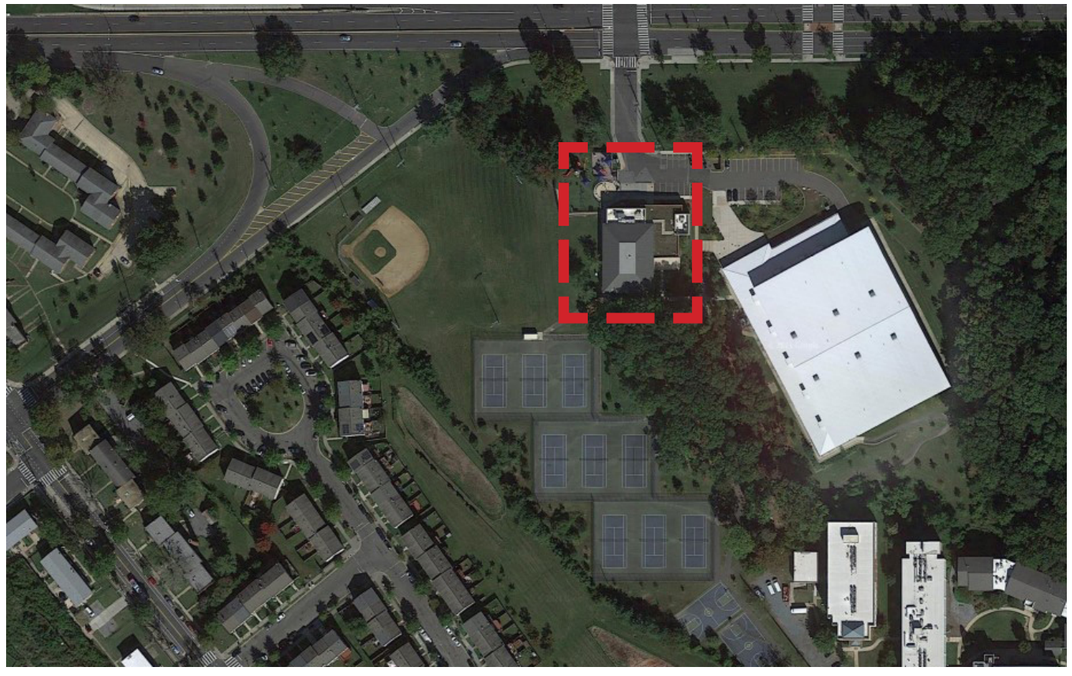
Feasibility Study and Concept Design for Expansion of the

# Benning Stoddert Community Center

## 100 Stoddert Place SE, Washington, DC

September 30, 2021



Presented by:

studiolaan
architecture | design | sustainability

Studio Laan
715 G St. SE, 3rd Floor
Washington, DC 20003

**Index**



DPR DC DEPARTMENT OF PARKS AND RECREATION

DGS DEPARTMENT OF GENERAL SERVICES BUILD MAINTAIN SUSTAIN

WE ARE WASHINGTON DC GOVERNMENT OF THE DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

## Introduction

Benning Stoddert Community Center is located at 100 Stoddert Place SE, in the Fort Chaplin neighborhood of DC's Ward 7. This DC Department of Parks and Recreation (DPR)-run facility features athletic programming and multi-purpose meeting rooms, along with exterior programming including a playground, tennis and basketball courts, and a baseball field. The existing building dates to 1972, and was expanded and modernized in 2015.

The enclosed Feasibility Study and Concept Design for the expansion of the Benning Stoddert Community Center was developed in Summer 2021 under direction of the DC Department of General Services (DGS). The design project team is composed as follows:

- Architecture and design project management – Studio Laan
- Mechanical, Electrical & Plumbing (MEP) engineering – Engenium Group
- Structural engineering – FMC Structural Design Group
- Surveyor – Christopher Consultants
- Cost estimator – Dharam Consulting

## Overview

Original construction documents for the "Benning-Stoddert Recreational Area Development" were developed in 1972. They depict a gymnasium, with a small one-story annex housing teen lounge; community, preschool and arts/crafts rooms. In 2015, an expansion and modernization project commenced under the direction of DGS and DPR. Online records of this process depict a series of community outreach events presenting design progress and soliciting feedback from numerous stakeholders.

The resulting design was implemented, opening in summer 2016 with an expanded one-story building. The original gymnasium was preserved and renovated, while the annex was demolished and replaced with a larger addition. The new building included locker rooms serving the gym; a fitness room; several multi-purpose assembly spaces; a computer lab; and a kitchen.

The new building employs steel framing and load-bearing masonry walls, with concrete slab on grade and composite steel/concrete roof deck, supporting an extensive green roof and several mechanical units. Exterior facades are clad in cementitious panels, painted metal panels, and masonry veneer. Aluminum storefront and windows provide the typical fenestration. Interiors are finished with painted gypsum board or Concrete Masonry Unit (CMU) walls, resilient flooring, open ceilings in the central circulation spaces and acoustical tile ceilings in assembly rooms. Many of these assembly rooms are visually connected to the ample central circulation space by means of oversized hollow metal-framed glazed walls.

The Benning Stoddert Community Center sits on a large and gently sloping lot, which it shares with an indoor tennis training facility administered by the non-profit Washington Tennis and Education Foundation. The site is bordered by Fort Chaplin Park immediately to the east, one of the Fort Circle Parks, a series of Civil War-era defensive sites running along the hilltops just east of the Anacostia River, administered by the US National Park Service. To the north, the site is accessed directly from East Capitol Street, via a short driveway leading to a parking lot shared between the two facilities. Immediately bordering the site to the south is the SEED Public Charter School, a college-preparatory boarding school, while the residential neighborhood of Fort Chaplin extends farther to the south and west.


Lounge ▲

Lounge with view of the multipurpose room ▲


Multipurpose room ▲

Green roof and gym roof ▲

Green roof ▲

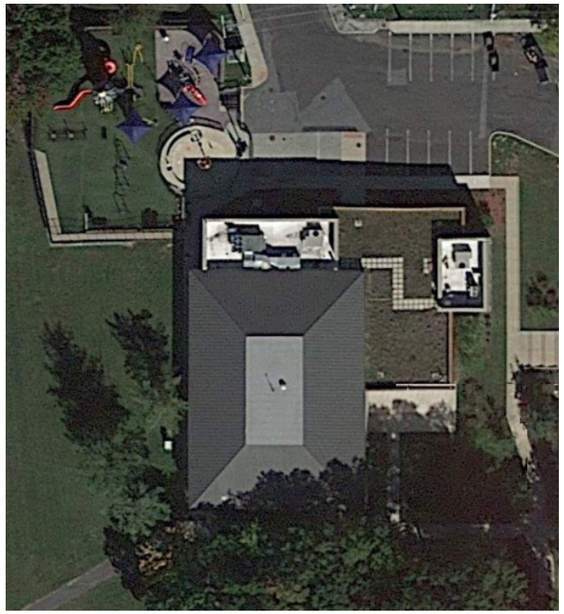
Green roof ▲

Northeast corner ▲

South facade - Multipurpose room ▲

North facade - Senior Lounge ▲

North facade - Main entrance ▲



Aerial view ▲

**Benning Stoddert Community Center**

100 Stoddert Place SE

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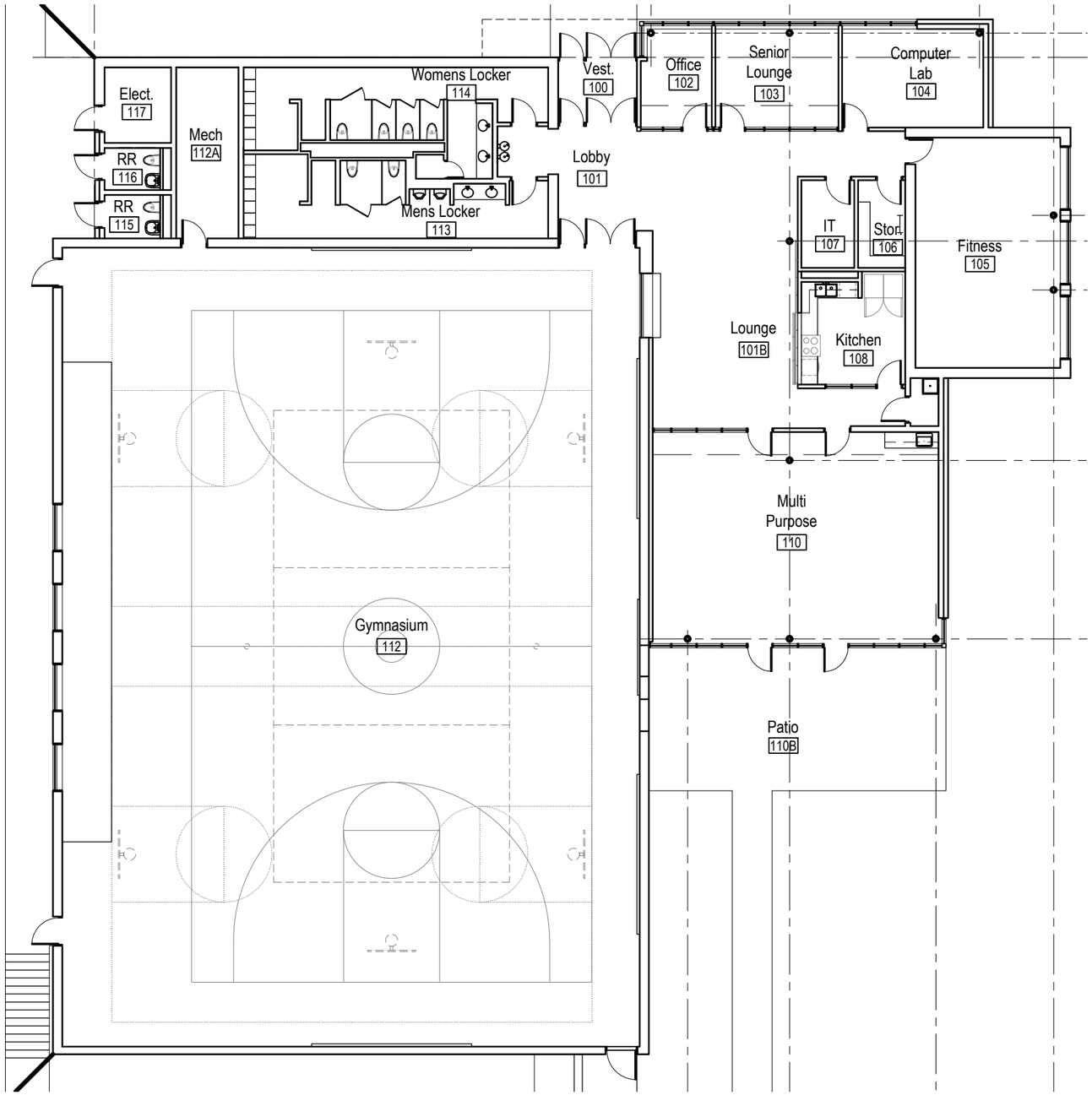


N

0 8’ 16’

Scale: 1” = 16’-0”

# Existing **First Floor Plan** 4

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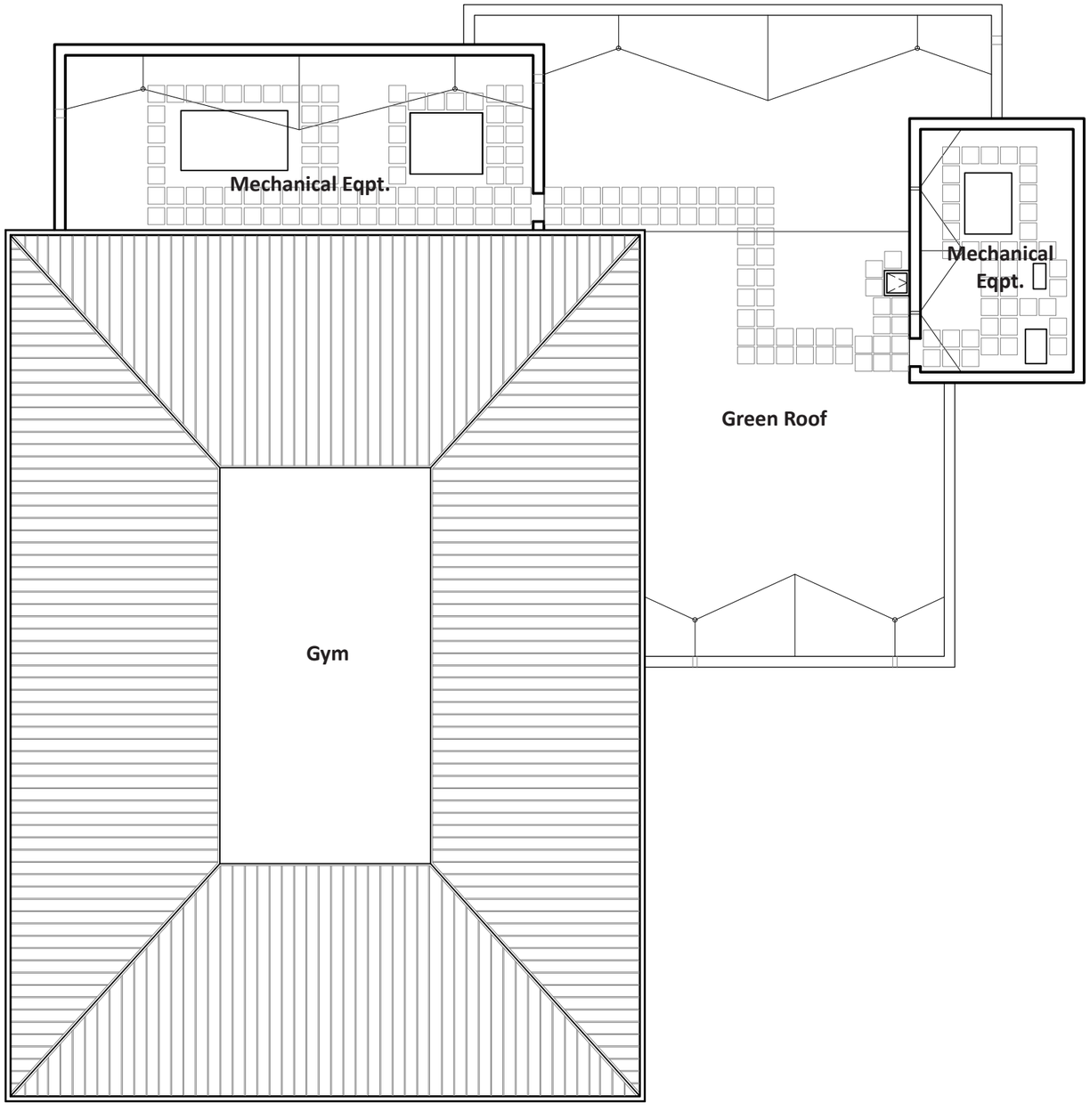
**Benning Stoddert Community Center**

100 Stoddert Place SE

September 30, 2021

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Exisiting **Roof Plan** | **5**

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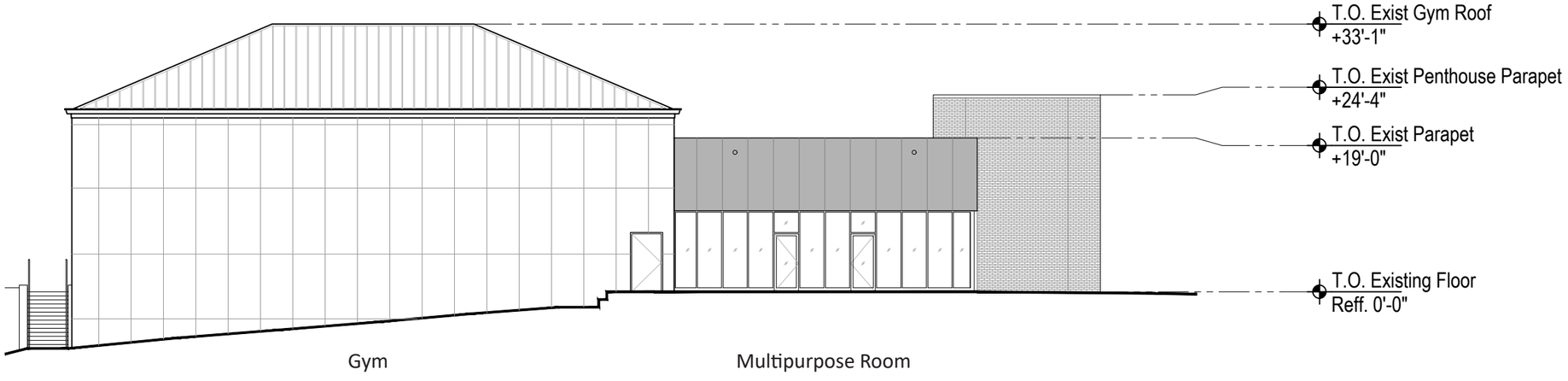


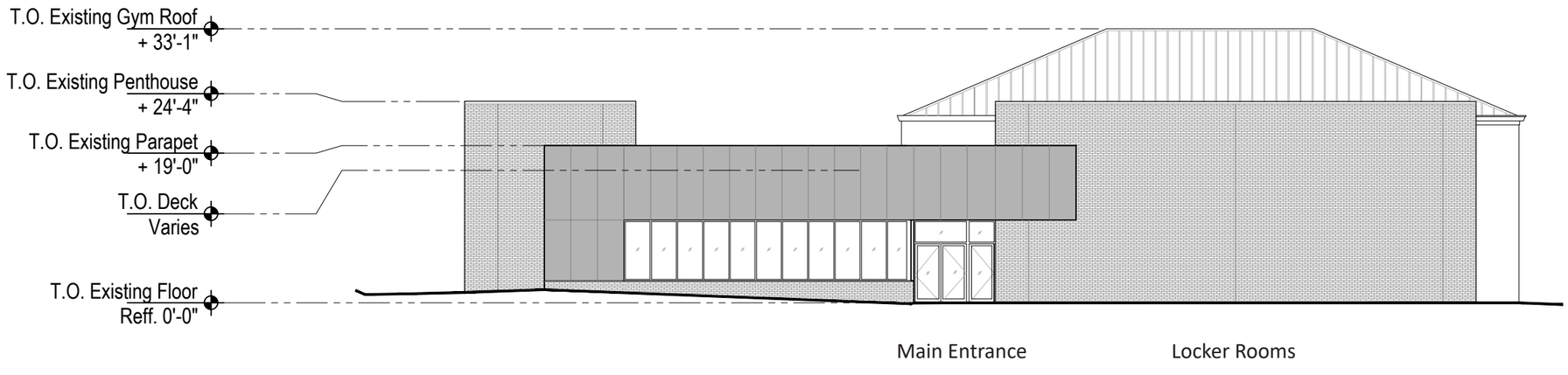


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# Existing **North and South Elevations**



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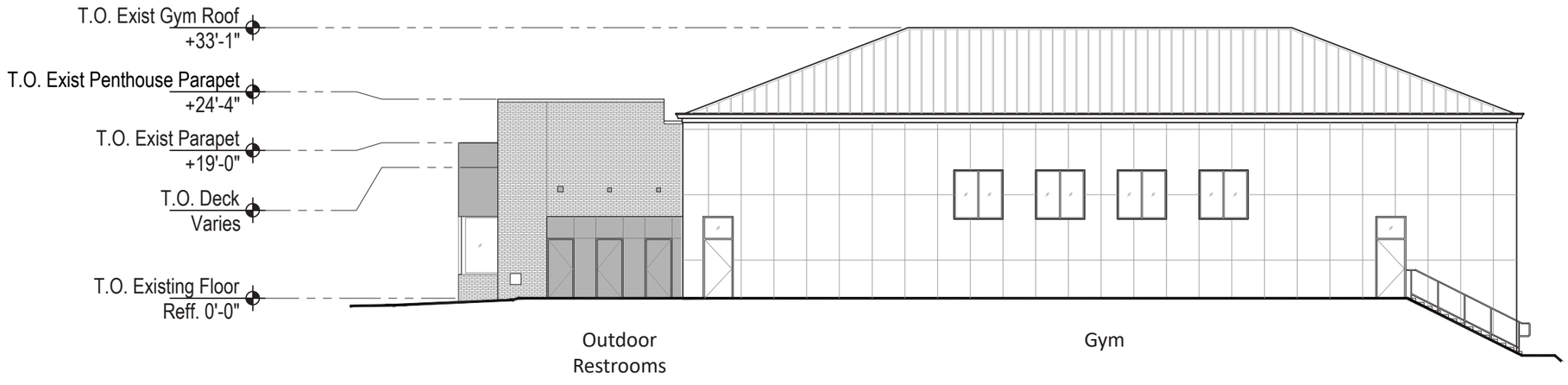


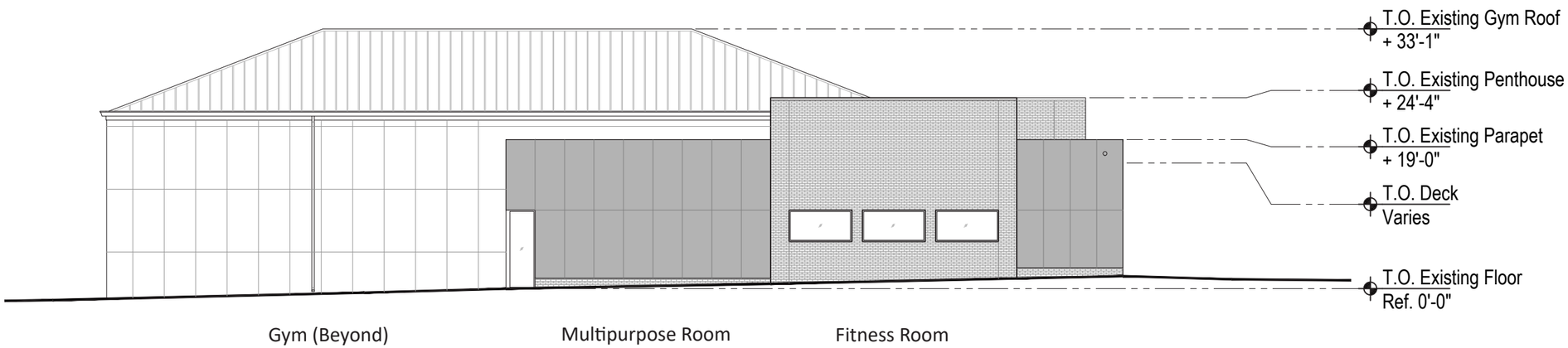


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Existing **East and West Elevations**

## GENERAL NOTES

1. THE PROPERTY SHOWN HEREON IS IDENTIFIED AS A PORTION OF A&T LOT 807, LOCATED IN SQUARE 5407 IN THE DISTRICT OF COLUMBIA.
2. THE PROPERTY SHOWN HEREON IS NOW IN THE NAME OF UNITED STATES OF AMERICA & DISTRICT OF COLUMBIA, NO DEED REFERENCE AVAILABLE, AMONG THE LAND RECORDS OF THE DISTRICT OF COLUMBIA.
3. A.) HORIZONTAL DATUM SHOWN HEREON IS REFERENCED TO THE DCSO NORTH AS ESTABLISHED FROM A FIELD SURVEY PERFORMED BY THIS FIRM IN NOVEMBER 2014, AND AVAILABLE DCSO PLATS AND PLANS. B.) THE VERTICAL DATUM SHOWN HEREON IS REFERENCED TO THE DCDPW VERTICAL DATUM AS ESTABLISHED FROM A CLOSED LOOP LEVEL RUN PERFORMED BY THIS FIRM IN DECEMBER 2014, FROM DC BENCHMARK NO. 11-19.
4. NO TITLE REPORT FURNISHED, ALL UNDERLYING TITLE LINES, EASEMENTS, SERVITUDES AND OTHER MATTERS OF TITLE MAY NOT BE SHOWN HEREON.
5. THIS DOCUMENT DOES NOT REPRESENT A CURRENT BOUNDARY SURVEY.
6. THE PHYSICAL IMPROVEMENTS AND TOPOGRAPHY SHOWN HEREON ARE BASED UPON A FIELD SURVEY CONDUCTED BY THIS FIRM BETWEEN THE DATES OF SEPTEMBER 9 AND 10, 2021.
7. NO GEOTECHNICAL, SUBSURFACE, FIELD REVIEWS, RESEARCH, AGENCY OR GOVERNMENTAL RECORD REVIEWS, OR OTHER INVESTIGATIONS HAVE BEEN MADE FOR THE PURPOSE OF LOCATING, OR DETERMINING THE EXISTENCE OF HAZARDOUS MATERIALS, OR OTHER ENVIRONMENTAL CONCERNS ON SITE IN THE PERFORMANCE OF CHRISTOPHER CONSULTANTS, LTD SERVICES FOR THE PROJECT AS SHOWN HEREON.
8. NO CERTIFICATION HAS BEEN MADE AS TO THE LOCATIONS OF UNDERGROUND UTILITIES SUCH AS, BUT NOT LIMITED TO ELECTRIC, GAS, TELEPHONE, CATV, WATER, SANITARY AND STORM SEWERS.
9. DURING THE PROCESS OF OUR PHYSICAL SURVEY NO INDICATIONS OF A CEMETERY WERE FOUND. NO FURTHER INSPECTION OF THIS PROPERTY HAS BEEN MADE FOR POSSIBLE CEMETERIES.
10. UNDERGROUND UTILITIES NOTED AS "PER PLAN" ARE SHOWN PER THE SITE PLAN FOR BENNING STODDERT COMMUNITY CENTER PREPARED BY CHRISTOPHER CONSULTANTS AND SIGNED ON 2/12/16. PORTIONS OF UTILITIES HAVE BEEN ADJUSTED TO TIE TO OBSERVED SITE FEATURES OF THE TOPOGRAPHIC SURVEY. THESE CONNECTIONS ARE ASSUMED AND AND DO NOT REPRESENT A CURRENT SUBSURFACE UTILITY INVESTIGATION. NO CERTIFICATION IS MADE AS TO THE LOCATIONS OF UNDERGROUND UTILITIES SUCH AS, BUT NOT LIMITED TO ELECTRIC, GAS, TELEPHONE, WATER, SANITARY AND STORM SEWERS SHOWN HEREON. BEFORE DIGGING IN THIS AREA, CALL "MISS UTILITY" 1-202-265-7177 FOR FIELD LOCATIONS (REQUEST FOR GROUND MARKINGS) OF UNDERGROUND UTILITY LINES.

## FLOOD ZONE NOTE

THE AREA SHOWN HEREON IS LOCATED ON THE FLOOD INSURANCE RATE MAP (FIRM), NO. 1100010039C, WITH AN EFFECTIVE DATE OF SEPTEMBER 27, 2010.

BY GRAPHIC DEPICTION ONLY, THE PROPERTY SHOWN HEREON IS SHOWN IN:

- FLOOD ZONE "X" (OTHER AREAS), AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

A FIELD SURVEY WAS NOT PERFORMED TO DETERMINE THE FLOOD ZONES LISTED HEREON. AN ELEVATION CERTIFICATE MAY BE NEEDED TO VERIFY THIS DETERMINATION OR APPLY FOR A VARIANCE FROM THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

## STORM STRUCTURE DATA

MANHOLE 135
RIM EL. = 91.39
INV IN (15" PVC FROM 324) = 83.32
INV IN (4" PVC FROM 317) = 89.20
INV IN (6" PVC FROM S) = 87.98
INV OUT (15" PVC TO N) = 83.28

STORM GRATE 117
RIM EL. = 92.89
INV IN (4" PVC FROM W) = 91.98
INV IN (4" PVC FROM S) = 92.23
INV OUT (4" PVC TO 316) = 92.19
STRUCTURE FULL OF DIRT AND DEBRIS

CLEANOUT 320
RIM EL. = 94.14
NOT ACCESSIBLE

CLEANOUT 321
RIM EL. = 94.40
NOT ACCESSIBLE

MANHOLE 324
RIM EL. = 93.28
INV IN (15" PVC FROM 326) = 86.22
INV IN (12" PVC FROM 325) = 87.52
INV OUT (15" PVC TO 316) = 84.54

CATCH BASIN 325
RIM EL. = 94.52
INV OUT (12" PVC TO 324) = 87.77

MANHOLE 326
RIM EL. = 95.63
INV IN (15" PVC FROM 327) = 87.64
INV IN (10" PVC FROM S) = 88.49
INV OUT (15" PVC TO 324) = 87.53

MANHOLE 327
RIM EL. = 97.45
INV IN (15" PVC FROM 597) = 88.53
INV IN (15" PVC FROM 1198) = 88.50
INV OUT (15" PVC TO 326) = 88.47

CATCH BASIN 597
RIM EL. = 98.37
INV OUT (15" PVC TO 327) = 89.61

CLEAN OUT 711
RIM EL. = 94.79
NOT ACCESSIBLE

CLEAN OUT 766
RIM EL. = 95.42
INV OUT (6" PVC TO 770) = 89.68

STORM GRATE 770
TOP OF DOME GRATE EL. = 94.94
INV IN (6" PVC FROM 766) = 89.51
INV OUT (6" PVC TO 711) = 89.65

ROOF DRAIN OUTFALL 787
INV OUT (6" PVC FROM BLDG) = 93.94

STORM GRATE 965
RIM EL. = 88.18
LID STUCK SHUT

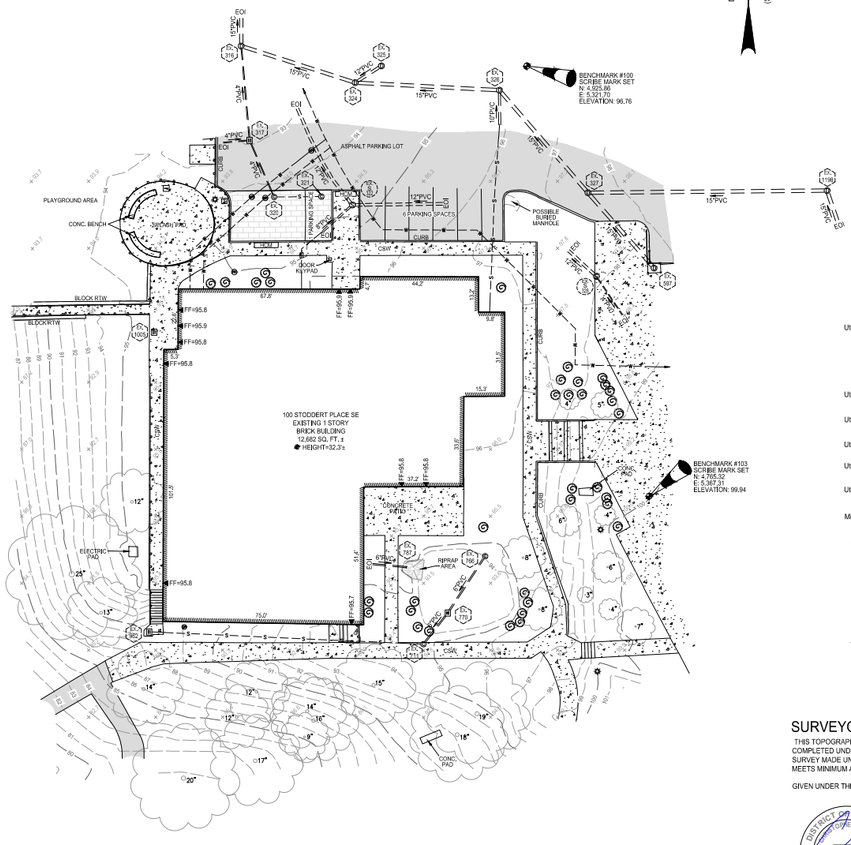
STORM GRATE 1005
RIM EL. = 95.64
LID STUCK SHUT

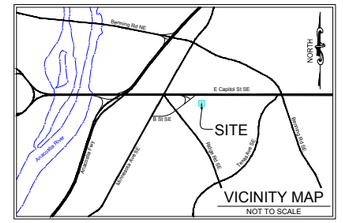
MANHOLE 1198
RIM EL. = 99.85
INV IN (15" PVC FROM SE) = 90.68
INV OUT (15" PVC TO 327) = 90.65

## SANITARY STRUCTURE DATA

MANHOLE 324
RIM EL. = 94.79
INV IN (12" PVC FROM E) = 86.59
INV IN (8" PVC FROM S) = 86.89
INV OUT (12" PVC TO NW) = 86.39

MANHOLE 326
RIM EL. = 97.90
INV IN (4" PVC FROM SE) = 90.15
INV OUT (12" PVC TO NW) = 89.78




## LEGEND

Utilities - Storm
- STORM MANHOLE
- STORM DRAIN INLET
- STORM DRAIN CATCH BASIN
- STORM INVERT
- CLEANOUT

Utilities - Sanitary
- SANITARY MANHOLE

Utilities - Water
- WATER MANHOLE

Utilities - Gas
- GAS METER

Utilities - Electric
- LIGHT POLE

Utilities - Communication
- COMMUNICATION PEDESTAL

Misc. Symbols
- SPOT ELEVATION
- DECIDUOUS TREE (TRUNK DIAMETER IN INCHES)
- BUSH
- SIGN
- DOOR LOCATION
- BOLLARD
- BUILDING HEIGHT LOCATION
- UNIDENTIFIED MANHOLE
- FLOW DIRECTION

Abbreviations
- CSW CONCRETE SIDEWALK
- CONC. CONCRETE
- PVC POLYVINYL CHLORIDE PIPE
- CLF CHAIN LINK FENCE
- FF FINISHED FLOOR

Surfaces
- ASPHALT AREA
- CONCRETE AREA
- BRICK AREA

Linetypes
- INDEX CONTOUR (5')
- INT. CONTOUR (1')
- HAND RAIL
- WATERLINE PER PLAN
- STORM LINE PER PLAN
- SANITARY LINE PER PLAN

## SURVEYOR'S CERTIFICATION

THIS TOPOGRAPHIC SURVEY ON THE LAND OF THE UNITED STATES OF AMERICA AND THE DISTRICT OF COLUMBIA WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF CHRISTOPHER G. HOBBS FROM AN ACTUAL GROUND SURVEY MADE UNDER MY SUPERVISION BETWEEN THE DATES OF SEPTEMBER 9 AND 10, 2021 AND THAT THIS PLAT MEETS MINIMUM ACCURACY STANDARDS OF THE DISTRICT OF COLUMBIA UNLESS OTHERWISE NOTED.

GIVEN UNDER THIS 30TH DAY OF SEPTEMBER, 2021

DISTRICT OF COLUMBIA — CHRISTOPHER G. HOBBS — No. LS905833 — 9/30/21 — LICENSED LAND SURVEYOR

CHRISTOPHER G. HOBBS, LS
DISTRICT OF COLUMBIA
LICENSED LAND SURVEYOR NO.: LS905833

GRAPHIC SCALE
1" = 20'

| REV# | DATE | REVISION |
|---|---|---|
| | | |
| | | |
| | | |

christopher consultants
9301 Innovation Ctr
Suite 150
Manassas, VA 20110
p 703.393.9887
engineering • surveying • land planning

TOPOGRAPHIC SURVEY

# BENNING STODDERT RECREATION CENTER

WASHINGTON, D.C.

| | |
|---|---|
| PROJECT: | 14148.003.00 |
| DRAWING NO.: | 111107 |
| SCALE: | 1" = 20' |
| DATE: | 9/10/2021 |
| DRAWN: | LFMB |
| CHECKED: | CGH |
| SHEET No. | 1 of 1 |

## Zoning

Address: 100 Stoddert Place SE

SSL: Square 5407, Lot 807. Note the 800-series lot number, which typically denotes a tax lot. This may trigger DCRA requirement to file for lot subdivision to create a record lot before an expansion may be permitted.

Zone: site is split-zoned RA-1/R-2. The existing/proposed building and all related site work sit entirely within the RA-1 portion of the lot. The lot does not lie within a DC Historic District.

Recreation Center by-right development standards are codified in the DC Zoning Regulations, Subtitle C, Chapter 16. Development standards not otherwise addressed by this Chapter default to the standards for the Zone – in this case Subtitle F. [1601.1]

RA-1/R-2 zone Recreation Center by-right development standards:

- Max. height 45' [1602.1(a)]
- Max. lot occupancy 20% [1603.3(a)]; 40% allowed subject to BZA Special Exception [1603.5]
- Max. area 40,000 gsf [1604.1(a)]
- Max. FAR 0.9 [1604.2]; up to 1.8 allowed subject to BZA Special Exception [1604.4]. Lot size is listed in DC tax records as 463,650 sf, which would yield a maximum floor area of (463,650 sf * 0.9 FAR =) 417,285 sf.

## Entitlements

The proposed building expansion will require a DCRA building permit.

As a DC-government owned/controlled property, US Commission of Fine Arts (CFA) and DC Historic Preservation Office (HPO) approval of the proposed expansion are required. Discussion with staff at both agencies will be required to determine if approval may be granted at staff level, or if board-level review is necessary.

The existing construction is not subject to any zoning relief, or Planned Unit Development (PUD) agreements. The concept design enclosed herein may be permitted by-right, with no zoning relief required.

## Building Code

Relevant codes: 2017 DC Building Code, incorporating & amending 2015 International Building Code (IBC)

Review of "Permit Documents" drawing set of the existing construction by Sorg Architects, dated May 8, 2015, indicates the following information:

- Existing construction permitted under 2013 DC Building Code, incorporating & amending 2012 IBC
- Use groups A-3 & B
- Construction type II-B
- Building fully sprinklered (determined to not match actual construction)
- Total occupant load 1,187, subdivided as:
  - Gym: 1,034
  - Community Center: 153

Proposed use groups for the expanded Community Center will remain A-3 & B.

Total occupant load in the proposed expanded structure is increased to 1,301, subdivided as follows:

- Gym: 1,034 (unchanged)
- Community Center, 1st Floor: 116
- Community Center, 2nd Floor: 151

The DC Building Code permits a single means of egress from a second building story containing A and/or B occupancies only where the occupant load of that story does not exceed 49, and the maximum common path of egress travel distance does not exceed 75' [Table 1006.3.2(2)]. As these conditions cannot be met while also satisfying the requested programming, the proposed design includes two stairs.

The DC Building Code requires that a new second floor must be accessible [1104.4]. A 2,100 lb. capacity elevator has therefore been proposed to satisfy this requirement.

Fire sprinklers are required in Group A-3 buildings with either: a fire area exceeding 300 occupants; or a fire area on a floor other than the level of exit discharge [903.2.1.3]. Both of these conditions exist in the proposed design, therefore the renovation should include addition of fire sprinklers throughout the building. Note the 2015 design documents showed a fire pump. It is recommended that a hydrant flow test be performed to inform the new design and determine if a fire pump is required to supply the new sprinkler system. If required, it could potentially be located in the existing mechanical room on the north side of the gym. This space was not accessible during the design team's survey, and therefore the existing layout could not be verified.

The existing plumbing fixtures are insufficient to serve the newly expanded facility. Supplemental restrooms have therefore been provided at the new second floor, in compliance with plumbing code requirements.

### Owner's criteria

DGS' initial design and programming criteria, as expressed in the Request for Task Order Proposal (RFTOP) and subsequent meetings, was provided as follows:

- DPR envisions the second floor containing multipurpose rooms, offices, senior room, and teen lounge, along with any required support spaces
- Assume that the current footprint of the Center will not be changed.

After an initial design charrette, two options were submitted for DGS and DPR review and comment. Due to the limited existing footprint and need to provide both a second means of egress from the second floor and an elevator, DPR and DGS directed the design team to implement an expansion option with a small increase in the existing building footprint.

### Proposed program

The proposed building layout modifies the existing first floor functions slightly, and provides new and/or expanded function on the second floor. The existing gym remains unmodified, as do the adjacent locker rooms and mechanical yard above. Fitness room and subdividable multipurpose room also remain in their current first floor locations to facilitate traffic flow from the main entrance. The current senior lounge is also proposed to remain in its current location at the front of the first floor, but it would be expanded.

Upstairs, a second senior lounge is added, allowing for varied simultaneous programming between the two lounges. The computer lab is proposed for relocation here, as well, freeing up space for the downstairs senior lounge expansion. Additional multipurpose/meeting rooms are proposed on this floor, and a teen lounge is secluded at the rear of the building.

A grand stair, open to both floors, is proposed for primary vertical circulation. Immediately visible from the main entrance, it is intended to draw visitors in, and encourage use of the stair over the elevator. Skylights could also be added overhead, to further enhance the verticality and appeal of this feature.

Offices, storage and restrooms complete the new second floor program. An open lobby lounge area offers informal gathering or pre/post-function space, and opens the airy stairwell to the rest of the floor. The second stairwell extends to the roof, providing service access to rooftop equipment. Existing equipment over the first floor locker rooms is accessed through the new office suite from a connecting storage room.

### Design solution

The existing massing and materials of the Benning Stoddert Community Center are carried forward in the expanded facility. At the front façade, the existing metal panel-clad volume is extended upward. Windows in the second floor program across the front of the building are located behind perforated metal screens to match the solid walls, which simultaneously reinforce the reading of a monolithic volume, and allow light and views into these rooms.

Existing masonry volumes are preserved and expanded upward to enclose new second floor program. At the front façade, painted supergraphics are added to the blank wall of the locker rooms to provide immediate identification of the Community Center against the larger volume of the adjacent tennis center. At the side façade, existing punched window openings in the masonry volume housing the fitness room are expanded upward to form the fenestration in one of the new second floor multipurpose rooms.

At the rear of the building, the teen lounge is provided with an oversized picture window, looking out to the wooded expanse bordering the Community Center. This feature could house a cozy reading nook, or even just a bench for quietly enjoying the unobstructed forest view. Additional perforated metal panels provide views and daylight to the adjacent breakout meeting space.

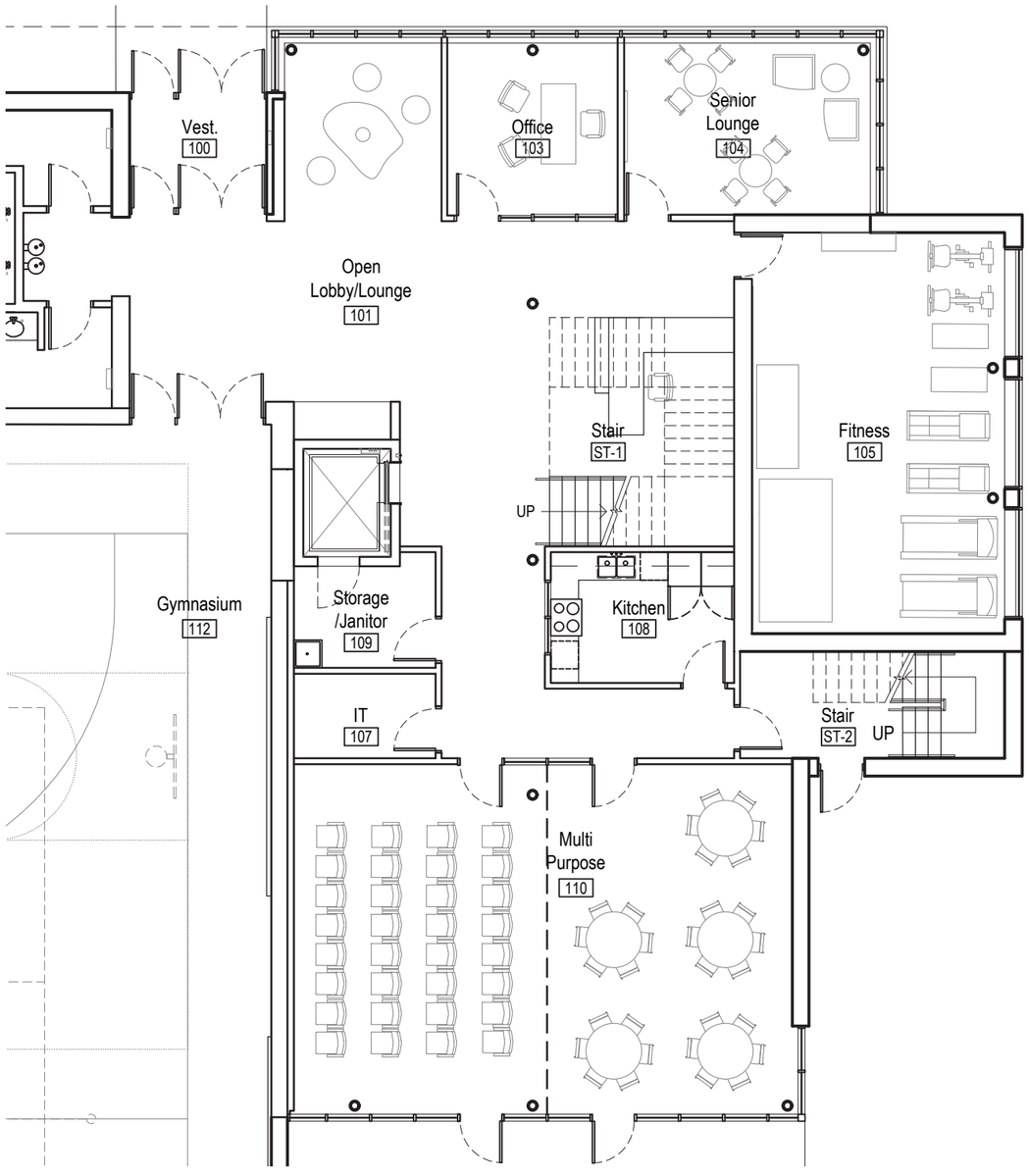
The existing cementitious panel-clad gymnasium volume has suffered significant vandalism, and will need to be repaired. A study of possible alternate, vandal-resistant, materials may be warranted.

**Benning Stoddert Community Center**

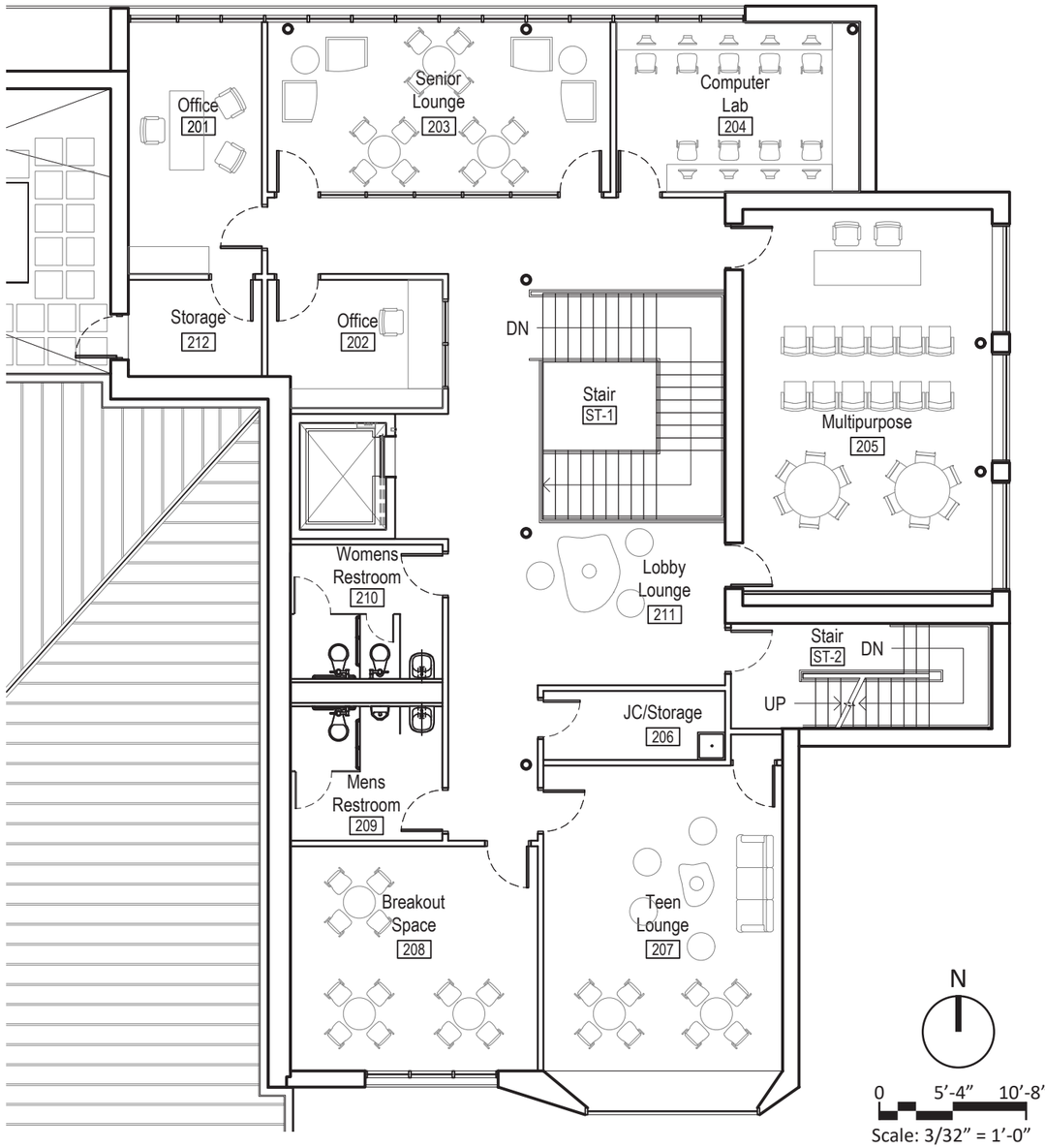
100 Stoddert Place SE

September 30, 2021

## First Floor




## Second Floor

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Scale: 3/32” = 1’-0”

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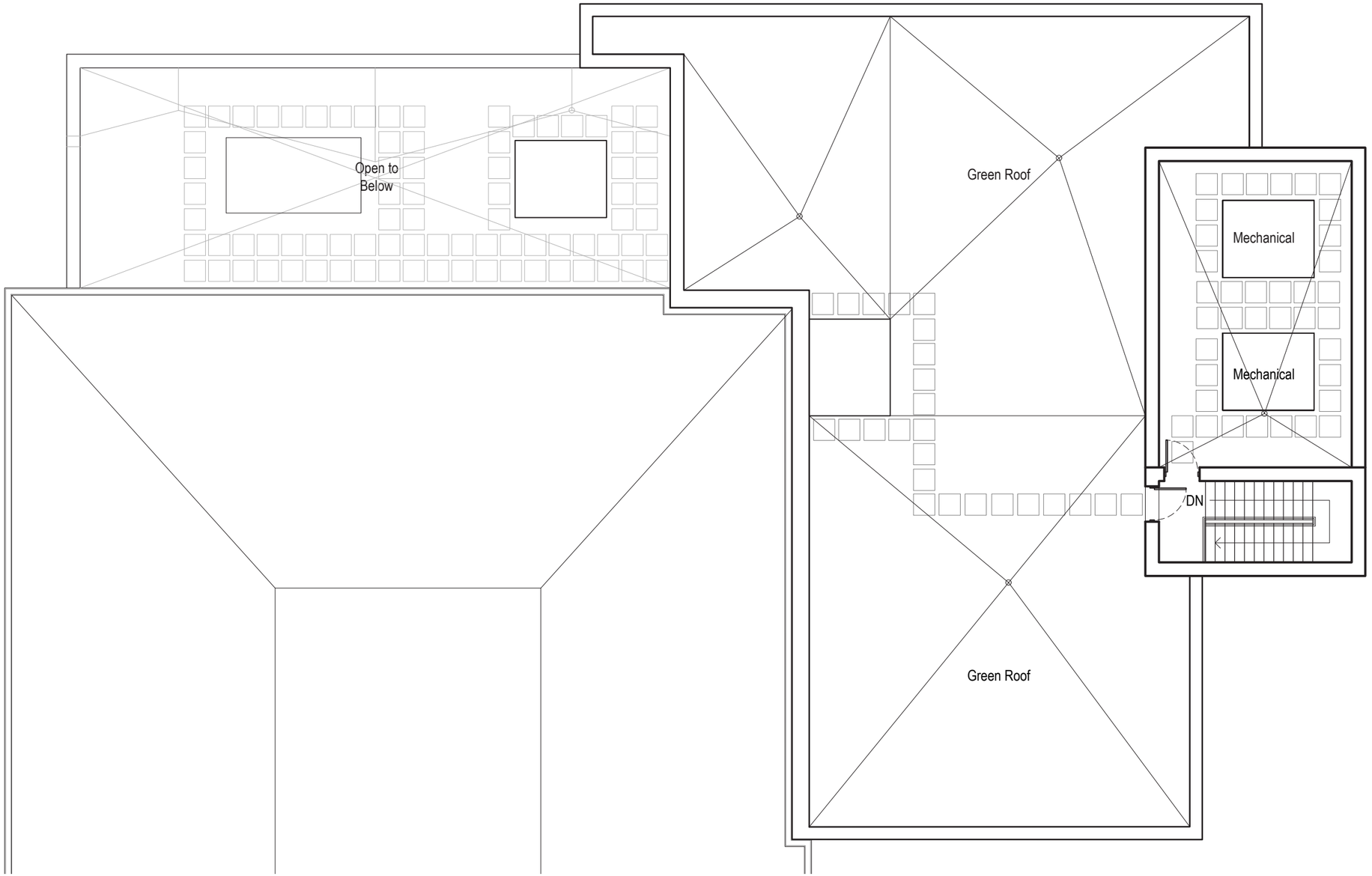
**Benning Stoddert Community Center**

100 Stoddert Place SE

September 30, 2021

**Roof**

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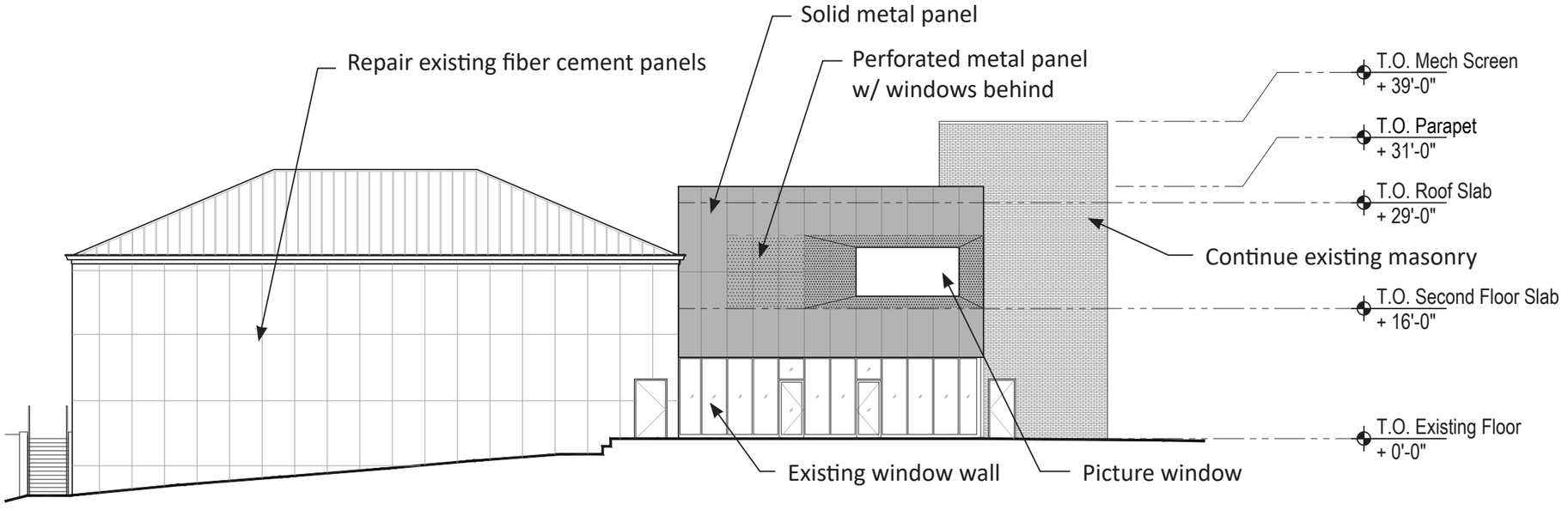
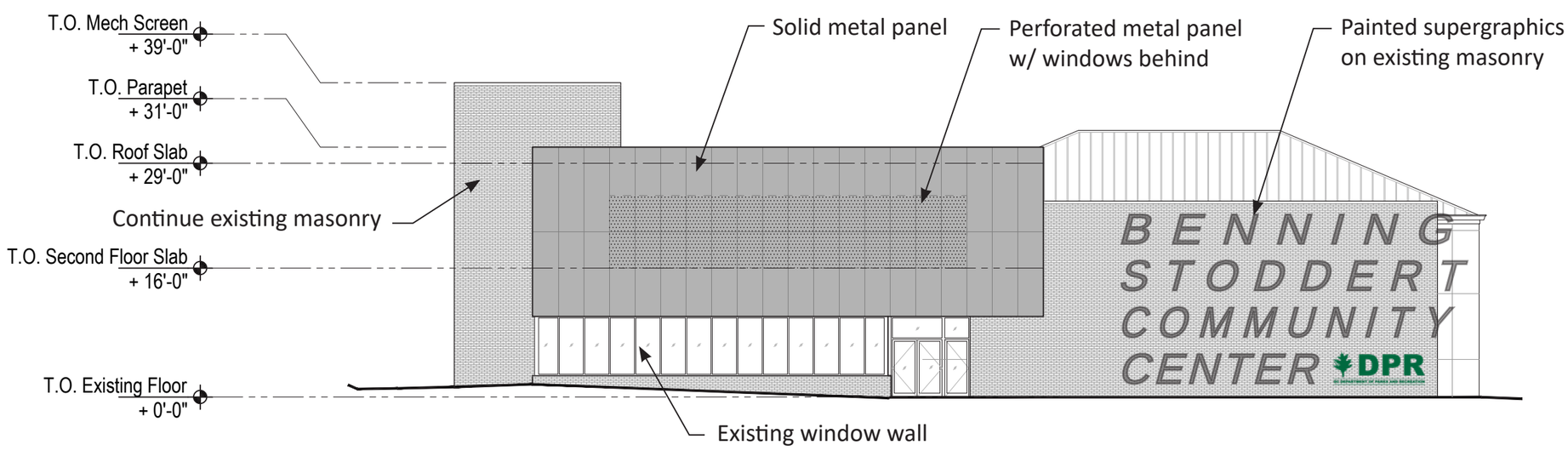
Proposed **Roof Plan** | **12**

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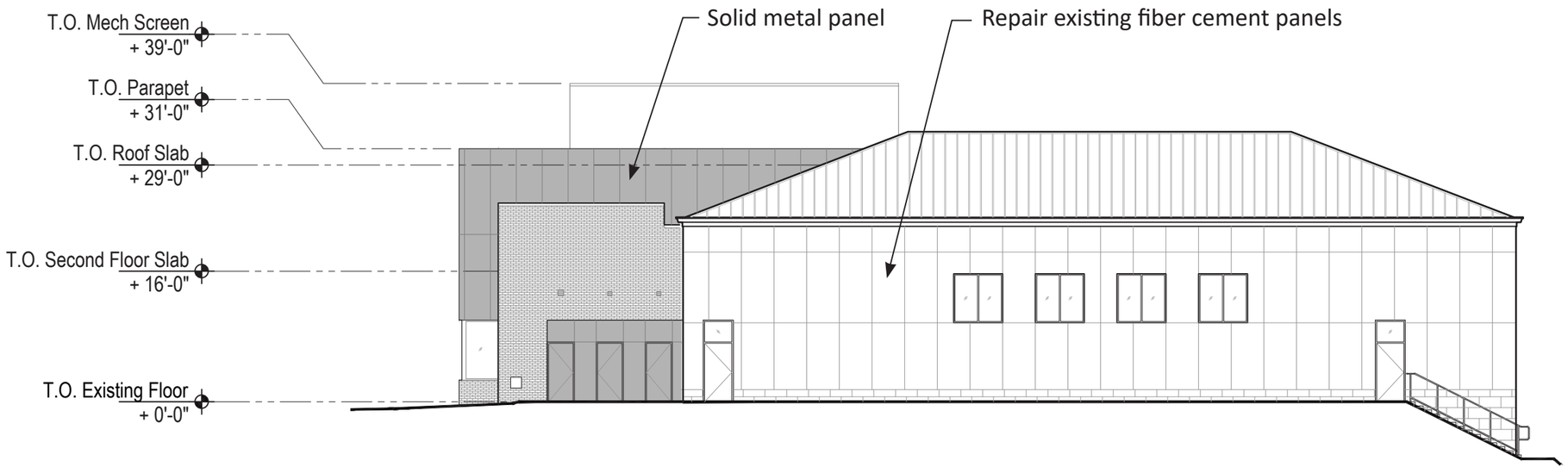


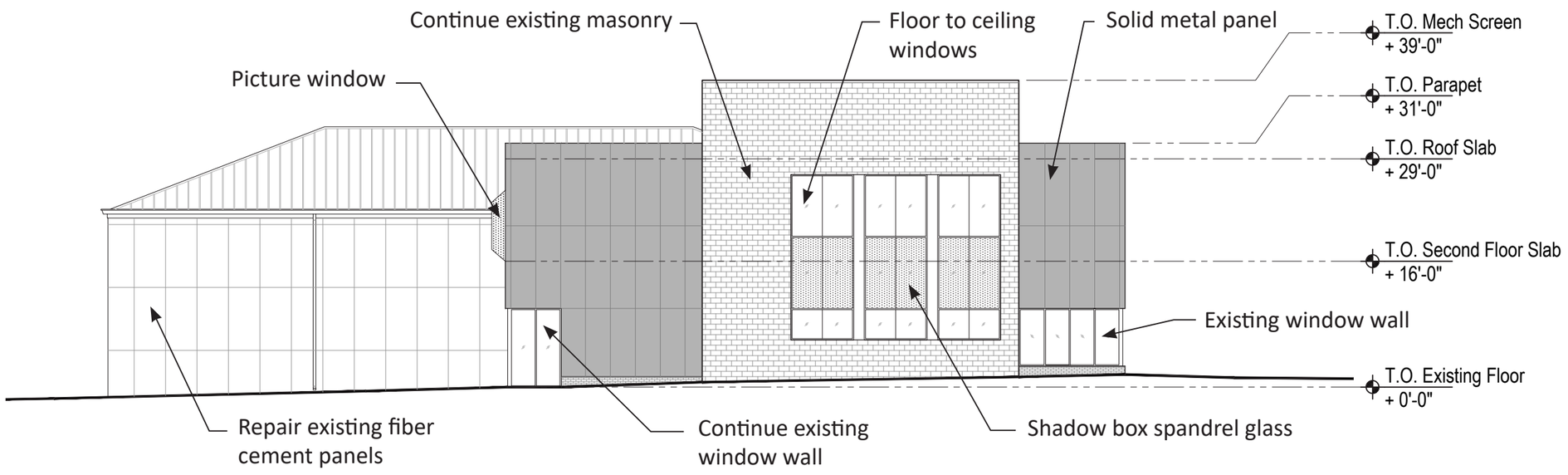


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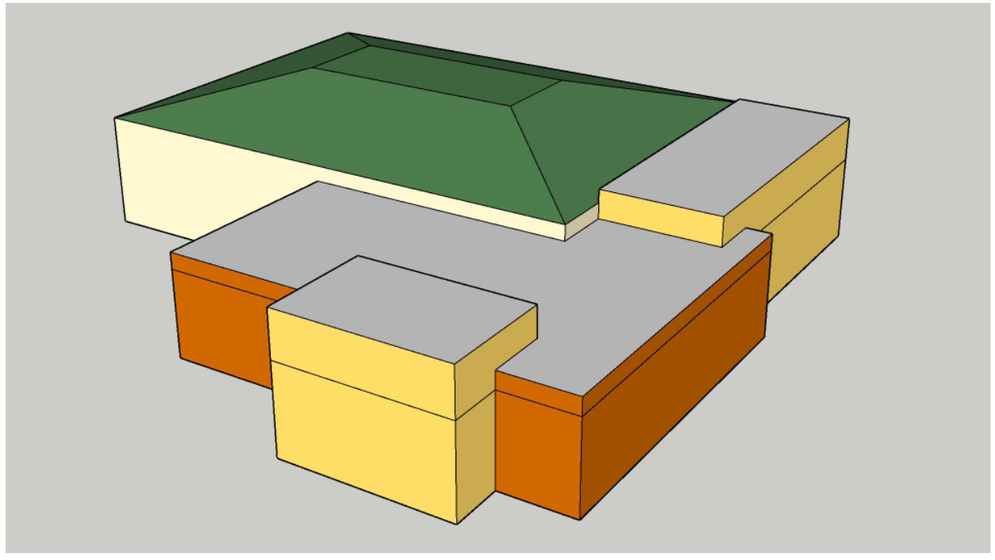
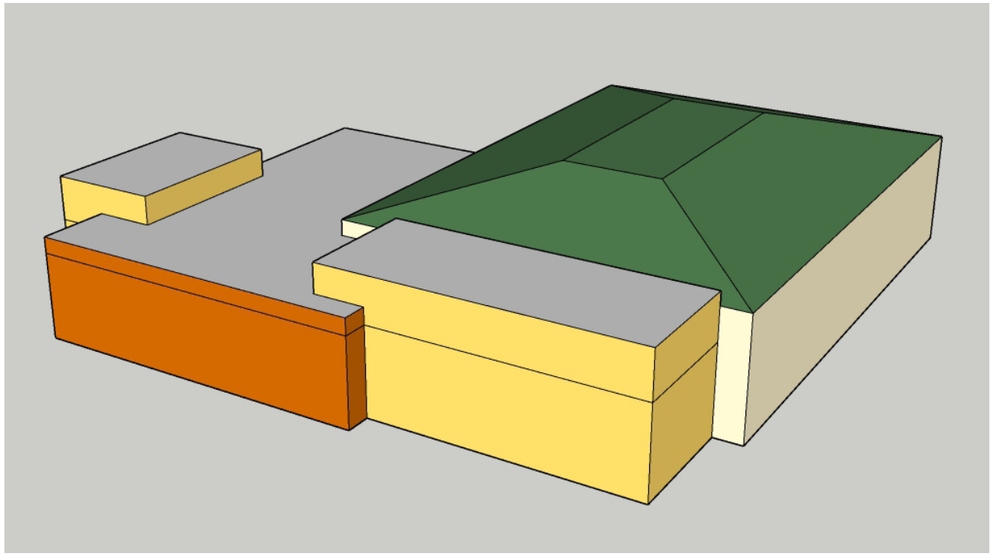
Scale: 1" = 16'-0"

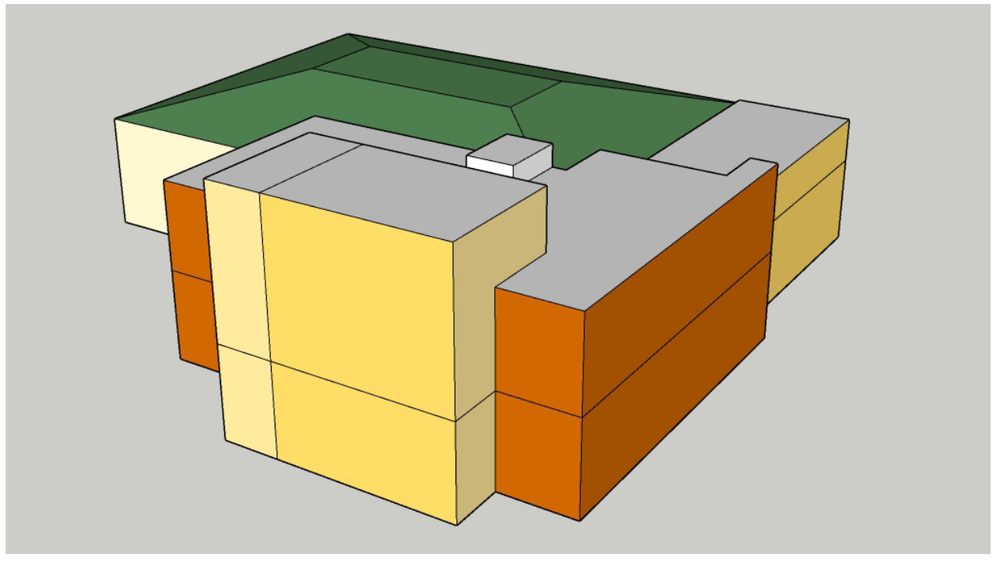
| | Existing Community Center | | Proposed new plans | |
|---|---|---|---|---|
| **Room** | Use | Area, sf | Use | Area, sf |
| 100 | Vestibule | 85 | Vestibule | 85 |
| 101 | Lobby / Lounge / Circ. | 934 | Open Lobby Lounge | 600 |
| 102 | Office | 137 | | |
| 103 | Senior Lounge | 227 | Office | 174 |
| 104 | Computer Lounge | 267 | Senior Lounge | 260 |
| 105 | Fitness | 648 | Fitness | 648 |
| 106 | Storage | 76 | | |
| 107 | IT | 90 | IT | 79 |
| 108 | Kitchen | 173 | Kitchen | 139 |
| 109 | Janitor | 21 | Janitor / Storage | 98 |
| 110 | Multi Purpose | 1,040 | Multipurpose | 994 |
| 112 | Gymnasium | 7,540 | Gymnasium | 7,540 |
| 112A | Mechanical | 190 | Mechanical | 190 |
| 113 | Mens Locker Room | 451 | Mens Locker Room | 451 |
| 114 | Womens Locker Room | 446 | Womens Locker Room | 446 |
| 114A | Janitor | 10 | Janitor | 10 |
| 115 | Restroom | 56 | Restroom | 56 |
| 116 | Restroom | 58 | Restroom | 58 |
| 117 | Electrical | 110 | Electrical | 110 |
| | | | Horizontal Circulation | 390 |
| | | | Vertical Circulation | 480 |
| | **Total 1st Floor Area:** | **12,559** | **Total 1st Floor Area:** | **12,808** |
| 201 | | | Office | 220 |
| 202 | | | Office | 135 |
| 203 | | | Senior Lounge | 348 |
| 204 | | | Computer Lab | 260 |
| 205 | | | Multi Purpose | 648 |
| 206 | | | Janitor / Storage | 76 |
| 207 | | | Teen Lounge | 488 |
| 208 | | | Breackout space | 352 |
| 209 & 210 | | | Restrooms | 289 |
| 211 | | | Lobby Lounge | 243 |
| 212 | | | Storage | 99 |
| | | | Horizontal Circulation | 445 |
| | | | Vertical Circulation | 481 |
| | | | **Total 2nd Floor Area:** | **4,084** |
| | **Total Building Area:** | **12,559** | **Total Building Area:** | **16,892** |
| | | | *Increase of* | *4,333 sf* |



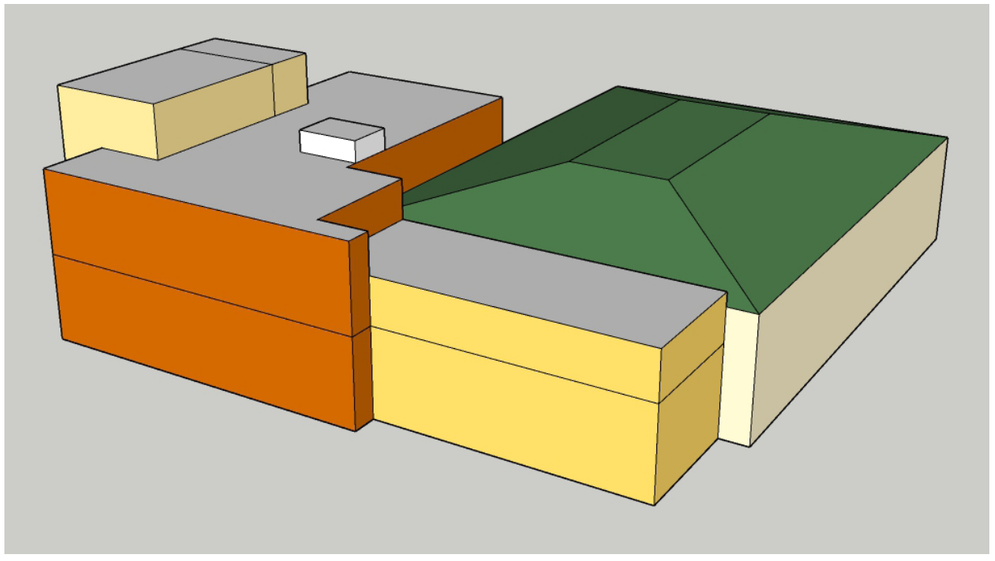
Existing NW View



Existing NE View

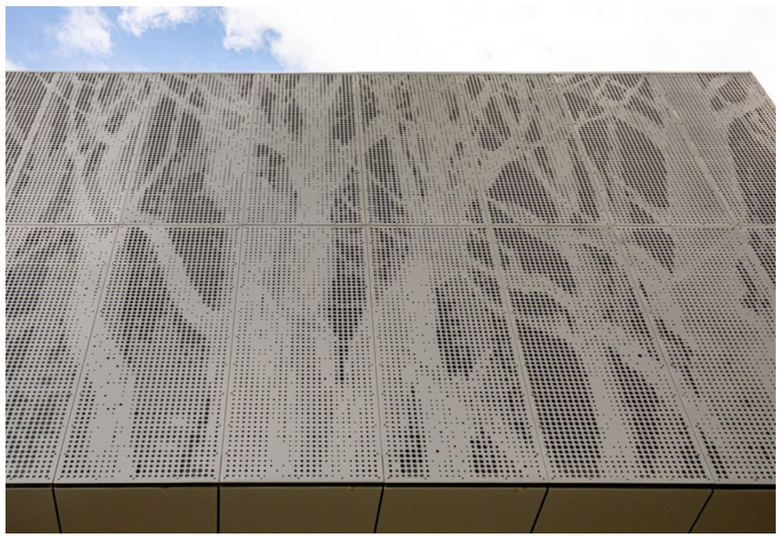


Proposed NE View



Proposed NW View

Perforated Metal Panels ▲
*Good Hope Recreation Center, Silver Spring MD*



Perforated Metal Panels *Detail* ▲

Perforated Metal Panels *Interior View* ▲


▲ Painted Supergraphics
*Bronx River Art Center, New York NY*

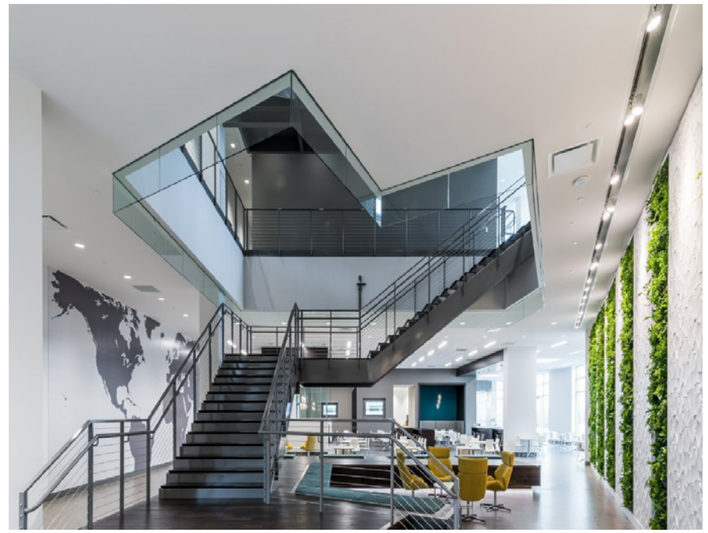

Painted Supergraphics
*CW Harris Elementary School, Washington DC* ▲

100 Stoddert Place SE

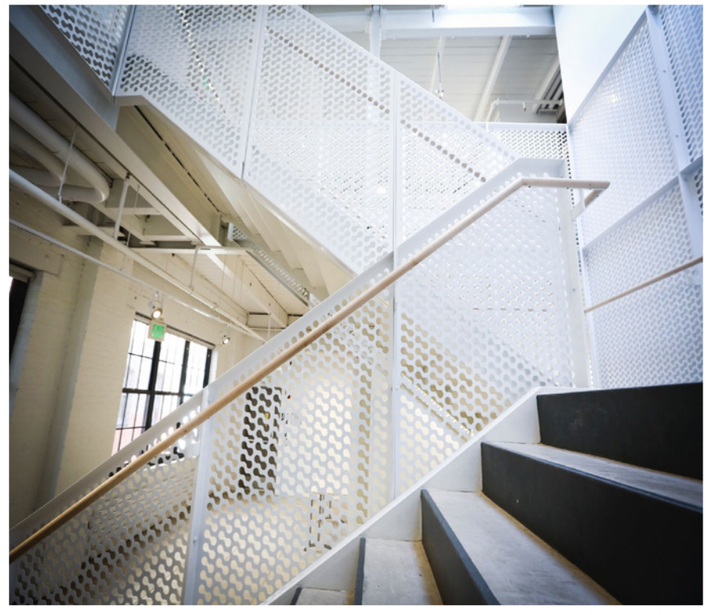
Picture Window ▲
*SFMOMA, San Francisco CA*


Picture Window ▲
*Whitney Museum, New York NY*

Picture Window ▲
*South 5th Residence, Austin TX*



Interior stair ▲
*Kubota North America Headquarter, Grapevine TX*



Interior stair ▲
*JHU/MICA Film Center, Baltimore MD*

**FMC Structural Design Group, LLC**

**1. PROJECT NAME & ADDRESS**

Benning Stoddert Community Center, 100 Stoddert Place SE, Washington, DC 20019.

**2. DESCRIPTION OF PROJECT**

The project site is in SE Washington DC. It is proposed to convert an existing one storey structure into a two-storey structure. Existing first floor occupancy consists of lobby, office , fitness, multipurpose, and other public areas. Existing roof consists of green roof area and MEP area. Proposed first floor serves similar functions as that of the existing. Propsoed Level 2 consists of office area, lounge, computer room and other public areas. See architect's proposed plans.

The review of existing structure is based on existing record drawings last dated 8 May 2015 (See Exhibit A for relevant exrepts of the record drawings.)

**3. STRUCTURAL SYSTEM FOR GRAVITY LOADS**

Exising roof framing is not structurally adequate to serve as the proposed occupiable area. Two strengthening options are suggested.

Level 2-Option 1: See Exhibit B-1 for the first option to strengthen existing roof to serve as new Level 2. In this option, the span of the structurally inadequate open-web josts is halved by inserting new steel beams. Detail of how the new steel beam supports the existing open-web joists is shown in Exhibit C-1. New floor deck consists the existing 1.5"-20 GA steel deck together with 3" thick light weight concrete (fc'=3000 psi). Existing roof is sloping, and whereas proposed Level 2 will need to be level. Existing or new beams at Level 2 will need to be leveled by moving either one of the supported ends upward or downward & reconnecting with existing steel columns at a new elevation.

Level 2-Option 2: See Exhibit B-2 for the second option to strengthen existing roof. In this case, new steel beams are inserted in liue of the exising open-web joists. The composition of the floor slab & manner of creating a level floor remain the same as in Option 1.

Roof Level: See Exhibit B-3 for concept framing of roof level. The floor consists of 1.5"-20 GA steel deck over new steel beams.


11820 Parklawn Drive, Suite 300, Rockville MD, 20852 | www.fmcassoc.com | P: 301-545-6740 | C: 301-502-7959

Benning-Stoddert
SE, Washington DC
Structural Narrative

Foundation Level: See Exhibit B-4 for concept foundation plan. Based on bearing capacity of 4000 psf and existing footing size of 4'x4' as noted on the existing record drawings, two existing footings will need to be strengthened.

**4. STRUCTURAL SYSTEM FOR LATERAL LOADS**

Lateral force resising system: Ordinary reinforced masonry shear walls

**5. DESIGN CRITERIA**

The following are the basic structural criteria for this project.

The proposed alrerations of the subject building will be in accordiance with IBC 2015 Building Code and 2017 DCMR Title 12 Supplement.

A. Design Live Loads

The live load shall be as follows:

Stairs rooms, lobby areas & corridors .....100 psf

Fitness room …….....100 psf

Office area……..50 psf

Mechanical floors/light storage areas ….....150 psf

Snow on roofs……..……..30 psf min. plus snowdrift where applicable.

B. Lateral Loads

B.1 Wind Loading

| | |
|---|---|
| Ultimate Wind Speed: | 115 mph |
| Wind Load Importance Factor: | 1.0 |
| Wind Exposure Type: | B |

B.2 Seismic Loading

| | |
|---|---|
| Seismic Group | I |
| Seismic Importance Factor: | 1.0 |
| SS (Per USGS): | 0.153g |

**6. MATERIALS**

A. Concrete

Minimum Ultimate Compressive Strength at 28 Days:

Footings …….. 4,000 psi

Lightweight concrete (110 pcf) ..……..……..... 3,000 psi

B. Reinforcing Steel

Reinforcing bars shall be deformed billet steel conforming to ASTM A615, Grade 60. Welded wire fabric shall conform to ASTM A-185.

Welded wire fabric shall conform to ASTM A-185.

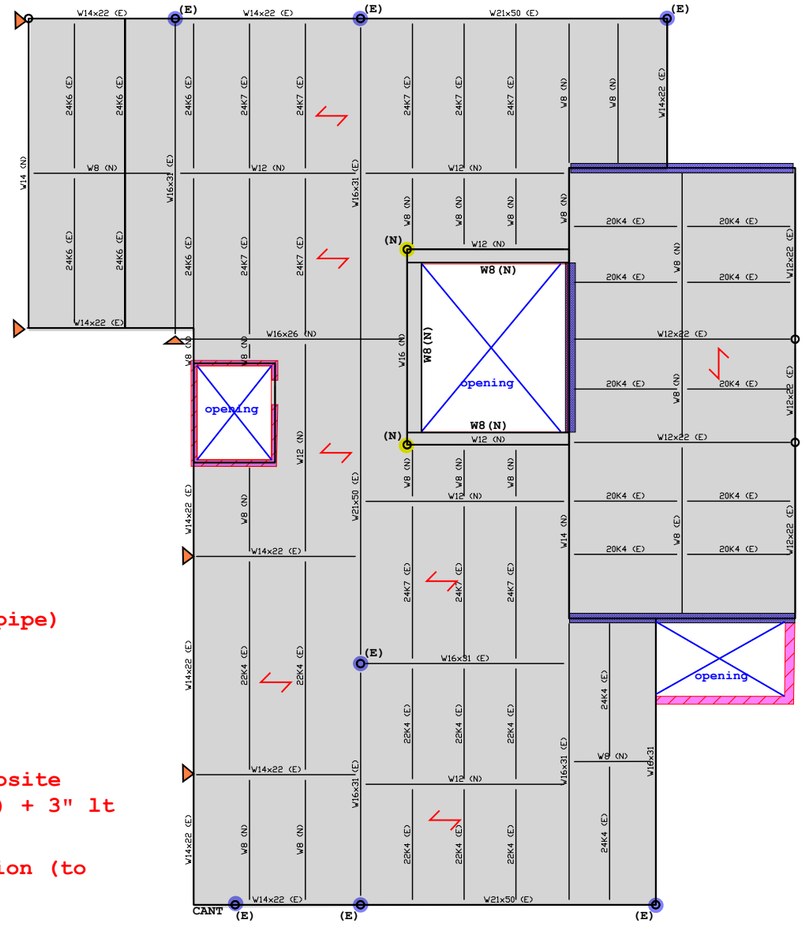
C. Structural Steel

All miscellaneous steel such as plates, angles, and channels shall conform to ASTM-A36 Fy = 36ksi. Steel beams and columns (W sections) shall conform to ASTM-992 Fy = 50ksi. Exposed permanent structural steel utilized for facade-support, entrance canopies, and cooling towers framing shall be hot-dip galvanized (G90).

D. Masonry

Hollow and solid CMU-ASTM C90 Type 1

Mortar-ASTM C270 Type M for below grade, Type S for all others.




## Level 2-Opton 1

(E) denotes existing member
(N) denotes new member

(E) denotes existing column

(N) denotes new column (8" diameter pipe)

denotes new 8" CMU wall

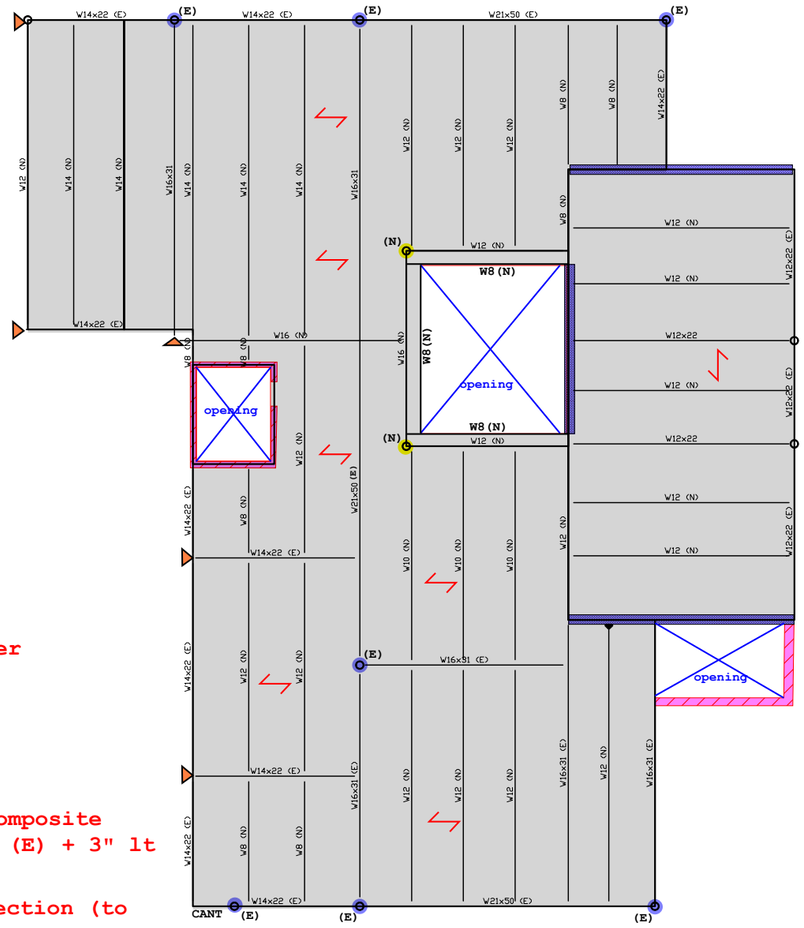
denotes existing CMU wall

denotes span of 4.5" thick composite floor: 1.5"-20 GA steel deck (E) + 3" lt wt concrete (N)

denotes existing support/connection (to be investigate further)

CANT denotes cantilever beam

**EXHIBIT B-1**
Benning-Stoddert
Structural Narrative
FMC
9.24.21




## Level 2-Opton 2

(E) denotes existing member
(N) denotes new member

(E) denotes existing column

(N) denotes new column (8" diameter standard pipe)

denotes new 8" CMU wall

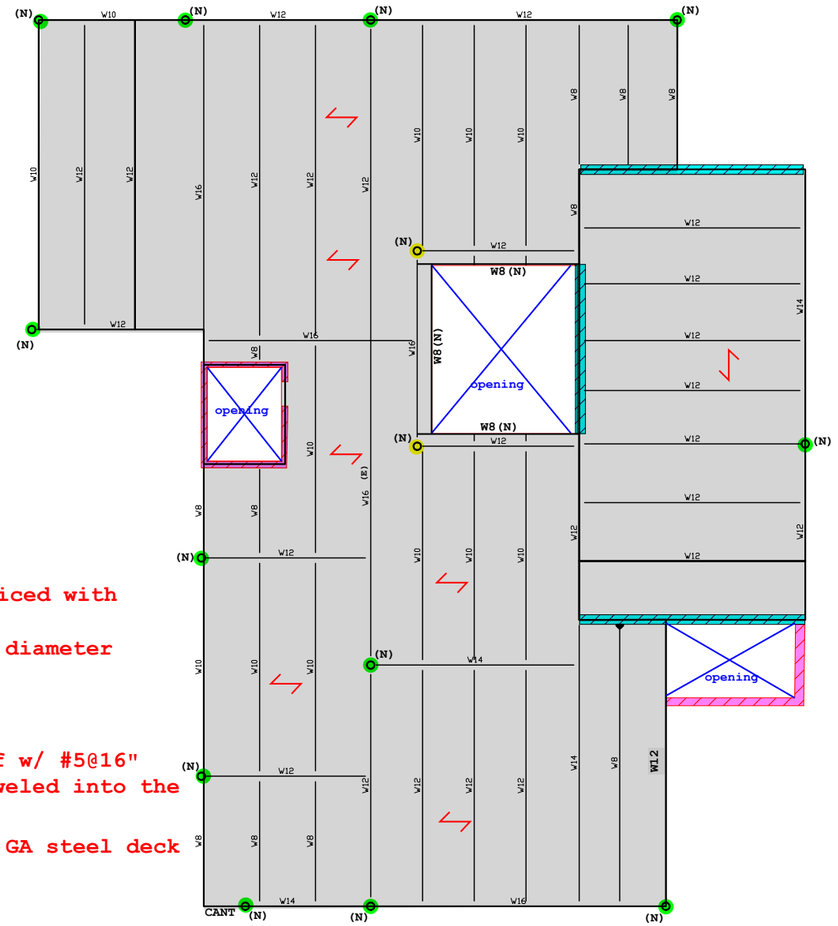
denotes existing CMU wall

denotes span of 4.5" thick composite floor: 1.5"-20 GA steel deck (E) + 3" lt wt concrete (N)

denotes existing support/connection (to be investigate further)

CANT denotes cantilever beam

**EXHIBIT B-2**
Benning-Stoddert
Structural Narrative
FMC
9.24.21

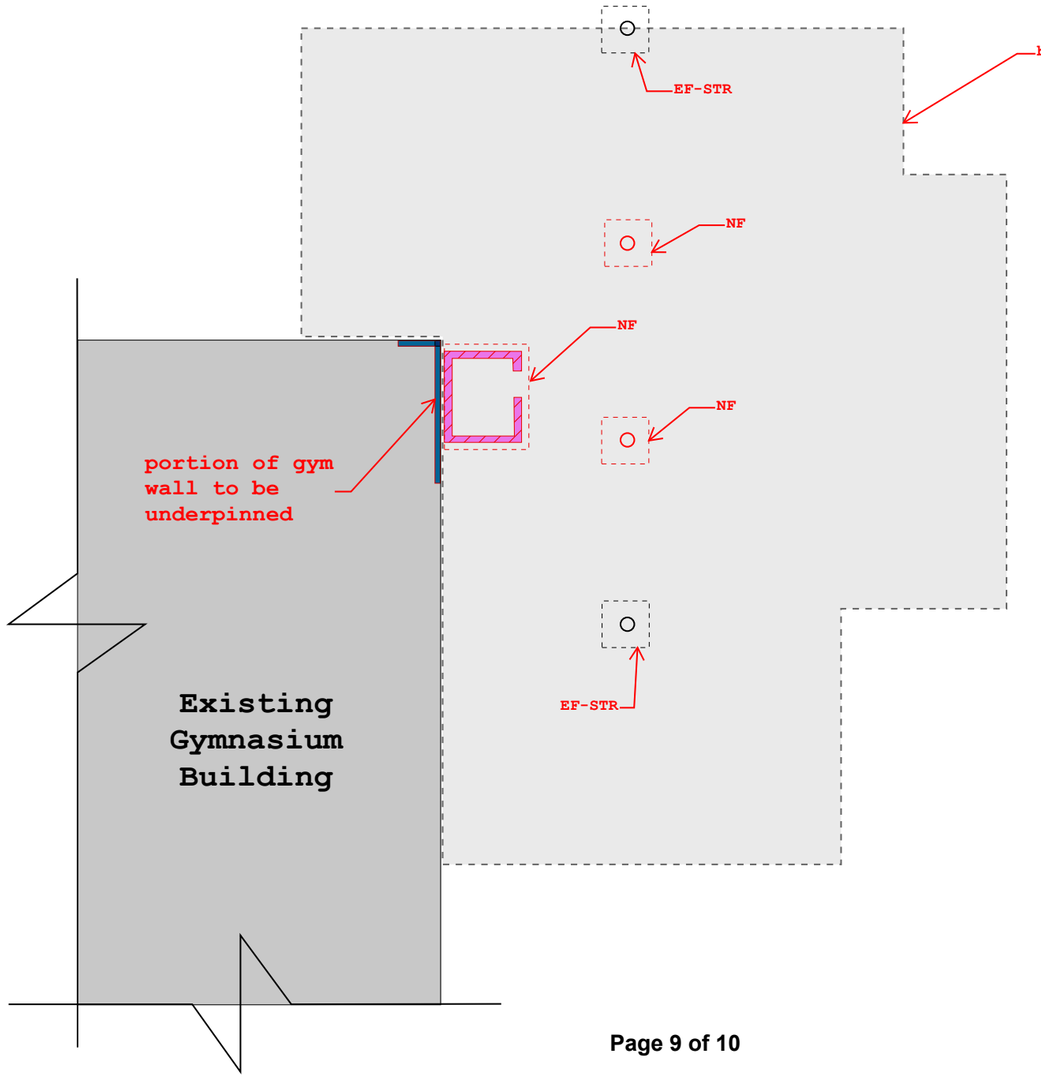



## Roof Level (New)

(E) denotes existing member
(N) denotes new member
(N) denotes new steel column spliced with exist steel column below.
(N) denotes new steel column (8" diameter standard pipe)
denotes new
denotes new 8" CMU wall reinf w/ #5@16" o.c. over exist CMU wall (doweled into the exist CMU)
denotes span of new 1.5"-20 GA steel deck

CANT denotes cantilever beam

**EXHIBIT B-3**
Benning-Stoddert
Structural Narrative
FMC
9.24.21




# Foundation Plan

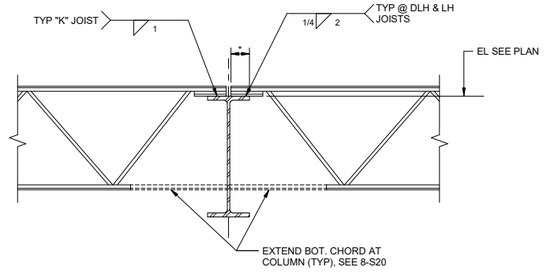
(E) denotes existing member
(N) denotes new member

NF denotes new footing

EF-STR denotes existing footing to be strengthened. See Note 1 below.

Notes:
1. Based on bearing capacity of 4000 psf and existing footing size of 4'x4' as noted on the existing record drawings. (See Exhibit B-1)

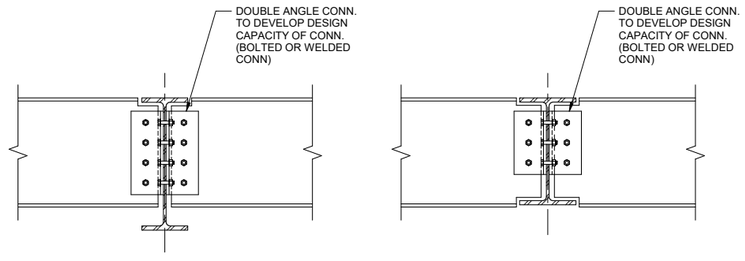
**EXHIBIT B-4**
Benning-Stoddert
Structural Narrative
FMC
9.24.21




- OFFSET JOISTS TO MAINTAIN PROPER BEARING EXCEPT AS REQUIRED AT COLUMNS
- * "K" JOISTS TO BEAR 2 1/2" ON BEAM "DLH" & "LH" JOISTS TO BEAR 4" ON BEAM (MIN)

TYPICAL STEEL JOIST BEARING ON STEEL BEAM

**Detail D-1**




TYPICAL BEAM TO BEAM SHEAR CONNECTION

**Detail D-2**

**EXHIBIT D**
Benning-Stoddert
Draft Narrative
FMC
9.17.21

1017 O Street NW
Washington, DC 20001

# Benning Stoddert Recreation Center

*MEP Narrative*

Prepared by:
**Engenium Group**
1017 O Street NW
Washington, DC 20001

**September 24, 2021**



## Table of Contents

### Contents

# 1 General

### *1.1 Existing Building Overview*

Benning Stoddert Recreation Center is a single-story community building located at 100 Stoddert Place, SE in the District of Columbia. The existing building offers a gymnasium, a fitness room, a multi-purpose room, offices, and supporting spaces to the community.

### *1.2 Project Scope Overview*

The existing gymnasium will remain in place and a new second floor will be added to the remainder of the building. A new egress stairwell and a new open stairwell will be constructed to facilitate access to and from the second floor. An elevator will also be provided for ADA and convenience access to the new second floor.

### *1.3 Narrative Intent*

The intent of this narrative is to describe the upcoming building upgrade so that a rough order-of-magnitude construction cost can be estimated.

### *1.4 Codes and Standards*

The scope of work will be designed to meet the requirements of the following codes and standards:

- ✓ 2017 District of Columbia Building Code.
- ✓ 2017 District of Columbia Energy Conservation Code.
- ✓ 2017 District of Columbia Green Construction Code
- ✓ 2015 International Mechanical Code.
- ✓ 2015 International Plumbing Code.
- ✓ 2015 International Fire Code.
- ✓ 2013 ASHRAE 90.1 as amended by DCMR Title 12, Sections A through M.

### *1.5 Design-Day Climate Conditions*

Summer Outside Design Conditions:

- ✓ Cooling: 94.7 degrees F dry bulb, 75.5 degrees F coincident wet bulb (0.4% column, 2017 ASHRAE Handbook of Fundamentals).
- ✓ Dehumidification: Design dew point 75.7 degrees F, 134.4 grains of moisture per pound of dry air, 83.2 degrees F coincident dry bulb (0.4% column, 2017 ASHRAE Handbook of Fundamentals).
- ✓ Evaporation: 78.4 degrees F wet bulb, 89.1 degrees F coincident dry bulb (0.4% column, 2017 ASHRAE Handbook of Fundamentals).

Winter Outside Design Conditions:

- ✓ Heating: 17.9 degrees F (99.6% column, 2017 ASHRAE Handbook of Fundamentals).





### *1.6 Conditioned Space Setpoints*

Occupied areas of the building will be conditioned to the following setpoints:

- ✓ Summer condition: Occupied areas will be cooled to 75 degrees Fahrenheit and dehumidified to 50% relative humidity.
- ✓ Winter condition: Occupied areas will be heated to 72 degrees Fahrenheit; no humidification will be provided.
- ✓ Filtration provisions: Filtration will be provided in accordance with 2015 International Mechanical Code and the 2017 District of Columbia Green Construction Code.

### *1.7 Ventilation*

Ventilation will be provided in accordance with Chapter 4 of the 2015 International Mechanical Code. Typical space requirements are as follows:

| Space Type | Occupancy (People / 1k SF) | Rp (CFM per person) | Ra (CFM per area) | Exhaust (CFM per area) |
|---|---|---|---|---|
| Lounges | 50 | 5 | 0.06 | 0 |
| Multiuse Assembly | 100 | 7.5 | 0.06 | 0 |
| Office Space | 5 | 5 | 0.06 | 0 |
| Main Entry Lobbies | 10 | 5 | 0.06 | 0 |
| Corridors | 0 | 0 | 0.06 | 0 |
| Computer Lab | 25 | 10 | 0.12 | 0 |
| Toilet Rooms | 0 | 0 | 0 | 50 (CFM / toilet) |
| Janitor's Closet | 0 | 0 | 0 | 1 |

## 2 Existing Mechanical and Plumbing Systems

### *2.1 Existing Mechanical Systems*

The existing gymnasium and the existing fitness center are each served by dedicated packaged gas-fired direct-expansion (DX) rooftop units (RTUs) which provide heating, cooling, dehumidification and ventilation. The remainder of the existing building is served by a decoupled system as follows:

- ✓ Comfort conditioning is provided by a variable refrigerant volume (VRV) system.
- ✓ Ventilation, pressurization, and primary dehumidification are provided by a dedicated outdoor air system (DOAS).

### *2.2 Existing Domestic Water System*

Domestic water is served to the building by DC Water through a 4-inch service at utility pressure. An ASSE 1015 double-check backflow preventer exists at the utility service entrance, and an existing 100-gallon gas-fired domestic water heater serves heating functions. An existing domestic hot water recirculation pump and return loop decrease water consumption and expedite delivery of hot water to occupants.

### *2.3 Existing Natural Gas System*

A 2-inch, 2 pound-per-square-inch (PSI) gas lateral serves an outdoor meter/regulator assembly provided by Washington Gas. Natural gas is distributed downstream of the regulator at 14 inches of water column (inwc), and is used to serve the domestic water heater, a kitchen stove, the emergency generator, and RTU/DOAS unit gas-fired heat exchangers.

### *2.4 Existing Sanitary and Vent System*

Sanitary waste is discharged to the local utility via gravity through a single 4-inch dedicated outfall. Observed sanitary traps appear to be properly vented to atmosphere.

### *2.5 Existing Stormwater System*

Stormwater is discharged from high roofs to low roofs via architectural scuppers with boots and downspouts. Stormwater is collected from low roofs by means of interior roof drains and is discharged to the utility via two independent 6-inch outfalls. Overflow systems include architectural scuppers through parapet walls.





## 3 Proposed Mechanical Systems

### *3.1 General*

Existing rooftop equipment will be relocated to the new roof above the second floor. The gymnasium RTU will be existing to remain. New and existing decoupled heating, ventilating and air-conditioning (HVAC) systems will serve new and reprogrammed areas of work:

- ✓ A new VRV system provides comfort conditioning to new areas of work, and the existing VRV system is modified to serve reprogrammed areas of work.
- ✓ A new DOAS unit is provided to serve new areas of work, and distribution associated with the existing DOAS unit is modified to serve reprogrammed areas of work.

### *3.2 Modifications to Existing Equipment at the First Floor*

The existing wall-mounted cooling-only ductless split system serving the existing IT Room will be relocated to serve the proposed IT Room. Refrigerant piping will be modified and extended as required.

Three (3) VRV indoor units including two cassette and one ducted-concealed unit will be relocated to facilitate the installation of open stairwell ST-1. Condensate and refrigerant piping will be modified and required.

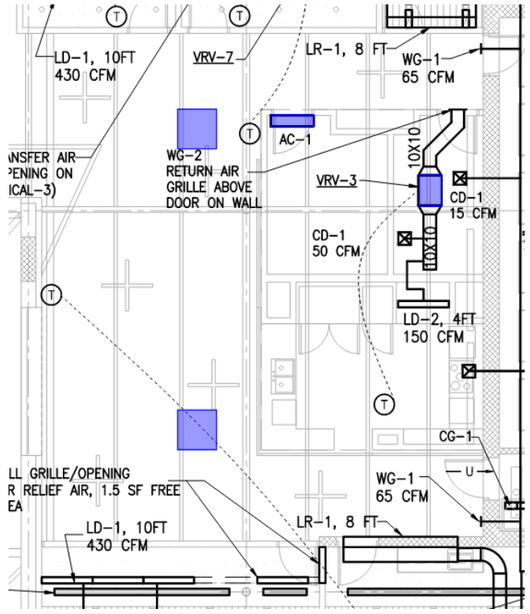



*Figure 1 – Modifications to Existing Equipment at the First Floor*

### *3.3 Modifications to Existing Equipment at the Roof Level*

Existing rooftop equipment including the fitness center RTU, the condensing unit serving the IT room, the existing VRV outdoor unit, the kitchen exhaust fan, and the janitor exhaust fan will be relocated to the second-floor rooftop. Gas piping, refrigerant piping, electrical conduit, and ductwork will be modified and extended as required.

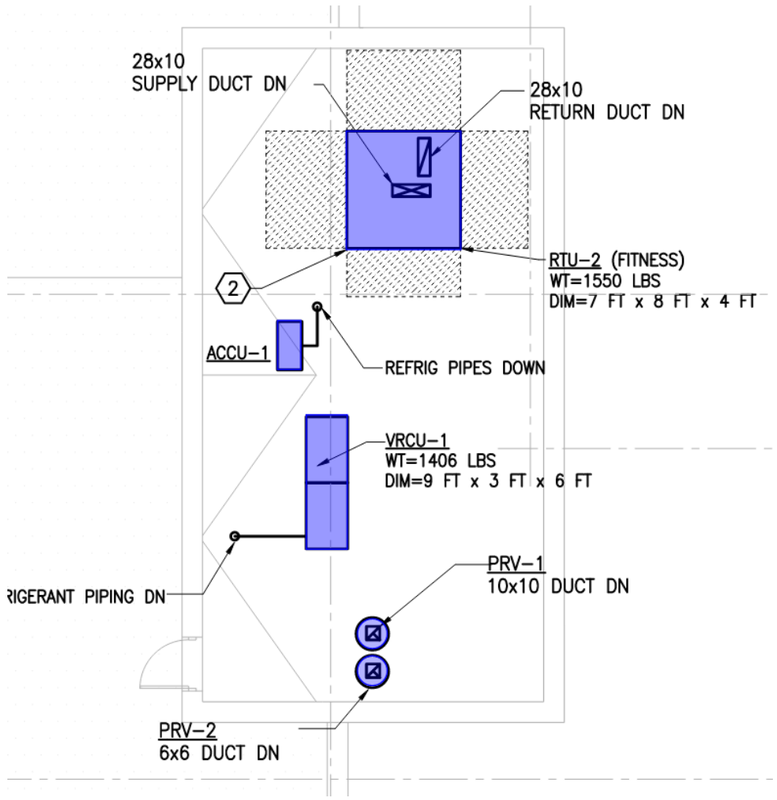



*Figure 2 – Rooftop Relocation Work*



Benning Stoddert Recreation Center

### *3.4 Space Conditioning - VRV System*

An air-cooled, heat-recovery-type VRV system equal to Daikin model REYQ96 is proposed to serve comfort conditioning to the second floor. The new VRV system will be curb-mounted on the second floor roof, and will provide 8 tons of cooling and 103,000 British thermal units per hour (BTU/hr) of heating to the space.


*Figure 3 – VRV Unit, Outdoor, Air-cooled, Heat Recovery Type*

A 3-pipe refrigerant distribution system will connect the VRV outdoor units to five (5) multi-port Branch Selector Boxes (BSBs) within the building. BSBs will distribute refrigerant to indoor fan coil units (FCUs) via dedicated 2-pipe distribution circuits.

*Figure 4 – VRV Branch Selector Box*

## Benning Stoddert Recreation Center

VRV FCUs will be provided to serve each space on the second floor. FCUs will be medium-static ducted units concealed above accessible ceilings; the Basis of Design (BOD) is Daikin model FXSQ. Each of the eight (8) FCUs will be provided with a return boot which includes sound attenuating liner. Low-pressure supply ductwork will distribute air from FCUs to 2x2 plaque-style supply diffusers. Each FCU will be provided with a dedicated wall-mounted controller to maximize occupant control and comfort, and integral pumps will be provided to remove condensate.

*Deduct Alternate: Provide 36"x36" round flow sensing cassettes equal to Daikin FXFQ in lieu of Daikin FXSQ.*

*Figure 5 – VRV Ducted Concealed Fan Coil Unit and 2x2 Plaque-Style Supply Diffuser*

Concept sketches are provided to show a potential layout of FCUs, low-pressure distribution ductwork, plaque-style supply diffusers and rooftop systems:

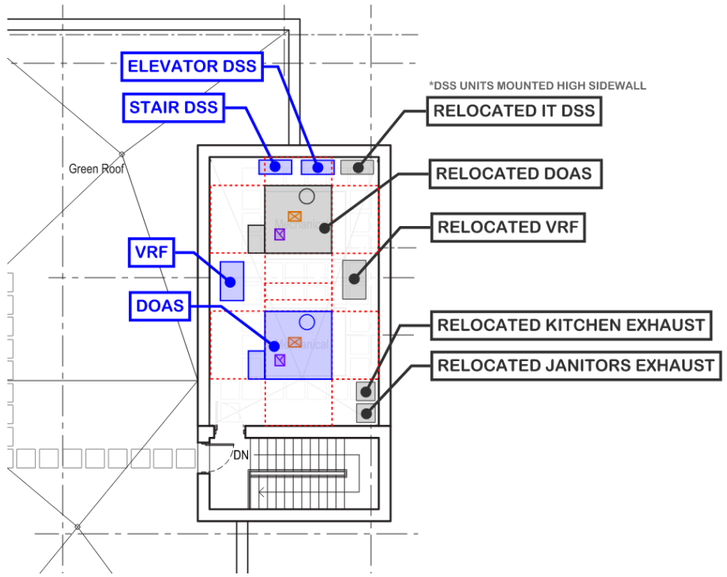



*Figure 6 – Mechanical Rooftop Layout*



## Benning Stoddert Recreation Center

**Second Floor**

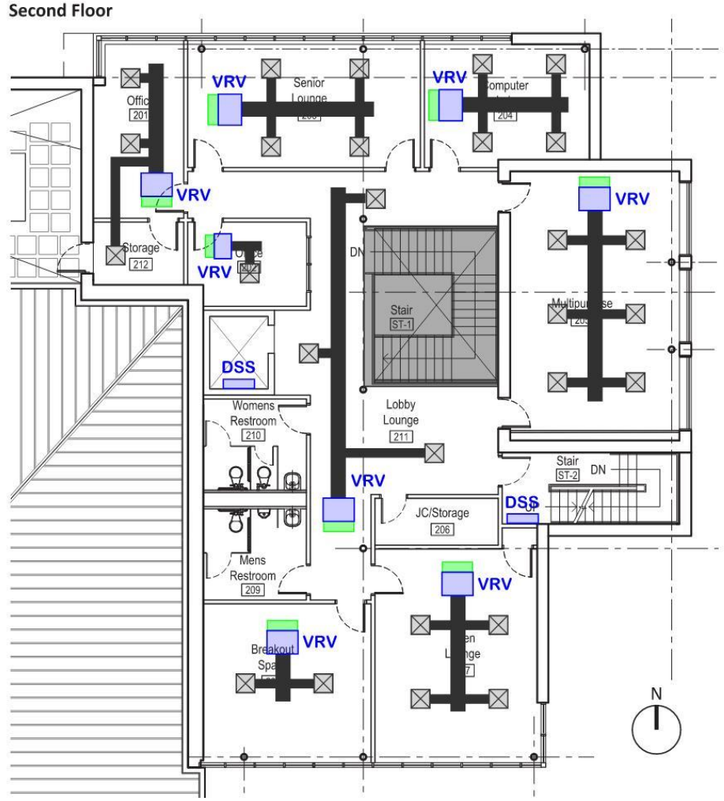



*Figure 7 – VRV Indoor Unit Layout*

### *3.5 Ventilation – Energy Recovery Unit*

A DOAS unit equal to Daikin model DPS004 (Rebel) will be provided to serve ventilation, pressurization, and primary dehumidification to the second floor. The unit will include a direct-drive supply fan with an electronically commutated motor (ECM) serving 1,000 cubic feet of air per minute (CFM) to the building. An exhaust fan will draw 900 CFM through a total-energy wheel facilitating energy recovery as required by code.

The DOAS unit will be provided with a 4-ton direct-expansion cooling system and the capability of providing 19,000 BTU/hr of hot gas reheat for dehumidification. An 80,000 BTU/hr stainless-steel natural gas heat exchanger with be provided, and outdoor air will be filtered using MERV 8 pre-filters and MERV 14 final filters before entering unit coils. Compressors and fans will be provided with internal vibration isolation, and the entire assembly will be mounted on a 14-inch prefabricated roof curb.

A microprocessor-based packaged unit controller equal to Daikin Microtech III will be provided to facilitate system control, monitoring and alarm. The unit will be calibrated to provide room-neutral ventilation air to occupied spaces during winter months and cooler ventilation air during summer months via a standard temperature reset schedule.

A 1-inch low-pressure natural gas line will be extended to the DOAS unit from existing gas infrastructure at the roof level. Gas will be regulated down to 7 inwg immediately prior to serving the gas-fired heat exchanger within the DOAS unit.


*Figure 5 – Energy Recovery Unit*





A concept sketch is provided showing a potential layout of the ventilation air and exhaust air duct distribution:

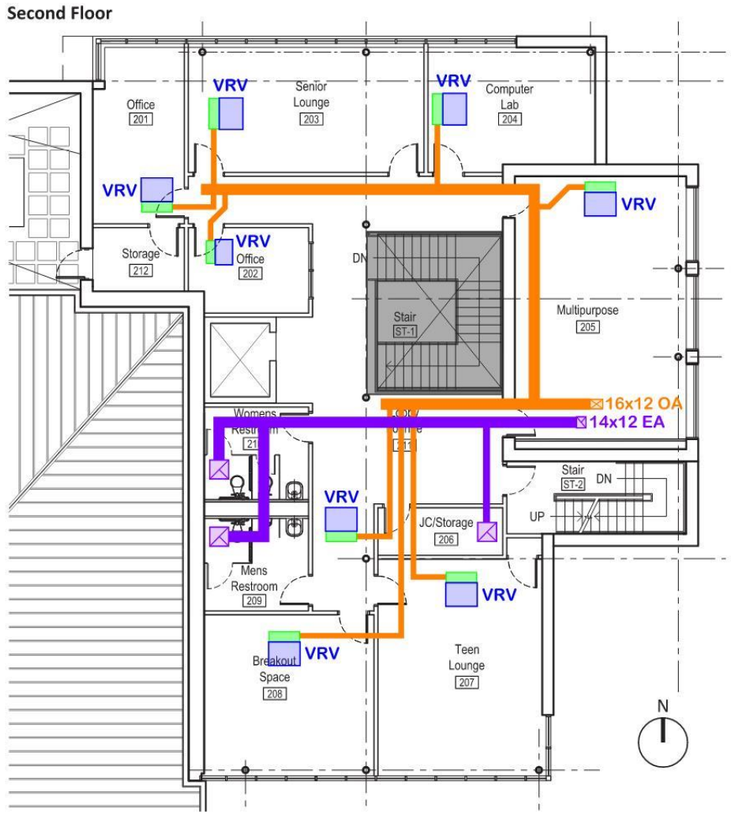



*Figure 6 – DOAS Ductwork Layout*

### *3.6 Miscellaneous HVAC*

Exterior stairwell *ST-2* will be served by a 1-ton cooling-only ductless split system (DSS) consisting of a wall-mounted indoor unit, a roof-mounted outdoor unit, a packaged controller, refrigerant piping, and integral condensate pump. The wall-mounted indoor unit will be located at the top of the stairwell. The base of the stairwell will be provided with a 2-kilowatt electric cabinet unit heater (ECUH).

A dedicated 1-ton cooling-only split system will be provided at the top of the machine-room-less elevator hoistway to extend the service life of elevator equipment.

An electric radiant heater will be provided to heat each second-floor restroom.

### *3.7 HVAC Controls*

A central controller equal to Daikin iTouch Manager will be provided to monitor and control of the VRV system. The system will be equipped with the following capabilities: remote monitoring, adjustment of setpoints, status/alarms, scheduling, and trending.

The DOAS will be provided with a packaged, microprocessor-based stand-alone unit controller which can control leaving air temperature, maintain building pressurization, provide dehumidification, run in the air-side economizer mode of operation, and facilitate remote monitoring and remote setpoint adjustment. The controller will also be capable of recording and relaying status and alarm and may be programmed to customize scheduling and trending. The DOAS controls will be integrated into the VRV system central controller. HVAC control architecture is described by figure 7, below:

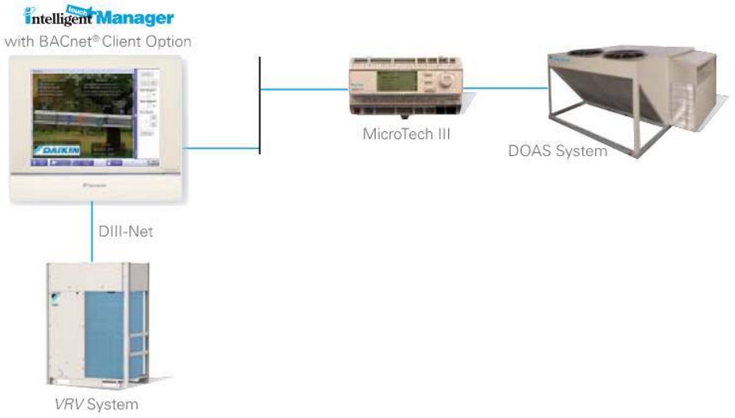



*Figure 7 – HVAC Controls Architecture*





## 4 Proposed Plumbing and Fire Protection Systems

### *4.1 First Floor Work*

The existing mop sink on the first floor will be demolished; plumbing services to the mop sink will be demolished back to mains and capped. A new mop sink will be provided in Janitor's Closet 109; plumbing services will be extended from existing infrastructure to the new mop sink. The existing slab-on-grade must be saw-cut and trenched to facilitate reconnection to the existing sanitary system.

A simplex elevator sump pump and oil minder system equal to Liberty Pumps ELV290 will be provided at the elevator hoistway. The sump pump will discharge to the existing storm piping system via an indirect connection. The sump pump and oil minder system will be configured as follows:

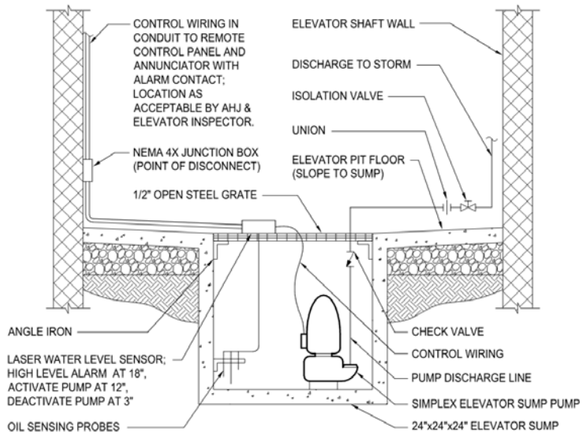



*Figure 8 – Elevator Simplex Sump Pump*

### *4.2 Second Floor Work*

A 1.5-inch domestic cold-water line, a 1-inch domestic hot water line, and a 3/4-inch domestic hot water return line will be extended from the first floor to serve the proposed second-floor mop sink, water closets, urinal, and lavatories. Domestic hot water return branches will be provided with balancing valves to facilitate code-compliant and energy-efficient operation.

A new 4-inch sanitary line will be provided to receive waste from second-floor fixtures. This line will drain to the existing sanitary system below the first-floor slab. Sanitary venting will be provided to maintain trap seals throughout the system. New vents will be provided through roof to serve new and existing venting systems.

Condensate drainage piping will be provided from each indoor VRV and DSS unit and will discharge to storm.

### *4.3 Rooftop Work*

Existing systems which previously terminated at the roof will be extended to the new second-floor roof. These systems include four (4) 3-inch roof drains, two (2) vents-through-roof, one (1) roof hydrant and one (1) gas line. The gas line will be reconnected into relocated equipment and will be extended to new equipment.

### *4.4 Fire Protection*

A new 4-inch fire suppression service will be provided to serve a new NFPA 13 wet pipe sprinkler system within the building. An ASSE 1048 double-check-detector backflow prevention assembly will be provided at the service entrance, and a fire department connection will be provided at the address side of the street. Each floor will be provided with a sprinkler zone valve assembly, and recessed-concealed sprinkler heads will be provided to serve the existing first floor and the new second floor.

A dedicated standpipe will be provided to serve the vegetated roof as required by NFPA 14. Total system flow is anticipated to be 500 GPM with street pressure achieving 65 PSI at the top of the standpipe. A fire pump is not anticipated (to be confirmed once a fire hydrant flow test is performed by DC Water).

*Add Alternate: Provide sprinkler coverage of the existing gymnasium (7,200 SF, Light Hazard)*





## 5 Existing Electrical Systems

### *5.1 Codes and Standards*

The scope of work will be designed to meet the requirements of the following codes and standards:

- ✓ 2017 District of Columbia Building Code.
- ✓ 2017 District of Columbia Energy Conservation Code.
- ✓ 2017 District of Columbia Green Construction Code
- ✓ 2015 International Fire Code.
- ✓ 2014 National Electric Code (NFPA 70)

### *5.2 Existing Power Distribution*

- ✓ The building electrical service is rated at 800A, 208/120V, 3-phase, 4-wire and feeds a main switchboard located in the ground level. The switchboard feeds three panels located within the same room. Panel R1 is fed with a 225 amp breaker. Panel M1 is fed with a 400 amp breaker. Panel L1 is fed with a 400 amp breaker. Each panel is supplied with 42 breaker spaces. All existing wiring in open areas is run in EMT, and wiring in concealed spaces is either MC cable type or run in EMT, contingent on the site specific conditions.

### *5.3 Existing Fire Alarm*

The existing fire alarm system utilizes a combination of audio/visual and visual devices and seem to be maintained. The system is digitally addressable and uses horns to notify occupants of fire alarm emergencies. Smoke detection systems are strategically placed throughout the facility to provide adequate detection capabilities in code-recommended spots. Manual pull stations are adequately spaced throughout the facility in accordance with NFPA and IBC requirements.

### *5.4 Existing Lighting and Lighting Controls*

- ✓ Existing lighting fixtures consist of 2'x2' recessed LED fixtures in office spaces, recessed round compact LED downlights in restrooms, and high-bay LED pendants in gym areas.
- ✓ All lighting is currently controlled via occupancy sensors with manual override switches located within the zones which are controlled.
- ✓ Emergency lighting and exit signs are powered via emergency generator backup power.

## 6 Proposed Electrical Systems

### *6.1 New Power Distribution System*

The existing electrical distribution system is sufficient to support the proposed renovations and addition of a new level. Approximately 3.0 watts per square foot are available for utilization by general purpose power systems and 1.0 watt per square foot is available for utilization by lighting. With an allocation of 10kW for plumbing equipment and an initial estimate of 85kW (24 tons) of HVAC equipment on the 2nd floor, the existing service of 800A has been determined to be sufficient to support new loads in the scope of work.

Space will be allocated to accommodate on level 2 to house a branch circuit panelboard serving that floor. The panelboard will be provided with a fully rated copper neutral and ground bus bar. The panelboard will be fed by using new copper conductors/feeders in a new conduit system. Integral or externally mounted Transient

voltage surge suppression (TVSS) or surge protection device (SPD) will be provided for the branch circuit panel. The panelboard will be rated at 208/120V, 3-phase, 4-wire, 250A, 60 poles, and 10kAIC. The provision would be made for a minimum 25% spare capacity for future expansion. The entire system will be grounded in accordance with the current code guidelines.

An EMON/DMON meter will be provided for the new panelboard to meter all loads connected to the panelboard. An additional, standalone multi-load metering station will be provided as required for green code requirements, model Setra Power Meter (12 Pole Multi-Load). HVAC and lighting loads will be connected to the multi-load center for independent tracking and monitoring purposes.

### *6.2 New Emergency Power Distribution System*

Emergency lighting will be provided throughout all interior egress areas of the building. All egress corridors/ pathways, stairs, exit doors etc. will be provided with the emergency lighting fixtures. These fixtures will have minimum 90min battery backup. In addition to the emergency lighting fixtures, exit lighting fixtures will be strategically located and provided throughout all interior exit pathways and corridors as well as at the designated exit doors. Exit signs will be specified with a LED light source and red color lettering.

### *6.3 General Lighting System*

The general lighting will be provide using mainly ceiling recessed Light Emitting Diode (LED) type lighting fixtures throughout the building. In selected located, these fixtures will be supplemented with special luminaires to address any special functional requirements and/or to create special visual effects. These fixtures will be equipped with Light Emitting Diode (LED). Lighting fixtures in the storage rooms, mechanical rooms, electrical rooms/closets, and telecom rooms etc. will be provided with LED strip lighting fixtures and with wire guards.

The lighting system will be designed to conserve energy and minimize glare, while providing a pleasant, comfortable and functional work environment. The guidelines set forth by the Illuminating Engineering Society of North America (IESNA), will be used to establish target-maintained illumination levels throughout each area. A minimum design parameter of 50 footcandles will be used for all meeting/teaching spaces, 10 footcandles will be used for all transitional spaces, 35 footcandles will be used for all private areas, and 20-30 footcandles will be used for all public areas. Specific impact of glare, task complexity, surface reflectance characteristics, ceiling brightness, and usage will be considered while designing the lighting system.

Exterior wall mounted lighting fixtures will be also LED type and will be controlled via photocell and time clock combination. The photocell will be integral to each roof-mounted light fixture, and shall automatically turn the fixtures ON, while the time clock will override the photocell to automatically turn the fixtures OFF at a pre-set time. These fixtures will provide adequate illumination near any equipment and/or access points to create safe and secure pathways. The fixtures located over or near any access to the exterior of the building will be provided with battery packs with min 90min runtime.

### *6.4 Lighting Control*

Local control will be provided via vacancy and occupancy sensors with dimmer switches for all interior non-emergency lighting in the building. Areas that are in daylight zones will be controlled by daylight sensors as required by the code. The vacancy and occupancy sensors will consist of ceiling mounted sensor devices that operate in conjunction with the relay units. These sensors send the signals to the respective relay units located in the space to turn the associated lighting fixtures on and/or off. Full On, Off, 50%, and AV (as required) levels of lighting control will be provided, in accordance with any applicable local and state codes/sustainability requirements.

Similarly, the occupancy and vacancy sensors utilizing ultrasonic technology will be utilized for all the restrooms. Ultrasonic sensors typically detect changes in the air pressure produced by the occupants in the space and do not need to “see” the occupants for the activation. The sensors using a combination of ultrasonic and passive-infrared technology will be used in all other interior spaces. The passive-infrared technology





detects heat motion and needs to “see” the person moving for activation. The sensors incorporating dual technology will be used to prevent false activation, which may result from air motion produced by HVAC systems. The dual technology sensors also limit inappropriate deactivation, which may result when small movements are not detected. All sensors will be equipped with time delay, sensitivity adjustment, and daylight compensation features.

### *6.5 Wiring Devices*

New 20 amp grounding type duplex convenience receptacles will be provided the building on an as needed basis and per new space and furniture layout and related requirements. All corridors will have duplex outlets a minimum 50 feet on center. A minimum one duplex receptacle will be provided in each utility and storage room. Duplex receptacles will be provided within 25 feet of the mechanical equipment. All receptacles exposed to the weather will be in NEMA 3R enclosures and equipped with ground fault interrupter type features. The ground fault interrupter type receptacles will be provided within 6 feet of sink areas, private bathrooms and where required by code. All receptacles will be tamperproof as required by the applicable codes.

All HVAC motors and equipment will also be wired based on the manufacturers’ requirements and recommendations. All the motors will be provided with the motor controllers and disconnect switches. All major equipment will be provided with either the fused or non-fused safety switches, based on the actual name plate data. All motor controllers/starters will be a minimum NEMA Size 1 in NEMA 1 enclosure unless required otherwise due to the environmental conditions. All disconnect switches will be heavy duty, either NEMA Type 1 or 3R, depending on the environment at the installed location. All fans with the fractional HP motors will be wired via motor rated switches with thermal overload protection.

All branch circuit wiring will be copper, type THHN or THWN, minimum #12 AWG in minimum 3/4-inch conduits. All circuits serving the computer outlets will have isolated ground wire, which will be connected to the dedicated grounding system/rod. All interior conduits will be Electrical Metallic Tubing (EMT) unless required otherwise by code. All exterior exposed conduits will be Galvanized Rigid Steel (GRS) and all exterior underground conduits will be PVC Schedule 40, unless required otherwise by code.

Dedicated empty conduits with pull strings will be provided for AV/IT systems as required. Conduit systems will be routed from the demarcation point for the building up to the second floor AV/IT closet. Supplementary conduit runs from the 1st floor IT closets will be provided as directed by the AV/IT consultant.

### *6.6 Fire Alarm System*

The current system is an intelligent zoned, horn evacuation, fully addressable system, which accommodates current life safety standards and meets the requirements of current local and national fire codes & the provision of the ADA. Calculations by fire alarm vendor will be necessary prior to the start of construction. A new fire alarm extender panel and terminal cabinet will be provided for the 2nd floor. An additional fire alarm extender panel and terminal cabinet will be provided for the renovated space on the lower levels as necessary (contingent on the calculations of the fire protection engineer). New manual pull stations will be provided within 5’ of designated exit doors. New fire alarm audio/visual devices will be provided throughout the building, in compliance with the present code. New smoke detectors will be provided in the utility rooms. New Duct mounted smoke detectors will be provided in all large HVAC units, as required by code. All sprinkler system devices will be tied to the FACP and fire alarm system. All new fire alarm devices will be compatible with the existing system.