		Photo #:	• Repair uneven surfaces • •
2.4	Is the route at least 36 inches wide? [403.5.1] Note: The accessible route can narrow to 32 inches min. for a max. of 24 inches. These narrower portions of the route must be at least 48 inches from each other.	☒ Yes ☐ No Measurement:	 	Photo #:	• Widen route • •
2.5	If the route is greater than 200 feet in length and less than 60 inches wide, is there a passing space no less than 60 x 60 inches? [403.5.3]	☐ Yes ☐ No Measurement:		Photo #:	• Widen route for passing space • •

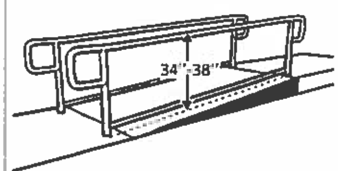
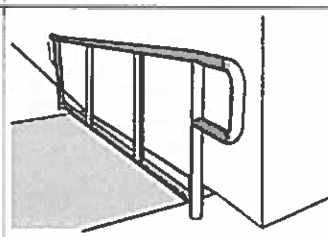
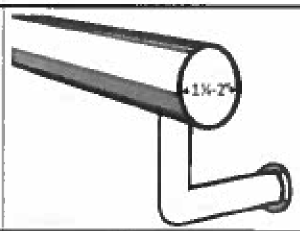
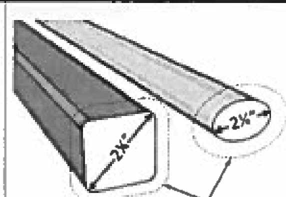
2.6	Is the running slope no steeper than 1:20, i.e. for every inch of height change there are at least 20 inches of route run? [403.3] Note: If the running slope is steeper than 1:20, treat as a ramp and add features such as edge protection and handrails.	☐Yes ☐No Measurement:		Not applicable Photo #:	• Regrade • •
2.7	Is the cross slope no steeper than 1:48? [403.3]	☐Yes ☐No Measurement:		Not applicable Photo #:	• Regrade • •
2.8	Do all objects on circulation paths through public areas, e.g. fire extinguishers, drinking fountains, signs, etc., protrude no more than 4 inches into the path? Or If an object protrudes more than 4 inches, is the bottom leading edge at 27 inches or lower above the floor? [307.2] Or	☐Yes ☐No Measurement: ☐Yes ☐No Measurement:	 Or 	Not applicable	• Remove object • Add tactile warning such as permanent planter or partial walls •

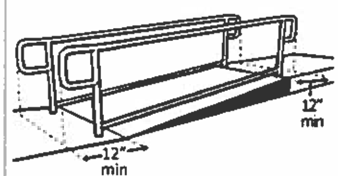
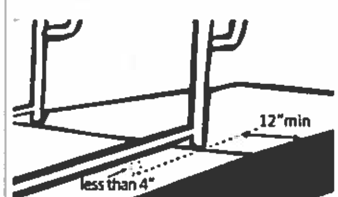
	Is the bottom leading edge at 80 inches or higher above the floor? [307.4]	☐Yes ☐No Measurement:	Or  	Photo #:	
2.9	Are there elevators or platform lifts to all public stories? Note: Vertical access is not required in new construction or alterations if a facility is less than three stories or has less than 3,000 square feet per story, unless the facility is a shopping center, shopping mall, professional office of a health care provider, transportation terminal, state facility or local government facility	☒Yes ☐No		Photo #:	• Install if necessary • Offer goods and services on an accessible story •

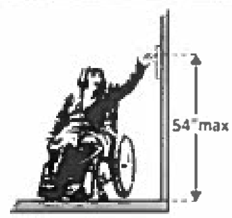
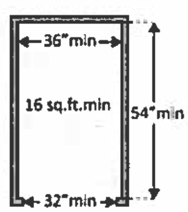
Ramps

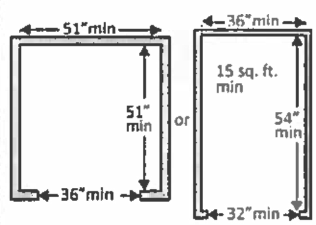
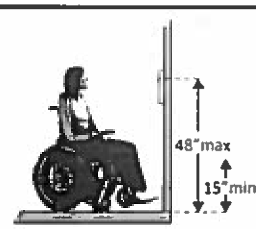
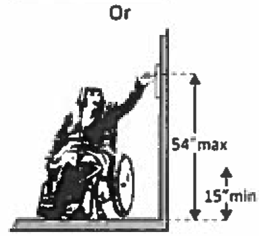
2.10 If there is a ramp, is it at least 36 inches wide? [405.5] Note: If there are handrails, measure between the handrails.	☐Yes ☐No Measurement:		Photo #:	• Alter ramp • •
2.11 Is the surface stable, firm and slip resistant? [405.4]	☐Yes ☐No		Photo #:	• Resurface ramp • •
2.12 For each section of the ramp, is the running slope no greater than 1:12, i.e. for every inch of height change there are at least 12 inches of ramp run? [405.2] Note: Rises no greater than 3 inches with a slope no steeper than 1:8 and rises no greater than 6 inches with a slope no steeper than 1:10 are permitted when due to space limitations.	☐Yes ☐No Measurement:		Photo #:	• Lengthen ramp to decrease slope • Relocate ramp •

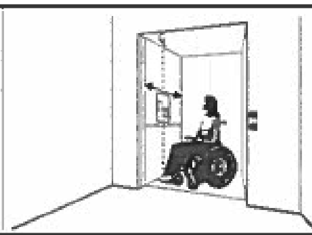
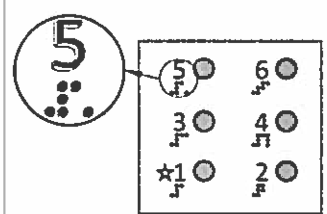
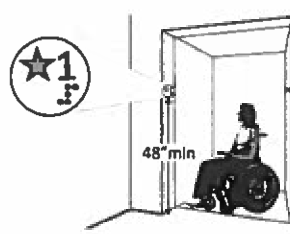
2.13 Is there a level landing that is at least 60 inches long and at least as wide as the ramp: At the top of the ramp? At the bottom of the ramp? [405.7.2, 405.7.3]	☐Yes ☐No Measurement: ☐Yes ☐No Measurement:		Photo #:	• Alter ramp • Relocate ramp •
2.14 Is there a level landing where the ramp changes direction that is at least 60 x 60 inches? [405.7.4]	☐Yes ☐No Measurement:		Photo #:	• Increase landing size • •
2.15 If the ramp has a rise higher than 6 inches are there handrails on both sides? [405.8]	☐Yes ☐No Measurement:		Photo #:	• Add handrails • •

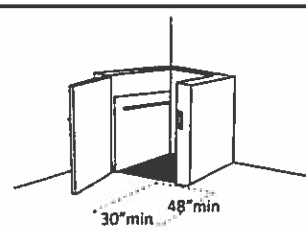
2.16	Is the top of the handrail gripping surface no less than 34 inches and no greater than 38 inches above the ramp surface? [505.4]	☐Yes ☐No Measurement:		Photo #:	• Adjust handrail height • •
2.17	Is the handrail gripping surface continuous and not obstructed along the top or sides? [505.3] If there are obstructions, is the bottom of the gripping surface obstructed no more than 20%? [505.6]	☐Yes ☐No ☐Yes ☐No Measurement:		Photo #:	• Reconfigure or replace handrails • •
2.18	If the handrail gripping surface is circular, is it no less than 1 ¼ inches and no greater than 2 inches in diameter? [505.7.1]	☐Yes ☐No Measurement:		Photo #:	• Replace handrails • •
2.19	If the handrail gripping surface is non-circular: Is the perimeter no less than 4 inches and no greater than 6¼ inches?	☐Yes ☐No Measurement:			• Replace handrails • •

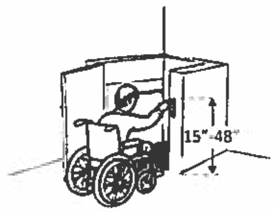
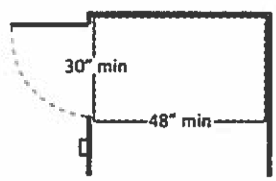
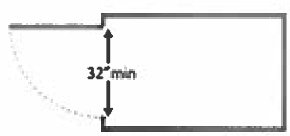
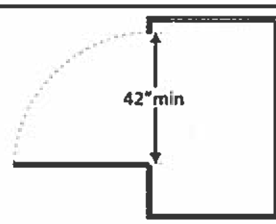
	Is the cross section no greater than 2¼ inches? [505.7.2]	☐Yes ☐No Measurement:		Photo #:	
2.20	Does the handrail: Extend at least 12 inches horizontally beyond the top and bottom of the ramp? Return to a wall, guard, or landing surface? [505.10.1] Note: If a 12" extension would be hazardous (in circulation path), it is not required.	☐Yes ☐No Measurement: ☐Yes ☐No		Photo #:	• Alter handrails • •
2.21	To prevent wheelchair casters and crutch tips from falling off: Does the surface of the ramp extend at least 12 inches beyond the inside face of the handrail? Or Is there a curb or barrier that prevents the passage of a 4-inch diameter sphere? [405.9.1, 405.9.2]	☐Yes ☐No Measurement: ☐Yes ☐No Measurement:		Photo #:	• Add curb • Add barrier • Extend ramp width • •

Elevators – Full Size & LULA (limited use, limited application) LULA elevators are often used in alterations.					
2.22	If there is a full size or LULA elevator, are the call buttons no higher than 54 inches above the floor? [407.2.1.1]	☒ Yes ☐ No Measurement:		Photo #:	• Change call button height • •
2.23	If there is a full size or LULA elevator, does the sliding door reopen automatically when obstructed by an object or person?* [407.3.3]	☒ Yes ☐ No		Photo #:	* If constructed before 3/15/2012 and manually operated, the door is not required to reopen automatically • Install opener •
2.24	If there is a LULA elevator with a swinging door: Is the door power- operated? Does the door remain open for at least 20 seconds when activated? [403.3.2]	 ☐ Yes ☐ No ☐ Yes ☐ No Time:		Photo #:	• Add power operated door • Adjust opening time •
2.25	If there is a full size elevator: Is the interior at least 54 inches deep by at least 36 inches wide with at least 16 sq. ft. of clear floor area? Is the door opening width at	 ☒ Yes ☐ No Measurement: ☒ Yes ☐ No			• Replace elevator • •

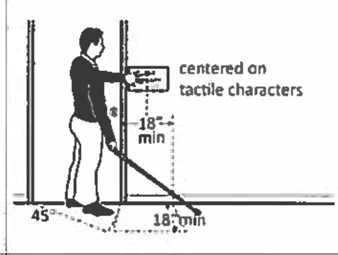
	least 32 inches? [407.4.1 Exception]	Measurement:		Photo #:	
2.26	If there is a LULA elevator, is the interior: At least 51 inches deep by 51 inches wide with a door opening width of at least 36 inches? Or At least 54 inches deep by at least 36 inches wide with at least 15 sq. ft. of clear floor area and a door opening width of at least 32 inches? [408.4.1 Exceptions 1 and 2]	☐ Yes ☐ No Measurement: ☐ Yes ☐ No Measurement:		Photo #:	• Replace elevator • •
2.27	If there is a full size or LULA elevator, are the in-car controls: No less than 15 inches and no greater 48 inches above the floor? Or Up to 54 inches above the floor for a parallel approach? [408.4.6, 407.4.6.1]	☒ Yes ☐ No Measurement: ☐ Yes ☐ No Measurement:	 Or 	Photo #:	• Change control height • •

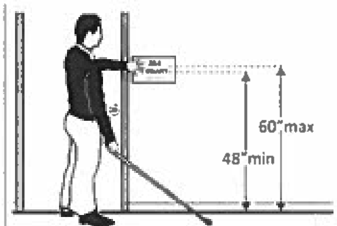
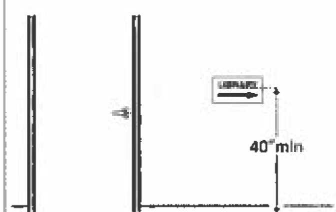
2.28	If there is a LULA elevator, are the in-car controls centered on a side wall? [408.4.6]	☐ Yes ☐ No Measurement:		Photo #:	• Reconfigure controls • •
2.29	If there is a full size or LULA elevator: Are the car control buttons designated with raised characters? Are the car control buttons designated with Braille? [407.4.7.1, 703.2]	 ☐ Yes ☒ No ☐ Yes ☒ No		Photo #:	• Add raised characters • Add Braille •
2.30	If there is a full size or LULA elevator, are there audible signals which sound as the car passes or is about to stop at a floor? [407.4.8]	☒ Yes ☐ No		Photo #:	• Install audible signals • •
2.31	If there is a full size or LULA elevator: Is there a sign on both door jambs at every floor identifying the floor? Is there a tactile star on both jambs at the main entry level? Do text characters contrast	 ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No			• Install signs • Change sign height • •

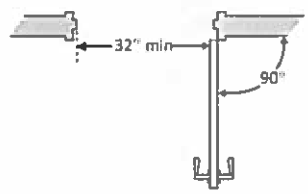
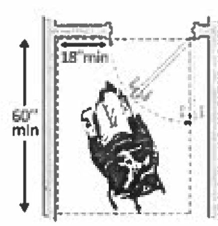
	with their backgrounds? Are text characters raised? Is there Braille? Is the sign mounted between 48 inches to the baseline of the lowest character and 60 inches to the baseline of the highest character above the floor?* [407.2.3, 408.2.3]	Yes No Yes No Yes No Measurement:		Photo #:	* If constructed before 3/15/2012 and mounted no higher than 60 inches to the centerline of the sign, relocation is not required
Platform Lifts					
2.32	If a lift is provided, can it be used without assistance from others? [410.1]	Yes No		Not applicable Photo #:	• Reconfigure so independently operable • •
2.33	Is there a clear floor space at least 30 inches wide by at least 48 inches long for a person using a wheelchair to approach and reach the controls to use the lift? [410.5]	Yes No Measurement:		Not applicable Photo #:	• Remove obstructions • •

2.34	Are the lift controls no less than 15 inches and no greater than 48 inches above the floor? [410.5]	☐ Yes ☐ No Measurement:		Not applicable Photo #:	• Change control height • •
2.35	Is there a clear floor space at least 30 inches wide by at least 48 inches long inside the lift? [410.3]	☐ Yes ☐ No Measurement:		Not applicable Photo #:	• Replace lift • •
2.36	If there is an end door, is the clear opening width at least 32 inches? [410.6]	☐ Yes ☐ No Measurement:		Not applicable Photo #:	• Alter door width • •
2.37	If there is a side door, is the clear opening width at least 42 inches? [410.6]	☐ Yes ☐ No Measurement:		Not applicable Photo #:	• Alter door width • •

Signs "Tactile characters" are read using touch, i.e. raised characters and Braille.

2.38	If there are signs designating permanent rooms and spaces not likely to change over time, e.g. room numbers and letters, room names, and exit signs: [216.2]				• Install tactile sign • Relocate sign •
	Do text characters contrast with their backgrounds? [703.5]	☒Yes ☐No			
	Are text characters raised? [703.2]	☐Yes ☒No			
	Is there Braille? [703.3]	☐Yes ☒No			
	Is the sign mounted: On the wall on the latch side of the door? [703.4.2]	☒Yes ☐No			
	Note: Signs are permitted on the push side of doors with closers and without hold-open devices.				
	With clear floor space beyond the arc of the door swing between the closed position and 45-degree open position, at least 18 x 18 inches centered on the tactile characters?* [703.4.2]	☒Yes ☐No Measurement:			*If constructed before 3/15/2012 and a person may approach within 3 inches of the sign without encountering protruding objects or standing within the door swing, relocation not required

	So the baseline of the lowest character is at least 48 inches above the floor and the baseline of the highest character is no more than 60 inches above the floor? * [703.4.1] Note: If the sign is at double doors with one active leaf, the sign should be on the inactive leaf; if both leaves are active, the sign should be on the wall to the right of the right leaf.	☐ Yes ☒ No Measurement: 58 1/2 inches to bottom edge		Photo #:	*If constructed before 3/15/2012 and mounted no higher than 60 inches to the centerline of the sign, relocation not required
2.39	If there are signs that provide direction to or information about interior spaces: Do text characters contrast with their backgrounds? [703.5.1] Is the sign mounted so that characters are at least 40 inches above the floor? [703.5.6] Note: Raised characters and Braille are not required.	☒ Yes ☐ No ☒ Yes ☐ No Measurement:		Photo #:	• Install signs with contrasting characters • Change sign height •

Interior Doors – to classrooms, medical exam rooms, conference rooms, etc.					
2.40	Is the door opening width at least 32 inches clear, between the face of the door and the stop, when the door is open 90 degrees? [404.2.3]	☒ Yes ☐ No Measurement:		Photo #:	• Install offset hinges • Alter the doorway •
2.41	If there is a front approach to the pull side of the door, is there at least 18 inches of maneuvering clearance beyond the latch side plus at least 60 inches clear depth? Note: See 2010 Standards 404.2.4 for maneuvering clearance requirements on the push side of the door and side approaches to the pull side of the door. On both sides of the door, is the floor surface of the maneuvering clearance level (no steeper than 1:48)? [404.2.4]	☒ Yes ☐ No Measurement: ☒ Yes ☐ No Measurement:		Photo #:	• Remove obstructions • Reconfigure walls • Add automatic door opener

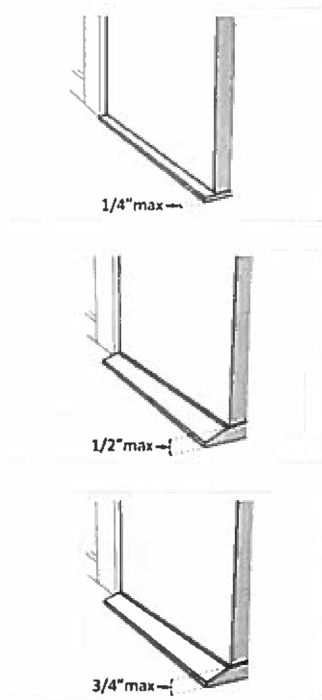
2.42	If the threshold is vertical is it no more than ¼ inch high? Or No more than ½ inch high with the top ¼ inch beveled no steeper than 1:2, if the threshold was installed on or after the 1991 ADA Standards went into effect (1/26/93)? Or No more than ¾ inch high with the top ½ inch beveled no steeper than 1:2, if the threshold was installed before the 1991 ADA Standards went into effect (1/26/93)? [404.2.5, 303.2] Note: The first ¼ inch of the ½ or ¾ inch threshold may be vertical; the rest must be beveled.	☒ Yes ☐ No Measurement: ☐ Yes ☐ No Measurement: ☐ Yes ☐ No Measurement:		Photo #:	• Remove or replace threshold • •
2.43	Is the door equipped with hardware that is operable with one hand and does not require tight grasping, pinching or twisting of the wrist? Door handle? Lock (if provided)? [404.2.7]	☐ Yes ☒ No ☐ Yes ☒ No ☐ Yes ☐ No		Door knobs are prevalent in the building.	• Replace inaccessible knob with lever, loop or push hardware • Add automatic door opener •

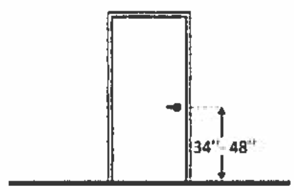
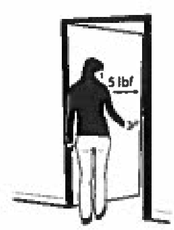
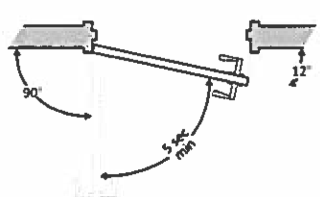
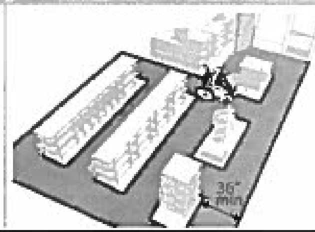
			Photo #:	
2.44 Are the operable parts of the hardware no less than 34 inches and no greater than 48 inches above the floor? [404.2.7]	☒ Yes ☐ No Measurement:		Photo #:	• Change hardware height • •
2.45 Can the door be opened easily (5 pounds maximum force)? [404.2.9] Note: You can use a pressure gauge or fish scale to measure force. If you do not have one you will need to judge whether the door is easy to open.	☐ Yes ☒ No Measurement:		Most doors measured between 10 to 22 pouinds of opening force. Photo #:	• Adjust or replace closers • Install lighter doors • Install power-assisted or automatic door openers
2.46 If the door has a closer, does it take at least 5 seconds to close from an open position of 90 degrees to a position of 12 degrees from the latch? [404.2.8.1]	☐ Yes ☒ No Measurement:		Most doors closed faster than 5 seconds.	• Adjust closer • •

				Photo #:	
Rooms and Spaces – stores, supermarkets, libraries, etc.					
2.47	Are aisles and pathways to goods and services, and to one of each type of sales and service counters, at least 36 inches wide? [403.5.1]	☐ Yes ☐ No Measurement:		Not applicable Photo #:	• Rearrange goods, equipment and furniture • •
2.48	Are floor surfaces stable, firm and slip resistant? [302.1]	☒ Yes ☐ No		Photo #:	• Change floor surface • •
2.49	If there is carpet: Is it no higher than ½ inch? Is it securely attached along the edges? [302.2]	☒ Yes ☐ No Measurement: ☒ Yes ☐ No		Photo #:	• Replace carpet • •
Controls – light switches, security and intercom systems, emergency/alarm boxes, etc.					

<table>
<tr>
<td>2.50</td>
<td>Is there a clear floor space at least 30 inches wide by at least 48 inches long for a forward or parallel approach?
[305.3]

Are the operable parts no higher than 48 inches above the floor?*
[309.3, 308]</td>
<td>☐Yes ☐No
Measurement:

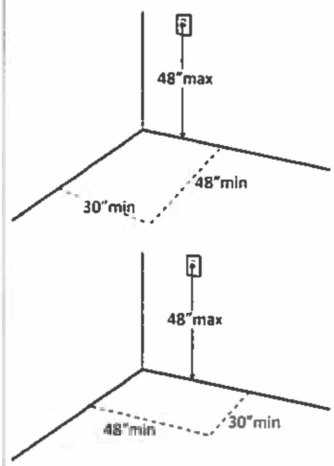
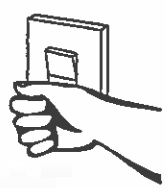
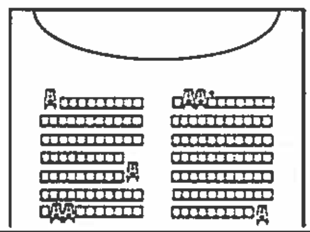
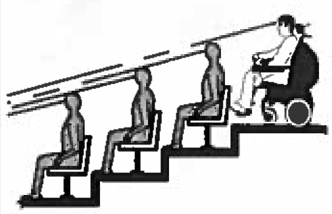
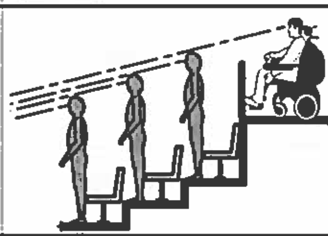
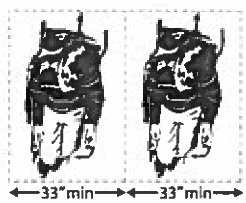
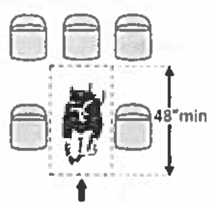
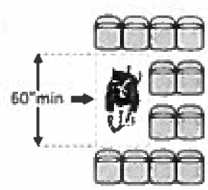
☐Yes ☒No
Measurement:
54 inches</td>
<td>
</td>
<td>There is not always proper clear floor space to light switches.

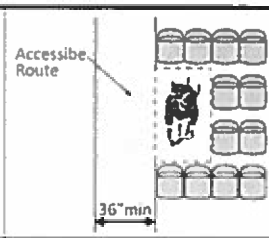
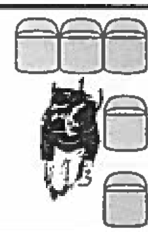
Photo #:</td>
<td>• Change height of control
•
•

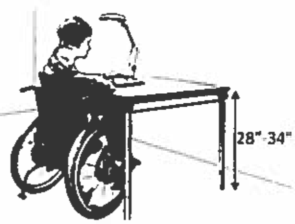
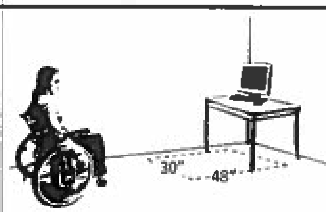
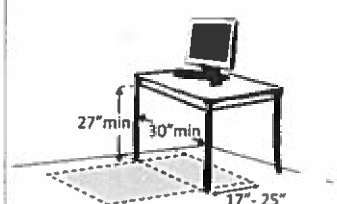
*If constructed before 3/15/2012 and a parallel approach is provided, controls can be 54 inches above the floor</td>
</tr>
<tr>
<td>2.51</td>
<td>Can the control be operated with one hand and without tight grasping, pinching, or twisting of the wrist?
[309.4]</td>
<td>☒Yes ☐No</td>
<td></td>
<td>Photo #:</td>
<td>• Replace control
•
•</td>
</tr>
<tr>
<td colspan="6">Seating: Assembly Areas – theaters, auditoriums, stadiums, theater style classrooms, etc.</td>
</tr>
<tr>
<td>2.52</td>
<td>Are an adequate number of wheelchair spaces provided?
[221.2.1]</td>
<td>☒Yes ☐No
Total #:

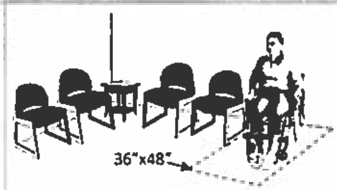
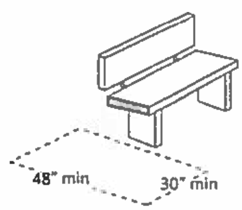
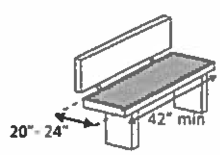
Wheelchair #:</td>
<td><table><tr><th># of Seats</th><th>Wheelchair Spaces</th></tr><tr><td>4 - 25</td><td>1</td></tr><tr><td>26 - 50</td><td>2</td></tr><tr><td>51 - 150</td><td>4</td></tr></table></td>
<td>Applies to Criminal and Civil Courtrooms.</td>
<td>• Reconfigure to add wheelchair spaces
•
•</td>
</tr>
</table>

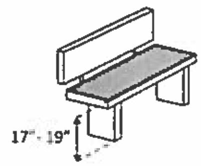
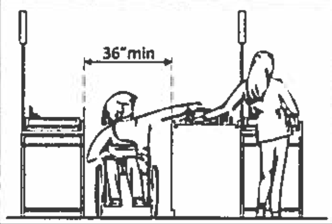
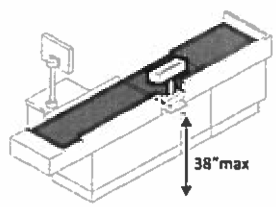
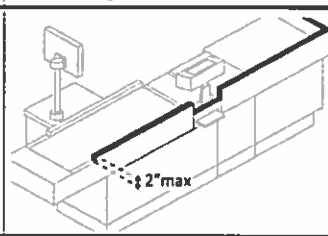
			151 - 300	5 300+ see 2010 Standards 221.2.1.	Photo #:	
2.53	Are wheelchair spaces dispersed to allow location choices and viewing angles equivalent to other seating, including specialty seating areas that provide distinct services and amenities? [221.2.3]	☐ Yes ☐ No		Verify Photo #:	• Reconfigure to disperse wheelchair spaces • •
2.54	Where people are expected to remain seated, do people in wheelchair spaces have a clear line of sight over and between the heads of others in front of them? [802.2.1.1, 802.1.1.2]	☒ Yes ☐ No		Photo #:	• Alter for line of sight • •
2.55	Where people are expected to stand, do people in wheelchair spaces have a clear line of sight over and between the heads of others in front of them? [802.2.2.1, 802.1.2.2]	☐ Yes ☐ No		Not applicable Photo #:	• Alter for line of sight • •

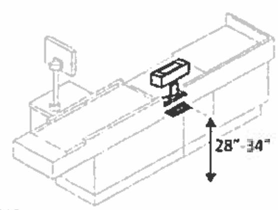
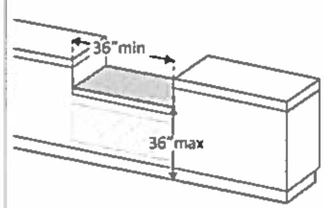
2.56	If there is a single wheelchair space, is it at least 36 inches wide? [802.1.2]	☐Yes ☐No Measurement:		Verify Photo #:	• Alter space • •
2.57	If there are two adjacent wheelchair spaces, are they each at least 33 inches wide? [802.1.2]	☐Yes ☐No Measurement:		Photo #:	• Alter spaces • •
2.58	If the wheelchair space can be entered from the front or rear, is it at least 48 inches deep? [802.1.3]	☐Yes ☐No Measurement:		Photo #:	• Alter space • •
2.59	If the wheelchair space can only be entered from the side, is it at least 60 inches deep? [802.1.3]	☐Yes ☐No Measurement:		Photo #:	• Alter space • •

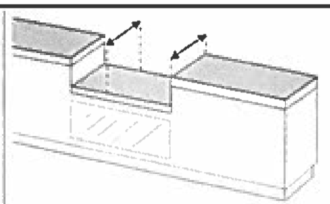
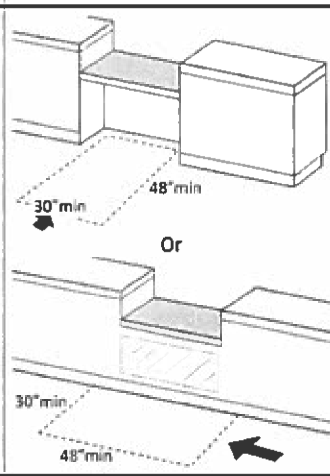
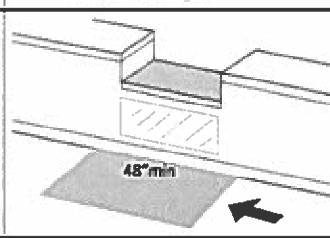
2.60	Do wheelchair spaces adjoin, but not overlap, accessible routes? [802.1.4]	☐Yes ☐No		Photo #:	• Alter spaces • •
2.61	Is there at least one companion seat for each wheelchair space? [221.3]	☐Yes ☐No		Photo #:	• Add companion seats • •
2.62	Is the companion seat located so the companion is shoulder-to-shoulder with the person in a wheelchair? [802.3.1]	☐Yes ☐No		Photo #:	• Alter seating • •
2.63	Is the companion seat equivalent in size, quality, comfort and amenities to seating in the immediate area? [802.3.2]	☐Yes ☐No		Photo #:	• Add equivalent seating • •
Seating: At dining surfaces (restaurants, cafeterias, bars, etc.) and non-employee work surfaces (libraries, conference rooms, etc.)					
2.64	Are at least 5%, but no fewer than one, of seating and standing spaces accessible for people who use wheelchairs? [226.1]	☐Yes ☐No Total #: Wheelchair #:		Not applicable Photo #:	• Alter to provide accessible spaces • •

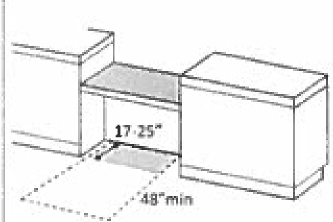
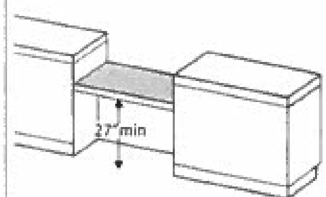
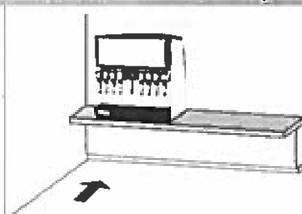
2.65 Is there a route at least 36 inches wide to accessible seating? [403.5.1]	☐Yes ☐No Measurement:		Not applicable Photo #:	• Widen route • •
2.66 At the accessible space(s), is the top of the accessible surface no less than 28 inches and no greater than 34 inches above the floor? [902.3] Note: If for children, the top should be no less than 26 inches and no greater than 30 inches above the floor.	☐Yes ☐No Measurement:		Not applicable Photo #:	• Alter surface height • •
2.67 Is there a clear floor space at least 30 inches wide by at least 48 inches long for a forward approach? [305.3] Does it extend no less than 17 inches and no greater than 25 inches under the surface? Is there knee space at least 27 inches high and at least 30 inches wide? [306.2, 306.3] Note: If for children, the knee space may be 24 inches high.	☐Yes ☐No Measurement: ☐Yes ☐No Measurement: ☐Yes ☐No Measurement:		Not applicable Photo #:	• Alter table or work surface • Add accessible table or work surface •

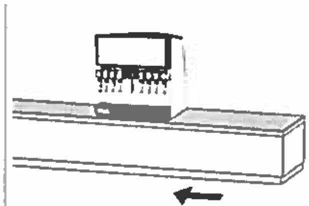
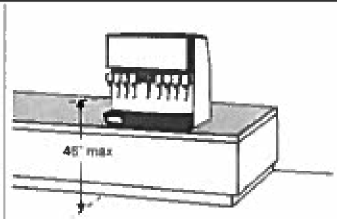
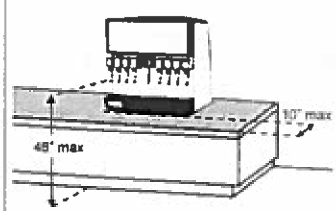
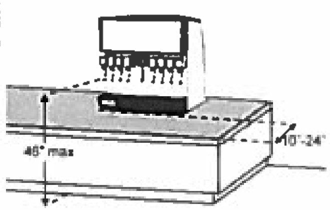
Seating: General – reception areas, waiting rooms, etc.					
2.68	Is there at least one space at least 36 inches wide by at least 48 inches long for a person in a wheelchair? [802.1.2, 802.1.3]	☐Yes ☐No Measurement:		Photo #:	• Move furniture and equipment to provide space • •
Benches – In locker rooms, dressing rooms, fitting rooms This section does not apply to any other bences.					
2.69	In locker rooms, dressing rooms and fitting rooms, is there at least one room with a bench? [222.1, 803.4]	☐Yes ☐No		Not applicable Photo #:	• Add bench • •
2.70	Is there a clear floor space at least 30 inches wide by at least 48 inches long at the end of the bench and parallel to the short axis of the bench? Is the bench seat at least 42 inches long and no less than 20 inches and no greater than 24 inches deep? Does the bench have back support or is it affixed to a wall? Is the top of the bench seat no less than 17 inches and no greater than 19 inches above the floor?	☐Yes ☐No Measurement: ☐Yes ☐No Measurement: ☐Yes ☐No ☐Yes ☐No Measurement:	 	Not applicable	• Move bench • Replace bench • Affix bench to wall • •

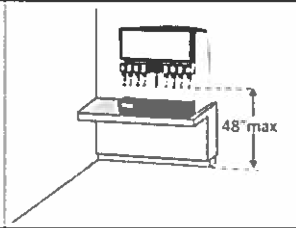
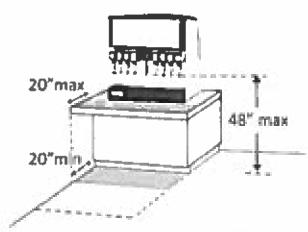
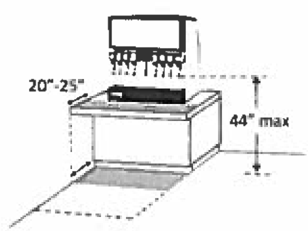
	[903]			Photo #:	
Check-Out Aisles – supermarkets, large retail stores, etc.					
2.71	Is the aisle at least 36 inches wide? [904.3.1]	☐Yes ☐No Measurement:		Not applicable Photo #:	• Widen aisle • •
2.72	Is the counter surface of at least one aisle no higher than 38 inches above the floor? [904.3.2]	☐Yes ☐No Measurement:		Not applicable Photo #:	• Lower counter • •
2.73	Is the top of the counter edge protection no higher than 2 inches above the counter surface? [904.3.2]	☐Yes ☐No Measurement:		Not applicable Photo #:	• Lower edge protection • •

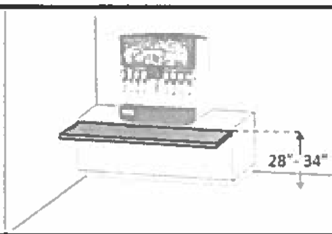
2.74	If there is a check writing surface, is the top no less than 28 inches and no greater than 34 inches above the floor? [904.3.3]	☐ Yes ☐ No Measurement:		Not applicable Photo #:	• Alter check writing surface • •
2.75	If there is more than one check-out aisle is there a sign with the International Symbol of Accessibility at the accessible aisle? [216.11]	☐ Yes ☐ No		Not applicable Photo #:	• Add sign • •
Sales & Service Counters – banks, stores, dry cleaners, auto repair shops, fitness clubs, etc.					
2.76	Is there a portion of at least one of each type of counter that is: No higher than 36 inches above the floor? At least 36 inches long? [904.4.1]	☒ Yes ☐ No Measurement: varies by location ☒ Yes ☐ No Measurement:		Not applicable Photo #:	• Lower section of counter • Lengthen section of counter •

2.77	**Does the accessible portion of the counter extend the same depth as the counter top? [904.4]**	☒ Yes ☐ No Measurement:		Not applicable Photo #:	• Alter accessible portion • •
2.78	**Is there a clear floor space at least 30 inches wide by at least 48 inches long for a forward or parallel approach? [904.4]**	☒ Yes ☐ No ☐ Parallel Measurement: ☐ Forward Measurement:		Not applicable Photo #:	• Reconfigure to provide a parallel or forward approach • •
2.79	**For a parallel approach, is the clear floor space positioned with the 48 inches adjacent to the accessible length of counter? [904.4.1]**	☐ Yes ☐ No Measurement:		Not applicable Photo #:	• If a parallel approach is not possible, a forward approach is required • •

2.80	For a forward approach: Do no less than 17 and no greater than 25 inches of the clear floor space extend under the accessible length of the counter? [306.2.2, 306.2.3] Is there at least 27 inches clearance from the floor to the bottom of the counter? [306.3.1]	☒Yes ☐No Measurement: ☒Yes ☐No Measurement:	 	Not applicable Photo #:	• Reconfigure to provide knee clearance • •
Food Service Lines – in cafeterias, salad bars, eat-in fast food establishments, etc.					
2.81	Does at least one of each type of self-service shelf or dispensing device for tableware, dishware, condiments, food and beverages have a forward or parallel approach? [904.5.1]	☐Yes ☐No ☐Forward ☐Parallel	 Or	Not applicable	• Reconfigure to provide approach • •

				Photo #:	
2.82	If there is an unobstructed parallel approach, is the shelf or dispensing device no higher than 48 inches above the floor? [308.3.1]	☐Yes ☐No Measurement:		Not applicable Photo #:	• Lower shelf and/or dispensing device • •
2.83	If there is a shallow obstruction no deeper than 10 inches with a parallel approach, is the shelf or dispensing device no higher than 48 inches above the floor? [308.3.1]	☐Yes ☐No Measurement:		Not applicable Photo #:	• Lower shelf and/or dispensing device • •
2.84	If there is an obstruction no less than 10 inches and no greater than 24 inches deep with a parallel approach, is the shelf or dispensing device no higher than 46 inches above the floor? [308.3.2]	☐Yes ☐No Measurement:		Not applicable Photo #:	• Lower shelf and/or dispensing device • •

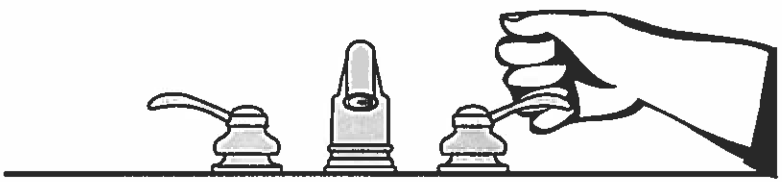
2.85	If there is an unobstructed forward approach, is the shelf or dispensing device no higher than 48 inches above the floor? [308.2.1]	☐Yes ☐No Measurement:	 	Not applicable Photo #:	• Lower shelf and/or dispensing device • •
2.86	If there is an obstruction no deeper than 20 inches with a forward approach: Does clear floor space extend under the obstruction that is at least the same depth as the obstruction? Is the shelf or dispensing device no higher than 48 inches above the floor? [904.5.1]	☐Yes ☐No Measurement: ☐Yes ☐No Measurement:	 	Not applicable Photo #:	• Reconfigure to provide knee space • Lower shelf and/or dispensing device •
2.87	If the obstruction is no less than 20 inches and no greater than 25 inches deep with a forward approach: Does clear floor space extend under the obstruction that is at least the same depth as the obstruction? Is the shelf or dispensing device no higher than 44 inches above the floor? [904.5.1]	☐Yes ☐No Measurement: ☐Yes ☐No Measurement:	 	Not applicable Photo #:	• Reconfigure to provide knee space • Lower shelf and/or dispensing device •

2.88	If there is a tray slide, is the top no less than 28 inches and no greater than 34 inches above the floor? [904.5.2]	☐Yes ☐No Measurement:		Not applicable Photo #:	• Reconfigure • •
		☐Yes ☐No		Photo #:	• • •
		☐Yes ☐No		Photo #:	• • •
		☐Yes ☐No		Photo #:	• • •
		☐Yes ☐No		Photo #:	• • •
		☐Yes ☐No		Photo #:	• • •

The ADA Checklist for Existing Facilities

Priority 3 - Toilet Rooms

Based on the 2010 ADA Standards for Accessible Design



Project ADA Survey

Building John Marshall Courts Building

Location 400 N. 9th St., Richmond, Va.

Typical Single User Staff Toilet

Date September 2, 2015

Surveyors Shane Rollison, AIA

David Butler, AIA

Contact Information HVC CHENAULT Archtectural Corp

1710 East Franklin St., Suite 100, Richmond, VA . 23223

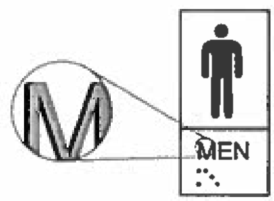
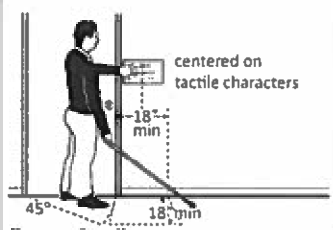
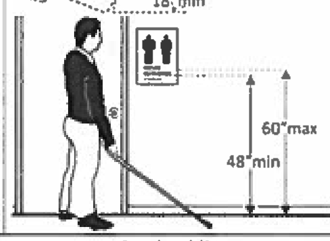
When toilet rooms are open to the public they should be accessible to people with disabilities.

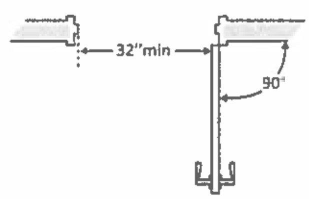
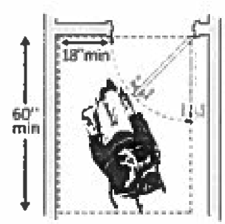
This checklist was produced by the New England ADA Center, a project of the Institute for Human Centered Design and a member of the ADA National Network. This checklist was developed under a grant from the Department of Education, NIDRR grant number H133A060092-09A. However the contents do not necessarily represent the policy of the Department of Education, and you should not assume endorsement by the Federal Government.

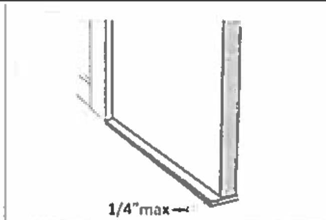
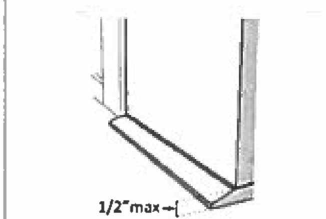
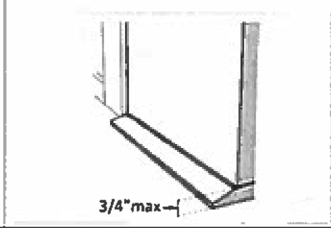
Questions or comments on the checklist contact the New England ADA Center at 617-695-0085 voice/tty or ADAinfo@NewEnglandADA.org

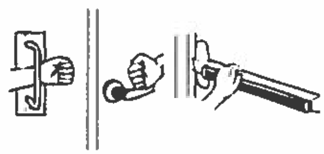
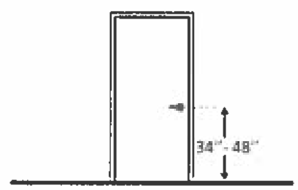
For the full set of checklists, including the checklists for recreation facilities visit www.ADAchecklist.org.

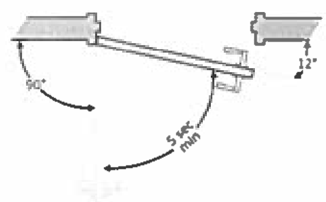
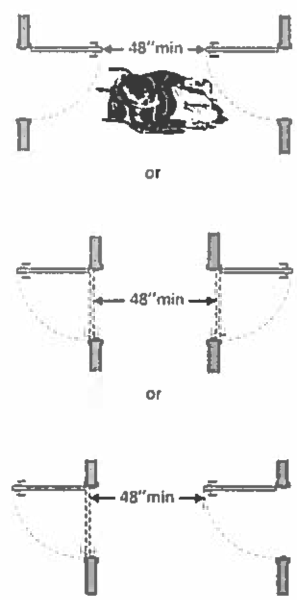
Priority 3 – Toilet Rooms				Comments	Possible Solutions
3.1	If toilet rooms are available to the public, is at least one toilet room accessible? (Either one for each sex, or one unisex.) Note: If toilet rooms are chiefly for children, e.g., in elementary schools and day care centers, use the children's specifications in Toilets - 604.1, 604.8, 604.9, 609.4 and Lavatories and Sinks – 606.2.	☒Yes ☐No		Photo #:	• Reconfigure toilet rooms • Combine toilet rooms to create one unisex accessible toilet room •
3.2	Are there signs at inaccessible toilet rooms that give directions to accessible toilet rooms? [See 2010 ADA Standards for Accessible Design – 216.8]	☐Yes ☒No		Photo #:	• Install signs • •
3.3	If not all toilet rooms are accessible, is there a sign at the accessible toilet room with the International Symbol of Accessibility? [216.8]	☐Yes ☒No		Photo #:	• Install sign • •
Accessible Route					
3.4	Is there an accessible route to the accessible toilet room? [206.2.4]	☒Yes ☐No		Photo #:	• Alter route • •

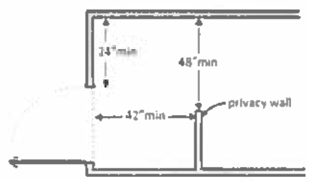
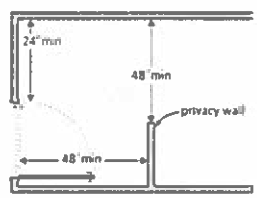
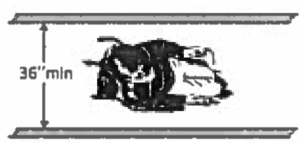
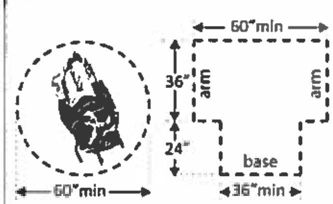
Signs at Toilet Rooms					
3.5	Do text characters contrast with their backgrounds? [703.5]	☒ Yes ☐ No			• Install tactile sign • Relocate sign •
	Are text characters raised? [703.2]	☐ Yes ☒ No			
	Is there Braille? [703.3]	☐ Yes ☒ No			
	Is the sign mounted: On the wall on the latch side of the door? [703.4.2]	☒ Yes ☐ No			
	Note: Signs are permitted on the push side of doors with closers and without hold-open devices.				
	With clear floor space beyond the arc of the door swing between the closed position and 45-degree open position, at least 18 x 18 inches centered on the tactile characters? * [703.4.2]	☒ Yes ☐ No Measurement:			*If constructed before 3/15/2012 and a person may approach within 3 inches of the sign without encountering protruding objects or standing within the door swing, relocation not required
	So the baseline of the lowest character is at least 48 inches above the floor and the baseline of the highest character is no more than 60	☐ Yes ☒ No Measurement: 58 1-2 inches to bottom.			*If constructed before 3/15/2012 and mounted no higher than 60 inches to the centerline of the sign, relocation is not

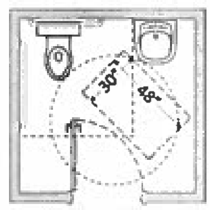
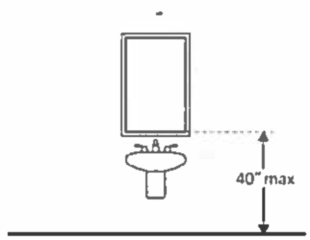
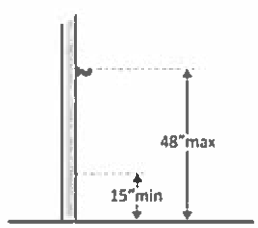
	inches above the floor? * [703.4.1] Note: If the sign is at double doors with one active leaf, the sign should be on the inactive leaf; if both leaves are active, the sign should be on the wall to the right of the right leaf.			Photo #:	required
Entrance					
3.6	Is the door opening width at least 32 inches clear, between the face of the door and the stop, when the door is open 90 degrees? [404.2.3]	☒Yes ☐No Measurement:		Photo #:	• Install offset hinges • Alter the doorway •
3.7	If there is a front approach to the pull side of the door is there at least 18 inches of maneuvering clearance beyond the latch side plus 60 inches clear depth? Note: See 2010 Standards 404.2.4 for maneuvering clearance requirements on the push side of the door and side approaches to the pull side of the door On both sides of the door, is the floor surface of the	☐Yes ☒No Measurement: ☒Yes ☐No			• Remove obstructions • Reconfigure walls • Add automatic door opener

	maneuvering clearance level (no steeper than 1:48)? [404.2.4]	Measurement:		Photo #:	
3.8	If the threshold is vertical is it no more than ¼ inch high? Or No more than ½ inch high with the top ¼ inch beveled no steeper than 1:2, if the threshold was installed on or after the 1991 ADA Standards went into effect (1/26/93)? Or No more than ¾ inch high with the top ½ inch beveled no steeper than 1:2, if the threshold was installed before the 1991 ADA Standards went into effect (1/26/93)? [404.2.5, 303.2] Note: The first ¼ inch of the ½ or ¾ inch threshold may be vertical; the rest must be beveled.	☒ Yes ☐ No Measurement: ☐ Yes ☐ No Measurement: ☐ Yes ☐ No Measurement:	  	Photo #:	• Remove or replace threshold • •

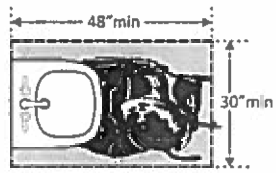
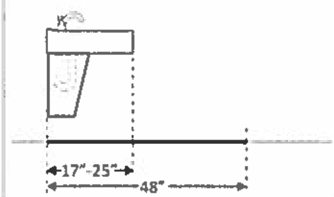
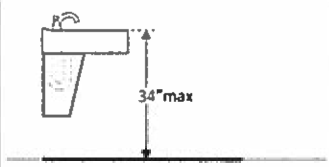
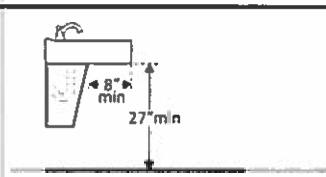
3.9	Is the door equipped with hardware that is operable with one hand and does not require tight grasping, pinching or twisting of the wrist? Door handle? Lock (if provided)? [404.2.7]	☐ Yes ☒ No		Photo #:	• Replace inaccessible knob with lever, loop or push hardware • Add automatic door opener •
3.10	Are the operable parts of the door hardware mounted no less than 34 inches and no greater than 48 inches above the floor? [404.2.7]	☒ Yes ☐ No Measurement:		Photo #:	• Change hardware height • •
3.11	Can the door be opened easily (5 pounds maximum force)? [404.2.9] Note: You can use a pressure gauge or fish scale to measure force. If you do not have one you will need to judge whether the door is easy to open.	☒ Yes ☐ No Measurement:		Photo #:	• Adjust or replace closers • Install lighter doors • Install power-assisted or automatic door openers

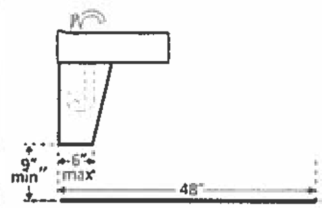
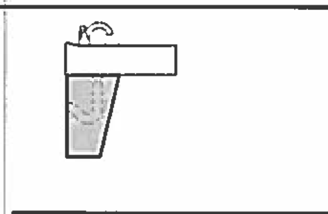
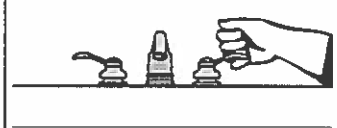
3.12	**If the door has a closer, does it take at least 5 seconds to close from an open position of 90 degrees to a position of 12 degrees from the latch? [404.2.8.1]**	☐Yes ☐No Measurement:		Not applicable Photo #:	• Adjust closer • •
3.13	**If there are two doors in a series, e.g. vestibule, is the distance between the doors at least 48 inches plus the width of the doors when swinging into the space? [404.2.6]**	☐Yes ☐No Measurement:		Not applicable Photo #:	• Remove inner door • Change door swing •

3.14	If there is a privacy wall and the door swings out, is there at least 24 inches of maneuvering clearance beyond the door latch side and 42 inches to the privacy wall? [404.2.4]	☐ Yes ☐ No Measurement:		Not applicable Photo #:	• Reconfigure space • •
3.15	If there is a privacy wall and the door swings in, is there at least 24 inches of maneuvering clearance beyond the door latch side and at least 48 inches to the privacy wall if there is no door closer or at least 54 inches if there is a door closer? [404.2.4]	☐ Yes ☐ No Measurement:		Not applicable Photo #:	• Reconfigure space • •
In the Toilet Room					
3.16	Is there a clear path to at least one of each type of fixture, e.g. lavatory, hand dryer, etc., that is at least 36 inches wide? [403.5.1]	☒ Yes ☐ No Measurement:		Photo #:	• Remove obstructions • •
3.17	Is there clear floor space available for a person in a wheelchair to turn around, i.e. a circle at least 60 inches in diameter or a T-shaped space within a 60-inch square? [603.2.1]	☐ Yes ☒ No Measurement: 4'-8" average width.		Photo #:	• Move or remove partitions, fixtures or objects such as trash cans • •

3.18	In a single user toilet room if the door swings in and over a clear floor space at an accessible fixture, is there a clear floor space at least 30 x 48 inches beyond the swing of the door? [603.2.3 Exception 2]	☐ Yes ☒ No Measurement:		Photo #:	• Reverse door swing • Alter toilet room •
3.19	If the mirror is over a lavatory or countertop, is the bottom edge of the reflecting surface no higher than 40 inches above the floor? Or If the mirror is not over the lavatory or countertop, is the bottom edge of the reflecting surface no higher than 35 inches above the floor?* [603.3]	☐ Yes ☒ No Measurement: ☐ Yes ☒ No Measurement:		Photo #:	* If installed before 3/15/2012 and the bottom edge of the reflecting surface is no higher than 40 inches above the floor, lowering the mirror to 35 inches is not required • Lower the mirror • Add another mirror •
3.20	If there is a coat hook, is it no less than 15 inches and no greater than 48 inches above the floor?* [603.4]	☐ Yes ☒ No Measurement: 58 inches		Not applicable Photo #:	• Adjust hook • Replace with or provide additional accessible hook • * If installed before 3/15/2010 and the clear floor space allows a parallel approach, the coat hook may be 54 inches above the floor.

Lavatories The 2010 Standards refer to sinks in toilet rooms as lavatories.

3.21	Does at least one lavatory have a clear floor space for a forward approach at least 30 inches wide and 48 inches long? [606.2]	☒ Yes ☐ No Measurement:		Photo #:	• Alter lavatory • Replace lavatory •
3.22	Do no less than 17 inches and no greater than 25 inches of the clear floor space extend under the lavatory so that a person using a wheelchair can get close enough to reach the faucet? [306.2]	☒ Yes ☐ No Measurement:		Photo #:	• Alter lavatory • Replace lavatory •
3.23	Is the front of the lavatory or counter surface, whichever is higher, no more than 34 inches above the floor? [606.3]	☐ Yes ☒ No Measurement:		Photo #:	• Alter lavatory • Replace lavatory •
3.24	Is there at least 27 inches clearance from the floor to the bottom of the lavatory that extends at least 8 inches under the lavatory for knee clearance? [306.3.3]	☒ Yes ☐ No Measurement:		Photo #:	• Alter lavatory • Replace lavatory •

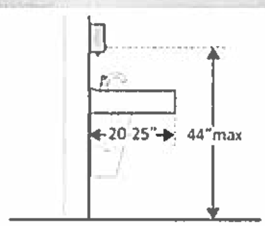
3.25	Is there toe clearance at least 9 inches high? [306.3.3] Note: Space extending greater than 6 inches beyond the available toe clearance at 9 inches above the floor is not considered toe clearance.	☒ Yes ☐ No Measurement:		Photo #:	• Alter lavatory • Replace lavatory •
3.26	Are pipes below the lavatory insulated or otherwise configured to protect against contact? [606.5]	☐ Yes ☒ No		Photo #:	• Install insulation • Install cover panel •
3.27	Can the faucet be operated without tight grasping, pinching, or twisting of the wrist? Is the force required to activate the faucet no greater than 5 pounds? [606.4]	☐ Yes ☒ No ☒ Yes ☐ No		Photo #:	• Adjust faucet • Replace faucet •

Soap Dispensers and Hand Dryers

3.28 Are the operable parts of the soap dispenser within one of the following reach ranges:

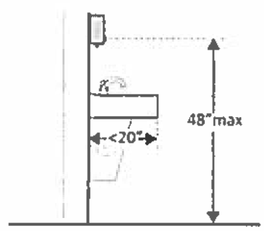
Above lavatories or counters no less than 20 inches and no greater than 25 inches deep: no higher than 44 inches above the floor?
[308.2.2]

☐ Yes ☒ No
Measurement:



Above lavatories less than 20 inches deep: no higher than 48 inches above the floor?

☐ Yes ☒ No
Measurement:



Not over an obstruction: no higher than 48 inches above the floor?
[308.2]

☐ Yes ☒ No
Measurement:

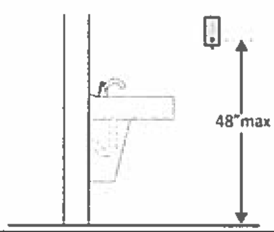


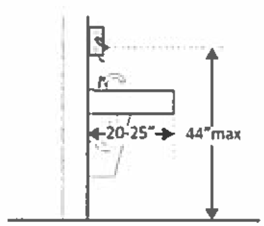
Photo #:

- Adjust dispensers
- Replace with or provide additional accessible dispensers
-

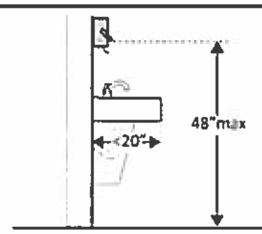
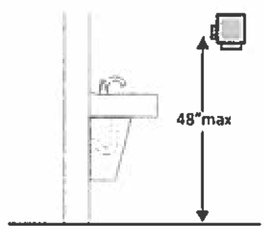
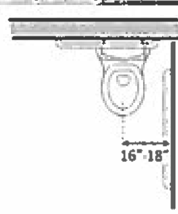
3.29 Are the operable parts of the hand dryer or towel dispenser within one of the following reach ranges:

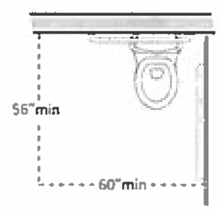
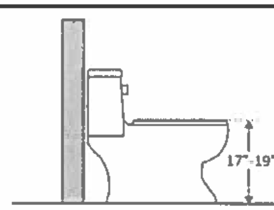
Above lavatories or counters no less than 20 inches and no greater than 25 inches deep: no higher than 44 inches above the

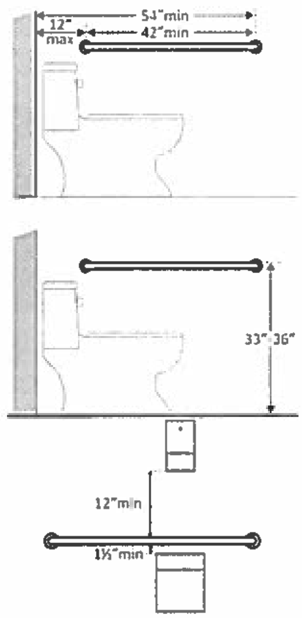
☐ Yes ☒ No
Measurement:

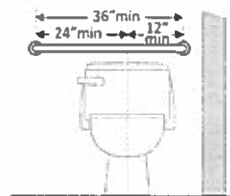
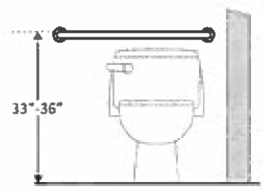
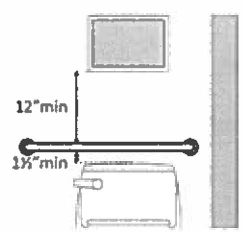


- Adjust dispensers
- Replace with or provide additional accessible dispensers
-

	floor? Above lavatories less than 20 inches deep: no higher than 48 inches above the floor? Not over an obstruction: no higher than 48 inches above the floor? [308.2] Can the operable parts of the hand dryer or towel dispenser be operated without tight grasping, pinching or twisting of the wrist? Is the force required to activate the hand dryer or towel dispenser no greater than 5 pounds? [309.4]	 ☐Yes ☒No Measurement: ☐Yes ☒No Measurement: ☒Yes ☐No ☒Yes ☐No Measurement:	 	Photo #:	
Water Closets in Single-User Toilet Rooms and Compartments (Stalls) The 2010 Standards refer to toilets as water closets.					
3.30	Is the centerline of the water closet no less than 16 inches and no greater than 18 inches from the side wall or partition? [604.2]	☒Yes ☐No Measurement:		Photo #:	• Move toilet • Replace toilet • Move partition •

3.31	Is clearance provided around the water closet measuring at least 60 inches from the side wall and at least 56 inches from the rear wall?* [604.3.1]	☐Yes ☒No Measurement:		Photo #:	* If constructed before 3/15/12, clearances around water closets in single user toilet rooms can be 48 inches wide by 66 inches long or 48 inches wide by 56 inches long (depending on the approach to the water closet, see 1991 Standards Figure 28) and the lavatory may overlap that clearance if the door to the room does not swing into the required clearances at fixtures (such as lavatories, water closet and urinals) and the edge of the lavatory is at least 18 inches from the centerline of the water closet • Alter room/compartment for clearance • •
3.32	Is the height of the water closet no less than 17 inches and no greater than 19 inches above the floor measured to the top of the seat? [604.4]	☒Yes ☐No Measurement:		Photo #:	• Adjust toilet height • Replace toilet •

3.33	Is there a grab bar at least 42 inches long on the side wall? Is it located no more than 12 inches from the rear wall? Does it extend at least 54 inches from the rear wall? [604.5.1] Is it mounted no less than 33 inches and no greater than 36 inches above the floor to the top of the gripping surface? [609.4] Is there at least 12 inches clearance between the grab bar and protruding objects above?* Is there at least 1½ inches clearance between the grab bar and projecting objects below?* Is the space between the wall and the grab bar 1 ½ inches? [609.3]	☐ Yes ☒ No Measurement: ☐ Yes ☒ No Measurement: ☐ Yes ☒ No Measurement: ☐ Yes ☒ No Measurement: ☐ Yes ☒ No Measurement: ☐ Yes ☒ No Measurement: ☐ Yes ☒ No Measurement:		Photo #:	• Install grab bar • Relocate grab bar • Relocate objects • * If constructed before 3/15/2012 grab bars do not need to be relocated; there are no space requirements above and below grab bars in the 1991 Standards

3.34	Is there a grab bar at least 36 inches long on the rear wall?	☐ Yes ☒ No Measurement:			• Install grab bar • Relocate grab bar • Relocate objects •
	Does it extend at least 12 inches from the centerline of the water closet on one side (side wall)?	☐ Yes ☒ No Measurement:	 		
	Does it extend at least 24 inches on the other (open) side? [604.5.2]	☐ Yes ☒ No Measurement:			
	Is it mounted no less than 33 inches and no greater than 36 inches above the floor to the top of the gripping surface? [609.4]	☐ Yes ☒ No Measurement:	 		
	Are there at least 12 inches clearance between the grab bar and protruding objects above?*	☐ Yes ☒ No Measurement:	 		
	Are there at least 1½ inches clearance between the grab bar and projecting objects below?*	☐ Yes ☒ No Measurement:			* If constructed before 3/15/2012 grab bars do not need to be relocated; there are no space requirements above and below grab bars in the 1991 Standards
	Is the space between the wall and the grab bar 1½ inches? [609.3]	☐ Yes ☒ No Measurement:		Photo #:	

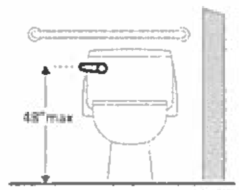
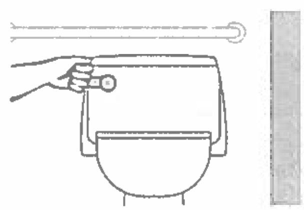
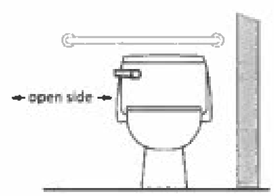
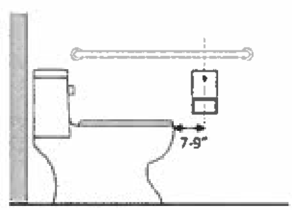
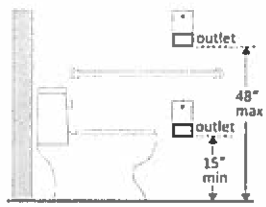
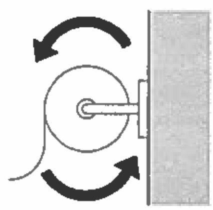
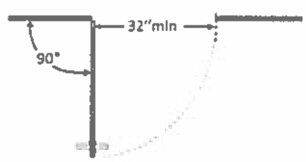
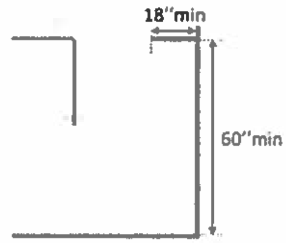
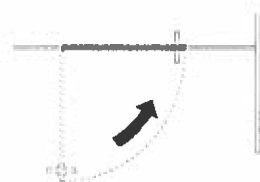
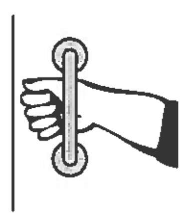
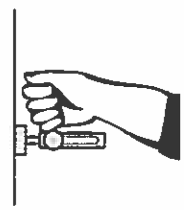
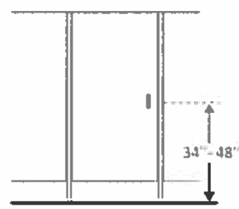
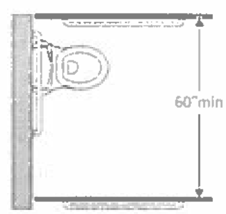
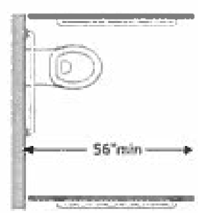
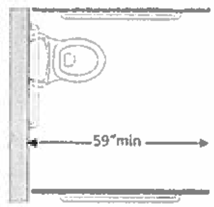
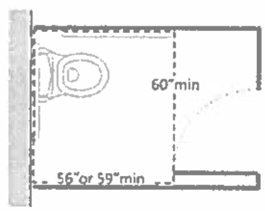
3.35	**If the flush control is hand operated, is the operable part located no higher than 48 inches above the floor? [604.6]**	☒Yes ☐No Measurement:		Photo #:	• Move control • Install sensor with override button no higher than 48 inches •
3.36	**If the flush control is hand operated, can it be operated with one hand and without tight grasping, pinching, or twisting of the wrist?** **Is the force required to activate the flush control no greater than 5 pounds? [605.4]**	☒Yes ☐No ☒Yes ☐No Measurement:		Photo #:	• Change control • Adjust control •
3.37	**Is the flush control on the open side of the water closet? [604.6]**	☐Yes ☒No		Photo #:	• Move control • •
3.38	**Is the toilet paper dispenser located no less than 7 inches and no greater than 9 inches from the front of the water closet to the centerline of the dispenser?* [604.7]**	☐Yes ☒No Measurement:			* If constructed before 3/15/2012 dispenser does not need to be relocated if it is within reach from the water closet seat; the 1991 Standards do not specify distance from the front of the water closet

			Photo #:	• Relocate dispenser • •
3.39 Is the outlet of the dispenser: Located no less than 15 inches and no greater than 48 inches above the floor? Not located behind grab bars? [604.7]	☒Yes ☐No Measurement: ☒Yes ☐No		Photo #:	• Relocate dispenser • •
3.40 Does the dispenser allow continuous paper flow? [604.7]	☒Yes ☐No		Photo #:	• Adjust dispenser • Replace dispenser •
Toilet Compartments (Stalls)				
3.41 Is the door opening width at least 32 inches clear, between the face of the door and the stop, when the door is open 90 degrees? [604.8.1.2]	☐Yes ☐No Measurement:		Not applicable Photo #:	• Widen door width • •

3.42	If there is a front approach to the pull side of the door, is there at least 18 inches of maneuvering clearance beyond the latch side plus 60 inches clear depth? [604.8.1.2] Note: See 2010 Standards 604.8.1.2 Doors for maneuvering clearance requirements on the push side of the door and side approaches to the pull side of the door	☐Yes ☐No Measurement:		Not applicable Photo #:	• Remove obstructions • •
3.43	Is the door self-closing? [604.8.1.2]	☐Yes ☐No		Not applicable Photo #:	• Add closer • Replace door •
3.44	Are there door pulls on both sides of the door that are operable with one hand and do not require tight grasping pinching or twisting of the wrist?* [604.8.1.2]	☐Yes ☐No		Not applicable Photo #:	* If constructed before 3/15/2012 door pulls do not need to be added; door pulls are not required in the 1991 Standards • Replace hardware • •

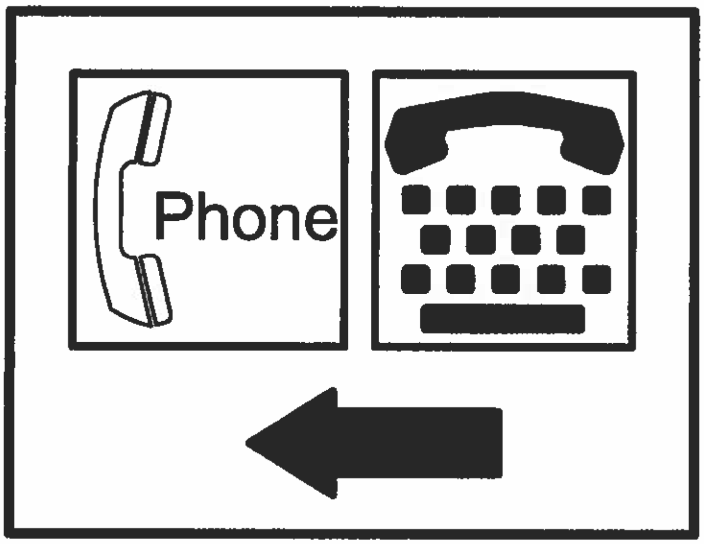
3.45 Is the lock operable with one hand and without tight grasping, pinching or twisting of the wrist? [309.4]	☐ Yes ☐ No		Not applicable Photo #:	• Replace lock • •
3.46 Are the operable parts of the door hardware mounted no less than 34 inches and no greater than 48 inches above the floor? [404.2.7]	☐ Yes ☐ No Measurement:		Not applicable Photo #:	• Relocate hardware • •
3.47 Is the compartment at least 60 inches wide? [604.8.1.1]	☐ Yes ☒ No Measurement:		Photo #:	• Widen compartment • •
3.48 If the water closet is wall hung, is the compartment at least 56 inches deep? [604.8.1.1]	☐ Yes ☒ No Measurement:		Photo #:	• Widen compartment • •

3.49 If the water closet is floor mounted, is the compartment at least 59 inches deep? [604.8.1.1]	☐ Yes ☐ No Measurement:		Not applicable Photo #:	• Alter compartment • •
3.50 If the door swings in, is the minimum required compartment area provided beyond the swing of the door (60 inches x 56 inches if water closet is wall hung or 59 inches if water closet is floor mounted)? [604.8.1.1]	☐ Yes ☒ No Measurement:		Photo #:	• Reverse door swing • Alter compartment •
	☐ Yes ☐ No		Photo #:	• • •
	☐ Yes ☐ No		Photo #:	• • •
	☐ Yes ☐ No		Photo #:	• • •

ADA Checklist for Existing Facilities

Priority 4 – Additional Access

Based on the 2010 ADA Standards for Accessible Design



Project ADA Survey

Building John Marshall Courts

Location 400 N. 9th St., Richmond, Va.
General for all Floors

Date September 2, 2015

Surveyors Shane Rollison, AIA

David Butler, AIA

Contact Information HVC CHENAULT Architectural Corp.

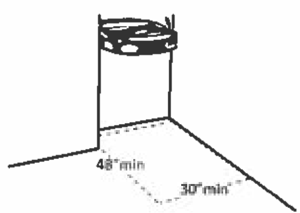
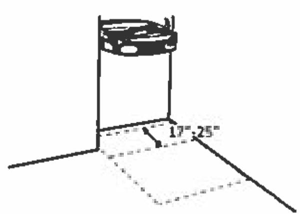
1710 East Franklin St., Suite 100 Richmond, Va. 23223

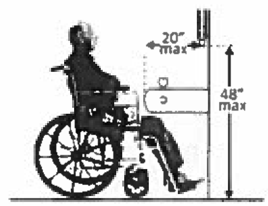
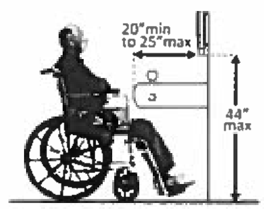
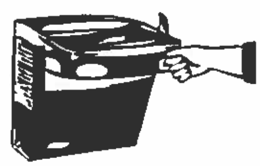
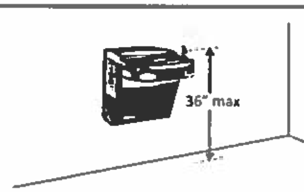
Amenities such as drinking fountains and public telephones should be accessible to people with disabilities.

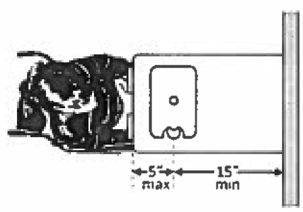
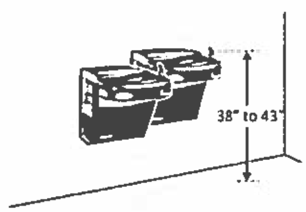
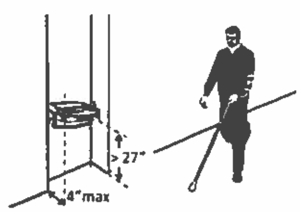
This checklist was produced by the New England ADA Center, a project of the Institute for Human Centered Design and a member of the ADA National Network. This checklist was developed under a grant from the Department of Education, NIDRR grant number H133A060092-09A. However the contents do not necessarily represent the policy of the Department of Education, and you should not assume endorsement by the Federal Government.

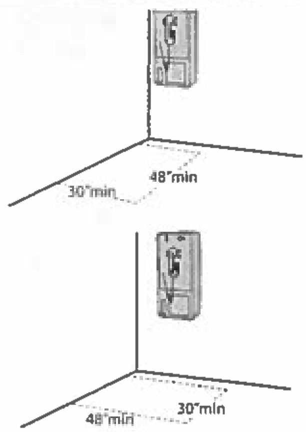
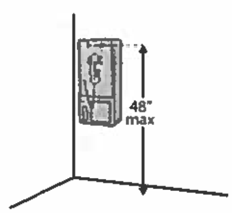
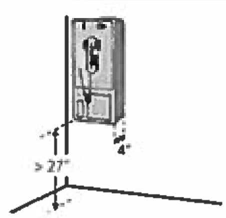
Questions or comments on the checklist contact the New England ADA Center at 617-695-0085 voice/tty or ADAinfo@NewEnglandADA.org

For the full set of checklists, including the checklists for recreation facilities visit www.ADAchecklist.org.

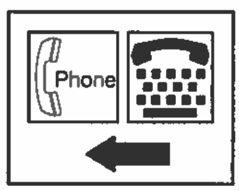
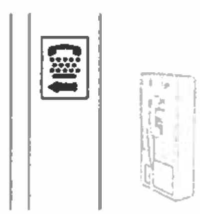
Priority 4 – Additional Access				Comments	Possible Solutions
Drinking Fountains					
4.1	Does at least one drinking fountain have a clear floor space at least 30 inches wide x at least 48 inches long centered in front of it for a forward approach?* [See 2010 ADA Standards for Accessible Design – 602.2]	☐Yes ☒No Measurement:		Drinking fountains are typically semi-recessed units with inadequate knee space for front approach. Units are located in corridors in the path of travel to and from public toilets. Photo #:	*If installed before 3/15/2012, a parallel approach is permitted and the clear floor space is not required to be centered • Alter space • Relocate drinking fountain • Install a drinking fountain in another location
4.2	If there is a forward approach, do no less than 17 inches and no greater than 25 inches of the clear floor space extend under the drinking fountain? [306.2.2, 306.2.3] Note: If the drinking fountain is primarily for children's use and the spout is no more than 30 inches above the floor and no more than 3 ½ inches from the edge of the unit, a parallel approach is permitted.	☐Yes ☒No Measurement:		Photo #:	• Alter space • Replace drinking fountain • No changes required

4.3	**If the drinking fountain is no deeper than 20 inches, are the operable parts no higher than 48 inches above the floor?** **[308.2.2]**	☒ Yes ☐ No Measurement: 39 inches		Photo #:	• Adjust drinking fountain • Replace drinking fountain •
4.4	**If the drinking fountain is no less than 20 inches and no greater than 25 inches deep, are the operable parts no higher than 44 inches above the floor?** **[308.2.2]**	☐ Yes ☐ No Measurement:		Not applicabel, see 4.9 Photo #:	• Adjust drinking fountain • Replace drinking fountain •
4.5	**Can the control be operated with one hand and without tight grasping, pinching or twisting of the wrist?** **Is the force required to activate the control no more than 5 pounds?** **[309.4]**	☐ Yes ☒ No ☐ Yes ☐ No Measurement:		Photo #:	• Change control • Adjust control • Replace drinking fountain
4.6	**Is the spout outlet no higher than 36 inches above the floor?** **[602.4]**	☐ Yes ☒ No Measurement: 39 inches		Photo #:	• Adjust drinking fountain • Replace drinking fountain •

4.7	Is the spout: At least 15 inches from the rear of the drinking fountain? No more than 5 inches from the front of the drinking fountain? [602.5]	☐ Yes ☒ No Measurement: 4 inches ☐ Yes ☐ No Measurement:		Photo #:	• Adjust spout • Replace drinking fountain •
4.8	If there is more than one drinking fountain, is there at least one for standing persons? [211.2] Is the spout outlet no lower than 38 inches and no higher than 43 inches above the floor? [602.7]	☐ Yes ☒ No ☒ Yes ☐ No Measurement: 39 inches		Drinking fountains are typically single units with no dual height provisions. Photo #:	• Adjust drinking fountain • Install new drinking fountain for standing height •
4.9	If the leading (bottom) edge of the fountain is higher than 27 inches above the floor, does the front of the fountain protrude no more than 4 inches into the circulation path? [307.2]	☐ Yes ☒ No Measurement: 8 inches		Photo #:	• Adjust drinking fountain • Replace drinking fountain • Add tactile warning such as permanent planter or partial walls

Public Telephones					
4.10	Does at least one telephone have a clear floor space at least 30 inches wide x at least 48 inches long for a parallel or forward approach? [704.2.1]	☐Yes ☐No		Not applicable Photo #:	• Move telephone • Install new telephone for clear floor space •
4.11	Is the highest operable part of the telephone no higher than 48 inches above the floor? [704.2.2]	☐Yes ☐No Measurement:		Not applicable Photo #:	• Adjust telephone • •
4.12	If the leading (bottom) edge of the telephone is higher than 27 inches above the floor, does the front of the telephone protrude no more than 4 inches into the circulation path? [307.2]	☐Yes ☐No Measurement:		Not applicable Photo #:	• Adjust telephone • •

4.13	**Does at least one telephone have a volume control?** **[704.3]**	☐Yes ☐No		**Photo #:**	• **Install volume control** • **Replace telephone with one that has volume control** •
4.14	**Is the volume control identified by a pictogram of a telephone handset with radiating sound waves?** **[703.7.2.3]**	☐Yes ☐No		**Photo #:**	• **Add pictogram** • •
4.15	**Does at least one telephone have a TTY?** **[217.4.1]** **Note: TTY's are devices that employ interactive text-based communication through the transmission of coded signals across the telephone network. They are mainly used by people who are deaf and/or cannot speak.**	☐Yes ☐No		**Photo #:**	• **Install TTY** • •

4.16 Is the touch surface of the TTY keypad at least 34 inches above the floor? [704.4.1] Note: If a seat is provided, TTY is not required to be 34 inches minimum above the floor	☐Yes ☐No Measurement:		Photo #:	• Adjust height of TTY • •
4.17 Is the TTY identified by the International Symbol of TTY? [703.7.2.2]	☐Yes ☐No		Photo #:	• Add symbol • •
4.18 Do signs that provide direction to public telephones also provide direction to the TTY? [216.9.2]	☐Yes ☐No		Photo #:	• Add signs • •
4.19 Do telephones that do not have a TTY provide direction to the TTY? [216.9.2]	☐Yes ☐No		Photo #:	• Add signs • •

Fire Alarm Systems				
4.20 If there are fire alarm systems, do they have both flashing lights and audible signals? [702.1]	☐ Yes ☒ No		Photo #:	• Install audible and visual alarms • •
	☐ Yes ☐ No		Photo #:	• • •
	☐ Yes ☐ No		Photo #:	• • •
	☐ Yes ☐ No		Photo #:	• • •
	☐ Yes ☐ No		Photo #:	• • •

What changes must a public entity make to its existing facilities to make them accessible?

Printer-friendly version

A public entity must ensure that individuals with disabilities are not excluded from services, programs, and activities because existing buildings are inaccessible. A State or local government's programs, when viewed in their entirety, must be readily accessible to and usable by individuals with disabilities. This standard, known as "program accessibility," applies to facilities of a public entity that existed on January 26, 1992. Public entities do not necessarily have to make each of their existing facilities accessible. They may provide program accessibility by a number of methods including alteration of existing facilities, acquisition or construction of additional facilities, relocation of a service or program to an accessible facility, or provision of services at alternate accessible sites.

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Yes No

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**Note: If you need answers to your ADA questions, email us.

Contact Us!

Toll Free Voice or TTY
1-800-949-4232
Or **Email Us**

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The ADA National Network is funded through the Department of Health and Human Services, National Institute on Disability, Independent Living, and Rehabilitation Research

Department of Justice
September 15, 2010

2010 ADA Standards for Accessible Design

Introduction

The Department of Justice published revised regulations for Titles II and III of the Americans with Disabilities Act of 1990 "ADA" in the *Federal Register* on September 15, 2010. These regulations adopted revised, enforceable accessibility standards called the 2010 ADA Standards for Accessible Design "2010 Standards" or "Standards". The 2010 Standards set minimum requirements – both scoping and technical -- for newly designed and constructed or altered State and local government facilities, public accommodations, and commercial facilities to be readily accessible to and usable by individuals with disabilities.

Adoption of the 2010 Standards also establishes a revised reference point for Title II entities that choose to make structural changes to existing facilities to meet their program accessibility requirements; and it establishes a similar reference for Title III entities undertaking readily achievable barrier removal.

The Department has assembled this online version of the official 2010 Standards to increase its ease of use. This version includes:

2010 Standards for State and Local Government Facilities Title II

2010 Standards for Public Accommodations and Commercial Facilities Title III

The Department has assembled into a separate publication the revised regulation guidance that applies to the Standards. The Department included guidance in its revised ADA regulations published on September 15, 2010. This guidance provides detailed information about the Department's adoption of the 2010 Standards including changes to the Standards, the reasoning behind those changes, and responses to public comments received on these topics. The document, **Guidance on the 2010 ADA Standards for Accessible Design**, can be downloaded from **www.ada.gov**

For More Information

For information about the ADA, including the revised 2010 ADA regulations, please visit the Department's website www.ADA.gov; or, for answers to specific questions, call the toll-free ADA Information Line at 800-514-0301 (Voice) or 800-514-0383 (TTY).

2010 STANDARDS FOR STATE AND LOCAL GOVERNMENT FACILITIES: TITLE II

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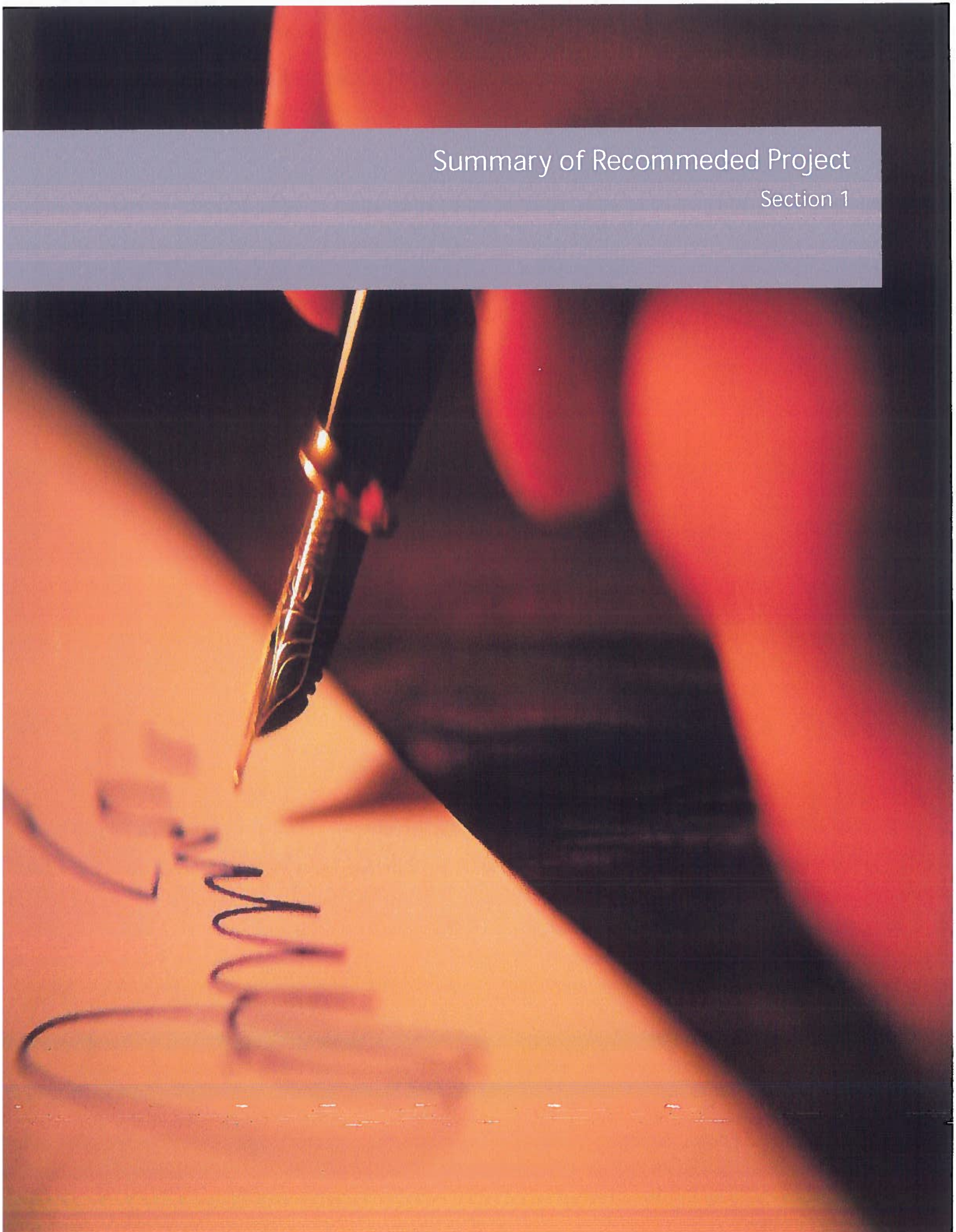
TAB#	Title
1	Section 1: Overview of Audit Results
2	Section 2: Detailed Investment Grade Audit Results
3	General Office Buildings
4	Public Safety Buildings
5	Police Precincts
6	Courts
7	Libraries
8	Operations / Auto Shops
9	Fire Houses
10	Section 3: Project Implementation and Commissioning Plan
11	Appendix A Detailed Open Book Pricing
12	Appendix B Utility Rates
13	Appendix C Benchmarking
14	Appendix D Detailed Water Conservation Scope
15	Appendix E Measurement and Verification Methodology
16	Appendix F Detailed Lighting Scope
17	Appendix G MBE Plan

Summary of Recommeded Project

Section 1



SUMMARY OF RECOMMENDED PROJECT

Siemens professional engineers, energy engineers, operations managers, technicians and subcontractors have reviewed and evaluated the energy and water using systems in the buildings included in this Investment Grade Audit (IGA) for the City of Richmond (the "City") to determine the feasibility of entering into an Energy Performance Contract to provide for installation and implementation of energy and water savings measures at the City's facilities. This evaluation included:

- Analysis of present utility use and costs
- Benchmarking of energy use against the energy use of similar facilities
- Modeling and evaluation of energy uses in the facility
- Analysis of present operating and maintenance costs
- On-site survey of equipment, facilities and operations
- Review of technical drawings
- Identification and analysis of alternative energy sources, equipment, processes and operating methods
- Discussions with facilities and other City staff
- Recommendations of measures with the guaranteed savings, cost, simple payback and useful life

This report provides the results of this Investment Grade Audit and a recommended energy saving project to improve the efficiency and operations of the buildings included in the audit.

Utility Use & Costs

Siemens reviewed and evaluated the utility use and cost information supplied by the City for electricity, natural gas, and water/sewer to gain insight into current overall building energy use, trends, operations and costs that establish a baseline for use in identifying potential opportunities for building improvements and savings. The resulting baselines were used to compare the energy use of the facilities with similar facilities using proven building energy benchmarking methods to determine the overall efficiency of the facilities and the potential for energy improvements in the facilities. The resulting baselines were also used to identify potential opportunities for specific building improvements and the magnitude of the potential savings from the improvements. Siemens also evaluated recent utility rate trends for the utility sources used by the City and applied these trends to the baseline energy use of the buildings to accurately identify present and future utility costs and long term savings potential from energy saving improvements to the buildings. The resulting baseline utility use and costs are summarized below.

Section 2 of this report contains a general discussion of the energy billing and use data analyzed for this audit as well as specific results, trends and energy rates for each building. This section also evaluates each of the buildings' energy use relative to similar or typical building. Details of energy rates paid by the City and the results of the energy benchmarking are contained in the appendices.

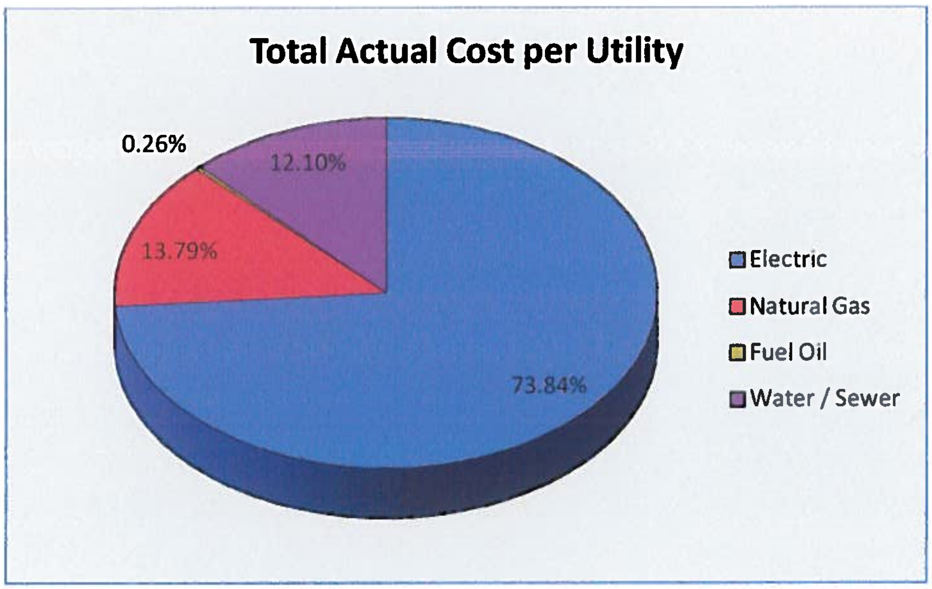
Following is a brief summary of the baseline energy use for the buildings included in this audit. All costs are as billed amounts and do not include the recent increases in utility rates implemented July 1, 2015.

City of Richmond Facilities Audited
Baseline Utility Use

	Actual Cost	Percent of Total Utility Cost
Total Energy Cost	$2,769,120	
Electric Cost	$2,044,802	73.84%
Natural Gas Cost	$381,973	13.80%
Fuel Oil	$7,237	0.26%
Water & Sewer	$335,107	12.10%
Energy Use	Total	Percent of Total Energy
Electric Consumption (kWh)	26,542,168	57.26%
Natural Gas Consumption (Mcf)	66,023.5	42.56%
Fuel Oil (gallons)	2,050	0.18%
Total Energy Use (MMBTU)	158,217	
Annual Water Use (ccf)	33,942	

The data included in this table include only energy and water use related to building operation. Energy use for special operations associated with the building but not used for building operation, such as CNG vehicle fuel consumption, is not included.

As shown in this table and the chart below, energy use in the buildings audited is only dominated by electricity use, even in those building heated by natural gas. This was a major factor in the improvement measures recommended as a result of the project. However, energy use does not provide an accurate indication of building functionality of occupant comfort, both of which were also considered in developing the recommended measures.



Recommended Project

Based on the results of this IGA, Siemens developed a list of recommended Facility Improvement Measures (FIMs) and estimated the potential utility and cost savings that can be captured by these improvements as well as the cost of implementing these improvements. Using the facility needs identified by this audit and City staff, as well as the economic criteria presented in the original request for proposal, discussions with staff staff regarding the City's preferences for the program, as well as the known economic criteria usually applied in the Commonwealth of Virginia for similar county and municipal related projects, Siemens has developed the project summarized below and discussed in subsequent sections of this report.

Items considered in Siemens' evaluation included, but were not limited to, the following:

- Occupant comfort

- Occupant work environment
- Occupant needs and use
- Building orientation & landscaping
- Building envelope & fenestration
- Building air quality & health issues
- Heating, ventilation, exhaust and air conditioning systems
- Domestic water heating systems
- Lighting systems & day lighting opportunities
- Building energy management & automation systems
- Domestic water use and fixture performance
- Computer, vending machine and other loads
- Utility rates
- Applicable codes & standards
- Distributed generation or combined heat & power opportunities
- Equipment maintenance and reliability issues
- Equipment age and useful life
- Capital improvement needs
- Impacts of planned changes in building use
- Changes and schedules for completion of the School Consolidation Project

The resulting recommended program is summarized in the following table. Detailed costs and saving for each Facility Improvement Measure (FIM) recommended are provided in the tables later in this section as well as APPENDIX A.

Major improvements recommended for inclusion in the project include the following:

- Energy efficient lighting retrofits and controls
- Water conservation measures
- Replacement of old inefficient HVAC equipment
- Installation of new building automation and controls
- Implementation of energy saving equipment operation sequences to reduce energy use
- Building envelope improvements to reduce energy losses and increase comfort
- Development of guidelines and training to improve energy conservation awareness in City operations
- Implementation of remote maintenance technology to improve the timeliness of maintenance service

As shown in the table, savings resulting from the improvements included in the proposed energy performance contract (EPC) fully support the implementation of all improvements recommended.

Cash flow for the project over the fifteen (15) year financing period is shown below. The cash flow analysis shows $297,962 in positive cash flow over the next 15 years for the recommended project.

Savings shown assume continued recommended maintenance of the facilities by the City.

Recommended Project Cost & Savings Summary

Total Project Cost	$13,531,272
Annual Utility Savings (Base FY 2015)	
Electricity	6,451,598 kWh 24.31% of Base
Natural Gas	10,744 Mcf 16.27 % of Base
Water	3,753 ccf 11.05% of Base
Sewer	9,337 ccf 27.51% of Base
Annual Utility Cost Savings (Base FY 2015)	
Electricity	$390,959
Natural Gas	$106,805
Water	$12,759
Sewer	$57,608
Total Utility Savings	$570,633
Annual O&M Savings	$497,381
Total Annual Savings	$1,068,014
Simple Payback	12.7 Years

Recommended Project Emissions Savings

The use of various forms of energy in building systems results in the release of a number of different air pollutants or suspected pollutants. Chief among these are sulfur dioxide (SO2), the major pollutant in the formation of acid rain, nitrogen oxides (NOx), a major contributor to ground level ozone formation, and carbon dioxide (CO2), the suspected major contributor to global climate change. These compounds are emitted from the combustion of fossil fuels either directly in building heating, power and drive equipment or indirectly through the generation of electricity used in the buildings. As a result, actions to reduce the energy use of building systems not only reduces the use of scarce energy resources and operating costs for the building owner, but also reduces the potential harm done to the environment by the building's use of energy.

The table below shows estimates of the emissions savings that will result from the implementation of the recommended facility improvement measures. The emissions savings estimates are based on electric emission data for the local utilities' regional electricity supply grid contained in the U. S. Environmental Protection Agency's Emissions and Generation Resources Integrated Database (eGRID) and on fossil fueled equipment emissions estimates contained in the U. S. Environmental Protection Agency's publication AP 42, Fifth Edition, Compilation of Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources.

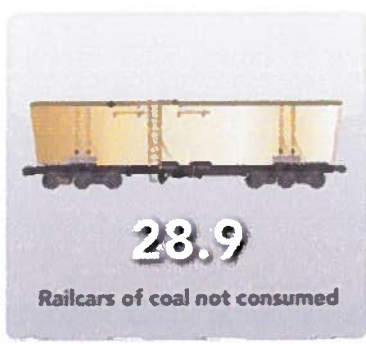
Recommended Project Emissions Savings (pounds per year)

Facility	Sulfur Dioxide (SO2)	Nitrogen Oxides (NOx)	Carbon Dioxide (CO2)
Total	32,487	9,966	12,074,408

These savings are equivalent to:

Equivalencies

Annual Reduction



Conclusions

It is apparent that local governments will continue to be challenged in upcoming years with many needs and constrained budgets so it is critical to find ways to reduce cost and operate more efficiently and effectively.

Siemens has a proven track record of supporting the City. Our local Richmond office is a full-service branch staffed by on-site technical service specialists and project management teams that deliver complete building solutions and are committed to ensure this project is a success. This team will support the city with the solutions and ongoing service.

Siemens will serve as a strong energy partner for the City of Richmond in pursuing the project objectives. Our experienced team, proposed solutions and guaranteed savings will provide the City with a fiscally responsible package that improves infrastructure without the raising taxes.

Buildings Included in Investment Grade Audit

Group	Facility	Location	Square Footage
1	General Office Buildings		622,307
1.1	City Hall	900 E. Broad Street	501,076
1.2	Marshall Plaza	900 E. Marshall Street	103,577
1.3	East District Initiative	701 North 25th Street	17,654
2	Public Safety Buildings		213,331
2.1	Police Training Academy	1202 W. Graham Street	61,625
2.2	Juvenile Detention Center	1700 Oliver Hill Way	41,906
2.3	Police Headquarters	200 W. Grace Street	109,800
2.4	Police Precincts		35,767
2.4.1	First Police Precinct	2501 "Q" Street	7,325
2.4.2	Second Police Precinct	177 Belt Blvd.	17,010
2.4.3	Third Police Precinct	301 S. Meadow Street	11,432
2.5	Fire Houses		118,558
2.5.1	Engine Co. #1	308 N. 24th Street	11,518
2.5.2	Engine Co. #5	324 W. Leigh Street	6,726
2.5.3	Engine Co. #6	120 S. Jefferson Street	6,750
2.5.4	Engine Co. #8	1018 Williamsburg Road	4,540
2.5.5	Engine Co. #11	1235 N. 28th Street	8,940
2.5.6	Engine Co. #12*	2223 W. Cary Street	6,360
2.5.7	Engine Co. #14	2932 Hawthorne Avenue	7,844
2.5.8	Engine Co. #15	2614 1st Avenue	6,729
2.5.9	Engine Co. #18	412 N. Thompson Street	5,610
2.5.10	Engine Co. #19	313 Maple Avenue	6,757
2.5.11	Engine Co. #20	4715 Forest Hill Avenue	6,193
2.5.12	Engine Co. #21	2505 Jefferson Davis Highway	6,159
2.5.13	Engine Co. #22	2420 Broad Rock Boulevard	8,400
2.5.14	Engine Co. #23	495 LaBrook Concourse	9,050
2.5.15	Engine Co. #24	7400 Forest Hill Avenue	7,885
2.5.16	Engine Co. #25	8800 W. Huguenot Road	9,097

Group	Facility	Location	Square Footage
3	Courts		186,959
3.1	John Marshall Courthouse	400 N. 9th Street	139,071
3.2	Oliver Hill Courthouse	1600 Oliver Hill Way	47,888
4	Branch Libraries		36,136
4.1	Broad Rock Library	4820 Old Warwick Road	7,514
4.2	Ginter Park Library	1200 Westbrook Avenue	6,551
4.3	Hull Street Library	1400 Hull Street	7,119
4.4	North Avenue Library	2901 North Avenue	6,942
4.5	West End Library	5420 Patterson Avenue	8,010
5	Auto Shops/ Operations		68,052
5.1	Fleet Maint. Shop	1650 Commerce Road	34,560
5.2	Fleet Maint. Office	1700 Commerce Road	23,256
5.3	DPW Southside Operations	3506 North Hopkins Road	10,236
35	Total Floor Area		1,281,110

Recommended Facility Improvement Measures

Building Location	FIM #	Rec.	FIM DESCRIPTION	SAVINGS	COST	SPB (YEARS)	DOLLAR AMOUNT ($)	DOLLAR AMOUNT $	DOLLAR AMOUNT $	Useful Life
City Hall	01.01.01	Y	Water Conservation Retrofits	$10,083	$125,769	12.5	$725	$723	$8,636	10
City Hall	01.01.02	Y	Cooling Tower MakeUp Metering	$15,315	$58,190	3.8	$0	$0	$15,315	25
City Hall	1.01.03.0	Y	Lighting Upgrades - LED	$67,982	$1,102,221	16.2	$54,040	$13,942	$0	14.5
City Hall	1.01.04.0	Y	Lighting Upgrades - LED - Lutron Controls	$15,235	$1,101,719	72.3	$15,235	$0	$0	15
City Hall	01.01.05	Y	Inspect & Replace Steam Traps	$7,604	$105,333	13.9	$6,169	$1,435	$0	15
City Hall	01.01.06	Y	Inspect & Repair Mixing Boxes	$5,219	$97,805	18.7	$0	$5,219	$0	20
City Hall	01.01.09	Y	Replace AHU 7	$1,044	$77,863	74.6	$0	$1,044	$0	25
City Hall	01.01.10	Y	Optimize Chiller Operation	$4,586	$35,984	7.8	$3,059	$1,527	$0	NA
City Hall	01.01.11	Y	Building Automation Expansion	$42,768	$44,621	1.0	$42,768	$0	$0	NA
City Hall	01.01.13	Y	Electric Domestic Hot Water Controls	$1,313	$6,116	4.7	$1,313	$0	$0	16
City Hall	01.01.14	Y	Weatherization	$4,688	$49,020	10.5	$4,688	$0	$0	5
Marshall Plaza	01.02.01	Y	Water Conservation Retrofits	$7,028	$21,849	3.1	$1,451	$124	$5,453	10
Marshall Plaza	1.02.02.0	Y	Lighting Upgrades - LED	$28,551	$320,910	11.2	$24,786	$3,765	$0	14.5
Marshall Plaza	01.02.03	Y	Replace Heat Pumps (3rd Floor) & 3 Split Systems	$5,501	$208,707	37.9	$4,951	$550	$0	20
Marshall Plaza	01.02.05	Y	Building Automation Expansion	$18,524	$55,972	3.0	$18,524	$0	$0	NA
Marshall Plaza	01.02.06	Y	Electric Domestic Hot Water Controls	$225	$2,280	10.2	$225	$0	$0	16
Marshall Plaza	01.02.08	Y	Weatherization	$4,392	$14,122	3.2	$4,392	$0	$0	5
East District Initiative	01.03.01	Y	Water Conservation Retrofits	$268	$6,696	25.0	$43	$40	$185	10
East District Initiative	1.03.02.0	Y	Lighting Upgrades - LED	$5,190	$59,897	11.5	$4,280	$910	$0	14.5
East District Initiative	01.03.04	Y	Building Automation Expansion	$8,843	$74,896	8.5	$8,843	$0	$0	NA
East District Initiative	01.03.05	Y	Weatherization	$765	$6,407	8.4	$765	$0	$0	5
East District Initiative	01.03.06	Y	Window Replacement/Upgrade	$1,024	$92,621	90.5	$1,024	$0	$0	30
Police Training Academy	02.01.01	Y	Water Conservation Retrofits	$623	$15,574	25.0	$24	$98	$501	10
Police Training Academy	2.01.02.0	Y	Lighting Upgrades - LED	$19,389	$223,268	11.5	$14,666	$4,723	$0	14.5
Police Training Academy	02.01.03	Y	Rate Optimization for Thermal Storage System	$1,700	$18,733	11.0	$0	$1,700	$0	NA
Police Training Academy	2.01.04.0	Y	Replace Boiler Burners	$5,068	$53,364	10.5	$3,964	$1,104	$0	25
Police Training Academy	02.01.05	Y	Replace Chiller	$7,743	$401,003	51.8	$5,818	$1,925	$0	15
Police Training Academy	02.01.07	Y	Building Automation Expansion	$5,615	$34,986	6.2	$5,615	$0	$0	NA
Police Training Academy	02.01.09	Y	Weatherization	$806	$8,328	10.3	$806	$0	$0	5
Juvenile Detention Center	02.02.01	Y	Water Conservation Retrofits	$3,816	$20,446	5.4	$82	$133	$3,601	10
Juvenile Detention Center	2.02.02.0	Y	Lighting Upgrades - LED	$13,869	$132,310	9.5	$11,258	$2,611	$0	14.5
Juvenile Detention Center	02.02.03	Y	Replace RTU 4 & 10	$2,507	$113,307	45.2	$959	$1,548	$0	20
Juvenile Detention Center	02.02.04	Y	Optimize Boiler Operation	$406	$12,138	29.9	$0	$406	$0	NA
Juvenile Detention Center	02.02.05	Y	Building Automation Expansion	$985	$86,257	87.6	$985	$0	$0	NA
Juvenile Detention Center	02.02.07	Y	Weatherization	$691	$6,947	10.1	$691	$0	$0	5
Police Headquarters	02.03.01	Y	Water Conservation Retrofits	$4,003	$17,271	4.3	$57	$247	$3,699	10
Police Headquarters	02.03.02	Y	Cooling Tower MakeUp Metering	$7,177	$38,762	5.4	$0	$0	$7,177	25
Police Headquarters	2.03.03.0	Y	Lighting Upgrades - LED	$36,471	$502,431	13.8	$28,727	$7,744	$0	14.5
Police Headquarters	02.03.04	Y	Replace Chiller	$9,134	$581,310	63.6	$5,830	$3,304	$0	15
Police Headquarters	02.03.05	Y	Convert CT to Closed Loop	$1,322	$305,330	231.0	$0	$1,322	$0	25
Police Headquarters	02.03.07	Y	Move & Add Server Room HVAC	$1,072	$66,287	61.8	$412	$661	$0	20
Police Headquarters	02.03.08	Y	Building Automation Expansion	$12,249	$198,331	16.2	$12,249	$0	$0	NA
Police Headquarters	02.03.10	Y	Weatherization	$808	$10,437	12.9	$808	$0	$0	5
First Police Precinct	2.04.01.0	Y	Water Conservation Retrofits	$866	$7,727	8.9	$43	$56	$767	10
First Police Precinct	04.01.02	Y	Lighting Upgrades - LED	$5,808	$41,193	7.1	$4,834	$974	$0	14.5
First Police Precinct	2.04.01.0	Y	Building Automation Installation	$0	$17,847	N/A	$0	$0	$0	NA
First Police Precinct	2.04.01.0	Y	Weatherization	$713	$4,969	7.0	$713	$0	$0	5
Second Police Precinct	2.04.02.0	Y	Water Conservation Retrofits	$701	$8,990	12.8	$37	$66	$598	10
Second Police Precinct	04.02.02	Y	Lighting Upgrades - LED	$8,023	$127,887	15.9	$6,390	$1,633	$0	14.5
Second Police Precinct	2.04.02.0	Y	Replace Old RTU	$4,567	$187,322	41.0	$1,858	$2,709	$0	20
Second Police Precinct	2.04.02.0	Y	Weatherization	$1,800	$13,946	7.7	$1,800	$0	$0	5
Third Police Precinct	04.03.02	Y	Lighting Upgrades - LED	$6,109	$65,304	10.7	$4,568	$1,541	$0	14.5
Third Police Precinct	2.04.03.0	Y	Replace Split System Cooling Units	$2,072	$209,737	101.2	$1,858	$215	$0	20
Third Police Precinct	2.04.03.0	Y	Building Automation Expansion	$0	$0	N/A	$0	$0	$0	NA
Third Police Precinct	2.04.03.0	Y	Weatherization	$732	$5,811	7.9	$732	$0	$0	5
Third Police Precinct	2.04.03.0	Y	Ceiling Insulation	$871	$2,279	2.6	$871	$0	$0	50
Engine Co. #1	05.01.02	Y	Lighting Upgrades - LED	$3,184	$35,030	11.0	$3,114	$70	$0	14.5
Engine Co. #1	2.05.01.0	Y	Building Automation Installation	$346	$14,657	42.3	$346	$0	$0	NA
Engine Co. #1	2.05.01.0	Y	Weatherization	$187	$13,166	70.4	$187	$0	$0	5
Engine Co. #5	2.05.02.0	Y	Water Conservation Retrofits	$371	$4,155	11.2	$75	$28	$268	10
Engine Co. #5	05.02.02	Y	Lighting Upgrades - LED	$3,373	$27,711	8.2	$2,966	$407	$0	14.5
Engine Co. #5	2.05.02.0	Y	Building Automation Installation	$129	$14,577	112.6	$129	$0	$0	NA
Engine Co. #5	2.05.02.0	Y	Weatherization	$329	$8,231	25.0	$329	$0	$0	5
Engine Co. #5	2.05.02.0	Y	Window Replacement/Upgrade	$333	$31,343	94.2	$333	$0	$0	30
Engine Co. #6	2.05.03.0	Y	Water Conservation Retrofits	$358	$3,479	9.7	$74	$24	$260	10
Engine Co. #6	05.03.02	Y	Lighting Upgrades - LED	$2,106	$21,110	10.0	$1,928	$179	$0	14.5
Engine Co. #6	2.05.03.0	Y	Building Automation Installation	$160	$14,588	91.3	$160	$0	$0	NA
Engine Co. #6	2.05.03.0	Y	Weatherization	$469	$6,297	13.4	$469	$0	$0	5
Engine Co. #6	2.05.03.0	Y	Insulate Windows - Thermal Panels	$160	$3,952	24.7	$160	$0	$0	50

Building Location	FIM #	Rec.	FIM DESCRIPTION	SAVINGS	COST	SPB (YEARS)	DOLLAR AMOUNT ($)	DOLLAR AMOUNT $	DOLLAR AMOUNT $	Useful Life
Engine Co. #8	2.05.04.0	Y	Water Conservation Retrofits	$275	$2,575	9.4	$48	$19	$208	10
Engine Co. #8	05.04.02	Y	Lighting Upgrades - LED	$1,242	$8,131	6.5	$954	$288	$0	14.5
Engine Co. #8	2.05.04.0	Y	Building Automation Installation	$143	$14,582	102.0	$143	$0	$0	NA
Engine Co. #8	2.05.04.0	Y	Weatherization	$756	$10,296	13.6	$756	$0	$0	5
Engine Co. #8	2.05.04.0	Y	Add Insulation - Thermal Ceilings	$340	$1,586	4.7	$340	$0	$0	50
Engine Co. #11	05.05.02	Y	Lighting Upgrades - LED	$3,348	$28,181	8.4	$2,978	$370	$0	14.5
Engine Co. #11	2.05.05.0	Y	Building Automation Installation	$138	$14,580	105.4	$138	$0	$0	NA
Engine Co. #11	2.05.05.0	Y	Weatherization	$723	$12,801	17.7	$723	$0	$0	5
Engine Co. #11	2.05.05.0	Y	Add Insulation - Thermal Ceilings	$301	$1,572	5.2	$301	$0	$0	50
Engine Co. #12	2.05.06.0	Y	Water Conservation Retrofits	$138	$1,821	13.2	$62	$11	$65	10
Engine Co. #12	05.06.02	Y	Lighting Upgrades - LED	$2,063	$13,967	6.8	$1,554	$510	$0	14.5
Engine Co. #12	2.05.06.0	Y	Building Automation Installation	$154	$14,586	94.4	$154	$0	$0	NA
Engine Co. #12	2.05.06.0	Y	Weatherization	$336	$9,207	27.4	$336	$0	$0	5
Engine Co. #12	2.05.06.0	Y	Ceiling Insulation	$1,679	$9,869	5.9	$1,679	$0	$0	50
Engine Co. #14	05.07.02	Y	Lighting Upgrades - LED	$2,097	$18,439	8.8	$1,608	$489	$0	14.5
Engine Co. #14	2.05.07.0	Y	Resize & Replace split systems	$657	$79,857	121.6	$108	$549	$0	20
Engine Co. #14	2.05.07.0	Y	Building Automation Installation	$138	$14,580	105.4	$138	$0	$0	NA
Engine Co. #14	2.05.07.0	Y	Weatherization	$1,085	$11,554	10.6	$1,085	$0	$0	5
Engine Co. #14	2.05.07.0	Y	Add Insulation - Thermal Ceilings	$65	$389	6.0	$65	$0	$0	50
Engine Co. #15	2.05.08.0	Y	Water Conservation Retrofits	$301	$4,221	14.0	$44	$30	$227	10
Engine Co. #15	05.08.02	Y	Lighting Upgrades - LED	$4,728	$30,445	6.4	$3,835	$894	$0	14.5
Engine Co. #15	2.05.08.0	Y	Building Automation Installation	$138	$14,580	105.4	$138	$0	$0	NA
Engine Co. #15	2.05.08.0	Y	Weatherization	$554	$6,775	12.2	$554	$0	$0	5
Engine Co. #15	2.05.08.0	Y	Add Insulation - Thermal Ceilings	$6,608	$39,723	6.0	$6,608	$0	$0	50
Engine Co. #18	2.05.09.0	Y	Water Conservation Retrofits	$268	$2,852	10.6	$41	$25	$202	10
Engine Co. #18	05.09.02	Y	Lighting Upgrades - LED	$1,837	$23,211	12.6	$1,410	$427	$0	14.5
Engine Co. #18	2.05.09.0	Y	Replace Old Split Systems	$2,812	$58,084	20.7	$160	$2,652	$0	20
Engine Co. #18	2.05.09.0	Y	Building Automation Installation	$93	$14,563	156.8	$93	$0	$0	NA
Engine Co. #18	2.05.09.0	Y	Weatherization	$638	$11,233	17.6	$638	$0	$0	5
Engine Co. #18	2.05.09.0	Y	Add Insulation - Thermal Ceilings	$280	$1,564	5.6	$280	$0	$0	50
Engine Co. #19	2.05.10.0	Y	Water Conservation Retrofits	$555	$2,681	4.8	$65	$19	$470	10
Engine Co. #19	05.10.02	Y	Lighting Upgrades - LED	$2,005	$14,555	7.3	$1,859	$147	$0	14.5
Engine Co. #19	2.05.10.0	Y	Convert DHW heater to Tankless Nat. Gas	$176	$7,092	40.3	$102	$74	$0	10
Engine Co. #19	2.05.10.0	Y	Optimize Boiler Operation	$740	$12,095	16.3	$0	$740	$0	NA
Engine Co. #19	2.05.10.0	Y	Building Automation Installation	$143	$14,582	102.0	$143	$0	$0	NA
Engine Co. #19	2.05.10.0	Y	Weatherization	$652	$9,365	14.4	$652	$0	$0	5
Engine Co. #19	2.05.10.0	Y	Add Insulation - Thermal Ceilings	$340	$1,586	4.7	$340	$0	$0	50
Engine Co. #20	2.05.11.0	Y	Water Conservation Retrofits	$309	$3,014	9.7	$65	$19	$225	10
Engine Co. #20	05.11.02	Y	Lighting Upgrades - LED	$1,124	$10,317	9.2	$926	$198	$0	14.5
Engine Co. #20	2.05.11.0	Y	Building Automation Installation	$239	$14,617	61.2	$239	$0	$0	NA
Engine Co. #20	2.05.11.0	Y	Weatherization	$516	$8,220	15.9	$516	$0	$0	5
Engine Co. #20	2.05.11.0	Y	Add Insulation - Thermal Ceilings	$340	$1,586	4.7	$340	$0	$0	50
Engine Co. #21	2.05.12.0	Y	Water Conservation Retrofits	$335	$2,746	8.2	$68	$16	$251	10
Engine Co. #21	05.12.02	Y	Lighting Upgrades - LED	$1,557	$8,418	5.4	$1,310	$247	$0	14.5
Engine Co. #21	2.05.12.0	Y	Building Automation Installation	$239	$14,617	61.2	$239	$0	$0	NA
Engine Co. #21	2.05.12.0	Y	Weatherization	$588	$8,612	14.6	$588	$0	$0	5
Engine Co. #21	2.05.12.0	Y	Add Insulation - Thermal Ceilings	$340	$1,586	4.7	$340	$0	$0	50
Engine Co. #22	2.05.13.0	Y	Water Conservation Retrofits	$462	$4,422	9.6	$87	$31	$344	10
Engine Co. #22	05.13.02	Y	Lighting Upgrades - LED	$1,808	$17,203	9.5	$1,612	$196	$0	14.5
Engine Co. #22	2.05.13.0	Y	Building Automation Installation	$357	$14,661	41.1	$357	$0	$0	NA
Engine Co. #22	2.05.13.0	Y	Weatherization	$617	$11,869	19.2	$617	$0	$0	5
Engine Co. #23	2.05.14.0	Y	Water Conservation Retrofits	$441	$4,240	9.6	$89	$31	$320	10
Engine Co. #23	05.14.02	Y	Lighting Upgrades - LED	$2,109	$22,718	10.8	$2,015	$94	$0	14.5
Engine Co. #23	2.05.14.0	Y	Building Automation Installation	$370	$14,666	39.7	$370	$0	$0	NA
Engine Co. #23	2.05.14.0	Y	Weatherization	$307	$12,318	40.1	$307	$0	$0	5
Engine Co. #23	2.05.14.0	Y	Add Insulation - Thermal Ceilings	$259	$1,556	6.0	$259	$0	$0	50
Engine Co. #23	2.05.14.0	Y	Window Replacement/Upgrade	$159	$15,669	98.3	$159	$0	$0	30
Engine Co. #24	05.15.02	Y	Lighting Upgrades - LED	$2,888	$27,409	9.5	$2,531	$357	$0	14.5
Engine Co. #24	2.05.15.0	Y	Resize and Replace RTU	$1,096	$54,372	49.6	$145	$951	$0	20
Engine Co. #24	2.05.15.0	Y	Building Automation Installation	$376	$14,668	39.0	$376	$0	$0	NA
Engine Co. #24	2.05.15.0	Y	Weatherization	$543	$12,203	22.5	$543	$0	$0	5
Engine Co. #24	2.05.15.0	Y	Window Replacement/Upgrade	$159	$15,669	98.3	$159	$0	$0	30
Engine Co. #25	2.05.16.0	Y	Water Conservation Retrofits	$445	$3,575	8.0	$85	$25	$335	10
Engine Co. #25	05.16.02	Y	Lighting Upgrades - LED	$2,647	$27,741	10.5	$2,053	$594	$0	14.5
Engine Co. #25	2.05.16.0	Y	ReplaceRTU Upsize for Heat	$934	$86,407	92.5	$139	$795	$0	20
Engine Co. #25	2.05.16.0	Y	Building Automation Installation	$216	$14,609	67.6	$216	$0	$0	NA
Engine Co. #25	2.05.16.0	Y	Weatherization	$635	$14,792	23.3	$635	$0	$0	5
Engine Co. #25	2.05.16.0	Y	Add Insulation - Thermal Ceilings	$259	$1,556	6.0	$259	$0	$0	50
Engine Co. #25	2.05.16.0	Y	Window Replacement/Upgrade	$319	$31,338	98.3	$319	$0	$0	30

Building Location	FIM #	Rec.	FIM DESCRIPTION	SAVINGS	COST	SPB (YEARS)	DOLLAR AMOUNT ($)	DOLLAR AMOUNT $	DOLLAR AMOUNT $	Useful Life
John Marshall Courthouse	03.01.01	Y	Water Conservation Retrofits	$6,742	$44,090	6.5	$379	$281	$6,082	10
John Marshall Courthouse	03.01.02	Y	Cooling Tower MakeUp Metering	$11,962	$46,279	3.9	$0	$0	$11,962	25
John Marshall Courthouse	3.01.03.0	Y	Lighting Upgrades - LED	$31,339	$467,143	14.9	$25,946	$5,393	$0	14.5
John Marshall Courthouse	03.01.04	Y	Replace Boilers	$8,552	$497,109	58.1	$8,348	$205	$0	25
John Marshall Courthouse	03.01.05	Y	Inspect & Repair Mixing Boxes	$3,778	$65,941	17.5	$1,535	$2,243	$0	20
John Marshall Courthouse	03.01.06	Y	Optimize Chiller Operation	$3,778	$31,939	8.5	$1,535	$2,243	$0	NA
John Marshall Courthouse	03.01.07	Y	Generator Installation	$0	$527,428	NA	$0	$0	$0	25
John Marshall Courthouse	03.01.08	Y	Building Automation Expansion	$29,964	$130,228	4.3	$29,964	$0	$0	NA
John Marshall Courthouse	03.01.09	Y	Weatherization	$354	$3,700	10.5	$354	$0	$0	5
Oliver Hill Courthouse	03.02.01	Y	Water Conservation Retrofits	$2,725	$20,718	7.6	$111	$140	$2,474	10
Oliver Hill Courthouse	3.02.02.0	Y	Lighting Upgrades - LED	$13,114	$180,324	13.8	$10,870	$2,244	$0	14.5
Oliver Hill Courthouse	03.02.03	Y	Replace Old Entry Area RTU	$1,334	$50,956	38.2	$468	$866	$0	20
Oliver Hill Courthouse	03.02.05	Y	Building Automation Expansion	$8,356	$124,666	14.9	$8,356	$0	$0	NA
Oliver Hill Courhouse	03.02.06	Y	Weatherization	$769	$5,914	7.7	$769	$0	$0	5
Broad Rock Library	04.01.04	Y	Building Automation Installation	$2,633	$19,179	7.3	$2,633	$0	$0	NA
Broad Rock Library	04.01.06	Y	Weatherization	$746	$4,768	6.4	$746	$0	$0	5
Ginter Park Library	04.02.05	Y	Building Automation Installation	$2,345	$19,072	8.1	$2,345	$0	$0	NA
Hull Street Library	4.03.02.0	Y	Lighting Upgrades - LED	$435	$7,421	17.1	$301	$134	$0	14.5
Hull Street Library	04.03.03	Y	Replace Old Split Systems	$324	$44,645	137.6	$324	$0	$0	20
Hull Street Library	04.03.04	Y	Building Automation Installation	$1,558	$18,778	12.1	$1,558	$0	$0	NA
Hull Street Library	04.03.06	Y	Weatherization	$1,366	$9,576	7.0	$1,366	$0	$0	5
North Avenue Library	4.04.02.0	Y	Lighting Upgrades - LED	$1,739	$34,659	19.9	$1,552	$187	$0	14.5
North Avenue Library	04.04.03	Y	Replace Old RTU	$383	$86,123	224.9	$383	$0	$0	20
North Avenue Library	04.04.05	Y	Building Automation Installation	$1,840	$18,883	10.3	$1,840	$0	$0	NA
North Avenue Library	04.04.07	Y	Weatherization	$408	$3,720	9.1	$408	$0	$0	5
West End Library	4.05.02.0	Y	Lighting Upgrades - LED	$2,316	$37,472	16.2	$1,763	$553	$0	14.5
West End Library	04.05.03	Y	Convert HVAC to Natural Gas	$2,096	$196,129	93.6	$1,722	$374	$0	20
West End Library	04.05.05	Y	Building Automation Installation	$2,536	$19,143	7.5	$2,536	$0	$0	NA
West End Library	04.05.07	Y	Weatherization	$681	$8,429	12.4	$681	$0	$0	5
1650 Auto Shop	5.01.02.0	Y	Lighting Upgrades - Fluorescent	$443	$8,601	19.4	$387	$57	$0	13.9
1650 Auto Shop	05.01.04	Y	Upgrade Building System for CNG Vehicle Compliance	$0	$71,902	N/A	$0	$0	$0	20
1650 Auto Shop	05.01.07	Y	Building Automation Installation	$2,572	$17,255	6.7	$2,572	$0	$0	NA
1650 Auto Shop	05.01.08	Y	Weatherization	$406	$30,722	75.6	$406	$0	$0	5
1700 Auto Shop	5.02.02.0	Y	Lighting Upgrades - LED	$3,943	$71,251	18.1	$3,353	$590	$0	14.5
1700 Auto Shop	05.02.03	Y	Replace Old Office RTU	$1,464	$52,030	35.6	$156	$1,308	$0	20
1700 Auto Shop	05.02.04	Y	Replace Paint Booth Heater	$998	$97,652	97.8	$821	$177	$0	20
1700 Auto Shop	05.02.06	Y	Building Automation Installation	$1,564	$17,570	11.2	$1,564	$0	$0	NA
1700 Auto Shop	05.02.07	Y	Weatherization	$1,448	$31,854	22.0	$1,448	$0	$0	5
Southside Operations	05.03.01	Y	Water Conservation Retrofits	$888	$11,098	12.5	$79	$66	$742	10
Southside Operations	5.03.02.0	Y	Lighting Upgrades - LED	$4,608	$48,931	10.6	$4,107	$501	$0	14.5
Southside Operations	05.03.03	Y	Replace Assembly/ Maint. Split Systems	$3,797	$96,702	25.5	$390	$3,408	$0	20
Southside Operations	05.03.06	Y	Upgrade 3502 for CNG Vehicle Compliance	$0	$56,674	NA	$0	$0	$0	20
Southside Operations	05.03.07	Y	Building Automation Installation	$1,325	$17,638	13.3	$1,325	$0	$0	NA
Southside Operations	05.03.08	Y	Weatherization	$2,565	$23,775	9.3	$2,565	$0	$0	5
All Buildings	06.01.00	Y	CMMS	$343,912	$215,283	0.6	$0	$343,912	$0	5
All Buildings	06.02.00	Y	Energy and Sustainability Standards and Guidelines	$28,500	$15,393	0.5	$0	$28,500	$0	NA
All Buildings	06.03.00	Y	Energy Conservation and Awareness Training	$28,500	$10,262	0.4	$0	$28,500	$0	NA
All Buildings	06.04.00	Y	Project Development	$0	$711,559	NA	$0	$0	$0	NA
All Buildings	06.05.00	Y	Project Implementation	$0	$710,914	NA	$0	$0	$0	NA
All Buildings	06.06.00	Y	M&V Setup	$0	$47,475	NA	$0	$0	$0	NA
			Project Total FIMs	**$1,463,077**	**$21,700,702**	**14.83**	**$820,332**	**$570,825**	**$71,920**	
			Project Recommended FIMs	**$1,068,014**	**$13,531,272**	**12.67**	**$500,266**	**$497,381**	**$70,367**	
			On-Going Service							
	3.00	Y	Energy Conservation and Awareness Training		$8,737					
	6.00	Y	Annual M&V Year 1		$67,777					
	7.00	Y	Annual M&V Year 2+		$35,673					
			Total On-Going Service - Year One	**$0**	**$76,514**	**N/A**	**$0**	**$0**	**$0**	
			Total On-Going Service - Year Two / On-Going	**$0**	**$44,410**	**N/A**	**$0**	**$0**	**$0**	

Note: A "*Y*" indicates improvements that require capital infusion to conform to the MOU financial terms.

SIEMENS

Cash Flow: Technical and Energy Savings Audit Report – with Capital Infusion

YEAR	Construction	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	TOTAL
PROGRAM BENEFITS																	
Utilities Savings	$ 144,731	$ 570,633	$ 587,752	$ 605,384	$ 623,546	$ 642,252	$ 661,520	$ 681,365	$ 701,806	$ 722,860	$ 744,546	$ 766,883	$ 789,889	$ 813,586	$ 837,993	$ 863,133	$10,757,880
Operational Savings		$ 497,381	$ 512,273	$ 527,642	$ 543,471	$ 559,775	$ 477,247	$ 491,565	$ 506,311	$ 521,501	$ 537,146	$ 509,572	$ 524,859	$ 540,604	$ 556,823	$ 573,527	$ 7,879,697
Capital Avoidance Savings	$ 3,200,000																$ 3,200,000
Rebates	$ -																$ -
Annual Total Benefits	$ 3,344,731	$ 1,068,014	$ 1,100,025	$ 1,133,026	$ 1,167,017	$ 1,202,027	$ 1,138,767	$ 1,172,930	$ 1,208,118	$ 1,244,361	$ 1,281,692	$ 1,276,454	$ 1,314,748	$ 1,354,190	$ 1,394,816	$ 1,436,660	$21,837,577
Cumulative Benefit	$ 3,344,731	$ 4,412,745	$ 5,512,770	$ 6,645,796	$ 7,812,813	$ 9,014,840	$ 10,153,607	$ 11,326,537	$ 12,534,654	$ 13,779,016	$ 15,060,708	$ 16,337,162	$ 17,651,910	$ 19,006,100	$ 20,400,916	$ 21,837,577	
PROGRAM COSTS																	
Project Down Payment	$ 3,200,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,200,000
Financing Payments	$ -	$ 803,500	$ 860,643	$ 886,462	$ 913,056	$ 940,448	$ 869,340	$ 895,420	$ 922,283	$ 949,951	$ 978,450	$ 964,115	$ 993,038	$ 1,022,829	$ 1,053,514	$ 931,888	$13,984,938
Ongoing Energy and PM Services	$ -	$ 76,514	$ 45,742	$ 47,114	$ 48,528	$ 49,984	$ 51,483	$ 53,028	$ 54,619	$ 56,257	$ 57,945	$ 59,683	$ 61,474	$ 63,318	$ 65,217	$ 67,174	$ 858,080
Service Allowance		$ 188,000	$ 193,640	$ 199,449	$ 205,433	$ 211,596	$ 217,944	$ 224,482	$ 231,216	$ 238,153	$ 245,297	$ 252,656	$ 260,236	$ 268,043	$ 276,084	$ 284,367	$ 3,496,596
Annual Gross Costs	$ 3,200,000	$ 1,068,014	$ 1,100,026	$ 1,133,026	$ 1,167,017	$ 1,202,027	$ 1,138,767	$ 1,172,930	$ 1,208,118	$ 1,244,361	$ 1,281,692	$ 1,276,454	$ 1,314,748	$ 1,354,190	$ 1,394,816	$ 1,283,429	$21,539,614
Cumulative Costs	$ 2,650,000	$ 3,718,014	$ 4,818,039	$ 5,951,065	$ 7,118,082	$ 8,320,109	$ 9,458,876	$ 10,631,806	$ 11,839,924	$ 13,084,285	$ 14,365,977	$ 15,642,431	$ 16,957,179	$ 18,311,369	$ 19,706,185	$ 20,989,614	
CASH FLOW																	
Net Program Benefit	$ 144,731	$ 0	$ (0)	$ (0)	$ (0)	$ (0)	$ 0	$ 0	$ (0)	$ (0)	$ 0	$ (0)	$ (0)	$ (0)	$ 0	$ 153,231	$ 297,962
Cumulative Net Benefit	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 297,962	

Financial Summary	
Program Cost	$13,531,272
Construction Capital Avoidance Down Payment	$ 3,200,000
Primary Financing	$10,331,272
On-Going Services.	$ 76,514
On-Going Services - Year Two	$ 45,742
Finance Rate - Primary Source	3.65%
Average Weighted useful Life	17
Term (Years)	15.0
Energy Escalation	3.0%
Operational Escalation	3.0%
Service Escalation	3.0%

Cash Flow: Technical and Energy Savings Audit Report – without Capital Infusion

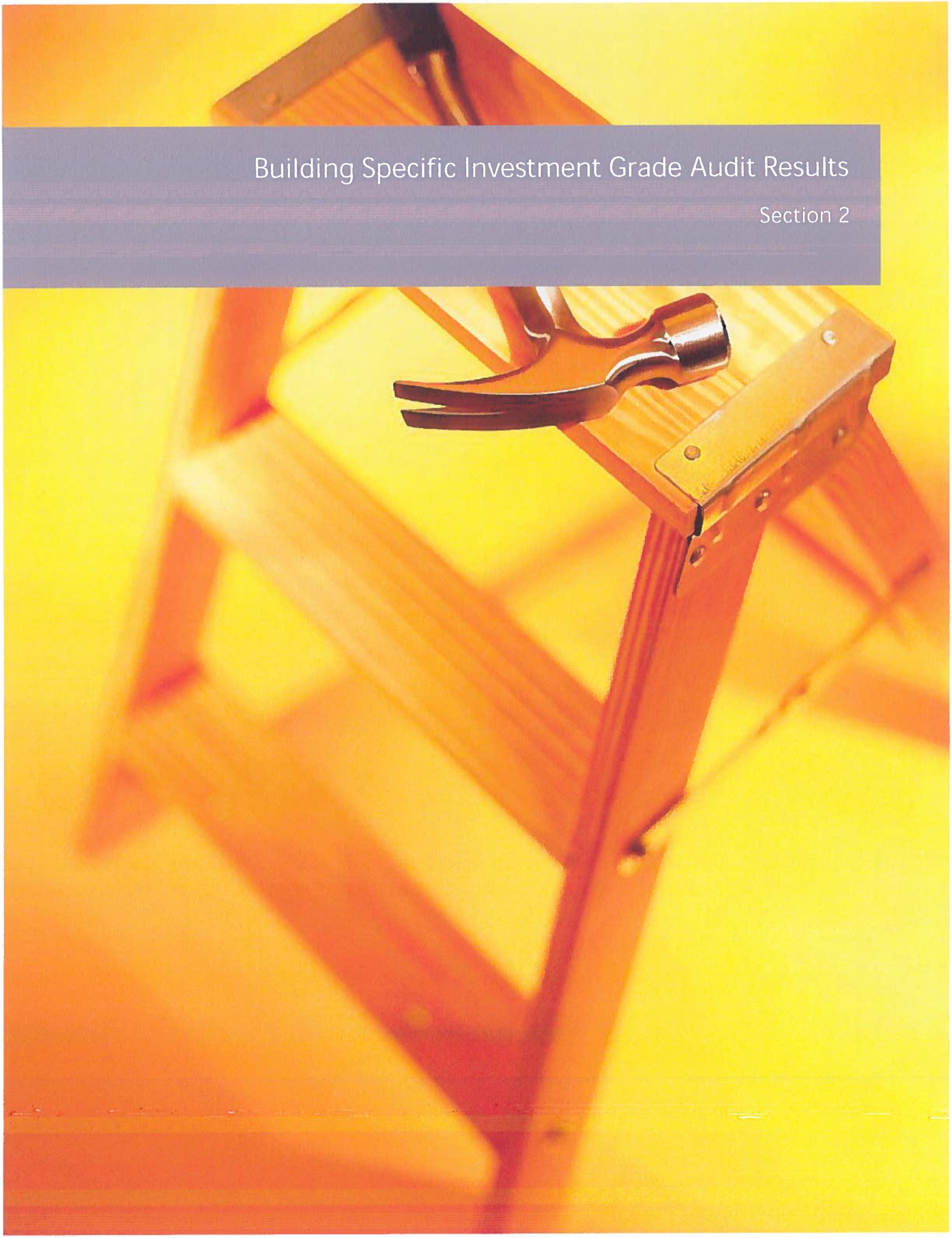
YEAR	Construction	1.0	2.0	3.0	4.0	5.0	6.0	7.0
PROGRAM BENEFITS								
Utilities Savings	$ 144,731	$ 556,907	$ 573,615	$ 590,823	$ 608,548	$ 626,804	$ 645,608	$ 664,977
Operational Savings		$ 482,250	$ 496,688	$ 511,589	$ 526,937	$ 542,745	$ 462,846	$ 476,732
Capital Avoidance Savings	$ 1,300,000							
Rebates	$ -							
Annual Total Benefits	$ 1,444,731	$ 1,039,157	$ 1,070,303	$ 1,102,412	$ 1,135,484	$ 1,169,549	$ 1,108,456	$ 1,141,708
Cumulative Benefit	$ 1,444,731	$ 2,483,888	$ 3,554,191	$ 4,656,603	$ 5,792,088	$ 6,961,637	$ 8,070,092	$ 9,211,800
PROGRAM COSTS								
Project Down Payment	$ 1,300,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Financing Payments	$ -	$ 774,644	$ 830,921	$ 855,848	$ 881,524	$ 907,970	$ 839,028	$ 864,199
Ongoing Energy and PM Services	$ -	$ 76,514	$ 45,742	$ 47,114	$ 48,528	$ 49,984	$ 51,483	$ 53,028
Service Allowance		$ 188,000	$ 193,640	$ 199,449	$ 205,433	$ 211,596	$ 217,944	$ 224,482
Annual Gross Costs	$ 1,300,000	$ 1,039,157	$ 1,070,303	$ 1,102,412	$ 1,135,484	$ 1,169,549	$ 1,108,456	$ 1,141,708
Cumulative Costs	$ 1,300,000	$ 2,339,157	$ 3,409,460	$ 4,511,873	$ 5,647,357	$ 6,816,906	$ 7,925,361	$ 9,067,069
CASH FLOW								
Net Program Benefit	$ 144,731	$ (0)	$ 0	$ (0)	$ (0)	$ (0)	$ (0)	$ (0)
Cumulative Net Benefit	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731

YEAR	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	TOTAL
PROGRAM BENEFITS									
Utilities Savings	$ 684,926	$ 705,474	$ 726,638	$ 748,437	$ 770,890	$ 794,017	$ 817,837	$ 842,373	$10,502,505
Operational Savings	$ 491,034	$ 505,765	$ 520,938	$ 507,796	$ 523,029	$ 538,720	$ 554,882	$ 571,528	$ 7,713,478
Capital Avoidance Savings									$ 1,300,000
Rebates									$ -
Annual Total Benefits	$ 1,176,960	$ 1,211,238	$ 1,247,576	$ 1,256,233	$ 1,293,920	$ 1,332,737	$ 1,372,719	$ 1,413,901	$19,516,083
Cumulative Benefit	$ 10,387,760	$ 11,598,998	$ 12,846,574	$ 14,102,806	$ 15,396,726	$ 16,729,463	$ 18,102,182	$ 19,516,083	
PROGRAM COSTS									
Project Down Payment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,300,000
Financing Payments	$ 890,125	$ 916,828	$ 944,333	$ 943,893	$ 972,210	$ 1,001,376	$ 1,031,417	$ 1,002,466	$13,656,782
Ongoing Energy and PM Services	$ 54,619	$ 56,257	$ 57,945	$ 59,683	$ 61,474	$ 63,318	$ 65,217	$ 67,174	$ 858,080
Service Allowance	$ 231,216	$ 238,153	$ 245,297	$ 252,656	$ 260,236	$ 268,043	$ 276,084	$ 284,367	$ 3,496,596
Annual Gross Costs	$ 1,176,960	$ 1,211,238	$ 1,247,576	$ 1,256,233	$ 1,293,920	$ 1,332,737	$ 1,372,719	$ 1,354,007	$19,311,459
Cumulative Costs	$ 10,243,029	$ 11,454,267	$ 12,701,843	$ 13,958,075	$ 15,251,995	$ 16,584,732	$ 17,957,452	$ 19,311,459	
CASH FLOW									
Net Program Benefit	$ (0)	$ 0	$ (0)	$ 0	$ 0	$ 0	$ (0)	$ 69,894	$ 204,625
Cumulative Net Benefit	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 144,731	$ 204,625	

Financial Summary	
Program Cost	$11,365,149
Construction Capital Avoidance Down Payment	$ 1,300,000
Primary Financing	$10,065,149
On-Going Services	$ 76,514
On-Going Services - Year Two	$ 45,742
Finance Rate - Primary Source	3.65%
Average Weighted useful Life	16
Term (Years)	15.0
Energy Escalation	3.0%
Operational Escalation	3.0%
Service Escalation	3.0%

Building Specific Investment Grade Audit Results

Section 2



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Note: The following sections present the findings and recommendations for each building grouped by building type. Each building type section has been independently number to allow the section to stand independently if needed.

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GENERAL OVERVIEW

Following is a building by building summary of the findings, recommended Facility Improvement Measures (FIMs), costs and expected savings resulting from the Investment Grade Audit (IGA). These results are based on review of the utility data available for each building, detailed Siemens examination of the building and energy using equipment, review of building operations and history and discussion with building occupants and City maintenance staff. Based on Siemens' findings, specific energy and operation improvements have been identified, the cost of implementation developed and resulting energy and operating savings estimated.

Siemens uses the term Facility Improvement Measures (FIMs) to encompass both improvements which provide energy savings (Energy Conservation Measures or ECMs) as well as improvements that provide non-energy related savings to the City. These savings may include water savings, operation and maintenance savings or capital savings. FIMs may also include improvements that provide other benefits to the City such as increased building or systems reliability and improved use of resources such as building space. The use of the term FIM in this report is consistent with the use of the term in the previous Back of the Envelope Report and Preliminary Findings Report submitted to the City.

Methodology

The FIMs listed for each building in this section are those judged by Siemens to be applicable, feasible and economical for the specific building or situation. FIMs were also included where a specific need was identified or where City staff indicated a particular interest or plan to pursue the item for the building. Recommended FIMs were also coordinated with City capital improvement plans. The FIMs recommended for each building were also evaluated and coordinated between buildings to develop the most beneficial total project for the City covering all 35 buildings. As a result, some FIMs may not always show attractive payback individually but when taken as a group with all other buildings included in the project meets the overall economic criteria for the project.

There are some FIMs that are directly related to changes in facility use over time. Siemens has identified these corrections and included them in the initial project. Over time and without proper maintenance, the savings from onetime improvements will deteriorate. Because of this gradual reduction, the guaranteed savings also should be reduced. A lifecycle service plan is a solution to avoid the reduction. With ongoing service, a continuous focus on energy savings and sustainability will identify and then correct negative impacts to savings. With a lifecycle service plan, the highest level of guaranteed savings can be maintained throughout the contract.

As shown in the Table of Contents above for this section, Siemens has grouped the buildings included in the audit by type of building and use. This grouping allows better visibility and comparison of the types of FIMs applicable to each similar group of buildings. It also allows for ease of comparison between the buildings and comparison of the buildings' energy efficiency to that of similar buildings using benchmarks developed by the U.S. Environmental Protection Agency and the U.S. Department of Energy through the Energy Star Buildings program and the Commercial Building Energy Consumption Survey (CBECS).

Measures Evaluated

The Memorandum of Understanding between Siemens and the City for performance of the IGA lists categories of ECM that are to be evaluated as a minimum during the IGA. Siemens has reviewed the ECM categories listed and determined the applicability and projected payback range for each. The results of this review are provided in the Preliminary Findings Report dated March 2015.

These categories are not specific enough in many cases to be of use in evaluating the improvements identified and are not inclusive of all the potential FIMs that could be of benefit to the City. To provide a more detailed preliminary evaluation of the buildings and better identify specific applicable FIMs recommended for inclusion in the IGA, Siemens performed a specific review of each building and identified specific recommended FIMs.

Siemens has also identified a number of recommended improvement measures that are general support programs to the City and all buildings included in this audit. These general recommended measures, costs and savings are listed later in this section of this report.

Utility Use & Costs

The assessment performed by Siemens for this audit included a detailed analysis of utility cost and consumption data. Data supplied by the City of Richmond for approximately 3 years of energy and water use were reviewed. In addition, Siemens coordinated with the City of Richmond staff to obtain the most recent 12 months of 30 minute electric interval use data for those buildings where interval data was available in order to evaluate how energy is currently being utilized and how efficient the building is currently operating.

The data analyzed, as well as the utilities and utility rates applicable to the City of Richmond buildings included in this assessment, is listed below.

Utility Data Analyzed

	Supplier	Rate Schedule	Beginning Bill Date	Ending Bill Date
Electricity	Dominion Virginia Power	100, 110, 130, 131, GS-1, GS-2, 150	December 14, 2011	April 14, 2015
Natural Gas	City of Richmond DPU	MGS, GS, FS, LVS	December 9, 2011	January 29, 2015
Water & Sewer	City of Richmond DPU	Commercial	December 9, 2011	January 29, 2015

Dominion Virginia Power supplies electricity to the City of Richmond under a private contractual agreement with the Virginia Energy Purchasing Governmental Association (VEPGA). As such, it is not subject to Virginia State Corporation Commission approval nor does it include all of the charges and rebate programs included in Dominion's jurisdictional rates. The City owned natural gas and water/ Sewer utilities provide these corresponding utilities to the city. The applicable rates for the City are typically similar to the commercial retail utility rates. A copy of the most current version of the rates is included in the appendices to this report. These rates reflect recent changes and additions to this schedule that became effective August 1, 2014.

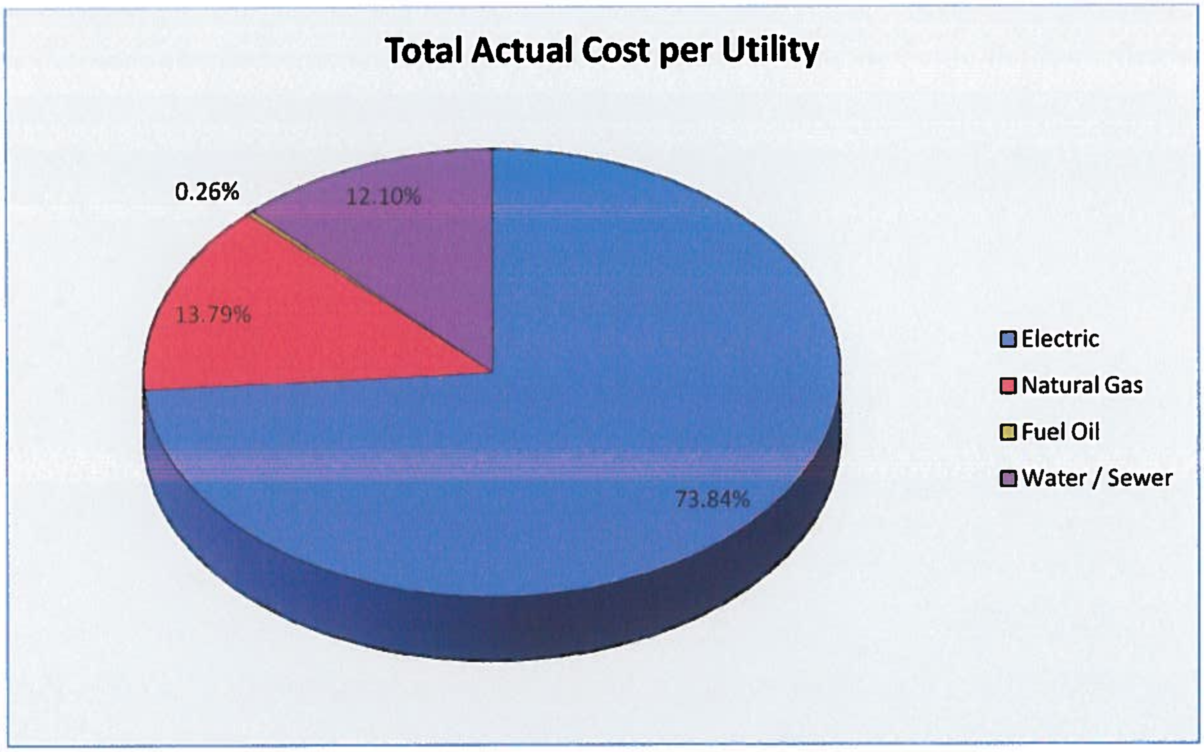
Baseline Period

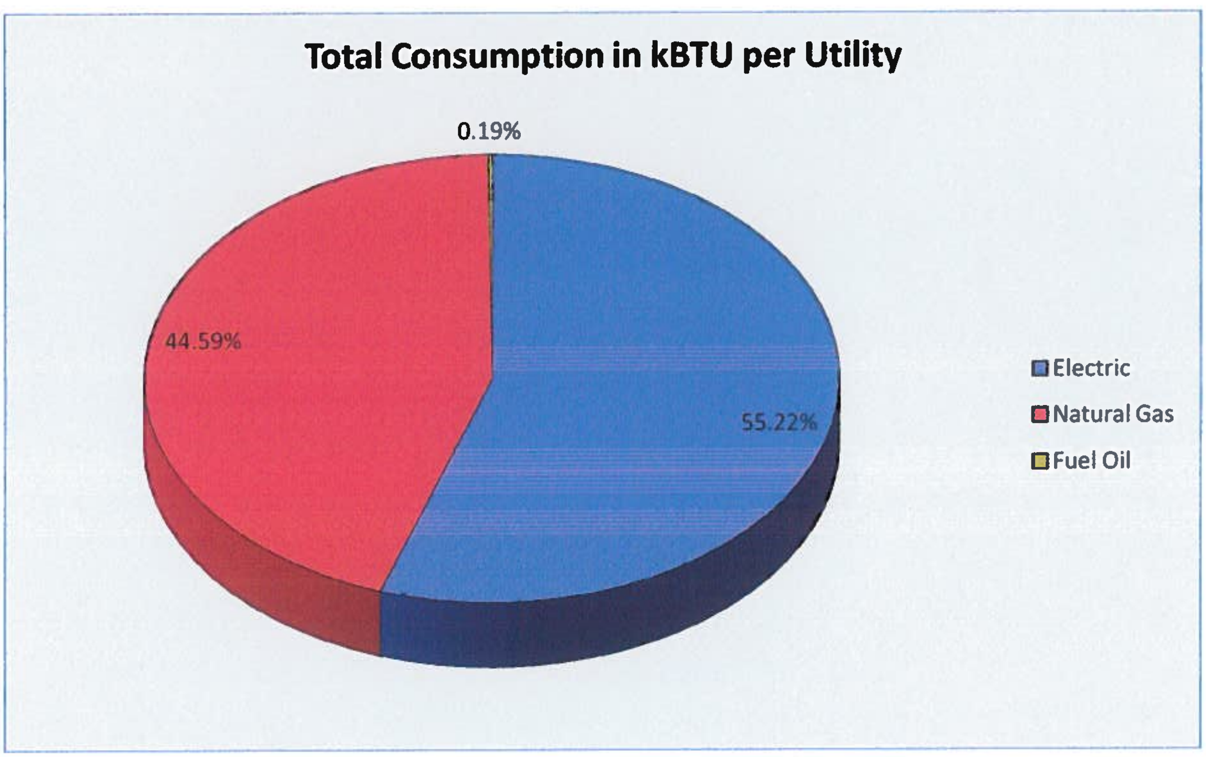
Siemens reviewed utility data representing the periods indicated in the table above in order to obtain the best understanding of electricity, natural gas, and water consuming patterns. Because of billing mismatches between the various utility billing periods and the need to capture the most current use patterns for each utility, Siemens developed separate baselines for each utility that included the last full 12 months of data for that utility. A summary of the baseline utility use is shown in the following table.

The breakdown of both utility cost and energy use by utility are shown in the charts which follow. As these charts show, electricity accounts for the majority of both energy costs and energy use for the buildings included in this assessment.

City of Richmond Facilities Audited
Baseline Utility Use

	Actual Cost	Percent of Total
Total Energy Cost	$2,469,375	
Electric Cost	$1,894,476	76.72%
Natural Gas Cost	$567,663	22.99%
Fuel Oil	$7,237	0.29%
Energy Use	150,247 MMBTU	
Electric Consumption (kWh)	25,813,797	58.64%
Natural Gas Consumption (Mcf)	61,861	41.47%
Fuel Oil (gallons)	2,050	0.19%
Water & Sewer Cost	$ 388,066	
Annual Water Use (ccf)	33,942	


Total Actual Cost per Utility
0.26%
12.10%
13.79%
73.84%
Electric
Natural Gas
Fuel Oil
Water / Sewer


Total Consumption in kBTU per Utility
0.19%
44.59%
55.22%
Electric
Natural Gas
Fuel Oil

Weather Impacts

One of the most critical variables that determine the amount of energy used by a building is weather, particularly weather conditions such as temperature, winds and cloud cover. Weather is the main factor which determines the amount of heating and cooling energy, the two major components of energy use, used by the building during the year. To a lesser extent, outdoor conditions also impact the amount of energy needed for domestic hot water heating, due to affects on incoming domestic water temperature.

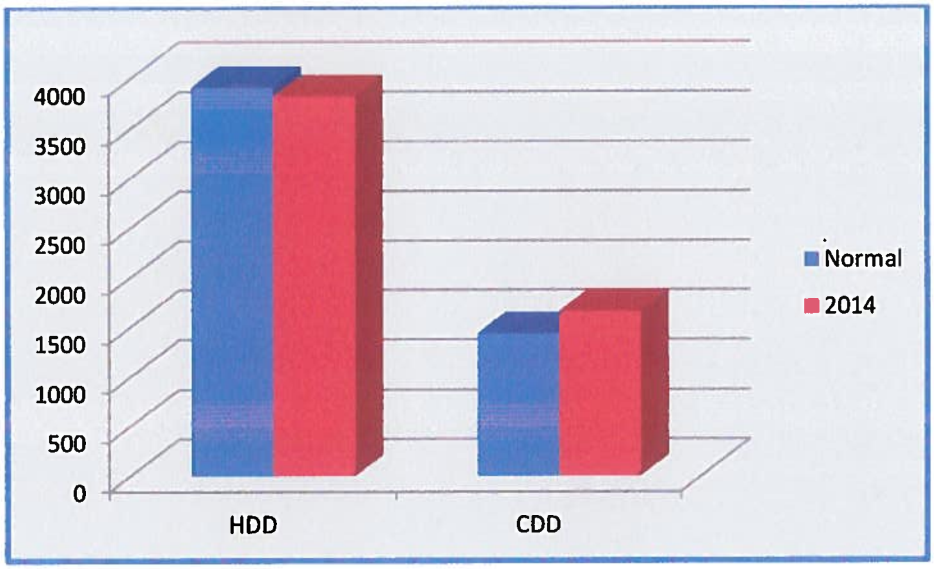
Electric and natural gas consumption are highly dependent upon weather conditions since they supply the heating and cooling energy for the facility. 'Degree Days' are an engineering measure used as a simple metric to quantify the time and amount of heating and cooling generally needed as a result of outdoor temperature conditions throughout the course of a year. As a result Heating Degree Days (HDD) and Cooling Degree Days (CDD) may be used to account for differing weather conditions between comparison periods. Degrees days are determined by calculating the average daily temperature over an extended historical period. This average temperature is subtracted from a defined base temperature, typically 65 degrees Fahrenheit. The base temperature represents the approximate break-even temperature between heating and cooling. The net difference between the average daily temperature and the base temperature define the number of degree days for that 24 hour period. Comparison of energy use under actual HDD and CDD data to 30 year HDD and CDD averages can be used to adjust energy calculations for normal or specific weather conditions.

Weather conditions for the Richmond area for calendar year 2014 are shown in the chart below. These conditions were based on weather as reported by the website www.degreedays.net using Station ID "KRIC" for the Richmond International Airport, VA, US Station. Additionally, the Normal Degree Days values were calculated using data from the NOAA National Centers for Environmental Information website. In this chart, "Normal" represents the long term thirty year average for the data.

As shown in these charts, heating degree days averaged about 4.5% above normal for calendar year 2014. Cooling degree days averaged about 5.2% above normal for the period. These variances are not significantly large enough to affect the recommendations or estimated savings results of the BOE analyses but will be accounted for in the investment grade audit.

In the analyses which follow for the City of Richmond, electric energy use will be evaluated in relation to cooling degree days, since electricity use variations in the facility are mainly driven by electric space cooling demands. Natural gas use will be evaluated in relation to heating degree days driven by space heating demands.

Richmond Area 2014 Weather Data



Utility Rates

Utility rates applicable to the buildings included in this audit are summarized in APPENDIX B.

Both the magnitude and structure of the utility rates applied to the utilities used by a building can have a significant impact on the economic viability of facility improvements. In particular, the average blended rate calculated for a utility can significantly vary from the marginal rate, or rate paid for the last unit used or first unit added, making marginal rates more accurate under certain conditions for estimating savings. The rates applied to the City of Richmond for calculations and economic analysis and the assumptions used for this analysis are summarized below. These rates were derived by applying current rate schedules to the baseline actual billed monthly energy use and demand.

The rates applicable during the period in which the audit was performed were used to calculate both average and marginal rates for the utility services provided to the City of Richmond. These rates can vary significantly depending on energy use and the structure of the rate schedule. Average rates are accurate in estimating savings when the energy improvement is a major component of the overall energy use on the account. Marginal rates reflect the cost of the last energy unit used on the account and are more accurate for estimating savings when the improvement is only a small portion of the overall load of the account. Marginal and average rates were calculated for the City of Richmond by modeling the rate structure, applying baseline usage and varying the last increments of billed usage. The results were used to accurately value the saving from the improvement measures identified.

Using the marginal rate approach to calculate savings, each building may have its own slightly different marginal savings rate based on the rate schedule under which it is served and its energy use. The marginal rates used to calculate savings for each building are identified in the detailed findings discussion for each building.

Siemens was informed by the City on July 1, 2015 that City utility rates were increased effective that date by the following percentages:

GAS UTILITY	4%
WATER UTILITY	6%
WASTEWATER UTILITY	4%

These increases have not been incorporated into the discussion of rates and marginal costs in the building sections due to the late receipt of this information. However, they have been incorporated into the calculated savings for each facility improvement measure.

Building Benchmarking

Benchmarking is the direct comparison of energy use, costs, or intensities. Benchmarking is a methodology that quantifies energy utilization and cost, per square foot per year. Benchmark data can be used to compare the characteristics of one building to another. It is a useful and industry standard method of quantifying the opportunity for energy conservation that exists.

Utility Cost Index (UCI) and Energy Usage Index (EUI) are indications of how efficiently the building actually performs. They are calculated based on the total cost of energy and the total energy consumed, relative to the area of space served. The national median EUI is a recommended benchmark metric for all buildings. The median value is the middle of the national population – half of buildings use more energy, half use less. The median works better than the mean (arithmetic average) for comparing relative energy performance, because it more accurately reflects the mid-point of energy use for most property types. Typical EUIs for the building groups included in the audit are listed in the following table.

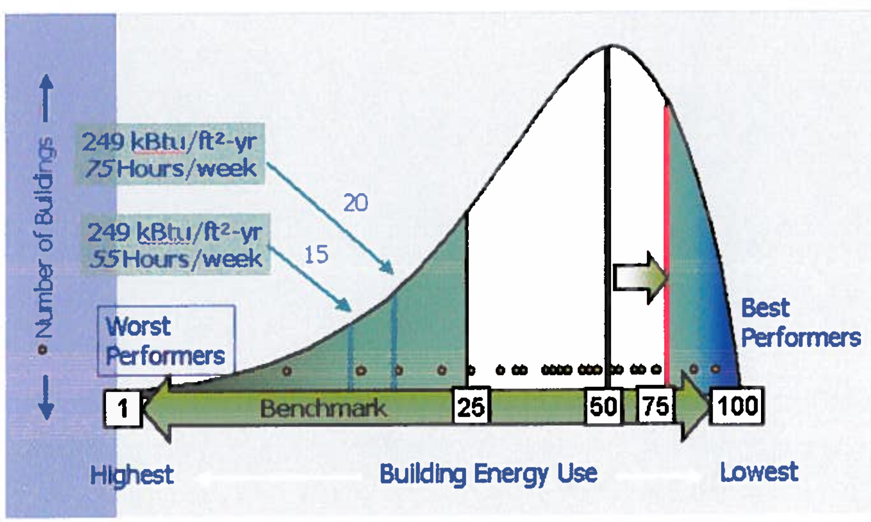
U.S. National Median Energy Use
Index Reference Values

Building Type	EUI (kBTU/ft^2)
Office Buildings	67.3
General Public Service	78.8
Prison/Incarceration	93.2
Police Station	88.3
Court	93.2
Library	91.6
Auto Repair Services	49.6
Fire Station	88.3

To better understand how efficiently the City of Richmond facility is currently operating, Siemens used the U. S. Environmental Protection Agency's Energy Star benchmarking tools to rate the building's energy use relative to other buildings of similar size, use and climate. The Energy Star rating system uses data on the energy use of hundreds of non-residential buildings from around the country gathered by the U. S. Department of Energy.

The Energy Use Intensity and rating generated by the Energy Star rating system reflects the distribution of energy performance in different building types derived from data in the Energy Information Agency's (US Department of Energy) Commercial Buildings Energy Consumption Survey (CBECS). CBECS is a statistical survey of building features, uses, energy consumption, and expenditures in U. S. non-residential buildings. Where CBECS is found to be inadequate to create ENERGY STAR criteria for a particular building type, other proprietary national data sets are used. The required data inputs were found to be the primary drivers of energy use. The zip code is used to determine the weather conditions that the building would experience in a normal year (based on a 30-year climate average). The total annual energy use intensity for the rating comparison is based on the energy sources typical in the region specified by the zip code for the building type.

Energy performance target rating uses a 1-100 scale. Lower energy use yields a higher performance target rating. An average building would generate a rating of 50 while an ENERGY STAR target rating is 75 or higher. The process is depicted graphically below. To accurately benchmark the energy performance of a building, only the building's characteristics and the most recent available 12 months of energy use for the building is required.



The EPA Energy Star Rating Process

The results of building benchmarking for each of the buildings evaluated are provided in each building section. Detailed results are provided in APPENDIX C.

Equipment Life

The expected life for new equipment recommended for each FIM has been identified and is reported in the sections which follow. This data has been determined from the following sources, depending on the type and application of the equipment.

- Instructions For Performing a Multifamily PCA, Estimated Useful Life Tables, Fannie Mae, 2014
- ASHRAE: Service Life and Maintenance Cost Database, http://xp20.ashrae.org/publicdatabase/default.asp
- Weighted manufacturer/ contractor rated life.
- 2015 ASHRAE Handbook, HVAC Applications, Comparison of Service Life Estimates
- Recommended project equipment replacement schedules.

GENERAL RECOMMENDED MEASURES

As part of Siemens investigations in performing the investment grade audit, Siemens investigated a number of additional items that may provide the City with energy and operating savings that are not specific to a single building or group of buildings. In addition, Siemens discussed with City staff opportunities for improvements based on their experience with the City and its operations. As a result, Siemens identified several additional measures that, if implemented as part of the performance contract will benefit the City's operation and provide additional energy and operating savings. These measures are summarized below. Details are provided in the following sections.

In addition, several other items of overall costs are required for the proper implementation of an energy performance contract and the guaranteed savings from the facility improvement measures. These are also detailed in the sections which follow.

Recommended General Facility Improvement Measures

Siemens recommends the following improvements, applicable to all City facilities, be implemented to improve the energy and operational performance of the City's facilities. Details are contained in the following sections.

General Recommended FIMs
City Maintenance Management System Individual Hardware
Energy & Sustainability Standards and Guidelines
Energy Conservation Awareness Training

City Maintenance Management System Individual Hardware

Scope

The City's current maintenance management software is capable of allowing City staff to receive, review and close work orders remotely using individual network connected devices. This capability allows staff to more rapidly and efficiently respond to facilities needs saving time, fuel and materials while increasing the number of work orders processed. Siemens will supply approximately 100 individual remote network connected devices to the City for distribution to staff to implement this remote work order system. Siemens will also supply continuing service to maintain and replace the devices on a set maintenance schedule. The exact number of devices, device specifications and details will be supplied to Siemens by City staff.

Calculation Methodology

Savings have been calculated in coordination with City staff based on historic work order closeout time and costs as well as a pilot conducted by the City. The increased number of work orders processed using the devices, decreased staff time and decreased contractor costs were estimated and included in the savings calculation.

Measurement & Verification Methodology

International Performance Measurement and Verification Protocol (IPMVP) Option E will be used to verify savings. Savings will be stipulated based on the previously identified calculations.

	Savings				
City Maintenance Management System Individual Hardware	Electric	Natural Gas	Water/ Sewer	O & M	Total Annual Savings
	kWh	CCF	CCF		MMBTU
Utility Unit Savings	0	0.0	0.0	-	0.0
Dollars Savings	$0	$0	$0	$300,000	$300,000
Total Price	$143,522				
Simple Payback	0.5				
Ongoing Service Price	$63,846				
Equipment Life	5 years				

Energy and Sustainability Standards and Guidelines

Scope

Based on Siemens investigation and discussions with the City Energy Manager, the City's current operating standards and guidelines do not address energy and sustainability related areas of City operations. As a result, actions by City staff do not always consider or maintain the efficiency and sustainability of City operations. Siemens will develop a set of standards and guidelines for use by the City to ensure these goals and principals are maintained in City facilities related activities.

Many organizations lack comprehensive, institutional sustainability policies, standards and guidelines that serve to ensure that consistent sustainability practices are implemented and that performance is effectively tracked over time. Implementing sustainable operations & maintenance policies and standards leverage industry best practices across an organization, and play a key role in reducing environmental impact while ensuring high performance operations and maintenance throughout the building lifecycle.

Siemens will develop clearly defined, actionable standards and purchasing guidelines for the City, ensuring that sustainability and energy conservation are incorporated into every aspect of the building lifecycle and the ongoing operations of the site. Siemens will work closely with City leadership to understand existing goals and objectives related to energy performance, emissions reduction, and overall environmental performance. We will review any existing sustainability and energy management plans, and create a framework to guide the development of the standards and guidelines that are closely aligned with the City's goals. All of the standards and guidelines that Siemens develops will be in line with the latest and most relevant industry energy and sustainability standards in the marketplace.

Primary Goal: Develop a Green Operations and Maintenance (O&M) and Indoor Air Quality (IAQ) Manual that creates standards and procedures for the following:

- Repair, maintain and operate existing systems and equipment in a manner that is energy efficient and promotes healthy indoor air quality
- Clean, landscape, and maintain building/facility furnishings/surfaces, building envelope, and surroundings in a way that promotes healthy indoor air quality, energy efficiency, and water quality while minimizing waste.
- Provide a means for training, field testing, implementation, oversight and accountability.

The range of energy conservation standards and guidelines include (but are not limited to) the following:

- heating/cooling set points, schedules, and maintenance routines
- lighting specifications and schedules
- air filter replacement schedules
- roofing specifications and maintenance guidelines
- building envelope (windows, walls, and doors) specifications and maintenance
- population density and partition guidelines
- parking deck/lot maintenance guidelines
- snow removal and de-icing
- water fixture specifications and repair/service guidelines
- Cleaning procedures, product and supply guidelines
- Procurement
- Solid Waste tracking and reduction, including hazardous waste disposal
- Landscape – plant selection and location, proper use and selection of chemicals and fertilizers, irrigation schedules, and storm water impacts
- Green infrastructure maintenance

In addition, Siemens will support the implementation and rollout of any standards or guidelines that are developed. We will create the necessary tracking tools and procedures for ongoing performance monitoring, and provide training to ensure successful implementation.

Calculation Methodology

The U.S. Environmental Protection Agency estimates that a typical workplace energy awareness program can result in overall savings of 3 percent on an organization's energy bill. This estimate is supported by Bin's findings in his study of the effectiveness of workplace energy behavior programs (Greening Work Styles: An Analysis of Energy Behavior Programs in the Workplace, Shui Bin, January 2012, Report Number B121. The Association for the Advancement of

Sustainability in Higher Education (AASHE) notes that an effective energy awareness program might reduce energy consumption by 5 or 10 % or more. Allegheny County, PA saw over 20% savings from their Energy Conservation Through Behavior Change® (ECTBC) Program (Energy Saving Behavior Change For The 21st Century, Zachery Ambrose, Allegheny County, Ashley Jones, NORESCO, Sally Russell, GreenNurture, 2014 ACEEE Summer Study on Energy Efficiency in Buildings).

Based on these and many similar studies, Siemens has calculated a conservative savings for this effort of 1% of the City's base year energy costs for the buildings included in this audit.

Measurement & Verification Methodology
International Performance Measurement and Verification Protocol (IPMVP) Option E will be used to verify savings. Savings will be stipulated based on the previously identified criteria.

	Savings				
Energy and Sustainability Standards and Guidelines	Electric	Natural Gas	Water/ Sewer	O & M	Total Annual Savings
	kWh	CCF	CCF		MMBTU
Utility Unit Savings	0	0.0	0.0	-	0.0
Dollars Savings	$0	$0	$0	$28,500	$28,500
Total Price	$15,393				
Simple Payback	0.5				
Equipment Life	Not Applicable				

Energy Conservation and Awareness Training

Scope
In order to ensure that facility staff is up to date on energy conservation strategies and technology, Siemens will develop a comprehensive annual training program and curricula for the City of Richmond. Siemens will utilize experienced local and national resources to develop the necessary materials, uniquely catered to the unique needs of the City and its staff.

Siemens will conduct bi-annual, in-person training sessions for staff:

- Each session will be approximately 3 to 4 hours in duration.
- Experienced Siemens personnel, from the local area or leveraging national resources as needed, will conduct the training.
- If necessary, Siemens will contract 3rd parties who can bring unique perspective to the City and its staff
- The curriculum will be develop by Siemens, working closely with City leadership to ensure that the topics address the City's needs and objectives
- Topics can include, but are not limited to:
    - Energy auditing
    - Emerging energy conservation strategies and technologies
    - Existing Building commissioning
    - Occupant engagement and communications programs
    - Green building strategies

Calculation Methodology

Based on the studies and results as noted above, Siemens has calculated a conservative savings for this effort of an additional 1% of the City's base year energy costs for the buildings included in this audit. This results in the total savings from the guidelines/ standards to be 2% of the City baseline energy cost, which is below the lowest savings cited in most information on benefits from these types of measures.

Measurement & Verification Methodology
International Performance Measurement and Verification Protocol (IPMVP) Option E will be used to verify savings. Savings will be stipulated based on the previously identified criteria.

	Savings				
Energy Conservation and Awareness Training	Electric	Natural Gas	Water/ Sewer	O & M	Total Annual Savings
	kWh	CCF	CCF		MMBTU
Utility Unit Savings	0	0.0	0.0	-	0.0
Dollars Savings	$0	$0	$0	$28,500	$28,500

Total Price	$10,262
Simple Payback	0.4
Ongoing Service Price	$8,737
Equipment Life	Not Applicable

Other General Facility Improvement Measures Considered

FIMs initially considered for inclusion in the project, including those FIMs cited in the Memorandum of Understanding, are listed in the Preliminary Findings Report Dated March 12, 2015. From these preliminary findings, a number of FIMs were determined to warrant further more detailed analysis. The following FIMs were evaluated in more detail as part of this audit and found to be less technically or financially viable than the FIMs recommended above. In some cases the FIMs were included as part of the recommended FIMs discussed above. This list includes major potential FIMs as well as FIMs requested for further analysis by COR staff. It is not inclusive of all FIMs considered by Siemens during this IGA evaluation.

- Energy Performance Benchmarking
- Automation Service

Other General Project Costs

The following additional costs are required to implement an energy performance contract as recommended in this report. These costs are described as follows and included in detail in APPENDIX A:

Project Development

Siemens costs required for performing the audit including site reviews, data analysis, preliminary design, data measurement, reporting and project management.

Project Implementation

Siemens costs for execution of the recommended project including project management, energy engineering, procurement, documentation and reporting.

Measurement & Verification Setup and Annual Reporting

Siemens costs for collection of baseline data, development of detailed facility specific plan and tools for tracking savings, collection and analysis of ongoing data and annual reporting and reconciliation. See APPENDIX E for details. These costs are related to and required for the performance savings guarantee.

Courts

Courts	Page
John Marshall Courthouse	2
Oliver Hill Courthouse	25

JOHN MARSHALL COURTS

Location:	400 N. 9th Street
Original Construction:	1976
Floor Area:	139,071 ft^2
Building Use:	Courts & Legal Offices
Annual Utility Cost:	$350,416
Utility Cost Index:	$2.01 / ft^2
Energy Use Index:	116.4 kBTU/ ft^2
U.S. median:	99.4 kBTU / ft^2

Building Description

The John Marshall Courthouse consists of 3 above ground floors and 1 below ground floor that includes mechanical, garage, storage and office facilities. Heating and cooling is provided by 2 250 ton water cooled chillers, 2 335 MMBTUH boilers and 8 air handlers, 3 of which provide only cooling for the building interior. Perimeter areas are heated by radiant hot water perimeter heating. The boilers are original to the building. A large electric water heater provides domestic hot water.

Typical building occupancy is approximately 8:00 AM to 5:00 PM week days with some after hour and weekend use. Temperatures are typically controlled at about 72°F. The building uses both Siemens and Johnson Controls automation systems to control major equipment and space conditions. Set back temperature control is minimal.

Lighting is a mixture of T-12 and T-8 technology. Only a few fixtures are automatically operated based on occupancy. Water fixtures are original to the building.

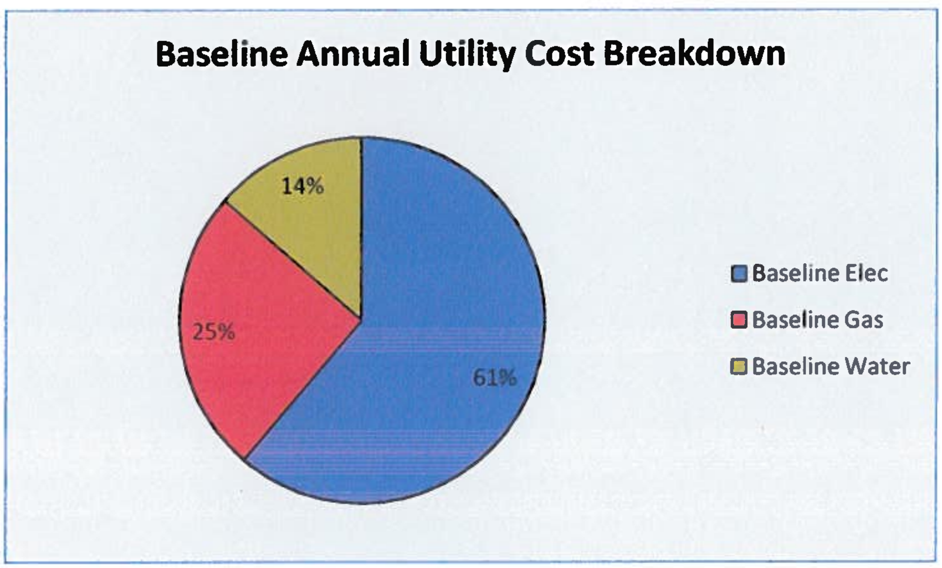
Consolidated Utility Overview

The following table summarizes the overall utility cost and consumption data reflected by the building over the baseline period. Costs shown in the table have been updated to reflect current rates. The baseline annual utility expenditure totaled $350,416.11. For the combined building heated and cooled area of 139,071 square feet, the Utility Cost Index using the baseline year data was $2.661 / ft^2 and is dominated by the electricity costs of the facility. The Energy Utilization Index for the baseline is 125.172 kBTU / ft^2.

Baseline Utility Consumption & Costs – Current Rates

Utility	Quantity	Units	Quantity	Units	Current Cost
Electricity	3,520,080	kWh	11,060,091	kBTU	$214,487.89
Natural Gas	62,232	CCF	6,347,664	kBTU	$88,223.99
Water	4,783	CCF	3577.684	kgal	$47,704.23
Total			17,407,755	kBTU	350,416.11

A detailed review of the data is essential to establish a thorough understanding of the consumption and cost characteristics, and form the basis for additional analyses. The Baseline Annual Utility Cost Breakdown chart below demonstrates that the cost of electricity represents the majority (61%) of the John Marshall Courthouse's total utility expense.



Historical trends for each of the utilities used by the facility are addressed in the specific utility sections which follow. Review of all data provided by the City for multiple years indicates that, overall, utility use is relatively stable with variations directly correlated to weather conditions and occupancy except for a few random variations. Some utility costs have and continue to trend higher each year directly due to utility adjustments in billed rates while others have not. In the following discussions, Siemens has recalculated all baseline utility costs to match the current rates in effect as of April 2015 in order to capture these changes and their impacts on facility operation costs and potential savings. Differences due to rate changes are summarized in the following table.

Impact of Utility Rate Changes on Last 12 Months Baseline Cost

Utility	Billed Cost	Current Cost	Percent Increase
Electricity	$262,075.67	$214,487.89	-18.16%
Natural Gas	$58,846.34	$88,223.99	49.92%
Water & Sewer	$49,190.14	$ 47,704.23	-3.02%
Total	$370,112.15	$350,416.11	-5.32%

Note: The Current Cost totals do not reflect Winter Threshold heightened water bills, or miscellaneous fees (late fees, service fees). The costs also do not reflect increases in the rates for City supplied utilities effective July 1, 2015.

Utility Rates

John Marshall Courthouse is supplied under Rate Schedule 130 for Electricity, Municipal Gas Service (Rate MGS) for Natural Gas, and a Commercial Service 2" pipeline for Water and Sewer. Details for the applicable rates are provided in APPENDIX B.

Utility rates are frequently structured to decrease with increasing use or penalize for large use at critical times of day or of short duration. As a result, an average rate or the costs in the rate schedules do not always reflect the cost of the "last" unit used or the savings from incremental reductions in energy use. However, this marginal cost can be calculated from the utility use data and used to accurately value incremental energy savings.

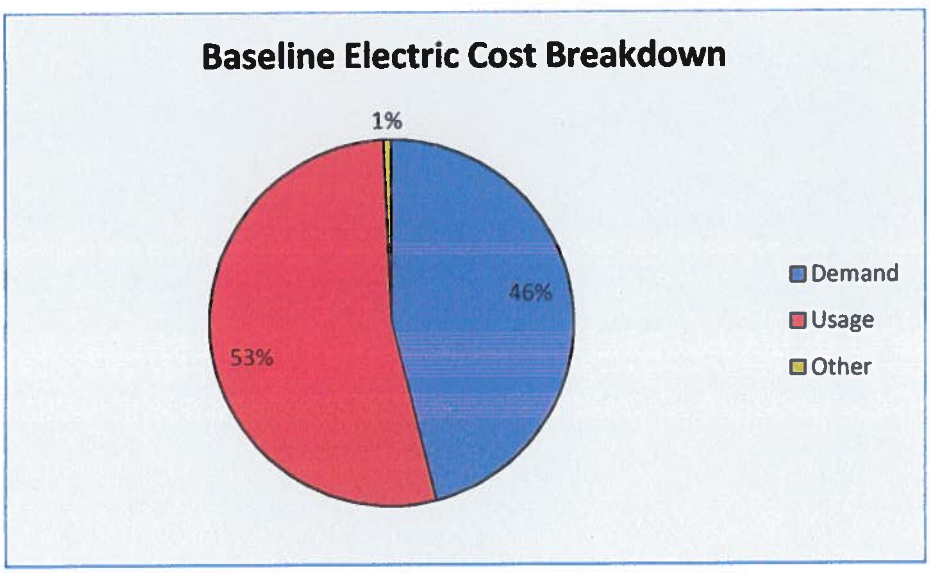
The marginal rates calculated for the building and used for savings analysis are summarized in the table below.

Electricity	Rate 130
Marginal Energy	$0.03230 / kWh
Marginal Demand	$13.512 / kW
Blended Average	$0.06732 / kWh
Natural Gas	**Rate MGS**
Marginal Gas	$9.92 / Mcf
Water/Sewer	**Commercial 2"Line**
Marginal Water	$3.4 / Ccf
Marginal Sewer	$6.17 / Ccf

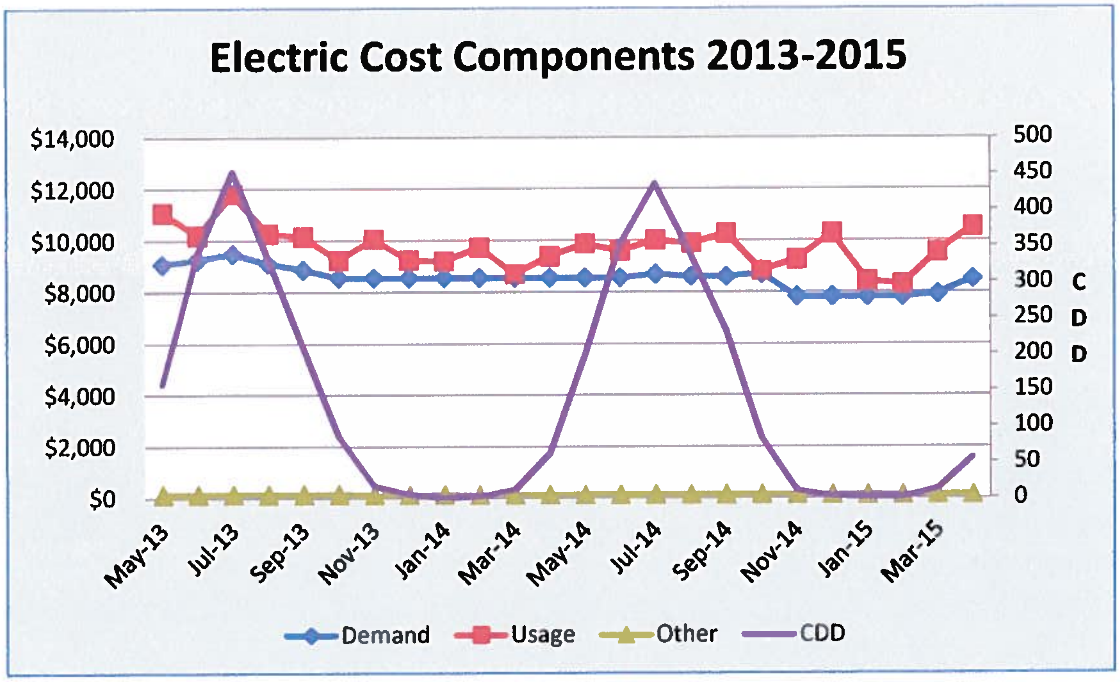
Electricity Detailed Analysis

Electricity is typically the largest utility used in a facility since it is necessary for basic building functions such as lighting and appliances as well as for any space conditioning systems in fans, pumps and controls regardless of the heating or cooling source. At the John Marshall Courthouse, electricity is a dominating 61% of overall utility costs as well as 63.54% of overall energy use on a kBTU basis because of the use for conditioning fresh air.

Rate 130 costs are based on total energy use (kWh) for the billing period as well as average peak electricity demand during 30 minute intervals. The breakdown of costs by demand and energy for the baseline period, as shown in the Baseline Electric Cost Breakdown below, is weighted toward the energy costs. Energy use accounts for a little over half of the overall John Marshall Courthouse electricity cost.

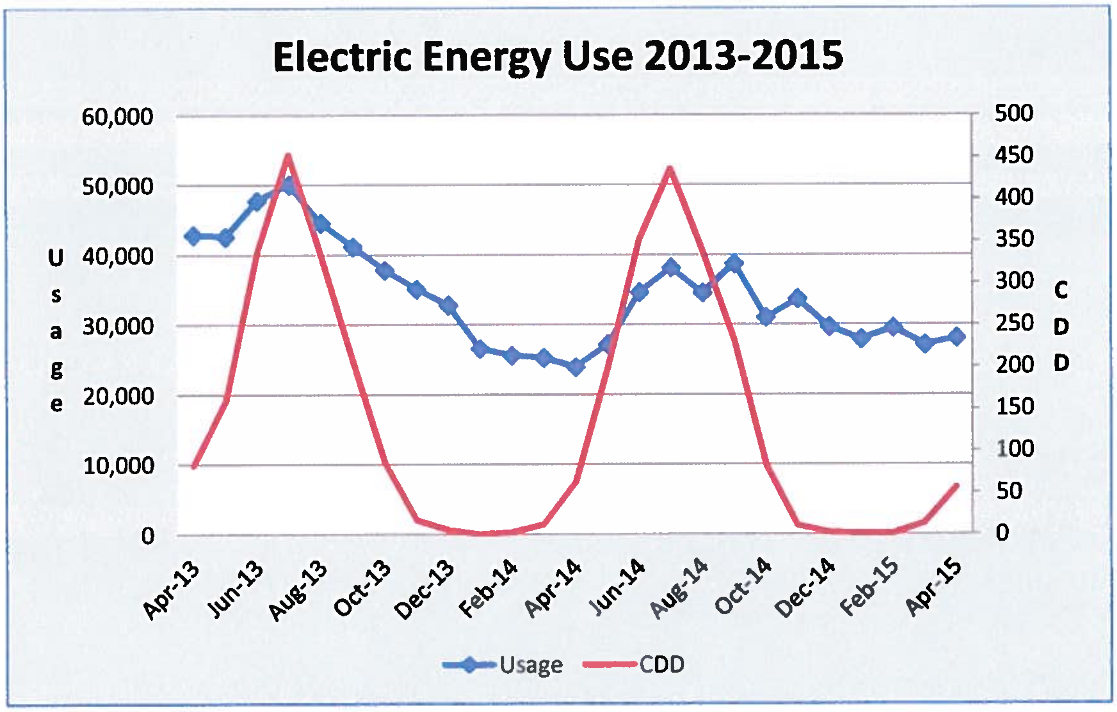


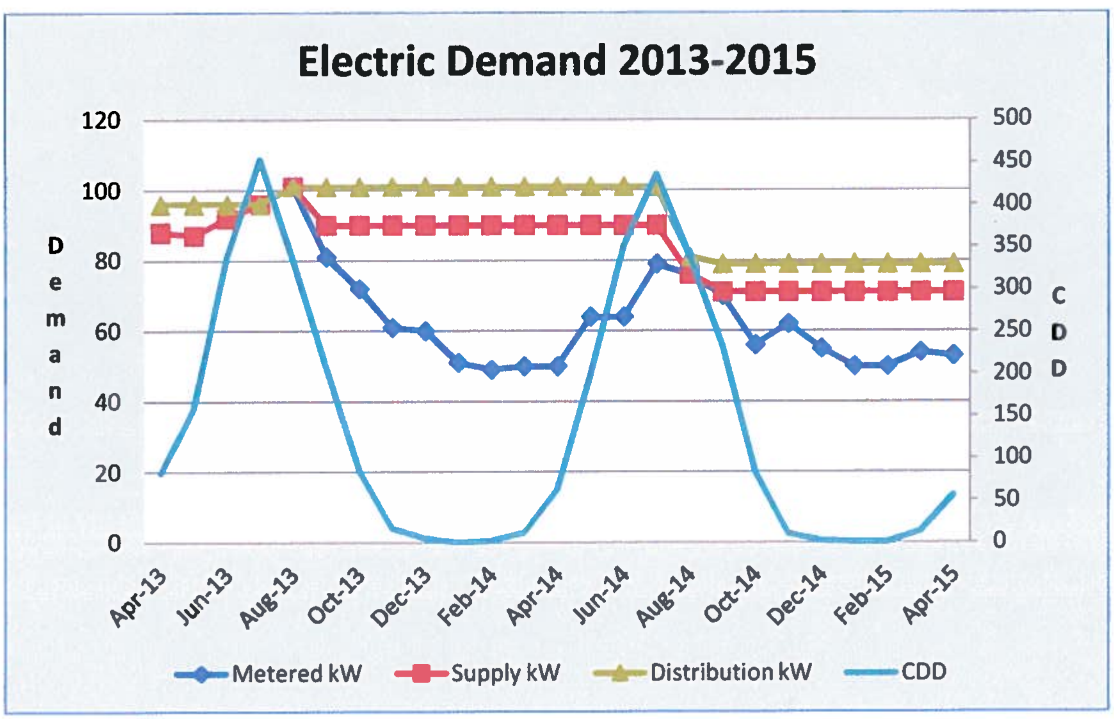
A further breakdown of electricity costs is shown in the Electric Cost Components chart below. The chart shows that electric energy costs are not strongly correlated to seasonal cooling needs, and that electricity costs tend to remain relatively the same throughout the year due to the rate structure and the consistent operation of air handling/cooling equipment. As can be seen, the highest cost percentage is due to energy use, showing how efforts to reduce energy use will be more effective in reducing cost.



When compared to the weather data, electric energy use (kWh) shows the typical correlation with higher temperatures and cooling needs as shown in the charts below. The correlation is not as similar as would be expected for most buildings. This indicates that there may be opportunities for energy savings by reducing energy use during the non-cooling season or unoccupied times.

Billed demand shows little variation, whereas actual (labeled Metered kW) electric demand shows a typical seasonal fluctuation. This demonstrates that one month of high demand impacts costs over the entire year. The Electric Demand chart shows how the rate structure applies a ratchet based on actual demand. The Billed Demands listed (labeled as Supply kW and Distribution kW) indicate the two demand components of energy demand costs based on peak actual demand. This more clearly demonstrates how reducing actual demand will lower cost.


Electric Energy Use 2013-2015
60,000
50,000
40,000
30,000
20,000
10,000
0
Usage
500
450
400
350
300
250
200
150
100
50
0
CDD
Apr-13
Jun-13
Aug-13
Oct-13
Dec-13
Feb-14
Apr-14
Jun-14
Aug-14
Oct-14
Dec-14
Feb-15
Apr-15
Usage
CDD

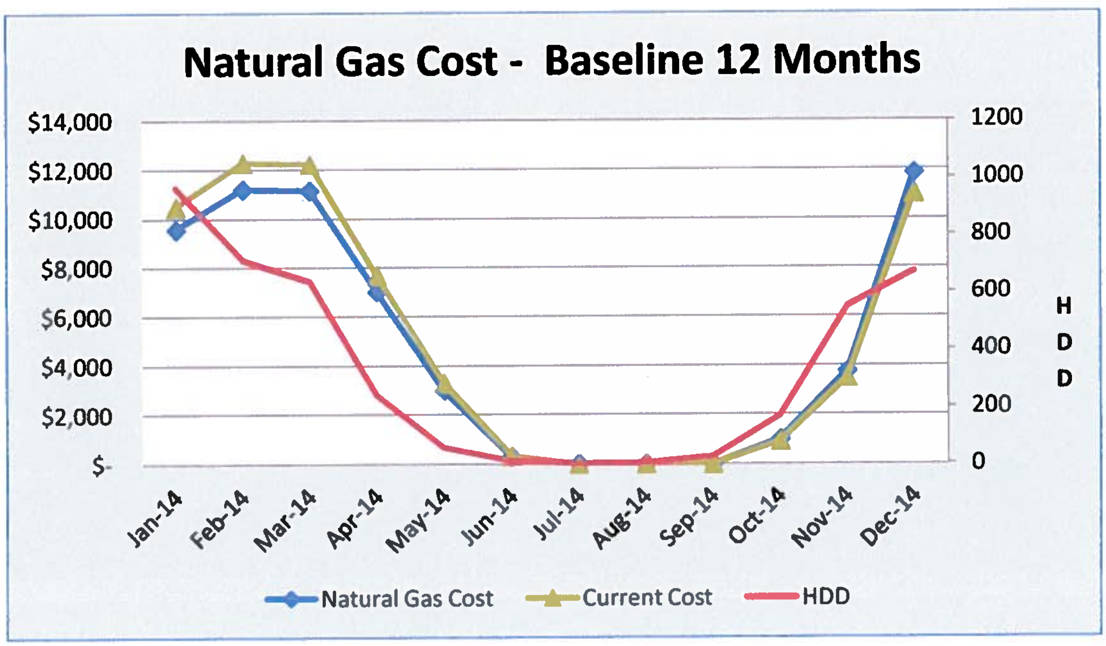

Electric Demand 2013-2015
120
100
80
60
40
20
0
Demand
500
450
400
350
300
250
200
150
100
50
0
CDD
Apr-13
Jun-13
Aug-13
Oct-13
Dec-13
Feb-14
Apr-14
Jun-14
Aug-14
Oct-14
Dec-14
Feb-15
Apr-15
Metered kW
Supply kW
Distribution kW
CDD

Natural Gas Detailed Analysis

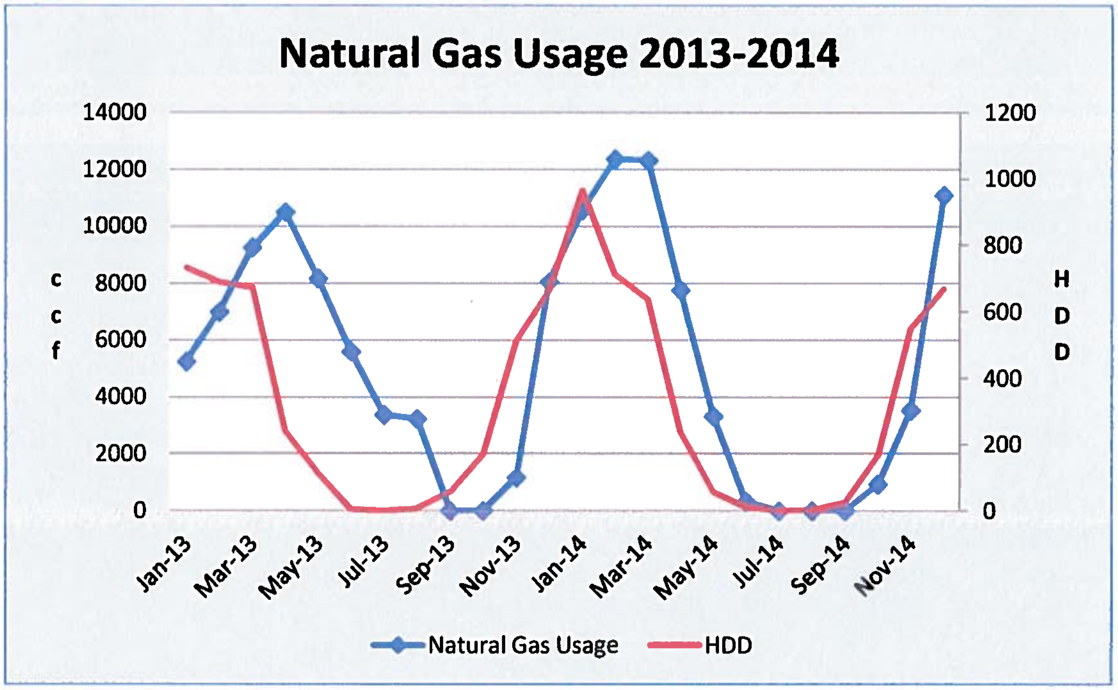
Natural gas is typically the second largest utility used in a facility since it is necessary for space heating. Natural gas is only about 25% of overall utility costs, and only 14% of overall energy use on a kBTU basis.

The City of Richmond Department of Public Utilities delivers natural gas to the John Marshall Courthouse under their Municipal Gas Service (MGS) rate. The most recent rate, effective July 1, 2014, is included in the appendices to this report. The impact of this new rate results in approximately $84 per year higher natural gas costs than the originally billed costs as shown in the figure below.

Note in the figures that peak natural gas use appears to lag the weather peak. This is only due to the timing of meter readings for billing which, during this period were performed about mid-month.



When compared to the weather data, natural gas use at the John Marshall Courthouse shows the typical strong correlation with lower temperatures and heating needs as shown in the chart below. The data indicates that natural gas use has remained relatively stable the last 2 years.

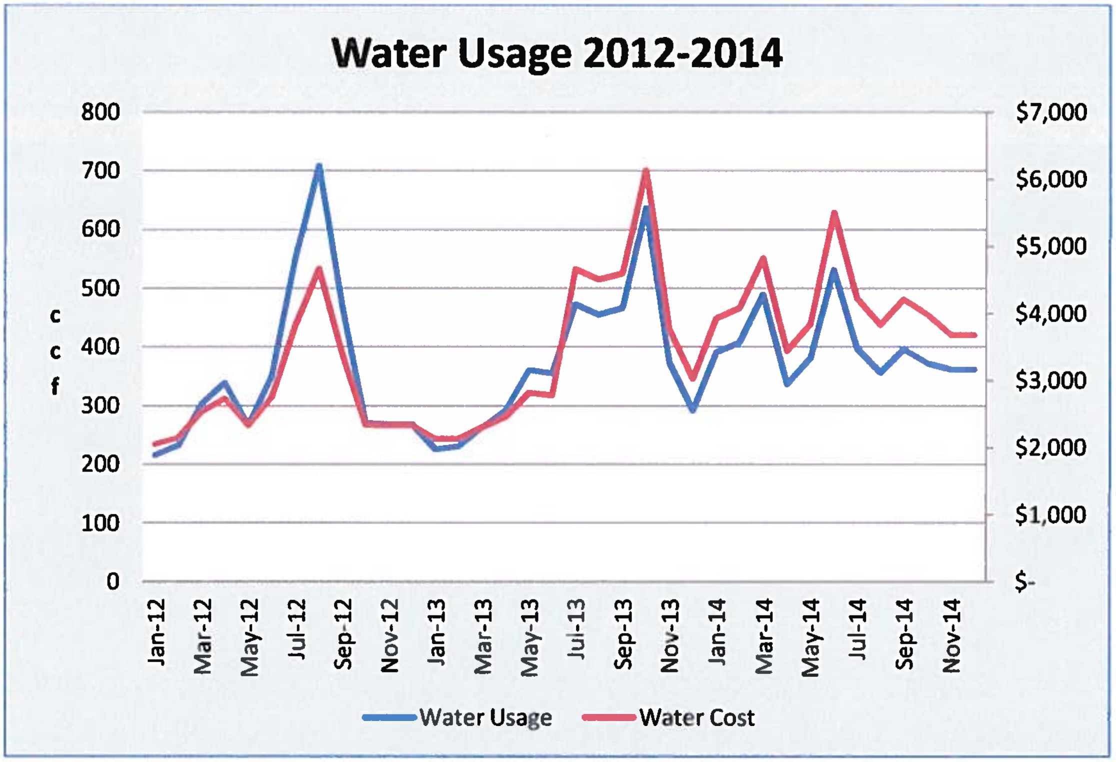


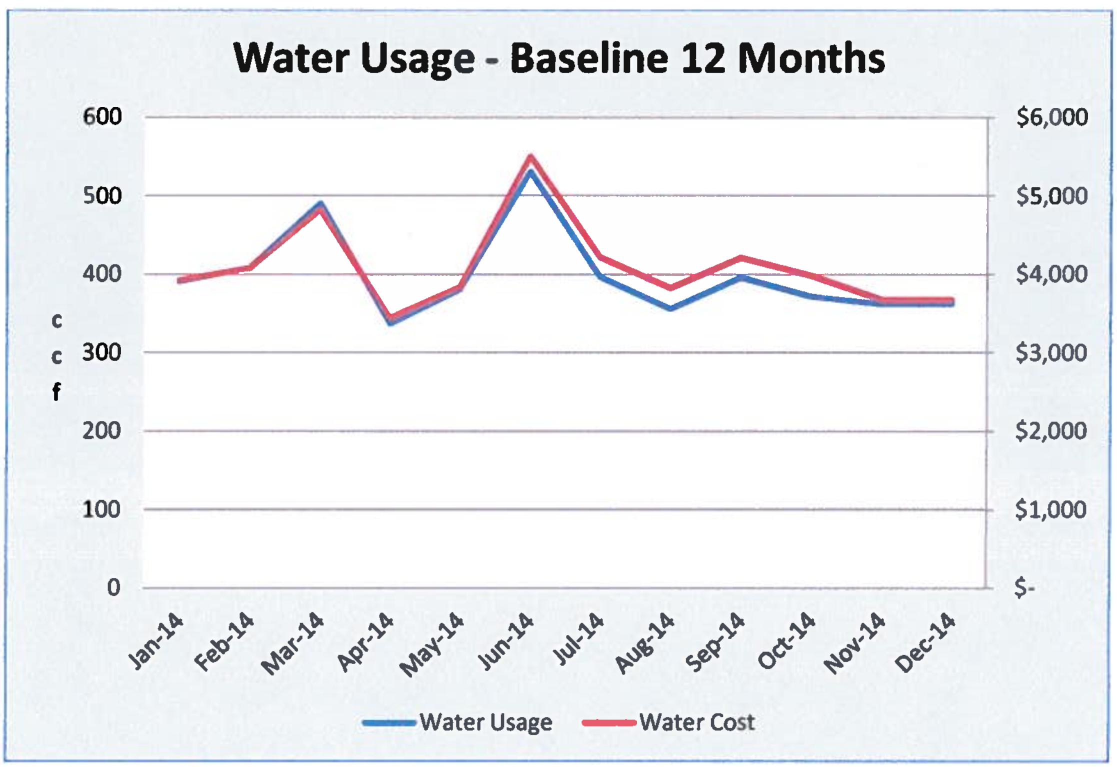
Water & Sewer Detailed Analysis

Water and Sewer service is typically the smallest utility used in a facility due to its intermittent, non-weather related use, unless the facility uses water based equipment, such as a cooling tower, for space conditioning. The John Marshall Courthouse uses utility supplied sewage service in addition to water supply service for the cooling towers supporting the chillers that condition the building. As a result, the John Marshall Courthouse's water related utility cost is higher and more seasonal than a building with direct air cooled equipment. Water supply and wastewater service makes up about 14% of total utility baseline costs.

The City of Richmond Department of Public Utilities supplies water to the John Marshall Courthouse. A copy of City of Richmond's most current rates, effective June 30, 2015 is included in the appendices. Water use and costs for the John Marshall Courthouse are shown in the figures below.

Cost is very closely reflected by the usage, and usage appears to be erratic throughout the last year. While increased use in the summer months from cooling tower operation is evident, water use spikes early in 2014 are unusual and warrant continued monitoring.

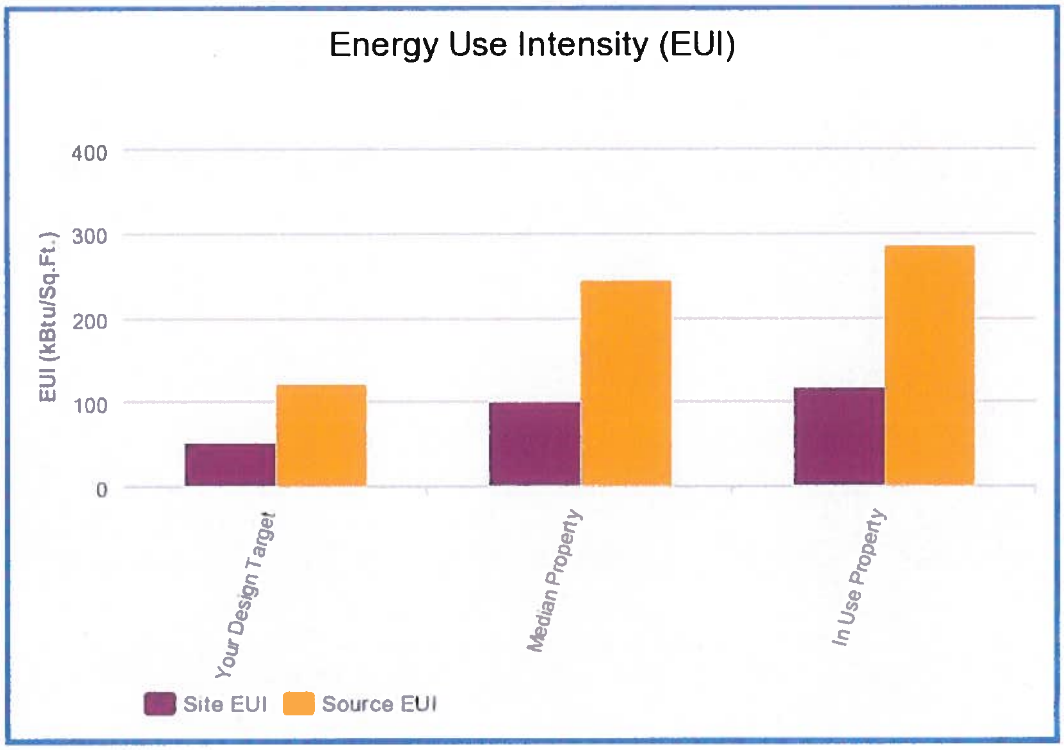

Water Usage 2012-2014
800
700
600
500
400
300
200
100
0
c
c
f
$7,000
$6,000
$5,000
$4,000
$3,000
$2,000
$1,000
$-
Jan-12
Mar-12
May-12
Jul-12
Sep-12
Nov-12
Jan-13
Mar-13
May-13
Jul-13
Sep-13
Nov-13
Jan-14
Mar-14
May-14
Jul-14
Sep-14
Nov-14
Water Usage
Water Cost


Water Usage - Baseline 12 Months
600
500
400
300
200
100
0
c
c
f
$6,000
$5,000
$4,000
$3,000
$2,000
$1,000
$-
Jan-14
Feb-14
Mar-14
Apr-14
May-14
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Dec-14
Water Usage
Water Cost

Benchmarking

Using the data available, Siemens was able to estimate energy performance and ratings for the building. Results are shown both graphically and in the tables below. These results show that there is a large potential for improvement in the energy performance of the building.

The detailed Energy Star report is included in the appendices to this report.



The data shown in the table provides the Utility Cost Index ($/ft²) and the Energy Usage Index (BTU/ft²) for the building, as calculated by Energy Star. These results are weather adjusted as part of the benchmarking process. Although these results may reflect differences in how the facility is operated compared to other facilities (for example lower cooling temperatures or usual equipment) they show a significant opportunity for energy savings at the John Marshall Courthouse.

Baseline Utility Cost Index and Energy Usage Index

	Utility Cost Index	Energy Usage Index
John Marshall Courthouse Building Performance	$2.010 / ft^2	116.4 kBTU / ft^2
Benchmark Performance	$0.918 / ft^2	50.3 kBTU / ft^2

Recommended Facility Improvement Measures

Siemens recommends the following specific improvements be implemented to improve the energy and operation of John Marshall Courthouse. Details are contained in the following sections.

John Marshall Courthouse Recommended FIMs
Water Conservation Retrofits
Lighting Upgrades Full LED
Cooling Tower Make-Up Metering
Replace Boilers
Inspect & Repair Mixing Boxes
Optimize Chiller Operation
Generator Installation
Building Automation Expansion
Weatherization

These FIMs are expected to provide the following savings for John Marshall Courthouse.

	Savings				
John Marshall Courthouse	Electric	Natural Gas	Water/ Sewer	O & M	Total Annual Savings
	kWh	CCF	CCF		MMBTU
Utility Unit Savings	925,835	2228.2	475.3	-	3,387.8
Dollars Savings	$45,957	$22,104	$18,043	$10,364	$96,468
Total Price	$1,813,857				
Simple Payback	18.8 Years				

Water Conservation Retrofits

Scope

Water fixtures in the facility are mainly original to the facility and do not meet current standards for water efficiency. Savings will be generated by using variable flow technology to tune and calibrate each fixture to ensure water is being introduced to the fixture in the correct manner that the fixture is performing properly and that water consumption is reduced to currently recommended levels. These improvements will include replacement of fixture components as well as installing low flow water fixtures and flow restrictors where necessary. The number and type of retrofits to be performed, based on Siemens detailed audit of the facility, are provided in APPENDIX D.

Calculation Methodology
Savings are calculated by taking flow measurements on a statistically significant sample for each fixture or retrofit type. Pre-retrofit flow rates used in calculating savings are included in APPENDIX D. Calculation methodology, baseline fixture frequency, typical usage, and occupancy information used to determine savings are detailed in APPENDIX E.

Maintenance savings are based on typical fixture maintenance requirements and manufacturer data. Maintenance savings include only materials.

Measurement & Verification Methodology
International Performance Measurement and Verification Protocol (IPMVP) Option A will be used to verify savings. Savings generated by tuning and installing low flow water fixtures and flow restrictors shall be based upon one-time pre and post sample measurements of the key parameter of fixture flow rate. Savings will be calculated by taking flow measurements on a statistically significant sample for each fixture or retrofit type. The methodology and other parameters used in the savings calculation and verification are defined in detail under Water Conservation Retrofits in APPENDIX E.

	Savings				
Water Conservation Retrofits	Electric	Natural Gas	Water/ Sewer	O & M	Total Annual Savings
	kWh	CCF	CCF		MMBTU
Utility Unit Savings	11,740	0.0	475.3	-	40.1
Dollars Savings	$379	$0	$6,082	$281	$6,742
Total Price	$44,090				
Simple Payback	6.5				
Equipment Life	10.0 Years				

Lighting Upgrades

Scope
The current lighting in the facility is a mixture of old technology being effectively phased out by government regulations and current standard technology. Siemens plans to retrofit the building lighting with more efficient state-of-the-art LED technology to reduce lighting energy use and increase lighting equipment life, reducing maintenance costs. This will also allow the City more variety in obtaining replacement stock and better consistency in stocking and maintenance. Lighting not applicable to LED retrofit will use state of the art high efficiency fluorescent technology to increase the efficiency of lighting equipment. Control of lighting equipment to reduce energy use during unoccupied times will also be included. The number and type of

retrofits to be performed, based on Siemens detailed audit of the facility, are provided in APPENDIX F.

Calculation Methodology
Guaranteed electrical energy savings generated by the lighting retrofit portion of this project will be based upon pre and post one-time measurement of the lighting energy consumption multiplied by annual burn hours. Annual energy savings will be calculated multiplying the difference in measured kilowatts (kW) by the pre and post baseline lighting burn hour usage and demand months. Pre-retrofit consumption and operating hours used in calculating savings are included in APPENDIX E.

Maintenance savings are based on typical fixture maintenance requirements and manufacturer data. Maintenance savings include only materials.

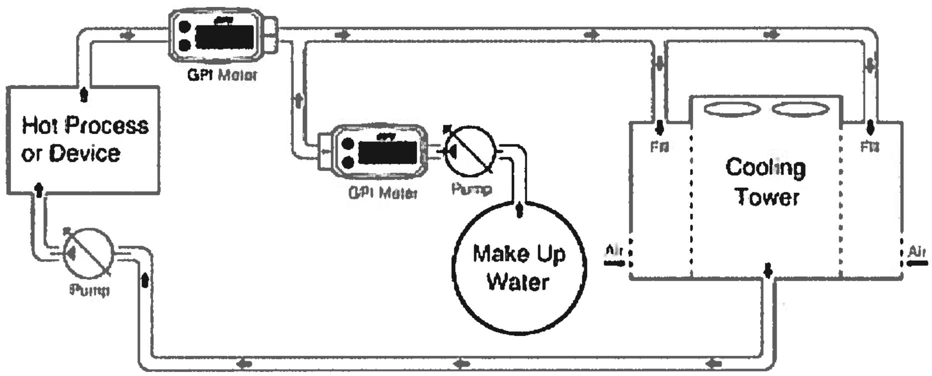
Measurement & Verification Methodology
International Performance Measurement and Verification Protocol (IPMVP) Option A will be used to verify savings. Savings generated by lighting retrofits and controls will be based upon one-time pre and post sample measurements of the key parameters of consumption and operating hours. Savings will be calculated by taking measurements on a statistically significant sample for each fixture or retrofit type. The methodology and other parameters used in the savings calculation and verification are defined in detail under Lighting Upgrades and Retrofit and Lighting Controls in APPENDIX E.

	Savings				
Lighting Upgrades	Electric	Natural Gas	Water/ Sewer	O & M	Total Annual Savings
	kWh	CCF	CCF		MMBTU
Utility Unit Savings	306,310	0.0	0.0	-	1,045.1
Dollars Savings	$25,946	$0	$0	$5,393	$31,339
Total Price	$467,143				
Simple Payback	14.9				
Equipment Life	14.5 Years				

Cooling Tower Make-Up Metering

Scope
Approximately five percent of the condenser water is lost to evaporation in a typical cooling tower, requiring the addition of makeup water to the cooling tower system. Many buildings are charged for sewerage based on metered consumption. By metering the makeup water and subtracting these losses from consumption, buildings can eliminate sewage charges for the water that evaporates from the cooling tower.

Open-loop cooling towers, such as that used at the Courthouse, cool water through a combination of heat and mass transfer. Warm water from the condenser is circulated to the tower and distributed in the tower by spray nozzles or splash bars. Outside air is circulated through the tower by a fan or natural draft as warm air rises through the tower. As some water evaporates, the remaining liquid gives up heat to the evaporation process, effectively cooling the condenser water.



This FIM will include the following:

- Install water meters as required by the Department of Public Works.
- All meters shall have isolation valves and unions on both sides of the meter.
- Meters shall meet the Department of Public Works specification and be factory calibrated.
- All cooling tower makeup, blow down, and drain lines will require a meter.
- Remote registers will be installed as per the requirement of the Department of Public Works.
- Remote registers will be labeled as required by the Department of Public Works.
- Proper operation of all meters and remote registers will be verified.
- In locations where there is potential for freezing required insulation, etc., to prevent freezing will be installed.

Calculation Methodology

Guaranteed sewer savings generated by the addition of tower metering will be based upon pre and post installation water and sewer bills for the building. Annual sewer charge savings have been calculated by estimating the evaporation of the cooling tower during a typical year based on the data developed during the audit. The detailed methodology and assumptions are provided in APPENDIX E.

Measurement & Verification Methodology

International Performance Measurement and Verification Protocol (IPMVP) Option C will be used to verify savings. Savings generated by the sewage deduction will be determined by compilation of monthly utility bills that will include total building water use, sewage deduction volume and net billed sewage volume. Savings will be the total sewage deduction multiplied by the applicable sewage rate for the period. The methodology and other parameters used in the savings calculation and verification are defined in detail in APPENDIX E.

Cooling Tower Make-Up Metering	Savings				
	Electric	Natural Gas	Water/ Sewer	O & M	Total Annual Savings
	kWh	CCF	CCF		MMBTU
Utility Unit Savings	0	0.0	0.0	-	0.0
Dollars Savings	$0	$0	$11,962	$0	$11,962
Total Price	$46,279				
Simple Payback	3.9				
Equipment Life	25.0 Years				

*Sewage savings only.

Replace Boilers

Scope

The boilers currently serving the Courthouse are original to the building and beyond expected useful life. These boilers operate below current standard efficiencies and required increased maintenance for continued operation. A planned project to replace the boilers during summer 2015 has been canceled to allow the boiler replacement to be included in the performance contract.

The boilers will be replaced with new high efficiency boilers. This replacement will include augmentation of the boiler flue system to ensure proper venting of the high efficiency boilers. The scope will include the following:

- Demolition and remove existing boilers.
- Boilers to be replaced with Basis of Design boiler Lochinvar Crest FBN3500 or equivalent.
- Remove the existing 18"Ø boiler flue from the boiler connection to the roof, approx. 150 ft.
- A new boiler venting system shall be installed in accordance with the boiler manufacturer and all applicable codes. New venting shall be manifolded and follow the same routing as the existing removed vent. Vent material shall be UL listed for Category II and IV appliances and constructed of AL29-4C vent material. The vent shall be insulated to maintain 0" clearance to combustible materials. With the Lochinvar Crest FBN3500 as a basis of design, the new vent diameter shall be 10" from each boiler and 16" where the vents come together. Continue the 16" vent to termination on the roof.
- Install roof mounted vent exhaust fan and all necessary electrical work.
- Boilers shall be optimally sequenced based on manufacturer's software.
- New equipment shall be Energy Star compliant where applicable.
- Start up and verify proper operation of all systems including owner training and O&M manuals.
- Controls integration to the building automation system.

Calculation Methodology
Savings generated by replacing the existing boilers with high efficiency boilers shall be based upon the difference between the existing boiler's combustion and seasonal efficiencies and the new boiler combustion and seasonal efficiencies. The calculation uses the base year bills to determine the annual savings gained by the increase in the heating system efficiency during the heating season. The detailed methodology and assumptions are provided in APPENDIX E.

Maintenance savings are based on fifty percent of reported fiscal year 2014 heating maintenance expense for the building.

Measurement & Verification Methodology
International Performance Measurement and Verification Protocol (IPMVP) Option A will be used to verify savings. Savings generated by replacement will be based upon one-time pre and post measurements along with annual inspection of systems to verify system operation. The previous one-time calculations are used to determine annual Savings for the entire Performance Guarantee Period. The methodology and other parameters used in the savings calculation and verification are defined in detail in APPENDIX E.

	Savings				
Replace Boilers	Electric	Natural Gas	Water/ Sewer	O & M	Total Annual Savings
	kWh	CCF	CCF		MMBTU
Utility Unit Savings	0	8415.0	0.0	-	864.2
Dollars Savings	$0	$8,348	$0	$205	$8,552
Total Price	$497,109				
Simple Payback	58.1				
Equipment Life	25.0 Years				

Inspect & Repair Mixing Boxes

Scope
There are approximately 130 Barber Coleman pneumatic VAV boxes at John Marshall Courthouse. The majority of these boxes have never been serviced as they are located above either a solid or interlocking tile ceiling. This proposal would cover the following items:

- Calibrating room thermostat
- Checking & adjusting damper linkages
- Calibrating volume regulators
- Documenting individual VAV function status

The proposal covers full repairs up to 13 VAV boxes. Repairs could include replacing bad actuators, bellows, volume regulators, and broken linkages. The city will be responsible for making each VAV box accessible through the various types of ceiling.

Calculation Methodology
Savings generated from repairing the VAV boxes should lead to the air handling unit variable speed drive backing down. The savings assume the fan running near full speed currently as a result of failed open boxes. Siemens will trend the variable frequency drive speed as well as take one time measurements at various speeds on the fan motor to properly model the fan power draw curve.

Maintenance savings generated by inspecting & repairing mixing boxes are based on ten percent of reported fiscal year 2014 heating & cooling maintenance expense for the building.

Additional calculation methodology, baseline assumptions, measurement tables, client responsibility, measurement tools, and reporting used to determine savings are detailed in APPENDIX E.

Measurement & Verification Methodology
International Performance Measurement and Verification Protocol (IPMVP) Option E will be used to verify savings. Savings generated by the repair of VAV boxes shall be stipulated based upon estimated proposed air handling unit run hours, air handling unit static pressure, VFD speed, and outside air temperature. The methodology and other parameters used in the savings calculation and verification are defined in detail under Inspect & Repair Mixing Boxes in APPENDIX E.

	Savings				
Inspect & Repair Mixing Boxes	Electric	Natural Gas	Water/ Sewer	O & M	Total Annual Savings
	kWh	CCF	CCF		MMBTU
Utility Unit Savings	47,258	0.0	0.0	-	162.2
Dollars Savings	$1,535	$0	$0	$2,243	$3,778
Total Price	$65,941				
Simple Payback	17.5				
Equipment Life	20.0 years				

Optimize Chiller Operation

Scope
City maintenance staff has noted that the existing chillers have required frequent maintenance for continued operation. In addition, Siemens' audit has identified modifications to the operation and control of the units that will result in energy savings. Siemens will recommission the existing chillers to ensure proper operation as well as modify control and sequences to maximize operating efficiency. These improvements will include the following:

- Recommission existing chiller system for proper condition and specified operation.
- Ensure proper outdoor air lock-out temperature

- Verify flow rates and temperatures compared to design conditions.
- Check for leaks and flow obstructions.
- Verify refrigerant and lubricant levels.
- Verify proper operation of all chiller integrated (non-BAS) controls.
- Verify proper response to control sequences.
- Correct any discrepancies found and prepare a report of results.

Calculation Methodology
Savings generated by installing chiller optimization will be determined by trending chiller kW, outdoor air temperature, and chiller tonnage output from supply and return water temperatures. The building load information measured during the baseline period will be used for Post savings since the building loads may change in the future. The detailed methodology and assumptions are provided in APPENDIX E.

Maintenance savings are based on ten percent of reported fiscal year 2014 cooling maintenance expense for the building.

Measurement & Verification Methodology
International Performance Measurement and Verification Protocol (IPMVP) Option B will be used to verify savings. Operation parameters will be trended for one year to verify achievement of recommended savings with annual inspections thereafter. The methodology and other parameters used in the savings calculation and verification are defined in detail in APPENDIX E.

	Savings				
Optimize Chiller Operation	Electric	Natural Gas	Water/ Sewer	O & M	Total Annual Savings
	kWh	CCF	CCF		MMBTU
Utility Unit Savings	47,528	0.0	0.0	-	162.2
Dollars Savings	$1,535	$0	$0	$2,243	$3,778
Total Price	$31,939				
Simple Payback	8.5				
Equipment Life	N/A				

Generator Installation

Scope
Part of the City's prior planned project to replace the boilers was to also replace the existing emergency back-up generator for the building. This generator supplies power to the emergency circuits of the building and allows the building to operate during utility power outages. The 175 kW generator is diesel fueled and is water cooled using a once through heat exchanger supplied with utility domestic fresh water. The generator is original to the facility and beyond expected life.

Siemens will install a new state of the art emergency back-up generator as follows:

- Design, install and commission a replacement diesel fueled electric emergency generator set with nominal peak electrical output capacity of approximately one hundred seventy five (175) kilowatts, sixty (60) hertz, alternating current, three (3) phase, four (4) wire matching the design characteristics of the existing unit.
- The system shall be installed in the same location as the existing generator and use the existing fuel system or other existing components if possible based on applicability, age and reliability.
- Provide complete factory assembled generator set equipment with digital generator set controls, digital governor, and digital voltage regulator.
- Provide factory test, startup by a factory authorized dealer and on-site load bank testing of the system. Test shall be a minimum duration of four hours. Supplier start up personnel shall meet with the owner's operating personnel to review the operation of the complete standby system. Once the system is operational, the load will be transferred to the standby generator system to demonstrate the ability of the standby generator to assume the emergency load.
- Install the complete electrical generating system including all fuel connections between main fuel supply, engine, etc., all in accordance with manufacturer's recommendations.
- Supply detailed operation and maintenance manuals including complete parts list. Manuals shall include engine manufacturer's maintenance recommendations as well as alternator operating instructions.
- Generator emission shall comply with all applicable federal, state and local emissions standards.
- Installation will include all necessary controls.
- Installation will include replacement or upgrade of all transfer or electrical equipment as necessary to meet current codes and standards.
- Installation shall include a new air cooled radiator system for engine cooling to meet current practice and code and eliminate the use of utility supplied water for cooling.

Calculation Methodology
Because this equipment is only for use on an emergency basis, no energy or operating savings have been calculated. However, the new unit will operate more efficiently than the existing unit when needed and will provide less unscheduled maintenance.

Measurement & Verification Methodology
Since no savings are identified, no measurement and verification of savings is required for this FIM.

Generator Installation	Savings				
	Electric	Natural Gas	Water/ Sewer	O & M	Total Annual Savings
	kWh	CCF	CCF		BTU
Utility Unit Savings	0	0	0	0	0
Dollars Savings	0	0	0	0	
Total Price	$527,428				
Simple Payback	Not Applicable				
Equipment Life	25 years				

Building Automation Expansion

Scope

Expansion of the existing Siemens Building Automation system at the John Marshall Courthouse will provide the City with additional opportunities to implement advanced control schemes. These additional controls measures will improve building operations as well as reduce energy consumption. The following automation items will be implemented at the John Marshal Courthouse:

- Taking over control of AHU-7 (Commonwealth Attorney's office) & 20 DDC VAV boxes as they are all currently on JCI.
- Take over control of new boilers and hot water pumps which are currently on JCI.
- New graphics will be created for boilers and hot water system.
- New graphic will be created for AHU-7 as well as floor layout for VAVs served by AHU-7.
- CO2 sensors will be added to AHUs 1-7 return ducts. Demand control ventilation will be implemented.
- Scheduling with start/stop optimization for all AHUs.
- Mixed air reset will be applied to AHUs 1-7.

Calculation Methodology

Savings due to the building automation expansion are calculated by several different methods.

Savings generated from the reduction of HVAC equipment run time shall be based on documenting the reduction of run hours for each individual piece of equipment. Siemens will take one time measurements on run hours, outdoor air temperature, supply discharge temperature, and fan kW and speed along with existing equipment CFM, outdoor air minimum, mixed air set points, Bin weather data, and system efficiencies to calculate the Equipment Scheduling Savings. The building hours of operation and equipment operation measurements are agreed upon by Siemens and the customer.

Savings generated by reducing the amount of outdoor air are based on building occupancy and mixed air control. Siemens will calculate the savings by using the existing Pre outdoor air minimum and mixed air control setting and by trending Post outdoor air minimum and mixed air controls versus outdoor air conditions. This data will be used along with bin weather data to calculate ventilation heating and cooling savings. The building hours of operation as well as Pre equipment measurements are agreed upon by Siemens and the customer.

Additional calculation methodology, baseline assumptions, measurement tables, client responsibility, measurement tools, and reporting used to determine savings are detailed in APPENDIX E.

Measurement & Verification Methodology
International Performance Measurement and Verification Protocol (IPMVP) Option B will be used to verify savings. Savings generated by the building automation expansion shall be based upon ongoing trending of outside air percentage, mixed air control, air handling unit run hours, and outside air temperature. These trended values will be recorded on all applicable air handling units. The methodology and other parameters used in the savings calculation and verification are defined in detail under Building Automation in APPENDIX E.

	Savings				
Building Automation Expansion	Electric	Natural Gas	Water/ Sewer	O & M	Total Annual Savings
	kWh	CCF	CCF		MMBTU
Utility Unit Savings	511,397	13554.0	0.0	-	3,136.9
Dollars Savings	$16,518	$13,446	$0	$0	$29,964
Total Price	$130,228				
Simple Payback	4.3				
Equipment Life	Not Applicable				

Weatherization

Scope
Savings from air sealing measures are generated by reducing uncontrolled air flow across the building envelope. Air flow is reduced be replacing worn-out weather-stripping around doors and windows, and installing new door sweeps to reduce air flow under doors. The proposed weatherization includes repairing/replacing weather-stripping on 8 doors, and installing sweeps on 8 doors.

Calculation Methodology
Weatherization is characterized by the reduction in air infiltration by air sealing cracks or other gaps in the building envelope. Infiltration savings are calculated using a standard pressure difference model. A difference in pressure between the indoors and outdoors is generated by

wind, vertical pressure differences, and ventilation. Free flow of the air through the air gaps (cracks) in the envelope is impeded by friction as the air is forced through cracks in the building envelope due to the pressure difference. Standard engineering models can show the relationship between the crack size and length, pressure difference, and air flow rate. As the size of these cracks are reduced, flow rate is reduced, thus a lower quantity of conditioned air is allowed to escape the building. This calculation will be made for each temperature bin for the agreed upon hours using actual trended data taken during the first year to determine the annual energy savings.

Measurement & Verification Methodology

International Performance Measurement and Verification Protocol (IPMVP) Option E will be used to verify savings. Savings generated by reducing infiltration shall be stipulated based upon building envelope savings models. The methodology and other parameters used in the savings calculation and verification are defined in detail under Building Envelope Improvements in APPENDIX E.

	Savings				
Weatherization	Electric	Natural Gas	Water/ Sewer	O & M	Total Annual Savings
	kWh	CCF	CCF		MMBTU
Utility Unit Savings	1,333	313.2	0.0	-	36.7
Dollars Savings	$43	$311	$0	$0	$354
Total Price	$3,700				
Simple Payback	10.5				
Equipment Life	5.0 Years				

Other Facility Improvement Measures Considered

FIMs initially considered for inclusion in the project, including those FIMs cited in the Memorandum of Understanding, are listed in the Preliminary Findings Report Dated March 12, 2015. From these preliminary findings, a number of FIMs were determined to warrant further more detailed analysis. The following FIMs were evaluated in more detail as part of this audit and found to be less technically or financially viable than the FIMs recommended above. In some cases the FIMs were included as part of the recommended FIMs discussed above. This list includes major potential FIMs as well as FIMs requested for further analysis by COR staff. It is not inclusive of all FIMs considered by Siemens during this IGA evaluation.

- Lighting Upgrades – Fluorescent Option
- Chemical Free Cooling Tower Treatment
- OA Recovery in Restrooms
- AHU Coil Cleaning
- Demand Management