



ROANOKE COUNTY

Purchasing Division

5204 Bernard Drive, Suite 300-F, P.O. Box 29800
Roanoke, Virginia 24018-0798
TEL: (540) 772-2061 FAX: (540) 772-2074

January 13, 2021

ADDENDUM NO. 1 TO ALL BIDDERS/OFFERRORS:

Reference – IFB 2021-062

Description: Bent Mountain Center “Change-of-Use” & Interior Renovations

Issue Date: December 16, 2020

Proposal Due: January 22, 2021

The above Project is hereby changed as addressed below:

- A. Pre-Bid Conference Sign-In Logs – from the pre-bid conference held on December 29, 2020, included as Attachment A to this addendum.
- B. Extension of Due Date —The due date and time for this IFB is hereby extended, due to the extent of clarifications offered and the need for additional revised drawings. Bids must be submitted to the Roanoke County Purchasing Division no later than **Friday, January 22, 2021 at 2:00 PM EST**.
- C. Revised Sheets M3.1, M4.01, and A1.03 – Revised plans are hereby included as attachments to this Addendum 1 to IFB 2021-062. These revised plans shall supersede the original plans in the event of any conflict, and serve to update the scope of work to be included in the base bid and alternates, as applicable.
- D. RFIs – Questions received by prospective bidders, and the responses provided by Roanoke County as we are able, are listed below for review.
 1. Drawing M4.01 includes a “Scope of Work for Controls” and a “Sequence of Operations”. May we request Additional Information regarding the Existing Controls Systems for the Facility? Whose “Building Existing Front Controls” are currently in the facility?
Please see revised sheets M3.1, M4.01 and A1.03 (list of alternates), which have revisions for the scope of work for the HVAC controls system, including a requested Alternate regarding HVAC controls.
 2. Does Roanoke County want to specify or indicate whose brand/system of Controls that they want to see go into the facility?
Please see revised sheets M3.1, M4.01 and A1.03 (list of alternates), which

have revisions for the scope of work for the HVAC controls system, including a requested Alternate regarding HVAC controls.

3. Where is/are the Existing Front End Control Panel within the Existing Facility? Please see revised sheets M3.1, M4.01 and A1.03 (list of alternates), which have revisions for the scope of work for the HVAC controls system, including a requested Alternate regarding HVAC controls.
4. Regarding the bid form unit prices for ACT & Plaster/GWB replacements, are we to include the marked areas on the drawings for ceiling replacement in our base bid? I.e., is the unit price for additional area(s) that may need ceiling replacement, but aren't noted on the drawings? Or will all of this type work be subject to the unit prices? Also, please confirm the unit price needs to include removal (including hazardous abatement, if required) and replacement?
The ceiling areas specifically marked on sheet A1.02 as being replacement ceiling areas are to be included in the base bid. The unit price requested is for other areas that may be unforeseen at this time that may require removal and replacement in order to access equipment to be replaced. The unit price shall include removal of existing ceiling and replacement with new ceiling, for each ceiling type.
5. Will builders' risk be required per section 4a of p. 57 of IFB? It states 'At the discretion of the County'.
Builders' risk will not be required for this work.
6. Sheet M1.04 is listed in the drawing index, but is not found in the drawing set. Please advise.
M1.04 was consolidated with M1.03 prior to issuing the bid drawings. As such, there is no M1.04; please disregard references.
7. Sheet P1.02 is listed in the drawing index, but is not found in the drawing set. Sheet P2.01 is found in the drawing set, but not listed in the drawing index. Are these the same drawing? Please advise.
Yes. The sheet number was changed at the last moment, so there is no P1.02; please disregard references.
8. We cannot locate a sidewalk profile. Please advise stone type and thickness.
Concrete sidewalks shown are replacing sections of existing sidewalk, so sidewalk replacement to be 4" thick concrete as specified on sheet A1.01, over existing gravel base.
9. Please provide an asphalt section detail.
The asphalt pavement shown is replacing an area of existing asphalt, so please assume existing pavement base to remain, with thickness of new topping asphalt as required to achieve the parking slopes shown.

10. Is RTU #2 to be removed as a part of the Base Bid? With Alternate #3 encompassing the provision & installation of a new RTU#2? Or is RTU #2 removal to be included in Alternate #3?
RTU #2 shall be priced to remain with the Base Bid, and shall be priced as an Add/Alternate (Alternate #3) to be replaced as specified on the Mechanical Drawings. Drawing sheets A1.03 and M3.02 have been revised/updated so the RTU number is correct. Please note, the Add/Alternate shall include any roofing/flashing work associated with RTU replacement.

11. Sheet A1.03 – Add/Alternate #3: Note advises that RTU #3 is to be removed and replaced. On the same drawing, a separate note denotes RTU #2 as the RTU of interest. An additional note labels existing RTU #3 to remain. Please advise.
Drawing sheets A1.03 and M3.02 have been revised/updated so the RTU numbers are correct and agree. Add/Alternate #3 is for the replacement of RTU #2.

12. For the stage lift, are you accepting bids from other manufacturers or just RAM?
Yes. The lift noted was simply a “Basis-of-Design”, but other manufacturers’ may be submitted if they meet the requirements.

13. Section 7 of the IFB states that 2 copies of the bid are required in addition to the original, however, the last page of the Bid Form states that 1 copy is required. Section 7 also states that 2 digital copies are required. Due to the tight timing between when subcontractor pricing is received and the GC bids are due to the Owner, can one original copy be submitted? Please advise.
One original signed copy is the absolute requirement. Number of copies and digital copies may be waived as formalities and would not necessarily disqualify a Bidder.

14. The IFB cover page requires a signature but the bid form does not have a signature area. Please advise.
Both a signed copy of the cover page, and a completed Bid Form (Attachment A) are required to be included in the bid submission. An original signature on pages 2-3 of the IFB document verifies the accuracy of the overall bid submission, including the Bid Form.

15. E1.1: Alternate 1 ask to change lights to new lamps. Is this for all fixtures in the area of work to be done?
Yes, the request is to change the lamps throughout the entire building-including the former school, the gym, the kitchen and the restrooms. The replacement shall be a “like kind” replacement.

16. E1.1: Are the bulbs to go to LED or stay fluorescent?
Any existing fluorescent shall stay fluorescent, UNLESS the replacement to

LED lamps (including any ballast changes) is less expensive.

17. E1.1: Is there any work to be done with rooftop unit # 3?

No. But, there will be some electrical work associated with the Add/Alternate #3 for replacement of RTU #2. This is anticipated to be re-connecting to existing circuit(s) only.

18. E2.1: There are some lights that are darker than others; are these lights to be changed with bulbs or new lights? Do we need to do anything with the lights that are not the darker shade?

All existing light fixtures shall receive new lamps/bulbs. We are not anticipating new light fixtures, except for emergency lighting and lighted exit signs. Please note that all locations shown for exit and emergency lights are to be new fixtures.

19. E2.1: The lights in the 121-meeting room are not the same as shown on the drawing, they say pendent lights, but the lights are 2x4.

The existing lights in Room 121 shall remain and shall have lamps replaced. The number of lamp replacements in Room 121 shall be verified by Bidder as part of the Base Bid.

20. E2.1: Note 7 calls for replacement of the emergency lights. Is there a specified light to replace them with?

Lithonia Model EU2C LED, or equivalent fixture may be used by other manufacturers.

21. E2.1: If we are changing the bulbs out in the gym, is the use of a lift permitted on the gym floor?

The gym floor is a concrete slab, so yes, a lift may be used. But, some layer of protection shall be put down for the lift to roll over so the gym flooring is not damaged.

22. E3.1: Can the exit and emergency light be surfaced mounted on the walls with exposed conduit?

Yes, surface-mounted is acceptable for new locations, but in locations where it is a simple replacement they shall match what is currently in place.

23. E3.1: F-5 is this a new fan? It says to connect to existing circuit. Do we need to provide a means of disconnect for this? If so, what size does this need to be?

Yes, this is a replacement fan, re-wired to existing circuit as is.

24. E3.1: Fire alarm, is this something the county will be using their own company to complete this or can outside company work on the system?

All work shown on the Bid Documents is part of the Bidder's scope of work for this project, unless specifically designated as "by owner." Yes, an outside

company can work on the existing fire alarm system.

25. E3.1: Can the fire alarm be surface mounted?

Surface-mounted is acceptable for new locations. However, in locations where it is a simple replacement they shall match what is currently in place.

26. The Lighting Schedule (Sheet E1.1) has a note on the bottom, Note #1, stating “schedule is image of schedule shown from original drawings for Bent Mtn. Elementary, by SFCS., 1989.” All of the lighting fixtures that appear on Sheet E2.1 appear to have corresponding fixtures listed on the Finish Schedule (all of which are understood to be EXISTING fixtures).

a. Per that understanding, are all fixtures shown on Sheet E2.1 Existing?

Yes; with the exception that any emergency lighting or lighted exit signs are to be new. See answers to other questions submitted, for further explanation.

b. If all fixtures shown on Sheet E2.1 are existing, then will you please provide further clarification as to the quantities and locations of existing fixtures? For example, in the Kitchen (Room 133), the drawings are representative of a different fixture layout than what is actually present on site.

The existing lights throughout shall remain and shall have lamps replaced. The number of lamp replacements in each room shall be verified by the Bidder as part of the base bid.

c. If all fixtures shown on Sheet E2.1 are existing, please provide a drawing that is representative of the locations, quantities, and types of new fixtures.

This will be addressed in a separate addendum with updated drawings.

d. If there are both New and Existing fixtures shown on Sheet E2.1, please provide further clarification for differentiation between the two.

The County does not anticipate new light fixtures, except for emergency lighting and lighted exit signs.

27. Detail 2 on Sheet A1.01 is showing the new door elevation *without* a transom.

The existing door openings that are getting replaced have transoms, please confirm that the rough openings will need to be framed in to accommodate a standard 3'0" x 7'0" door & frame? Please advise.

Yes, please include 2x wood framing and 5/8" fire-code GWB to frame in the existing opening for a standard 3'x7' door and frame. This should affect two doors: the door from the corridor into classroom 123, and the door from the corridor into open office 126.

28. Spec Section 081113-4 calls for the painting of newly installed door frames.

What about existing door frames? Haven't found finish direction on the drawing for such. Please advise.

Painting of existing door frames is only required if those doors will be disturbed during construction processes. If so, one coat of finish matching the paint specification will suffice.

29. Per scope of work for controls on Sheet M4.01, the system front-end controls shall be expanded to accommodate the new equipment. What is the existing system in the building so that the appropriate vendor can be contacted in preparation for proposed expansion and integration of new equipment?

Please see revised sheets M3.1, M4.01, and A1.03 (list of alternates), which have revisions for the scope of work for the HVAC controls system, including a requested Alternate regarding HVAC controls.

30. There is much confusion concerning the scope of hazardous abatement for the Bent Mtn. Community Center project. Would the Owner consider creating an allowance for such?

No allowance will be made; any asbestos present has been clearly identified in the report, therefore it is the expectation of the County that the Contractor shall be able to determine what if any abatement shall be necessary for the work as specified.

31. Can you provide dates for the following items: start date, substantial completion date, and final completion date?

The IFB specifies project completion seven (7) months from the issuance of a Notice to Proceed. However, there are too many variables to consider for the County to be comfortable assigning specific dates.

Note: A signed acknowledgment of this addendum must be received at the location indicated on the original solicitation either prior to the proposal due date or attached to your proposal. Signature on this addendum does not substitute for your signature on the original proposal/bid document. The original proposal/bid document must be signed.

Thank you,

Kate Hoyt
Phone: (540) 283-8149
KHoyt@roanokecountyva.gov

Sign Name:

Print Name:

Name of Firm:

Date:

IFB #2021-062 Bent Mountain Center Renovations

December 29, 2020

10:00 AM

(PLEASE PRINT)

Name/Title David Vogelsong / Director
Organization S.C. Rossi & Company
Email & Phone dvogelsong@scrossi.com (540) 400-2386

Name/Title James Green, Project Manager
Organization S. C. Rossi & Co., Inc.
Email & Phone jgreen@scrossi.com (540) 598-5417

Name/Title Ronnie Graham V.P.
Organization R.L. Lucas Construction Inc
Email & Phone rgraham@lucas-construction.com 540.597-0380

Name/Title David Alderman
Organization White Electrical Services
Email & Phone david@whiteelectricalservices.com 540-400-1456

Name/Title Aaron Yost
Organization MB Contractors
Email & Phone ayost@mbcontractors.com 540 342-6758

Name/Title Jeff Russell
Organization Russell's Remodeling Inc
Email & Phone Jeff-Russell-98@yahoo.com

Name/Title Steve Schmitt
Organization R.L. PRICE CONSTRUCTION
Email & Phone BIDROOM@RLPRICE.COM

Name/Title Josh Schmitt
Organization R.L. PRICE CONSTRUCTION
Email & Phone

IFB #2021-062 Bent Mountain Center Renovations

December 29, 2020

10:00 AM

(PLEASE PRINT)

Name/Title MICHAEL SCHMITT

Organization RL PRICE CONSTRUCTION

Email & Phone _____

Name/Title Travis Schmitt

Organization RL Price Construction

Email & Phone _____

Name/Title Chris Reed

Organization E. Luke Greene Co

Email & Phone chris@elukegreeneco.com 540 521 9183

Name/Title Jeff Loveless

Organization TCI Construction Services

Email & Phone (540) 389-6770 jloveless@tci.cs.com

Name/Title Kent Brown

Organization WEL Inc.

Email & Phone kent.brown@welinc.com 540-682-9768

Name/Title David Altman

Organization Comfort Services

Email & Phone 540 - 598 - 7964 DAltman@ComfortServicesHVAC.Com

Name/Title Roger Ransom

Organization Comfort Services

Email & Phone Ransom@comfortservicesHVAC.com / 540 598 7965

Name/Title RUSTY BROWN

Organization THOR Construction

Email & Phone estimating@thorconstruction.com / 540 580 4058

IFB #2021-062 Bent Mountain Center Renovations**December 29, 2020****10:00 AM****(PLEASE PRINT)**

Name/Title Tim Graver V.P. Operations

Organization Price Buildings Inc

Email & Phone tim.graver@pricebuildingsinc.com

Name/Title JEFF AUSTIN / CHIEF ESTIMATOR

Organization F&S Building Innovations

Email & Phone JEFF@FSBUILDINGINC.com 540-985-9160

Name/Title Danny Jarrett / Project Mgr

Organization Kegley Electric

Email & Phone djarrett@kegleyelectric.com 540-400-1451

Name/Title KEVIN MAZE

Organization PALLAMAN HVAC

Email & Phone KEVIN.G.MAZE@PALLAMANHVAC.COM

Name/Title TITO SAIZ / Owner

Organization /

Email & Phone TITO.SAIZ@PAK.COM

Name/Title Greg McDaniel Proj Mgr / Estimator

Organization Corell Electric

Email & Phone gmcdaniel@corell@yahoo.com 540-817-3784

Name/Title Britney Chitwood Project Admin

Organization G&H Contracting

Email & Phone BChitwood@ghcontracting.com 387-5059

Name/Title JOSH BEISLEY ESTIMATOR

Organization BUILDING SPECIALISTS INC

Email & Phone JBEISLEY@BSI-VA.COM

LIST OF ADD/ALTERNATES

THE FOLLOWING LIST INCLUDES ITEMS TO BE BID AS SEPARATE FROM THE BASE BID.

ADD/ALTERNATE #1: INSTALL OF NEW ACCESSIBLE LIFT FOR GYM STAGE, AS SHOWN ON SHEET A1.03, INCLUDING NEW POWER FEED SPECIFICALLY SHOWN IN ELECTRICAL DRAWINGS.

ADD/ALTERNATE #2: RE-LAMP ALL EXISTING LIGHT FIXTURES AS NOTED ON ELECTRICAL SHEETS E2.1 (SHEET SPECIFIC NOTE 7) AND E3.1 (GENERAL NOTE 1).

ADD/ALTERNATE #3: REMOVE AND REPLACE RTU #2 AS NOTED IN MECHANICAL DRAWINGS.

ADD/ALTERNATE #4: PROVIDE NEW CONTROLS SYSTEM FOR HVAC SYSTEM AS NOTED ON SHEET M4.01

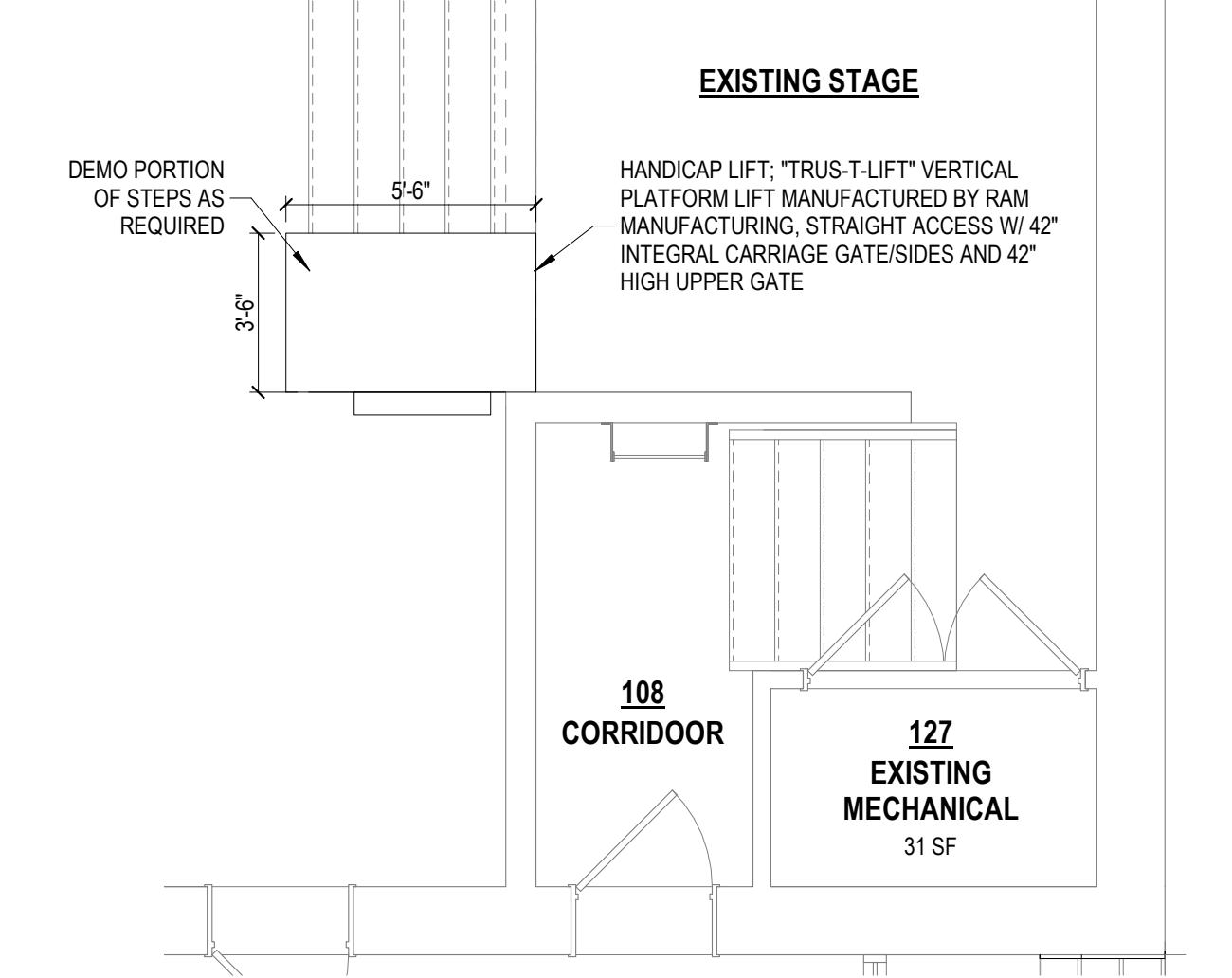
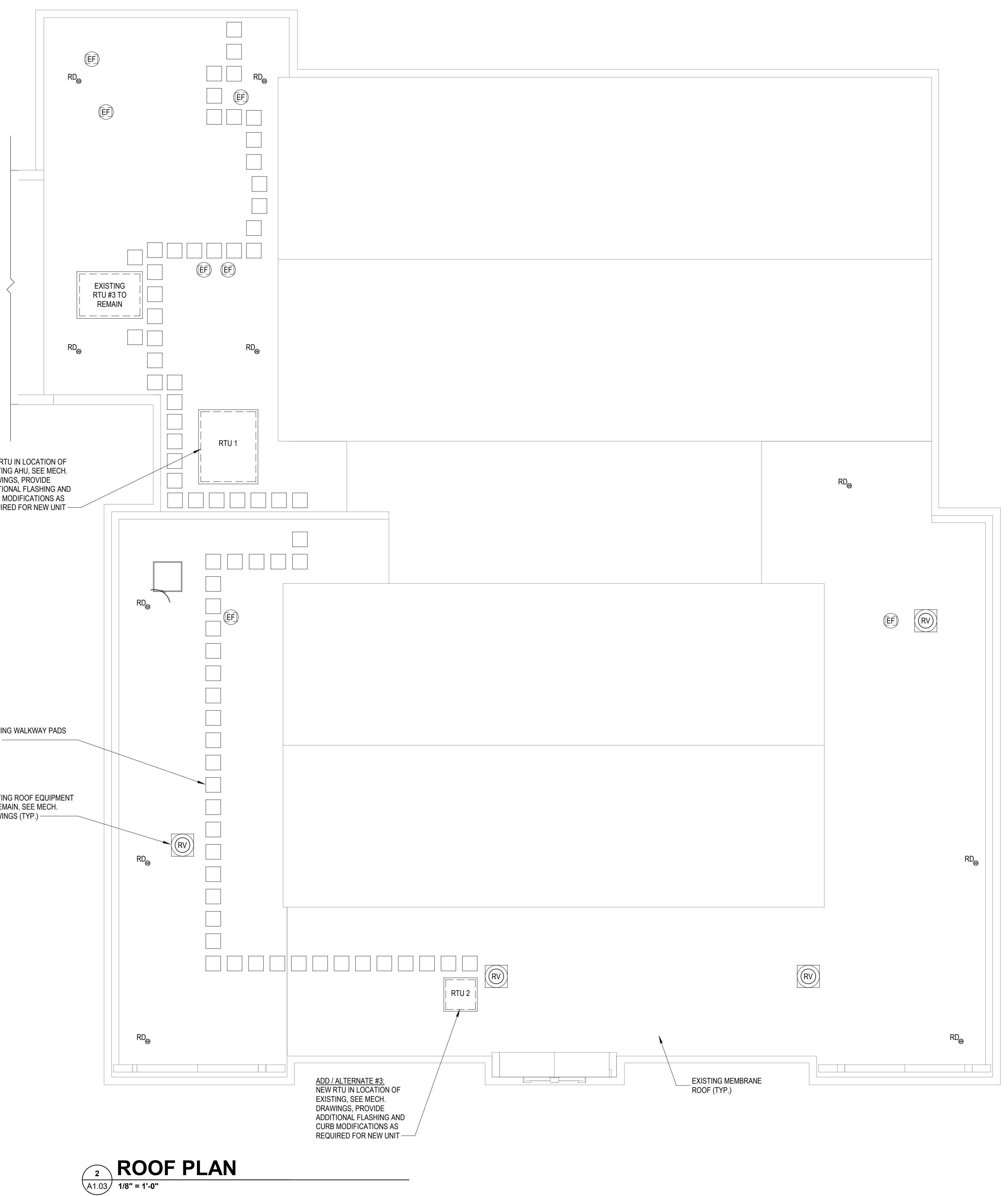
1/11/2021



ROOM FINISH SCHEDULE							
ROOM NO.	ROOM NAME	FLOOR	BASE	WALL	CEILING	MTL.	MTL.
100	EXISTING LOBBY	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
101	CORRIDOR	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
102	CORRIDOR	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
103	CORRIDOR	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
104	VESTIBULE	EXIST.	EXIST.	EXIST/GWB	EXIST/PAINT	EXIST.	EXIST.
105	CORRIDOR	EXIST.	EXIST.	EXIST.	EXIST/PAINT	EXIST.	EXIST.
106	CORRIDOR	EXIST.	EXIST.	EXIST.	EXIST/PAINT	EXIST.	EXIST.
107	VESTIBULE	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
108	CORRIDOR	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
109	CORRIDOR	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
110	EXISTING ELECTRICAL / MECHANICAL ROOM	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
111	CLASSROOM / MEETING ROOM	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
112	CLASSROOM / MEETING ROOM	EXIST.	EXIST.	EXIST.	EXIST/GWB	PAINT	NOTE 4, 10
113	EXISTING OFFICE	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
114	CLOSET	EXIST.	EXIST.	EXIST.	PAINT	EXIST.	EXIST.
115	EXISTING OFFICE	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
116	EXISTING RESTROOM	EXIST.	EXIST.	EXIST.	PAINT	EXIST.	EXIST.
117	EXISTING OFFICE	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	NOTE 8
118	EXISTING OFFICE	EXIST.	EXIST.	EXIST.	EXIST/GWB	PAINT	NOTE 4, 10
119	EXISTING OFFICE	EXIST.	EXIST.	EXIST.	EXIST/GWB	PAINT	NOTE 4, 10
120	EXISTING CLOSET	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
121	MEETING ROOM	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
122	CLASSROOM / MEETING ROOM	EXIST.	EXIST.	EXIST.	EXIST/GWB	PAINT	NOTE 4, 10
123	CLASSROOM / MEETING ROOM	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	NOTE 3, 6, 8
124	CLASSROOM / MEETING ROOM	EXIST.	EXIST.	EXIST/GWB	EXIST/PAINT	ACT/GWB	EXIST.
125	EXISTING OFFICE	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	NOTE 8
126	OPEN OFFICE	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
127	EXISTING MECHANICAL	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
128	UTILITY ROOM	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
129	EXISTING GYM-CAFETERIA	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
130	EXISTING MEN'S BATHROOM	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	NOTE 9
131	EXISTING WOMEN'S BATHROOM	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	NOTE 9
132	EXISTING KITCHEN	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
133	KITCHEN RESTROOM	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
134	KITCHEN STORAGE	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.
135	KITCHEN STORAGE	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.

GENERAL FINISH NOTES

- FINISHES SHOWN HEREIN ARE SCHEMATIC. CONSULT WITH OWNER FOR ALL REQUIRED FINISH COLOR/TEXTURES. OWNER SHALL HAVE CHOICE OF COLOR FROM MANUFACTURER. FULL RANGE OF COLORS FOR ALL FINISHES SPECIFIED.
- DAMAGED INTERIOR WALLS SHALL BE PAINTED TO MATCH EXISTING WALLS, CONSISTING OF (1) COAT OF INTERIOR LATEX PRIMER AND (2) COATS OF INTERIOR FINISH LATEX.
- DAMAGED ACT SHALL BE REPLACED WITH NEW CEILING TILES TO MATCH EXISTING. SEE CEILING PLAN KEYNOTES.
- DAMAGED PLASTER CEILING SHALL BE REPAIRED AND PAINTED TO MATCH EXISTING, CONSISTING OF (1) COAT OF INTERIOR LATEX PRIMER AND (2) COATS OF INTERIOR FINISH LATEX. PAINT ENTIRE CEILING IN ROOM.
- SEE KEYNOTES FOR WALL OPENING INFILL WITH GWB. PAINT ENTIRE WALL AT INFILL FROM CORNER TO CORNER.
- PATCH PAINT AT NEW DOOR(S) / FRAME(S), BLEND PAINT WITH EXISTING WALL, OR, IF NOT ABLE TO BLEND, PAINT ENTIRE WALL CORNER TO CORNER.
- PATCH / REPAIR GWB WALLS WHERE PLUMBING FIXTURES REMOVED. PAINT ENTIRE ROOM.
- REPLACE ANY ACT CEILING TILES OR GRID THAT ARE DAMAGED DURING DUCTWORK / HVAC INSTALL.
- PATCH / REPAIR GWB WALL WHERE PLUMBING FIXTURES MOVED. PAINT ENTIRE "WET" WALL BEHIND FIXTURES. (REMOVE AND REINSTALL ANY ACCESSORIES IF REQUIRED.)
- ANY EXISTING PLASTER CEILING REPAIRED WITH GWB SHALL INCLUDE THIN-COATED PLASTER AS REQUIRED TO FINISH TO "LIKE NEW" APPEARANCE.



ADD/ALTERNATE #1: STAGE HANDICAP LIFT

1 A1.03 1/4" = 1'-0"

DRAWN BY: MEA
DESIGNED BY: XXX
CHECKED BY: RWP
DATE: 1/11/2021
SCALE: As indicated
REVISIONS: 1 1/12/2021 REVISION

A1.03
PROJECT NO. 03160018.00

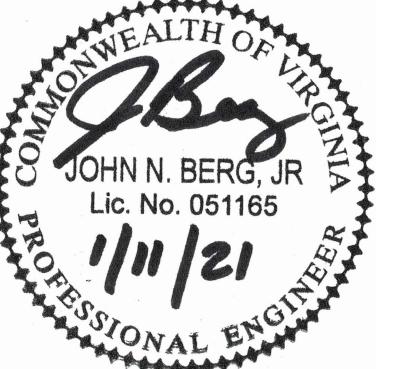


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BENT MOUNTAIN COMMUNITY CENTER
RENOVATION
MECHANICAL NEW WORK PLAN

10148 TINSLEY LANE
BENT MOUNTAIN, VA 24059

DRAWN BY
GTL
DESIGNED BY
GTL
CHECKED BY
JNB
DATE
10-06-2020
SCALE
1/8" = 1'-0"
REVISIONS

JAN. 11, 2021

GENERAL NOTES:

1. FOR EACH BRANCH DUCT AND AIR DEVICE BEING ALTERED IN THIS PROJECT, THE CONTRACTOR SHALL PROVIDE A MANUAL BALANCING VALVE TO ACHIEVE DESIRED AIRFLOW RATES INDICATED ON THE DRAWINGS.
2. AIR FLOW FOR EXISTING DEVICES IS SHOWN FOR REFERENCE. BALANCE EXISTING OUTLETS TO AIRFLOWS SHOWN.

NEW WORK KEYED NOTES:

1. BALANCE EXISTING SUPPLY/RETURN AIR DEVICE TO AIRFLOW INDICATED (CFM).
2. EXISTING EXHAUST GRILLE RELOCATED TO NEW LOCATION SHOWN. BALANCE TO AIRFLOW INDICATED (CFM).
3. EXISTING 24x10 SUPPLY AND NEW 22x10 RETURN DOWN FROM RTU-2 (EXISTING). WORK ASSOCIATED WITH REPLACING RTU-2 SHALL BE AN ADD ALTERNATE.
4. NEW TEMPERATURE SENSOR FOR ASSOCIATED VAV BOX (TYPICAL FOR ALL NEW FAN POWERED VAV BOXES).
5. WORK IN THE EXISTING OFFICE AREA SHALL BE ASSOCIATED WITH THE ADD ALTERNATE INCLUDING PROVIDING A NEW THERMOSTAT FOR THE ROOFTOP UNIT AND AIR BALANCE WORK.
6. EXTEND RETURN DUCTWORK FROM GRILLE TO RETURN AIR PLENUM. REFER TO RETURN GRILLE DETAIL FOR ADDITIONAL INFO.
7. EXISTING BUILDING AUTOMATION/DDC CONTROLLER, METASYS BY JOHNSON CONTROLS, NETWORK CONTROL ENGINE (NCE).
8. EXISTING AIR HANDLER UNIT SERVING GYM. UNIT PROVIDES HEAT AND VENTILATION WITH ELECTRIC HEATING ELEMENTS.
9. EXISTING RTU SERVING LIBRARY ON ROOF ABOVE.
10. EXISTING JOHNSON CONTROLS, FIELD EQUIPMENT CONTROLLER (FEC).

MECHANICAL NEW WORK PLAN

1
M3.01
SCALE = 1/8"=1'-0"

STOTTSBERG
ENGINEERING

www.stottsbergeng.com
540-216-0331
Project #20029

M3.01
PROJECT NO UNKNOWN



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& ASSOCIATES
PLANNERS / ARCHITECTS
ENGINEERS / SURVEYORS

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New River Valley / Staunton
Harrisonburg / Lynchburg

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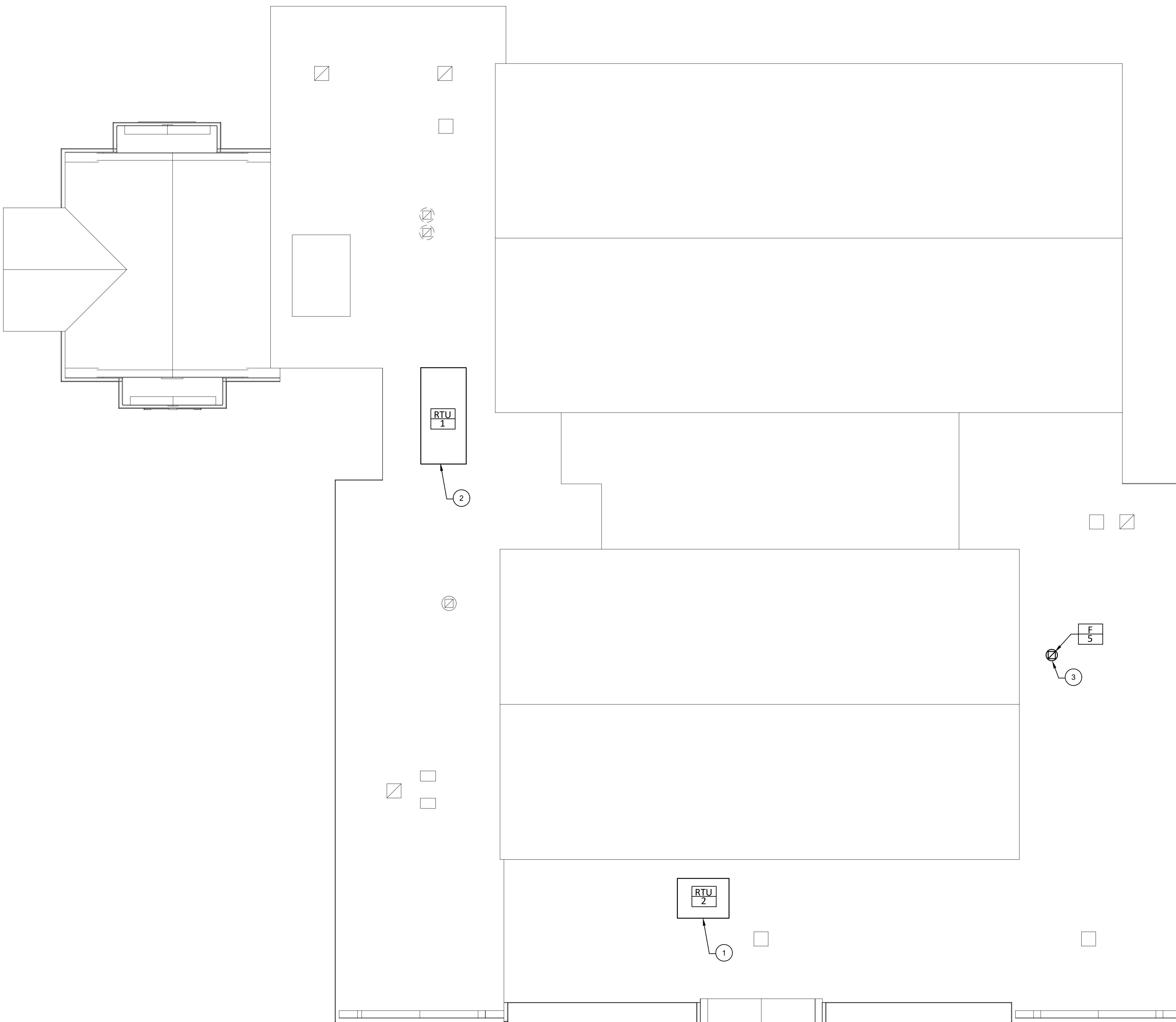


JOHN N. BERG, JR.

Lic. No. 051165

1/11/21

PROFESSIONAL ENGINEER



**BENT MOUNTAIN COMMUNITY CENTER
RENOVATION
MECHANICAL NEW WORK PLAN - ROOF**

10148 TINSLEY LANE
BENT MOUNTAIN, VA 24059

DRAWN BY GTL
DESIGNED BY GTL
CHECKED BY JNB
DATE 10-06-2020
SCALE 1/8" = 1'-0"
REVISIONS

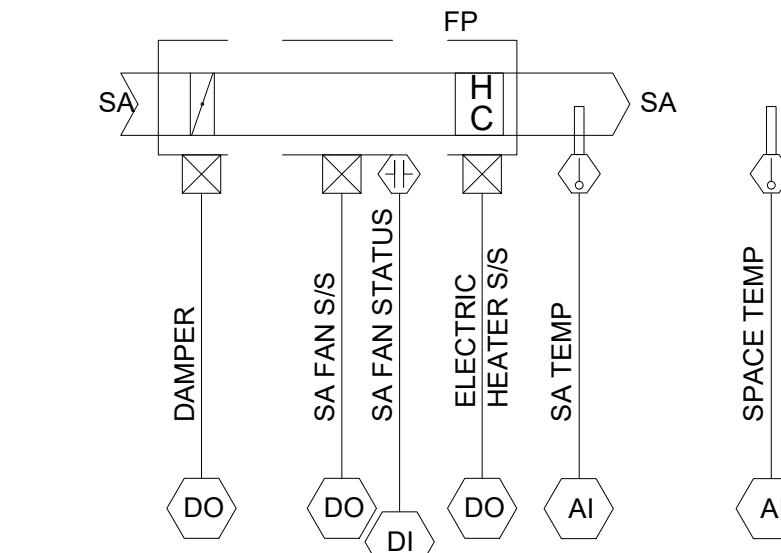
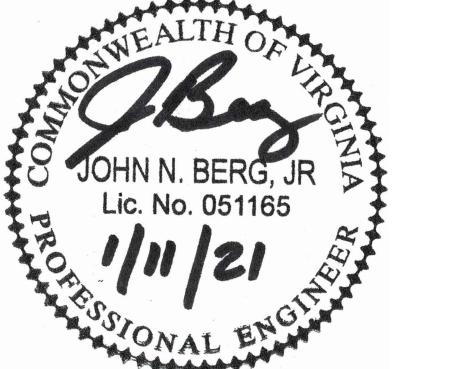
JAN. 11, 2021

MECHANICAL NEW WORK PLAN - ROOF

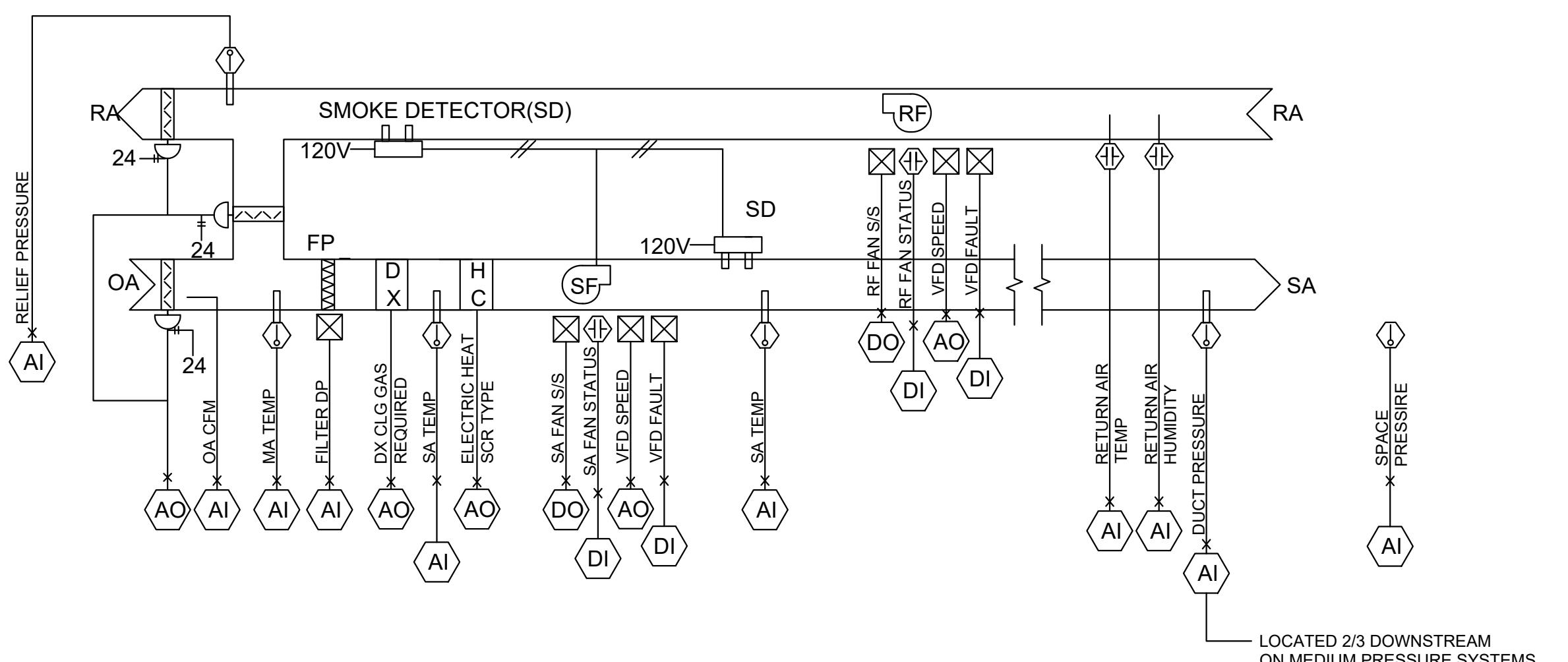
1
M3.02
SCALE = 1/8"=1'-0"

STOTTSBERG
ENGINEERING
www.stottsbergeng.com
540-216-0331
Project #20029

M3.02
PROJECT NO UNKNOWN



VAV BOX CONTROLS (FPU)



DX ROOFTOP AIR HANDLING UNIT CONTROL: RTU-1

CONTROLS LEGEND	
H	HUMIDISTAT
S	WALL SWITCH
□	TIMER
○	SENSOR
H	HUMIDISTAT
C	CO2 SENSOR
T	THERMOSTAT
S	SWITCH
□	CONTACTOR
ct	CURRENT TRANSFORMER
CR	CIRCUIT RELAY
DI	DIGITAL IN
DO	DIGITAL OUT
AI	ANALOG IN
AO	ANALOG OUT
AOP	ANALOG OUT PNEUMATIC
MA	MIXED AIR
FP	FREEZE PROTECTION
DDC	DIRECT DIGITAL CONTROLS SYSTEM
	AQUASTAT
M	MOTORIZED DAMPER (ELECTRIC ACTUATOR)
○	PUMP
MD	MANUAL DAMPER
	BACKDRAFT DAMPER
	MOTORIZED VALVE (ELECTRIC ACTUATOR) (TWO POSITION, TWO WAY)
	MOTORIZED VALVE (ELECTRIC ACTUATOR) (TWO POSITION, THREE WAY)
	CARBON MONOXIDE SENSOR

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SCOPE OF WORK FOR CONTROLS:

THE BUILDINGS EXISTING METASYS CONTROLS SYSTEM BY JOHNSON CONTROLS SHALL BE EXPANDED TO ACCOMMODATE AND GAIN FULL CONTROL OF ALL NEW MECHANICAL EQUIPMENT BEING ADDED IN THIS PROJECT INCLUDING ALL WORK IN AREAS BEING RENOVATED. THE CONTROLS CONTRACTOR SHALL FURNISH AND INSTALL A COMPLETE DIRECT DIGITAL TEMPERATURE CONTROL SYSTEMS (DDC) FOR ALL NEW EQUIPMENT AND ADD ONTO OR REPLACE EXISTING CONTROLLERS AS REQUIRED. FOR ANY NEW CONTROL PANELS, A LOCAL AREA NETWORK (LAN) SHALL BE PROVIDED TO INTERCONNECT THE SYSTEMS WITHIN THE BUILDING.

PROVIDE ALTERNATE PRICING TO REPLACE THE EXISTING JOHNSON CONTROLS METASYS BUILDING AUTOMATION CONTROLS SYSTEM IN ITS ENTIRETY WITH A NEW, FULLY FUNCTIONAL BUILDING AUTOMATION SYSTEM BY TRANE. THE NEW SYSTEM SHALL BE DIRECT DIGITAL CONTROL (DDC) TYPE CAPABLE OF CONTROLLING THE BUILDING MECHANICAL SYSTEMS AND MAINTAIN BUILDING CLIMATE. THE NEW SYSTEM SHALL BE COMPRISED OF SENSORS, CONTROLLERS, AND SHALL PROVIDE A NEW CENTRALIZED FRONT END CONTROLLER TO NETWORK ALL NEW AND EXISTING MECHANICAL EQUIPMENT AND SHALL PROVIDE WEB BASED ACCESS AND CONTROL OF THE SYSTEMS. THE EXISTING SYSTEMS TO BE INTEGRATED INCLUDE: 6 EXHAUST FANS, THE PACKAGED ROOFTOP UNIT SERVING THE LIBRARY, RTU-2 (OR EXISTING OFFICE UNIT), THE GYM AIR HANDLER, AND THE EXTERIOR BUILDING AND SITE LIGHTS.

SEQUENCE OF OPERATION:

VAV AIR HANDLER - RTU-1:

1. MORNING WARM-UP/COOL-DOWN: AT A PREDETERMINED OPTIMAL TIME CALCULATED BY THE DDC, THE DDC SHALL ENERGIZE THE UNIT SUPPLY FANS. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED, RETURN AIR DAMPER SHALL REMAIN OPEN, AND ASSOCIATED BUILDING EXHAUST FANS SHALL REMAIN OFF.
2. OCCUPIED CONTROL: DURING OCCUPANCY THE OUTSIDE AIR DAMPER SHALL BE OPENED TO ITS MINIMUM POSITION (AS REQUIRED TO MAINTAIN MINIMUM OUTDOOR AIR FLOW) AND THE INTERLOCKED BUILDING EXHAUST FANS SHALL BE ENERGIZED.
3. TEMPERATURE CONTROL: ON A RISE IN UNIT DISCHARGE AIR TEMPERATURE ABOVE 55F (ADJUSTABLE) AS SENSED BY THE SUPPLY AIR TEMPERATURE SENSOR, THE DDC SHALL MODULATE THE OUTDOOR AIR DAMPER OPEN WHILE PROPORTIONATELY CLOSING THE RETURN AIR DAMPER. ON A FURTHER RISE IN DISCHARGE AIR TEMPERATURE, THE DDC SHALL MODULATE DX COOLING ON AS REQUIRED. ON A FALL IN DISCHARGE AIR TEMPERATURE, THE REVERSE SHALL OCCUR. ON A FURTHER FALL IN DISCHARGE AIR TEMPERATURE THE DDC SHALL MODULATE THE ELECTRIC HEAT ON AS REQUIRED. AT ANY TIME THE OUTSIDE AIR ENTHALPY, AS SENSED BY THE DDC, EXCEEDS THE RETURN AIR ENTHALPY, THE DDC SHALL CLOSE THE OUTDOOR AIR DAMPER TO ITS MINIMUM POSITION, AND OPEN THE RETURN AIR DAMPER.
4. CARBON DIOXIDE CONTROL: WHEN SPACE CARBON DIOXIDE LEVEL EXCEEDS THE SETPOINT, AS SENSED BY THE SPACE CO2 SENSOR, THE DDC SHALL MODULATE THE OUTSIDE AIR DAMPER OPEN TO ITS HIGH MINIMUM POSITION WHILE PROPORTIONALLY OPENING THE RELIEF AIR DAMPER AND PROPORTIONALLY CLOSING THE RETURN AIR DAMPER TO MAINTAIN CO2 LEVELS BELOW 1000 PPM (ADJUSTABLE). IF AFTER 8 CONSECUTIVE HOURS, THE SPACE CO2 LEVEL REMAINS 10% (ADJUSTABLE) OR MORE ABOVE SETPOINT, THE AIR HANDLER SHALL ALARM THE DDC. THE DDC SHALL MONITOR RETURN AIR CO2 SENSOR AND SHALL ALARM THE DDC WHEN THE VALUE EXCEEDS ±15% (ADJUSTABLE). THE DDC SHALL NOT ALLOW THE OUTSIDE AIR DAMPER TO OPEN TO A POSITION THAT EXCEEDS THE HIGH MINIMUM POSITION UNLESS ECONOMIZER CONDITIONS PREVAIL.
5. SUPPLY FAN CONTROL: WHEN UNIT SUPPLY FAN IS STARTED, THE DDC SHALL SLOWLY RAMP UP THE SPEED OF THE SUPPLY FAN THROUGH ITS VFD AND CONTROL TO MAINTAIN A CONSTANT STATIC PRESSURE AS SENSED BY THE STATIC PRESSURE TRANSMITTER LOCATED 2/3 DOWNSTREAM OF SUPPLY TRUNK DUCT. THE DUCT PRESSURE SENSOR LOCATED AT FAN DISCHARGE SHALL PROVIDE HIGH LIMIT STATIC PRESSURE OVERRIDE.
6. RELIEF FAN AND RELIEF DAMPER CONTROL: WHEN THE UNIT RELIEF FAN IS STARTED, THE DDC SHALL SLOWLY RAMP UP THE SPEED TO THE RELIEF FAN THROUGH ITS VFD AND OPEN THE RELIEF AIR DAMPER PROPORTIONALLY TO MAINTAIN A 0.05 IN. W.C. (ADJUSTABLE) POSITIVE PRESSURE IN THE SPACE AS SENSED BY THE SPACE PRESSURE SENSOR.
7. AIRFLOW MEASURING: THE DDC SHALL VERIFY MINIMUM OUTSIDE AIR FLOWS AS SENSED BY THE RTU'S AIRFLOW MEASURING STATION AND MODULATE THE OUTDOOR AIR DAMPER AS NECESSARY TO MAINTAIN THE MINIMUM OUTSIDE AIR SETPOINT AS INDICATED ON THE DRAWINGS.
8. DUCT SMOKE DETECTORS: WHEN PRODUCTS OF COMBUSTION ARE SENSED BY A DUCT SMOKE DETECTORS AS INDICATED ON THE DRAWINGS, THE UNIT FAN SHALL BE DEENERGIZED.
9. SYSTEM MONITORING: IN ADDITION TO ALL POINTS LISTED ABOVE, THE DDC SHALL MONITOR RETURN AIR TEMPERATURE; MIXED AIR TEMPERATURE; RETURN AIR HUMIDITY THROUGH; AND VFD ALARMS.

SERIES FAN POWERED VARIABLE VOLUME W/ELECTRIC HEATING BOX:
THE FAN SHALL BE ENERGIZED DURING OCCUPIED PERIODS. ON A FALL IN SPACE TEMPERATURE AS SENSED BY THE SPACE TEMPERATURE SENSOR, THE BOX DAMPER SHALL MODULATE CLOSED TO ITS MINIMUM POSITION. ON A FURTHER FALL IN SPACE TEMPERATURE, THE ELECTRIC REHEAT SHALL MODULATE ON AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SET POINT. ON A RISE IN TEMPERATURE THE REVERSE SHALL OCCUR. DURING NIGHT OPERATION, THE FAN SHALL BE CYCLED AND THE SPACE TEMPERATURE SENSOR SHALL BE INDEXED TO MAINTAIN A REDUCED NIGHT TEMPERATURE.