MILLS WHITAKER ARCHITECTS
ARLINGTON MA www.millswhitaker.com BRIDGTON ME

June 16, 2017

David Ramsay, Town Administrator
Board of Selectmen
P.O. Box 250
Dover MA 02030

RE: Dover Caryl Community Center
Study for Required Improvements

Dear Mr. Ramsay,

In accordance with your request, we have completed the conceptual study for upcoming improvements to the Caryl Community Center. These improvements are summarized as follows:

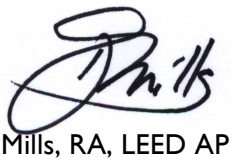
Mechanical: Replace boilers, piping, controls and heating distribution equipment.
Electrical: Replace fire alarm system, electrical panels and emergency generator.
Structural: Selective masonry, concrete and carpentry repairs.
Accessibility: Upgrade to meet current regulations of the Architectural Access Board as will be required due to the cost of mechanical improvements relative to the building's value. Work includes making the back entrance accessible, improving front entrance walkway, upgrading door hardware and clearances, and several other required items per the accessibility study.
Common Areas: Upgrade flooring, ceilings and lighting in hallway areas on both floor levels.

In addition to the items identified for needed improvements, we have included brief comments about other items that could be considered in the future, noted in the study as "further observations."

As a single combined project to address the improvements, we recommend budgeting an approximate total just under $4 million for the cost of construction, A/E fees, project management, escalation and contingencies. This value assumes that the designer selection process will commence in July 2018 and construction would start in June 2019. If the project is delayed, or if it is subdivided into separate projects instead of being a single effort, the cost would increase beyond what is outlined herein.

If you have any questions regarding this study, please do not hesitate to contact me.

Sincerely,



Donald W. Mills, RA, LEED AP
Mills Whitaker Architects LLC

Attachments:
Budget for Required Improvements (1 page): Mills Whitaker Architects / 16 June 2017
Study for Required Improvements (113 pages): Mills Whitaker Architects / 17 May 2017
Conceptual Estimate (12 pages): Daedalus Projects / 16 June 2017

P.O. Box 750089
Arlington MA 02475
617.876.7611 voice
617.876.6420 fax

Dover Caryl Community Center
Budget for Required Improvements
Mills Whitaker Architects / 16 June 2017

Project Criteria and Assumptions:
1. Estimated costs are conceptual based on recommendations in the "Study for Required Improvements."
2. Project will be executed by a qualified General Contractor per MGL Chapter 149.
3. Project will follow public bidding regulations and prevailing wage rates.
4. The Town will select an Owner's Project Manager prior to selection of a Designer.
5. Designer will consist of an architectural firm with engineering consultants.
6. An accessibility variance will be required for selected items as outlined in the study.
7. Cost escalation values assume that the project will be completed during FY 2020.

Cost	Description
$1,221,705	MECHANICAL IMPROVEMENTS: Replace boilers, piping, controls & heating distribution equipment. Includes patching, finishes and electrical related to the HVAC work.
$154,580	ELECTRICAL IMPROVEMENTS: Replace antiquated electrical panels and emergency generator. (Mechanical, accessibility & common areas include the related electrical budget costs that are applicable to each of those categories.)
$257,006	STRUCTURAL IMPROVEMENTS: Selective masonry, concrete and carpentry repairs. (Accessibility budget includes the structural costs that are applicable to that category.)
$751,319	ACCESSIBILITY IMPROVEMENTS
$297,455	COMMON AREA IMPROVEMENTS
N.A.	FURTHER OBSERVATIONS: Refer to study for outline of future considerations.
$2,682,065	**Subtotal of Conceptual Costs**
$210,000	Design and Pricing Contingency (Conceptual Estimate)
$227,000	Cost Escalation (Start Construction July 2019)
$3,119,065	**Conceptual Estimated Construction Budget**

	Related Project Components
$250,000	Construction Contingency (Unforeseen Conditions)
$100,000	Allowance for Asbestos Abatement (Heating Piping, Boiler, Misc.)
$100,000	Consultant: Owner's Project Manager (Allowance for Consultant)
$325,000	Architectural & Engineering Services (Arch, Struct, Mech, Elect)
$25,000	Project Expenses (Printing, Advertising, Mileage, Miscellaneous)
$3,919,065	**Conceptual Project Budget**

DOVER CARYL COMMUNITY CENTER
STUDY for REQUIRED IMPROVEMENTS
4 Springdale Avenue
Dover MA

Mills Whitaker Architects LLC
17 May 2017

INTRODUCTION

The Caryl Community Center, formerly the Caryl School, was converted from an elementary school into a community center in 2001 following construction of a new elementary school. The facility consists of three interconnected buildings dating from 1910, 1931 and 1971. In 2003, Mills Whitaker Architects prepared a "Deferred Maintenance Study" outlining prioritized repairs for the former school given its deteriorated condition. Since that time, the following studies and projects have been completed:

2006 Study to upgrade or replace the building based on the preferred programming of the projected uses at that time. The study resulted in a recommendation to replace the existing building with new construction at a cost of $18.5 million versus the cost to address all deferred maintenance issues at a cost of $9.3 million, both in 2008 dollars. The proposal to replace the building was never brought to Town Meeting for a vote. As a result, sequential deferred maintenance projects have been undertaken.

2008 Replacement of all shingled and membrane roofing surfaces

2009 Repairs to deteriorated brick masonry and reinforcement of 1931 hip roof structure

2011 Removal of underground fuel oil tanks for boilers and emergency generator; provision of replacement tank for boilers above-ground and indoor tanks for generator

2014 "HVAC Boiler Replacement & System Evaluation" study and recommendations

2016 Renovation of public multi-fixture toilet rooms and associated janitor's closets

2016 "Accessibility Study" to evaluate existing conditions and prescribe needed improvements

2017 This "Study for Required Improvements" which intends to summarize the remaining deferred maintenance items into a single combined project, along with noting any other future considerations. This study was intended to seek a scope and budget for joining the HVAC system upgrades into the accessibility improvements, along with any other lingering and prioritized deferred maintenance issues. This study was conducted with the following firms:

Architect:	Mills Whitaker Architects LLC
Structural:	Structures North Consulting Engineers Inc
Mechanical:	VAV International Inc
Electrical:	Johnson Engineering & Design Inc
Estimating:	Daedalus Projects Inc

MECHANICAL IMPROVEMENTS

The existing pair of boilers, along with all associated piping, controls and distribution equipment (radiation and unit ventilators) are antiquated and well beyond their useful life. There was an HVAC study done in 2014 to outline recommendations for improvements, and just recently a peer review was performed that modified some of the recommendations and expanded upon certain aspects of the future project. The intent of the mechanical improvements will be to perform them in such a way that the ongoing use of the building can be maintained, so a sequential work program will need to be established by the contractor.

The peer review study addressed the HVAC systems primarily and did not address any plumbing issues. Since the multi-fixture toilet rooms were just renovated, the only remaining known plumbing issues that need to be addressed are related to accessibility issues as noted in that report. It should also be noted that the existing septic tank and leaching field are regularly maintained and, it is assumed (no testing was performed) that that sanitary disposal system will continue to function without incident into the foreseeable future.

The Cost Estimator will review the following elements related to the Mechanical Systems:

- HVAC: Budget pricing of improvements based on VAV International's report.
- PLUMBING: Budget pricing of items as noted in the Accessibility Study. Hot and cold water supply piping to classroom sinks should be replaced as part of the upgrades.
- SPRINKLERS: Exempt per state code and general laws as noted below, subject to AHJ approval.

The scope of improvements as outlined in this study will result in a construction project that would be classified as "*Repairs*" and "*Alterations – Level 1*" per the current building code 780 CMR 8th Edition, which refers to the 2009 International Existing Building Code, Chapter 4, "Classifications of Work." Level 1 work consists of "*the removal or replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment or fixtures that serve the same purpose*." This level of work does not trigger the need for providing automatic sprinkler protection, as noted in 2009 IEBC 603, which requires the current level of fire protection to be maintained. Also note that, per Massachusetts General Laws Chapter 148, Section 26G, a building exceeding 7,500 SF in area undergoing major alterations but lacking sufficient water supply and pressure is exempt from providing sprinklers. This building is approximately 41,300 SF in area, but the pending improvement project does not qualify as major alterations since it is limited to "*Repairs*" and "*Level 1 work*." The lack of sufficient water supply and pressure allows for an exemption from sprinklers provided that the local building and fire departments agree with this interpretation for this existing building.

As of the date of this study, there is a pending building code update in review, but a final version and release date has not yet been announced. It is probable that the new code will apply to this project.

ELECTRICAL IMPROVEMENTS

Existing electrical switchgear and panels date from the 1971 work and consist of products from a company that is no longer in business (Empire), making repairs and maintenance infeasible. This was noted in 2003, and reiterated in the 2017 review by the Electrical Engineer. Replacement of primary equipment is recommended as noted in the report. Also, replacement of the fire alarm system in its entirety, along with upgrading of corridor lighting, is recommended to be included.

The Cost Estimator will review the following elements related to the Electrical Systems:

- Costs related to recommendations in the recent electrical survey report.
- Costs related to HVAC and Accessibility improvements.

ACCESSIBILITY IMPROVEMENTS

The cost of the HVAC improvements are expected to exceed 30% of the value of the building, so this triggers the requirement for full conformance with current accessibility regulations under 521 CMR. An "Accessibility Study" was undertaken in 2016 to address these issues, along with a conceptual budget. The Cost Estimator will review the scope of work required and the costs associated with that work as part of an overall project that will include improvements noted for the HVAC, Electrical, Structural and Common Areas as referenced herein.

STRUCTURAL IMPROVEMENTS

In 2003, prioritized repairs to the building's structure were identified and a project in 2009 addressed the most critical of masonry repairs and executed structural reinforcement of the 1931 hip roof rafter framing system. An updated structural report has identified additional masonry work due to typical ongoing maintenance issues, all of which should be addressed as part of the next improvement project. (*Note to Daedalus: Refer to exterior elevations and captioned photos for information related to masonry conditions and locations. Narrative details the locations; elevations are not annotated*.)

COMMON AREA IMPROVEMENTS

The corridors at both floor levels consist of circa 1971 vinyl composition tile floors (over slabs at the first floor; over wood framing at the second floor) that are somewhat deteriorated and are a remnant of the former use as an elementary school. The corridors also have 1971 light fixtures that should be replaced. While many of the rooms have been renovated to some extent, the corridors are the most visually prominent vestige of the former school and should be updated as part of the next project.

- Remove VCT at the first floor hallways; level the slab and provide replacement VCT.
- Remove VCT at the second floor hallways; remove underlayment; re-nail subfloors and provide replacement underlayment plywood and replacement VCT.
- Replace VCT at stair treads between riser and abrasive nosing; replace VCT at landings.
- Remove existing linear light fixtures; provide acoustical ceiling tiles (2 x 2 mineral fiber Armstrong "Ultima Vector"); provide recessed LED lay-in lighting fixtures.

FURTHER OBSERVATIONS

The initial assessment report of 2003 addressed prioritized items and this 2017 study concludes the list of maintenance and improvements needed for the adaptive reuse of the former Caryl School as the Caryl Community Center. A few items to keep in mind for possible future work include:

- Additional incremental masonry repairs when needed.
- Continued monitoring of the 1971 glue-laminated timbers.
- Any use-related improvements to specific rooms if required.
- Monitoring of window conditions for future replacement if needed.
- Continued maintenance and monitoring of septic system and leaching field.
- Adding two large dormers in the former library double-height space, facing Springdale Avenue, with floor-to-roof windows in the dormers to supplement the low ribbon windows. That would transform the space into a "Community Great Room" to complement its voluminous size.

ATTACHMENTS

- CAPTIONED PHOTOS OF EXISTING CONDITIONS – May 2017 (17 pages)
  - Exterior Views
  - Roofing Areas
  - Interior Conditions
  - Mechanical Systems
  - Electrical Systems
  - Structural Systems
  - (*Also see photos in the Accessibility Improvements report)*
- DRAWINGS OF EXISTING BUILDING
  - Floor Plans, Roof Plans, Exterior Elevations – May 2017 (5 pages)
- SITE SURVEY:
  - Feldman Surveying EX-1 / 2005 with Notes from 2017 (1 page)
- MECHANICAL IMPROVEMENTS
  - VAV International – 12 May 2017 (13 pages – DRAFT / Peer Review of Forte Study)
  - Forte Engineering – 20 Oct 2014 (21 pages)
- ELECTRICAL IMPROVEMENTS
  - Johnson Engineering & Design – 15 May 2017 (4 pages)
- ACCESSIBILITY IMPROVEMENTS
  - Mills Whitaker Architects – 30 June 2016 (43 pages)
- STRUCTURAL CONDITIONS REPORT:
  - Structures North Consulting – 10 May 2017 (5 pages)

EXTERIOR VIEWS

170511-P1010085.JPG

Main Entrance Walkway from Springdale;
Refer to Accessibility Info for Re-Grading

EXTERIOR VIEWS

170511-P1010057.JPG

Back Parking Lot Area;
Refer to Electrical Report for Pole Lighting

EXTERIOR VIEWS

170511-P1010083.JPG

Front Facade (North) of 1971 Addition;
Refer to Structural Report for Continuous Window Sill

EXTERIOR VIEWS

170511-P1010084.JPG

Front Facade (North) of 1910 Original Building;
Refer to Structural Info for Moss at Watertable

EXTERIOR VIEWS

170511-P1010061.JPG

West Side Covered Areaway Entrance;
Water Infiltration at Foundation Wall of Link

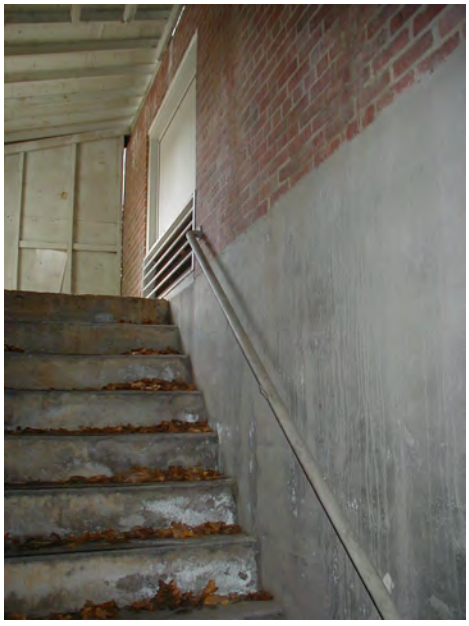
EXTERIOR VIEWS

170511-P1010063.JPG

Covered Areaway Service Stair to Boiler Room;
Requires Re-painting & Re-roofing

EXTERIOR VIEWS

170511-P1010049.JPG



Areaway to Boiler Room

EXTERIOR VIEWS

170511-P1010059.JPG

Remove Unnecessary Exit Stair from Classroom;
Retain Enclosure for Gym Exit Areaway Below &
Re-paint and Re-roof the Enclosure

ROOFING AREAS

170511-P1010003.JPG

South Edge of Link Roof Looking Toward 1931 Addition

ROOFING AREAS

170511-P1010004.JPG

North Edge of Link Roof Looking Toward 1910 Original Building

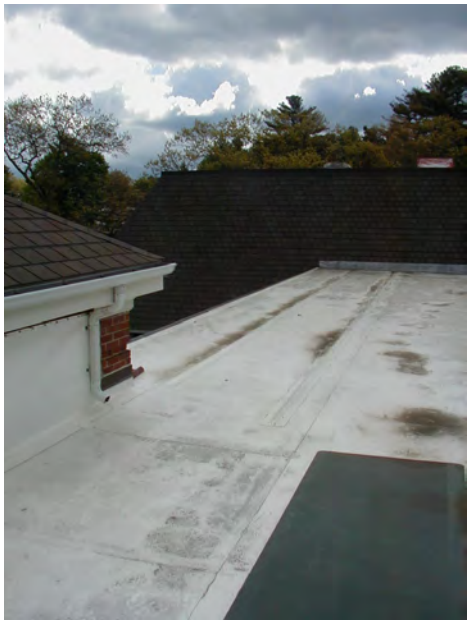
ROOFING AREAS

170511-P1010002.JPG

NE Corner of 1931 Addition

ROOFING AREAS

170511-P1010001.JPG



SE Corner of 1910 Original Building

ROOFING AREAS

170511-P1010011.JPG

Boiler Chimney Repaired in 2009;
All Roofing Replaced in 2008

ROOFING AREAS

170511-P1010012.JPG

1910 Building Beyond;
1971 Flat Link Roof;
1931 Roof in Foreground

ROOFING AREAS

170511-P1010010.JPG

View of 1971 Addition from Upper Flat Roof Area of 1931 Building

ROOFING AREAS

170511-P1010013.JPG

Popped Nail Head at North Slope of 1931 Roof Below 2008 Shingle Work

ROOFING AREAS

170511-P1010009.JPG

Upper Flat Roof of 1931 Addition

ROOFING AREAS

170511-P1010008.JPG

Re-roofing required at Areaway Entrance Canopy

ROOFING AREAS

170511-P1010006.JPG

2016 Toilet Fan for Second Floor Renovated Areas; Emergency Generator Intake Air Hood & Exhaust, Remove & Patch Roof per Generator Upgrades

ROOFING AREAS

170511-P1010005.JPG

Replace Glass & Louver for Elevator Venting with Louver and Motorized Damper for Energy Efficiency; Upgrade as Mech/Elect/Fire Alarm Improvements

INTERIOR CONDITIONS

170511-P1010055.JPG

Looking North in First Floor Corridor of 1931 Addition

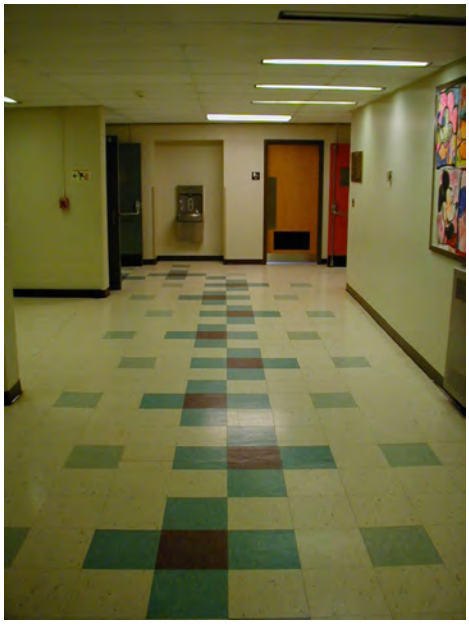
INTERIOR CONDITIONS

170511-P1010017.JPG

Looking South in Second Floor Corridor of 1931 Addition

INTERIOR CONDITIONS

170511-P1010016.JPG



Looking West in Second Floor Corridor of 1971 Link

INTERIOR CONDITIONS

170511-P1010015.JPG

Looking East in Second Floor Corridor of 1971 Link

INTERIOR CONDITIONS

170511-P1010021.JPG

Back Entrance to Stair Landing of 1931 Addition;
4-Stop LU/LA to be Installed to Left of Stair

INTERIOR CONDITIONS

170511-P1010052.JPG

Bottom Landing of 1931 Stair at Gym Level;
Lower Run to be Rebuilt for Access to LU/LA Beyond

INTERIOR CONDITIONS

170511-P1010051.JPG

Gym at Lower Level, Looking Northwest

INTERIOR CONDITIONS

170511-P1010053.JPG

Gym at Lower Level, Looking Northeast

INTERIOR CONDITIONS

170511-P1010066.JPG

Mezzanine Stair at Second Floor of 1971 Addition in Former Library of Elementary School

INTERIOR CONDITIONS

170511-P1010073.JPG

Mezzanine Level Above Former Library; Refer to Accessibility Info for Vertical Wheelchair Lift

INTERIOR CONDITIONS

170511-P1010019.JPG

Second Floor Classroom in 1931 Addition

INTERIOR CONDITIONS

170511-P1010020.JPG

Second Floor Classroom in 1931 Addition

INTERIOR CONDITIONS

170511-P1010032.JPG

2016 Renovations of Public Toilet Rooms at First & Second Floors (First Floor Women's Shown)

INTERIOR CONDITIONS

170511-P1010038.JPG

First Floor Renovated Women's Room

INTERIOR CONDITIONS

170511-P1010039.JPG

First Floor Renovated Women's Room; Men's Rooms Also Include Changing Tables

INTERIOR CONDITIONS

170511-P1010040.JPG

First Floor Renovated Women's Room

MECHANICAL SYSTEMS

170511-P1010044.JPG

Antiquated Cast Iron Steam Fired Boiler;
Oil Burner Replacement in Process

MECHANICAL SYSTEMS

170511-P1010043.JPG

Insulation Jacketing for Boilers;
Breaching Beyond

MECHANICAL SYSTEMS

170511-P1010042.JPG

Boiler Burner Replacement in Process

MECHANICAL SYSTEMS

170511-P1010041.JPG

Boilers From Entrance to Room at Corridor Landing

MECHANICAL SYSTEMS

170511-P1010046.JPG

Boiler Room Equipment

MECHANICAL SYSTEMS

170511-P1010045.JPG

Compressor for Pneumatic Temperature Controls

MECHANICAL SYSTEMS

170511-P1010047.JPG

Duct From Areaway Window to Floor of Boiler Room Serving as Combustion Air Intake

MECHANICAL SYSTEMS

170511-P1010062.JPG

2011 Above Ground 3,000 Gallon Fuel Oil Tank

ELECTRICAL SYSTEMS

170511-P1010024.JPG

Empire Switchgear in Existing Electrical Room

ELECTRICAL SYSTEMS

170511-P1010028.JPG

Empire Panel Array in Main Electrical Room

ELECTRICAL SYSTEMS

170511-P1010018.JPG

Empire Panels on Second Floor in Janitor's Closet; One Panel Previously Damaged from Roof Leak

ELECTRICAL SYSTEMS

170511-P1010025.JPG

Communications Cabling & Fire Alarm Panel in Existing Electrical Room

ELECTRICAL SYSTEMS

170511-P1010023.JPG

Pull Box at Incoming Electrical Service Cable; Water Infiltration Due to Inappropriate Weather Head Treatment at Utility Pole

ELECTRICAL SYSTEMS

170511-P1010022.JPG

Three Fuel Oil Tanks Used for Temporary Heating Oil During 2011 Removal of Underground Tank; Now Only One in Use for Emergency Generator; This Room to Become New Electrical Room for Upgrades

ELECTRICAL SYSTEMS

170511-P1010027.JPG

Antiquated Emergency Generator to be Replaced with Outdoor Unit per Electrical Report

ELECTRICAL SYSTEMS

170511-P1010065.JPG

Proposed Outdoor Location for Emergency Generator; Pad Mounted with Sound Enclosure; Fuel Tank as Part of the Unit; Run Exhaust Above Roof Eave

ELECTRICAL SYSTEMS

170511-P1010031.JPG

Existing Indoor Generator and Transfer Switch

ELECTRICAL SYSTEMS

170511-P1010007.JPG

Existing Generator Exhaust at Link Roof;
Hood for Combustion Air Intake to Right;
Infill Roofing Systems Upon Removal (Sarnafil PVC)

ELECTRICAL SYSTEMS

170511-P1010074.JPG

Awkward Floor-Mounted Magnetic Hold-Open Device
Stair Doors in 1971 Addition; Remove as Part of
Fire Alarm System Improvements

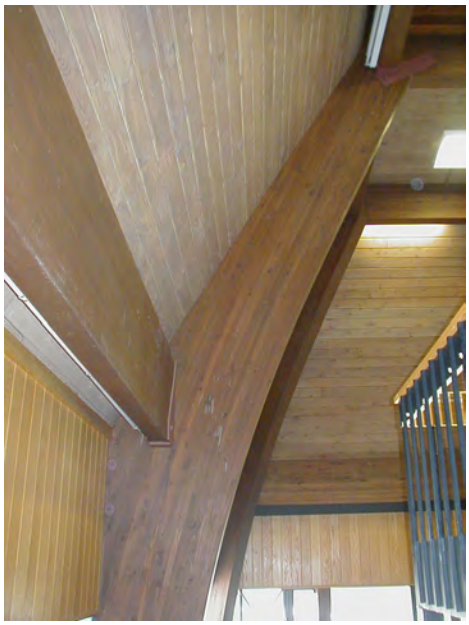
ELECTRICAL SYSTEMS

170511-P1010076.JPG

Delete Floor-Mounted Magnetic Hold-Open Device
During Fire Alarm System Improvements &
Replace Closer with Life Safety Type with
Built-In Hold-Open and Fire Alarm Relay

STRUCTURAL SYSTEMS

170511-P1010069.JPG



Arched Glue-Laminated Timbers of 1971 Addition

STRUCTURAL SYSTEMS

170511-P1010070.JPG

Perimeter Beam with Hanger at Right of Arch; Mezzanine Beam with Hanger to Left of Arch

STRUCTURAL SYSTEMS

170511-P1010067.JPG

Detail of Laminations with Slight Cracking Indicative of Wood Shrinkage Between Members

STRUCTURAL SYSTEMS

170511-P1010071.JPG

Structural Reinforcements at Corners of 1971 Addition; Steel Plates Below X-Bracing are Below Window Sills

STRUCTURAL SYSTEMS

170511-P1010079.JPG

Open Joint in Continuous Window Sill at SW Corner of 1971 Addition; See Structural Info

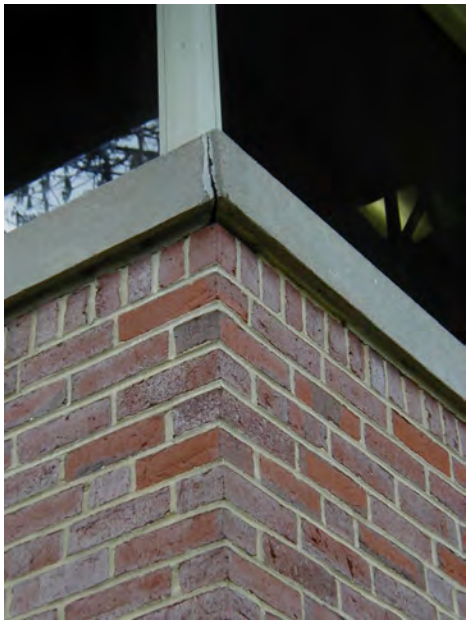
STRUCTURAL SYSTEMS

170511-P1010080.JPG

Open Joint in Continuous Window Sill at SE Corner of 1971 Addition; See Structural Info

STRUCTURAL SYSTEMS

170511-P1010081.JPG



Open Joint in Continuous Window Sill at NE Corner of 1971 Addition; See Structural Info

STRUCTURAL SYSTEMS

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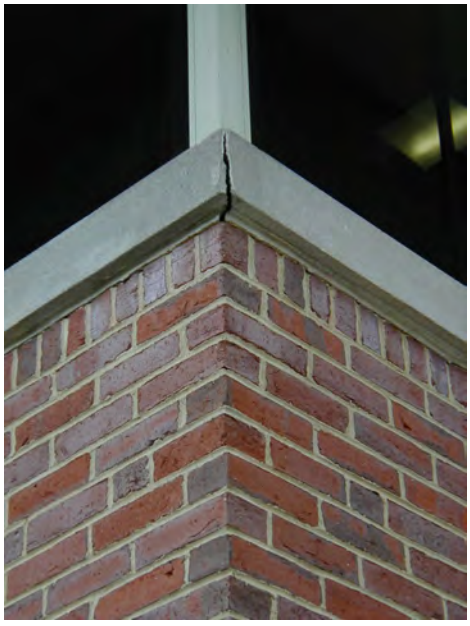


Open Joint in Continuous Window Sill at NW Corner of 1971 Addition; See Structural Info

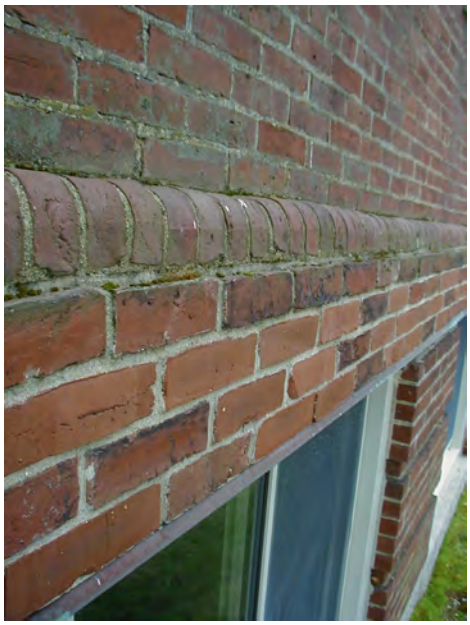
STRUCTURAL SYSTEMS

170511-P1010077.JPG

2009 Replacement Brickwork, Lintels and Flashing at East Facade of 1931 Addition; Watertable Above Requires Attention per Structural Info

STRUCTURAL SYSTEMS

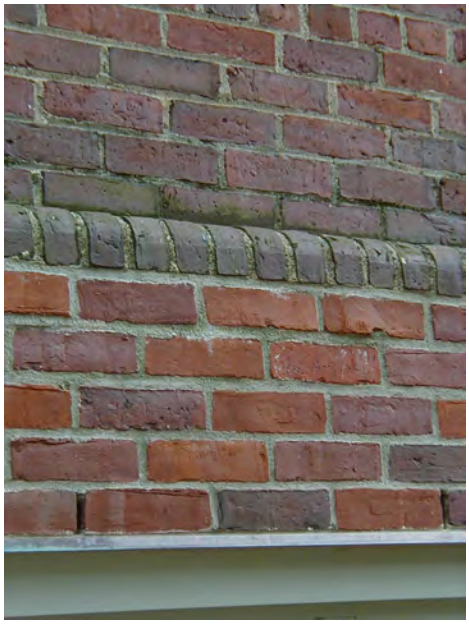
170511-P1010086.JPG



Detail of Watertable Brickwork at Front Facade (North) of 1910 Original School; Rebuilt Brickwork at Window

STRUCTURAL SYSTEMS

170511-P1010078.JPG

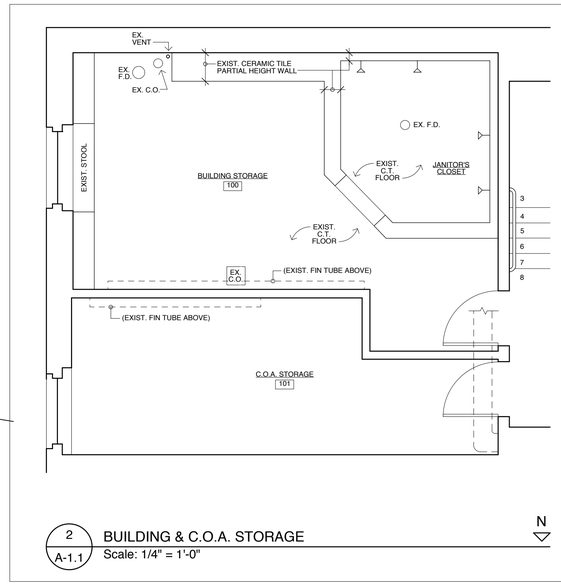


2009 Reconstruction Brickwork, Lintel & Flashing Above Window; See Structural Info for Watertable

STRUCTURAL SYSTEMS

170511-P1010054.JPG

Holes in Masonry at Former Attachments of Basketball Backboard in Gymnasium



2 A-1.1 BUILDING & C.O.A. STORAGE
Scale: 1/4" = 1'-0"

N

TO SEPTIC TANK & LEACHING FIELD

EXIST. MANHOLE

EXIST. MANHOLE

EXIST. UNDERGROUND SANITARY

CLASSROOM PENQUIN (4's)

CLASSROOM PANDA (3's)

EX. UNIT VENT

EAST STAIR

CUH

UP 19R

EX. UNIT VENT

CLASSROOM PENQUIN (4's)

CLASSROOM PANDA (3's)

EX. UNIT VENT

EX. UNIT VENT

CDC HALLWAY

RAD.

RAD.

RAD.

CDC STAFF

CDC DIRECTOR

CDC STORAGE

CDC STORAGE

HCAP SINK

CDC CHANGING

W.C.

W.C.

CUH

CUH

DF

F.E. CAB.

F.E. CAB.

ENTRY HALL

MAIN ENTRY

ELEV. MACH.

STO.

UP 14R

STAIR HALL

COA COATS

COA PANTRY

KITCHEN

SERVING

COA BLUE ROOM

EXIST. UNDERGROUND WATER SUPPLY

BUILDING STORAGE 101

COA STORAGE 101

BACK STAIR

EXIST. FIN RAD.

COA

COA FILES

COA STORAGE

FE

GYMNASIUM

EXIST. U.V. ABOVE

UP

UP 11R

COUNCIL ON AGING

HALL

EXIST. U.V. ABOVE

EXIST. U.V. ABOVE

COA OFFICE 102

MEN 104

WOMEN 103

DF

HALL 105

STORAGE #113

BOILER

UP 12 R

ELEC.

EXIST. 3,000 GALLON FUEL OIL TANK

EX. ELECT. PULL BOX

EXIST. UNDERGROUND ELECTRICAL

AREA WAY

DN 11R

VESTIBULE

FE

DF

EXIST. TELESCOPING BLEACHERS

EXIST. U.V.

CAFETERIA

UP

UP

EXIST. U.V.

EXIST. U.V.

EXIST. TELESCOPING BLEACHERS

1 A-1 EXISTING FIRST FLOOR PLAN
Scale: 1/8" = 1'-0"

N

MILLS WHITAKER ARCHITECTS LLC

P.O. BOX 750089
ARLINGTON MA 02475

tel: 617-876-7611
fax: 617-876-6420

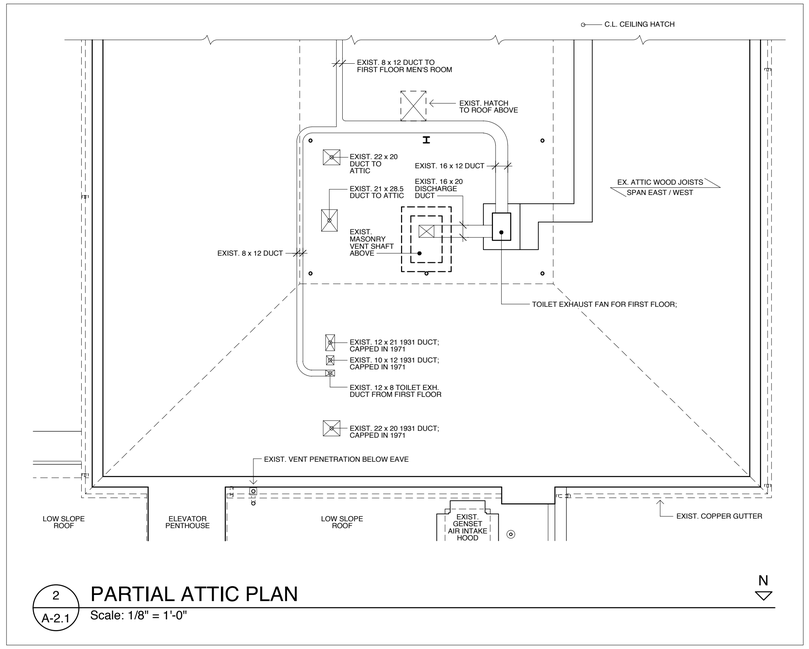
PROJECT NAME: DOVER MUNICIPAL FACILITY IMPROVEMENTS

PROJECT ADDRESS: RESTROOM RENOVATIONS & SLAB REPAIRS
4 SPRINGDALE AVE. & 1 WALPOLE ST. / DOVER MA

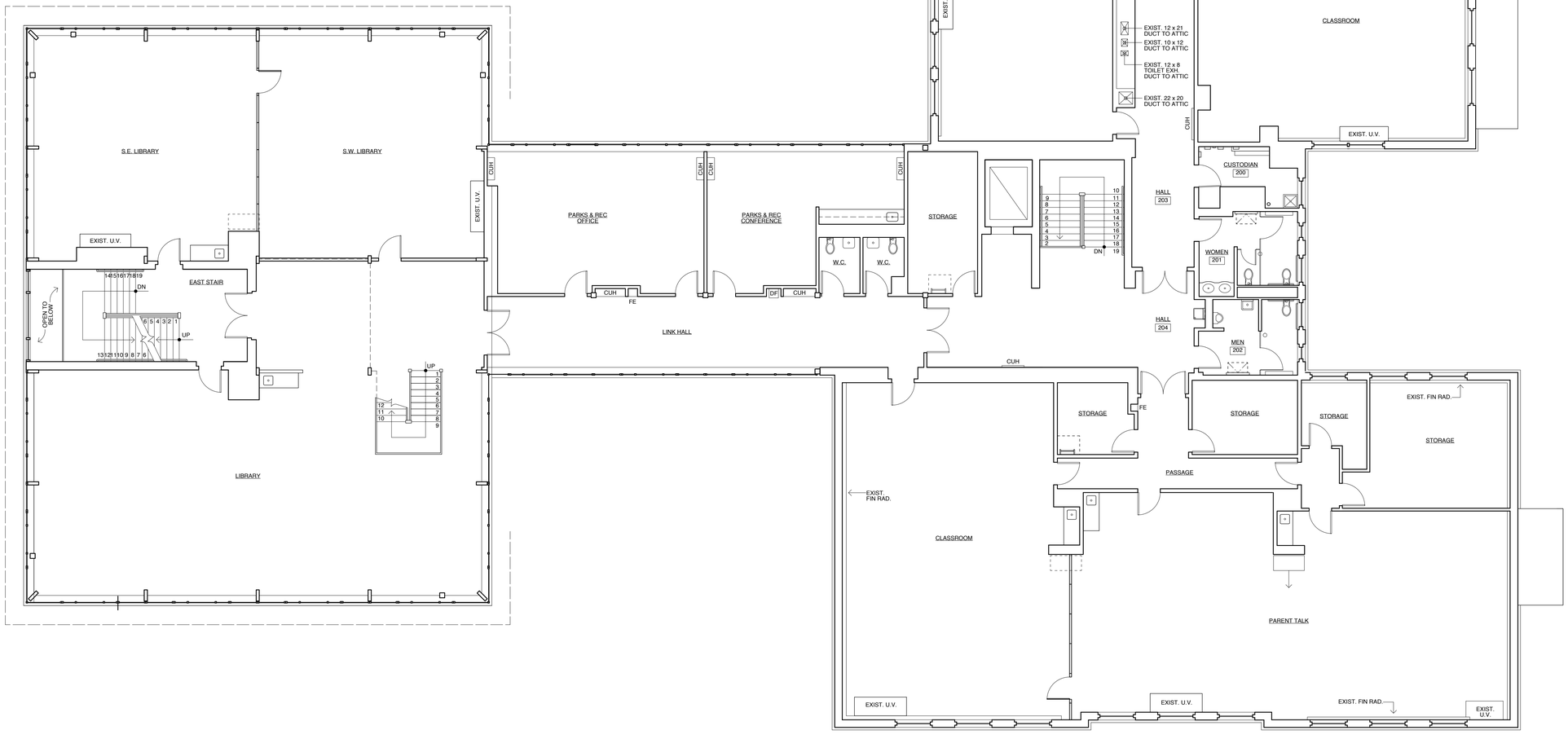
DRAWING TITLE: FIRST FLOOR PLAN

DATE: MAY 2017

A-1.1



2 / A-2.1 PARTIAL ATTIC PLAN
Scale: 1/8" = 1'-0"



1 / A-2 SECOND FLOOR PLAN
Scale: 1/8" = 1'-0"

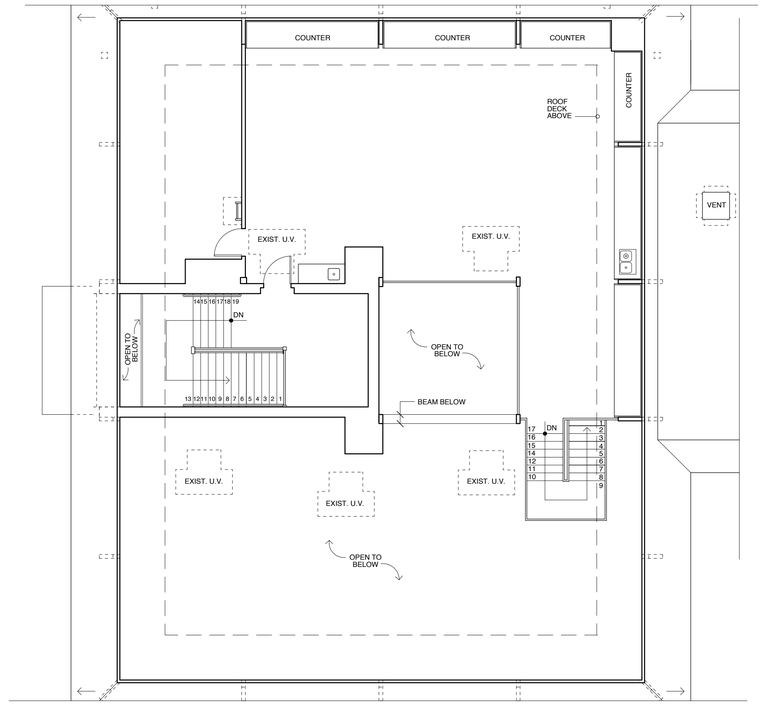
MILLS WHITAKER ARCHITECTS LLC
P.O. BOX 750089
ARLINGTON MA 02475
tel: 617-876-7611
fax: 617-876-6420

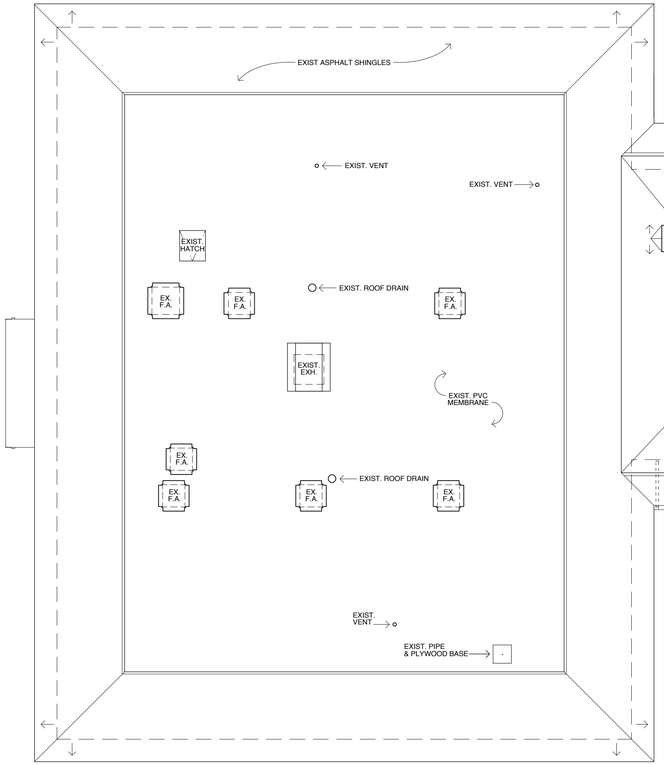
PROJECT NAME: DOVER MUNICIPAL FACILITY IMPROVEMENTS
PROJECT ADDRESS: RESTROOM RENOVATIONS & SLAB REPAIRS
4 SPRINGDALE AVE. & 1 WALPOLE ST. / DOVER MA

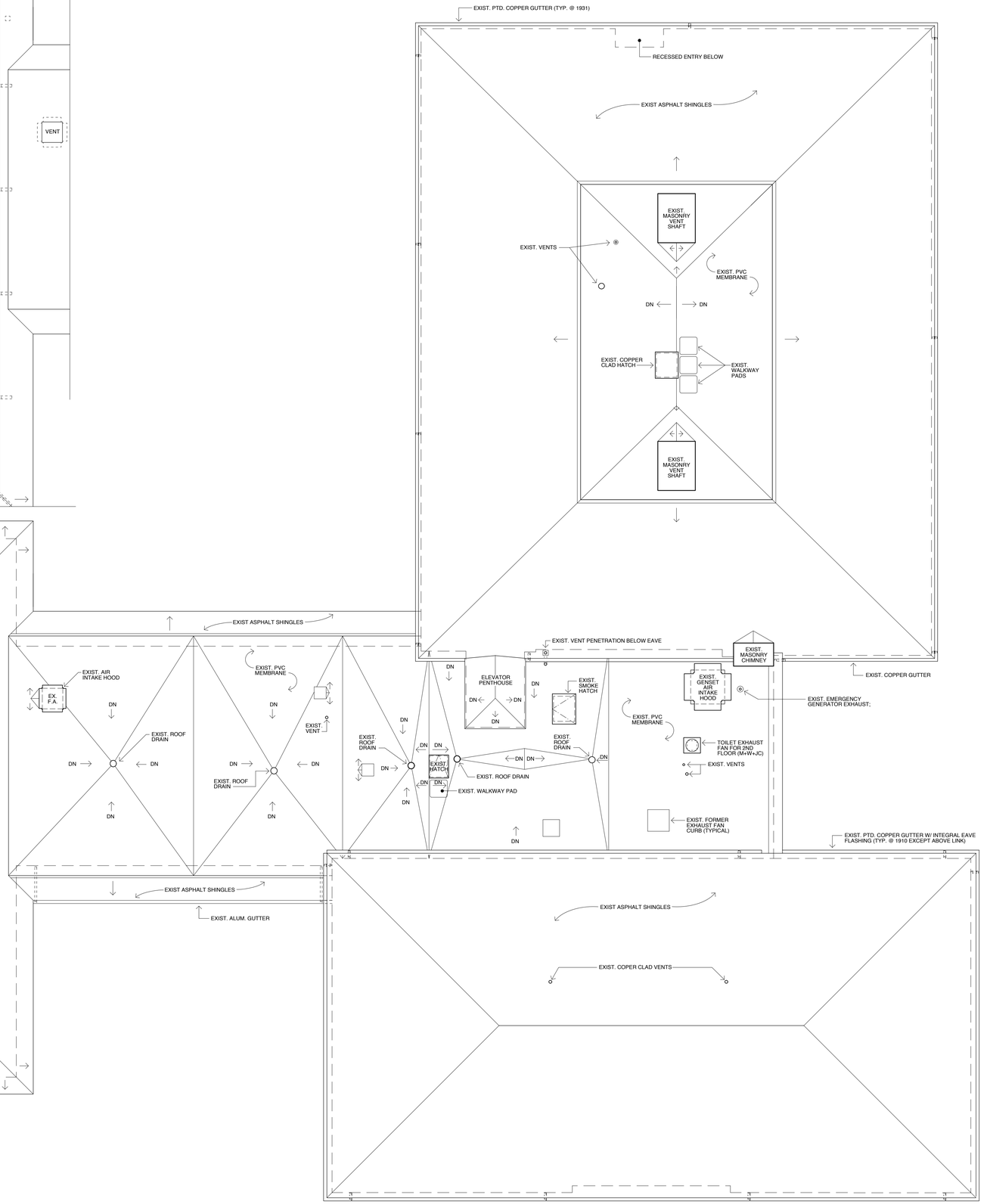
DRAWING TITLE: SECOND FLOOR PLAN

DATE: MAY 2017

A-2.1







1 A-2 MEZZANINE & ROOF PLAN
Scale: 1/8" = 1'-0"

N

MILLS WHITAKER ARCHITECTS LLC
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ARLINGTON MA 02475
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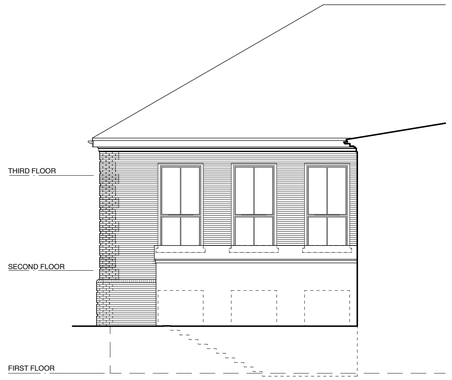
PROJECT NAME: DOVER MUNICIPAL FACILITY IMPROVEMENTS
RESTROOM RENOVATIONS & SLAB REPAIRS
PROJECT ADDRESS: 4 SPRINGDALE AVE. & 1 WALPOLE ST. / DOVER MA

DRAWING TITLE: MEZZANINE & ROOF PLAN

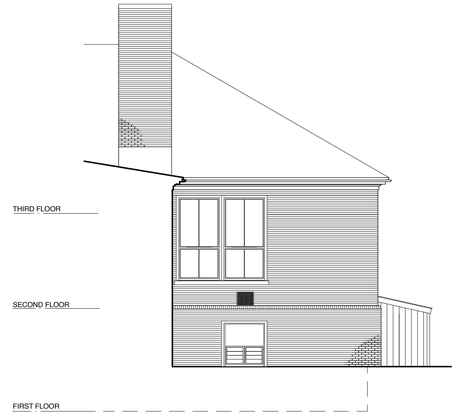
DATE: MAY 2017

A-10

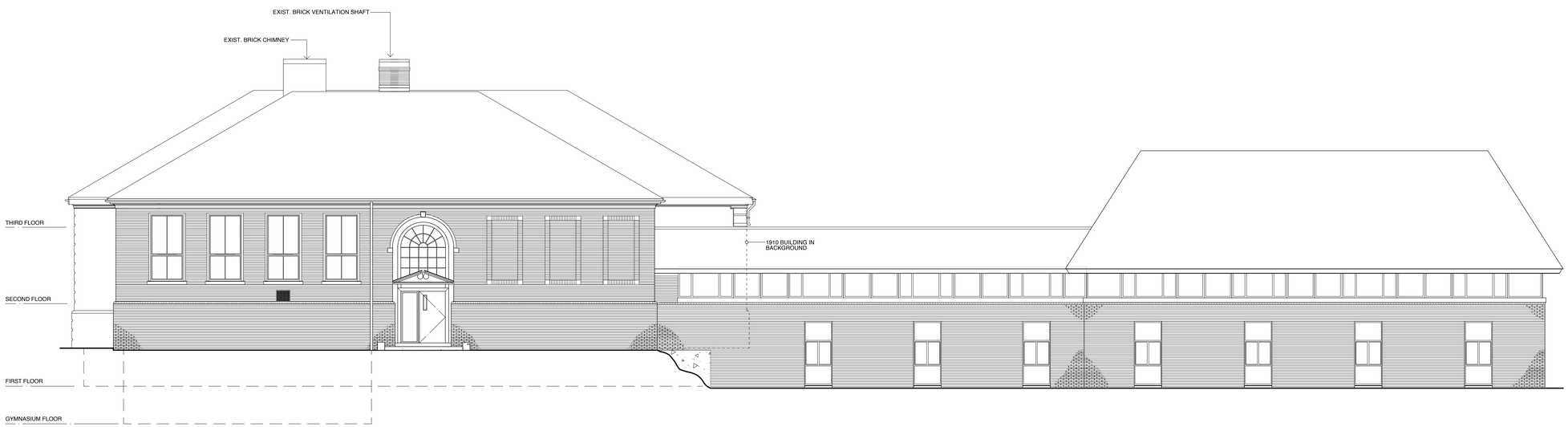
1 EX-4 EXISTING NORTH ELEVATION
Scale: 1/8" = 1'-0"



2 EX-4 EX PARTIAL NORTH ELEV @ 1910 BLDG
Scale: 1/8" = 1'-0"



3 EX-4 EX PARTIAL SOUTH ELEV. @ 1931 BLDG
Scale: 1/8" = 1'-0"



4 EX-4 EXISTING SOUTH ELEVATION
Scale: 1/8" = 1'-0"

MILLS
WHITAKER
ARCHITECTS
LLC

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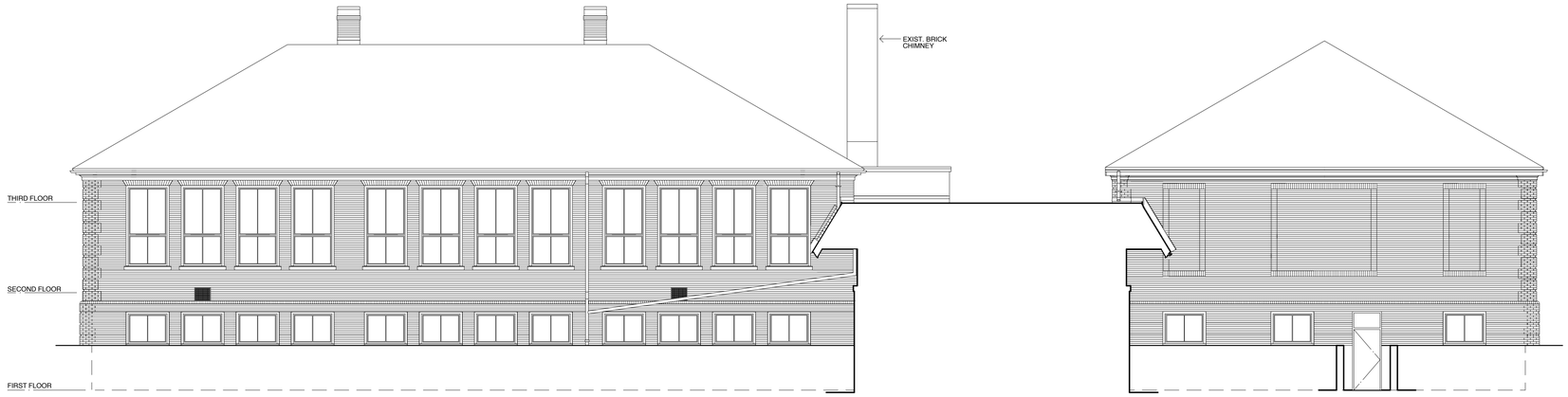
PROJECT NAME:
DOVER MUNICIPAL FACILITY IMPROVEMENTS
RESTROOM RENOVATIONS & SLAB REPAIRS

PROJECT ADDRESS:
4 SPRINGDALE AVE. & 1 WALPOLE ST. / DOVER MA

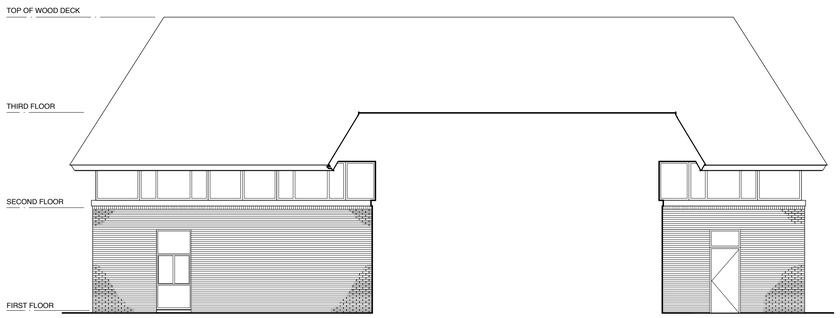
DRAWING TITLE:
EXISTING NORTH & SOUTH ELEVATIONS

DATE: MAY 2017

EX-4



1 EX-5 EXISTING EAST ELEVATION THRU 1971 LINK
Scale: 1/8" = 1'-0"



2 EX-5 EXISTING WEST ELEVATION THRU 1971 LINK
Scale: 1/8" = 1'-0"

3 EX-5 EXISTING EAST ELEVATION
Scale: 1/8" = 1'-0"

4 EX-5 EXISTING WEST ELEVATION
Scale: 1/8" = 1'-0"

MILLS
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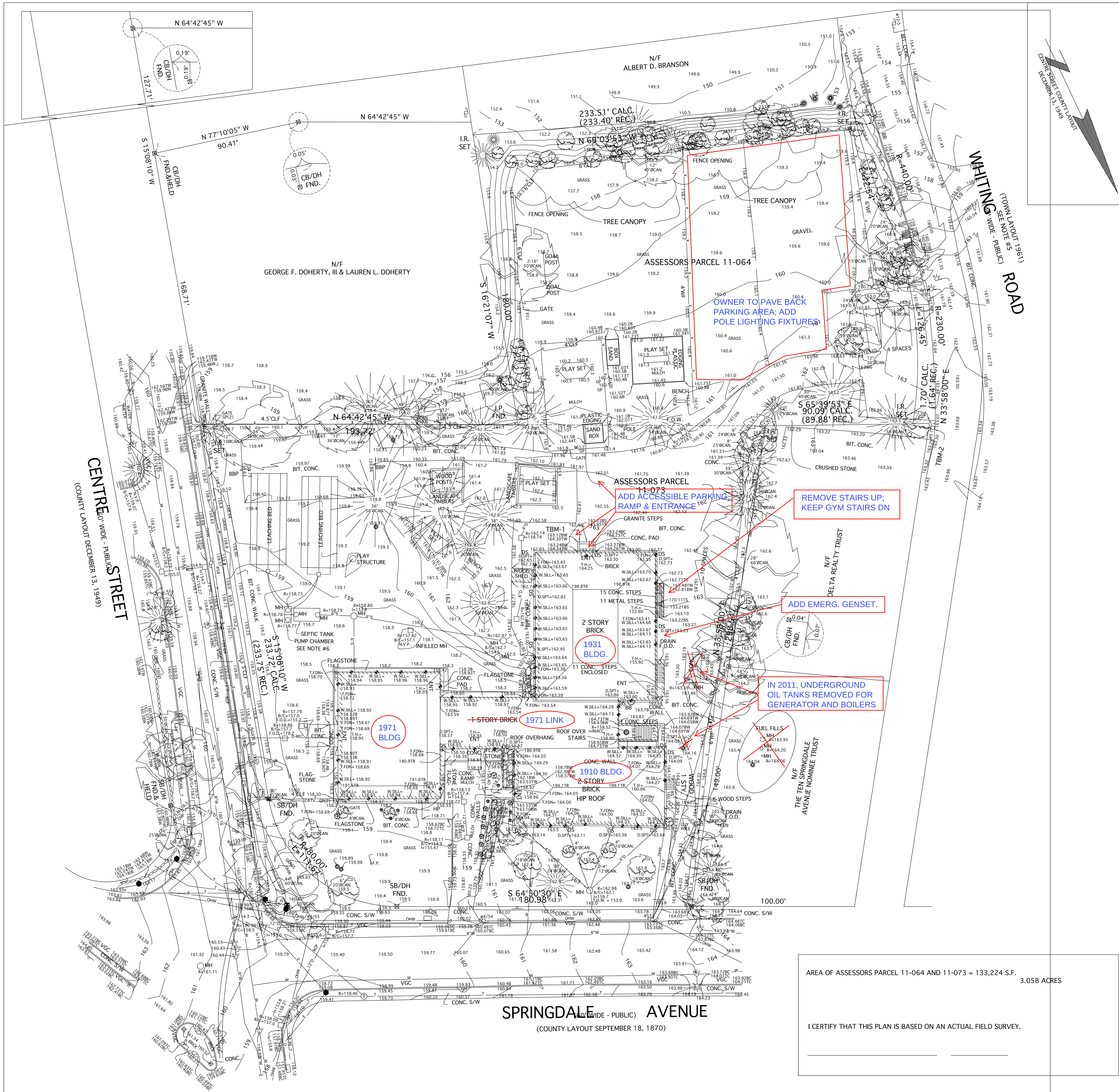
PROJECT ADDRESS:
4 SPRINGDALE AVE. & 1 WALPOLE ST. / DOVER MA

DRAWING TITLE:
EXISTING EAST & WEST ELEVATIONS

DATE: MAY 2017

EX-5



AREA OF ASSESSORS PARCEL 11-064 AND 11-073 = 133,224 S.F.
3.058 ACRES

I CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY.

LEGEND:

SHRUB	WF — WOOD FENCE
DECIDUOUS TREE	CLF — CHAIN LINK FENCE
CONIFEROUS TREE	N/F — NOW OR FORMERLY
MONUMENT	REC. — RECORD
DRAIN MANHOLE	CALC. — CALCULATED
TELEPHONE MANHOLE	ENT — ENTRANCE
MH — MANHOLE	BS — BOTTOM OF STEPS
HANDICAP RAMP	TS — TOP OF STEPS
WATER SHUT OFF	TBM — TEMPORARY BENCH MARK
WATER VALVE	TW — TOP OF WALL
CATCH BASIN	BW — BOTTOM OF WALL
CATCH BASIN-ROUND	TC — TOP OF CURB
UTILITY POLE	BC — BOTTOM OF CURB
HYDRANT	T.O.W. — TOP OF WATER
SIGN	T.O.D. — TOP OF DEBRIS
MAIL BOX	FND. — FOUND
TRAFFIC SIGNAL	SB/DH — STONE BOUND/DRILL HOLE
ELECTRIC HANDHOLE	CB/DH — CONC. BOUND/DRILL HOLE
BOLLARD	S/W — SIDEWALK
GUY WIRE	HP — HANDICAP PARKING
TRAFFIC CONTROL BOX	DN. — DOWN
SILL/FOUNDATION GRADE ELEVATION	STY. — STORY
OBSERVATION WELL	B/C= — BOTTOM OF CHIMNEY ELEVATION
GP — GATE POST	CAN. — CANOPY
VP — VENT PIPE	TB — TELEPHONE BOX
BBP — BASKETBALL BACKBOARD POLE	N.V.P. — NO VISIBLE PIPES
F.P. — FLAG POLE	INACC. — INACCESSIBLE
DS — DOWNSPOUT	TR — TOP OF ROOF
OF — OIL FILL	RCP — REINFORCED CONCRETE PIPE
I= — INVERT ELEVATION	D.SPT= — GRADE AT DOWNSPOUT
R= — RIM ELEVATION	T.FDN= — TOP OF CONCRETE FOUNDATION GRADE
T — TOP	T.H.= — THRESHOLD GRADE
B — BOTTOM	W.SILL= — WINDOW SILL GRADE
BIT. — BITUMINOUS	F.O.W. — FULL OF WATER
CONC. — CONCRETE	I.R. — IRON ROD
VGC — VERTICAL GRANITE CURB	I.P. — IRON PIPE
BB — BITUMINOUS CONCRETE BERM	RIP-RAP
S.F. — SQUARE FEET	

X	FENCE
S	SEWER
D	DRAIN
E	ELECTRIC
W	WATER
T	TELEPHONE
OHW	OVERHEAD WIRE
CATV	CABLE TELEVISION
	EDGE OF WOODS
	TREE CANOPY

NOTES:

1) BENCH MARK INFORMATION:

BENCH MARK USED:
MASSACHUSETTS GEODETIC SURVEY DISK "52E"
ELEVATION = 149.35

TEMPORARY BENCH MARKS SET:

TBM-1: X-CUT IN RIGHT OUTER CORNER OF A GRANITE STEP AS SHOWN ON THIS PLAN. ELEVATION = 163.65

TBM-2: PK NAIL SET 1' UP IN UTILITY POLE #3 ON WHITING ROAD AS SHOWN ON THIS PLAN. ELEVATION = 164.25

2) ELEVATIONS REFER TO N.G.V.D. 1929.

3) CONTOUR INTERVAL EQUALS ONE (1) FOOT.

4) UTILITY INFORMATION SHOWN IS BASED ON BOTH A FIELD SURVEY AND THE LATEST PLANS OF RECORD. THE LOCATIONS OF UNDERGROUND PIPES AND CONDUITS HAVE BEEN DETERMINED FROM THE AFOREMENTIONED RECORD PLANS AND ARE APPROXIMATE ONLY. BEFORE PLANNING FUTURE CONNECTIONS, THE PROPER UTILITY ENGINEERING DEPARTMENT SHOULD BE CONSULTED AND THE ACTUAL LOCATION OF SUBSURFACE STRUCTURES SHOULD BE DETERMINED IN THE FIELD. CALL, TOLL-FREE, THE DIG SAFE CALL CENTER AT 1-888-344-7233 SEVENTY-TWO HOURS PRIOR TO EXCAVATION.

5) WHITING ROAD LAYOUT TAKEN FROM A PLAN TITLED "SITE PLAN, ADDITIONS AND ALTERATIONS TO THE CARYL SCHOOL, SPRINGDALE AVE., DOVER, MASS." PREPARED BY RICH, PHINNEY, LANG & COTE, INC., DATED JANUARY 28, 1971.

6) ON-SITE SEPTIC SYSTEM TAKEN FROM A PLAN TITLED "PLAN OF CARYL SCHOOL SEPTIC SYSTEM", PREPARED BY R. HOMER, DOVER TOWN ENGINEER, DATED OCTOBER 13, 1998.

7) DAVID W. BURKE, WETLANDS RESOURCE SPECIALIST, REPORTED THAT THERE ARE NO WETLANDS OR WETLAND RESOURCE AREAS AFFECTING LOCUS.

REFERENCES

NORFOLK COUNTY REGISTRY OF DEEDS

DEEDS:

BOOK	PAGE
1108	199
1108	400
1597	546
11374	013
11388	110
11473	607
12705	159

PLANS:
35 OF 1929
144 OF 1955
15 OF 1994

NORFOLK COUNTY ENGINEEERING DEPARTMENT

SPRINGDALE AVENUE LAYOUT
SEPTEMBER 18, 1870

CENTRE STREET LAYOUT
DECEMBER 13, 1949

COMMENTS ARE RELATIVE TO PENDING IMPROVEMENTS PER STUDY OF 16 MAY 2017

GRAPHIC SCALE
30 0 15 30 60 120

FELDMAN
PROFESSIONAL LAND SURVEYORS

HARRY R. FELDMAN, INC.
112 SHAWMUT AVENUE
BOSTON, MASS 02118
tel: 617-357-9740

MILLS WHITAKER ARCHITECTS LLC
P.O. BOX 750089
ARLINGTON MA 02475
tel: 617-876-7611
fax: 617-876-6420

PROJECT ADDRESS: DOVER COMMUNITY CENTER
4 SPRINGDALE AVENUE
DOVER MASSACHUSETTS

DRAWING TITLE: EXISTING CONDITIONS PLAN

DATE: 20 DEC 2005

SCALE: 1"=30'

SHEET #: EX-1

RESEARCH JLC	FIELD CHIEF LW	CALC MJB	CADD MJB/PRF	FIELD CHECKED	JOB NO. 11487
				APPROVED	FILE NAME 11487
				CHECKED	CRD FILE 11487

VAV International, Inc. Consulting Mechanical Engineers
400 West Cummings Park S-4700 Woburn Massachusetts 01801 (781)935-7228 www.vavint.com

Caryl Community Center

5 Springdale Avenue, Dover, MA

Mechanical, Plumbing & Fire Protection Due Diligence Study

Springdale Avenue Main entrance

Rear view of the building

A. GENERAL:

1. The building was built in 1910 and 1931, as an elementary school.
2. Total floor area is 41,300 SF.
3. Renovated in 1971.
4. Building use as a school ceased in 2001 after a new school was constructed.
5. The building has been used as a community center since 2003.

6. Representative building uses are:
    a. Daycare in parts of first floor.
    b. COA office on first floor.
    c. Park & Recreation Department on second floor.
    d. Former cafeteria is rented out.
    e. Gym is utilized.
    f. Former Library is used by Police & Fire Departments for training.
    g. Various community group meetings.
    h. Martial arts, exercise, and Yoga classes.

Windows are nominal 1" thick high quality double pane type.

B. SCOPE:

1. Review Forte Engineering HVAC Boiler Replacement and System Evaluation report dated 10/20/2017.

2. Review Deferred Maintenance Study by Mills Whitaker Architects, dated 04/30/2003.

3. Review 1971 M/P/FP drawings.

4. Make a site visit.

5. Existing conditions report.

6. Recommendations.

C. EXISTING CONDITION:

1. Mechanical:

a. <u>Summary:</u>

1) ASHRAE Equipment Life Expectency (years old/ yearspast useful life):

- Boilers, hot water cast iron- 35 years, (86 Yrs old/ 51 Yrs past useful life).
- Boiler burners- 21 years, (46 Yrs old/ 25 Yrs past useful life).
- Unit heaters (Unit ventilators)- 20 years, (46 Yrs old/ 26 Yrs past useful life).
- Ductwork- 30 years, (46 Yrs old/ 16 Yrs past useful life).
- Dampers- 20 years, (46 Yrs old/ 26 Yrs past useful life).
- Fans, centrifugal- 25 years, (46 Yrs old/ 21 Yrs past useful life).
- Insulation, molded- 20 years, (46 Yrs old/ 26 Yrs past useful life).

- Pumps, base mounted- 20 years, (46 Yrs old/ 26 Yrs past useful life).
- Electric motos- 18 years, (46 Yrs old/ 28 Yrs past useful life).
- Controls, pneumatic- 20 years, (46 Yrs old/ 26 Yrs past useful life).

2) Conclusion- All of HVAC system component with exception of 2012 installed fuel oil system, well past its useful life and are in need of complete replacement.
3) System Outline:
   - Two oil fired low pressure steam boilers installed in 1931 were converted to hot water boilers in 1971.
   - Original 7,600 gallon underground fuel oil tank was replaced with above ground 3,000 gallon tank in 2012.
   - Typical class, library, cafeteria and gym are served by unit ventilators and exhaust fans. None of the exhaust fans seem to be operational.
   - General spaces such as corridors and offices are served by convectors or fintube radiation.
   - All new hot water piping distribution is assumed to have been installed in 1971. Pipes are leaking and they are repaired as needed.
   - Pneumatic controls. Due to air leakages, general practice is to run the compressor for a few hours each morning and shut off. Since outside air dampers are normally closed and heating valve is normally open, with the compressor shut down, all outside air dampers would close (not ventilation) and hot water control valves would fail open.

b. <u>Photo Essay:</u>

ROOF

L&C- roof access. R- Elevator penthouse- old louvers and glass, no dampers.

Panoramic views of roof. Flat part roof is clear of any mechanical equipment.

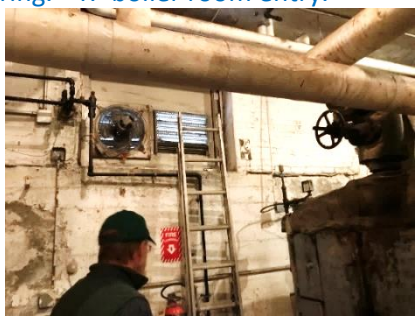
UNIT VENTILATORS



L- All unit ventilators (UV) are AAF Herman Nelson make installed in 1971. There are three basic types used CL- console type along perimeter wall with outside air (OA) louver directly behind, CR- console type in interior wall with OA shaft, and R- horizontal ceiling hung type.

BOILERS


L- Boiler room view as entering. R- boiler room entry.

L- second means of egress from boiler room directly to outside. R- ventilation fan.


L- view of two cast iron sectional oil fired boilers; note the removed burner against wall. R- close up shows that they are HB Smith boilers. Boilers are likely low pressure steam boilers from the original 1931 building and was converted to hot water boiler in 1971. The original 7,600-gallon underground storage tank was replaced with a new above ground 3,000-gallon fuel oil tank in 2012.

L- First boiler burner name plate indicates that it is the original vintage Ray Burner, designed for #2 oil, 2.5 to 4.1 million BTUH input, 120V/1-Ph; likely installed in 1971 which makes it 46 years old or 25 years past useful life. R- second boiler with burner removed; Town is planning to install a new burner. Two boilers are redundant with only one needed at a time.


L- conventional type expansion tank, most likely is water-logged. R- note that insulation is missing from much of the piping.



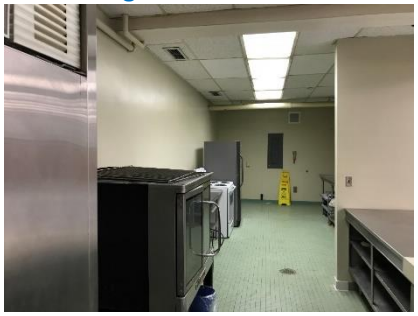
L- Hot water pumps are in very poor shape.
C- duplex fuel oil transfer pumps appear to be reasonably modern and are in good shape. R- boiler breeching and draft damper looks to be in a fair shape; but this ties into the original 1910 chimney which is likely not lined.

STAND BY GENERATORS


Inside diesel emergency generator with radiator venting and engine exhaust piping.

CAFETERIA


L- Cafeteria with folding bleachers on two sides, and direct exit on far side. R- close up view of the ceiling mounted UV.


L- Servery to Kitchen. C- not hood over cooking line. R- pot wash station.

OFFICES

L- this office has a ceiling UV for winter heating, and a wall hung mini-split for summer. C- mini-split outdoor unit is wall hung. R- other offices have window AC units.

GYM

Panoramic view of Gym.

L- One of the two ceiling hung UV serving the Gym, with outside air ducted to louver above window; Note the damaged pipe insulation from activities. R- low exhaust grille.

TERMINAL DEVICES

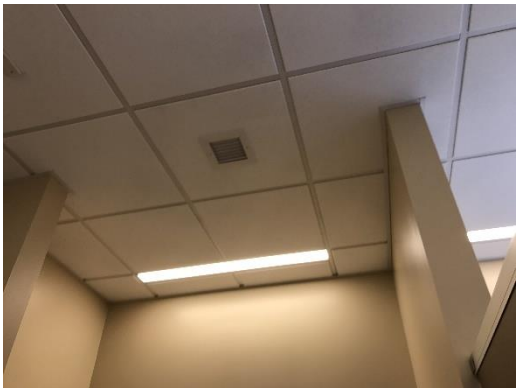
Corridors, offices, and general spaces are heated by convectors or fin tube radiation, and relies on operable windows for ventilation


Spaces that used to be classrooms are served by UVs plus low exhaust on opposite wall. UVs are heating, but its ventilation function likely is not working, and none of the exhaust grilles show any draw, suggesting that associated exhaust fans have long failed.

LIBRARY


Former Library is served by ceiling hung UVs with OA intakes on roof

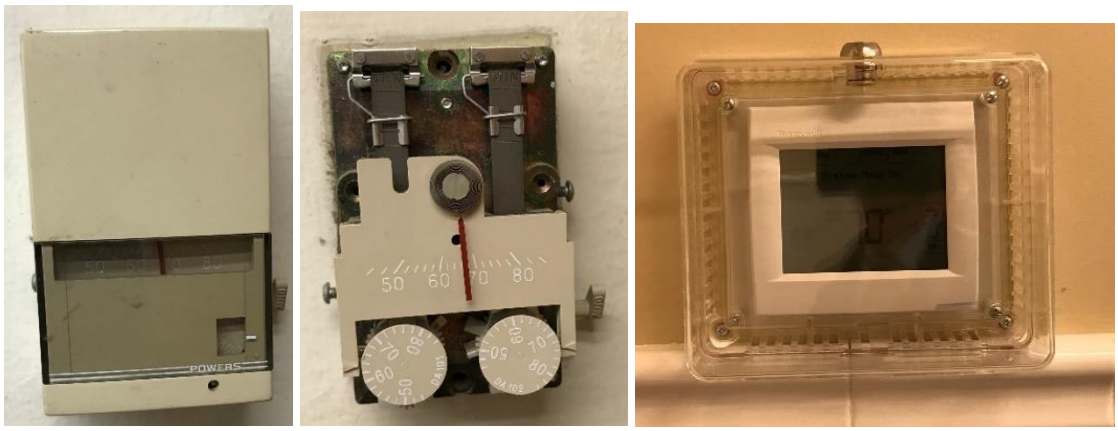
RENOVATED BATHROOMS

New FTR for heating, and new exhaust grilles are ducted to new roof exhaust fan.

CONTROLS

Pneumatic control compressor and dryer located in boiler room; note that one of the compressor has been removed.



L&C- MCC Powers pneumatic thermostat. R- renovated bathroom FRT is controlled by new low voltage electric thermostat in locking enclosure.

2. Plumbing:

Sink in a typical preschool class room.

L- Water cooler. C- bottle filler. R- newer looking potable water piping exposed section showing newer insulation and labeling system, possibly suggesting that at least some parts of the piping may have been replaced.

Renovated bathrooms. L- wall hung rear flush WC with dual flush flushometer; note the hose bib. R- urinal and Lavatory.

Kitchen pot sink with grease interceptor in floor.


L- electric domestic hot water heater in boiler room. R- see the boiler room sump pump; leaking fuel oil was observed as evidenced by absorbent spreads; sump is manually operated to avoid potentially contaminating the septic system.

3. **Fire Protection:**


This building is not sprinklered, said to be exempt due to low water pressure

There are extinguishers throughout the building

D. RECOMMENDATION:

1. **Mechanical:**
   a. **Forte Engineering Study Review:**
      1) We generally agree with the recommendation, but some changes would be required due to the new Energy Code IECC2015 which is enforced since 01/01/2017.
      2) We concur that the project should be done in two phases to assure that the building can continue to be in use with a minimal interruption.

b. Applicable Codes:

1) IMC 2009.
2) IECC 2015.

c. Pertinent Factors:

1) Facility needs to be in continued use with minimal interruption.
2) Facility does not need to be air conditioned.
3) Building usage is very light during summer.
4) With exception of Gym & Cafeteria, it is assumed that each space has adequate amount of operable windows (4% of floor area) to meet the Code mandated natural ventilation requirement.
5) It is assumed that cooking appliances in the Kitchen will be removed so that addition of commercial kitchen hood and makeup air system will not be required.

d. <u>Phase-I Work:</u>

1) To be performed during non-heating season.
2) Remove and properly dispose of existing boiler, breeching, fuel oil branch piping, combustion air, ventilation.
3) Remove pumps and hot water piping.
4) Asbestos abatement by others.
5) Cleaning of the boiler room free of oil stains by others.
6) Install 24" AL209 lining inside the existing masonry chimney.
7) Install two 1,951,000 BTUH output Buderus Logano G615 oil fired boilers. Staged and with OAT based HWS reset controls.
8) New combustion air system and AF breeching to the chimney.
9) Install two new base mounted end suction Taco pumps selected for 200 GPM at 60' of head, PE motor and VFD. Set up initially to operate as a constant flow pumps.
10) New Taco CA 300 diaphragm expansion tank.
11) New ¾" BFP and PRV for makeup water.

e. <u>Phase-II Work:</u>

1) Work to be done is four phases in continuous sequence, involving three wings plus connector.
2) Remove all existing FTR, UV, piping, insulation, fans, ductwork, and controls. Properly cap so as not to effect other areas during this phased construction.
3) Horizontal piping mains shall run exposed in first floor ceiling to feed up second floor and feed down first floor.
4) Typical Spaces- Slope-top commercial grade 14" high fintube radiation with full backing plate. Each space is to have thermostat.
5) Gym- is to be served by one 3,000 CFM heating & ventilating AHU ceiling hung with a duct sox air distribution. Outside air intake through a new louver above window and relief louver with modulating control damper.
6) Cafeteria- FTR along two long walls, one new 400-CFM horizontal ceiling hung ERV with hot water heating coil OAI through window louver.
7) Each of the three wings to have a 1,000 CFM energy recovery ventilator in the attic space, and its supply and exhaust ducted down to serve corridors. All perimeter spaces will rely on operable windows to meet the ventilation requirements.
8) Full DDC ystsem.
9) Mini-splits and window AC will continue to provide air conditioning to selected spaces.
10) Add-alternate- provide a 300 CFM ERV to each of four of the preschool classrooms on first floor. The ERV shall be ceiling hung with OA & EA ducts through existing shafts up to attic space.

2. **Plumbing:**
   a. Refer to accessibility study for upgrades.
   b. Replace hot and cold water piping and insulation.

3. **Fire Protection:**
   a. Analysis by our Code consultant Robert Carasitti.
   b. MGL Chapter 148 Section 26g is applicable because this building is over 7,500 gsf. As an existing building, sprinklers would not be triggered until a project cause 33% of the area to be altered or they spend 33% of its assessed value. There is an exemption if there is no water pressure, but the Fire Chief would be the one to make the determination.
   c. Separately, sprinklers under the building code 780 CMR could be triggered if there is a project that qualifies as an Alteration level 3 or a change in use. Here too there is an exemption if no water exists to support the sprinklers, but then this is the building officials' determination.
   d. It is possible that water pressure gets the building out of needing sprinklers under these two regulations but the design professional in responsible charge should get written determinations from both the building and fire officials; building commissioner for 780 CMR and Fire Chief for MGL Ch 148 s 26g. Technically, the design team would need to give them in writing the rationale and supporting data for the low pressure and they would each need to responded under their regulation.

Prepared by,

***Semoon Oh**, PE,* Principal
soh@vavint.com

Caryl Community Center
Town of Dover, MA

October 20, 2014

HVAC Boiler Replacement and System Evaluation.

FORTE ENGINEERING
P.O. Box 1157
Middleton, MA 01949
978-777-0484

Caryl Community Center
Town of Dover, MA

October 20, 2014

1. **Introduction**

2. **Existing Systems Description**

3. **Observations**

4. **Recommendations**

5. **Controls**

6. **Floor Plans**
   - **A-1**
   - **A-2**

7. **Proposed Boiler Room Plan**
   - **M-1**

8. **Cost estimate – New Boiler Plant**

9. **Cost estimate – Equipment & Controls Modifications**

10. **Photo Documentation**

HVAC Boiler Replacement and System Evaluation

1. Introduction

The purpose of this report on the building heating system (HVAC) is to identify and prioritize important action required for the continued use and reuse of the building as a community facility.

The existing HVAC system was installed circa 1971as part of an addition and alteration to the existing Caryl School (circa 1910 & 1931 addition). The HVAC system has received maintenance and repair as needed throughout its life; however, the practical limit for the age of the equipment is at issue. In particular the heating boilers, but other components will also be addressed.

The existing heating equipment was originally designed to provide heating and ventilation for a classroom environment. Historically schools of this vintage were provided with high outdoor air ventilation rates that resulted in higher overall heating loads. As this school was designed prior to the energy crisis of the early 1970's, energy consumption is expected to be high in the winter due to the higher outdoor air ventilation rates.

The current use of the building has evolved into a community based multiuse facility. The school use ceased to exist in 2001 after construction of a new elementary school. In 2003, a "Deferred Maintenance Study" was conducted to review conditions of the facility, but as of that time, a continuing use for the building had not yet been established. Now that the building's use is known and its future more certain, aspects of the HVAC comments from the 2003 study are being updated in this current report in order to recommend an appropriate approach to system upgrades.

A preschool daycare occupies a portion of the first floor. The COA also has an office on the first floor. The Park & Recreation Department has offices on the second floor. Other spaces on the first and second floors are utilized by various community groups. The former cafeteria is rented out by the Town. There are exercise classes and Yoga classes in the Blue Room. The existing Gym is utilized. The former Library has been utilized by the Police and Fire Departments for training. Uses for various spaces on the Second floor include; martial arts, a drop-in center, Parent Talk, birthday parties and meetings. It is also anticipated that spaces could be rented out for other uses. Occupancy count limits have been determined by the Fire Department.

2. Existing Systems Description

The existing heating system for the building consists of; two hot water boilers fired by oil, a piped hot water distribution system throughout that is pumped via a pair of base mounted centrifugal pumps, terminal units located in the various spaces consisting primarily of unit ventilators that provide heating and ventilation, as well as cabinet heaters and baseboard fin-tube. The former classrooms all utilized unit

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ventilators to provide heating and ventilation. Former classrooms on the second floor have both unit ventilators and supplemental baseboard fin-tube (the library does not have supplemental baseboard).

Automatic Temperature Controls (ATC) incorporate pneumatic control devices that are powered by a centralized air compressor. The pneumatic system was installed by MCC Powers Regulator (the company was acquired by Landis+Gyr in 1987) throughout the building in 1971, and operates thermostats, control valves and dampers, etc., as well as maintaining required set point temperatures and ventilation rates.

A new 3000 gallon exterior aboveground heating oil storage tank was installed in 2012. The original underground storage tank was removed. Fuel usage for the winter of 2014 was approximately 22,000 gallons of no. 2 fuel.

The exhaust component of the former classroom ventilation system consists of a series of roof exhaust fans. This sub-system is non-functional. In addition to classroom exhaust ventilation, roof exhaust fans are provided for toilets rooms throughout the building. These toilet exhaust fans are also non-functioning.

Windows throughout the building have been replaced with new thermally insulated type. The windows typically have an operable sliding section potentially providing occupant controlled ventilation.

The building does not have air-conditioning, although there have been some plans to add cooling to small spaces utilized for department offices.

Natural gas is not available to the building.

3. Observations

With the exception of the oil storage system, it appears that all the equipment that makes up the boiler plant, including the burners, but not the boilers, was replaced in 1971. The boilers themselves predate the 1971 renovation, and are likely original to the 1930's school building. Based on the age and condition of the boilers and our on-site observations there is little doubt that the boilers need replacement as soon as possible. This work should not be delayed any longer than necessary, especially since the boilers have long surpassed their expected life span, and it would not be unanticipated to see an irreversible loss in service from one or the other of the boilers in the near future. Were the boilers to fail in the middle of the heating season, damage could potentially extend to other equipment and piping throughout the building. It is known from experience that if one of the two boilers fails during the heating season and requires repair, an event that happened recently, the other boiler could adequately carry the heating load of the facility. Currently the boilers alternate in operation and rarely both operate simultaneously throughout the winter. This has allowed these aged boilers to continue to serve the facility, but their replacement should be scheduled in the near future in order to adequately protect the facility and its occupants should both boilers fail and be beyond repair. Newer more efficient boilers will realize a minimum of 15% reduction in fuel consumption.

The unit ventilators have been difficult to maintain and the basic ventilation aspect, as well as the temperature control aspect have been difficult to control. The result can be improper ventilation air introduced into the space and/or poorly controlled heating output due to malfunctioning control valves.

Current uses for the various spaces combined with energy conservation guidelines and the latest ventilation air standards dictate the required performance expectations needed for the spaces. If existing equipment is oversized short cycling can occur, if existing equipment introduces too much outdoor air excessive energy consumption results. In some cases the existing unit ventilators may represent a misapplication of that needed for the current service requirements of the space. In fact, as currently configured, the existing equipment likely provides incorrect ventilation rates, and uses excessive energy while providing poor temperature control. In particular the need for unit ventilator equipment should be scaled back in favor of more appropriate equipment with lower and more targeted outdoor air ventilation rates. In some high occupancy areas it may still make sense to utilize unit ventilators, but the use should be minimized

HVAC controls need to be address along with recommendations for new heating and ventilation equipment. A better control platform for the building would be one that provides the flexibility that responds to changing use and occupancy, as well as occupied/unoccupied conditions. An electronic digital control system with remote control and preprogramming capabilities will go a long way to reducing overall energy usage, as well as improving indoor air quality. See further discussion below in section titled "Controls". In the 2003 study, the aging pneumatic control system and related HVAC equipment was noted for repairs and maintenance, but that was in the absence of knowing what the future use of the facility might be. Now that the building has been converted into a community center use, maintaining the existing poorly functioning pneumatic control system and the outdated ventilation equipment is not recommended. Required ventilation rates relative to building use have changed significantly over the years, ranging from 20 to 30 CFM per person for classrooms in the pre-energy crises years of the last renovation in 1971, then being reduced to at least half of those quantities and even less for other less dense occupancies. Changes in ventilation rates are still ongoing due to the costs of energy related to this part of an HVAC system. The existing "classroom" equipment was designed for the higher rates required at the time. Less ventilation air results in savings of the energy required to temper the incoming air and for the related operational costs of running the equipment.

A portion of the heating system piping in the 1971 addition was designed to be located within a floor trench. This piping has been a source of continuous maintenance. Due to the inaccessibility of the piping the situation is a liability that needs corrective action.

4. Recommendations

We are first focusing on the most urgent work needed for the continued use of the building, i.e., the boilers. We have reviewed the heating load for the building based on the 1971 design drawings and considered the changing usage and the current energy conservation standards. We suggest the following parameters in developing a new boiler system configuration. An improvement in overall combustion efficiency to 85 % can be achieved with competitively available equipment. Boilers of the cast iron sectional type assembled on site will simplify the installation. Based on the load profile it appears that a three boiler configuration will provide an efficient part load arrangement. A three boiler configuration also provides a better level of redundancy and allows for greater control and energy efficiency due to the fluctuant nature of heating load requirements. Preliminary calculations indicate that a maximum boiler output of a little over 4 million BTUH is sufficient for this application. The combination of modulating burners used in conjunction with an electronic boiler control will improve fuel utilization. Sizing of the boilers should be based on an equal split that does not increase the overall capacity more than 10 – 15% of that required. Ancillary equipment, i.e., pumps, boiler control, expansion tank, combustion air supply, etc. should all be provided as new. The condition of the existing chimney should be assessed and any corrective action required should be included in the replacement work.

The boiler replacement work is of the highest priority and, if all of the recommendations herein cannot be accommodated into a single project, should precede the implementation of distribution equipment, controls, etc. These other improvements include upgrading ventilation units and temperature controls in order to realize additional energy savings and improved comfort levels. Ideally, the related work would be done simultaneously with the boilers in a single renovation project, saving time and money in comparison to doing multiple projects. If not done as a single project, upgrading of ventilation and control systems could be deferred as long as the existing systems are still serviceable, recognizing that deferral will sacrifice energy savings and improvements to comfort while continuing to require potentially significant maintenance costs.

If the recommendations could not be afforded simultaneously, then the work could be phased as follows:

- Phase One – Boilers: The boilers could be replaced without having to replace the control systems and ventilation units, and without having to prevent their future replacement. Modern boilers are equipped with electronic control systems that can operate on a standalone basis and in compatibility with the building's aging pneumatic controls until those systems are upgraded.
- Phase Two – Ventilation & Controls: While the boilers will reduce fuel oil use by at least 15%, additional savings will be realized when the ventilation and control systems are replaced. Phase Two would also result in improved comfort levels for occupants, whereas the boiler replacement work will have no apparent effect on comfort. The replacement of ventilation and control systems is the more expensive of the two phases, but more

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affordability would not be achieved by doing this work incrementally since the cost would be significantly higher owing to duplication, re-mobilization and construction management costs. Therefore, although possible, taking an incremental approach to this phase of the work is not recommended. Ideally all of the new equipment should be of the same "generation" and manufacturer for both maintenance and compatibility. Controls are no longer strictly proprietary; however, a partial installation of controls installed at one point in time by a bidding controls contractor may need unanticipated reworking (due to technology updating) by a future contractor in the next phase. Also, if controls and ventilation were upgraded in selected areas over time (i.e., incrementally) there would need to be dual control systems in the building (new electronic and old pneumatic) and costly changes to existing systems would be required in order to accommodate replacement and upgrading of only portions of the ventilation units and temperature controls.

- Conceptual Budgets: $0.4m Phase One + $1.3m Phase Two = $1.7 million; see attached details.

Despite the fact that the usage of the building as a school will not continue, the newly evolving uses are similar to the former school. The classroom unit ventilator terminals, typically one or more in each space, have now been in service for over 40 years. They have been difficult to maintain, however more importantly, they no longer meet the design criteria. The newer installed windows and lower ventilation rate requirements allow for a reduction in the overall heating capacity needed. Many of the spaces may no longer need unit ventilators. Automatic Temperature Control (ATC) issues related to the existing unit ventilators are discussed further in the subsequent paragraphs of this report. The ATC devices associated with the equipment cannot be reused if the control system and/or terminal units are modernized. This means the ATC work cannot be separated from the equipment modernization. Replacement of the existing unit ventilators is recommended, due to the age of the equipment, the control issues, and the no longer justified heating output provided by the original system design.

Some of the spaces on the first floor could benefit from the installation of baseboard heat to be utilized in an unoccupied mode. This allows the unit ventilators (or other fan coils) to remain off and thus saves the fan energy. The second floor has existing baseboard heat for the most part (as well as unit ventilators), and therefore could utilize this effectively. The baseboard heat should remain in all cases, but control valves will need replacement. There is an expectation that smaller spaces that currently have unit ventilators may not need them, or could be spaces that are designated for lower occupant density such as offices, where ventilation could be satisfied naturally via operable windows (occupant control).

Pressurization relief via the existing classroom exhausts should not be reinstituted. Currently, with the fans off, air may still be relieving naturally by gravity. As an uncontrolled loss, this wastes energy. Since the building is never fully occupied, any over pressurization control, if needed, should be done locally as part of a dedicated system for the space in question.

Air conditioning is outside the scope of this report and has been given no consideration. Additional equipment and piping would need to be incorporated into the building resulting in further cost impact. The summer time use of the building is diminished to a few small departments that can be satisfied with small scale dedicated equipment.

5. ATC Controls

The existing pneumatic control system can be considered to be a piece of equipment that needs to be in full working order for the proper functioning of the HVAC system. A control system has historically been installed by a vendor that utilizes proprietary devices. Therefore the proper operation usually requires the vendor's participation to maintain and fine tune the system for continued operation throughout the lifetime of the system. Considering the age of this system, it is likely that there are impairments that prevent proper temperature control as well as ventilation air control. Typically the control equipment such as thermostats and associated control valves, ventilation control dampers, low limit and freeze stats, sensors, etc. needs to be checked for proper operation according to the "sequence of operation" that the devices were originally designed to perform.

A "fine tuning" program that reviews the functionality of each component of the control system can be performed by a qualified subcontractor. This process is time consuming and will result in the need to replace components that cannot be properly calibrated or repaired. It is expected that there will be many unrepairable components in a system of this age. Furthermore, since the application of this type of system has been diminished in favor of state of art digital/electronic type control systems, performing maintenance in the future will become even more difficult.

The cost benefit for instituting a fine tuning program is based on capturing energy efficiencies due to overheating, lack of setbacks, and improper introduction of outdoor ventilation air. However, since the system was originally designed as a school, changes to the HVAC system equipment are being recommended that will require additional control work with the intent of reducing energy use and providing better control. A revised sequence of operation based on the current use will also be needed for some of the spaces. Parameters such as; override of unoccupied cycle, warm-up cycle, ventilation air rate, control of exhaust fans, and occupancy sensors, may all need to be accounted for in a different way. The expectation that the existing control system could be economically upgraded while being adapted to new equipment is highly unlikely. We therefore recommend that the existing control system not be upgraded and that a new control system will be the most sensible approach to minimizing energy use as well as providing accurate temperature control throughout the facility.

A new control system should allow for programming of spaces based on the usage. In this case the building usage is consistently variable, which makes it difficult to efficiently manage the facility. A control system based on digital/electronic/electric devices with a Local Open Protocol (Lonworks) network or similarly comparable Building Automated Control network (BacNet) system can provide the flexibility needed for the building. Setpoints can be changed easily without having to visit the space, temperatures can be monitored remotely and setbacks can be scheduled and overridden. This allows energy management to be more flexible. This type of system is not proprietary and therefore it can be maintained by any qualified contractor.

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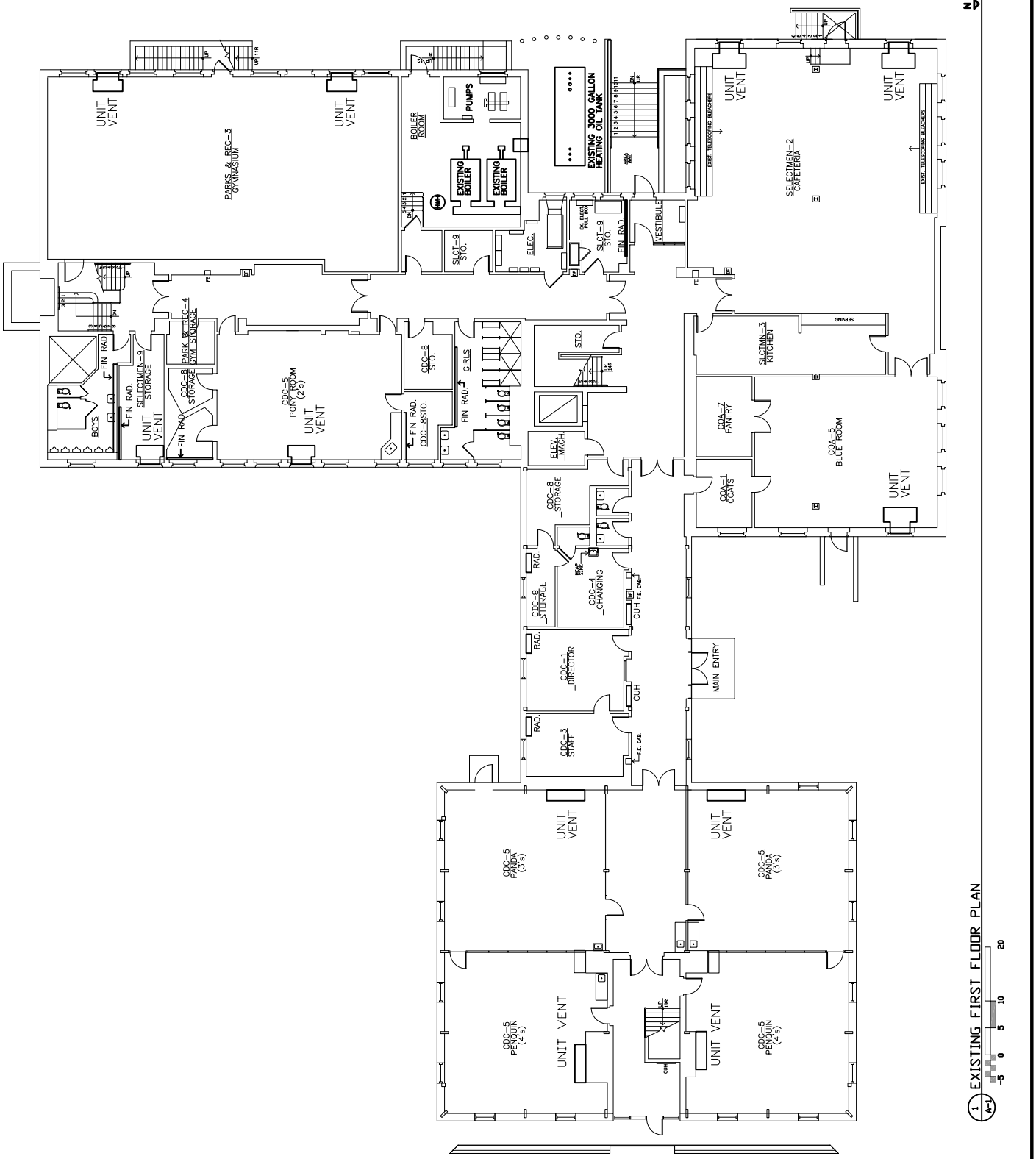
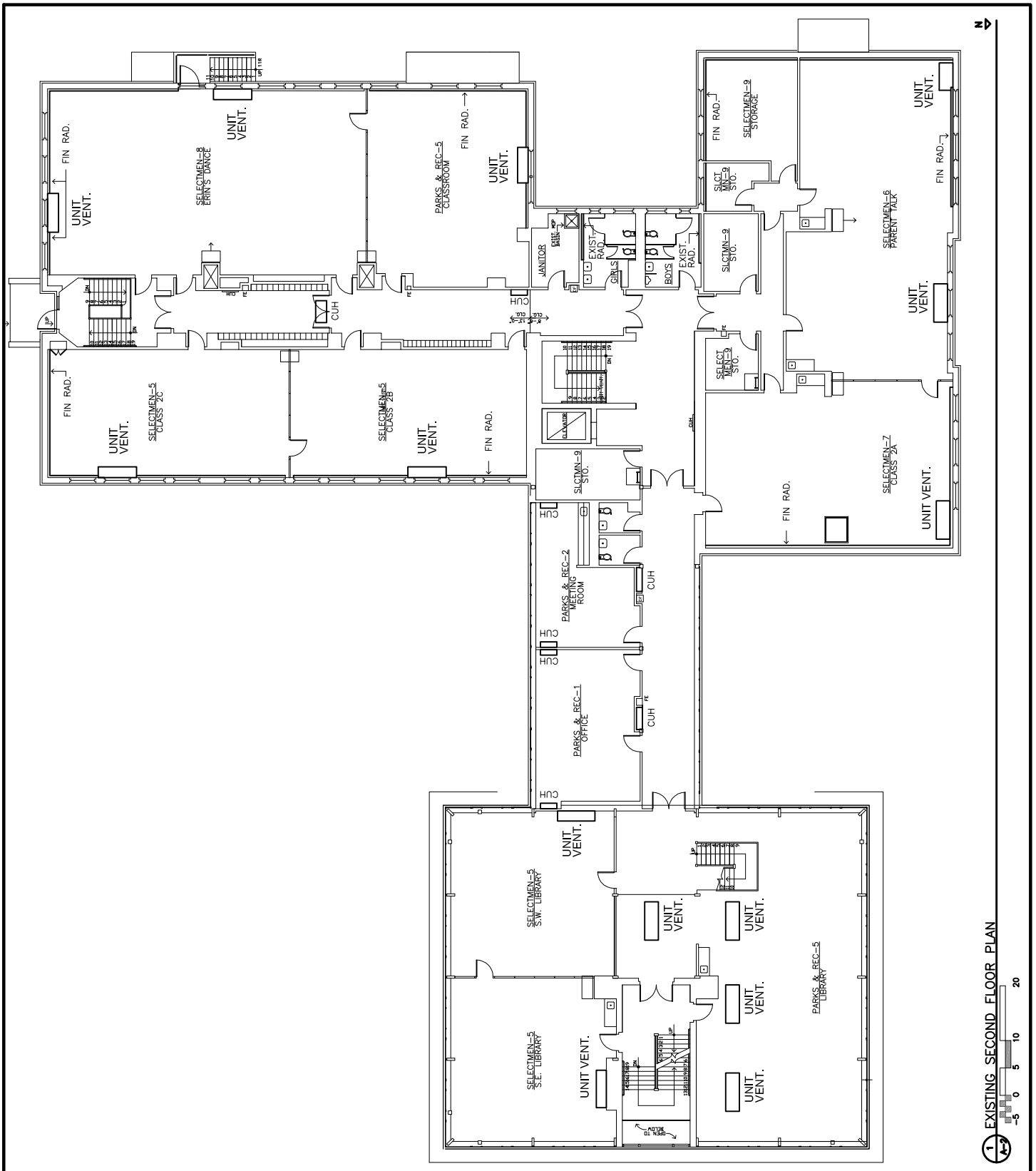


FORTE ENGINEERING P.O. BOX 1157 MIDDLETON, MA 01949 978-777-0484	CARYL COMMUNITY CENTER 4 SPRINGDALE AVE. DOVER, MA TITLE EXISTING CONDITIONS PLAN FIRST FLOOR	DATE: 8-15-14 SCALE: 1"=25' +/- JOB NO. F14.14

A-1



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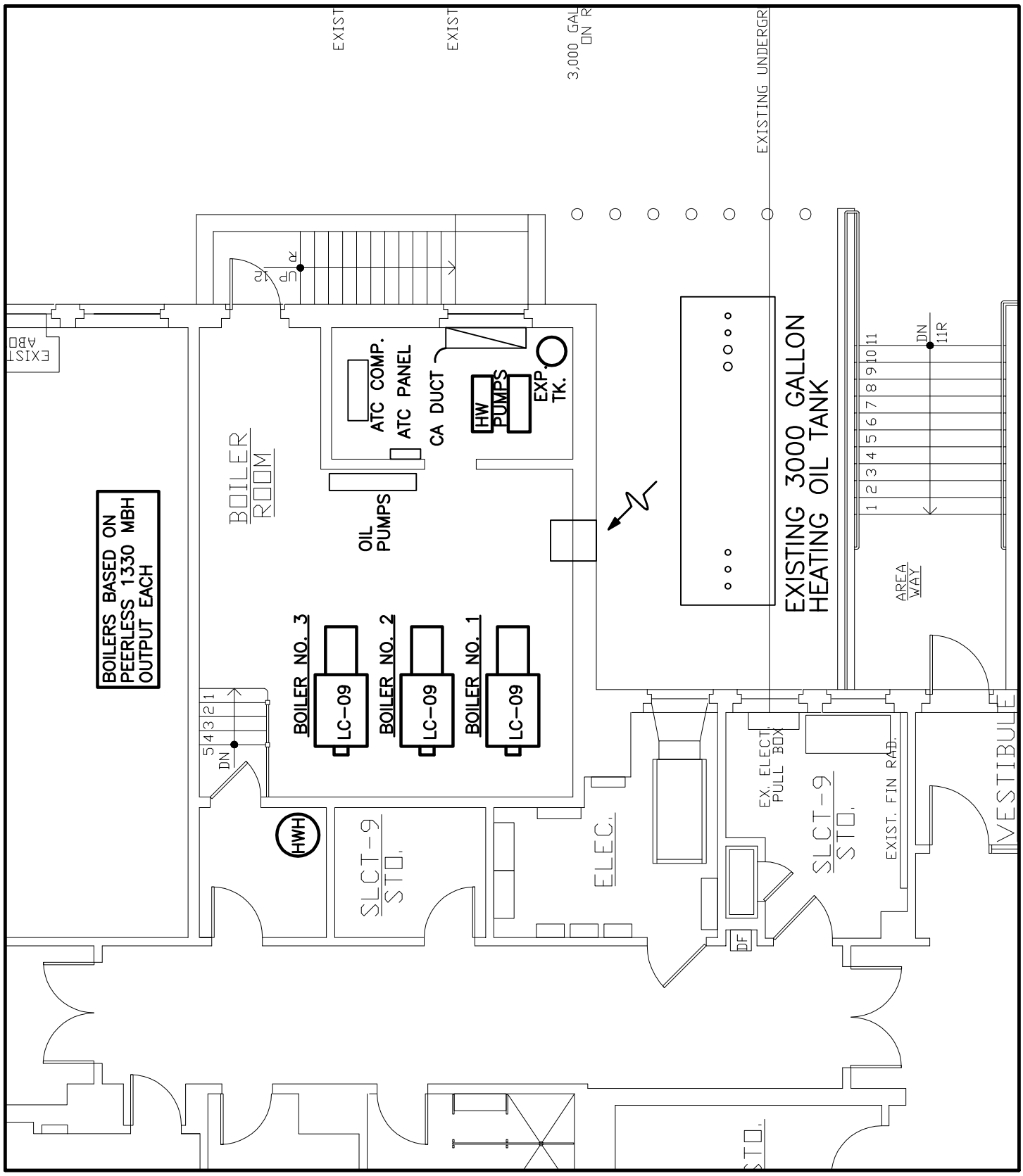
CARYL COMMUNITY CENTER
4 SPRINGDALE AVE.
DOVER, MA

TITLE

EXISTING CONDITIONS PLAN
SECOND FLOOR

DATE: 8-15-14
SCALE: 1"=25' +/-
JOB NO. F14.14

A-2



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CARYL COMMUNITY CENTER
4 SPRINGDALE AVE.
DOVER, MA

TITLE

PROPOSED BOILER RM. PLAN
FIRST FLOOR

DATE: 8-15-14
SCALE: 1/8"=1'-0"
JOB NO. F14.14

M-1

Cost Estimate
New Boiler Plant

Section 15500 - HVAC

	Quantity	Unit	Unit $		Total
Demolition:					
Asbestos abatement	1	LS	3,000	$	3,000.00
Remove Piping	1	LS	3,000	$	3,000.00
Remove pumps & converter	1	LS	1,000	$	1,000.00
Remove Boilers	2	ea.	1,500	$	3,000.00
New Work:					
Boilers / Burners & Trim	3	ea.	32,000	$	96,000.00
Pumps & trim	2	ea.	23,450	$	46,900.00
Variable speed pump controller	2	ea.	3,800	$	7,600.00
Expansion Tank	1	ea.	7,000	$	7,000.00
Air separator	1	ea.	4000	$	4,000.00
Heating Piping	300	LF	110	$	33,000.00
OS&Y Valves	4	ea.	1,500	$	6,000.00
Insulation	300	LF	20	$	6,000.00
Boiler controls	1	LS	7,500	$	7,500.00
Oil piping	100	ft	21	$	2,100.00
Backflow preventer	1	LS	2,000	$	2,000.00
Breeching	60	LF	250	$	15,000.00
Chimney Liner	1	LS	5,000	$	5,000.00
Combustion Air ducting	1	LS	3,000	$	3,000.00
Comb. Air controls	1	LS	1,500	$	1,500.00
Concrete pads	5	ea.	510	$	2,550.00
Electrical wiring	1	LS	5,000	$	5,000.00
Water Balancing	1	LS	1,000	$	1,000.00
Permits, Submittals, testing, closeout, etc.	1	LS	3,000	$	3,000.00
Sub-total				$	264,150.00

Contingency, 12.5%	1	0.15		$39,622.50
Sub total			$	303,772.50
O&P, 10%	1	0.1		$30,377.25
Total Construction Cost			**$**	**334,149.75**
New Boiler Plant				
Estimated A&E Fees, 15%		0.15		$50,122.46
Grand Total			**$**	**384,272.21**

Exclusions:

* Interest Expense
* Relocation expenses
* Printing & Advertising
* Police & Fire - Details
* Owner Administration: Legal fees, Advertising, Printing
* Utility Back Charges
* Furnishings & Fixtures
* Escalation

Cost Estimate
Equipment and Controls Modifications

Section 15500 - HVAC

	Quantity	Unit	Unit $		Total
Demolition:					
Asbestos abatement	1	LS	15,000	$	15,000.00
Unit ventilators	25	LS	600	$	15,000.00
Remove ATC Comp. and Access.	1	LS	600	$	600.00
Piping in trench	1	LS	2,500	$	2,500.00
Remove Sys. Isolation Valves	6	LS	100	$	600.00
New Work:					
Unit Ventilators	12	Ea.	8,000	$	96,000.00
Fan coils w/ OA	11	Ea.	1,500	$	16,500.00
Cabinet Exhaust Fans	12	Ea.	1,500	$	18,000.00
Fintube Radiation (1st flr.)	250	LF	120	$	30,000.00
Fintube Radiation (2 nd flr.)	100	LF	120	$	12,000.00
Heating specialties	12	LS	200	$	2,400.00
Heating Piping (new equip)	500	LF	60	$	30,000.00
OS&Y Valve Replacement	4	Ea.	1,300	$	5,200.00
Insulation	1000	LF	20	$	20,000.00
New valve install ETR Equip.	25	Ea.	200	$	5,000.00
Replace Pipe in Trench w/ New	450	Ft.	75	$	33,750.00
Ductwork & insulation	1	LS	40,000	$	40,000.00
Diffusers & Grilles	1	LS	25,000	$	25,000.00
Testing & Balancing	1	LS	5,000	$	5,000.00
Architectural Divisions	35000	SQ FT	6	$	210,000.00
GC Supervision	25	Wks	2,500	$	62,500.00
Electrical wiring	1	LS	10,000	$	10,000.00
ATC Controls	1	LS	175,000	$	175,000.00
Permits, Submittals, testing, closeout, etc.	1	LS	40,000	$	40,000.00
Sub-total				$	870,050.00

Contingency, 18%	1	0.18	$156,609.00
Sub total			$ 1,026,659.00
O&P, 10%	1	0.1	$102,665.90
Total Construction Cost			**$ 1,129,324.90**
New Equipment & Controls			
Estimated A&E fees of 15%		0.15	$169,398.74
Grand Total			**$ 1,298,723.64**

Exclusions:

* Interest Expense
* Relocation expenses
* Printing & Advertising
* Police & Fire - Details
* Owner Administration: Legal fees, advertising, Printing
* Utility Back Charges
* Furnishings & Fixtures
* Escalation

Existing Boilers

Hot water pump (1 of 2)

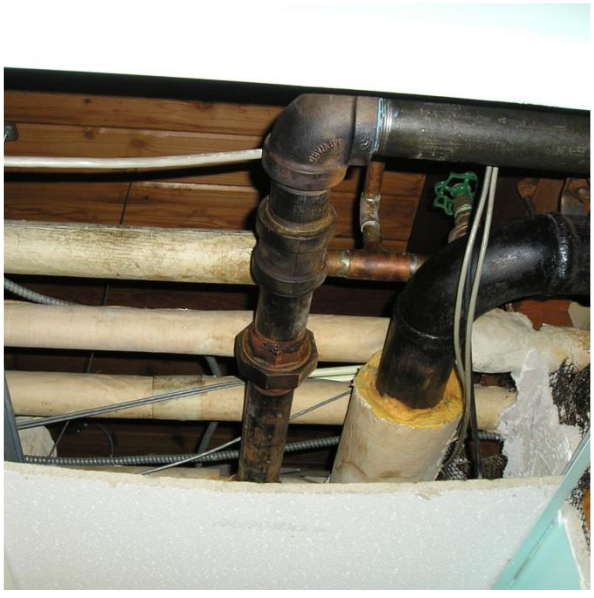
Existing ATC compressor

New oil pump set

Heavily corroded existing valves

New Oil Tank

Repaired pipe elbows included removal of asbestos insulation



Existing ATC panel

Typical Classroom Unit Ventilator & baseboard radiation below windows

Ceiling Mounted Unit ventilator in former Library

Cabinet heater in Corridor

Pipe Tunnel access

Caryl Community Center
Town of Dover, MA

October 20, 2014

Gym relief vent

Gym Unit Ventilator

Cafeteria Unit Ventilator

Ceiling mounted
Classroom Unit Ventilator

Classroom Relief Vent.

Gym ventlation intake grille

Typical Classroom ventilation intake

Typical thermostat

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Caryl Community Center

4 Springdale Avenue
Dover, MA 02030
Electrical

Prepared for: **Mr. Donald Mills**
Mills Whitaker Architects, LLC
P.O. Box 750089
Arlington, MA 02475

Date: **May 15, 2017**

Job #: **JE-3074**

Prepared by: **Johnson Engineering and Design, Inc.**
Eric D. Johnson
Electrical Engineer
MA Engineering License No. 32641

Basis

This report was prepared based on a building survey conducted on May 11, 2017. In 2003, Johnson Engineering & Design, Inc. provided an electrical assessment of the Community Center outlining recommended improvements, this was used as general reference and this reports updates past recommendations.

Objective

The objective of this study was to assess the electrical system and provide a scope of recommended improvements. Improvements are to both comply with the mandated electrical code upgrades resulting from the HVAC project and also recommended improvements based on equipment life expectancy.

Fire Alarm System

The International Existing Building Code requires updating of the fire alarm system and given the age of the system, complete replacement is recommended. The main fire alarm panel, located in the electrical room, should be replaced along with all associated remote devices and wiring. Within the daycare facility, carbon monoxide detection is also required. The building does not have an existing sprinkler system and therefore detection devices are required for all spaces.

The new system should be addressable, with all addressable remote devices. The main FACP will be located in the electrical room with a remote annunciator at the front lobby. FACP will have dual telephone line connection with autodialer to a monitoring company selected by the Town.

Electrical Service

The electrical service is sized at 600 amps, 120/208V, 3 phase, 4 wire, (800 amps fused switch with 600 amp fuses). The Town of Dover has indicated no desire for air conditioning which would require an increase in size. Given this criteria, the 600A service is adequately sized, however, the main switchboard is old and should be replaced. There was extensive electrical work done in 1971/1972 which included the installation of the existing switchboard. The switchboard was manufactured by Empire Electric Company which is no longer in business.

Our recommendation is to provide a new switchboard in the adjacent fuel storage room, new incoming service conductors sized at 600 amps should be routed from the existing utility pole through the existing below grade conduits.

Water Infiltration

Water is currently present and entering the building through the existing electrical service entrance conduits. As part of the project, new duct seal and cable drip loop will be installed at the pole to prevent water migration.

Generator

The generator is located in the electrical room and is also in need of replacement. The generator is classified as an emergency generator which services both life safety and standby loads.

We recommend a new exterior generator, sized at 60KW, 120/208V, three phase, four wire, with a weatherproof sound attenuated enclosure and integral diesel fuel tank be installed on the building exterior. The generator would be along the drive parking area protected by twelve (12) bollards. The generator will feed into two (2) transfer switches, one for life safety loads and one for miscellaneous loads such as heat system loads so that the compete heating system is functional with loss of power, as well as other owner selected equipment.

Panels

All panelboards, except one, were installed as part of the 1972 upgrade and are manufactured by Empire Electric Company. The Empire Electric Company panelboards are as follows:

Panel P1, rated: 225A 120/208V, 3 phase, 4 wire, MLO, 42 ckt, located in the boiler room.

Panel P2, rated: 225A 120/208V, 3 phase, 4 wire, MLO, 42 ckt, located in first floor closet.

Panel P3, rated: 225A 120/208V, 3 phase, 4 wire, MLO, 36 ckt, located in first floor main electrical room.

Panel L1, rated: 225A, 120/208V; 3 phase, 4 wire, MLO, 42 ckt with adjacent 12 ckt panelboard, located in the first floor electrical closet.

Panel L2, rated: 225A, 120/208V, 3 phase, 4 wire, MLO, 42 ckt, located in second floor electrical closet.

Panel L3, rated: 225A, 120/208V, 3 phase, 4 wire, MLO, 42 ckt, located in second floor electrical closet.

Panel L4, rated: rated: 225A, 120/208V, 3 phase, 4 wire, MLO, 42 ckt, located in second floor electrical closet.

Panel DE rated: 225A, 120/208V, 3 phase, 4 wire, with 150A main circuit breaker, 42 ckt located in the first floor main electrical room.

Panel EA rated: 100A, 120/208V, 3 phase, 4 wire, MLO, 30 ckt located in the first floor main electrical room

Panel EB rated: 100A, 120/208V, 3 phase, 4 wire, MLO, 30 ckt located in the first floor electrical closet.

Panel EC rated: 100A, 120/208V, 3 phase, 4 wire, MLO, 30 ckt located in the second floor electrical closet.

Panel ED rated: 100A, 120/208V, 3 phase, 4 wire, 12 ckt located in the second floor electrical closet.

We recommend new feeders from the main switchboard and/or the main emergency distribution panelboard be installed in new conduit to each of the twelve (12) panelboards. We recommend new panels be installed, directly replacing the existing, in the same location. Existing branch circuit wiring can be reconnected to new panelboards.

Corridors

The corridor electrical lighting systems including: switches, branch circuit wiring, lighting fixtures, emergency lighting fixtures and exit signs are to be removed. Complete new corridor lighting systems are to be installed. Our recommendation would be for the emergency egress lighting systems to also serve as the buildings night light system. Thus, new emergency lighting fixtures, 2x2 LED, would be positioned along the corridors, unswitched and direct wired to the nearest emergency lighting panel. New LED exit signs would also be connected to the corridor emergency lighting circuits.

The normal corridor lighting fixtures would be 3 way/4 way switched from stairway locations and exterior door locations. Assume three (3) switches per floor for control of corridor lighting. Normal power corridor lighting fixtures would also be LED type, 2 x 2, lay-in fixtures.

Site Lighting

Site lighting poles, with cut off type LED lamps shall be installed to illuminate back parking lot. Pole heights are estimated at 12 foot, to be installed on concrete pole bases.

Eight (8) building mounted fixtures, LED cutoff type, shall be installed to illuminate front and rear walkways and parking in close proximity to the building.

-End of Report-

DOVER CARYL COMMUNITY CENTER
ACCESSIBILITY STUDY
4 Springdale Avenue
Dover MA

Mills Whitaker Architects LLC
30 June 2016

INTRODUCTION

The Caryl Community Center is an adaptive reuse of the former Caryl Elementary School that was constructed in three phases: 1910, 1931 and 1971. In 2001, the school moved to new facilities and the Town has been incrementally repairing and improving the building for continuing use. Projects thus far have included roofing, masonry repairs and toilet renovations. The next significant improvement will be replacement of the aging boilers, heating distribution equipment, ventilation systems and temperature controls. The existing heating system is outdated and the ventilation system was based on the former school use and codes that required higher levels of outside air and its resultant greater energy usage. The conceptual cost of the next facility improvement will be a substantial expenditure that will trigger the need to meet current accessibility regulations for the entire facility.

This study was commissioned by the Board of Selectmen in January 2016 and was completed in June of the same year. Mills Whitaker Architects LLC performed the services related to this study. No other professional consultants (mechanical, electrical, structural, civil, estimating) were used during the course of this review. The accessibility study included the following elements:

1. Review existing conditions of the facility relative to conformance with 521 CMR, the regulations of the Massachusetts Architectural Access Board.

2. Identify deficiencies relative to accessibility standards and recommend improvements that should be made and/or possible variances that could be sought in lieu of full compliance.

3. Develop a preliminary outline plan and conceptual budget for addressing deficiencies, including soft costs related to recommended variance requests and renovations.

FACILITY DESCRIPTION

The existing facility is a two-story brick building consisting of approximately 41,300 square feet. A third floor mezzanine level is located above the former library space in the 1971 wing. Uses in the building include a pre-school program (CDC), Council on Aging (COA), Parks & Recreation offices, a dance studio (Erin's) and a local support group for young families (Parent Talk). The building's uses and maintenance are overseen and operated under the direction of the Board of Selectmen.

Existing accessibility provisions include an accessible front entrance, a two-stop passenger elevator, accessible toilet rooms (renovation in progress) and accessible drinking fountains. Not all spaces are accessible to persons with disabilities, the most notable of which are the gymnasium and mezzanine levels, and not all features of the building are in compliance with current accessibility regulations.

ACCESSIBILITY REGULATIONS

Regulations of the Massachusetts Architectural Access Board (521 CMR) require compliance in existing buildings based on expenditures for permitted renovations over a three-year period. If the cost of work amounts to 30% or more of the "full and fair cash value" of a building, exclusive of land, then the entire building must comply with current regulations, just as if the facility were being built new. Invariably, certain aspects of an existing building may become the subject of variance requests. Variances can be granted by the Board if an applicant demonstrates that full compliance is technically infeasible, or if the cost of full compliance is excessive as compared to the benefit gained by the disabled. When variances are granted for specific components, then those are considered to be in full compliance with 521 CMR.

The "full and fair cash value" of the building is the value listed in the Town Assessor's office and then equalized by the assessment ratio used by the Department of Revenue. The Assessor lists the 2016 building value at $3,214,900 ($4,075,200 total including land). At this value, if all permitted work at the building were to total $964,470 over a three-year period, then full compliance with current accessibility regulations must be provided. Building permit activity over the last three years consists of the current toilet room renovations in 2016 valued at $520,000, leaving an additional work cost of $444,470 to reach the 30% threshold. Thus far, work being performed has conformed to the regulations but the threshold of expenditure has not yet triggered full compliance for the whole building. The anticipated cost of the pending heating, ventilating and controls project will exceed the 30% trigger and mandate full compliance with current accessibility regulations.

521 CMR COMPONENTS

The Commonwealth of Massachusetts Regulations (CMR) was enacted in 1975, four years following completion of the 1971 additions and modifications to the Caryl School. The regulations have been revised several times, the most recent of which was in 2006. The Architectural Access Board of Massachusetts oversees 521 CMR. The regulations are organized into five parts:

PART A:	**ADMINISTRATION**
PART B:	**BUILDING TYPES**
PART C:	**EXTERIOR**
PART D	**INTERIOR**
PART E:	**DWELLING UNITS**

PART A includes "Jurisdiction" of the regulations, the relevant portions of which were stated above in terms of when compliance is triggered based on the cost of renovations. There are also intermediate level triggers, but since the pending HVAC project at the Caryl Community Center will exceed the 30% rule, those intermediate compliance issues are not addressed in this report. PART A also includes variance information and specific definitions used in the code.

PART B lists specific requirements for various building categories. Community Centers are not listed as a separate building type and they bridge several of the uses listed. Relevant information for four types is included herein, namely: Commercial, Educational, Places of Assembly and Recreational facilities. In general, each of these four types must comply with all of 521 CMR but nuances for each use are further clarified in PART B.

PARTs C (Exterior) and D (Interior) describe requirements for the site and public use areas of a facility. PART E (Dwelling Units) is not relevant for this study since it is not a residential building. Relevant issues for each portion of the regulations are described below with a summary of conditions and the resultant recommendations for compliance. In some instances, variance requests are recommended when the cost of full compliance is likely to exceed the perceived benefit gained by the disabled.

521 CMR 11 / Commercial Buildings:

This building type includes municipal facilities and requires them to conform fully to 521 CMR. There are no specific issues listed in this section that are not addressed elsewhere in this report.

521 CMR 12 / Educational Facilities:

This building type includes pre-schools and requires them to conform fully to 521 CMR. In section 12.4, requirements related to sinks and counters in classrooms are addressed, specifying counter height and sink accessibility criteria. Two different types of sinks/counters are indicated in the drawings as follows:

S1: Sinks/Counters in Occupied Areas (CDC, COA, Parent Talk)
S2: Sinks/Counters in Unoccupied Areas (Park/Rec Storage, Mezzanine)

Existing sinks and counters in the classrooms, meeting rooms and hallways were installed during the 1971 addition and renovation work. While most sinks have lever-style faucet handles as required, they do not provide clear knee space below and the counters are higher than 34" AFF.

Educational Facility Recommendations:

1. *Remove the non-accessible sinks/counters in the CDC corridor areas in two locations. These should not be located in the path of egress per the building code and are redundant given that each CDC classroom also has a sink and counter.*
2. *In the other S1 locations, replace the existing sink, counter and base cabinet with accessible versions of the same (34" counter maximum height, clear knee space with correct piping array).*
3. *Sinks in the S2 locations can remain as-is unless they are renovated into public use spaces.*

In addition, the "Educational Facilities" section notes that any "Recreational Facilities" associated with this building type must comply with 521 CMR 19. Refer to that narrative for the gym and playground.

521 CMR 14 / Places of Assembly:

An "Assembly Area" is defined in 521 CMR 5 (Definitions) as, "A room or space accommodating a group of individuals for recreational, educational, political, social, or amusement purposes or for the consumption of food and drink." In 521 CMR 14.5, this is clarified to include any meeting room that can accommodate at least 50 persons. This occupancy threshold requires the provision of assistive listening systems for the hearing impaired. Spaces that meet this potential occupancy load in the Caryl Community Center include the Dining Room, Blue Room and Library.

Places of Assembly Recommendations:

1. *Provide assistive listening systems in the assembly areas in conformance with 521 CMR 14.5.*

521 CMR 19 / Recreational Facilities:

The gymnasium and playground areas of the Caryl Community Center are classified as recreational facilities. The gymnasium is on a lower level that is not accessible, and this issue is being addressed as explained in the narratives on Entrances (521 CMR 25), Stairs (521 CMR 27) and Elevators (521 CMR 28). The exterior playground space at the facility requires an accessible route to provide a path to the play space and to its equipment.

Recreational Facility Recommendations:

1. *Provide vertical access to the Gymnasium as explained elsewhere in this narrative.*
2. *Provide an accessible route to and within the surrounding of the exterior playground.*
3. *Note that the existing bleachers in the Dining Room do not conform to accessibility regulations, and the drawings indicate that these should be removed rather than be replaced.*

521 CMR 20 / Accessible Route:

An accessible route needs to be provided at the exterior and interior of all public portions of the site and building. In addition to the note above regarding playgrounds (521 CMR 19), there are three elements at the building's interior that need to be addressed. Two of the three relate to existing drinking fountains that protrude more than 4" into corridors in the zone between 27"-80" AFF, thereby creating a hazard in the accessible route. The third area is the open floor area below the mezzanine stair where the intermediate landing is open to the adjacent library area, creating a headroom hazard.

Accessible Route Recommendations:

1. *Remove the two protruding drinking fountains (DX on drawings) as noted in 521 CMR 36. These are located in the 1971 Link hallway at both floor levels and are redundant with other accessible drinking fountains that are nearby on each floor level (see DF in drawings).*
2. *Provide cane detection guards between the upright posts at the open area below the mezzanine stair to a height of 27" AFF to protect headroom clearances below the landing.*
3. *Provide an accessible path in the playground as noted in 521 CMR 19.*

521 CMR 22 / Walkways:

The regulations require that exterior walkways not exceed a 5% running slope (1:20) in the direction of pedestrian travel and a 2% cross slope (1:50). Any running slopes in excess of 5% require provision of an accessible ramp with dual-height handrails at each side. At the front of the building, there are two sections of walkway that exceed 5% but are not configured as ramps. Rather than construct ramps, grading can be modified in order to reduce the slope appropriately.

Walkway Recommendations:

1. *At the approach walkway from Springdale Avenue, re-grade the sidewalk to eliminate the steep section of approximately 7.7% that slopes down from the street. The grade difference between the street sidewalk (160.13') and the main entrance (158.93') over a distance of about 98' should yield an average overall running slope of less than 2% while still providing adequate drainage.*
2. *At the Blue Room exit door, re-grade the steep walkway (12.5%) to slope more gently (<5%) to the front walkway, thereby avoiding construction of a ramp.*

521 CMR 23 / Parking:

Existing parking for the facility is located in striped parallel spaces on Springdale Avenue, striped spaces within the site (front, side and back) and in unmarked spaces in the back gravel lot. There are four so-called accessible spaces marked for use, two at the street and two by the front entrance. The spaces at the street are not in compliance (no marked access aisles and no flush curbs) while the two by the front door require driving on the entrance walkway and constitute a pedestrian safety hazard.

Excluding the street parking, which is not applicable, there appears to be a capacity for parking about 60 cars on site at present: 2 at the front door, 3 unmarked spaces by the back door, 8 at the entry drive, 11 diagonally striped spaces in the side drive, and 36 in the gravel lot (subject to future layout review). For facility parking in the range of 51-75 spaces, a minimum of 3 accessible spaces is required, at least one of which should be van accessible.

Parking Recommendations:

1. *Delete the two accessible spaces at the front walkway and entrance area (hazardous, awkward).*
2. *Provide two van-accessible spaces at the rear entrance area in the currently unmarked space adjacent to the back entrance (see recommendations for accessible entrance at back). Provide a shared access aisle (8' wide) with cars parked between the back entrance and back play area.*
3. *Provide one or two additional accessible spaces in the parking area near the back entrance.*
4. *Existing "accessible" parallel spaces at the street are not relevant for building compliance.*

521 CMR 25 / Entrances:

Current regulations require all public entrances into a facility to be accessible, with the exception of a service entrance (unless it is the sole entry). This facility has ten exterior doors, three of which serve as entrances while the remaining seven are used only as exits (and for boiler room service). The drawings indicate the exterior doors with an "E" designation for entrances and an "X" for exits as follows:

E1: FRONT ENTRANCE – from Springdale Avenue
E2: BACK ENTRANCE – from back parking lot
E3: SIDE ENTRANCE – from exit driveway
X1: BLUE ROOM EXIT – to front walkway
X2: DINING ROOM AREAWAY EXIT – to exit driveway
X3: BOILER ROOM AREAWAY EXIT – to exit driveway (boiler room service)
X4: GYMNASIUM AREAWAY EXIT – to exit driveway
X5: CDC CLASSROOM EXIT – in southwest corner of 1971 addition
X6: EAST STAIR EXIT – to side yard along Centre Street
X7: ERIN'S DANCE STUDIO FIRE ESCAPE EXIT – to exit driveway

Of the three public entrances, only the front entrance is currently accessible. The back entrance is used very regularly (more than the front) while the side entrance is used less frequently.

Entrances Recommendations:

1. *Make the back entrance accessible by providing an exterior ramp to a raised landing platform and eliminate the step up at the threshold. Refer to recommendations for Stairs (521 CMR 27) and Elevators (521 CMR 28) for interior modifications to provide access from the back entry interior landing to the gym, first and second floor levels.*

2. *Request a variance for the side entrance and provide signage to accessible entrance locations.*

Accessibility issues related to exit doors are described separately in the "Doors" section that follows.

52 CMR 26 / Doors & Doorways:

Current regulations require all doors and openings along accessible routes to meet minimum clear widths, maneuvering clearances and accessible hardware features. The existing facility has about 97 door openings (counting paired doors as one; excluding doors in operable walls).

7 Existing Openings are accessible (includes 4 at toilet renovations in progress)
20 Existing Openings are for staff use only (accessible route provision not required)
70 Existing Openings are public doorways that are currently not accessible

Of the 70 openings that are not accessible, deficiencies fall into the following categories:

- 70 openings have knob set latches that require replacement with lever set hardware;
- 9 openings have restricted maneuvering clearances for door access that need correction;
- 11 openings have restricted maneuvering clearances, but variance requests are recommended;
- 2 openings have maneuvering clearance issues, and automatic operators are recommended;
- 6 openings have maneuvering issues but are primarily controlled by staff; request variances;
- 7 openings have thresholds or floor level issues that require corrective work or variances

Another aspect of the current regulations states that required egress doors that lead directly to the outside at grade in educational and assembly type buildings with over 150 occupants must be accessible at both the interior and exterior sides of the doors. While there are ten exterior doors at the building, only six are required as exits while the other four are redundant or limited to service only.

Doors & Doorways Recommendations (see drawings for "legend items" as noted below):

1. *Upgrade hardware for 70 existing doors at accessible routes from knob sets to latch sets.*
2. *Improve maneuverability clearances at 9 openings as noted in the drawings (Legend Item 2).*
3. *Request variances for maneuverability issues at 11 openings (Legend Item 3).*
4. *Provide automatic door operators with actuators at 2 openings (Legend Item 4).*
5. *Request variances for 6 openings in CDC area that are controlled by staff (Legend Item 6).*
6. *Address threshold and floor level issues, or request variances, at 7 openings (Legend Item 7):*
   a. *Back Entrance: delete step up at stoop while making back entrance accessible.*
   b. *Side Entrance: request variance for step at door due to exterior areaway and drainage.*
   c. *Gym Exit: request variance for step at door due to exterior areaway and drainage.*
   d. *Gym Entry: lower and taper existing door threshold to comply with height and slope.*
   e. *Dining Room Exit: delete this exit and create safe second means of egress via adjacent Blue Room as recommended in a separate study issued on 10/22/2015 and 2/26/2016.*
   f. *CDC Class Exit: door at S.W. corner is not required as an exit and should be removed.*
   g. *Erin's Dance Studio Exit: door (+ stairs) not required as an exit and should be removed.*

521 CMR 27 / Stairs:

There are four sets of interior stairways in the building. The central stair and back stair serve the first and second floors. The east stair serves the first, second and third floors (library mezzanine) and the

remaining stair is an open stairway connecting the library to its mezzanine level. With the exception of the mezzanine stair, each of the other three stairs has wall-mounted handrails with guardrails on the opposite side. The mezzanine stair has guardrails on both sides. None of the guardrail heights meet current code and few of the handrails meet current regulations either, but neither of these conditions is unusual for existing buildings since codes have changed many times following original construction.

The back interior stairway also serves the back entrance. This back entrance level is located at an intermediate landing between the first and second floor levels.

There are five exterior stairways, one of which serves the side entrance while the others are for service (boiler room) or exits (dining room, gym, dance studio). With the exception of the gym exit, the dining room and dance studio exit stairs are not required due to the alternate availability of interior exit paths. In the case of the dining room, some interior modifications are required in order to delete the areaway, while the dance studio already has three interior exit doors, so the exterior exit (+ stair) is redundant.

Stair Recommendations:

1. *Replace wall-mounted handrails with compliant handrails that meet current code for height requirements (34" – 38") and extensions (12" horizontal at top landings; 1 tread sloping + 12" horizontal at bottom landing).*
2. *Also provide lower set of handrails at areas where preschool children normally use the stairs.*
3. *At mezzanine level guardrail, add handrail with extensions to existing guardrail at outside perimeter of stair run.*
4. *At other interior stairs, request variance to retain existing guards without having to modify them and without having to add handrails, both of which will be based on the cost of full compliance.*
5. *Replace handrails at exterior gym exit stairs for compliance. Refer to Doors (521 CMR 26) for additional comments regarding accessibility issues at the gym exit.*
6. *Delete exterior stairway serving the dance studio since it is redundant.*
7. *Refer to the narrative on Entrances (521 CMR 25) and Elevators (521 CMR 28) regarding the proposed reconstruction of the back stair's lowest portion from the gym to the first floor.*

521 CMR 28 / Elevators:

Accessibility regulations require that a passenger elevator serve every accessible space and floor level. The drawings included in this study report designate the floor levels of the building as follows:

L-0: GYMNASIUM – not currently accessible
L-1: FIRST FLOOR – served by existing passenger elevator
L-2: SECOND FLOOR – served by existing passenger elevator
L-3: THIRD FLOOR (Library Mezzanine) – not currently accessible

If provisions other than a passenger elevator are used for vertical access, then variances for alternative forms of vertical access are required unless that is the only work being performed in a facility.

The existing elevator, located in the central stair hall, serves the first and second floors. Several aspects of the existing elevator meet current regulations, including dimensions of the cab, mounting height of hall call buttons, and the location of jamb markings on the frames. Components of the existing elevator that do not comply are noted in the recommendations herein.

Elevator Recommendations:

1. *Upgrade deficiencies of the existing passenger elevator to bring into full compliance:*
   a. *Provide hall and in-cab lanterns with visual and audible signals.*
   b. *Relocate existing handrails in cab from 38" AFF down to 34" AFF (or seek variance).*
   c. *Upgrade the in-cab control panel to comply with requirements of 521 CMR 28.8.*
2. *Provide a limited use/limited application elevator (LU/LA) in the back stairway area to serve the four floor levels of the stairway. This will add access to the gym level and provide a second public accessible entrance as noted in the narrative for Entrances (521 CMR 25). Installation of a LU/LA, which will require a variance, is much less expensive than the cost of a full passenger elevator.*
3. *If the Mezzanine (third floor) were re-opened for public use, the most logical means of vertical access would be to install a vertical wheelchair lift in the open floor area. This would require a variance based on the excessive cost of installing a passenger elevator to serve this floor level.*

521 CMR 30 / Public Toilet Rooms:

Existing toilet rooms include two multi-fixture men's and women's rooms on each floor, two single-user toilet rooms on each floor, and one single user toilet room inside the former school nurse's office that is in use by the CDC on the first floor. Of these toilet rooms, the four multi-fixture toilet rooms (which are undergoing extensive renovations at the time of this study report) include accessible fixtures while none of the single-user toilet rooms are accessible.

Toilet Recommendations:

1. *Provide signage at the single-user toilet rooms directing the public to the accessible toilets.*
2. *Request a variance to allow continuation of the non-accessible unisex toilet rooms based on the provision of signage above and justified by the cost of full compliance.*

521 CMR 32 / Kitchens:

The existing facility has one warming kitchen (dining room) and one kitchenette (conference room). These two kitchens are identified on the drawings as follows:

K1: FIRST FLOOR – Dining Room Commercial Warming Kitchen
K2: SECOND FLOOR – Conference Room Kitchenette

Accessibility regulations require compliance for non-commercial kitchens that are used by the public while commercial kitchens are not regulated because they are assumed to used only by staff. In a community center, when a kitchen has commercial fixtures that are used by the public, the regulations are somewhat "gray" at best since commercial fixtures are not manufactured to be accessible.

The existing dining room kitchen has commercial fixtures, most of which were in use when the former school served hot lunches that were prepared off site and kept warm on the premises. In cases such as this some accessibility provisions need to be provided in order to accommodate the public even if not all features can comply with the regulations. Existing commercial fixtures include a refrigerator, hand sink, serving tray area, dishwashing area, convection oven and stainless worktable. A residential refrigerator and electric range are also provided in the current configuration.

The other kitchen facility in the building, at the second floor conference room, is more limited in that is only has a sink and microwave. The existing counter is 34.5" high with a base cabinet the full length of the kitchenette. The sink is only 7" deep and has accessible faucets, but there is no knee space below. This kitchenette is used only by staff and is not available for use by the public, so modifications to meet current accessibility standards are not required.

Kitchen Recommendations:

1. *Dining Room Kitchen: make the following modifications and variance requests.*
   a. *Replace the hand-washing sink with an accessible hand-washing sink.*
   b. *Provide a worktable at 34" AFF with knee clearance below for accessibility.*
   c. *Provide a general use sink that is fully accessible.*
   d. *Request a variance for the hallway door clearance of 9" to the existing dishwashing counter, noting that the door leading into the more public end of the kitchen can be made accessible.*
   e. *Request clarification from the Board that the existing commercial fixtures will remain as-is. Note that the existing commercial convection oven is at an accessible height for cooking.*
2. *Conference Room Kitchen: modifications are not required unless converted into public use.*

521 CMR 36 / Drinking Fountains:

The drawings indicate two types of existing drinking fountains. Those designated as "DF" are in compliance with accessibility regulations, while those designated as "DX" are not. Interestingly, an accessible style of drinking fountain can be located in such a way that it violates another aspect of the accessibility regulations, namely, the clearance width required (if a wall recess is less than 30" wide) or by protruding into the accessible route (by projecting more than 4" from the wall).

Drinking Fountain Recommendations:

1. *Remove inaccessible units and cap piping in walls. Finish recess to match adjacent surfaces. These units are located near existing accessible drinking fountains and are therefore no longer required in current locations.*

521 CMR 39 / Controls:

This section stipulates accessible heights and clearances for controls (e.g., light switches, outlets) and dispensers (e.g., toilet paper, hand soap) in accessible spaces. Generally speaking, switch heights of 48" AFF are in compliance. Not all control heights were observed in the existing building, so additional survey work will be required when the upgrades are to be done. Fire alarm pulls, however, are not in the range of heights mandated by code (many 58"-66" AFF; very few at required minimum of 48" AFF), and they were also not in the correct locations in all instances.

Controls Recommendations:

1. *Make corrections to fire alarm pull heights and locations. Refer to recommendation to replace the existing fire alarm system per 521 CMR 40 due to other extensive alarm deficiencies.*
2. *In spaces that are not controlled primarily by staff (e.g., in public meeting rooms), lower the height of light switches to 48". For rooms where staff are in charge of lights (offices, preschool classrooms), request a variance if any light switches are beyond these height limitations.*
3. *Confirm that receptacle locations are within 18" to 48" of the floor, and that none are within 18" of an inside corner.*

521 CMR 40 / Alarms:

Visual and audible alarms are required for an accessible fire alarm system, including strobes that must be located in "restrooms, meeting rooms, hallways, lobbies, classrooms, and any general usage areas open to the public." The existing fire alarm system has only minimal strobes in hallways, with the exception of the multi-fixture toilet rooms that are currently undergoing renovations.

Alarms Recommendations:

1. *Replace and upgrade the existing fire alarm system to incorporate audible and visual alarms in all required spaces. There are too many changes needed for effective re-use and expansion of the existing fire alarm system. (Note that replacement of the fire alarm system was identified and budgeted as a long-term need in the 2003 Deferred Maintenance Study report.)*

521 CMR 41 / Signage:

For the most part, existing rooms and spaces have signage that meets current regulations. However, some areas will need additional signage as noted below.

Signage Recommendations:

1. *Provide accessible parking signage at new spaces by back entrance per 521 CMR 23.*
2. *Provide signs at existing non-accessible toilet rooms directing the public to the locations of accessible toilet rooms per 521 CMR 30.*
3. *Provide signage at all interior stairways.*
4. *Provide signage at the non-accessible side public entrance directing the public to the locations of accessible entrances per 521 CMR 25.*
5. *Provide accessible illuminated exit signs with the universal wheelchair symbol to differentiate between accessible and inaccessible exits.*
6. *Provide signs identifying the availability of assistive listening systems in assembly areas as noted in 521 CMR 14.*

IMPLEMENTATION CONSIDERATIONS

This study was limited to addressing accessibility improvements and was not intended to address other future improvements to the facility. Compliance with 521 CMR will be required when the HVAC project is underway since the cost of that project will exceed 30% of the building's value. We recommend incorporating the accessibility work into the HVAC project as part of one renovation. Doing so will prevent having to undo any related work in the mechanical and electrical trades. Also, involving more work should be beneficial to the Town in terms of a potential economy of scale and for limiting the disruptions associated with construction work in an occupied building.

For years, there has been consideration given to renovating the hallways, especially flooring, lighting and ceilings, in order to remove the visual vestige of the former school. Thus far, the walls have been painted and lockers have been removed, but no other improvements have been made to the corridors. Inclusion of that future work at the same time as the HVAC and accessibility work would be a very efficient way of procuring that aspect of the adaptive re-use project list, especially since much of the work involved will affect the corridors. Similarly, if the mezzanine level were to be made accessible for re-use, renovations of that dormant floor level should be done at the same time. No budgets have been developed for the corridors and the mezzanine level since they were not part of the study focus.

Prior to proceeding with project design and documentation work beyond schematic layouts, a variance application should be prepared and submitted to the Massachusetts Architectural Access Board for its review and decision. Variances are granted when the Board agrees that the cost of full compliance is excessive as compared to the benefit gained for the disabled. While components that are potential variances have been outlined above, the costs associated with full compliance in lieu of receiving those specific variances have not yet been determined. Those costs will be determined and submitted with the variance application when the project design proceeds. Our recommendations are based on experience with other similar building conditions and successful variance applications on other projects.

Assuming that the variances suggested are granted, the cost of achieving compliance is relatively high for this building. A detailed conceptual budget is attached to this report, indicating a value of $750,000, which amounts to a project cost of about $18 per square foot. A summary by project component, with rounded costs that include contingencies and fees, is as follows:

$268,000: Vertical Accessibility
Provide small elevator in back stairway; modify back stairway at gym level; provide exterior accessible ramp and modified landing at back entrance; replace wall-mounted handrails at all interior stairways for compliance; provide vertical wheelchair lift to mezzanine level; upgrade specific components of existing passenger elevator

$237,000: Accessible Doors, Doorways & Exits
Modify hardware at interior doors; modify openings for maneuverability clearances; remove and infill redundant exits (3); provide all associated patching and finishing

$188,000: Accessible Fire Alarm, Exit Signs & Electrical Devices
Replace existing fire alarm system; provide illuminated exit signs with wheelchair symbol at accessible exits; modify light switches and outlets where needed; provide GFIs at lavs

$ 24,500: Accessible Exterior Walkway Improvements
Modify front walkway to eliminate steeply pitching sloped walkway toward main entry; modify exterior walkway exiting from Blue Room to reduce slope for compliance

$ 32,500: Accessible Sinks, Counters and Kitchens
Replace non-compliant sinks and counters in classrooms and meeting rooms where applicable; remove sinks and counters in CDC hallway and stairway areas; provide accessible fixtures in dining room kitchen

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$750,000: Conceptual Budget for Accessibility Improvements
Based on assumptions related to full compliance with 521 CMR
Assumes that all variances noted in the narrative will be granted

CONCLUDING REMARKS

This study was undertaken to review conditions of the existing building and site to ascertain the extent of work needed to comply with current regulations of the Massachusetts Architectural Access Board (521 CMR). These regulations were not in effect until after the building had been constructed, so there are a number of issues that fall short of compliance. The regulations were first promulgated in 1975 whereas the last addition to the building was completed in 1971. The regulations are updated from time to time, and the current version was last revised in 2006.

Mills Whitaker Architects has extensive experience working on improvements to existing buildings and renovating facilities to comply with current accessibility regulations. When an expenditure of 30% or more of a building's value is incurred in permitted renovation work over a three-year period, a building must comply with 521 CMR in full. The regulations allow for variance requests for certain features of a building if it can be proven to the Architectural Access Board that the cost of full compliance is excessive as compared to the benefit gained for the disabled. The Board makes decisions to grant or deny requests based on the merits of each building's conditions and the types of items that are requested.

In the case of this study, the conceptual project cost for recommended improvements is $750,000, assuming that issues for which variances are requested will be granted. While determining the value of variance requests was beyond the scope of this study since that work is done during the preparation of a variance application, we have relied on our experience with decisions of the Board on our applications to outline our recommendations. We assume that full compliance to 521 CMR, without the benefit of any variance requests, would at least double this conceptual budget to a cost of $1.5 million.

We understand that the cost of accessibility improvements for an existing building can be somewhat daunting upon first review. We welcome the opportunity to discuss the scope of recommended work and the logic of intended variance requests to clarify the components of this study report.

ATTACHMENTS

- PLAN DRAWINGS (12 pages)
- CAPTIONED PHOTOS (18 pages)
- ITEMIZED BUDGET (1 page)

A-00 LIST OF DRAWINGS
A-01 DRAWING LEGEND

A-1.0 FIRST FLOOR – EXISTING CONDITIONS
A-1.1 FIRST FLOOR – ACCESSIBILITY UPGRADES

A-2.0 SECOND FLOOR – EXISTING CONDITIONS
A-2.1 SECOND FLOOR – ACCESSIBILITY UPGRADES

A-3.0 THIRD FLOOR – EXISTING CONDITIONS
A-3.1 THIRD FLOOR – ACCESSIBILITY UPGRADES

A-4.0 FIRST FLOOR – EXISTING BACK STAIR
A-4.1 FIRST FLOOR – BACK STAIR UPGRADES

A-5.0 SECOND FLOOR – EXISTING BACK ENTRANCE
A-5.1 SECOND FLOOR – BACK ENTRANCE UPGRADES

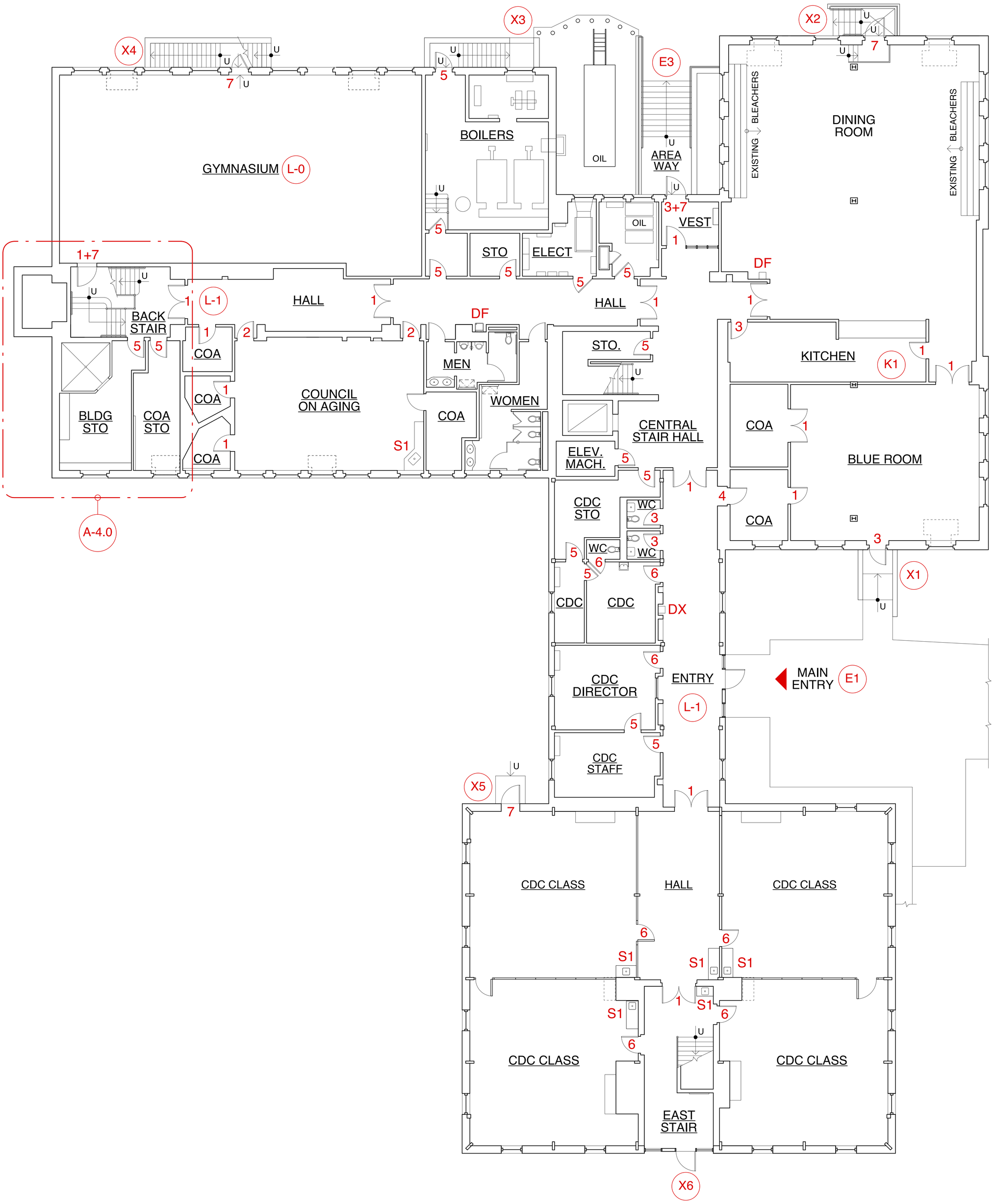
PROJECT: CARYL COMMUNITY CENTER ACCESSIBILITY IMPROVEMENTS STUDY 4 SPRINGDALE AVENUE / DOVER MA	MILLS WHITAKER ARCHITECTS, LLC P.O. Box 750089 Arlington MA 02475	A-00
DRAWING: LIST OF DRAWINGS	DATE: JUNE 2016	

ITEM	EXISTING CONDITIONS	ACCESS UPGRADES
1	Hardware is a Knobset; Other Issues Are Accessible (Width & Clearances)	Change Hardware to Lever Set (No Other Changes)
2	Knobset & Clearance Issues (Maneuverability Inaccessible)	Change to Lever; Improve Clearances for Compliance with Maneuverabilty
3	Non-Accessible Public Door (Knobset and/or Maneuverability Issues)	Seek Variance per Narrative
4	Inaccessible Public Door in Deep Recess; Hardware Knobset	Provide Lever Set and Automatic Door Operator with Push-Button Actuators
5	Door for Staff Use Only	Accessibility Not Mandated
6	Public Door But Staff Controlled	Seek Variance per Narrative
7	Door Threshold Not Accessible	Refer to Narrative
E#	Entrance Designation	Refer to Narrative
DF	Accessible Drinking Fountain	No Work Required
DX	Inaccessible Drinking Fountain	Remove Drinking Fountain
K#	Kitchen	Refer to Narrative
L#	Floor Level Designations	Refer to Narrative
S#	Sink & Counter Areas	Refer to Narrative
X#	Exit Designation	Refer to Narrative

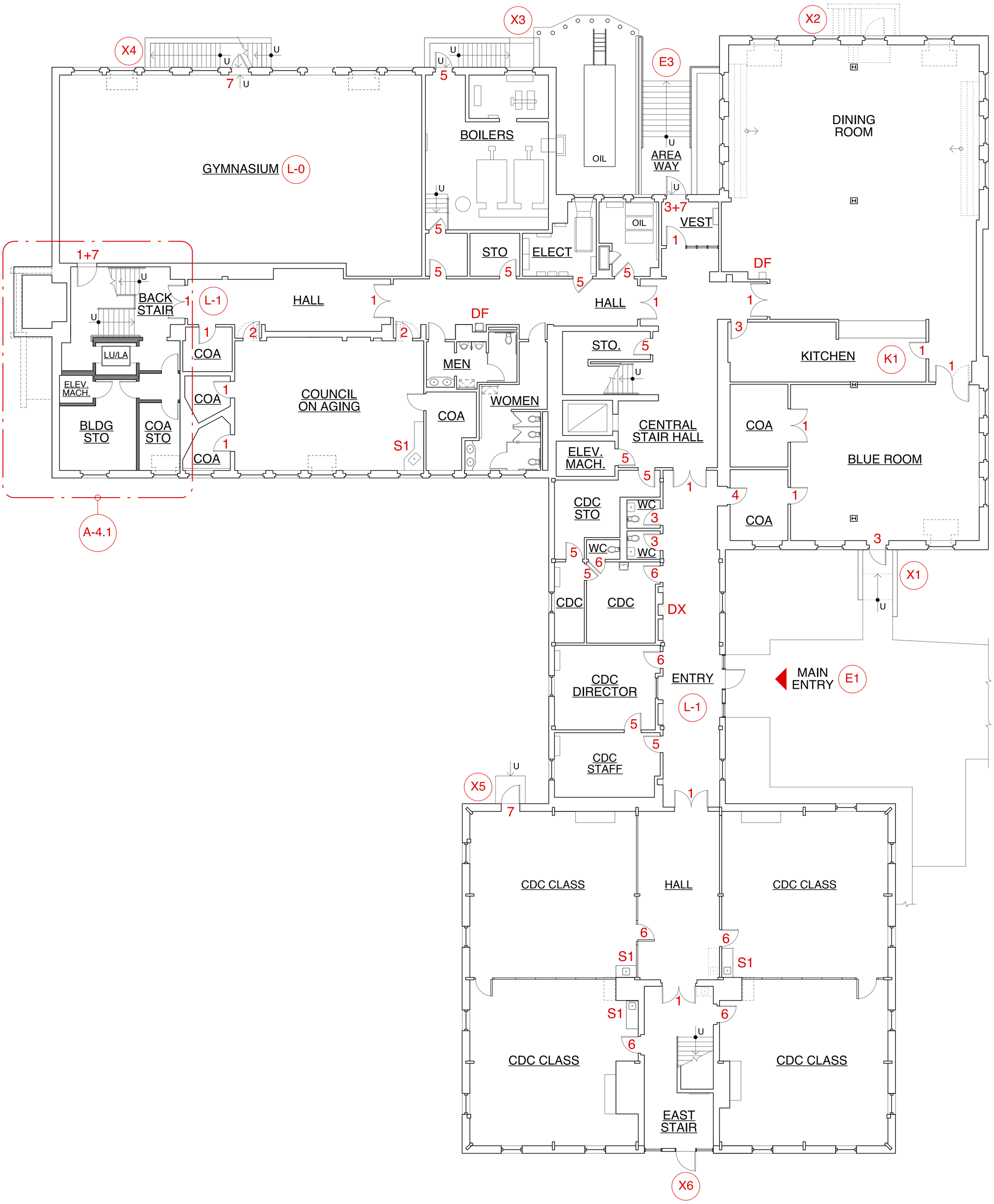
NOTES:

1) At the time of the study, renovation of the first and second floor public toilet rooms were just starting construction and have been shown as "existing" though the work had not yet been completed.
2) Renovation or repair of the existing dining room second exit via the existing areaway at the exit drive is not recommended as had been previously noted under a separate study (see narrative).

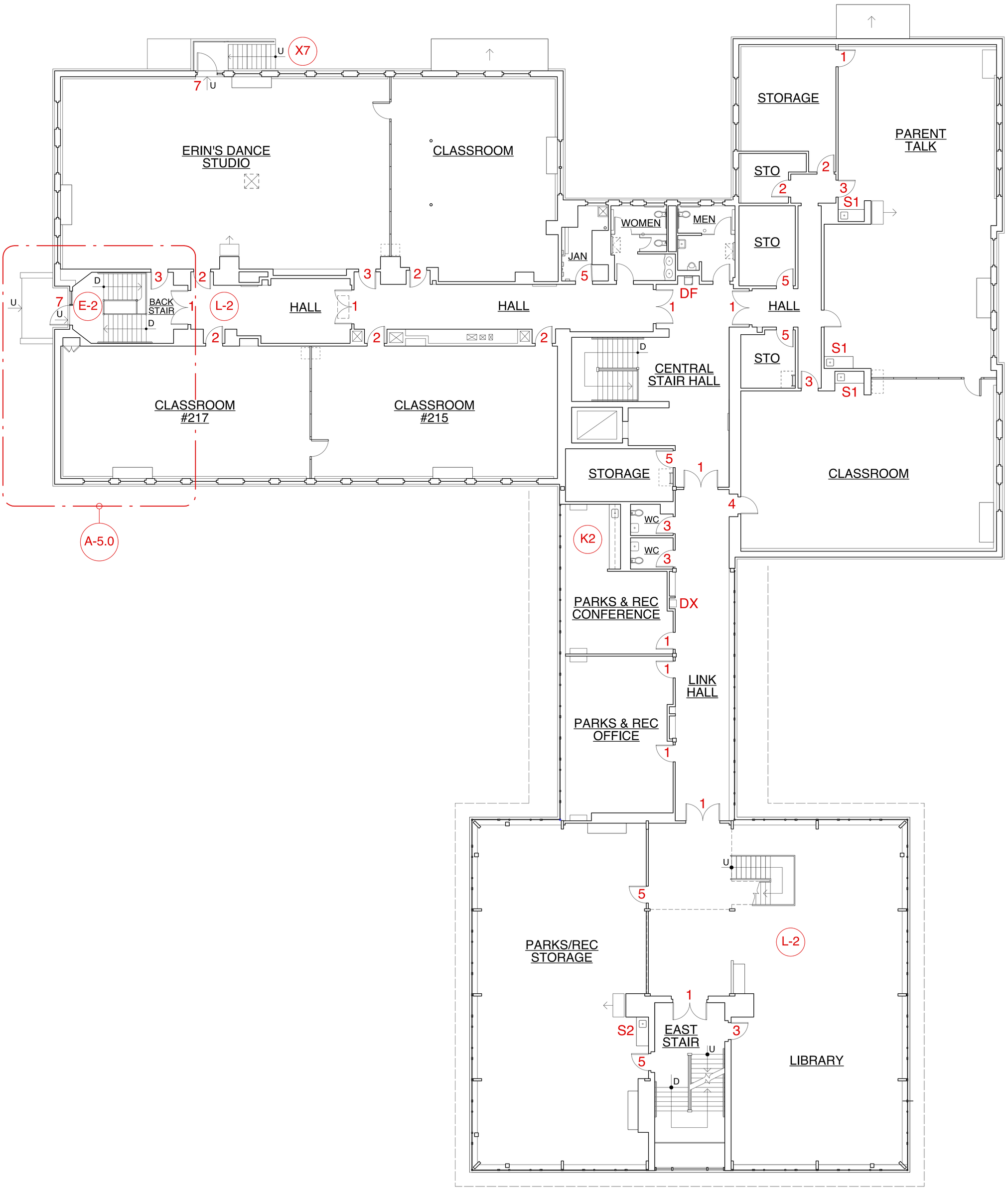
PROJECT: CARYL COMMUNITY CENTER ACCESSIBILITY IMPROVEMENTS STUDY 4 SPRINGDALE AVENUE / DOVER MA	MILLS WHITAKER ARCHITECTS, LLC P.O. Box 750089 Arlington MA 02475	A-01
DRAWING: DRAWING LEGEND	DATE: JUNE 2016	



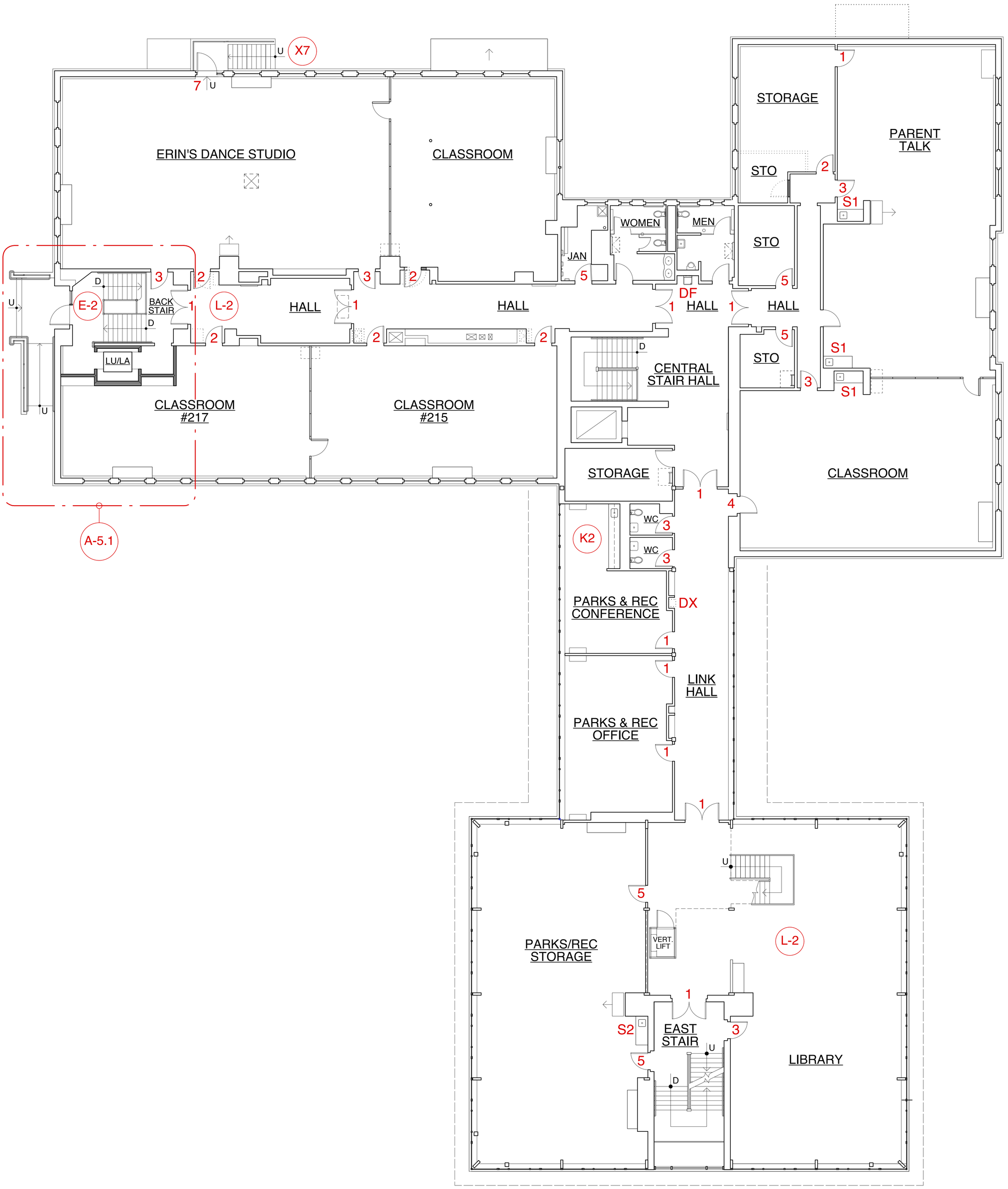
PROJECT:	CARYL COMMUNITY CENTER ACCESSIBILITY IMPROVEMENTS STUDY 4 SPRINGDALE AVENUE / DOVER MA	MILLS WHITAKER ARCHITECTS, LLC P.O. Box 750089 Arlington MA 02475	A-1.0
DRAWING:	FIRST FLOOR - EXISTING CONDITIONS	DATE: JUNE 2016	



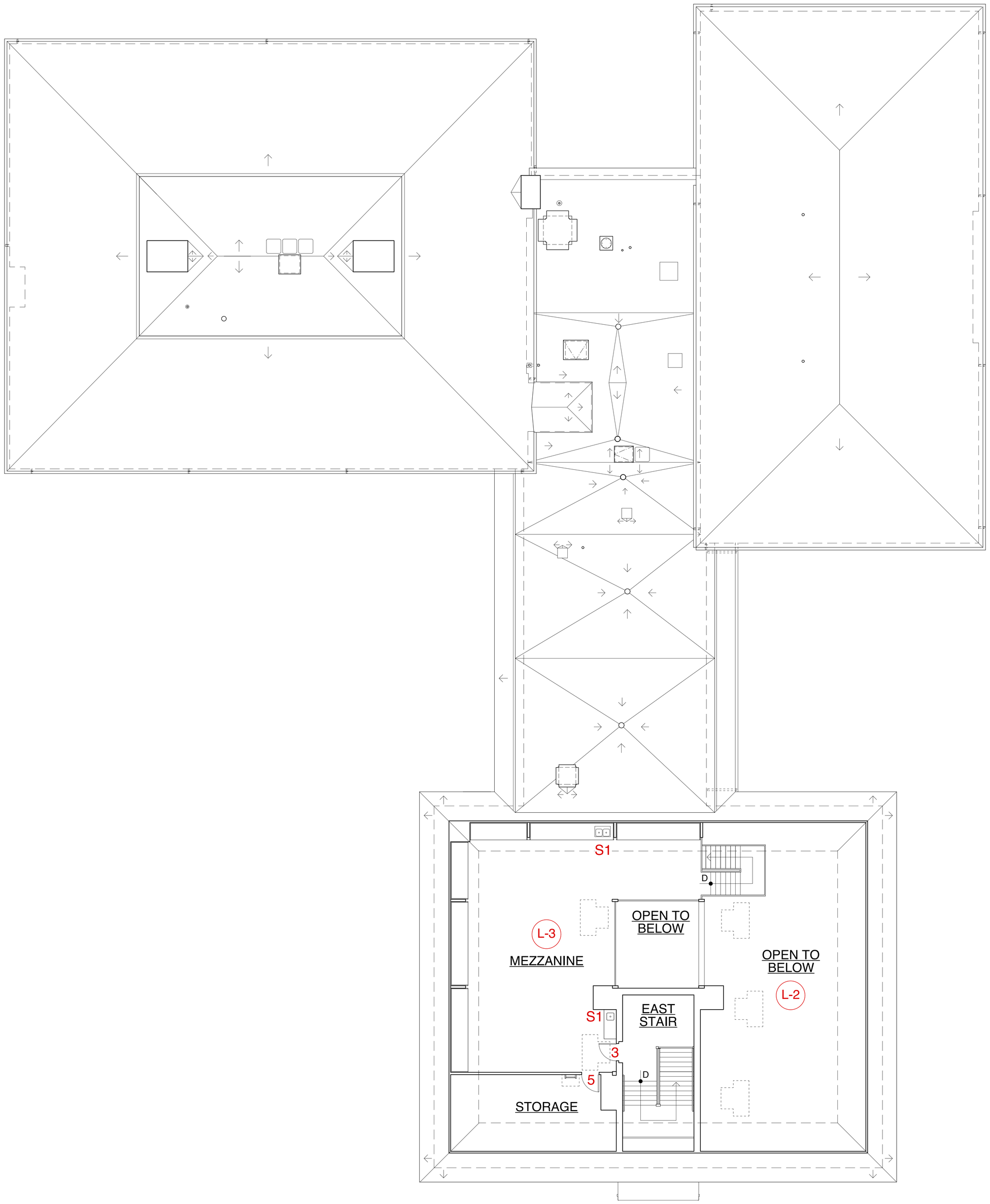
PROJECT:	CARYL COMMUNITY CENTER ACCESSIBILITY IMPROVEMENTS STUDY 4 SPRINGDALE AVENUE / DOVER MA	MILLS WHITAKER ARCHITECTS, LLC P.O. Box 750089 Arlington MA 02475	A-1.1
DRAWING:	FIRST FLOOR - ACCESSIBILITY UPGRADES	DATE: JUNE 2016	



PROJECT:	CARYL COMMUNITY CENTER ACCESSIBILITY IMPROVEMENTS STUDY 4 SPRINGDALE AVENUE / DOVER MA	MILLS WHITAKER ARCHITECTS, LLC P.O. Box 750089 Arlington MA 02475	A-2.0
DRAWING:	SECOND FLOOR - EXISTING CONDITIONS	DATE: JUNE 2016	

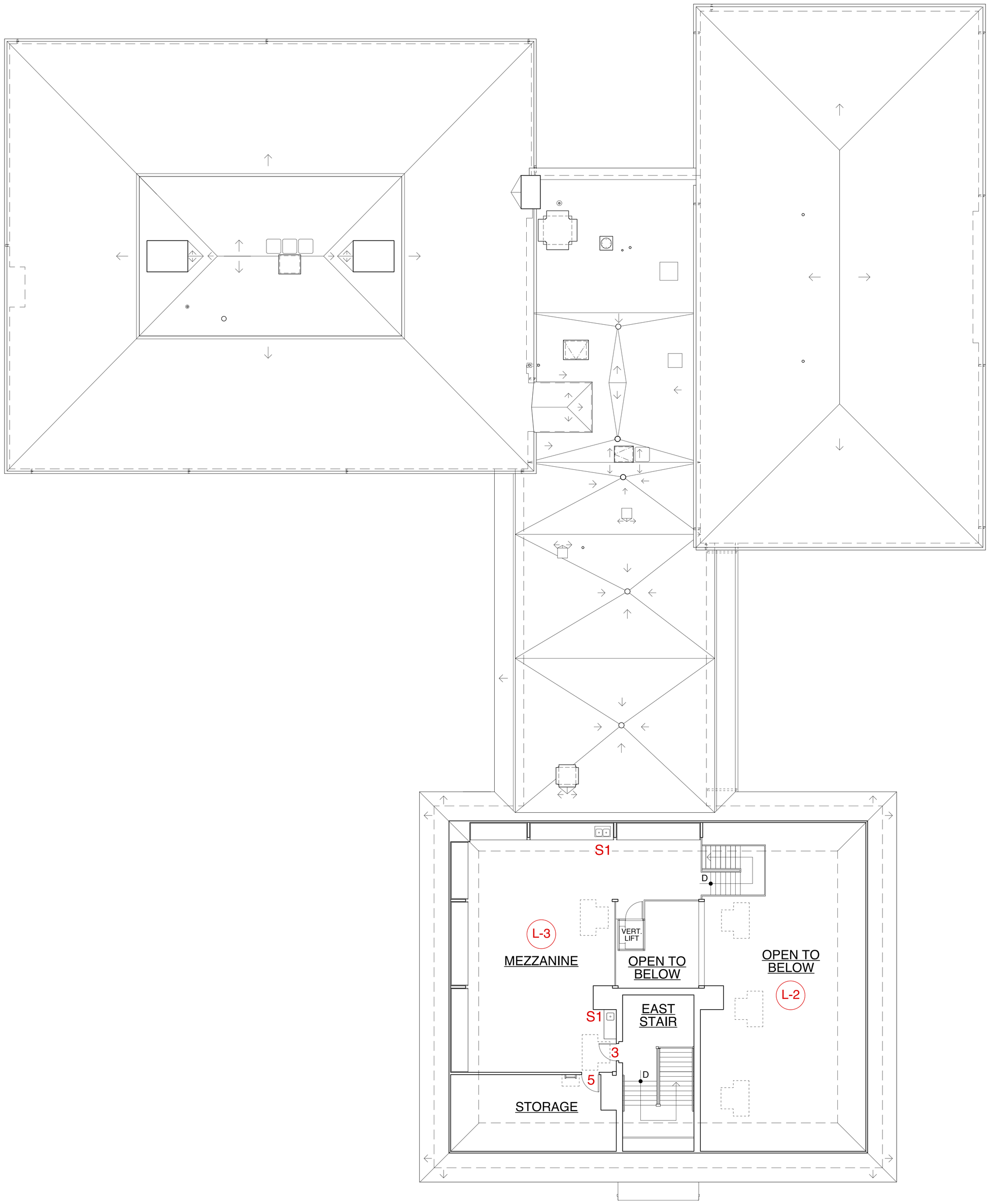


PROJECT:	CARYL COMMUNITY CENTER ACCESSIBILITY IMPROVEMENTS STUDY 4 SPRINGDALE AVENUE / DOVER MA	MILLS WHITAKER ARCHITECTS, LLC P.O. Box 750089 Arlington MA 02475	A-2.1
DRAWING:	SECOND FLOOR - ACCESSIBILITY UPGRADES	DATE: JUNE 2016	



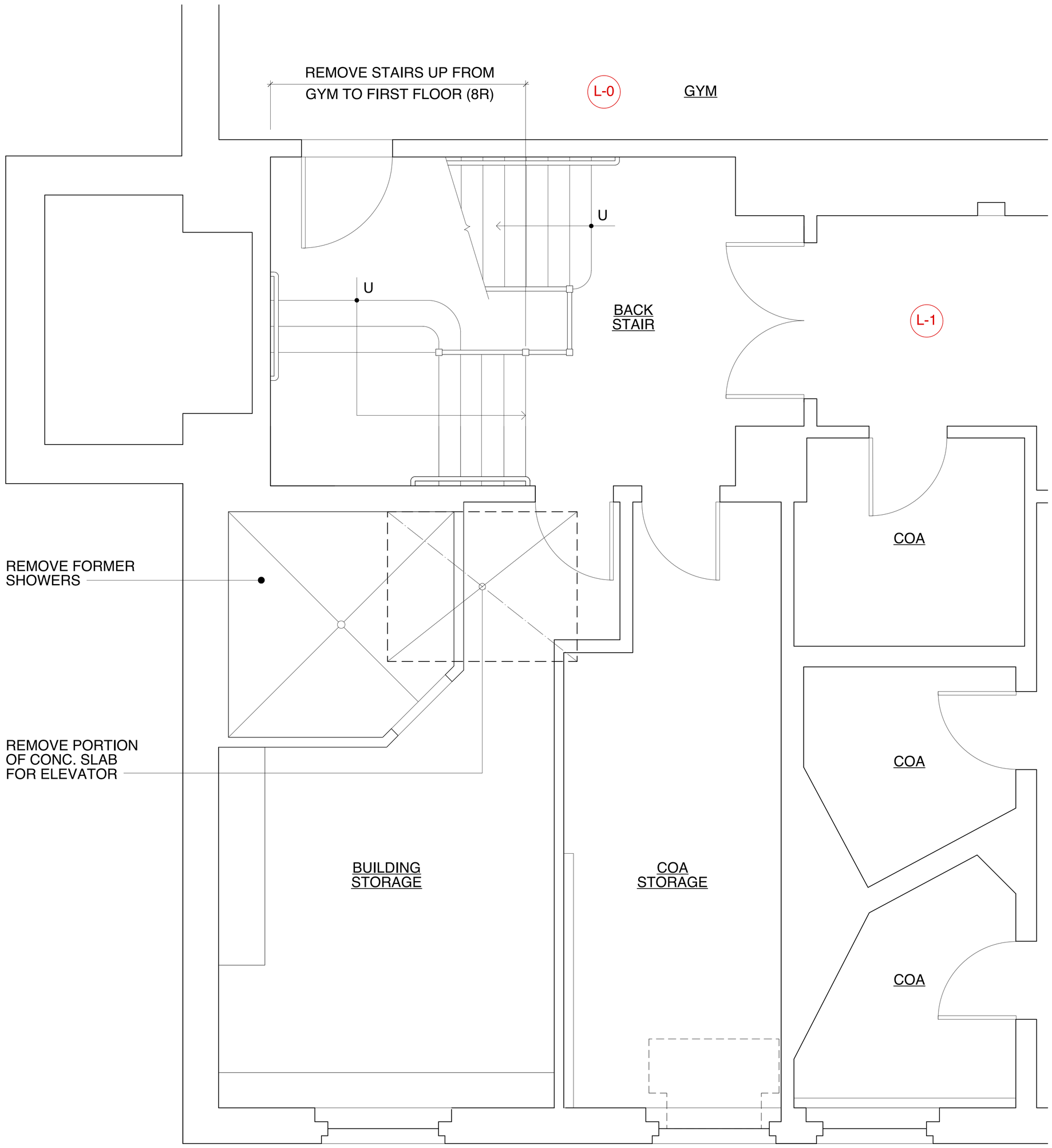
0' 4' 8' 16' N

PROJECT: CARYL COMMUNITY CENTER ACCESSIBILITY IMPROVEMENTS STUDY 4 SPRINGDALE AVENUE / DOVER MA	MILLS WHITAKER ARCHITECTS, LLC P.O. Box 750089 Arlington MA 02475	A-3.0
DRAWING: THIRD FLOOR - EXISTING CONDITIONS	DATE: JUNE 2016	

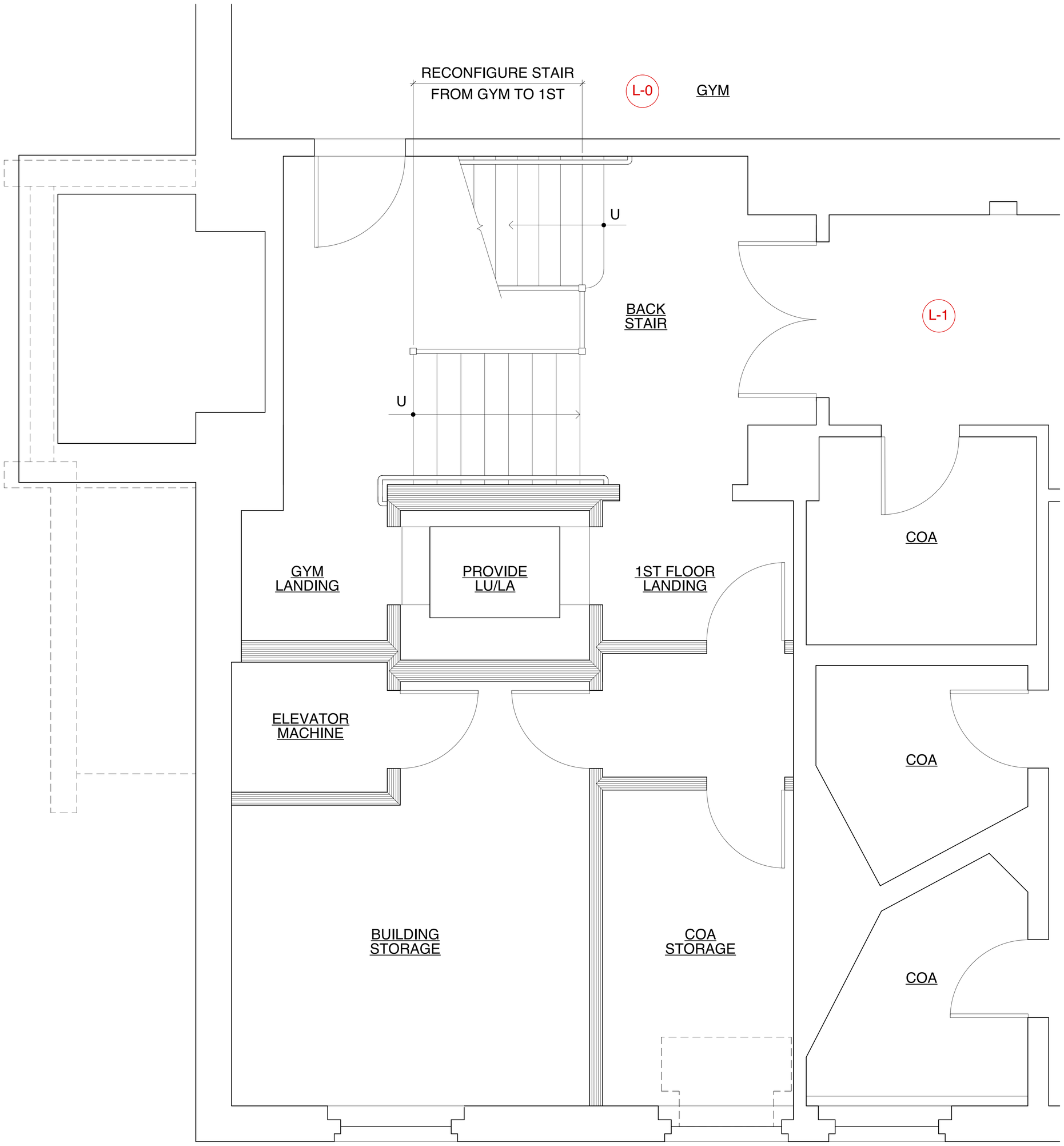


0' 4' 8' 16' N

PROJECT:	CARYL COMMUNITY CENTER ACCESSIBILITY IMPROVEMENTS STUDY 4 SPRINGDALE AVENUE / DOVER MA	MILLS WHITAKER ARCHITECTS, LLC P.O. Box 750089 Arlington MA 02475	A-3.1
DRAWING:	THIRD FLOOR - ACCESSIBILITY UPGRADES	DATE: JUNE 2016	



PROJECT:	CARYL COMMUNITY CENTER ACCESSIBILITY IMPROVEMENTS STUDY 4 SPRINGDALE AVENUE / DOVER MA	MILLS WHITAKER ARCHITECTS, LLC P.O. Box 750089 Arlington MA 02475	A-4.0
DRAWING:	FIRST FLOOR - EXISTING BACK STAIR	DATE: JUNE 2016	

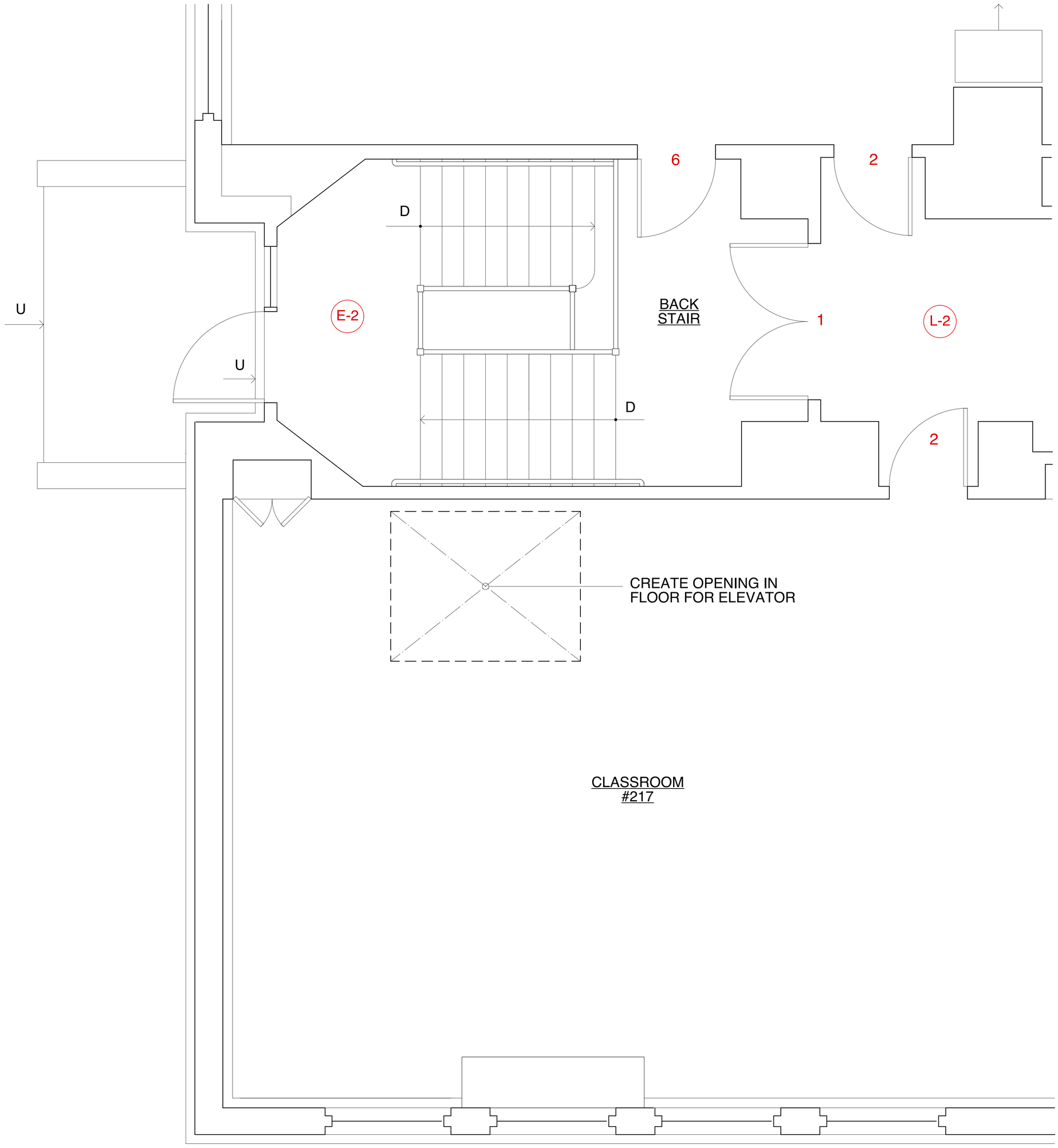


NOTE: LU/LA = "LIMITED USE / LIMITED APPLICATION" ELEVATOR

0' 4' 8' 16'

N

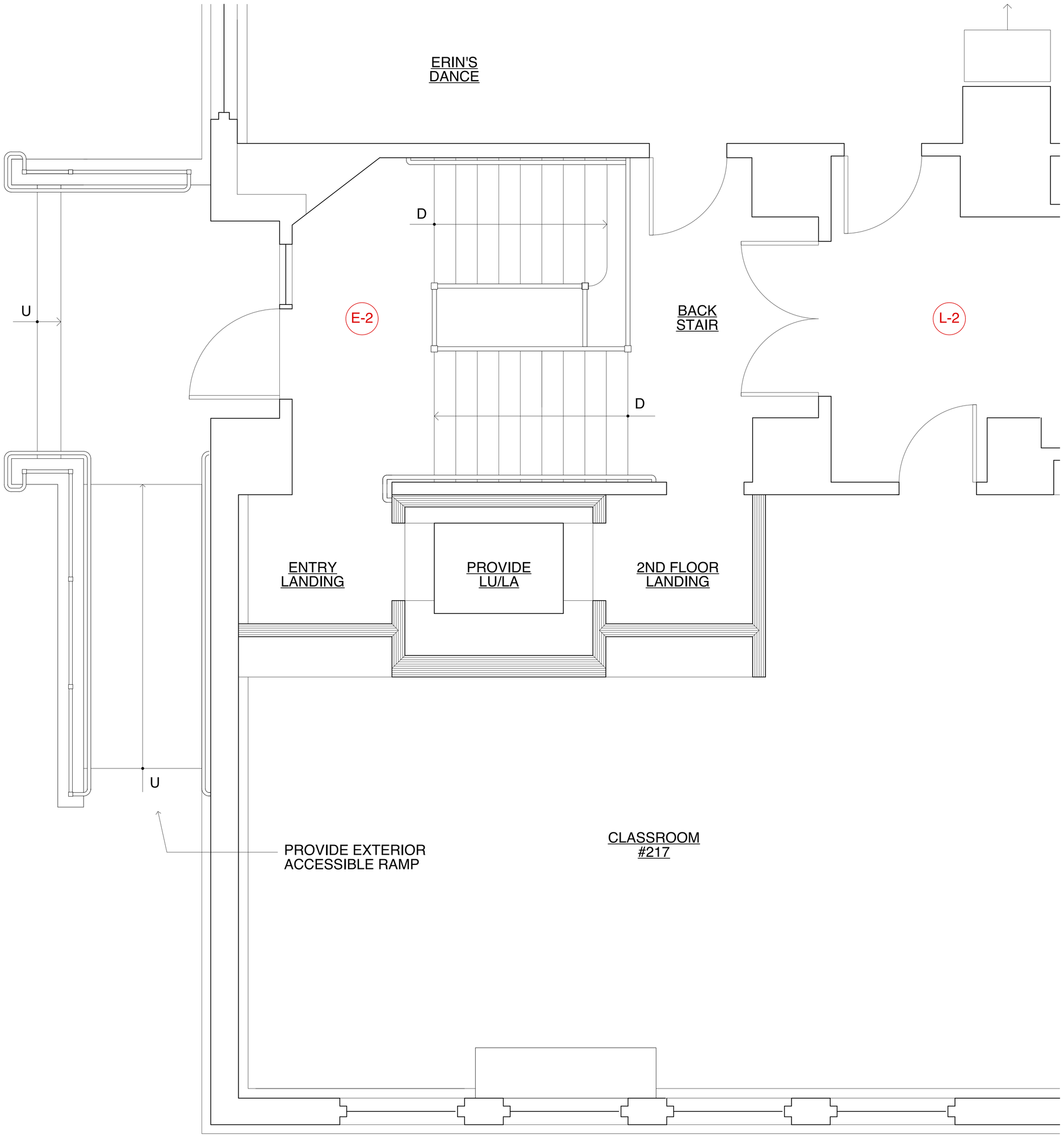
PROJECT:	CARYL COMMUNITY CENTER ACCESSIBILITY IMPROVEMENTS STUDY 4 SPRINGDALE AVENUE / DOVER MA	MILLS WHITAKER ARCHITECTS, LLC P.O. Box 750089 Arlington MA 02475	A-4.1
DRAWING:	FIRST FLOOR - BACK STAIR UPGRADES	DATE: JUNE 2016	



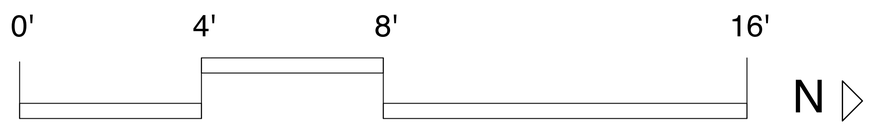
0' 4' 8' 16'

N

PROJECT:	CARYL COMMUNITY CENTER ACCESSIBILITY IMPROVEMENTS STUDY 4 SPRINGDALE AVENUE / DOVER MA	MILLS WHITAKER ARCHITECTS, LLC P.O. Box 750089 Arlington MA 02475	A-5.0
DRAWING:	SECOND FLOOR - EXISTING BACK ENTRANCE	DATE: JUNE 2016	



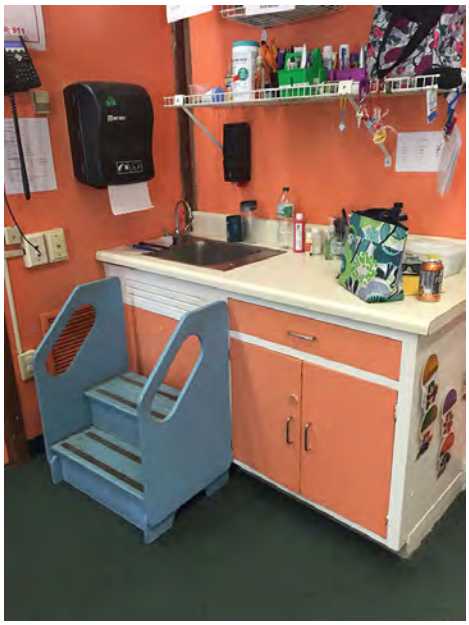
NOTE: LU/LA = "LIMITED USE / LIMITED APPLICATION" ELEVATOR



PROJECT:	CARYL COMMUNITY CENTER ACCESSIBILITY IMPROVEMENTS STUDY 4 SPRINGDALE AVENUE / DOVER MA	MILLS WHITAKER ARCHITECTS, LLC P.O. Box 750089 Arlington MA 02475	A-5.1
DRAWING:	SECOND FLOOR - BACK ENTRANCE UPGRADES	DATE: JUNE 2016	

521 CMR 12: EDUCATIONAL FACILITIES

160609-IMG_4827.jpg



Typical Sink and Counter Area in Pre-School Classroom Not Accessible (Knee Space; Counter Ht; Sink Depth)

521 CMR 12: EDUCATIONAL FACILITIES

160609-IMG_4855.jpg

Sink and Counter in Pre-School Hallway Not Accessible (Knee Space and Sink Depth)

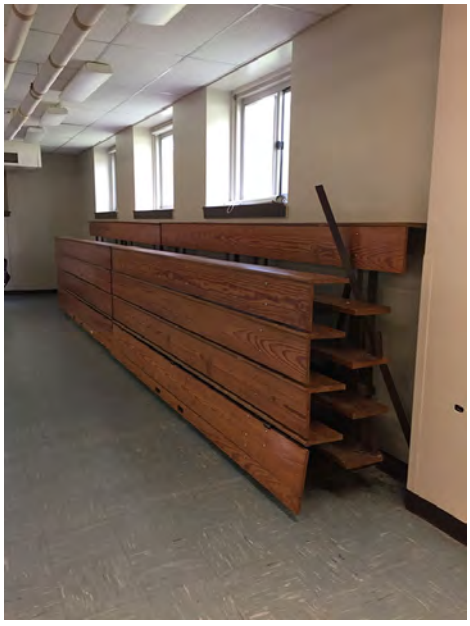
521 CMR 12: EDUCATIONAL FACILITIES

160609-IMG_4858.jpg

No Knee Space and Insufficient Clearance Width at Council on Aging Lavatory in Counter Area

521 CMR 12: EDUCATIONAL FACILITIES

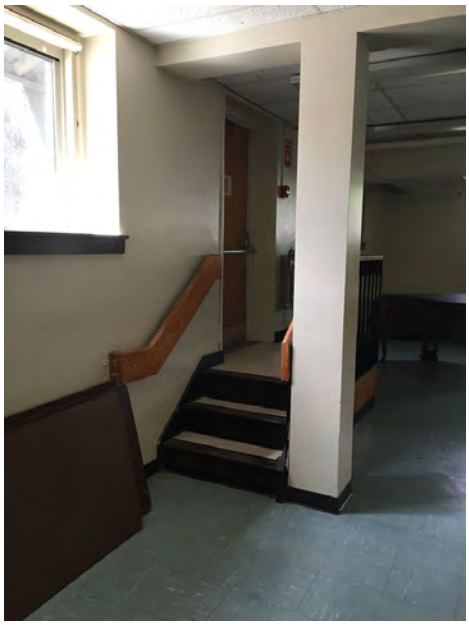
160609-IMG_4848.jpg



Bleachers in Dining Room - No Rails & Guards

521 CMR 14: PLACES OF ASSEMBLY

160609-IMG_4845.jpg



Inaccessible Second Exit from Dining Area Leads to Deteriorated Exterior Areaway

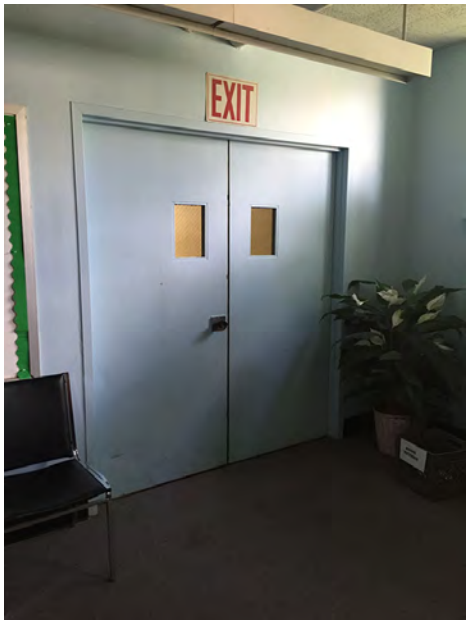
521 CMR 14: PLACES OF ASSEMBLY

160609-IMG_4846.jpg

Locked Doorway to Blue Room Could Serve as Accessible Second Exit from Dining Room if Modified to be Double Egress Opening

521 CMR 14: PLACES OF ASSEMBLY

160609-IMG_4853.jpg



Exit from Blue Room to Dining Does Not Allow Exit from Dining Room into Blue Room

521 CMR 14: PLACES OF ASSEMBLY

160609-IMG_4854.jpg

Exit from Blue Room Direct to Exterior; Non-Illuminated Exit Sign; Steeply Sloping Walkway Beyond

521 CMR 23: PARKING

160609-IMG_4822.jpg

Two Street Parking Spaces Marked Accessible But Not Compliant with Regulations

521 CMR 23: PARKING

160609-IMG_4823.jpg

Curb Cut at Street to Front Walkway Serving as Driveway to Accessible Parking Spaces at Front Entrance

521 CMR 23: PARKING

160609-IMG_4821.jpg

Accessible Parking Space to Left of Entrance

521 CMR 23: PARKING

160609-IMG_4820.jpg

Accessible Parking Space Adjacent to Front Entrance; Both Spaces at Entry Creates Pedestrian Hazard

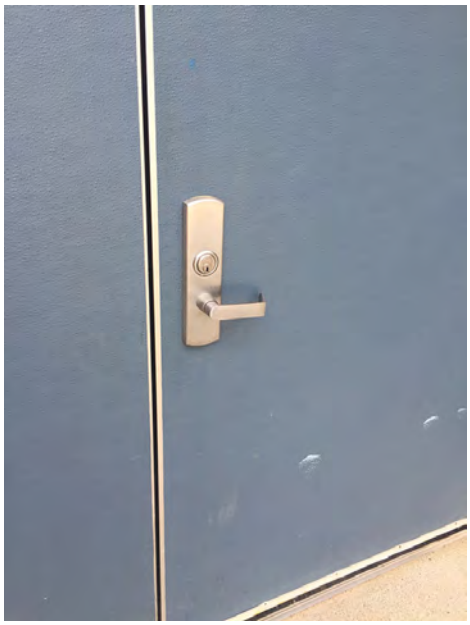
521 CMR 25: ENTRANCES

160609-IMG_4819.jpg

Drain at Front Walkway in Steeply Sloping Portion of Walk; Requires Re-grading or Construction of Ramp with Rails

521 CMR 25: ENTRANCES

160609-IMG_4824.jpg



Front Door Entrance with Accessible Lever Handle

521 CMR 25: ENTRANCES

160609-IMG_4818.jpg

Steeply Sloping Walk at Blue Room Exit

521 CMR 25: ENTRANCES

160609-IMG_4817.jpg

East Stair Exit to Side Yard at Centre Street

521 CMR 25: ENTRANCES

160609-IMG_4816.jpg

Redundant Exit from S.W. Corner CDC Classroom

521 CMR 25: ENTRANCES

160609-IMG_4836.jpg

Dining Room Exit Shed Enclosure at Driveway

521 CMR 25: ENTRANCES

160609-IMG_4837.jpg

Side Entrance Roof Canopy at Stairs Down to First Floor

521 CMR 25: ENTRANCES

160609-IMG_4806.jpg

Door at Side Entrance Not Accessible Due to Limited Pull Side Clearance and Step Up at Door

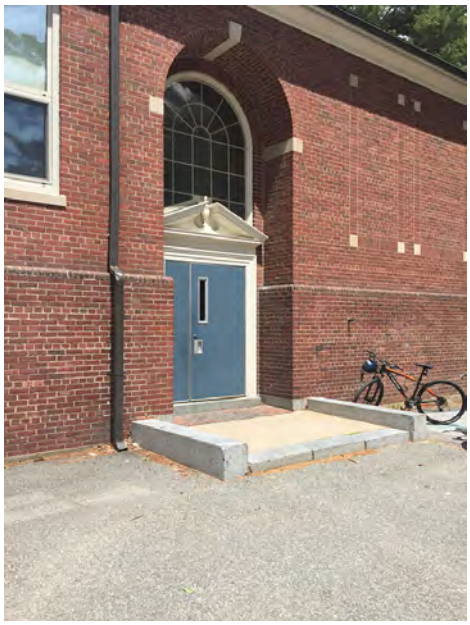
521 CMR 25: ENTRANCES

160609-IMG_4838.jpg

Canopy Cover at Service Stair to Boiler Room (Left); Redundant Exit Stair Beyond at Dance Studio with Required Gym Stair Below at Driveway

521 CMR 25: ENTRANCES

160609-IMG_4813.jpg



Back Entrance with Stoop and Landing

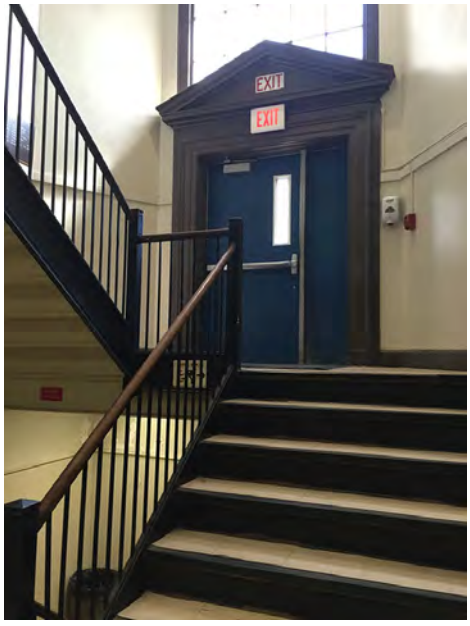
521 CMR 25: ENTRANCES

160609-IMG_4815.jpg

Step Up at Back Entrance Door

521 CMR 25: ENTRANCES

160609-IMG_4865.jpg



Back Entrance Arrives at Intermediate Stair Landing

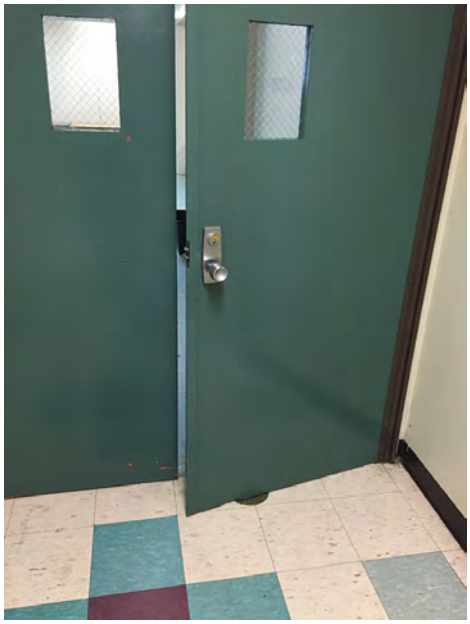
521 CMR 26: DOORS & DOORWAYS

160609-IMG_4840.jpg

Typical Corridor Paired Opening with Magnetic Hold-Open Devices

521 CMR 26: DOORS & DOORWAYS

160609-IMG_4850.jpg



Typical Paired Opening with Knob Set at Active Leaf & No Pull at Passive Leaf

521 CMR 26: DOORS & DOORWAYS

160609-IMG_4857.jpg

Deep Recess in Masonry Wall at Doorway into COA's Blue Room on First Floor

521 CMR 26: DOORS & DOORWAYS

160609-IMG_4799.jpg

Deep Recess in Masonry Wall at Doorway into Classroom at Second Floor (above Blue Room)

160609-IMG_4828.jpg

Lever Handle on Door with Furniture Obstruction on Push Side of Door & Set > 6" from Wall Plane

521 CMR 26: DOORS & DOORWAYS

160609-IMG_4797.jpg

Typical Knob Set Hardware

521 CMR 26: DOORS & DOORWAYS

160609-IMG_4859.jpg

Limited Push Side Clearance at Door to Hallway

521 CMR 26: DOORS & DOORWAYS

160609-IMG_4861.jpg

Limited Pull Side Clearance at Door into Activity Area

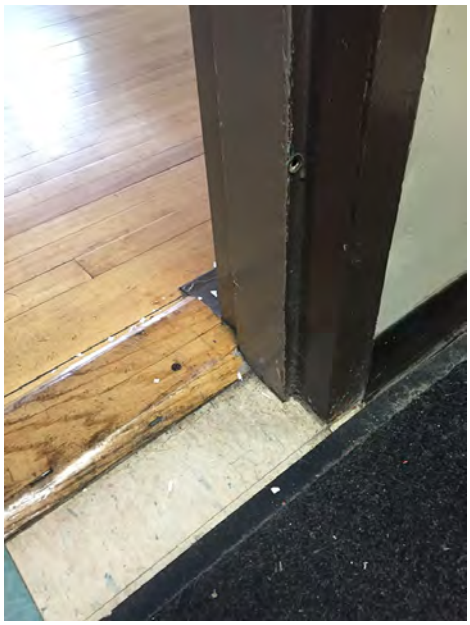
521 CMR 26: DOORS & DOORWAYS

160609-IMG_4825.jpg

Furniture Obstruction Within 18" of Pull Side at Door

521 CMR 26: DOORS & DOORWAYS

160609-IMG_4867.jpg



Raised Threshold into Gym from Back Stairway

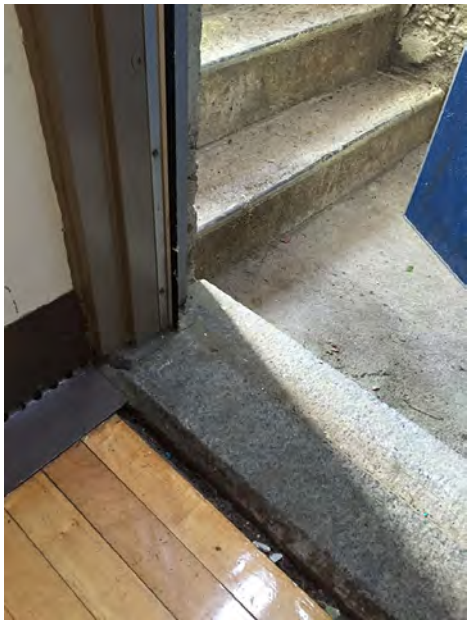
521 CMR 26: DOORS & DOORWAYS

160609-IMG_4812.jpg

Step at Areaway Exit from Gym

521 CMR 26: DOORS & DOORWAYS

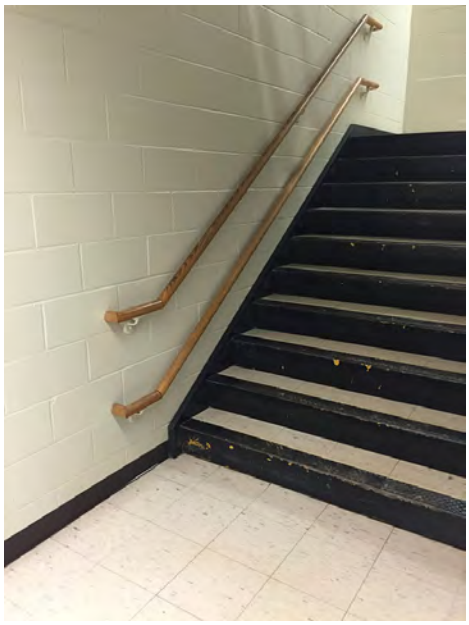
160609-IMG_4868.jpg



Threshold Gap and Step Down at Gym Exit

521 CMR 27: STAIRS

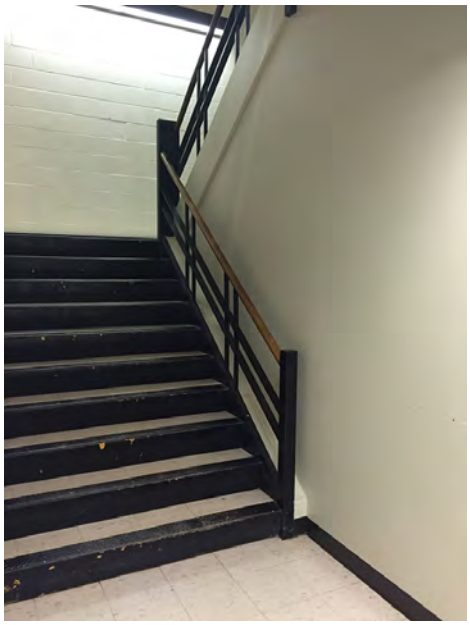
160609-IMG_4851.jpg



Dual Handrails at Central Stair

521 CMR 27: STAIRS

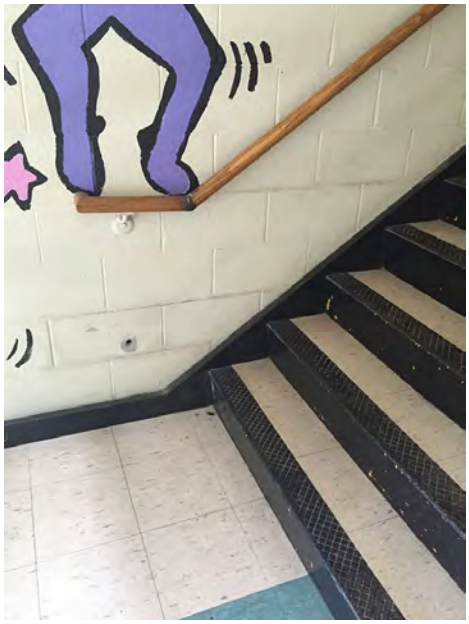
160609-IMG_4852.jpg



Guardrail at Opposite Wall of Central Stair

521 CMR 27: STAIRS

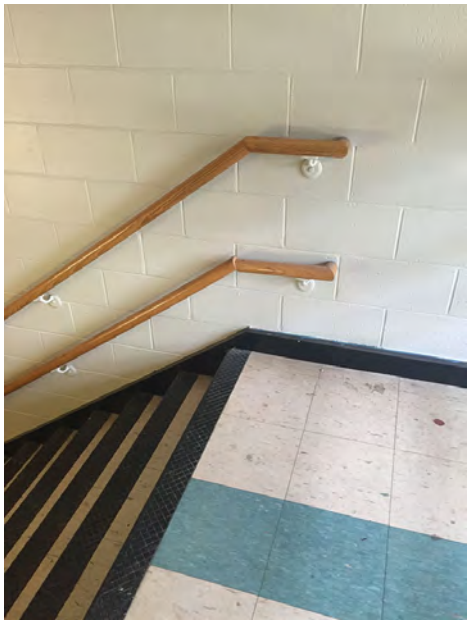
160609-IMG_4830.jpg



Single Handrail at CDC (East) Stairway

521 CMR 27: STAIRS

160609-IMG_4829.jpg



Dual Handrails with Deteriorated Joinery

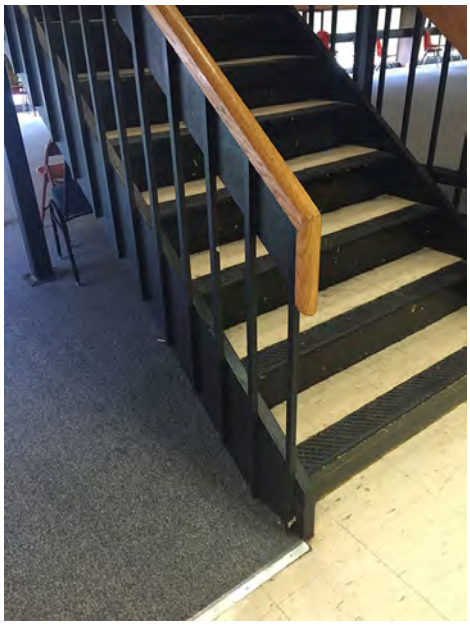
521 CMR 27: STAIRS

160609-IMG_4832.jpg

Guardrail at Library Mezzanine Stairway

521 CMR 27: STAIRS

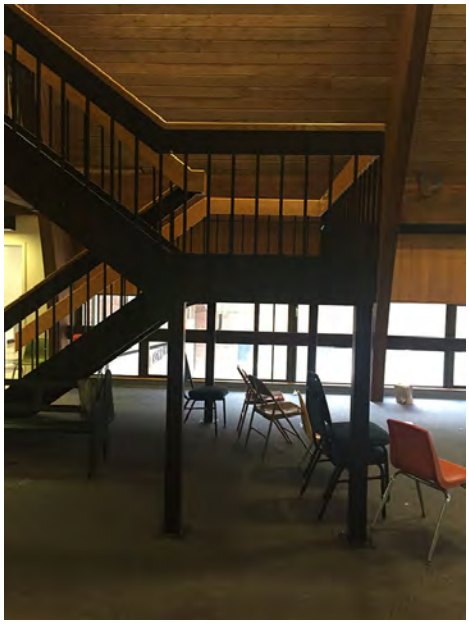
160609-IMG_4831.jpg



Guardrail at Library Mezzanine Stairway

521 CMR 27: STAIRS

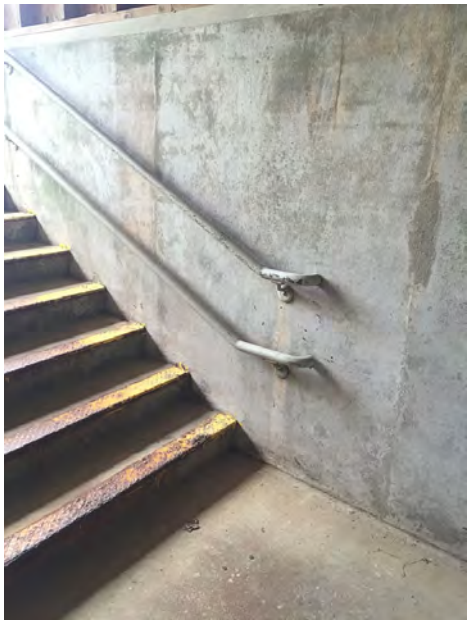
160609-IMG_4834.jpg



Landing at Library Mezzanine Stairway
Requires Headroom Protection (Cane Guard)

521 CMR 27: STAIRS

160609-IMG_4807.jpg



Dual Handrails at Exterior Areaway to Side Entrance

521 CMR 27: STAIRS

160609-IMG_4808.jpg

Unnecessary Exit Stair from Erin's Dance Studio Above Needed Gym Stairway Below

521 CMR 27: STAIRS

160609-IMG_4809.jpg

Gym Stair with Incomplete Railing Extensions

521 CMR 27: STAIRS

160609-IMG_4810.jpg

Incomplete Railing Extension at Gym Exit Areaway

521 CMR 27: STAIRS

160609-IMG_4811.jpg

Opposite Side of Gym Exit Areaway Stair

521 CMR 28: ELEVATORS

160609-IMG_4800.jpg

Passenger Elevator with Hall Call Button

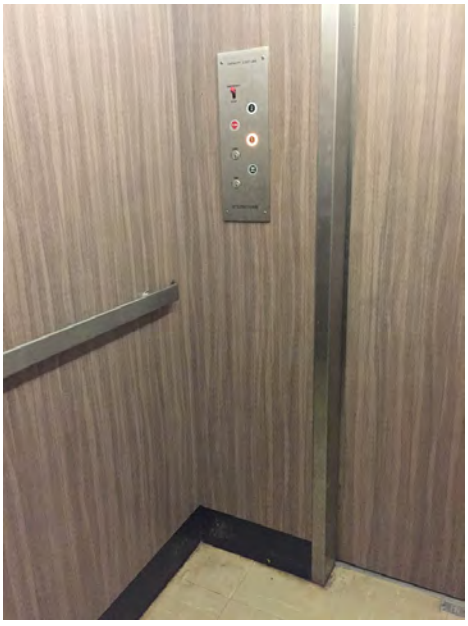
521 CMR 28: ELEVATORS

160609-IMG_4801.jpg

Handrails in Passenger Elevator Cab Mounted 4" Higher Than Currently Mandated

521 CMR 28: ELEVATORS

160609-IMG_4802.jpg



Cab Call Buttons Not in Compliance

521 CMR 28: ELEVATORS

160609-IMG_4803.jpg

Detail of Cab Call Buttons and Emergency Notifications

521 CMR 28: ELEVATORS

160609-IMG_4804.jpg

Jamb Markings at Elevator Frame

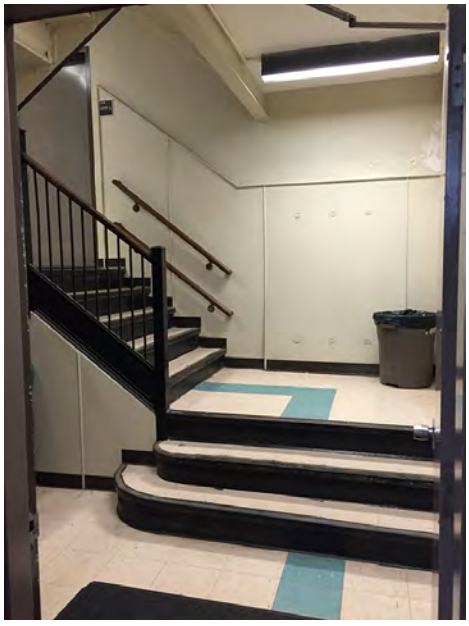
521 CMR 28: ELEVATORS

160609-IMG_4870.jpg

Entrance Landing Level at Back Door;
Proposed LU/LA at Wall Beyond

521 CMR 28: ELEVATORS

160609-IMG_4869.jpg



Lower Run of Back Stairs to be Rebuilt;
LU/LA to be at Wall Beyond

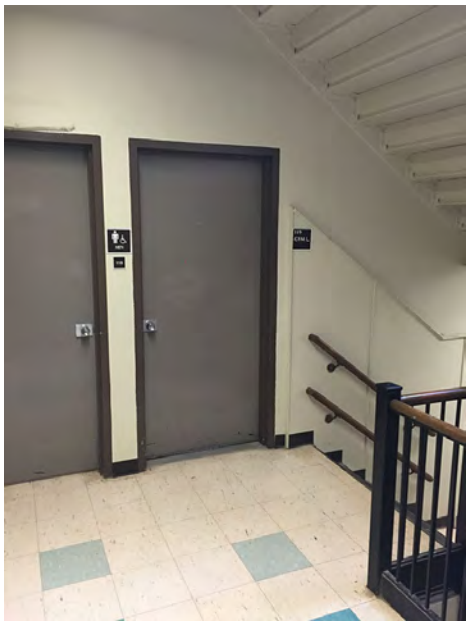
521 CMR 28: ELEVATORS

160609-IMG_4864.jpg

Rebuild Lower Run of Back Stair to
Provide Access to Gym via LU/LA

521 CMR 28: ELEVATORS

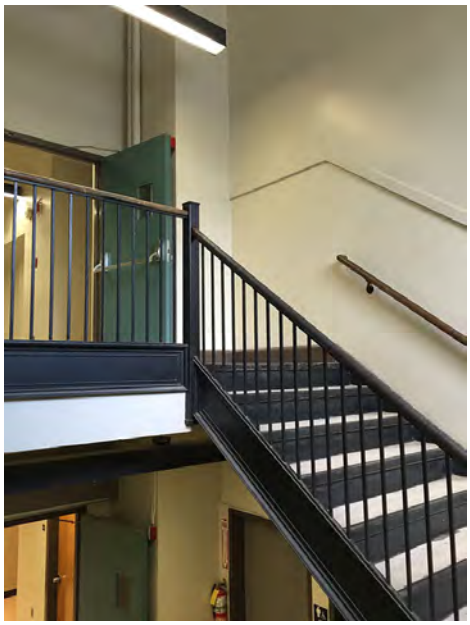
160609-IMG_4866.jpg



Proposed LU/LA Location at First Floor

521 CMR 28: ELEVATORS

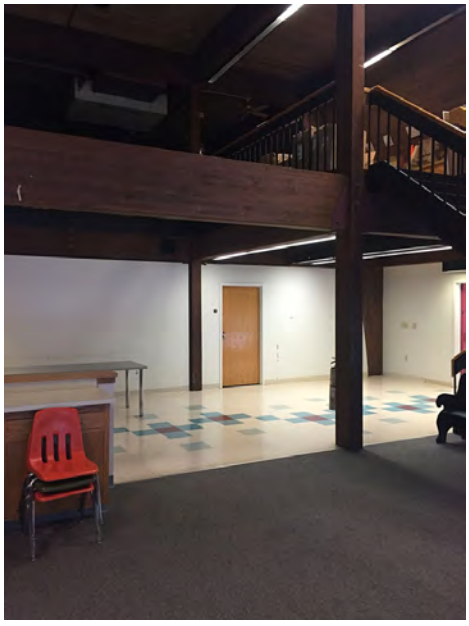
160609-IMG_4871.jpg



Second Floor Landing in Back Stair

521 CMR 28: ELEVATORS

160609-IMG_4833.jpg



Library Area with Mezzanine Above

521 CMR 28: ELEVATORS

160609-IMG_4835.jpg

Library Level with Mezzanine Above;
Proposed Location of Vertical Wheelchair Lift

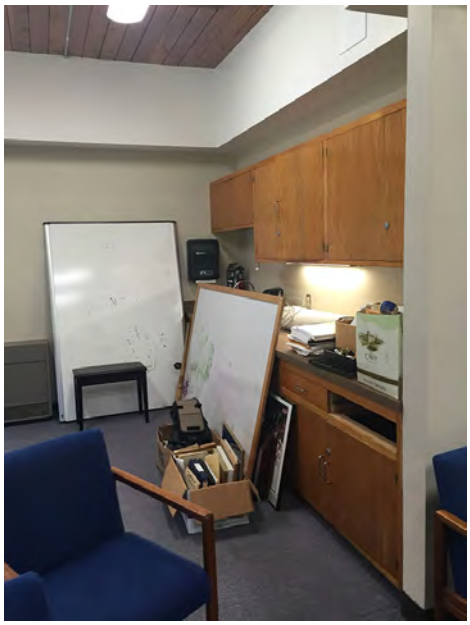
521 CMR 30: PUBLIC TOILET ROOMS

160609-IMG_4856.jpg

Single User Non-Accessible Toilet Room (1 of 4)

521 CMR 31: KITCHENS

160609-IMG_4795.jpg



Conference Room Kitchenette
for Staff Use Only

521 CMR 31: KITCHENS

160609-IMG_4796.jpg

Lever Handles and Gooseneck Faucet at
Conference Room Kitchenette

521 CMR 31: KITCHENS

160609-IMG_4847.jpg

Dining Room Kitchen Serving Area

521 CMR 31: KITCHENS

160609-IMG_4843.jpg

Serving Counter at Dining Room Kitchen

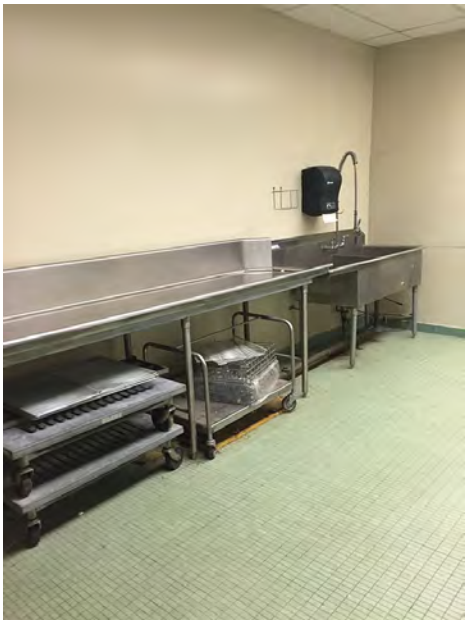
521 CMR 31: KITCHENS

160609-IMG_4844.jpg

Hand-Washing Sink and Convection Oven

521 CMR 31: KITCHENS

160609-IMG_4842.jpg



Dishwashing Station at Dining Room Kitchen

521 CMR 31: KITCHENS

160609-IMG_4841.jpg

Residential Refrigerator & Range at Dining Room Kitchen

521 CMR 36: DRINKING FOUNTAINS

160609-IMG_4863.jpg

Inaccessible Drinking Fountain in Hallway

521 CMR 36: DRINKING FOUNTAINS

160609-IMG_4862.jpg

Accessible Drinking Fountain, but in an Inaccessible Recess in Wall (<30" Wide)

521 CMR 36: DRINKING FOUNTAINS

160609-IMG_4798.jpg

Accessible Drinking Fountain, But Protruding >4" Into Accessible Route, Creating an Egress Hazard

521 CMR 36: DRINKING FOUNTAINS

160609-IMG_4849.jpg

Accessible Drinking Fountain at Dining Room

Caryl Community Center - Accessibility Study Conceptual Budget		June 2016
	Project Components by Division	Budget
01	General Requirements supervision, temporary facilities, project management	40,000
02	Demolition remove portions of walls, fixtures, ceilings, asbestos, floor slabs & framing, redundant exits	14,250
03	Concrete saw-cutting of slab, foundation/pit for elevator, reinforced stem walls, stair pans, patching	12,500
04	Masonry infill exterior walls at removal of redundant exit doors	22,000
05	Metals accessible counter supports, framing elevator walls & floors, ramp/stair railings, 8-riser stair run	41,675
06	Wood & Plastics counters, framing, blocking, miscellaneous carpentry	13,500
07	Thermal & Moisture waterproofing, sealants, roofing for elevator vent	8,000
08	Openings hardware modifications, window infills at removal of redundant exit doors	65,500
09	Finishes patching, gypsum wallboard, patch flooring, infill base, acoustical tile	27,500
10	Specialties supplemental signage at interior, accessible parking signage	1,500
11	Equipment limited foodservice equipment at dining room kitchen	3,000
14	Conveying Equipment LU/LA elevator (4-stops); vertical wheelchair lift to mezzanine; upgrades to existing passenger elevator	65,000
22	Plumbing accessible sinks at classroom and meeting rooms, accessible hand-washing sink piping in kitchen	10,050
23	HVAC elevator hoistway venting, heating modifications in back stairway, piping modifications where needed	8,500
26	Electrical replace fire alarm system, elevator power, modify switch heights, GFIs at lavatories, exit signs	114,725
32	Exterior Improvements front walk/Blue Room exit, back entry ramp/stoop, accessible parking; infill dining areaway; play path	50,000
	Subtotal of Conceptual Construction Costs	497,700
	Bonds, Insur., OH+P (10%)	49,770
	Pricing Contingency (10%)	49,770
	Escalation Allowance (3%)	17,917
	Conceptual Construction Budget	615,157

	Arch/Engr Allowance (15%)	92,274
	Construction Contingency + Project Expenses (7.5%)	46,137
	Conceptual Project Cost	753,568

NOTES:

1 Refer to accessibility study narrative, drawings & photos prepared by Mills Whitaker Architects.
2 Costs indicated are very preliminary and may be higher or lower than indicated.
3 Project scope for accessibility should be combined with pending HVAC upgrade project.
4 Costs incorporate Dining Room exit modifications previously described in 22 Oct 2015 budget.
5 Costs do not include general renovations to corridors and mezzanine level beyond accessibility.

Structures North
CONSULTING ENGINEERS, INC.

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Salem, Massachusetts 01970-3517
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T 978.745.6817 | F 978.745.6067
www.structuresnorth.com

10 May 2017

Mills Whitaker Architects, LLC
PO Box 750089
Arlington, MA 02475

Attention: Don Mills

Reference: Caryl Community Center
Dover, MA

Dear Don:

On Tuesday 2 May 2017, we visited the Caryl Community Center in Dover, MA to make a general assessment of structure's condition since our report dated 25 April 2003. The following is a summary of our observations and recommendations.

General Description

The Caryl Community Center, originally called the Caryl School, consists of three structures that were constructed in three phases.

The Original School was built in 1910 as a two-story, Colonial Revival-style hipped roof structure with wood-framed floors and roof and perimeter walls of load-bearing, multi-wythe brick masonry with a concrete foundation. This structure burned, requiring that the first floor, attic floor, roof and eaves be rebuilt in 1971 using dimensional lumber and steel beam construction. The exterior walls have divided windows that are spanned by the brick wall construction on steel angle lintels. The tops of the walls were reconstructed following the fire with concrete block back-up and brick veneer. As part of the 1971 reconstruction, the former entrance to the school on the north wall was closed in with new brickwork when the main entrance was relocated away from this structure into the 1971 addition.

The First Addition was built in 1931, also in the Colonial Revival-style with multi-wythe load bearing brick masonry perimeter walls and steel assisted, wood framed roof and interior construction. This addition included a truncated hip-roofed classroom section to the extreme south of the site, connected by a flat-roofed link to the original school. There are two brick masonry vent stacks and one brick masonry chimney projecting from the roof. Like the original 1910 building, the exterior walls have divided windows that are spanned by the brick wall construction on steel angle lintels. This structure also suffered a fire, however, according to an engineering report dated January 10, 2000 and as confirmed by our visit, the members that were significantly charred were strengthened or replaced and the remainder of the structure was not critically affected.

The Second Addition was built in 1971 in the modernist style as a three-level structure of glued-laminated timber and timber plank deck construction. The glued-laminated timber frames project upward from a concrete foundation in an arched fashion and support a full second floor level, a partial third floor or mezzanine, and a flat roof, all of which hang from the curved timbers. There is an interior stairwell structure of load-bearing concrete block masonry which supports the interior of the structure and helps laterally brace the building, along with exterior walls of brick veneer over concrete block around the perimeter. Modifications to the original school (see above) were also made at the time of this addition.

Since our 2003 report, some of the recommended repairs included in our report have been completed. These repairs include the replacement of the rusted steel lintels, repairs to the chimney and vent stacks, reinforcement of the first addition roof and selective maintenance of the exterior masonry. There has been further deterioration of the masonry has occurred and additional selective repairs are described and recommended below.

Noted Conditions and Recommendations

During our survey, we noted the following items and have the following *recommendations*:

Original Building / 1910 Exterior-

E1 On the north elevation, two of the steel lintels that support brick masonry over window and door openings are sagging. There is no visible damage to the surrounding masonry. *These locations should be monitored and replaced with new properly sized galvanized steel lintels.*

E2 There is moss and other vegetation growing in the mortar joints between the upper and lower windows and watertable on the north elevation. *The masonry should be cleaned of all moss and vegetation and the mortar joints cut and pointed with a compatible mortar.*

E3 The watertable along the bottom of the brick wall construction on the south, east and west elevations have weathered and the mortar joints have deteriorated. *The affected masonry should be cut and pointed with a compatible mortar.*

E4 There are open and eroded mortar joints along the “quoin” bricks at the north corner of the west elevation. *The mortar joints should be cut and pointed with a compatible mortar.*

E5 The stone retaining wall at the stairs on the west elevation is in very poor condition with cracks at the top of the wall below the cast-in-place concrete cap. A few of the stones along the west wall have fallen out and the mortar joints in the area are wet. *We understand that this exit stair areaway is scheduled for demolition and we support that approach. Otherwise, significant reconstruction would be required for*

an element that is not original to the structure and that restricts the width of the exit driveway.

E6 There is a crack in the brick masonry at the base of the lower east window on the north elevation. *The cracked brick masonry should be dismantled and reset and all damaged bricks replaced.*

Original Building / 1910 Interior-

I1 There is no lateral bracing provided for the attic floor framing bearing on the interior support beam. Because of this, a large portion of the attic floor joists have rotated. *Solid blocking must be installed between the joists to stop this rotation.*

I2 During our survey in 2003, a crack was noted in the interior plaster finishes at the west edge of the westernmost window of the north wall at the lower level. This crack is still visible and additional cracking can be seen between the bottom corners of all of the windows on the north, west and south walls. It is unclear if this cracking is from seasonal movement of the finishes or if there is a more significant issue with the foundation. *The plaster should be removed to expose the foundation construction and repairs made as needed.*

First Addition / 1931 Exterior-

E7 Much of the watertable masonry along the bottoms of the brick first floor walls has deteriorated. This occurs along the entire west elevation, one third of the south elevation, and one half of the east elevation. *The eroded mortar joints should be cut and pointed with a compatible mortar.*

E8 There is a crack in the exterior brickwork between the northernmost windows on the east elevation. *This needs to be sequentially excavated, grouted, and re-toothed with new brick to be knit back together.*

E9 There is a crack in the northern stone windowsills on the east elevation. *The damaged windowsills should be replaced.*

E10 There is a crack in the top of the concrete foundation wall at the southeast corner and on the south elevation. *The cracks should be grout injected and the surrounding concrete patch repaired.*

E11 There is cracking and spalling of the concrete retaining walls of both stairs on the west elevation. There is also damage to the foundation wall and brickwork from a rusted anchor in the northern stair and a crack in the foundation of the southern stair. *The cracked concrete should be grout injected and the spalled sections patched. All*

exposed reinforcement should be cleaned and painted. The rusted anchor should be removed and surrounding masonry and concrete repaired.

E12 There is water entering the building at the doorway on the west elevation located in the connector between the original building and the first addition. *While the interior has been recently patched and sealed, the Owner conveys that an exterior below-grade crack allows water penetration into the interior and a permanent repair is required.*

First Addition / 1931 Interior-

The interior spaces are visibly free of any structural defects other than for the items noted below. The previous fire affected a portion of this structure and smoke-damaged and minorly charred a portion of the structure that remained.

I3 In the gymnasium, there is cracked and spalled masonry where the anchors were located for the removed basketball hoops. *The damaged units should be replaced.*

Second Addition / 1971 Exterior-

E13 There are cracks in the mortar joints of the cast stone sills at the second floor windows as well as cracks in the bed joints of the sills. This damage is noted throughout the addition and is most likely due to rust jacking of the angle ledger supporting the cast stone sills. *At the worst of the damage, the cast stone sills should be removed and the rusted angle cleaned and painted. The remaining cracked mortar joints should be cut and pointed with a compatible mortar.*

E14 The paint of the bottom face of the steel lintels at the first floor windows is peeling at most of the windows. *The peeling paint should be removed, the steel cleaned and repainted. If rusting is found to be more extensive than surface rusting, the steel lintels should be replaced with new properly sized galvanized lintels.*

E15 The mortar joints along the base of the connector wall on the south elevation and at the northeast corner are deteriorated and *should be cut and pointed with a compatible mortar.*

Second Addition / 1971 Interior-

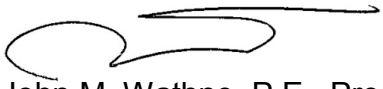
I4 There are longitudinal splits along the glue-lines of the arched glue-lam members that support the roof and upper floor of the structure. These are the widest and most apparent in the members along the sides of the building and do not appear to be present in the members at the corners of the structure. There appears to be little difference in the splits seen in photos taken during our 2003 survey when compared

with those from our recent survey. *As the cracks appear to be stable, no repairs or reinforcement is recommended at this time. The glue-lam members should be monitored and reviewed again if the splitting worsens.*

We trust that the preceding information will be useful in understanding deficiencies and improvement needs the Caryl School. Please contact us if you have any questions or if we may be of further assistance.

Respectfully yours,
Structures North Consulting Engineers, Inc.

Stephanie Davis, EIT



John M. Wathne, P.E., President

Dover Caryl Community Center
Dover, MA

Conceptual Estimate

June 16, 2017

Architect:
Mills Whitaker Architects, LLC
P O Box 750089
Arlington, MA 02475
(617) 876 7611

Cost Estimator:
Daedalus Projects Incorporated
112 South Street
Boston, MA 02111
(617) 451 2717

INTRODUCTION

Project Description:

The Caryl Community Center is an adaptive reuse of the former Caryl Elementary School building is being incrementally renovated.

This project consists of HVAC and electrical system upgrades as well as accessibility and structural improvements

Project Particulars:

Study for Required Improvement dated May 17, 2017 prepared by Mills Whitaker Architects LLC

Daedalus Projects, Inc. experience with similar projects of this nature

Discussion and review with Mills Whitaker Architects LLC and their Design Team

Project Assumptions:

The project will be publicly bid per MGL Chapter 149

Our costs assume that there will be competitive bidding in all trades and sub-trades i.e. at least three bids per trade or sub-trade

Unit rates are based on current dollars, using prevailing wages

The Total Construction Cost reflects the fair construction value of this project and should not be construed as the prediction of the lowest bid

Operation during normal working hours

Work will be phased and building will be partially occupied during construction

Subcontractor's markups have been included in each unit rate. These markups cover the cost of field overhead, home office overhead and subcontractor's fee

Design and Pricing Contingency markup is an allowance for unforeseen design issues, design detail development and specification clarifications during design period

General Conditions covers supervision, general facilities to support Project, and site office overheads that are not attributable to the direct trade costs

Project Requirements value covers scaffolding, staging and access, temporary protection, and cleaning

Profit markup is calculated on a percentage basis of direct construction costs

Anticipated start of construction June, 2019, for a construction period of 6 months and completion December, 2019

Escalation allowance from now to start of construction has been carried in the Main Summary at a rate of 4% per year

INTRODUCTION

Project Exclusions:

Fire sprinklers
Site or existing condition surveys and investigations
Hazardous materials survey, report and abatement
Architectural/Engineering; Designer and other Professional fees, testing, printing, surveying
Owner's administration; legal fees, advertising, permitting, Owner's insurance, administration, testing & inspections
Owner's site representation and project administration
Interest expense
Program relocation expenses, construction of temporary facilities
Specialties, furnishings, artwork, fixtures, equipment and loose case goods beyond what is noted
Construction Contingency
Utility company service consumption costs and back charges during construction
Work beyond the boundary of the Project
Police details and street/sidewalk permits
IT and AV terminal equipment

MAIN SUMMARY

ELEMENT			COST	COST/SF
Direct Trade Cost			**$2,100,065**	**$50.85**
Design and Pricing Contingency	10.00%	$2,100,065	$210,000	$5.08
Total Direct Trade Costs			**$2,310,065**	**$55.93**
Markups				
General Conditions, Project Requirements, Phasing	6 MTH	$58,000	$348,000	$8.43
Sub-Contractor and Performance Bonds	2.00%	$2,658,065	$53,000	$1.28
General Liability Insurance	1.10%	$2,711,065	$30,000	$0.73
Building Permit	1.00%	$2,310,065	Waived	
Profit	5.50%	$2,741,065	$151,000	$3.66
Estimated Construction Cost Total			**$2,892,065**	**$70.03**
Escalation allowance to start of construction, June 2019	7.85%	$2,892,065	$227,000	$5.50
ECC, including Escalation Allowance			**$3,119,065**	**$75.52**

DIRECT TRADE COST SUMMARY

DESCRIPTION	BUILDING	COST/SF
02-EXISTING CONDITIONS	$53,858	$1.30
03-CONCRETE	$50,900	$1.23
04-MASONRY	$131,445	$3.18
05-METALS	$36,500	$0.88
06-WOOD, PLASTICS, & COMPOSITES	$31,786	$0.77
07-THERMAL & MOISTURE PROTECTION	$19,695	$0.48
08-OPENINGS	$99,400	$2.41
09-FINISHES	$185,811	$4.50
10-SPECIALTIES	$3,750	$0.09
14-CONVEYING EQUIPMENT	$120,000	$2.91
22-PLUMBING	$89,650	$2.17
23-HVAC	$896,278	$21.70
26&27-ELECTRICAL, COMMUNICATION	$355,993	$8.62
32-EARTHWORK	$25,000	$0.61
Total Direct Trade Costs	**$2,100,065**	**$50.85**

Direct Trade Cost Details

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
8	**02-EXISTING CONDITIONS**				
9					
10	Remove VCT flooring @ hallways	**5,315**	SF	$2.50	$13,288
11	remove underlayment @ 2nd floor hallways	**2,395**	SF	$1.50	$3,593
12	Remove VCT @ stair treads and landing	**371**	LFR	$5.00	$1,853
13	fixtures, piping, conduit, plumbing (cut, drop and make safe)				MEP
14	*Exterior, west elevation*				
15	Remove exit stair from Classroom	**1**	LOC	$750.00	$750
16	Remove exit areaway from Cafeteria	**1**	LOC	$1,350.00	$1,350
17	Stairs up from Gym to 1st floor; interior; metal pan w/conc infill	**40**	LFR	$10.00	$400
18	Remove existing bleachers @ Dining Room	**1**	LS	$1,500.00	$1,500
19	Remove conc slab for new LULA	**45**	SF	$30.00	$1,350
20	Open floor	**45**	SF	$15.00	$675
21	Interior partitions	**1**	LS	$1,500.00	$1,500
22	Temporary shoring & bracing at areas of struct. demolition; LULA	**1**	LOC	$2,500.00	$2,500
23	Scaffolding for all trades for work higher than 8';1st & 2nd Floor	**10**	LOC	$2,000.00	$20,000
24	Dispose of demolition debris	**1**	LS	$2,600.00	$2,600
25	Asbestos-containing materials removal				By Owner
26	Temporary dust protection and doorways	**1**	LS	$2,500.00	$2,500
27	**02-EXISTING CONDITIONS TOTAL**				**$53,858**
28					
29					
30	**03-CONCRETE**				
31					
32	E10. Grout injected concrete foundation crack, patch and repair	**1**	LOC	$1,000.00	$1,000
33	E11. north and south stairs	**2**	LOC	$1,500.00	$3,000
34	E12. repair below-grade cracks at west elevation, connector	**1**	LOC	$2,500.00	$2,500
35	I2; Remove plaster, expose, repair foundation @ west corner window	**1**	LOC	$2,500.00	$2,500
36	LULA; conc slab & walls, incl's excavation	**1**	LS	$2,750.00	$2,750
37	Ramp; incl's foundation @ back entrance	**1**	LS	$4,375.00	$4,375
38	underpinning existing foundation	**20**	LF	$1,500.00	$30,000
39	Concrete pad for generator; exterior	**1**	LS	$2,500.00	$2,500
40	Remove step, infill, prep and level, replace threshold where needed;	**7**	LOC	$325.00	$2,275
41	qty provided				
42	**03-CONCRETE TOTAL**				**$50,900**
43					
44					
45					
46					
47					
48					
49					

Direct Trade Cost Details

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
50	**04-MASONRY**				
51					
52	E1; Clean masonry from moss & vegetation between windows &	**20**	MHR	$75.00	$1,500
53	watertable @ North elevation				
54	E2; Cut mortar joints and repoint; assumed qty	**805**	SF	$35.00	$28,175
55	E3, E7; Cut mortar joints and repoint; watertable	**890**	LF	$30.00	$26,700
56	E4; at "quoin" bricks at north corner of west ele; assume 2'x2'sf	**1**	LOC	$1,000.00	$1,000
57	E6, E8. Dismantle, reset/replace damaged bricks	**2**	LOC	$1,000.00	$2,000
58	E9. Replace damaged window sill	**1**	LOC	$1,500.00	$1,500
59	E13. Remove/replace cast stone sill @ 2nd floor windows	**35**	EA	$1,500.00	$52,500
60	I3; Remove and replace cracked & spalled masonry where anchors	**4**	LOC	$750.00	$3,000
61	for basketball hoops @ Gym				
62	E15; Cut mortar joints and repoint; connector wall	**104**	LF	$30.00	$3,120
63	Infill ext wall opening @ Cafeteria exit	**1**	LOC	$1,950.00	$1,950
64	Patch and repair, allow	**1**	AL	$10,000.00	$10,000
65	**04-MASONRY TOTAL**				**$131,445**
66					
67					
68	**05-METALS**				
69					
70	E1 New steel lintel @ window & door opening, North Ele, qty provided	**2**	EA	$2,500.00	$5,000
71	Rebuild lower run of metal stair @ Gym level for access to LULA	**40**	LFR	$125.00	$5,000
72	New wall mounted handrails to meet code requirement @ 3 int. stairs	**4**	FLT	$3,500.00	$14,000
73	New lower set of handrails at preschool areas; allow	**1**	AL	$3,500.00	$3,500
74	Allowance for retaining existing hand railing	**1**	AL	$2,500.00	$2,500
75	Cane detection guards below mezzanine stair	**1**	LOC	$1,500.00	$1,500
76	Misc. metals to exterior; allow	**1**	AL	$5,000.00	$5,000
77	**05-METALS TOTAL**				**$36,500**
78					
79					
80	**06-WOOD, PLASTICS, & COMPOSITES**				
81					
82	New underlayment @ 2nd floor hallways	**2,395**	SF	$2.75	$6,586
83	I1; Install solid blocking between joists of Attic floor to stop rotation	**3,360**	SF	$7.50	$25,200
84	**06-WOOD, PLASTICS, & COMPOSITES TOTAL**				**$31,786**
85					
86					
87					
88					
89					
90					
91					

Direct Trade Cost Details

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
92	**07-THERMAL & MOISTURE PROTECTION**				
93					
94	Re-roofing of covered areaway service stair to boiler room	**120**	SF	$40.00	$4,800
95	Gym exit areaway roof	**80**	SF	$40.00	$3,200
96	Areaway from lower level link	**100**	SF	$40.00	$4,000
97	Gym exit areaway enclosure assembly	**105**	SF	$59.00	$6,195
98	Remove & patch roof per generator upgrades	**1**	LS	$1,500.00	$1,500
99	**07-THERMAL & MOISTURE PROTECTION TOTAL**				**$19,695**
100					
101					
102	**08-OPENINGS**				
103					
104	*Door recommendations to meet the regulations; qty provided*				
105	upgrade hardware for existing doors at accessible doors	**70**	OPEN	$325.00	$22,750
106	improve maneuverability clearances; door	**9**	OPEN	$2,275.00	$20,475
107	allow for maneuverability in other areas	**11**	OPEN	$2,275.00	$25,025
108	automatic door operator	**2**	OPEN	$3,500.00	$7,000
109	allow for improvement in CDC area openings	**6**	OPEN	$2,275.00	$13,650
110	Demo window, install new to match adjacent at Cafeteria and	**2**	OPEN	$4,000.00	$8,000
111	2nd fl Classrooms				
112	Replace glass & louver for elevator vent w/louver & motorized damper	**1**	LOC	$2,500.00	$2,500
113	**08-OPENINGS TOTAL**				**$99,400**
114					
115					
116	**09-FINISHES**				
117					
118	I2; Remove and apply new plaster after foundation repair, west corner wi	**1**	LS	$750.00	$750
119	ACT ceiling; 2' x 2' @ hallways	**5,315**	SF	$7.50	$39,863
120	Prep and level floor for new finish	**5,315**	SF	$3.75	$19,931
121	VCT flooring @ hallways & stair landing	**5,315**	SF	$6.50	$34,548
122	Remove VCT @ stair treads	**371**	LFR	$15.00	$5,558
123	Patch and repair areas where HVAC upgrades	**1**	AL	$15,000.00	$15,000
124	Paint interior of all surfaces in renovated areas and any	**41,300**	GSF	$0.75	$30,975
125	disrupted areas of the building				
126	Covered areaway service stair to boiler room enclosure	**120**	SF	$5.00	$600
127	Gym exit areaway enclosure	**105**	SF	$5.00	$525
128	E13. Clean and paint rusted angles @ 2nd floor windows	**35**	EA	$412.50	$14,438
129	E14. Clean and paint steel lintels @ 1st floor windows	**55**	EA	$375.00	$20,625
130	Misc painting	**1**	LS	$3,000.00	$3,000
131	**09-FINISHES TOTAL**				**$185,811**
132					
133					

Direct Trade Cost Details

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
134	**10-SPECIALTIES**				
135					
136	Add. signage per accessibility regulations, entrance, exit, wayfinding	**14**	LOC	$175.00	$2,450
137	Signage @ single use toilet directing to accessible toilets	**4**	RMS	$175.00	$700
138	existing single use toilet non-accessible	**4**	RMS	$150.00	$600
139	**10-SPECIALTIES TOTAL**				**$3,750**
140					
141					
142	**14-CONVEYING EQUIPMENT**				
143					
144	Upgrade exist. elevator per accessibility regulations	**1**	LS	$25,000.00	$25,000
145	New 4-stop LULA	**1**	LS	$95,000.00	$95,000
146	**14-CONVEYING EQUIPMENT TOTAL**				**$120,000**
147					
148					
149	**22-PLUMBING**				
150					
151	*Phase 1*				
152	No work shown				
153	*Phase 2*				
154	Circulating Pump	**1**	EA	$850.00	$850
155	Water Closet; replace existing with new water efficient version	**4**	FIX	$4,850.00	$19,400
156	Lavatory; replace existing with new water efficient version	**4**	FIX	$4,850.00	$19,400
157	Utility Sink; new accessible in kitchen	**1**	FIX	$4,850.00	$4,850
158	Hand Sink; new accessible in kitchen	**1**	FIX	$4,850.00	$4,850
159	Classroom Sink SI	**6**	FIX	$4,250.00	$25,500
160	Coring, Sleeves & sleeves	**1**	LS	$1,050.00	$1,050
161	Commissioning	**1**	LS	$1,850.00	$1,850
162	Coordination	**1**	LS	$2,500.00	$2,500
163	Misc. pipe & valves; replace all H/C piping and insulation	**1**	LS	$2,500.00	$2,500
164	Demo; remove & cap drinking fountains	**2**	LOC	$450.00	$900
165	Permits & Fees	**1**	LS	$2,000.00	$2,000
166	Testing	**1**	LS	$1,500.00	$1,500
167	Drawings	**1**	LS	$2,500.00	$2,500
168	**22-PLUMBING TOTAL**				**$89,650**
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175					

Direct Trade Cost Details

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
176	**23-HVAC**				
177					
178	*Phase 1*				
179	Boilers:				
180	- B-1 & 2 1330 MDH	**2**	EA	$33,250.00	$66,500
181	Oil Pumps	**1**	EA	$2,250.00	$2,250
182	Fuel Oil Tank 3,000 CFM				
183	Pumps:				
184	- HW	**2**	EA	$9,500.00	$19,000
185	Expansion Tank	**2**	EA	$4,250.00	$8,500
186	Air Separator	**1**	EA	$2,250.00	$2,250
187	Fuel Oil lines	**1**	LS	$3,850.00	$3,850
188	Hot Water Piping Insulation	**1**	LS	$12,500.00	$12,500
189	Hot Water Piping	**1**	LS	$3,250.00	$3,250
190	Equipment Hook-ups				
191	- Boilers	**2**	EA	$3,250.00	$6,500
192	- 2" Pumps	**2**	EA	$5,750.00	$11,500
193	Flue	**1**	LS	$10,000.00	$10,000
194	VFD	**1**	LS	$5,000.00	$5,000
195	Coring, Sleeves & sleeves	**1**	LS	$3,250.00	$3,250
196	Lifting	**1**	LS	$6,000.00	$6,000
197	Misc. equipment and valves	**1**	LS	$8,500.00	$8,500
198	Demolition	**1**	LS	$7,500.00	$7,500
199	Lifting and hoisting	**1**	LS	$3,500.00	$3,500
200	Controls	**1**	LS	$30,000.00	$30,000
201	Commissioning	**1**	LS	$6,500.00	$6,500
202	Permits & Fees	**1**	LS	$2,500.00	$2,500
203	Test and sterilize	**1**	LS	$3,250.00	$3,250
204	Shop drawings	**1**	LS	$4,500.00	$4,500
205	*Phase 2*				
206	Energy Recovery Unit:				
207	- ERV- 400 CFM (Cafeteria)	**1**	EA	$1,850.00	$1,850
208	- ERV- 1,000 CFM (3 wings of the bld.)	**3**	EA	$4,850.00	$14,550
209	Preschool Classrooms	**4**	EA	$4,850.00	$19,400
210	Heating & Ventilation Unit				
211	- HVU 3,000 CFM (Gym)	**1**	EA	$11,250.00	$11,250
212	Split Units	**1**	LS	$25,000.00	$25,000
213	Radiators:				
214	- RAD	**3**	EA	$950.00	$2,850
215	Unit Ventilator:				
216	- UV	**26**	EA	$4,250.00	$110,500
217					

Direct Trade Cost Details

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
218	Fin-tube Radiator				
219	- FT	**300**	LF	$95.00	$28,500
220	Cabinet Unit Heaters:				
221	- CUH	**12**	EA	$1,250.00	$15,000
222	Duct Sock (Gym)	**1**	LS	$10,000.00	$10,000
223	Duct Galv.	**3,850**	LS	$10.50	$40,425
224	Duct insulation	**1,250**	SF	$4.50	$5,625
225	Duct Sealant	**325**	LS	$1.50	$488
226	Hot Water Piping Insulation	**1**	LS	$35,000.00	$35,000
227	Hot Water Piping	**1**	LS	$11,500.00	$11,500
228	Fuel Oil lines	**1**	LS	$5,000.00	$5,000
229	Equipment Hook-ups				
230	- UV	**26**	EA	$1,450.00	$37,700
231	- Rad	**3**	EA	$1,250.00	$3,750
232	- CUH	**10**	EA	$1,120.00	$11,200
233	- FT	**12**	EA	$1,145.00	$13,740
234	Louvers	**1**	LS	$5,000.00	$5,000
235	Coring, Sleeves & sleeves	**1**	LS	$10,000.00	$10,000
236	Demolition (drop to floor removal by others)	**1**	LS	$7,500.00	$7,500
237	Lifting	**1**	LS	$6,000.00	$6,000
238	Misc. equipment and valves	**1**	LS	$8,500.00	$8,500
239	Controls	**1**	LS	$210,000.00	$210,000
240	Commissioning	**1**	LS	$6,500.00	$6,500
241	Permits & Fees	**1**	LS	$3,500.00	$3,500
242	Test and sterilize	**1**	LS	$4,850.00	$4,850
243	Shop drawings	**1**	LS	$4,500.00	$4,500
244	**23-HVAC TOTAL**				**$896,278**
245					
246					
247	**26&27-ELECTRICAL, COMMUNICATION**				
248					
249	***26 00 00* Electrical***				
250					
251	*Normal Power*				
252	600A main switchboard	**1**	LS	$20,000.00	$20,000
253	225A panelboard	**8**	EA	$2,350.00	$18,800
254	100A panelboard	**4**	EA	$1,850.00	$7,400
255	600A feed from Utility pole in existing conduits (allow)	**150**	LF	$105.00	$15,750
256	Re-use feeders to new panelboards, per narrative				ETR
257	Grounding	**1**	LS	$3,500.00	$3,500
258					
259					

Direct Trade Cost Details

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
260	*Emergency Power*				
261	60KW diesel generator with sound atten, cover	**1**	LS	$30,000.00	$30,000
262	100A ATS	**2**	EA	$3,800.00	$7,600
263	Associated panelboards to be replaced (allow)	**1**	LS	$5,000.00	$5,000
264	Re-use feeders to new panelboards, per narrative				ETR
265	*Equipment Wiring*				
266	ERV feed and connection	**8**	EA	$1,500.00	$12,000
267	UV feed and connection	**26**	EA	$650.00	$16,900
268	Boiler feed and connection	**2**	EA	$1,500.00	$3,000
269	Pump feed and connection	**2**	EA	$1,500.00	$3,000
270	CUH feed and connection	**12**	EA	$650.00	$7,800
271	*Lighting & Branch Power*				
272	*Lighting*				
273	New corridor LED 2x4 lighting, (allow)	**30**	EA	$200.00	$6,000
274	Exit lighting	**41,300**	SF	$0.25	$10,325
275	Emergency lighting	**41,300**	SF	$0.35	$14,455
276	Lighting controls for corridors, switches only, per narrative	**1**	LS	$750.00	$750
277	Device box (allow)	**25**	EA	$28.50	$713
278	12-2 MC cable	**1,000**	LF	$4.00	$4,000
279	12-3 MC cable	**1,000**	LF	$5.00	$5,000
280	*Fire Alarm*				
281	New control panel	**1**	LS	$8,500.00	$8,500
282	Annunciator	**1**	EA	$1,500.00	$1,500
283	Initiating, reporting devices and circuitry	**41,300**	SF	$2.00	$82,600
284	Testing and programming	**1**	LS	$2,500.00	$2,500
285	*Assistive Listening*				
286	Assistive listening system	**3**	LOC	$4,500.00	$13,500
287	*Reimbursable*				
288	Demolition work, remove lighting and devices	**1**	LS	$4,500.00	$4,500
289	Fees & Permits	**1**	LS	$4,500.00	$4,500
290	*Site Lighting*				
291	12' Pole LED pole light allow	**10**	EA	$2,500.00	$25,000
292	LED wall mounted fixture	**8**	EA	$550.00	$4,400
293	Base	**10**	EA	$350.00	$3,500
294	Circuitry	**900**	LF	$15.00	$13,500
295	**ELECTRICAL TOTAL**				**$355,993**
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Direct Trade Cost Details

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
302	**32-EARTHWORK**				
303					
304	Regrading @ Main Entrance area, grading, new pavement	**1**	LS	$7,500.00	$7,500
305	Accessible path to & within the surrounding of exterior playground,	**250**	LF	$70.00	$17,500
306	**32-EARTHWORK TOTAL**				**$25,000**
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309					