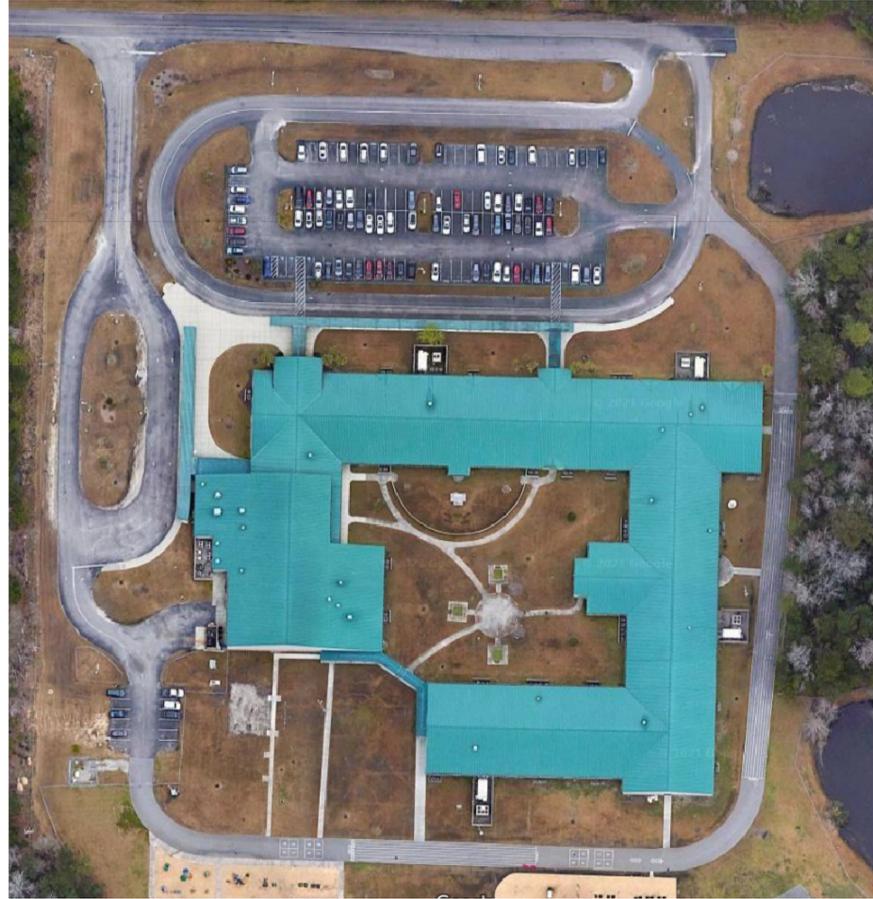


PALMETTO BAYS ELEMENTARY HVAC RENEWAL HORRY COUNTY SCHOOLS MYRTLE BEACH, SOUTH CAROLINA



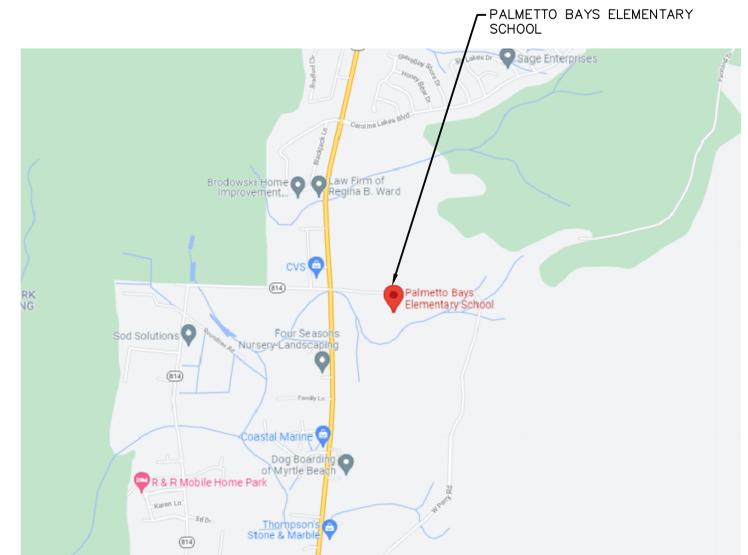
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 Charlotte, NC 28224 • 704/527-2112 • 21-099



SITE PLAN
 N.T.S.

SHEET LIST

- CS1.0 COVER SHEET
- MECHANICAL PLANS**
- M1.0 MECHANICAL FLOOR PLAN UNIT B
- M1.1 MECHANICAL FLOOR PLAN UNIT C
- M1.2 MECHANICAL FLOOR PLAN UNIT D
- M1.3 MECHANICAL FLOOR PLAN UNIT E
- M1.4 MECHANICAL FLOOR PLAN ALT #1 - LP GAS PLAN
- M2.0 MECHANICAL DETAILS AND SCHEDULES
- M2.1 MECHANICAL DETAILS
- M3.0 MECHANICAL COMCHECK
- ELECTRICAL PLANS**
- E1.0 ELECTRICAL FLOOR PLAN UNIT B
- E1.1 ELECTRICAL FLOOR PLAN UNIT C
- E1.2 ELECTRICAL FLOOR PLAN UNIT D
- E1.3 ELECTRICAL FLOOR PLAN UNIT E
- E2.0 SYMBOLS AND SCHEDULES
- E2.1 SPECIFICATIONS



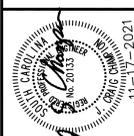
VICINITY MAP
 N.T.S.

JOB NUMBER	REVISION DATES
21-099	JSC
	JJC
	11/17/2021

JOB TITLE
 PALMETTO BAYS ELEMENTARY
 8900 SC-544
 MYRTLE BEACH, SC 29588
 HVAC RENEWAL

SHEET TITLE
 COVER SHEET

SHEET
 CS1.0
 1 OF 1

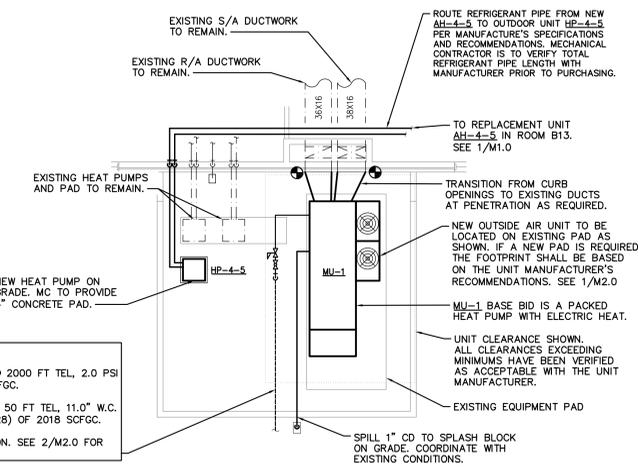


REVISION DATES	21-099	JSC	JOC
JOB NUMBER	21-099	DRN BY	JSC
CHECKED BY	JOC	DATE	11/07/2021

PALMETTO BAYS ELEMENTARY
8900 SC-544
MYRTLE BEACH, SC 29588
HVAC RENEWAL

MECHANICAL FLOOR PLAN
UNIT B

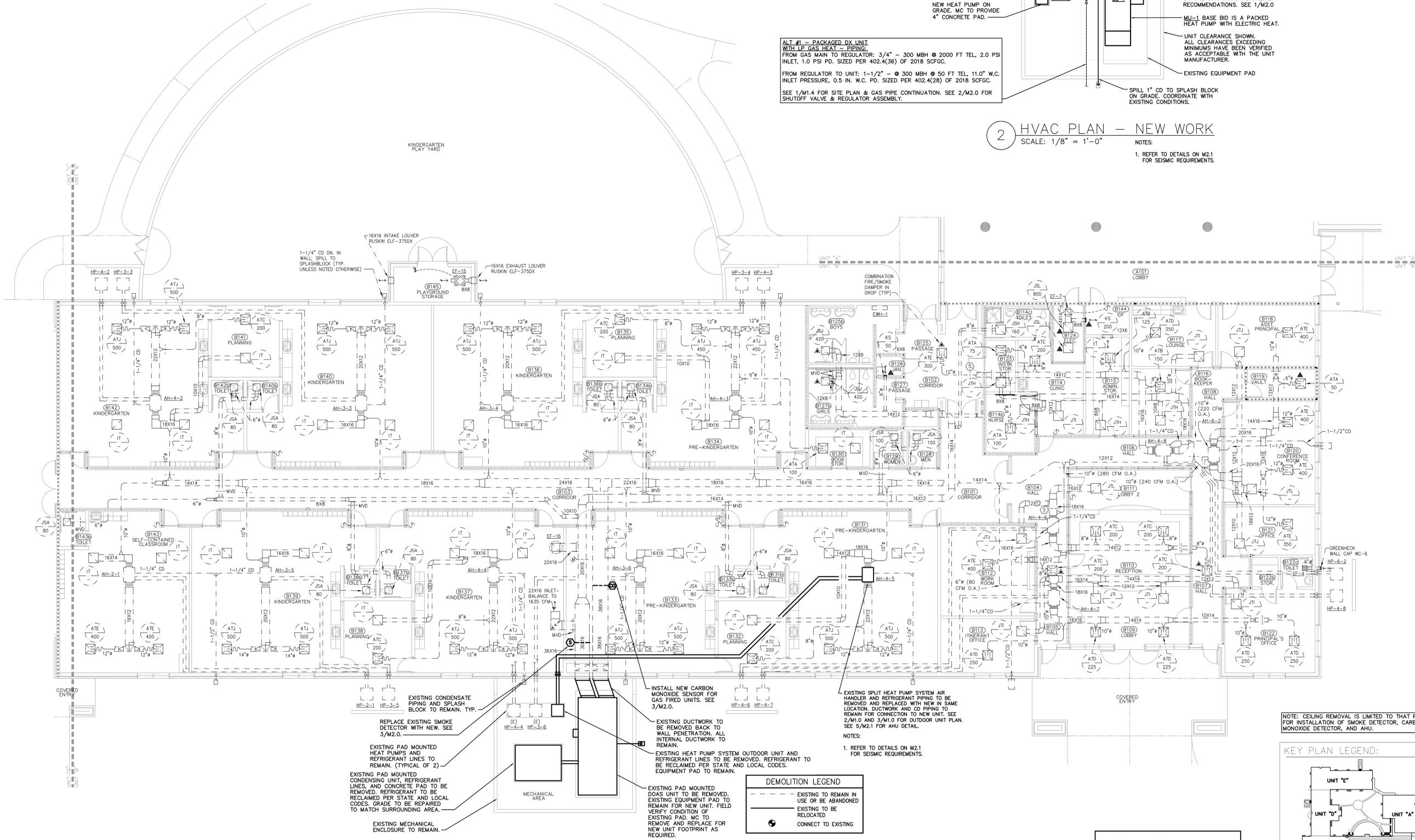
SHEET
M1.0
1 OF 8



ALT #1 - PACKAGED DX UNIT WITH LP GAS HEAT - PIPING:
FROM GAS MAIN TO REGULATOR: 3/4" - 300 MBH @ 2000 FT TEL, 2.0 PSI INLET, 1.0 PSI PD. SIZED PER 402.4(36) OF 2018 SCFGC.
FROM REGULATOR TO UNIT: 1-1/2" - @ 300 MBH @ 50 FT TEL, 11.0" W.C. INLET PRESSURE, 0.5 IN. W.C. PD. SIZED PER 402.4(28) OF 2018 SCFGC.
SEE 1/M1.4 FOR SITE PLAN & GAS PIPE CONTINUATION. SEE 2/M2.0 FOR SHUTOFF VALVE & REGULATOR ASSEMBLY.

2 HVAC PLAN - NEW WORK
SCALE: 1/8" = 1'-0"

NOTES:
1. REFER TO DETAILS ON M2.1 FOR SEISMIC REQUIREMENTS.



REPLACE EXISTING SMOKE DETECTOR WITH NEW. SEE 3/M2.0.
EXISTING PAD MOUNTED HEAT PUMPS AND REFRIGERANT LINES TO BE REMOVED. (TYPICAL OF 2)
EXISTING PAD MOUNTED CONDENSING UNIT, REFRIGERANT LINES, AND CONCRETE PAD TO BE REMOVED. REFRIGERANT TO BE RECLAIMED PER STATE AND LOCAL CODES. GRADE TO BE REPAIRED TO MATCH SURROUNDING AREA.
EXISTING MECHANICAL ENCLOSURE TO REMAIN.
EXISTING CONDENSATE PIPING AND SPLASH BLOCK TO REMAIN. TYP.
INSTALL NEW CARBON MONOXIDE SENSOR FOR GAS FIRED UNITS. SEE 3/M2.0.
EXISTING DUCTWORK TO BE REMOVED BACK TO WALL PENETRATION. ALL INTERNAL DUCTWORK TO REMAIN.
EXISTING HEAT PUMP SYSTEM OUTDOOR UNIT AND REFRIGERANT LINES TO BE REMOVED. REFRIGERANT TO BE RECLAIMED PER STATE AND LOCAL CODES. EQUIPMENT PAD TO REMAIN.
EXISTING PAD MOUNTED DOAS UNIT TO BE REMOVED. EXISTING EQUIPMENT PAD TO REMAIN FOR NEW UNIT. FIELD VERIFY CONDITION OF EXISTING PAD. MC TO REMOVE AND REPLACE FOR NEW UNIT FOOTPRINT AS REQUIRED.

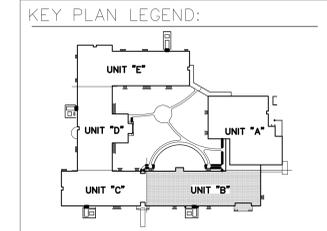
DEMOLITION LEGEND

(---)	EXISTING TO REMAIN IN USE OR BE ABANDONED
(---)	EXISTING TO BE RELOCATED
(---)	CONNECT TO EXISTING

FIRE RATED WALLS

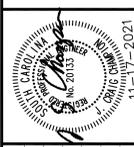
(---)	1 HOUR WALL
(---)	2 HOUR WALL
(---)	4 HOUR WALL

NOTE: CEILING REMOVAL IS LIMITED TO THAT REQUIRED FOR INSTALLATION OF SMOKE DETECTOR, CARBON MONOXIDE DETECTOR, AND AHU.



NOTE: THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS. SUBMISSION OF BIDS IS CONSIDERED VERIFICATION THAT THE CONTRACTOR HAS VISITED THE SITE. NO EXTRAS WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS.

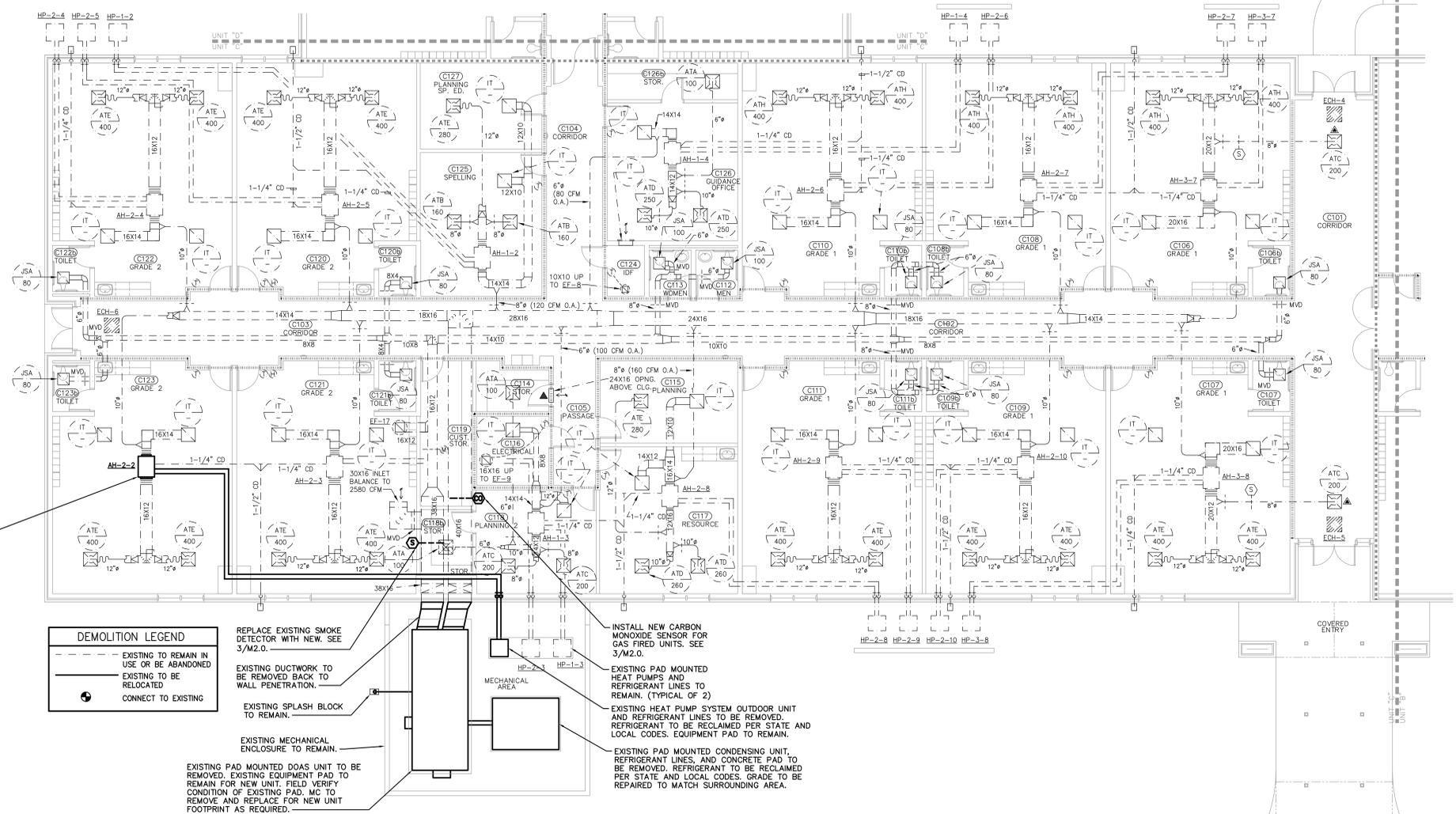
1 HVAC PLAN - UNIT B - DEMO
SCALE: 1/8" = 1'-0"



JOB NUMBER	21-099	REVISION DATES
DRAWN BY	JSC	
CHECKED BY	JSC	
DATE	11/17/2021	

JOB TITLE
PALMETTO BAYS ELEMENTARY
8900 SC-544
MYRTLE BEACH, SC 29588
HVAC RENEWAL

SHEET TITLE
MECHANICAL FLOOR PLAN
UNIT C



EXISTING SPLIT HEAT PUMP SYSTEM AIR HANDLER AND REFRIGERANT PIPING TO BE REMOVED AND REPLACED WITH NEW IN SAME LOCATION. DUCTWORK AND CD PIPING TO REMAIN FOR CONNECTION TO NEW UNIT. SEE 2/M1.0 AND 3/M1.0 FOR OUTDOOR UNIT PLAN. SEE 5/M2.1 FOR AHU DETAIL.

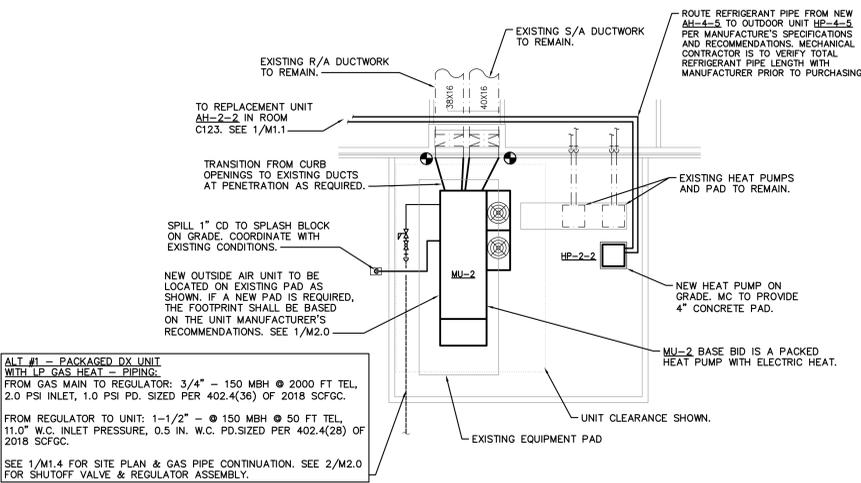
NOTES:
1. REFER TO DETAILS ON M2.1 FOR SEISMIC REQUIREMENTS.

DEMOLITION LEGEND

---	EXISTING TO REMAIN IN USE OR BE ABANDONED
---	EXISTING TO BE RELOCATED
○	CONNECT TO EXISTING

- REPLACE EXISTING SMOKE DETECTOR WITH NEW. SEE 3/M2.0.
- EXISTING DUCTWORK TO BE REMOVED BACK TO WALL PENETRATION.
- EXISTING SPLASH BLOCK TO REMAIN.
- EXISTING MECHANICAL ENCLOSURE TO REMAIN.
- EXISTING PAD MOUNTED DOAS UNIT TO BE REMOVED. EXISTING EQUIPMENT PAD TO REMAIN FOR NEW UNIT. FIELD VERIFY CONDITION OF EXISTING PAD. MC TO REMOVE AND REPLACE FOR NEW UNIT FOOTPRINT AS REQUIRED.
- INSTALL NEW CARBON MONOXIDE SENSOR FOR GAS FIRED UNITS. SEE 3/M2.0.
- EXISTING PAD MOUNTED HEAT PUMPS AND REFRIGERANT LINES TO REMAIN. (TYPICAL OF 2)
- EXISTING HEAT PUMP SYSTEM OUTDOOR UNIT AND REFRIGERANT LINES TO BE REMOVED. REFRIGERANT TO BE RECLAIMED PER STATE AND LOCAL CODES. EQUIPMENT PAD TO REMAIN.
- EXISTING PAD MOUNTED CONDENSING UNIT, REFRIGERANT LINES, AND CONCRETE PAD TO BE REMOVED. REFRIGERANT TO BE RECLAIMED PER STATE AND LOCAL CODES. GRADE TO BE REPAIRED TO MATCH SURROUNDING AREA.

1 HVAC PLAN - UNIT C - DEMO
SCALE: 1/8" = 1'-0"



ALT #1 - PACKAGED DX UNIT WITH LP GAS HEAT - PIPING.
FROM GAS MAIN TO REGULATOR: 3/4" - 150 MBH @ 2000 FT TEL, 2.0 PSI INLET, 1.0 PSI PD. SIZED PER 402.4(36) OF 2018 SCFGC.
FROM REGULATOR TO UNIT: 1-1/2" - 150 MBH @ 50 FT TEL, 11.0" W.C. INLET PRESSURE, 0.5 IN. W.C. PD. SIZED PER 402.4(28) OF 2018 SCFGC.
SEE 1/M1.4 FOR SITE PLAN & GAS PIPE CONTINUATION. SEE 2/M2.0 FOR SHUTOFF VALVE & REGULATOR ASSEMBLY.

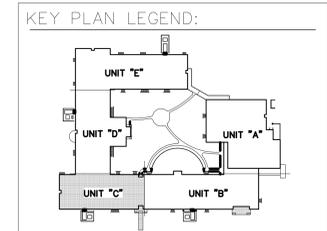
2 HVAC PLAN - NEW WORK
SCALE: 1/8" = 1'-0"

NOTES:
1. REFER TO DETAILS ON M2.1 FOR SEISMIC REQUIREMENTS.

FIRE RATED WALLS

---	1 HOUR WALL
---	2 HOUR WALL
---	4 HOUR WALL

NOTE: CEILING REMOVAL IS LIMITED TO THAT REQUIRED FOR INSTALLATION OF SMOKE DETECTOR, CARBON MONOXIDE DETECTOR, AND AHU.



NOTE: THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS. SUBMISSION OF BIDS IS CONSIDERED VERIFICATION THAT THE CONTRACTOR HAS VISITED THE SITE. NO EXTRAS WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS.

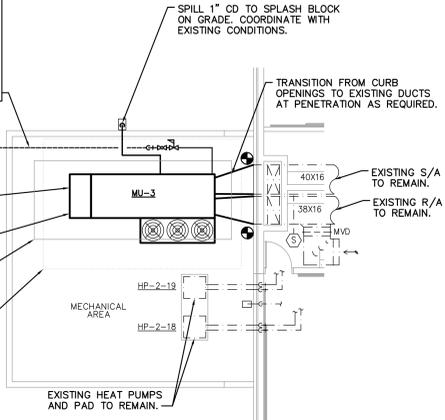
ALT #1 - PACKAGED DX UNIT WITH LP GAS HEAT - PIPING:
 FROM GAS MAIN TO REGULATOR: 3/4" - 150 MBH @ 2000 FT TEL, 2.0 PSI INLET, 1.0 PSI PD. SIZED PER 402.4(36) OF 2018 SFGC.
 FROM REGULATOR TO UNIT: 1-1/2" - @ 150 MBH @ 50 FT TEL, 11.0" W.C. INLET PRESSURE, 0.5 IN. W.C. PD. SIZED PER 402.4(28) OF 2018 SFGC.
 SEE 1/M1.4 FOR SITE PLAN & GAS PIPE CONTINUATION. SEE 2/M2.0 FOR SHUTOFF VALVE & REGULATOR ASSEMBLY.

NEW OUTSIDE AIR UNIT TO BE LOCATED ON EXISTING PAD AS SHOWN. IF A NEW PAD IS REQUIRED, THE FOOTPRINT SHALL BE BASED ON THE UNIT MANUFACTURER'S RECOMMENDATIONS. SEE 1/M2.0.

MU-3 BASE BID IS A PACKED HEAT PUMP WITH ELECTRIC HEAT.

EXISTING EQUIPMENT PAD

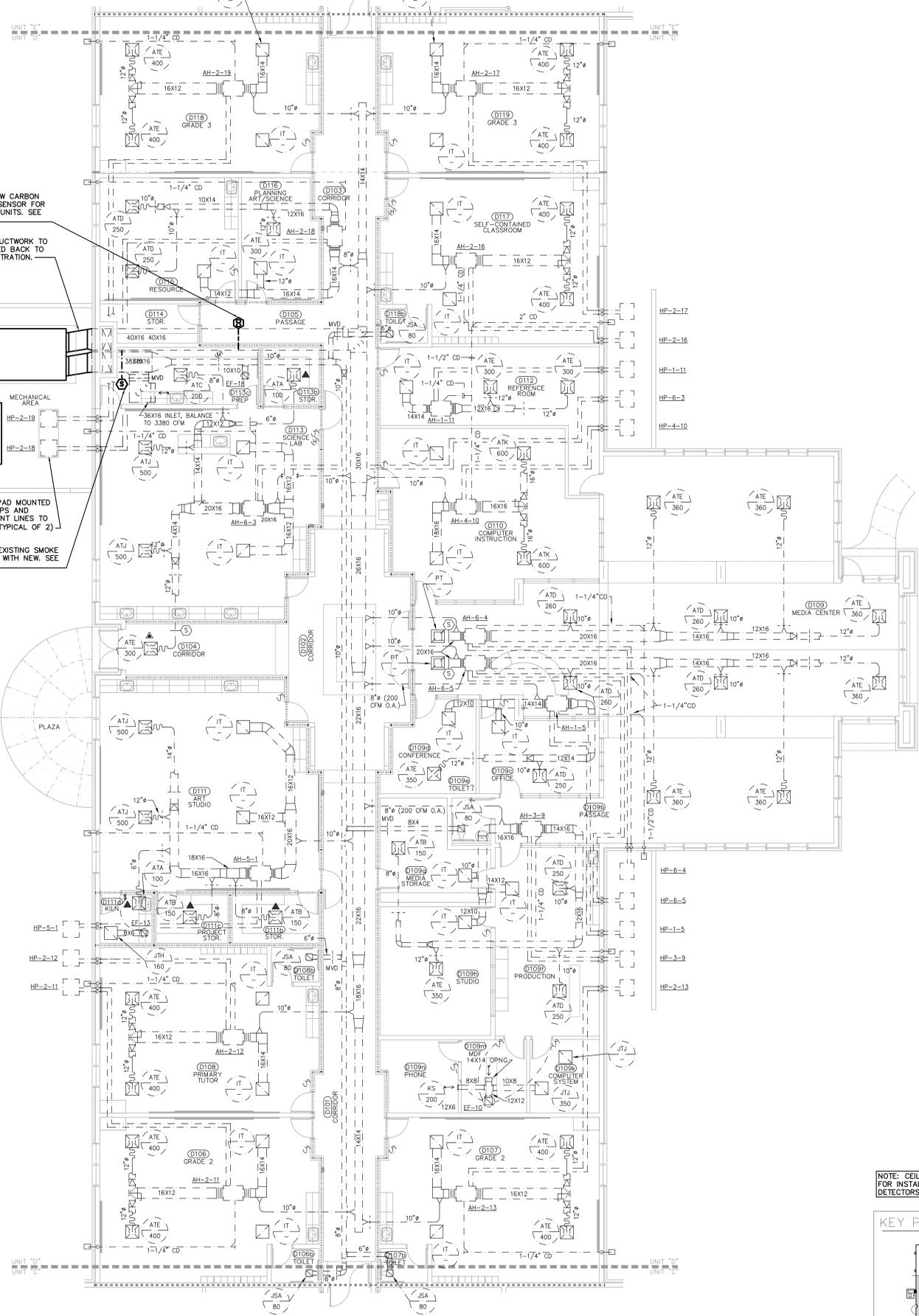
UNIT CLEARANCE SHOWN.



2 HVAC PLAN - NEW WORK
 SCALE: 1/8" = 1'-0"

NOTES:
 1. REFER TO DETAILS ON M2.1 FOR SEISMIC REQUIREMENTS.

1 HVAC PLAN - UNIT D - DEMO
 SCALE: 1/8" = 1'-0"



DEMOLITION LEGEND

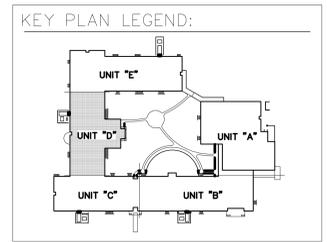
---	EXISTING TO REMAIN IN USE OR BE ABANDONED
---	EXISTING TO BE RELOCATED
●	CONNECT TO EXISTING

FIRE RATED WALLS

---	1 HOUR WALL
---	2 HOUR WALL
---	4 HOUR WALL

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO APPLY THE PROPER FIRE-SAVING DETAIL FOR ALL DUCT AND PIPE PENETRATIONS THRU FIRE-RATED WALLS AND SMOKE PARTITIONS.

NOTE: CEILING REMOVAL IS LIMITED TO THAT REQUIRED FOR INSTALLATION OF SMOKE AND CARBON MONOXIDE DETECTORS.



NOTE: THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS. SUBMISSION OF BIDS IS CONSIDERED VERIFICATION THAT THE CONTRACTOR HAS VISITED THE SITE. NO EXTRAS WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS.

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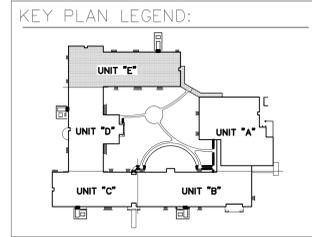
M. GRIFFIN
 MECHANICAL ENGINEER
 No. 20133
 State of North Carolina

JOB NUMBER	21-099	REVISION DATES
DRAWN BY	JSC	
CHECKED BY	JSC	
DATE	11/07/2021	

JOB TITLE: PALMETTO BAYS ELEMENTARY
 8900 SC-544
 MYRTLE BEACH, SC 29588
 HVAC RENEWAL

SHEET TITLE: MECHANICAL FLOOR PLAN
 UNIT D

SHEET
M1.2
 3 OF 8



FIRE RATED WALLS

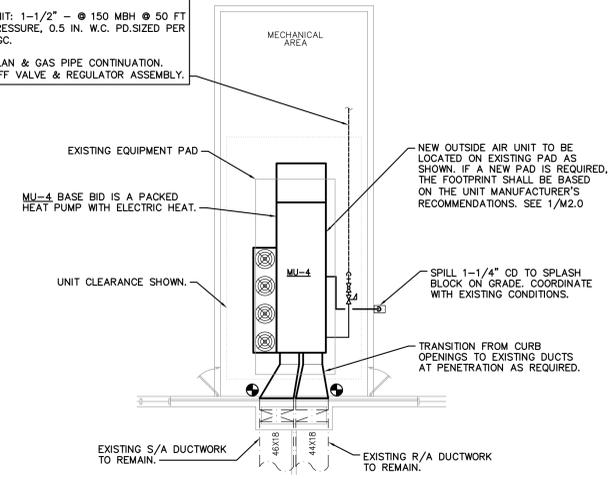
---	1 HOUR WALL
---	2 HOUR WALL
---	4 HOUR WALL

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO APPLY THE PROPER FIRE-SAFING DETAIL FOR ALL DUCT AND PIPE PENETRATIONS THRU FIRE-RATED WALLS AND SMOKE PARTITIONS.

NOTE: THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS. SUBMISSION OF BIDS IS CONSIDERED VERIFICATION THAT THE CONTRACTOR HAS VISITED THE SITE. NO EXTRAS WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS.

NOTE: CEILING REMOVAL IS LIMITED TO THAT REQUIRED FOR INSTALLATION OF SMOKE AND CARBON MONOXIDE DETECTORS.

ALT #1 - PACKAGED DX UNIT WITH LP GAS HEAT - PIPING:
 FROM GAS MAIN TO REGULATOR: 3/4" - 150 MBH @ 2000 FT TEL, 2.0 PSI INLET, 1.0 PSI PD. SIZED PER 402.4(36) OF 2018 SCFG.
 FROM REGULATOR TO UNIT: 1-1/2" - @ 150 MBH @ 50 FT TEL, 11.0" W.C. INLET PRESSURE, 0.5 IN. W.C. PD. SIZED PER 402.4(28) OF 2018 SCFG.
 SEE 1/M1.4 FOR SITE PLAN & GAS PIPE CONTINUATION.
 SEE 2/M2.0 FOR SHUTOFF VALVE & REGULATOR ASSEMBLY.



2 HVAC PLAN - NEW WORK
 SCALE: 1/8" = 1'-0"

NOTES:
 1. REFER TO DETAILS ON M2.1 FOR SEISMIC REQUIREMENTS.

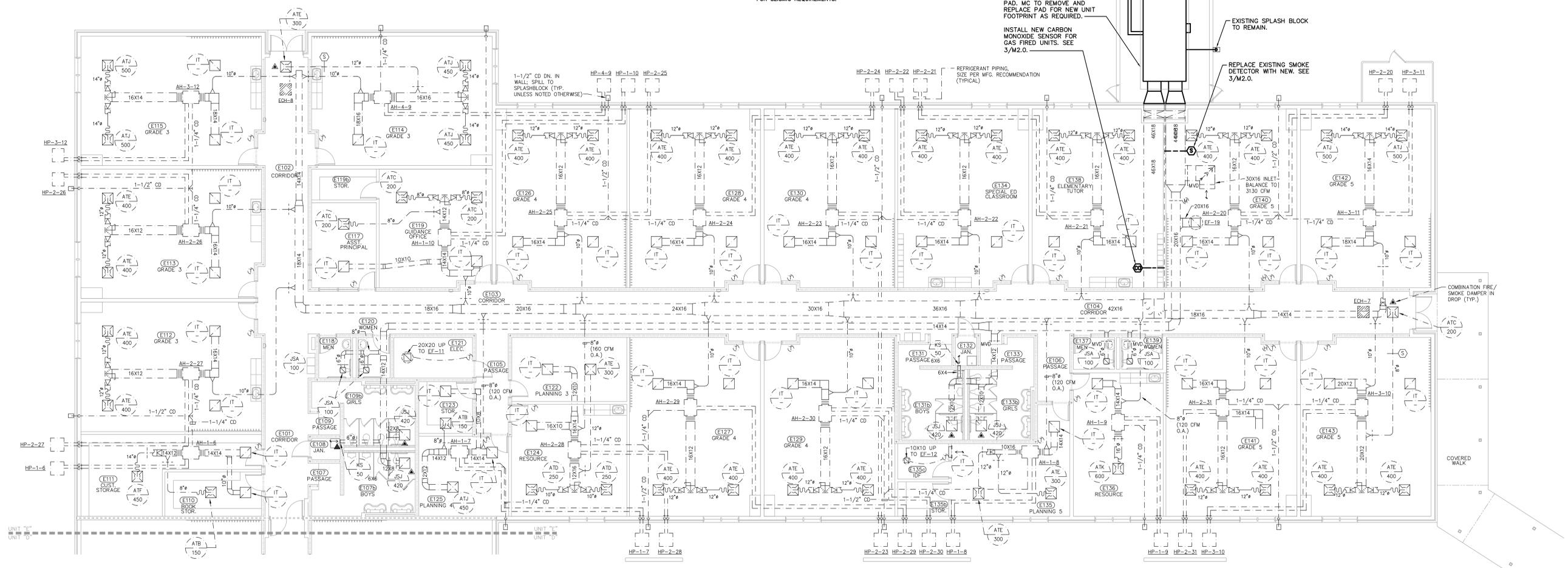
EXISTING PAD MOUNTED CONDENSING UNIT, REFRIGERANT LINES, AND CONCRETE PAD TO BE REMOVED. REFRIGERANT TO BE RECLAIMED PER STATE AND LOCAL CODES. GRADE TO BE REPAIRED TO MATCH SURROUNDING AREA.

EXISTING PAD MOUNTED DOAS UNIT TO BE REMOVED. EXISTING EQUIPMENT PAD TO REMAIN FOR NEW UNIT. FIELD VERIFY CONDITION OF EXISTING PAD. MC TO REMOVE AND REPLACE PAD FOR NEW UNIT FOOTPRINT AS REQUIRED.

INSTALL NEW CARBON MONOXIDE SENSOR FOR GAS FIRED UNITS. SEE 3/M2.0.

DEMOLITION LEGEND

---	EXISTING TO REMAIN IN USE OR BE ABANDONED
---	EXISTING TO BE RELOCATED
●	CONNECT TO EXISTING



1 HVAC PLAN - UNIT E - DEMO
 SCALE: 1/8" = 1'-0"

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JOB NUMBER: 21-099
 JOB TITLE: PALMETTO BAYS ELEMENTARY
 8900 SC-544
 MYRTLE BEACH, SC 29588
 HVAC RENEWAL

SHEET TITLE: MECHANICAL FLOOR PLAN
 UNIT E

SHEET: M1.3

JOB NUMBER: 21-099
 JOB TITLE: PALMETTO BAYS ELEMENTARY
 8900 SC-544
 MYRTLE BEACH, SC 29588
 HVAC RENEWAL

SHEET TITLE: MECHANICAL FLOOR PLAN
 UNIT E

SHEET: M1.3

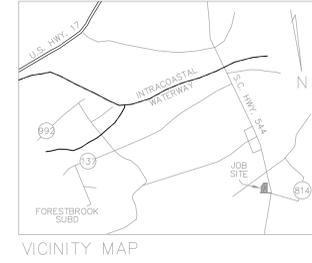
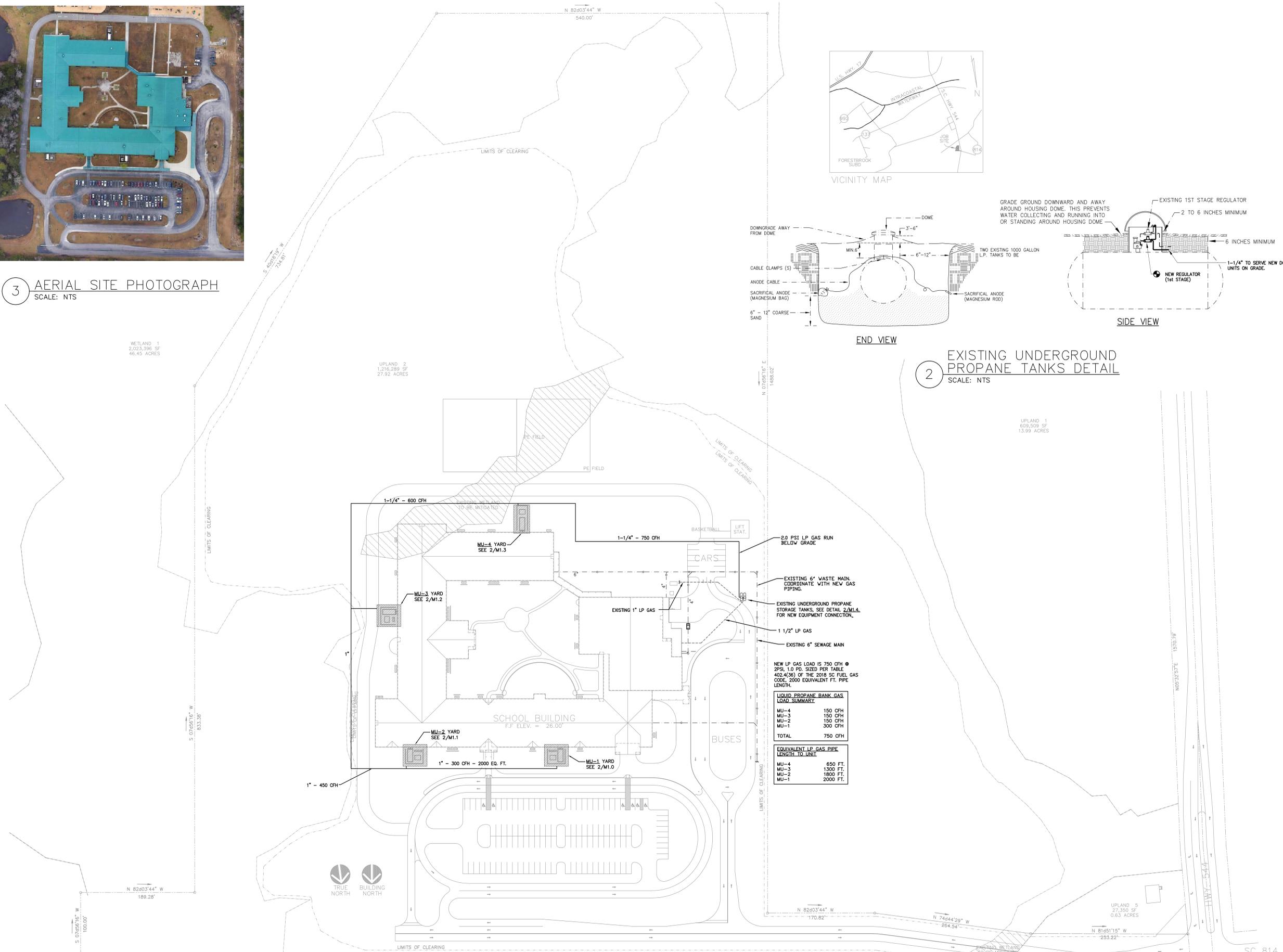


3 AERIAL SITE PHOTOGRAPH
SCALE: NTS

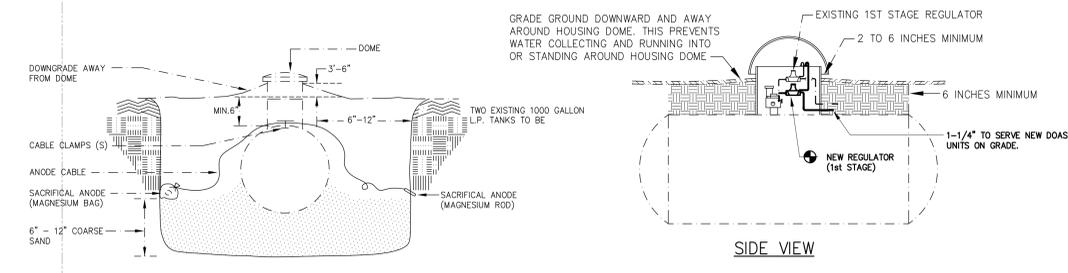
WETLAND 1
2,023,396 SF
46.45 ACRES

UPLAND 2
1,216,289 SF
27.92 ACRES

UPLAND 1
609,508 SF
13.99 ACRES



VICINITY MAP



2 EXISTING UNDERGROUND PROPANE TANKS DETAIL
SCALE: NTS

NEW LP GAS LOAD IS 750 CFH @ 2PSI, 1.0 PD. SIZED PER TABLE 402.4(36) OF THE 2018 SC FUEL GAS CODE, 2000 EQUIVALENT FT. PIPE LENGTH.

LIQUID PROPANE BANK GAS LOAD SUMMARY	
MU-4	150 CFH
MU-3	150 CFH
MU-2	150 CFH
MU-1	300 CFH
TOTAL	750 CFH

EQUIVALENT LP GAS PIPE LENGTH TO UNIT	
MU-4	650 FT.
MU-3	1300 FT.
MU-2	1800 FT.
MU-1	2000 FT.

1 ALTERNATE #1
SITE PLAN - LIQUID PROPANE GAS
SCALE: 1" = 60' - 0"

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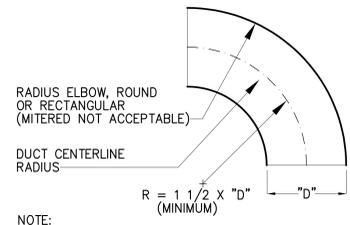


JOB NUMBER	REVISION DATES
21-099	JSC
	JJC
	11/17/2021
	DATE

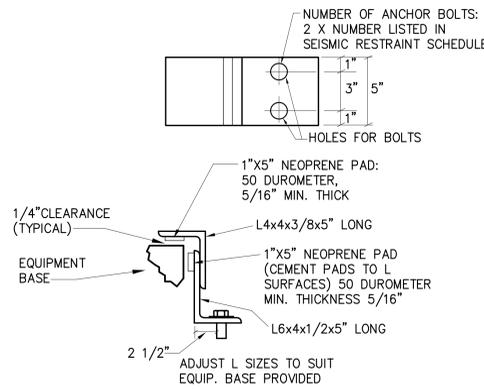
JOB TITLE
PALMETTO BAYS ELEMENTARY
8900 SC-544
MYRTLE BEACH, SC 29588
HVAC RENEWAL

SHEET TITLE
MECHANICAL FLOOR PLAN
ALT #1 - LP GAS PLAN

SHEET
M1.4
5 of 8



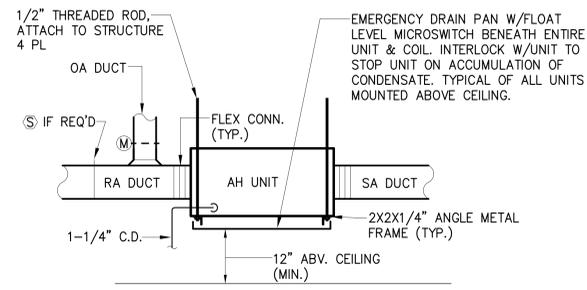
4 RADIUS ELBOW DETAIL
SCALE: NTS



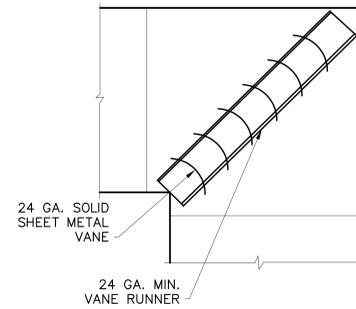
3 SEISMIC SNUBBER DETAIL
SCALE: NTS NOTE: IN LIEU OF THIS DETAIL, PROVIDE MASON INDUSTRIES TYPE "Z" SNUBBER.

SEISMIC RESTRAINT SCHEDULE (BASED ON INTERNATIONAL BUILDING CODE)						
EQUIPMENT	SEE DETAIL	MOUNTING		BOLTS/ANCHORS		REMARKS
		VIB. ISOL. OR FIXED	DIA.	QNTY		
SUSPENDED EQUIPMENT						
PIPING	SEE 2008 SMACNA SEISMIC RESTRAINT MANUAL GUIDELINES FOR MECHANICAL SYSTEMS: SEISMIC HAZARD LEVEL (SHL) "B" RESTRAINTS					1, 2
DUCT						1, 3
ALL OTHER SUSPENDED EQUIPMENT	DETAIL 2/M2.1					1

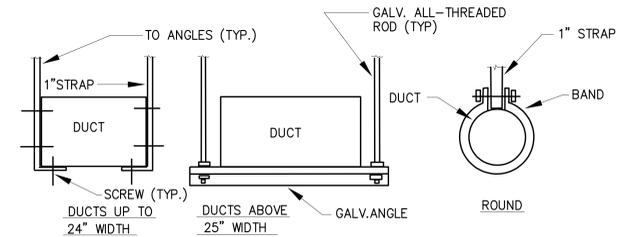
- SEISMIC HAZARD EXPOSURE GROUP II, A = .1, GROUP D, SEISMIC PERF. CATEGORY D. ALL MECHANICAL & PLUMBING EQUIPMENT SHALL BE DESIGNED TO RESIST SEISMIC FORCES. SEISMIC RESTRAINTS ARE REQUIRED FOR THIS PROJECT WITH EXCEPTIONS LISTED IN 2 AND 3. SEISMIC FORCE TO BE RESISTED EQUALS 3 TIMES THE EQUIPMENT WEIGHT IN ANY HORIZONTAL DIRECTION, AND .1 TIMES THE EQUIPMENT WEIGHT IN THE VERTICAL DIRECTION.
- SEISMIC RESTRAINTS SHALL NOT BE REQUIRED FOR THE FOLLOWING PIPING INSTALLATIONS (EXCLUDING GAS, HIGH HAZARD, AND FIRE PROTECTION):
 - PIPING IN BOILER & MECHANICAL ROOMS, LESS THAN 1 1/4" INSIDE DIAMETER.
 - PIPING IN OTHER AREAS WHICH HAS LESS THAN 2 1/2" INSIDE DIAMETER.
 - PIPING SUSPENDED BY INDIVIDUAL HANGERS 12" OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE SUPPORT FOR THE HANGER.
- SEISMIC RESTRAINTS SHALL NOT BE REQUIRED FOR THE FOLLOWING DUCT INSTALLATIONS:
 - ALL RECTANGULAR AIR HANDLING DUCTS LESS THAN 6 sq. ft. IN CROSS-SECTIONAL AREA.
 - ALL ROUND AIR HANDLING DUCTS LESS THAN 28" IN DIAMETER.
 - ALL DUCTS SUSPENDED BY HANGERS 12" OR LESS IN LENGTH FROM THE TOP OF THE DUCT TO THE BOTTOM OF THE SUPPORT FOR THE HANGER.



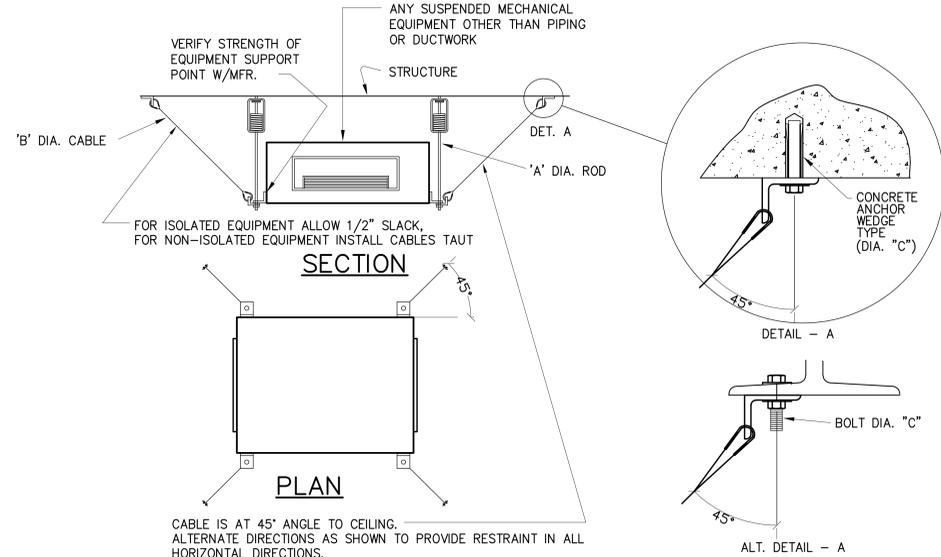
5 SECTION AT AHU DETAIL
SCALE: NTS



6 TURNING VANE DETAIL
SCALE: NTS PERMITTED ONLY WHERE RADIUS ELL WILL NOT FIT.



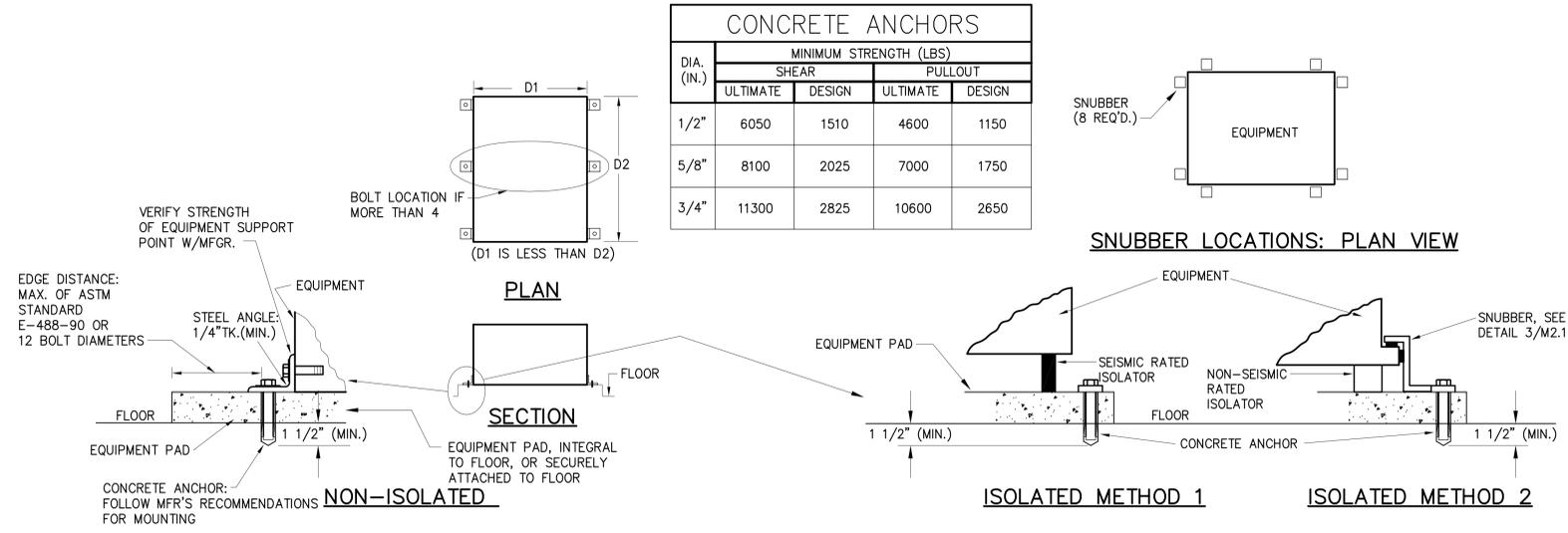
7 DUCTWORK HANGER DETAILS
SCALE: NTS



2 TYP. SEISMIC CABLE RESTRAINTS FOR EQUIPMENT SUSPENDED FROM STRUCTURE
SCALE: NTS
NOTE: REFERENCE SEISMIC RESTRAINT SCHEDULE FOR MORE INFORMATION. THIS DETAIL APPLIES TO ALL SUSPENDED EQUIPMENT UNLESS NOTED OTHERWISE.

CABLE, BOLT SIZES							
UNIT WGT. (LB)	ROD DIA. "A"	QNTY	CABLE		BOLTS/ANCHORS		ANCHORS: ULTIMATE STRENGTH MIN. LBS.(EA)
			DIA. "B"	QNTY	DIA. "C"	QNTY	
1 - 1000	1/2"	4	1/8"	4	1/2"	4	4600 6050
1001 - 4000	1/2"	4	3/16"	4	1/2"	4	4600 6050
4001 - 8000	3/4"	4	1/4"	4	3/4"	8	10600 11300

DIA. (IN.)	MINIMUM STRENGTH (LBS)			
	SHEAR		PULLOUT	
	ULTIMATE	DESIGN	ULTIMATE	DESIGN
1/2"	6050	1510	4600	1150
5/8"	8100	2025	7000	1750
3/4"	11300	2825	10600	2650



1 SEISMIC RESTRAINTS FOR FLOOR/SLAB MOUNTED EQUIPMENT
SCALE: NTS

- NOTES:
- THIS DETAIL APPLIES TO ALL FLOOR/SLAB MOUNTED EQUIPMENT UNLESS NOTED OTHERWISE.
 - REFER TO SEISMIC RESTRAINT SCHEDULE FOR ANCHOR SIZES FOR SPECIFIC PIECES OF EQUIPMENT



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Section 1: Project Information

Energy Code: 2009 IECC
Project Title: 21-099 Palmetto Bays Elementary
Project Type: Alterations
Construction Site: 8900 SC-544
Owner/Agent: Myrtle Beach, South Carolina 29588
Designer/Contractor: Craig Champion
MSWG Engineers Inc.
4223 South Blvd,
Charlotte, North Carolina 28209
704-527-2112
cchampion@mswg.com

Section 2: General Information

Building Location (for weather data): Myrtle Beach, South Carolina
Climate Zone: 3a

Section 3: Mechanical Systems List

- MU-1 (Single Zone): Heating: 1 each - Other, Electric, Capacity = 109 kBtu/h
MU-2 (Single Zone): Heating: 1 each - Other, Electric, Capacity = 109 kBtu/h
MU-3 (Single Zone): Heating: 1 each - Other, Electric, Capacity = 136 kBtu/h
MU-4 ALTERNATE (Single Zone): Heating: 1 each - Other, Electric, Capacity = 150 kBtu/h

Project Title: 21-099 Palmetto Bays Elementary
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Report date: 11/08/21
Page 1 of 5

- Requirements Specific To: MU-2 ALTERNATE:
1. Equipment minimum efficiency: Single Package Unit: 9.80 EER + 9.5 IPLV
2. Integrated economizer is required for this location and system.
Requirements Specific To: MU-3 ALTERNATE:
1. Equipment minimum efficiency: Single Package Unit: 10.80 EER
Requirements Specific To: MU-4 ALTERNATE:
1. Equipment minimum efficiency: Single Package Unit: 9.80 EER + 9.5 IPLV
Generic Requirements: Must be met by all systems to which the requirement is applicable:
1. Plant equipment and system capacity no greater than needed to meet loads

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Data filename:
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Page 4 of 5

- Fully ducted return and/or exhaust air systems, 0.4844 credit
MU-4 (Single Zone): Heating: 1 each - Other, Electric, Capacity = 136 kBtu/h
AH-2-2/HP-2-2 (Single Zone): Split System Heat Pump
AH-4-SHP-4-5 (Single Zone): Split System Heat Pump
MU-1 ALTERNATE (Single Zone): Heating: 1 each - Other, Electric, Capacity = 150 kBtu/h
MU-2 ALTERNATE (Single Zone): Heating: 1 each - Other, Electric, Capacity = 150 kBtu/h
MU-3 ALTERNATE (Single Zone): Heating: 1 each - Other, Electric, Capacity = 150 kBtu/h

Project Title: 21-099 Palmetto Bays Elementary
Data filename:
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Page 2 of 5

- Exception(s):
Systems with heat recovery,
Multiple-zone systems without DDC of individual zones communicating with a central control panel,
Systems with a design outdoor airflow less than 1200 cfm,
Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1200 cfm,
15. Motorized, automatic shutoff dampers required on exhaust and outdoor air supply openings

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2009 IECC requirements to COMcheck-Web and to comply with the mandatory requirements in the Requirements Checklist.

Craig Champion P.E.
Signature: [Signature]
Date: 11/10/2021

Section 6: Post Construction Compliance Statement

HVAC record drawings of the actual installation, system capacities, calibration information, and performance data for each equipment provided to the owner.
HVAC O&M documents for all mechanical equipment and system provided to the owner by the mechanical contractor.
Written HVAC balancing and operations report provided to the owner.

Principal Mechanical Designer-Name Signature Date

- EF-3 ALT Exhaust, Constant Volume, 4134 CFM, 3.0 motor nameplate hp, 1.8 design brake hp (1.8 max. BHP)
SF-3 ALT Supply, Constant Volume, 4475 CFM, 5.0 motor nameplate hp, 3.7 design brake hp (3.7 max. BHP)
MU-4 ALTERNATE (Single Zone): Heating: 1 each - Other, Propane, Capacity = 300 kBtu/h
EF-4 ALT Exhaust, Constant Volume, 5654 CFM, 5.0 motor nameplate hp, 2.9 design brake hp (2.9 max. BHP)
FS-4 ALT Supply, Constant Volume, 6245 CFM, 7.5 motor nameplate hp, 4.9 design brake hp (4.9 max. BHP)

Section 4: Requirements Checklist

- Requirements Specific To: MU-1:
1. Equipment minimum efficiency: Single Package Unit: 10.00 EER + 9.7 IPLV
Requirements Specific To: MU-2:
1. Equipment minimum efficiency: Single Package Unit: 10.00 EER + 9.7 IPLV
Requirements Specific To: MU-3:
1. Equipment minimum efficiency: Single Package Unit: 10.00 EER + 9.7 IPLV
Requirements Specific To: MU-4:
1. Equipment minimum efficiency: Single Package Unit: 10.00 EER + 9.7 IPLV
Requirements Specific To: AH-2-2/HP-2-2:
1. Equipment minimum efficiency: Heat Pump: 7.70 HSPF 13.00 SEER
Requirements Specific To: AH-4-SHP-4-5:
1. Equipment minimum efficiency: Heat Pump: 7.70 HSPF 13.00 SEER
Requirements Specific To: MU-1 ALTERNATE:
1. Equipment minimum efficiency: Single Package Unit: 9.80 EER + 9.5 IPLV

Project Title: 21-099 Palmetto Bays Elementary
Data filename:
Report date: 11/08/21
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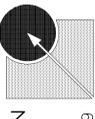
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4223 South Boulevard
Charlotte, NC 28224 • 704/527-2112 • 21-099



Table with columns: JOB NUMBER, REVISION DATES, JOB, DATE

JOB TITLE: PALMETTO BAYS ELEMENTARY
8900 SC-544
MYRTLE BEACH, SC 29588
HVAC RENEWAL

JOB TITLE: PALMETTO BAYS ELEMENTARY
8900 SC-544
MYRTLE BEACH, SC 29588
HVAC RENEWAL



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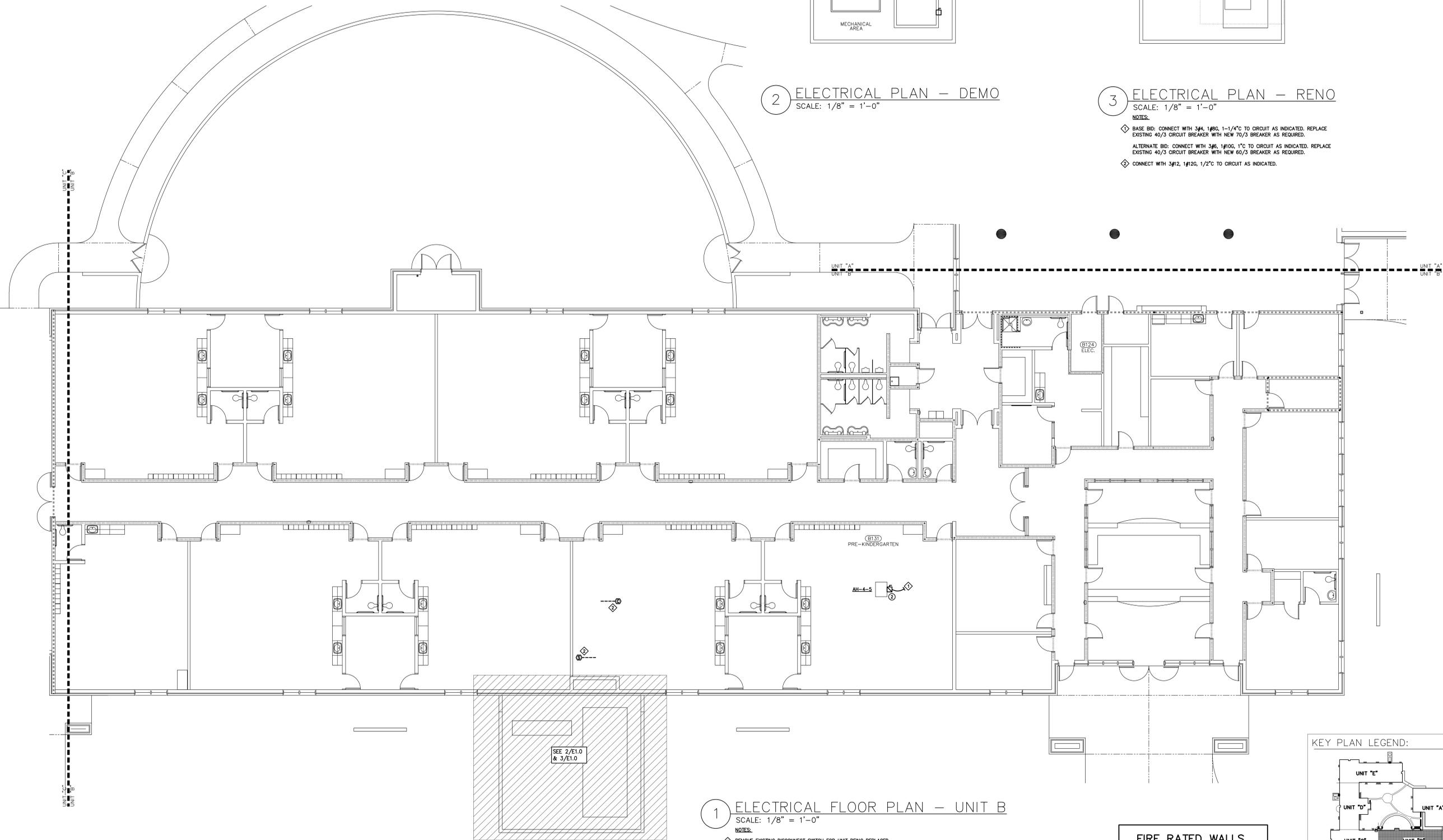
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JOB NUMBER	REVISION DATES
21-099	
5/16	
11/17/2021	

JOB TITLE
PALMETTO BAYS ELEMENTARY
8900 SC-544
MYRTLE BEACH, SC 29588
HVAC RENEWAL

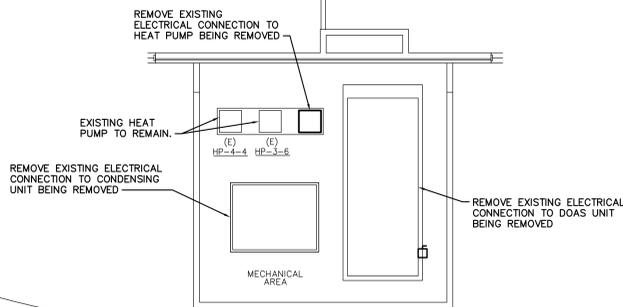
SHEET TITLE
ELECTRICAL FLOOR PLAN -
UNIT B

SHEET
E1.0
 1 OF 6

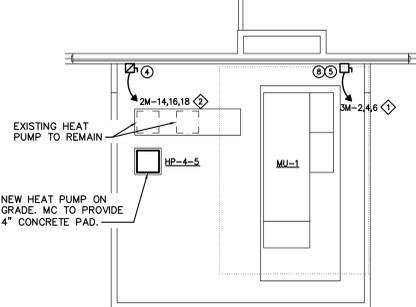


1 ELECTRICAL FLOOR PLAN - UNIT B
 SCALE: 1/8" = 1'-0"
 NOTES:
 ◆ REMOVE EXISTING DISCONNECT SWITCH FOR UNIT BEING REPLACED. CONNECT WITH 3#12, 1#12G, 1/2" TO EXISTING CIRCUIT SERVING AIR HANDLER BEING REPLACED.
 ◆ CONNECT TO EXISTING ADDRESSABLE FIRE ALARM CIRCUIT.

2 ELECTRICAL PLAN - DEMO
 SCALE: 1/8" = 1'-0"



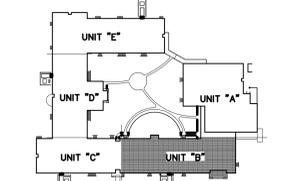
3 ELECTRICAL PLAN - RENO
 SCALE: 1/8" = 1'-0"



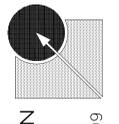
- NOTES:
 ◆ BASE BID: CONNECT WITH 3#4, 1#8G, 1-1/4" TO CIRCUIT AS INDICATED. REPLACE EXISTING 40/3 CIRCUIT BREAKER WITH NEW 70/3 BREAKER AS REQUIRED.
 ALTERNATE BID: CONNECT WITH 3#6, 1#10G, 1" TO CIRCUIT AS INDICATED. REPLACE EXISTING 40/3 CIRCUIT BREAKER WITH NEW 60/3 BREAKER AS REQUIRED.
 ◆ CONNECT WITH 3#12, 1#12G, 1/2" TO CIRCUIT AS INDICATED.

FIRE RATED WALLS	
.....	1 HOUR WALL
.....	2 HOUR WALL
.....	4 HOUR WALL

KEY PLAN LEGEND:



NOTE: THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS. SUBMISSION OF BIDS IS CONSIDERED VERIFICATION THAT THE CONTRACTOR HAS VISITED THE SITE. NO EXTRAS WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS.



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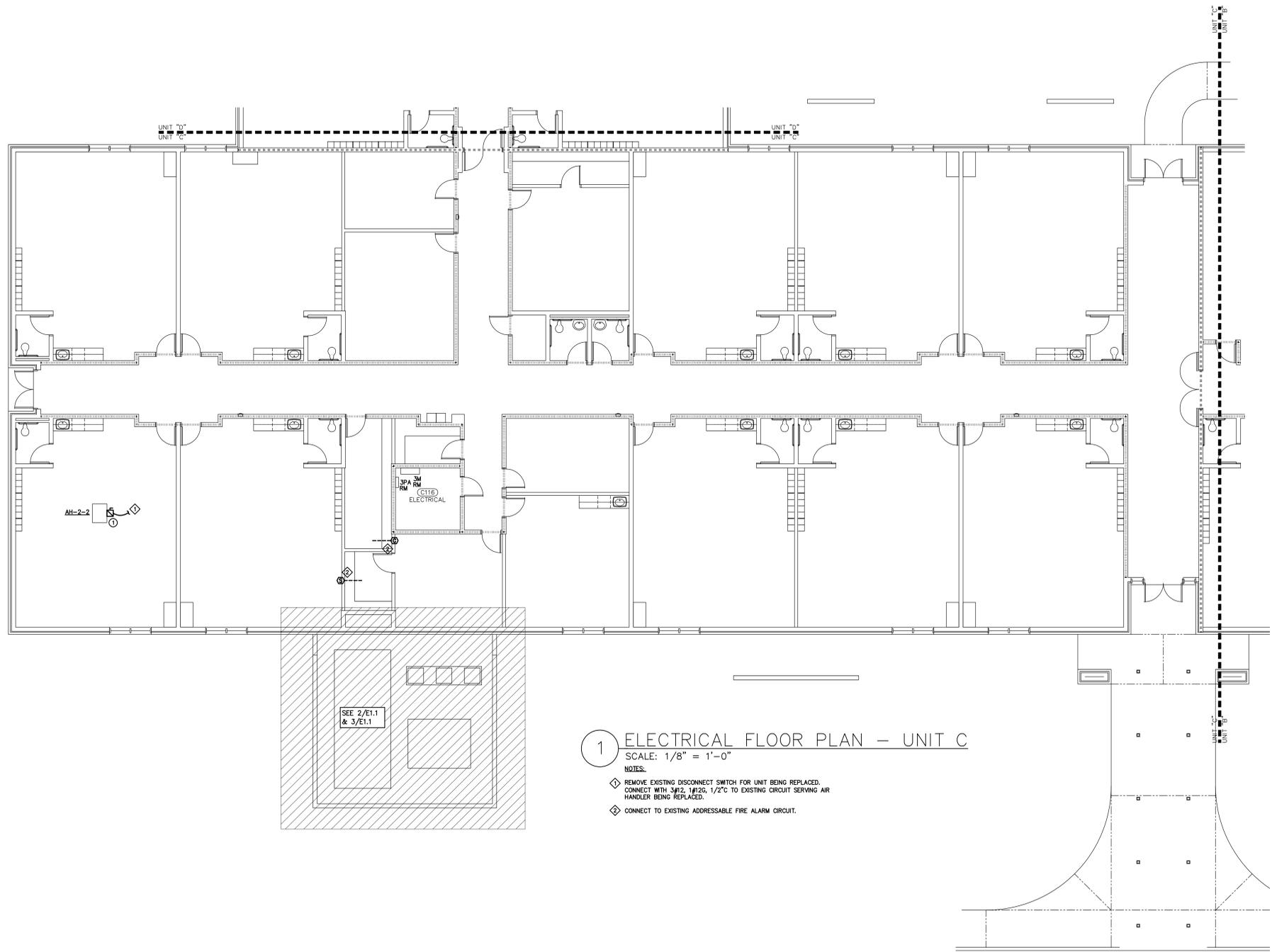


JOB NUMBER	21-099	REVISION DATES
DESIGNED BY	SMB	
CHECKED BY	WFA	
DATE	11/17/2021	

JOB TITLE
PALMETTO BAYS ELEMENTARY
8900 SC-544
MYRTLE BEACH, SC 29588
HVAC RENEWAL

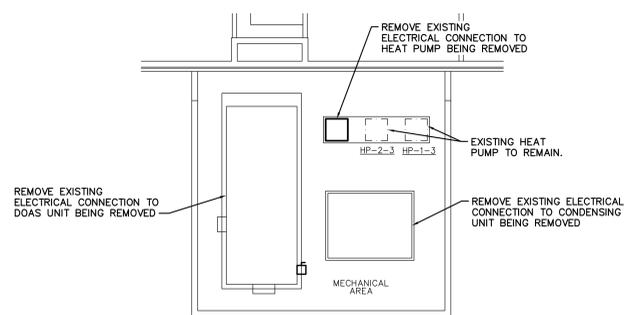
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UNIT C

SHEET
E1.1
2 OF 6

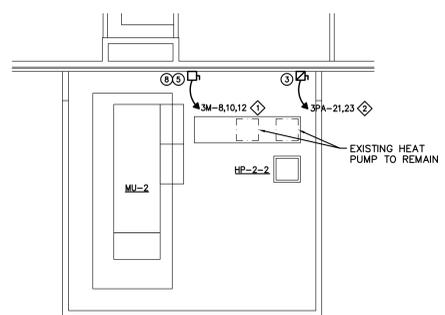


1 ELECTRICAL FLOOR PLAN - UNIT C
SCALE: 1/8" = 1'-0"

- NOTES:
- ◇ REMOVE EXISTING DISCONNECT SWITCH FOR UNIT BEING REPLACED. CONNECT WITH 3#12, 1#12G, 1/2" C TO EXISTING CIRCUIT SERVING AIR HANDLER BEING REPLACED.
 - ◇ CONNECT TO EXISTING ADDRESSABLE FIRE ALARM CIRCUIT.



2 ELECTRICAL PLAN - DEMO
SCALE: 1/8" = 1'-0"

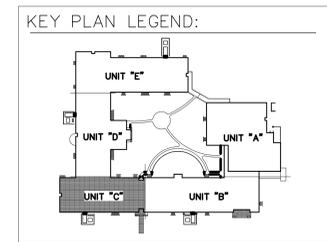


3 ELECTRICAL PLAN - RENO
SCALE: 1/8" = 1'-0"

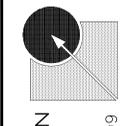
- NOTES:
- ◇ BASE BID: CONNECT WITH 3#4, 1#6G, 1-1/4" C TO CIRCUIT AS INDICATED. REPLACE EXISTING 40/3 CIRCUIT BREAKER WITH NEW 70/3 BREAKER AS REQUIRED.
 - ◇ ALTERNATE BID: CONNECT WITH 3#6, 1#10G, 1" C TO CIRCUIT AS INDICATED. REPLACE EXISTING 40/3 CIRCUIT BREAKER WITH NEW 60/3 BREAKER AS REQUIRED.
 - ◇ CONNECT WITH 2#10, 1#10G, 1/2" C TO CIRCUIT AS INDICATED.

FIRE RATED WALLS	
.....	1 HOUR WALL
.....	2 HOUR WALL
.....	4 HOUR WALL

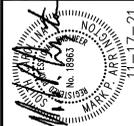
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO APPLY THE PROPER FIRE-SAVING DETAIL FOR ALL DUCT AND PIPE PENETRATIONS THRU FIRE-RATED WALLS AND SMOKE PARTITIONS.



NOTE: THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS. SUBMISSION OF BIDS IS CONSIDERED VERIFICATION THAT THE CONTRACTOR HAS VISITED THE SITE. NO EXTRAS WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS.



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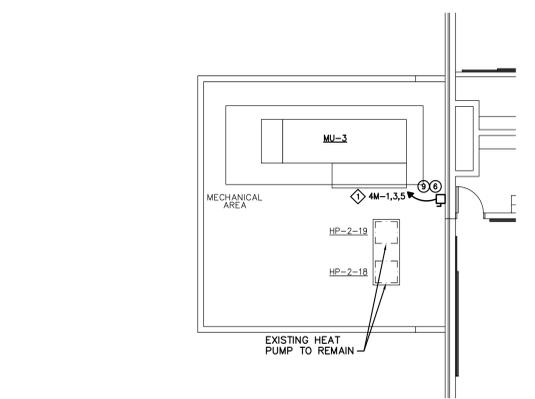


JOB NUMBER	21-099	REVISION DATES
DRAWN BY	SMB	
CHECKED BY	MFA	
DATE	11/17/2021	

JOB TITLE
PALMETTO BAYS ELEMENTARY
8900 SC-544
MYRTLE BEACH, SC 29588
HVAC RENEWAL

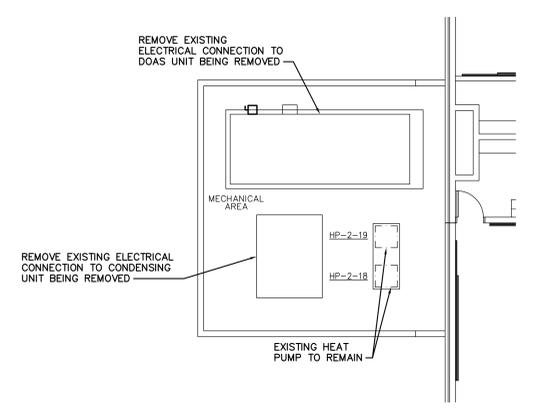
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SHEET
E1.2
3 OF 6

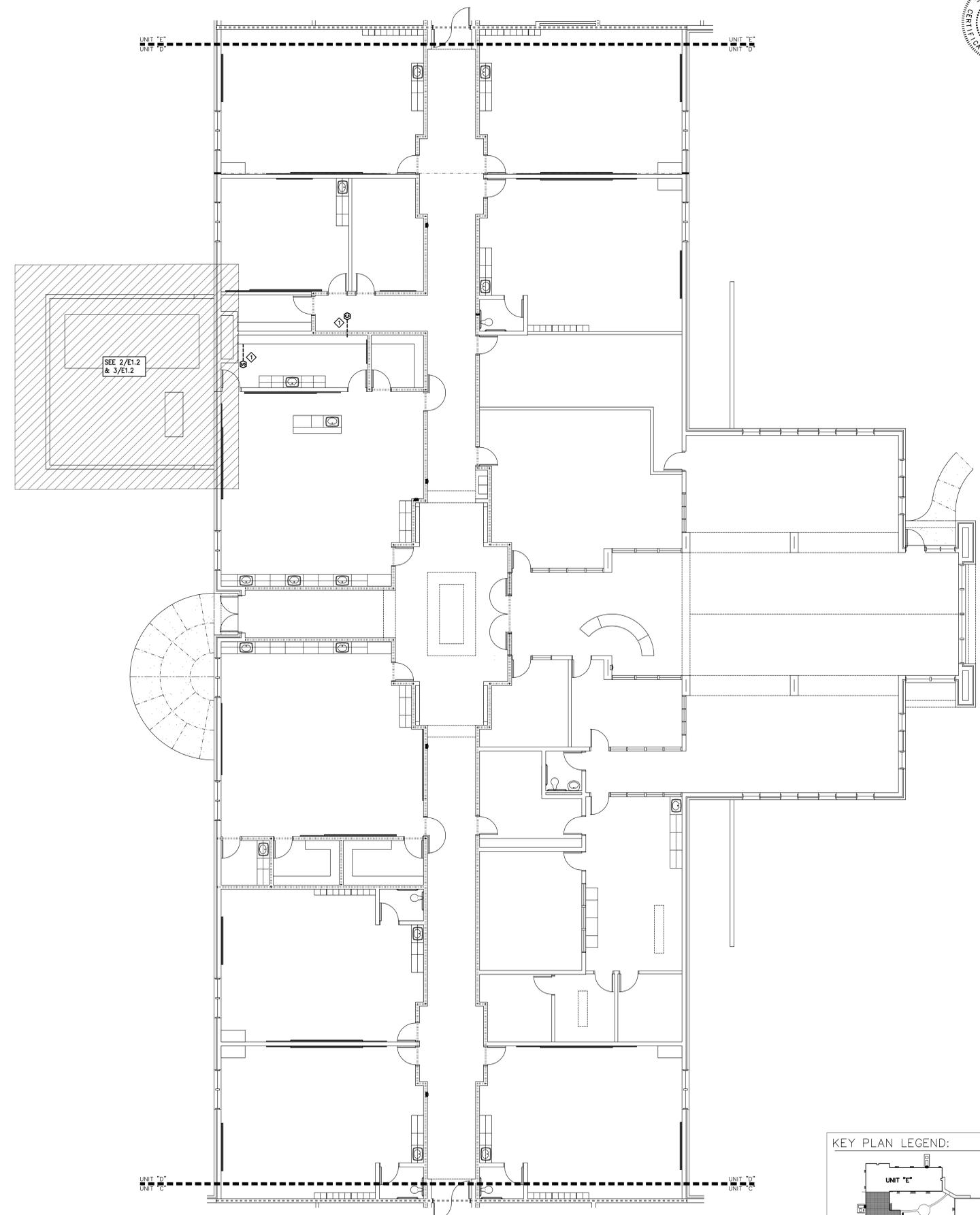


3 ELECTRICAL PLAN - RENO
SCALE: 1/8" = 1'-0"

NOTES:
◆ BASE BID: CONNECT WITH 3/8, 1#8G, 1-1/4" TO CIRCUIT AS INDICATED. REPLACE EXISTING 40/3 CIRCUIT BREAKER WITH NEW 100/3 BREAKER AS REQUIRED.
ALTERNATE BID: CONNECT WITH 3/8, 1#10G, 1" TO CIRCUIT AS INDICATED. REPLACE EXISTING 40/3 CIRCUIT BREAKER WITH NEW 60/3 BREAKER AS REQUIRED.



2 ELECTRICAL PLAN - DEMO
SCALE: 1/8" = 1'-0"

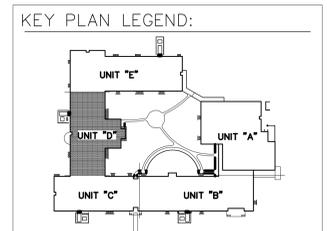


1 ELECTRICAL FLOOR PLAN - UNIT D
SCALE: 1/8" = 1'-0"

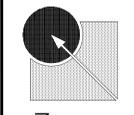
NOTES:
◆ CONNECT TO EXISTING ADDRESSABLE FIRE ALARM CIRCUIT.

FIRE RATED WALLS	
.....	1 HOUR WALL
.....	2 HOUR WALL
.....	4 HOUR WALL

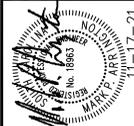
NOTE: THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS. SUBMISSION OF BIDS IS CONSIDERED VERIFICATION THAT THE CONTRACTOR HAS VISITED THE SITE. NO EXTRAS WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS.



NOTE: THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS. SUBMISSION OF BIDS IS CONSIDERED VERIFICATION THAT THE CONTRACTOR HAS VISITED THE SITE. NO EXTRAS WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS.



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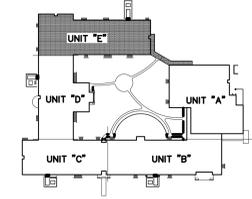
JOB NUMBER	21-099	REVISION DATES
DRAWN BY	SMB	
CHECKED BY	WFA	
DATE	11/17/2021	

JOB TITLE
PALMETTO BAYS ELEMENTARY
 8900 SC-544
 MYRTLE BEACH, SC 29588
 HVAC RENEWAL

SHEET TITLE
ELECTRICAL FLOOR PLAN -
UNIT E

SHEET
E1.3
 4 of 6

KEY PLAN LEGEND:

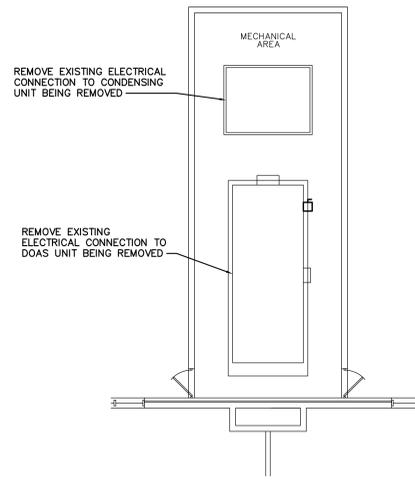


FIRE RATED WALLS

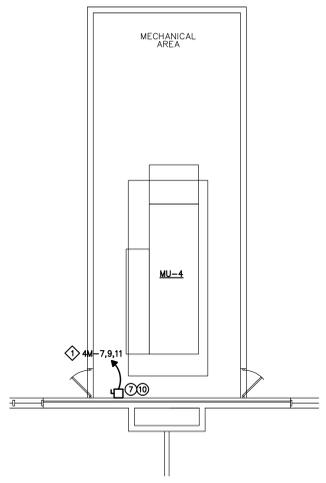
.....	1 HOUR WALL
-----	2 HOUR WALL
-----	4 HOUR WALL

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO APPLY THE PROPER FIRE-SAFING DETAIL FOR ALL DUCT AND PIPE PENETRATIONS THRU FIRE-RATED WALLS AND SMOKE PARTITIONS.

NOTE: THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS. SUBMISSION OF BIDS IS CONSIDERED VERIFICATION THAT THE CONTRACTOR HAS VISITED THE SITE. NO EXTRAS WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS.

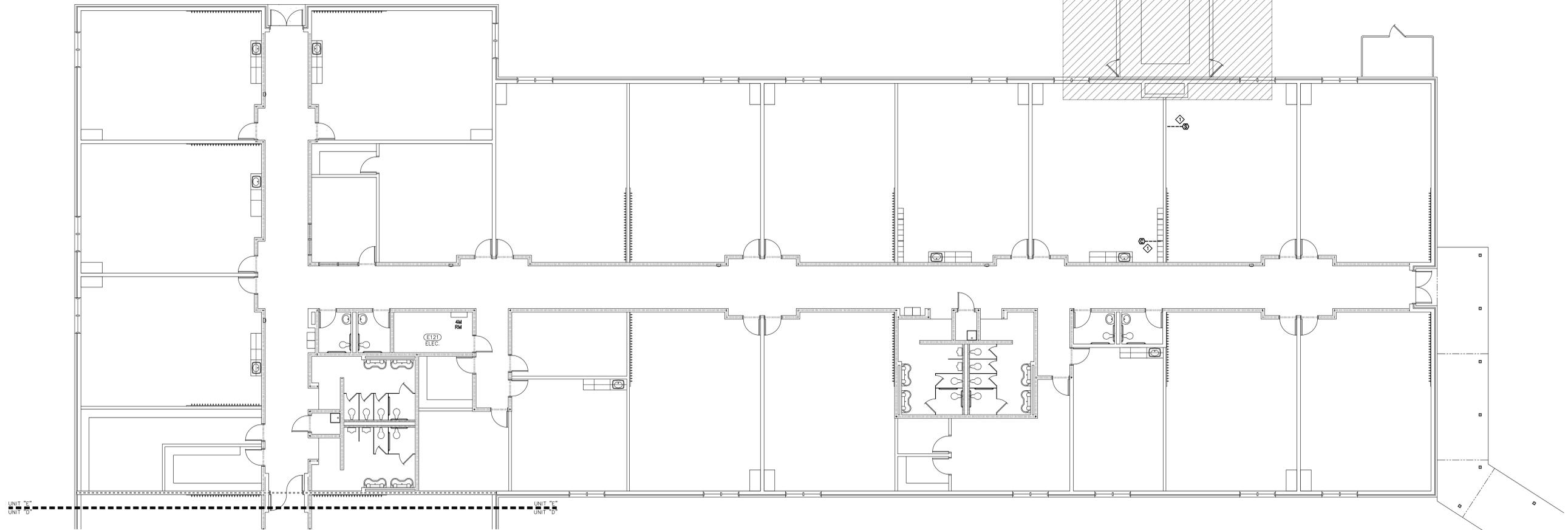


2 ELECTRICAL PLAN - DEMO
 SCALE: 1/8" = 1'-0"



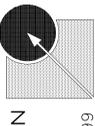
3 ELECTRICAL PLAN - RENO
 SCALE: 1/8" = 1'-0"

NOTES:
 ◆ BASE BID: CONNECT WITH 3#3, 1#6G, 1-1/4" TO CIRCUIT AS INDICATED. REPLACE EXISTING 50/3 CIRCUIT BREAKER WITH NEW 90/3 BREAKER AS REQUIRED.
 ALTERNATE BID: CONNECT WITH 3#3, 1#6G, 1-1/4" TO CIRCUIT AS INDICATED. REPLACE EXISTING 50/3 CIRCUIT BREAKER WITH NEW 90/3 BREAKER AS REQUIRED.



1 ELECTRICAL FLOOR PLAN - UNIT E
 SCALE: 1/8" = 1'-0"

NOTES:
 ◆ CONNECT TO EXISTING ADDRESSABLE FIRE ALARM CIRCUIT.



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SYMBOL SCHEDULE	
GENERAL SYMBOLS	
SYMBOL	DESCRIPTION
—	CONDUIT RUN CONCEALED ABOVE CEILINGS OR IN WALLS.
→	HOMERUN TO PANEL AND CIRCUIT(S) DESIGNATED. ARROW(S) INDICATE QUANTITY OF CIRCUITS.
◇	SPECIAL NOTE, NUMERALS IDENTIFY, SEE SCHEDULE.
①	SPECIAL CONNECTION TO A SPECIFIC ITEM OF EQUIPMENT. SEE CONNECTION SCHEDULE.
DISTRIBUTION	
SYMBOL	DESCRIPTION
■	ELECTRICAL PANELBOARD, SURFACE MOUNTED.
□	DISCONNECT SWITCH, NON-FUSIBLE.
⊞	DISCONNECT SWITCH, FUSIBLE.
—	GROUND CONNECTION.
△	DRY-TYPE TRANSFORMER, 480-120/208V 3-PHASE OR 208-120/208V 3-PHASE.
FIRE ALARM SYSTEM	
SYMBOL	DESCRIPTION
⊙---	FIRE ALARM SYSTEM DUCT MOUNTED PHOTOELECTRIC TYPE SMOKE DETECTOR.
⊙---	FIRE ALARM SYSTEM DUCT MOUNTED CARBON MONOXIDE DETECTOR.

EQUIPMENT CONNECTION SCHEDULE												
SYM.	EQUIPMENT	LOAD	VOLT / PHASE	DISCONNECT				CONDUCTORS	RACEWAY		NOTES	
				TYPE	RATING	POLES	TRIP / FUSE		ENCL.	TYPE		SIZE
①	AH-2-2	1/4HP, 4.8KW	480/3	FDS	30A	3	15A	1	3#12, 1#12G	FMC	1/2"	
②	AH-4-5	1/2HP, 7.7KW	480/3	FDS	30A	3	15A	1	3#12, 1#12G	FMC	1/2"	
③	HP-2-2	0.6FLA, 10.9RRLA	208/1	FDS	30A	2	25A	3R	2#10, 1#10G	LFMC	1/2"	
④	HP-4-5	0.4FLA, 4.3RRLA	480/3	FDS	30A	3	15A	3R	3#12, 1#12G	LFMC	1/2"	
⑤	MU-1.2 (BASE BID)	5, 3HP; 32KW	480/3	NFS	100A	3	---	3R	3#4, 1#8G	LFMC	1-1/4"	
⑥	MU-3 (BASE BID)	206, 6HP; 40KW	480/3	NFS	100A	3	---	3R	3#3, 1#8G	LFMC	1-1/4"	
⑦	MU-4 (BASE BID)	7.5, 5HP; 40KW	480/3	NFS	100A	3	---	3R	3#3, 1#8G	LFMC	1-1/4"	
⑧	MU-1.2 (ALTERNATE BID)	5, 3HP	480/3	NFS	100A	3	---	3R	3#3, 1#8G	LFMC	1-1/4"	
⑨	MU-3 (ALTERNATE BID)	5, 3HP	480/3	NFS	100A	3	---	3R	3#3, 1#8G	LFMC	1-1/4"	
⑩	MU-4 (ALTERNATE BID)	7.5, 5HP	480/3	NFS	100A	3	---	3R	3#3, 1#8G	LFMC	1-1/4"	

LEGEND			STARTER TYPES
DISCONNECT TYPES	DISCONNECT ENCLOSURE TYPES	RACEWAY TYPES	CFVNR = COMBINATION FULL VOLTAGE, NONREVERSING
ETCB = ELECTRONIC-TRIP CIRCUIT BREAKER	1 = NEMA 1 ENCLOSURE	EMT = ELECTRIC METALLIC TUBING	
FDS = FUSIBLE DISCONNECT SWITCH	3R = NEMA 3R ENCLOSURE	FMC = FLEXIBLE METAL CONDUIT	
MCP = MOTOR CIRCUIT PROTECTOR	4 = NEMA 4 ENCLOSURE	IMC = INTERMEDIATE METAL CONDUIT	CONTROL DEVICES
NFDS = NON-FUSIBLE DISCONNECT SWITCH	4X = NEMA 4X ENCLOSURE	LFMC = LIQUID-TIGHT FLEXIBLE METAL CONDUIT	HOA = HAND-OFF-AUTO
ST/DS = COMBINATION STARTER/DISCONNECT SWITCH		PVC = NON-METALLIC PVC CONDUIT	RPL = RED PILOT LIGHT
TMCB = THERMAL-MAGNETIC CIRCUIT BREAKER	FPN = FUSE PER NAMEPLATE	RMC = RIGID METAL CONDUIT	AUX = AUXILIARY CONTACTS (2 N.O., 1 N.C.)
TOG = HP RATED TOGGLE SWITCH			CTSD = 50 VA CONTROL TRANSFORMER

NOTES

ALL ELECTRICAL CHARACTERISTICS SCHEDULED ABOVE ARE BASED ON INFORMATION AVAILABLE AT THE TIME OF DESIGN. ELECTRICAL CONTRACTOR SHALL VERIFY ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT WITH EQUIPMENT SUPPLIER(S) PRIOR TO ROUGHING, AND SHALL VERIFY EXACT LOCATION AND EXACT TYPE OF CONNECTION. ALL EQUIPMENT SHALL BE PROPERLY AND SECURELY GROUNDED. ANY SIGNIFICANT CHANGES IN LOCATION, ELECTRICAL REQUIREMENTS, OR TYPE OF CONNECTION REQUIRED FOR ANY EQUIPMENT SCHEDULED ABOVE SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING PRIOR TO PROCEEDING.

CONDUCTORS AND RACEWAY SPECIFIED IN THE ABOVE SCHEDULE ARE FOR FINAL CONNECTION TO UNIT AND SHALL BE EXTENDED FROM THE DISCONNECT SHOWN ON THE FLOOR PLANS TO THE EQUIPMENT TERMINATION BOX.

CONDUIT AND BOXES REQUIRED FOR EQUIPMENT CONNECTIONS SHALL BE INSTALLED IN SUCH A WAY AS TO NOT COVER UP EQUIPMENT NAMEPLATES, SERVICE AREAS, AIR FLOW AREAS, ETC.



JOB NUMBER	21-099	REVISION DATES	
DRAWN BY	SWB		
CHECKED BY	WPA		
DATE	11/07/2021		

JOB TITLE
PALMETTO BAYS ELEMENTARY
8900 SC-544
MYRTLE BEACH, SC 29588
HVAC RENEWAL

SHEET TITLE
SYMBOLS AND SCHEDULES

ELECTRICAL GENERAL REQUIREMENTS

1.1 SCOPE:

- a. Applicable requirements of the General Conditions of the Contract, Amendments, Supplementary General Conditions, and Special Conditions govern work under this Division.
- b. Work covered by this Division consists of providing all labor, equipment, supplies, and materials; and performing all operations, including trenching, backfilling, cutting, patching, and chasing necessary for the installation of complete electrical systems in strict accordance with these specifications and the applicable drawings.
- c. Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the work, the same as if herein specified or shown.
- d. This Contractor is referred to the General and Special Conditions of the contract which shall form a part and be included in this section of the specification and shall be binding on this Contractor.
- e. Some items of equipment are specified in the singular; however, the Contractor shall provide and install the number of items or equipment as indicated on the drawings, and as required for complete systems.

1.2 RECORD DRAWINGS:

- a. During construction of this project, the Contractor shall maintain one complete set of electrical contract drawings, on which shall be recorded all significant changes. This set of drawings shall be used for no other purpose. In the event of a discrepancy, the Contractor shall submit these drawings to the Architect/Engineer for approval and presentation to the Owner.

1.3 REGULATIONS AND COMPLIANCE:

- a. The requirements of the International Building Code which includes the National Electrical Code, and of all other State and Local codes, ordinances, regulations and interpretations by authorities having jurisdiction are binding upon this Contractor, and nothing contained in, or inferred by, these specifications or the applicable drawings may be construed as waiving those requirements. The latest edition of the National Electrical Code, referred to herein and on the drawings as "N.E.C.", forms a part of these specifications; and under no circumstances may the installation fail to meet the minimum requirements therein.
- b. This Contractor shall secure and pay for all permits, fees, inspections and licenses required. It is the responsibility of the Contractor to notify the Local Electrical Inspector to schedule the required inspections. Upon completion of the project and prior to his request for final payment he shall present to the Architect/Engineer a certificate of inspection and approval from the inspection authorities.
- c. All materials and equipment shall bear the approval label, and shall be listed by the Underwriters' Laboratories, Inc.

2.1 GENERAL:

- a. Except where reuse of existing items are specifically indicated or permitted, all materials and equipment shall be new and shall conform with the standards of the National Electrical Manufacturers' Association and Underwriter's Laboratories, Inc. in every instance where such a standard has been established for the item involved.
- b. Materials shall be inspected by the Contractor upon their arrival at the site to be sure they are correct. Material and equipment stored on the site shall be protected against physical damage, dirt and damage caused by precipitation, wind, condensation, excessive humidity, and extremes of temperature. Materials shall be stored in their original cartons within substantial, clean and dry storage facilities provided under this Contract. Conduit, large galvanized boxes, and lighting poles may be stored outdoors on suitable blocks or racks clear of the earth and undergrowth, and pitched to drain. Large electrical equipment intended for ultimate installation outdoors may be stored in the weather on suitable blocks or platforms clear of the earth and undergrowth, and with interior lamps or space heaters continuously energized to prevent condensation. Alternate storage provisions may be submitted to the Architect/Engineer for approval prior to the arrival of the material. Under no circumstances shall equipment be stored in the weather under a cover of polyethylene or tarpaulin. The Architect/Engineer will be the sole judge as to the acceptability of storage facilities, and when directed by the Architect/Engineer, improperly stored or damaged material shall be removed from the site and replaced with new material.
- c. The Contractor shall coordinate the work and equipment of this Division with the work and equipment specified elsewhere in order to assure a complete and satisfactory installation. Work such as excavation, backfill, concrete, flashing, wiring, etc., which is required by the work of this section shall be performed in accordance with the requirements of the applicable section of the specifications.
- d. It is the intention of these specifications and drawings to call for finished work, tested and ready for operation. Whenever the work "provide" is used, it shall mean "furnish and install complete and ready for use".

3.1 COORDINATION:

- a. This Contractor coordinate the work of all subs and shall furnish any information necessary to permit the work of all trades to be installed satisfactorily and with the least possible interference or delay.
- b. Where the work will be installed in close proximity to, or may interfere with the work of other trades, the Contractor shall prepare composite working drawings and sections at a suitable scale not less than 3/8" = 1" or 1/4" = 1", clearly showing how his work is to be installed in relation to the work of other trades. If the Contractor installs his work before coordination, or so as to cause any interference with work of any subs, he shall make the necessary changes in his work to correct the condition without extra charge.
- c. The Contractor shall furnish to other trades, as required, all necessary templates, patterns, setting plans, and shop details for the proper installation of work and for the purpose of coordinating adjacent work.

3.3 SLEEVES, CUTTING, AND PATCHING:

- a. Contractor shall place his own sleeves and advise other trades of required chases and openings so they can be properly built in. Where any raceway supports installed under this Contract pierce the roof, suitable pith pockets shall be provided and coordinated with the roofing contractor as necessary to be acceptable to the Architect. Provide suitable fittings where any raceways or equipment cross expansion joints.
- b. Permitted cutting or patching necessary shall be done by Contractor. Structural members shall not be cut except by written permission of Architect/Engineer.

3.4 PROTECTION AND CLEAN-UP:

- a. Protect all material and work from damage during construction. Equipment installed in the building prior to its being closed in and drier out shall be protected from the elements in the same manner as previously specified for stored materials. Protect finished surfaces from splattering of mortar, paint, dirt, plaster, etc. Do not install device plates, face plates, covers, flush cabinet trims, or fittings on walls or ceilings until after painting or cleaning of the surface has been completed, and arrange for such items that are required to be field painted to be painted before being mounted. Repair, clean and touch-up or replace, all damaged material. At the completion of the project, remove all dust from finished surfaces, including lighting fixtures, lenses and lamps.
- b. The Contractor shall keep premises free of debris resulting from his work.

3.5 PAINTING AND FINISHING:

- a. Suitable finishes shall be provided on all items of electrical equipment and materials which are exposed. This shall consist of either an acceptable finish as manufactured and supplied to the job or application of suitable finishes after installation.
- b. Where installed in finished areas, exposed equipment and materials shall be supplied with prime coat, and shall be professionally painted or enameled as directed to match or blend with adjacent surfaces.
- c. In unfinished areas such as equipment rooms, exposed equipment shall be furnished with suitable factory applied finishes (e.g. standard gray enamel finish for panelboards, etc.).

3.6 OBSERVATION:

- a. The project will be observed periodically as construction progresses. The Contractor will be responsible for notifying the Architect at least 72 hours in advance when any work to be covered up is ready for inspection. No work will be covered up until after observation has been completed on such items as piping and insulation, etc.

EQUIPMENT CONNECTIONS AND COORDINATION

1.1 GENERAL:

- a. Heating, Ventilating, Air Conditioning, Refrigeration and Plumbing Equipment: Unless otherwise indicated, provide all power wiring, including feeders and branch circuits, to the terminals of the equipment, including mounting of motor starters, feeder and branch circuit over-current protection; disconnecting means within sight of each motor and each starter, whether or not specifically indicated on drawings; and Motor Control Centers indicated, complete as scheduled and specified.

BASIC MATERIALS AND METHODS

1.1 WIRING METHOD:

- a. Unless otherwise indicated or specified, the Wiring Method for this project shall consist of copper conductors with 600 volt insulation installed in metal raceways.
- b. The word "Raceway" and the word "Conduit" (or abbreviation "C") used herein or on the drawings indicate Rigid Metal Conduit, and where permitted, Intermediate Metal Conduit, Electrical Metallic Tubing, Rigid Nonmetallic Conduit, Flexible Metal Conduit, or Liquidtight Flexible Metal Conduit.
- c. Reference to "MC" indicates Intermediate Metal Conduit.
- d. Reference to "EMT" or "Tubing" indicates Electrical Metallic Tubing.
- e. Reference to "Flex" or "Flexible Conduit" indicates Flexible Metal Conduit, or, where required, Liquidtight Flexible Metal Conduit.

1.2 FASTENINGS METHODS:

- a. Acceptable fastening methods include wood screws and nails on wood construction, toggle bolts on hollow masonry, expansion bolts and lead anchors on brick and concrete, and machine screws on metal surfaces.
- b. Explosive fasteners may be used in steel and concrete in accordance with the manufacturer's recommendations.
- c. Wire, perforated metal strap, and wooden plugs are not acceptable as fastening material.
- d. Materials used shall be good quality, made of zinc or cadmium coated steel or other non-corroding material.
- e. Materials, whether exposed or concealed, shall be firmly and adequately held in place. Fastening and support shall afford safety factor of three or higher, and shall be in full compliance with the seismic protection requirements of the N.C. State Building Code.
- f. Fixtures, raceways, and equipment shall be supported from the structure. Nothing may be supported on suspended ceiling unless definitely noted so on the Drawings or specifically permitted by the Architect/Engineer.
- g. Equipment and raceways attached to outside walls, or interior walls subject to permanent moisture, shall be shimmed out with non-corrodible material so as to provide 1/4" air space between wall and equipment or raceway.

RACEWAYS AND FITTINGS

1.1 MATERIALS AND APPLICATIONS:

- a. Intermediate Metal Conduit (IMC) with threaded couplings and fittings may be used for exposed and concealed work in lieu of rigid metal conduit except underground outside the building foundation, or where supporting lighting fixtures, or in hazardous locations, or where exposed to severe impact or injury. Termination at sheet metal enclosures shall consist of double locknuts and insulating bushings.
- b. Electrical Metallic Tubing (EMT) of 2" maximum size may be used for concealed work in lieu of Rigid Metal Conduit except underground or in poured concrete. EMT of 2" maximum size may be used for exposed work in lieu of Rigid Metal Conduit except

outdoors, or above a roof, or where supporting lighting fixtures, or where exposed to severe impact or injury, or in hazardous locations, or less than 10 feet above a floor or platform in electrical, mechanical, or communications closets or equipment rooms.

- j. Flexible Metal Conduit shall be of zinc coated steel of minimum length, and shall be used in lieu of Rigid Metal Conduit for connections to moving or vibrating apparatus, recessed lighting fixtures, dry-type transformers, and motors. Flexible Metal Conduit may be used where rigid connections are impractical due to obstructions or space limitations. Flexible Metal Conduit used in wet, damp, or corrosive location shall be PVC jacketed liquid-tight complete with liquid-tight connectors.

- k. Fittings for steel conduit and tubing shall be of zinc coated steel or malleable iron. Insulating bushings of plastic provided for Rigid and Intermediate Metal Conduits shall be rated for 150°C. Bonding bushings shall be steel or malleable iron with non-removable plastic throats rated 150°C. EMT fittings shall be of the compression type. Set-screw, indentor, pressure cast, and die cast fittings are not acceptable. Connectors for EMT, Flexible Metal Conduit and Liquid-tight Flexible Metal Conduit shall be the insulated throat type. Connectors for Flexible Metal Conduits shall be of the "Tite-Bite" design.

- l. Conduit expansion fittings shall be of zinc coated cast or malleable iron and steel conduit, complete with flexible bonding straps. Expansion fittings shall allow longitudinal conduit movement of 4 inches.

- m. Minimum raceway size shall be 1/2". Other raceway sizes, unless indicated on the drawings, shall be determined by the Contractor in accordance with NEC requirements for type THW insulated conductors, or the actual insulation used if it is thicker than type THW.

2.1 INSTALLATION:

- a. Rigid and Intermediate Metal Conduits shall be made up with full threads, to which a conductive pipe compound (T & B Kopr-Shield or equal) has been applied, and butted in coupling. Terminations at sheet metal enclosures in indoor dry locations shall be made with double locknuts and an insulating bushing. Terminations at sheet metal enclosures in outdoor, damp, and wet locations shall be made with threaded conduit hubs of zinc coated malleable iron.
- b. Conduits shall be rigidly supported not more than 8 feet on center and shall be concealed within walls, ceilings, and floors, except as indicated or specifically approved by the Architect/Engineer; kept at least 6" from flues and steam or hot water pipes; and protected against the entry of dirt, plaster, or trash. Raceways shall be supported independently of suspended ceiling members and suspension wires.
- c. Suspended EMT shall be provided with additional hangers at elbows and bends, and where necessary to avoid strain at couplings and connectors.
- d. Exposed conduits, where permitted, shall be run parallel or perpendicular to walls, structural members and ceilings; with right-angle turns consisting of symmetrical bends or cast metal fittings with threaded hubs. Offsets may be used where necessary provided that they are of minimum length.
- e. Conduits crossing expansion and contraction joints shall cross perpendicular to the joint and shall be provided with expansion fittings. Conduits shall not be embedded in the concrete slabs at the expansion and contraction joints.

CONDUCTORS

1.1 MATERIALS:

- a. Unless otherwise indicated, all wire and cable conductors shall be copper.
- b. Conductors shall be not smaller than #12 AWG except that #10 AWG minimum is required for the entire length of 120 volt branch circuits whose distance to the center of the load exceeds 75 feet. #14 AWG may be used for signal and remote control circuits. #16 AWG may be used for taps to individual recessed lighting fixtures on circuits protected by over-current devices rated at 20 amperes or less and contained within flexible metal conduits that do not exceed 6 feet in length. Other conductors smaller than #14 AWG may be used only where specifically indicated on the drawings or specified herein.
- c. Conductors #10 AWG and smaller shall be solid, dual rated type THHN/THHN.
- d. Conductors #8 AWG and larger shall be stranded, dual rated type THHN/THHN.
- e. Each conductor shall bear easily readable markings along entire length, indicating size and insulation type.
- f. Insulation on conductors #10 AWG and smaller shall be suitably colored in manufacture.
- g. Conductors in any location subject to abnormal temperature shall be furnished with an insulation type suitable for temperature encountered.
- h. Where no indication is made of wire size, the conductor shall be of N.E.C. size to match its overcurrent protective device, but in no case smaller than #12 AWG.

2.1 SPLICES, TAPS, AND CONNECTIONS:

- a. Splices in conductors #10 AWG and smaller shall be made with twist-on spring steel devices UL listed as Pressure Cable Connectors, with integral insulating covers rated 75°C, at 600 volts.
- b. Splices in copper conductors #8 AWG and larger shall be made with mechanical devices UL listed as Pressure Cable Connectors and insulated with thermoplastic tape UL listed for use as sole insulation. Taps may be omitted from connectors supplied with securely fastened insulating covers which completely enclose the connector and the conductors. Insulating covers shall be rated 75°C at 600 volts.

2.2 COLOR CODING:

- a. All wiring shall be color coded.
- b. On 120/208V, 3 phase, 4 wire power systems, conductors shall be color coded Black (Phase A), Red (Phase B), Blue (Phase C), and White (Neutral). On 277/480V, 3 phase, 4 wire systems, conductors shall be color coded Brown (Phase A), Orange (Phase B), Yellow (Phase C), and Gray (Neutral).
- c. Insulation for grounding conductors on all systems shall be Green.
- d. Conductors #8 AWG and larger may be identified with two or more bands of proper color plastic tape applied near each splice and termination. Painting of wire will not be acceptable.
- e. Phase sequence shall be "A", "B" and "C" from left to right, top to bottom or front to back when facing equipment.

2.3 BRANCH CIRCUIT RACEWAY WIRING:

- a. Three-phase circuits shall be limited to one such circuit per raceway. They shall consist of three different phase wires, and a neutral where required.
- b. A neutral shall not serve more than one circuit. The neutral carrying all or any part of the current of any specific load shall be contained in the same raceway or enclosure with the phase wire or wires also carrying that current.
- c. Circuits shall be connected to panels as shown in the panel schedules.
- d. Under the above requirements and with required color coding system no raceway shall contain more than one wire of the same color, except for switch legs and control conductors.
- e. Conductors supplying lighting outlets may be combined in the same raceways with conductors supplying receptacles; but lighting outlets and receptacle outlets shall not be connected to the same circuits unless specifically indicated on the drawings.

GROUNDING AND BONDING

1.1 SCOPE:

- a. The electric system neutral, the neutral of each separately derived system, and all non-current-carrying metal parts, raceways, and enclosures shall be permanently and effectively grounded.
- b. Grounding and bonding shall be provided in strict accordance with the National Electrical Code, and as specified herein and on the drawings.
- c. The Contractor shall note that required grounding conductors and connections are not all shown on the drawings. NEC requirements apply.

2.1 MATERIALS AND APPLICATIONS:

- a. Grounding conductors shall be of THWN insulated copper, unless otherwise indicated.

3.1 EQUIPMENT GROUNDING:

- a. All non-current-carrying metal parts, raceways, and enclosures of the electrical system and of equipment supplied through the electrical system shall be permanently and effectively grounded.
- b. Equipment grounding conductors shall be provided for each feeder and for each branch circuit and shall be contained within the same raceways as the feeder and branch circuit conductors. The equipment grounding conductor shall be THWN insulated copper, not smaller than #12 AWG.
- c. Copper bonding strips normally included in small sizes of liquid-tight flexible metal conduit and dependent upon the terminal connectors for bonding continuity will not be accepted in lieu of the equipment grounding conductors specified herein.
- d. Where metal raceways enter sheet metal enclosures through knockouts provide bonding bushings and jumpers to the enclosure under any of the following conditions:
 1. Voltage exceeds 250 volts to ground.
 2. Branch circuit conduit exceeds 1" in size.
 3. Feeder conduit regardless of voltage and size.

SECONDARY DISTRIBUTION EQUIPMENT

1.1 OVERCURRENT PROTECTION DEVICES:

- a. Unless otherwise indicated, circuit breakers shall be provided as the overcurrent protection devices for services, separately derived systems, feeders, and branch circuits. Fuses may be used only where indicated on the drawings, or required by the manufacturer for equipment connected, or specified herein.
- b. Molded-case and insulated-case circuit breakers shall be the static or thermal-magnetic type, quick-make and quick-break for manual and automatic operation. Multiple breakers shall be common trip. Circuit breakers shall be bolted in place where possible. Thermal-magnetic breakers shall be calibrated at 40°C, or ambient compensated. Ampere ratings, frame sizes, and short circuit ratings shall be as indicated on the drawings. Series ratings may be applied only where specifically indicated on the drawings. Individual enclosures shall be NEMA 1 indoors, 3R outdoors, unless otherwise indicated. Other circuit breakers shall be suitable for installation in Switchboards, Panelboards, and Motor Control Centers as hereinafter specified.
 - c. Single-pole 15 and 20 amp circuit breakers shall be SMD rated.
- d. Fuses shall be the non-renewable, time delay, cartridge type, UL Class RK5 unless otherwise indicated; for installation in Safety

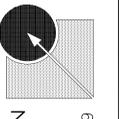
Switches, Panelboards, Switchboards, and/or Motor Control Centers as hereinafter specified.

1.2 SWITCHING EQUIPMENT:

- a. Fusible switches shall be incorporated into Safety Switches, as hereinafter specified. Manual operation shall be quick-make and quick-break. Fuse holders shall be the Class R rejection type unless otherwise indicated.
- b. Safety Switches shall be the NEMA heavy duty type, horsepower rated, with interlocked covers, non-fusible except where fused switches are indicated or fuses are required. Switch mechanisms shall be quick-make and quick-break. Enclosures shall be NEMA 1 indoors, NEMA 3R outdoors unless otherwise indicated. Fuse holders, where required, shall be as specified above for fusible switches.
- c. Switches for disconnecting small single-phase motors and appliances shall comply with SECTION 16150. WIRING DEVICES.

2.1 INSTALLATION:

- a. Distribution Equipment shall be installed in strict accordance with the manufacturer's instructions for handling, support, connections, assembly, protection, energization, adjustment, and similar procedures.
- b. Fastening methods shall comply with SECTION 16100. BASIC MATERIALS AND METHODS.
- c. Floor mounted equipment such as Switchboards, Motor Control Centers, and Dry-Type Transformers shall be provided with 4" high concrete pads and shall be secured to the concrete pad. Pads shall have a 3/4 inch chamber on each accessible side.
- d. Equipment interiors shall be thoroughly cleaned of dust, dirt, trash, and other foreign material prior to energization of the equipment.
- e. Exterior Safety Switches that are readily accessible to unauthorized persons shall have their covers padlocked closed by the Contractor. Keys shall be identified and delivered to the Owner.
- f. Upon completion of the project, furnish to the Owner one complete set of replacement fuses, consisting of three fuses of each type and rating used.
- g. Directory cards for Panelboards and for group mounted Switchboard sections shall be neatly filed-in with a typewriter to indicate the type and location of the load on each circuit or feeder.



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JOB NUMBER	21-099	REVISION DATES	
DESIGNED BY	SWB		
CHECKED BY	MFA		
DATE	11/07/2021		

PALMETTO BAYS ELEMENTARY
8900 SC-544
MYRTLE BEACH, SC 29588
HVAC RENEWAL

JOB TITLE
SHEET TITLE
SPECIFICATIONS
E2.1
6 OF 6