PROJECT:

LYMAN B. GOFF MIDDLE SCHOOL
WINDOW REPLACEMENT

974 NEWPORT AVE.
PAWTUCKET, RI 02861

CLIENT:

PAWTUCKET SCHOOL DEPARTMENT

286 MAIN ST.
PAWTUCKET, RI 02860

ARCHITECT:

WESSLING ARCHITECTS
AIA-CSI-BOCA
350 GRANITE STREET, SUITE 1103, BRAINTREE, MA 02184
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www.wesslingarchitects.com

CONSULTANTS:

STRUCTURAL ENGINEER:

Silman
A TYLin Company
111 Devonshire St, Suite 720
Boston, MA 02109
617 695 6700

MECHANICAL AND ELECTRICAL ENGINEER:

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Wozny/Barbar & Associates, Inc.
CONSULTING ENGINEERS
1076 Washington Street
Hanover, MA 02339
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161 Exchange Street
3rd Floor
Pawtucket, RI 02860

BID SET - 12/12/22

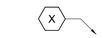
NOT FOR CONSTRUCTION
PROFESSIONAL

22081 LYMAN B. GOFF MIDDLE SCHOOL WINDOW REPLACEMENT

ABBREVIATIONS

&	AND
L	ANGLE
@	AT
℄	CENTERLINE
°	DEGREES
Ø	DIAMETER OR ROUND
#	POUND OR NUMBER
(E)	EXISTING
±	APPROXIMATELY
ACT	ACOUSTICAL CEILING TILE
AFF	ABOVE FINISHED FLOOR
ALUM	ALUMINUM
APPROX	APPROXIMATE
BOD	BOTTOM OF ROOF DECK
BOT	BOTTOM
CG	CORNER GUARD
CJ	CONTROL JOINT
CLG	CEILING
CLOS	CLOSET
CMU	CONCRETE MASONRY UNITS
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
CORR	CORRIDOR
CPT	CARPET
CT	CERAMIC TILE
DBL	DOUBLE
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DTL	DETAIL
DIA	DIAMETER
DIM	DIMENSION
DISP	DISPENSER
DN	DOWN
DWG	DRAWING
DS	DOWN SPOUT
EA	EACH
EJ	EXPANSION JOINT
ELEC	ELECTRICAL
ELEV	ELEVATION
EMER	EMERGENCY
EQ	EQUAL
EQPT	EQUIPMENT
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FHC	FIRE HOSE CABINET
FF	FINISH FLOOR
FIN	FINISH
FL	FLOOR
FL/FL	FLOOR TO FLOOR
FT	FIRE TREATED
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GFI	GROUND FAULT INTERRUPT
GND	GROUND
GWB	GYPSUM WALL BOARD
HP	HANDICAPPED
HB	HOSE BIB
HC	HOLLOW CORE
HM	HOLLOW METAL
HR	HOUR
HGT	HEIGHT
HWH	HOT WATER HEATER
INSUL	INSULATION
INT	INTERIOR
JAN	JANITOR
JT	JOINT
KIT	KITCHEN
LAB	LABORATORY
LAV	LAVATORY
LCC	LEAD COATED COPPER
MAX	MAXIMUM
MECH	MECHANICAL
MTL	METAL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MR	MOISTURE RESISTANT
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OH	OVERHEAD
OPP HND	OPPOSITE HAND
PL	PLATE
P LAM	PLASTIC LAMINATE
PLY	PLYWOOD
PR	PAIR
PTD	PAINTED
QT	QUARRY TILE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REF	REFERENCE
REIN	REINFORCED
REQD	REQUIRED
RESIL	RESILIENT
REV	REVISION
RM	ROOM
RO	ROUGH OPENING
ROW	RIGHT OF WAY
RTU	ROOF TOP UNIT
SC	SOLID CORE
SCHED	SCHEDULE
SF	SQUARE FEET
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
STC	SOUND TRANSMISSION COEFFICIENT
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURAL
SUSP	SUSPENDED
TEL	TELEPHONE
T&G	TONGUE AND GROOVE
TO	TOP OF
TOS	TOP OF SLAB
TV	TELEVISION
TYP	TYPICAL
UL	UNDERWRITER LAB
VCT	VINYL COMPOSITION TILE
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VWC	VINYL WALL COVERING
W/	WITH
WB	WOOD BASE
WC	WATER CLOSET
WD	WOOD
W/O	WITHOUT
WWF	WELDED WIRE FABRIC

SYMBOLS

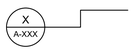


REFERENCE KEYNOTE

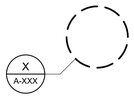
ROOM TAG

DOOR TAG

PARTITION TYPE



DETAIL CALL OUT



DETAIL CALLOUT

SECTION CALLOUT

ELEVATION CALLOUT

ELEVATION CALLOUT

INTERIOR ELEVATION CALLOUT

REVISION TAG

MATERIAL INDICATIONS

BATT INSULATION

BRICK MASONRY UNIT

BRICK MASONRY UNIT

CONCRETE

CONCRETE MASONRY UNIT

EARTH

GRAVEL

METAL PANEL INFILL

PLYWOOD

RIGID INSULATION

STEEL

WOOD

SUMMARY OF WORK

THE SCOPE OF WORK ON THIS PROJECT AS DEFINED BY THE CONTRACT DOCUMENTS INCLUDES THE FOLLOWING:

DEMOLITION WORK

WINDOWS

- REMOVE AND DISPOSE OF EXISTING ALUMINUM WINDOWS AND GLASS BLOCK UNITS BACK TO ORIGINAL ROUGH MASONRY OPENINGS.

DOORS

- REMOVE AND DISPOSE OF (3) SETS OF EXISTING METAL DOORS, FRAMES, AND HARDWARE AT THE SOUTH ELEVATION BACK TO ORIGINAL ROUGH MASONRY OPENINGS.

INTERIORS

- REMOVE AND DISPOSE OF EXISTING INTERIOR SILL MATERIALS (BACK TO ORIGINAL PLASTER SILL), SHELVING, AND ROLLER SHADES AT EXISTING WINDOW OPENINGS.
- SAWCUT AND REMOVE PLASTER AROUND PERIMETER AT EACH WINDOW OPENING AS CALLED FOR IN THESE DRAWINGS.

NEW WORK

WINDOWS

- PREP AND REPAIR EXISTING ROUGH MASONRY OPENINGS AS CALLED FOR IN THESE DRAWINGS.
- FURNISH AND INSTALL NEW ADA COMPLIANT ALUMINUM WINDOWS AND HARDWARE IN EXISTING MASONRY OPENINGS.

DOORS

- PREP AND REPAIR EXISTING OPENINGS AS CALLED FOR IN THESE DRAWINGS.
- FURNISH AND INSTALL NEW ALUMINUM DOORS, FRAMES, AND HARDWARE IN EXISTING MASONRY OPENINGS.

MASONRY

- PERFORM CONCRETE AND STONE REPAIR AT SILLS AS CALLED FOR IN THESE DRAWINGS.
- PREP AND PAINT EXISTING STEEL LINTELS WITH RUST PROHIBITIVE COATING.

WOOD TRIM

- REPAIR AREAS OF DETERIORATED WOOD TRIM ADJACENT TO WINDOW OPENINGS. REPLACE IN KIND WHERE ROTTED.

INTERIORS

- FURNISH AND INSTALL NEW INTERIOR PLASTER BASE AND SKIM COAT PLASTER AT WINDOW OPENINGS AND AREAS OF DETERIORATED / WATER DAMAGED PLASTER. PAINT TO MATCH EXISTING.
- COORDINATION AND MODIFICATION OF EXISTING MECHANICAL AND ELECTRICAL EQUIPMENT IN ROOMS. ALL SHUTDOWNS, REMOVALS, AND RECONNECTIONS OF M/E/P WORK TO BE PERFORMED AS NEEDED TO COMPLETE WORK.

NOTE: PROVIDE ALLOWANCES AND UNIT PRICES PER SPECIFICATION SECTION 00 10 00 BID/SOLICITATION INFORMATION.

BUILDING CODE REVIEW

APPLICABLE BUILDING CODES:

- BUILDING CODE: RISBC-1 RHODE ISLAND BUILDING CODE (510-RICR-00-00-1) INCORPORATES THE INTERNATIONAL BUILDING CODE, 2018 EDITION, BY REFERENCE
- ACCESSIBILITY CODE: RISBC-17 PUBLIC MEETINGS ACCESSIBILITY STANDARD, INCORPORATES THE UNIFORM FEDERAL ACCESSIBILITY STANDARDS, AS PUBLISHED IN THE FEDERAL REGISTER, BY REFERENCE.

GENERAL NOTES

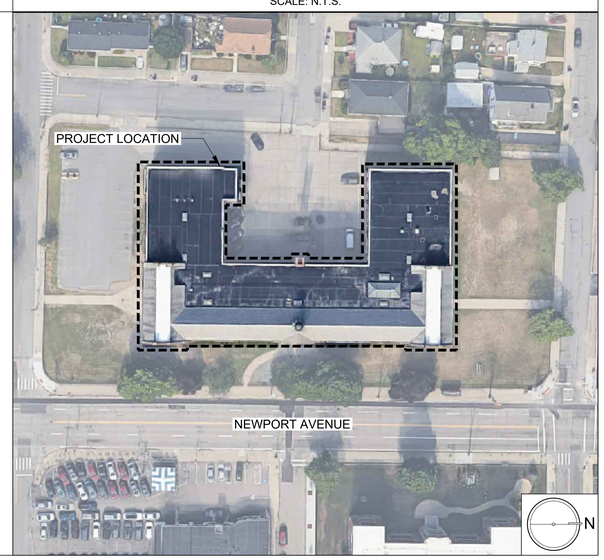
1. DIMENSIONS, QUANTITIES, AND CONDITIONS SHOWN ON THESE DRAWINGS ARE ASSUMED BY THE ARCHITECT BASED UPON AVAILABLE INFORMATION. THE CONTRACTOR SHALL, PRIOR TO THE START OF CONSTRUCTION, VERIFY ALL EXISTING CONDITIONS, DIMENSIONS, AND QUANTITIES. PROVIDE A COMPLETE FIELD LAYOUT OF THE PROJECT SITE AND NOTIFY THE ARCHITECT OF ANY DEVIATIONS OR CONFLICTS WITH THESE DRAWINGS.
2. THE DRAWINGS ARE NOT TO BE SCALED. THE GENERAL CONTRACTOR IS TO REFER TO THE DIMENSIONS INDICATED OR THE ACTUAL SIZES OF CONSTRUCTION ITEMS. WHERE NO DIMENSION OR METHOD OF DETERMINING A LOCATION IS GIVEN, VERIFY CORRECT LOCATION WITH THE ARCHITECT PRIOR TO INSTALLATION.
3. THE DRAWINGS AND REFERENCED DETAILS HAVE BEEN DIMENSIONED IN ORDER TO ESTABLISH THE CONTROL AND GUIDELINES FOR FIELD LAYOUT. WHERE A DISCREPANCY EXISTS BETWEEN THE DRAWING AND THE DETAIL, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT FOR CLARIFICATION PRIOR TO INSTALLATION. ALL INFORMATION SHALL BE VERIFIED BY THE GENERAL CONTRACTOR INTO THE PROJECT AS-BUILTS DRAWINGS AND SUBMITTALS.
4. THE BUILDING SHALL BE MADE WATERTIGHT AT THE END OF EACH WORK PERIOD OR IF INCLEMENT WEATHER THREATENS.
5. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO CONFORM TO ALL FEDERAL, STATE AND LOCAL BUILDING AND ZONING CODES.
6. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND THE SUBCONTRACTORS TO REVIEW ALL DRAWINGS, PROJECT MANUAL, ADDENDA, ETC. IN ORDER TO ASSURE THE COORDINATION OF ALL WORK AFFECTING EACH TRADE. FAILURE TO REVIEW AND COORDINATE ALL CONTRACT DOCUMENTATION BY THE GENERAL CONTRACTOR WITH ALL THE SUBCONTRACTORS FOR APPLICABLE ITEMS OF THE WORK SHALL NOT RELIEVE THE RESPONSIBLE PARTY FROM PERFORMING ALL WORK SO REQUIRED AS PART OF THE CONTRACT.
7. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND THE SUBCONTRACTORS TO INFORM THE ARCHITECT OF ANY DISCREPANCIES IN THE DOCUMENTS AND TO OBTAIN CLARIFICATION ON ALL ITEMS AFFECTING CONSTRUCTION COST FOLLOWING THE REVIEW OF THE DRAWINGS, PROJECT MANUAL, ADDENDA, ETC. PRIOR TO THE SUBMISSION OF THE BID.
8. THE GENERAL CONTRACTOR IS TO VISIT THE SITE WITH ALL SUBCONTRACTORS PRIOR TO BIDDING IN ORDER TO FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS AND THE IMPACT OF THE PROPOSED NEW WORK INDICATED IN THE DRAWINGS AND SPECIFICATIONS. ANY QUESTIONS REGARDING THE COORDINATION OF NEW WORK OR EXISTING CONDITIONS WILL BE SUBMITTED TO THE ARCHITECT IN WRITING PRIOR TO THE BID SUBMISSION. THE ARCHITECT WILL RESPOND TO ALL QUESTIONS WITH WRITTEN CLARIFICATIONS SUBMITTED TO ALL BIDDERS.
9. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ALL SCOPE OF THE WORK AFFECTING BOTH EXISTING CONDITIONS TO REMAIN AND NEW WORK. NO 'CHANGE REQUESTS' WILL BE CONSIDERED FOR ANY WORK WHICH THE GENERAL CONTRACTOR DID NOT BECOME FAMILIAR WITH DURING THE SITE VISIT, FIELD REVIEW OR SURVEY.
10. REFER TO THE PROJECT MANUAL FOR SPECIFICATIONS OF ITEMS. REQUIREMENTS OF THE SPECIFICATIONS APPLY TO ALL ASPECTS OF THE WORK AND ARE INDICATED AS ADDITIONAL INFORMATION FOR EACH ITEM SPECIFIED. IF DISCREPANCIES EXIST BETWEEN THE SPECIFICATION AND DRAWINGS, THE MORE STRINGENT REQUIREMENT SHALL PREVAIL. THE GENERAL CONTRACTOR IS TO NOTIFY THE ARCHITECT OF ANY DISCREPANCIES IN ORDER TO OBTAIN CLARIFICATION.
11. THE CONTRACTOR IS TO PERFORM NEW WORK IN ACCORDANCE WITH ESTABLISHED INDUSTRY PRACTICES PER NRCA AND SMACNA STANDARDS.
12. ALL ITEMS NOTED AS EXISTING ARE TO REMAIN UNLESS OTHERWISE NOTED.
13. ALL ITEMS SHALL BE CONTINUOUS UNLESS OTHERWISE NOTED.

DRAWING LIST

SHEET NUMBER	DRAWING TITLE	BID SET - 12/12/22							DRAWING & SKETCHES ISSUED DURING CONSTRUCTION
GENERAL									
G-000	COVER SHEET	●							
G-001	GENERAL REFERENCE SHEET	●							
G-002	SITE PLAN	●							
STRUCTURAL									
S-1	NEW EAST ELEVATION WALL PRESSURES	●							
S-2	NEW WEST ELEVATIONS WALL PRESSURES	●							
S-3	NEW SOUTH ELEVATIONS WALL PRESSURES	●							
S-4	NEW NORTH AND EAST ELEVATIONS WALL PRESSURES	●							
ARCHITECTURAL									
A-101	FIRST FLOOR PLAN	●							
A-102	SECOND FLOOR PLAN	●							
A-103	THIRD FLOOR PLAN	●							
AD-201	DEMOLITION EAST ELEVATION	●							
AD-202	DEMOLITION WEST ELEVATIONS	●							
AD-203	DEMOLITION SOUTH ELEVATIONS	●							
AD-204	DEMOLITION NORTH AND EAST ELEVATIONS	●							
A-201	NEW EAST ELEVATION	●							
A-202	NEW WEST ELEVATIONS	●							
A-203	NEW SOUTH ELEVATIONS	●							
A-204	NEW NORTH AND EAST ELEVATIONS	●							
A-401	NEW TYPICAL WINDOW BAY	●							
AD-501	DEMOLITION WINDOW DETAILS	●							
AD-502	DEMOLITION DOOR DETAILS	●							
A-501	NEW SINGLE HUNG WINDOW DETAILS	●							
A-502	NEW INSWING AWNING WINDOW DETAILS	●							
A-503	NEW DOOR DETAILS	●							
A-504	REPAIR DETAILS	●							
A-601	WINDOW AND DOOR SCHEDULES	●							
A-602	WINDOW SCHEDULE	●							
MECHANICAL									
M-0.00	MECHANICAL SYMBOL LEGEND AND NOTES	●							
MD-1.00	MECHANICAL LEVEL 1 FLOOR DEMO PLAN	●							
MD-1.01	MECHANICAL LEVEL 2 FLOOR DEMO PLAN	●							
MD-1.02	MECHANICAL LEVEL 3 FLOOR DEMO PLAN	●							
M-1.00	MECHANICAL LEVEL 1 FLOOR NEW PLAN	●							
M-1.01	MECHANICAL LEVEL 2 FLOOR NEW PLAN	●							
M-1.02	MECHANICAL LEVEL 3 FLOOR NEW PLAN	●							
M-2.00	MECHANICAL DETAILS & PICTURES	●							
M-3.00	MECHANICAL SPECIFICATIONS	●							
M-3.01	MECHANICAL SPECIFICATIONS	●							
M-3.02	MECHANICAL SPECIFICATIONS	●							
ELECTRICAL									
E-0.00	ELECTRICAL SYMBOL LIST, SCHEDULE AND GENERAL NOTES	●							
E-1.0	ELECTRICAL LEVEL 1 POWER FLOOR PLAN	●							
E-1.1	ELECTRICAL LEVEL 2 POWER FLOOR PLAN	●							
E-1.2	ELECTRICAL LEVEL 3 POWER FLOOR PLAN	●							
E-2.00	ELECTRICAL SPECIFICATION SHEET 1 OF 2	●							
E-2.01	ELECTRICAL SPECIFICATION SHEET 2 OF 2	●							

LOCUS PLAN

SCALE: N.T.S.



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PREPARED BY A LICENSED ARCHITECT
Any changes to this item can be a violation of the law unless altered by a licensed architect. Any alteration made to this item must be accompanied by a specific description of change or changes made; date change was made, as well as the seal of the licensed architect who made or oversaw the changes.

MARK	DATE	DESCRIPTION
	12-12-22	BID SET
ISSUE:		

PROJECT NO.:	22081
DRAWN BY:	LAP
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

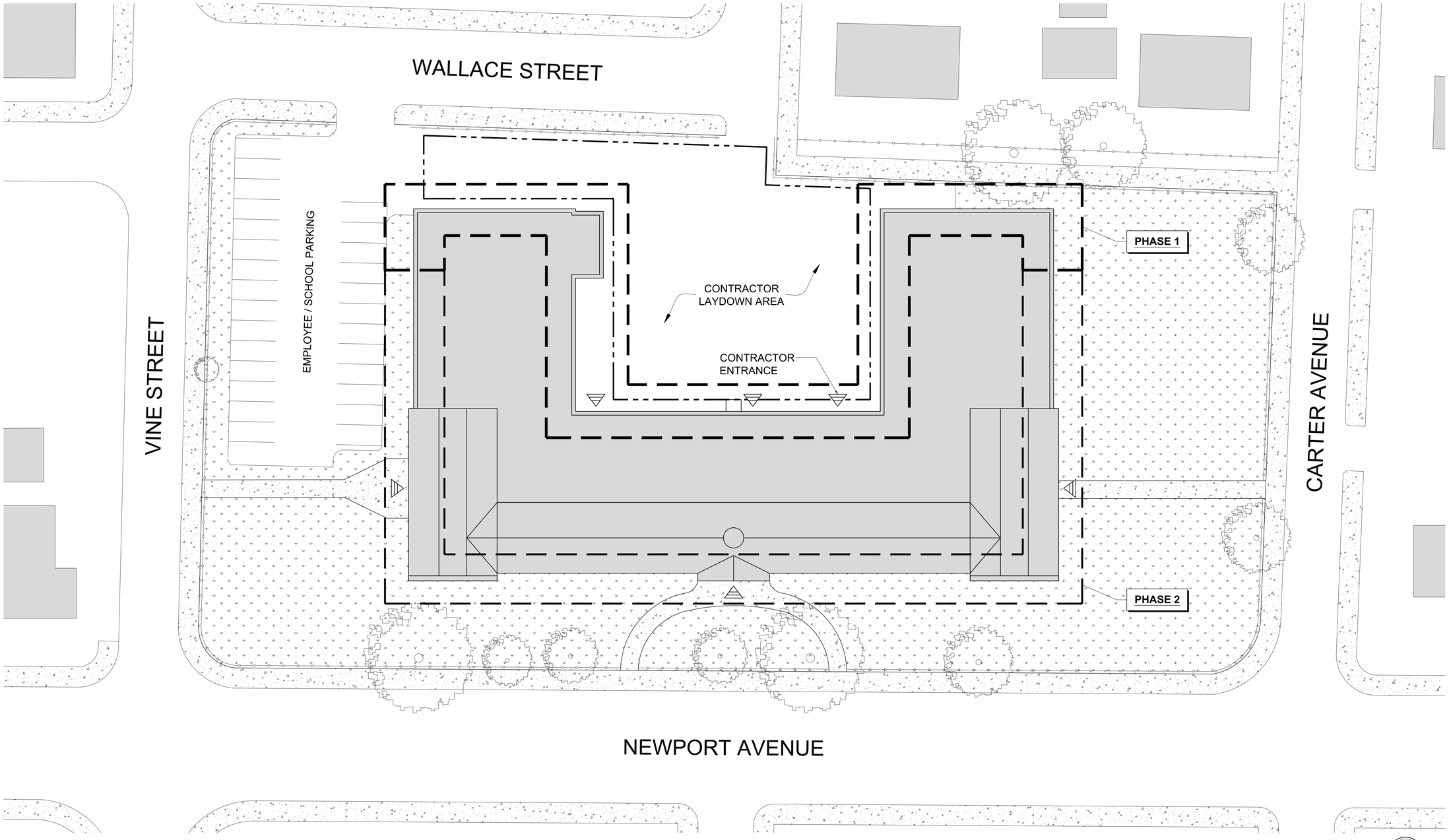
GENERAL REFERENCE SHEET

SHEET:

G-001

DO NOT SCALE DRAWING

SITE PLAN LEGEND	
	GRASS AREA
	PAVEMENT
	CONCRETE PATIO OR WALKWAY
	BUILDING ENTRANCE
	TREE/BUSH
	FENCING



1 SITE PLAN
1/16"=1'-0"
0 8'-0" 16'-0" 32'-0"

N

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AIA-CSI-BOCA
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MARK	DATE	DESCRIPTION
ISSUE:	12-12-22	BID SET

PROJECT NO.:	22081
DRAWN BY:	AC
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

SITE PLAN

SHEET:

G-002

DO NOT SCALE DRAWING

NOTES:
1. SILMAN HAS NOT REVIEWED THE EXISTING BASE BUILDING STRUCTURE, ROOFING, PARAPETS, ROOFTOP EQUIPMENT, ANCHORAGES, OR ANY OTHER EXISTING FEATURE FOR ABILITY TO WITHSTAND WIND LOADS SHOWN HERE. SILMAN HAS NOT REVIEWED ANY PROPOSED NEW EQUIPMENT, ROOFING, BUILDING MODIFICATIONS, ANCHORAGES, ETC. FOR ABILITY TO WITHSTAND WIND LOADS SHOWN HERE.
2. BUILDING HEIGHTS AND DIMENSIONS PROVIDED BY WESSLING ARCHITECTS.
3. BACKGROUND SHOWN FOR INFORMATION ONLY.
4. NO FM GLOBAL REQUIREMENTS OR MODIFICATIONS TO CODE-MANDATED WIND LOADS HAVE BEEN REVIEWED OR INCLUDED.
5. NEGATIVE PRESSURES ARE SUCTION PRESSURES ON A GIVEN SURFACE (ACTING AWAY FROM SURFACE), POSITIVE VALUES INDICATE PRESSURES ACTING TOWARD SURFACE.
6. ALL PRESSURES BASED ON ULTIMATE WIND SPEEDS AND A MEAN ROOF ELEVATION OF 46'-0".

Zone	Component area	$+GC_p$	$-GC_p$	+ Pressure (psf)	- Pressure (psf)
A	<=10 sf	0.9	-0.99	32.8	-35.5
	50 sf	0.79	-0.88	29.4	-32.1
	200 sf	0.69	-0.78	26.5	-29.2
	>500 sf	0.63	-0.72	24.6	-27.3
B	<=10 sf	0.9	-1.26	32.8	-43.7
	50 sf	0.79	-1.04	29.4	-37
	200 sf	0.69	-0.85	26.5	-31.1
	>500 sf	0.63	-0.72	24.6	-27.3

1 NEW EAST ELEVATION
1/8"=1'-0"

CONSULTANTS:
Silman
A TYLin Company
111 Devonshire St, Suite 720
Boston, MA 02109
617 695 6700

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DRAWING SCALE:	AS NOTED

SHEET TITLE:

NEW EAST ELEVATION WALL PRESSURES

SHEET:

S-1

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2 NEW WEST ELEVATION
1/8"=1'-0"

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1/8"=1'-0"

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SHEET TITLE:
NEW WEST ELEVATIONS WALL PRESSURES

SHEET:
S-2

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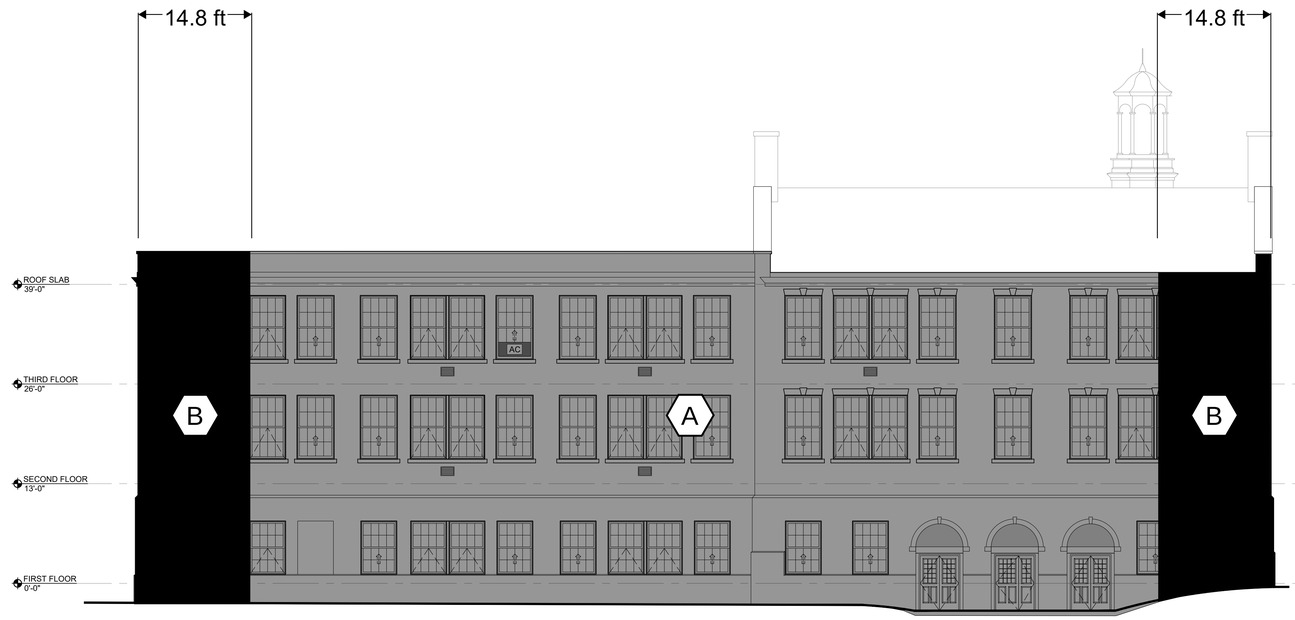
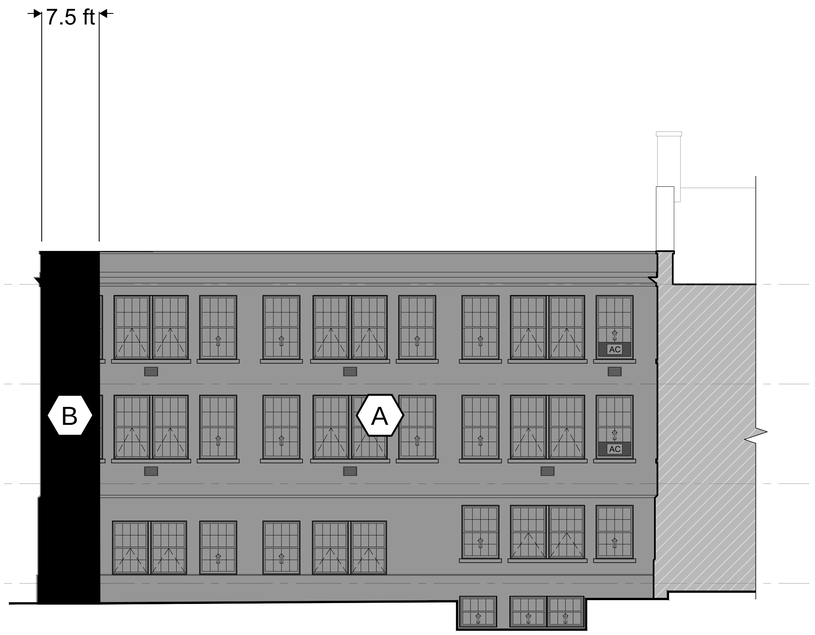
	>500 sf	0.63	-0.72	24.6	-27.3
B	<=10 sf	0.9	-1.26	32.8	-43.7
	50 sf	0.79	-1.04	29.4	-37
	200 sf	0.69	-0.85	26.5	-31.1
	>500 sf	0.63	-0.72	24.6	-27.3



2 NEW SOUTH ELEVATION
1/8"=1'-0"



1 NEW SOUTH ELEVATION
1/8"=1'-0"

CONSULTANTS:
Silman
A TYLin Company
111 Devonshire St, Suite 720
Boston, MA 02109
617 695 6700

PROJECT:

LYMAN B. GOFF MIDDLE SCHOOL WINDOW REPLACEMENT

974 NEWPORT AVE.
PAWTUCKET, RI 02861

CLIENT:

PAWTUCKET SCHOOL DEPARTMENT

286 MAIN ST.
PAWTUCKET, RI 02860

NOT FOR CONSTRUCTION
PROFESSIONAL

MARK	DATE	DESCRIPTION
	12-12-22	BID SET
ISSUE:		

PROJECT NO.:	22081
DRAWN BY:	AC
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

NEW SOUTH ELEVATIONS WALL PRESSURES

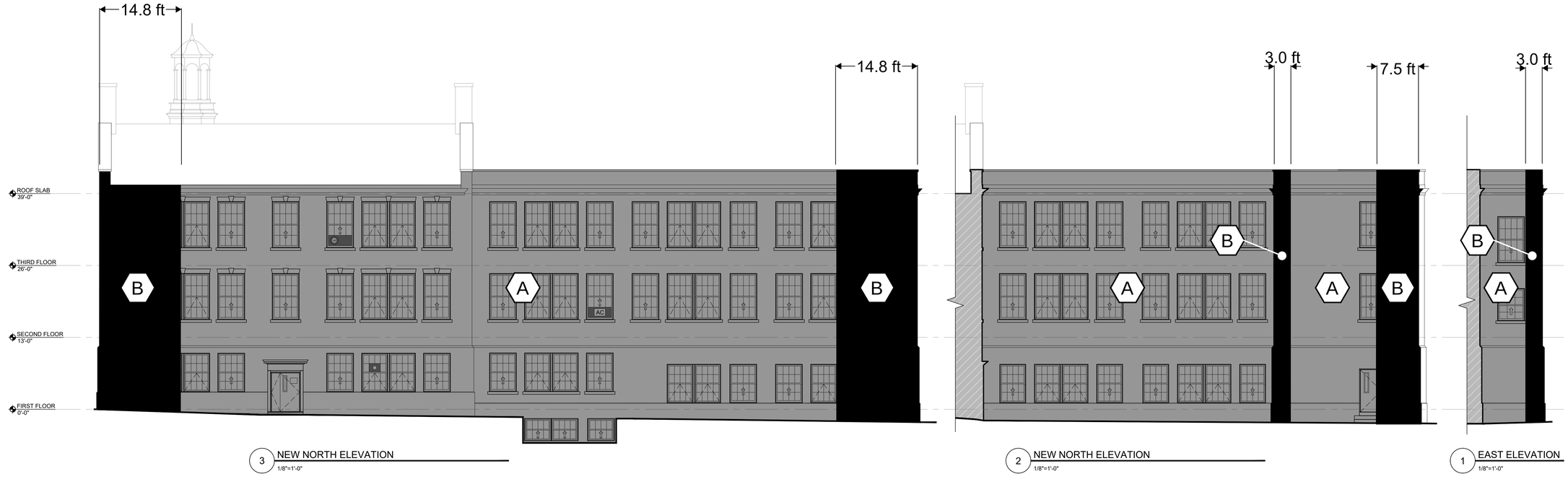
SHEET:

S-3

DO NOT SCALE DRAWING

NOTES:
1. SILMAN HAS NOT REVIEWED THE EXISTING BASE BUILDING STRUCTURE, ROOFING, PARAPETS, ROOFTOP EQUIPMENT, ANCHORAGES, OR ANY OTHER EXISTING FEATURE FOR ABILITY TO WITHSTAND WIND LOADS SHOWN HERE. SILMAN HAS NOT REVIEWED ANY PROPOSED NEW EQUIPMENT, ROOFING, BUILDING MODIFICATIONS, ANCHORAGES, ETC. FOR ABILITY TO WITHSTAND WIND LOADS SHOWN HERE.
2. BUILDING HEIGHTS AND DIMENSIONS PROVIDED BY WESSLING ARCHITECTS.
3. BACKGROUND SHOWN FOR INFORMATION ONLY.
4. NO FM GLOBAL REQUIREMENTS OR MODIFICATIONS TO CODE-MANDATED WIND LOADS HAVE BEEN REVIEWED OR INCLUDED.
5. NEGATIVE PRESSURES ARE SUCTION PRESSURES ON A GIVEN SURFACE (ACTING AWAY FROM SURFACE), POSITIVE VALUES INDICATE PRESSURES ACTING TOWARD SURFACE.
6. ALL PRESSURES BASED ON ULTIMATE WIND SPEEDS AND A MEAN ROOF ELEVATION OF 46'-0".

Zone	Component area	$+GC_p$	$-GC_p$	+ Pressure (psf)	- Pressure (psf)
A	<=10 sf	0.9	-0.99	32.8	-35.5
	50 sf	0.79	-0.88	29.4	-32.1
	200 sf	0.69	-0.78	26.5	-29.2
	>500 sf	0.63	-0.72	24.6	-27.3
B	<=10 sf	0.9	-1.26	32.8	-43.7
	50 sf	0.79	-1.04	29.4	-37
	200 sf	0.69	-0.85	26.5	-31.1
	>500 sf	0.63	-0.72	24.6	-27.3



3 NEW NORTH ELEVATION
1/8"=1'-0"

2 NEW NORTH ELEVATION
1/8"=1'-0"

1 EAST ELEVATION
1/8"=1'-0"

CONSULTANTS:
Silman
A TYLin Company
111 Devonshire St, Suite 720
Boston, MA 02109
617 695 6700

PROJECT:

LYMAN B. GOFF MIDDLE SCHOOL WINDOW REPLACEMENT

974 NEWPORT AVE.
PAWTUCKET, RI 02861

CLIENT:

PAWTUCKET SCHOOL DEPARTMENT

286 MAIN ST.
PAWTUCKET, RI 02860

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PROFESSIONAL

MARK	DATE	DESCRIPTION
	12-12-22	BID SET
ISSUE:		

PROJECT NO.:	22081
DRAWN BY:	AC
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

NEW NORTH & EAST ELEVATIONS WALL PRESSURES

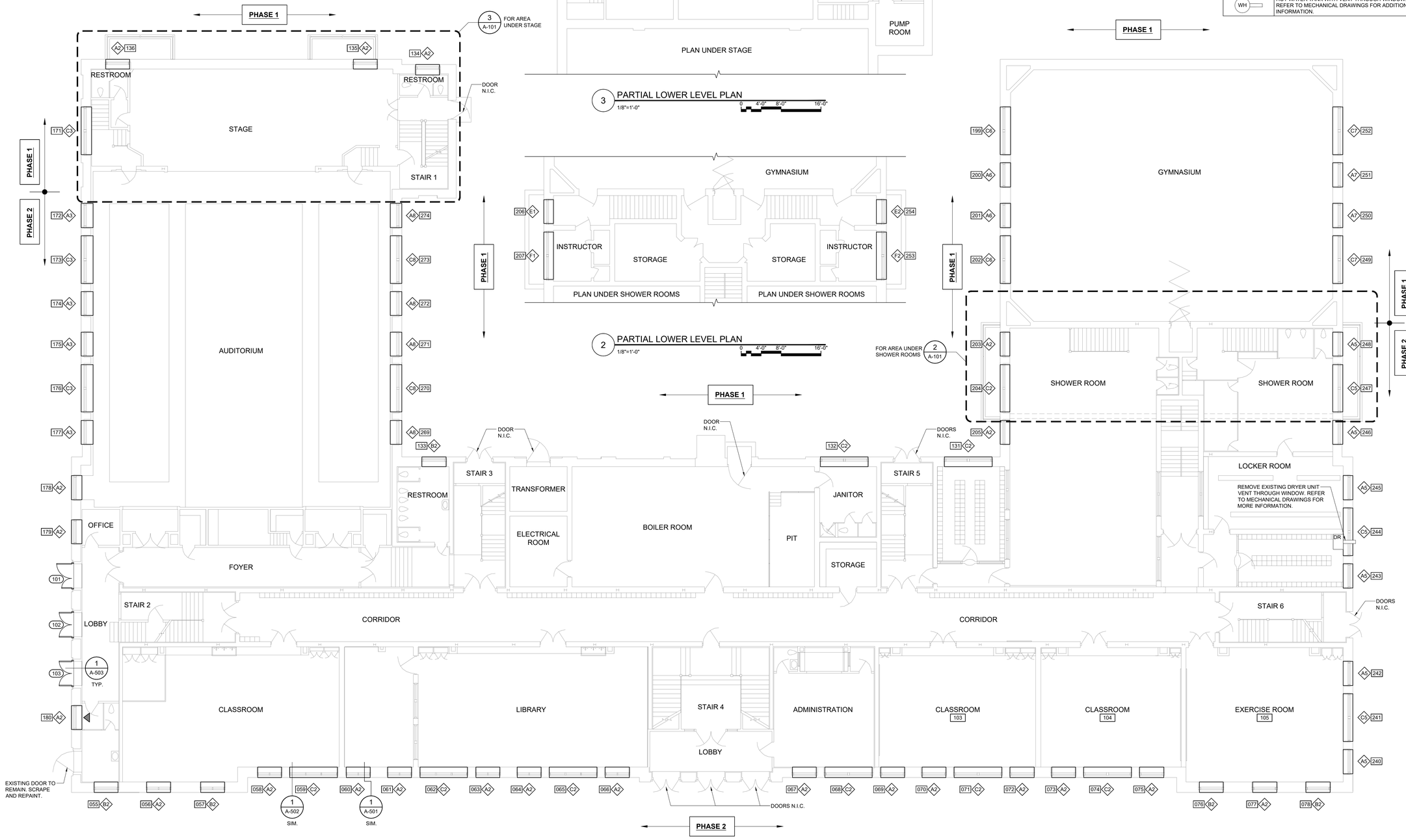
SHEET:

S-4

DO NOT SCALE DRAWING

SYMBOL LEGEND

◀	APPROXIMATE LOCATION OF EXISTING WATER DAMAGE AT INTERIOR FINISHES. INCLUDE REPAIR OF 4 S.F. OF PLASTER/GYPSUM BOARD AT EACH LOCATION.
VU	VENTILATION UNIT WITH LOUVER THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
DR	DRYER UNIT WITH VENT THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
K	NEW KILN UNIT WITH VENT THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
ST	KITCHEN EQUIPMENT UNIT WITH VENT THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
WH	HOT WATER TANK WITH VENT THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.



WESSLING ARCHITECTS
AIA-CSI-BOCA
350 GRANITE STREET, SUITE 1103, BRAINTREE, MA 02184
TEL. 617-773-8150 FAX 617-773-4902
www.wesslingarchitects.com

CONSULTANTS:

PROJECT:

LYMAN B. GOFF MIDDLE SCHOOL WINDOW REPLACEMENT

974 NEWPORT AVE.
PAWTUCKET, RI 02861

CLIENT:

PAWTUCKET SCHOOL DEPARTMENT

286 MAIN ST.
PAWTUCKET, RI 02860

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PROFESSIONAL

PREPARED BY A LICENSED ARCHITECT
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MARK	DATE	DESCRIPTION
	12-12-22	BID SET
ISSUE:		

PROJECT NO.:	22081
DRAWN BY:	AC
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

FIRST FLOOR PLAN

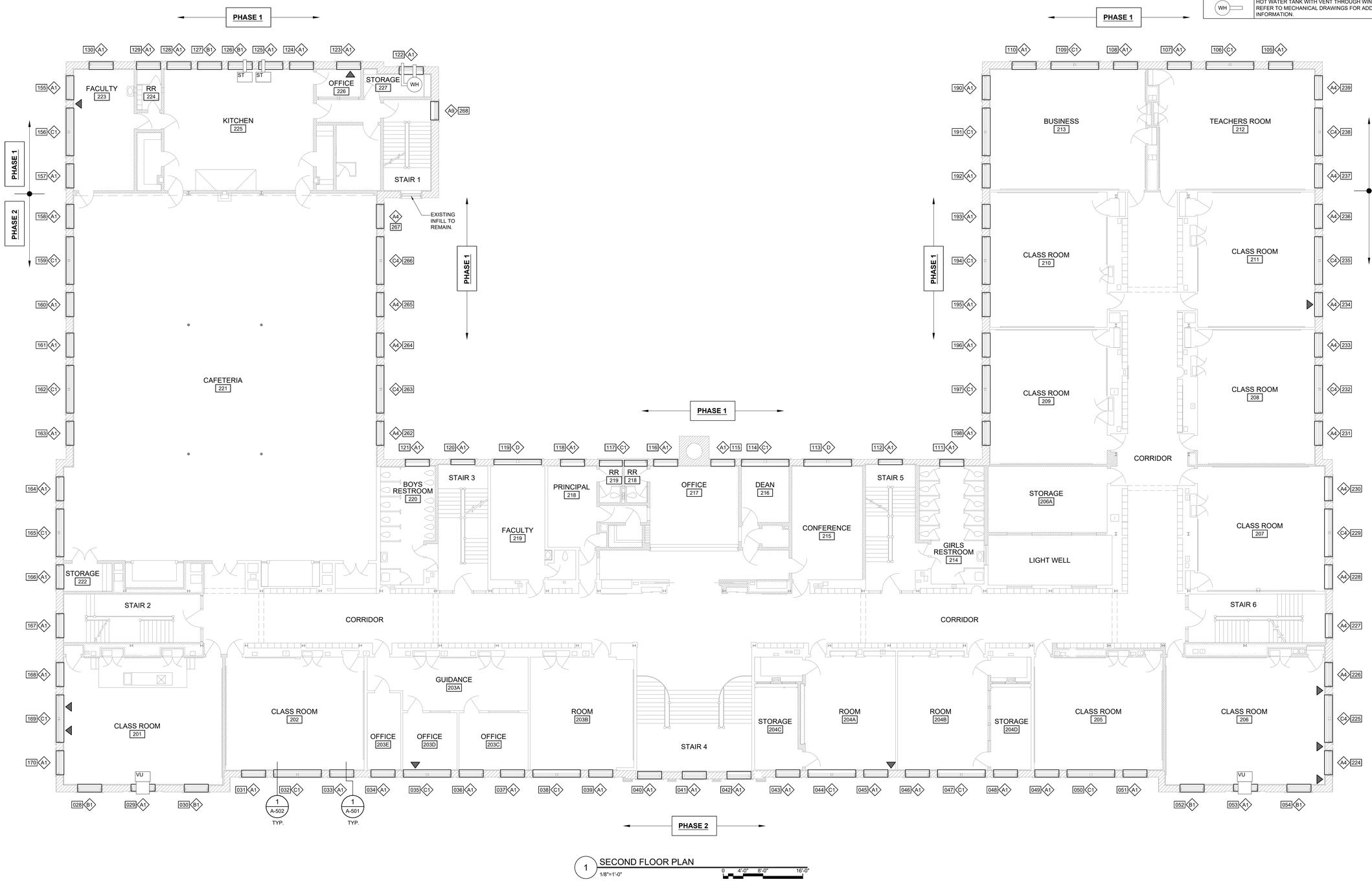
SHEET:

A-101

DO NOT SCALE DRAWING

SYMBOL LEGEND

◀	APPROXIMATE LOCATION OF EXISTING WATER DAMAGE AT INTERIOR FINISHES. INCLUDE REPAIR OF 4 S.F. OF PLASTER/GYPSUM BOARD AT EACH LOCATION.
VU	VENTILATION UNIT WITH LOUVER THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
DR	DRYER UNIT WITH VENT THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
K	NEW KILN UNIT WITH VENT THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
ST	KITCHEN EQUIPMENT UNIT WITH VENT THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
WH	HOT WATER TANK WITH VENT THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.



1 SECOND FLOOR PLAN
1/8"=1'-0"
0 4'-0" 8'-0" 16'-0"

WESSLING ARCHITECTS
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350 GRANITE STREET, SUITE 1103, BRAINTREE, MA 02184
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CONSULTANTS:

PROJECT:

LYMAN B. GOFF MIDDLE SCHOOL WINDOW REPLACEMENT

974 NEWPORT AVE.
PAWTUCKET, RI 02861

CLIENT:

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286 MAIN ST.
PAWTUCKET, RI 02860

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MARK	DATE	DESCRIPTION
	12-12-22	BID SET
ISSUE:		

PROJECT NO.:	22081
DRAWN BY:	AC
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

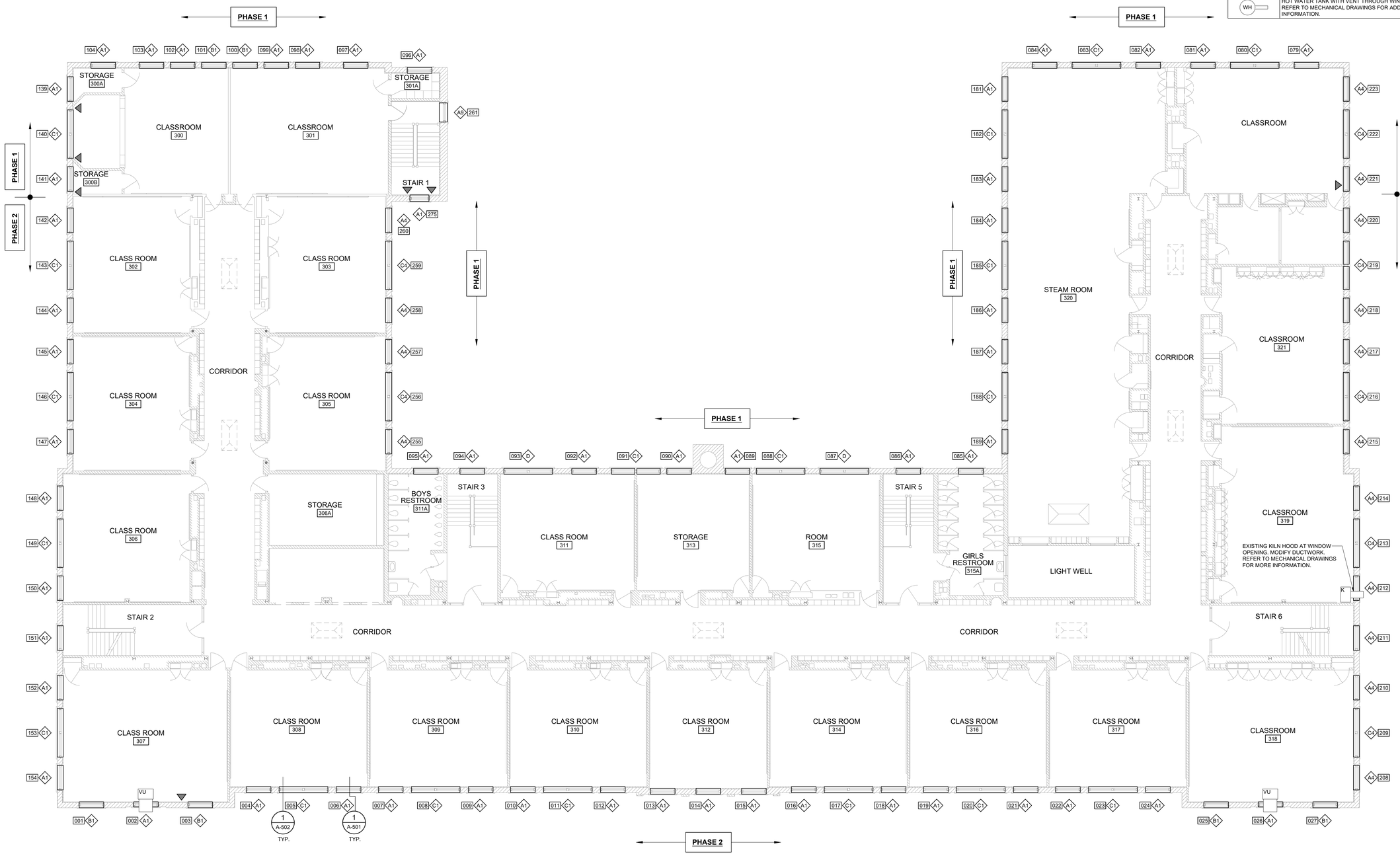
SHEET TITLE:
SECOND FLOOR PLAN

SHEET:
A-102

DO NOT SCALE DRAWING

SYMBOL LEGEND

◀	APPROXIMATE LOCATION OF EXISTING WATER DAMAGE AT INTERIOR FINISHES. INCLUDE REPAIR OF 4 S.F. OF PLASTER/GYPSUM BOARD AT EACH LOCATION.
VU	VENTILATION UNIT WITH LOUVER THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
DR	DRYER UNIT WITH VENT THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
K	NEW KILN UNIT WITH VENT THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
ST	KITCHEN EQUIPMENT UNIT WITH VENT THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
WH	HOT WATER TANK WITH VENT THROUGH WINDOW. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.



1 THIRD FLOOR PLAN
1/8"=1'-0"
0 4'-0" 8'-0" 16'-0"

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350 GRANITE STREET, SUITE 1103, BRAINTREE, MA 02184
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PAWTUCKET, RI 02861

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MARK	DATE	DESCRIPTION
	12-12-22	BID SET
ISSUE:		

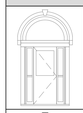
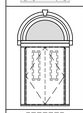
PROJECT NO.:	22081
DRAWN BY:	AC
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:
THIRD FLOOR PLAN

SHEET:
A-103

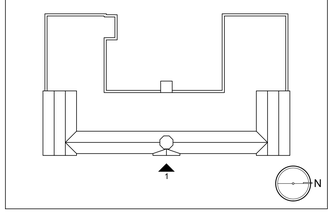
DO NOT SCALE DRAWING

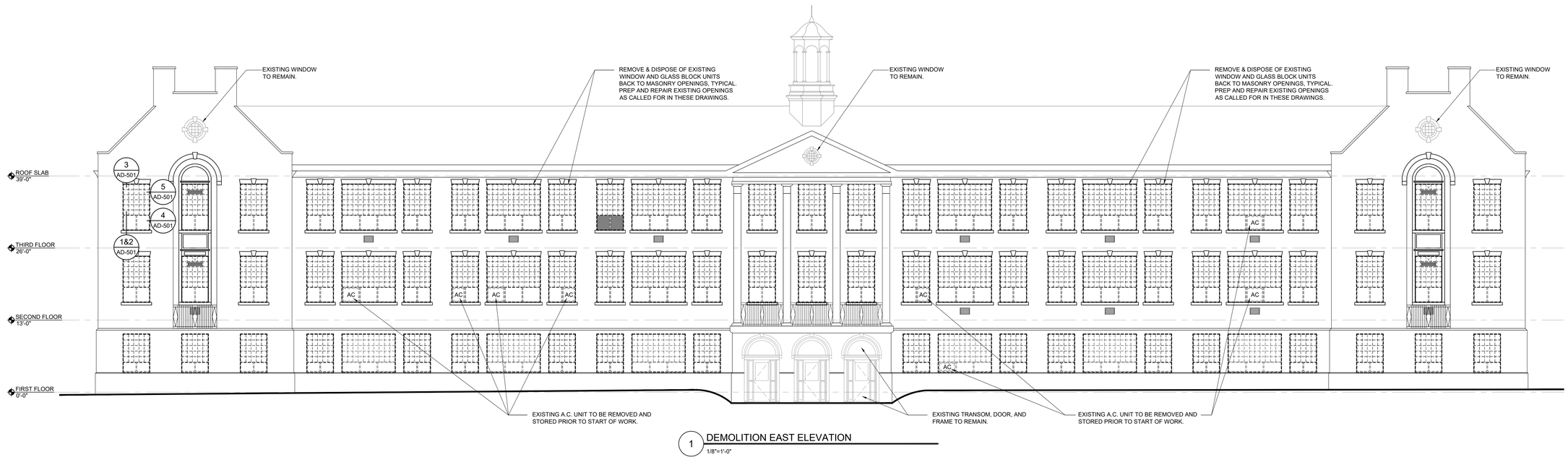
SYMBOL LEGEND

	EXISTING TRANSOM, DOOR, AND FRAME TO REMAIN.
	EXISTING DOOR AND FRAME TO BE REMOVED AND DISPOSED OF. TRANSOM TO REMAIN. PROTECT EXISTING TRANSOM DURING WORK.
	EXISTING WINDOW TO BE REMOVED AND DISPOSED OF.
	EXISTING WINDOW TO REMAIN.
AC	AIR CONDITIONING UNIT IN WINDOW TO BE REMOVED,STORED, AND REINSTALLED IN NEW WINDOW.
	EXISTING LOUVER BELOW WINDOW OPENING TO REMAIN.

KEY PLAN

SCALE: N.T.S.





1 DEMOLITION EAST ELEVATION

1/8"=1'-0"

WESSLING ARCHITECTS
AIA-CSI-BOCA

350 GRANITE STREET, SUITE 1103, BRAINTREE, MA 02184
TEL. 617-773-8150 FAX 617-773-4902
www.wesslingarchitects.com

CONSULTANTS:

PROJECT:

LYMAN B. GOFF MIDDLE SCHOOL WINDOW REPLACEMENT

974 NEWPORT AVE.
PAWTUCKET, RI 02861

CLIENT:

PAWTUCKET SCHOOL DEPARTMENT

286 MAIN ST.
PAWTUCKET, RI 02860

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PROFESSIONAL

PREPARED BY A LICENSED ARCHITECT

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MARK	DATE	DESCRIPTION
	12-12-22	BID SET
ISSUE:		

PROJECT NO.:	22081
DRAWN BY:	AC/PB
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

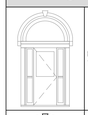
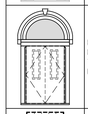
DEMOLITION EAST ELEVATION

SHEET:

AD-201

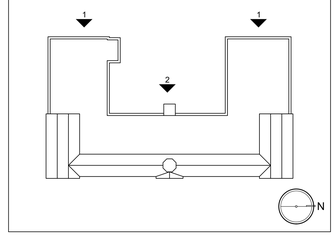
DO NOT SCALE DRAWING

SYMBOL LEGEND

	EXISTING TRANSOM, DOOR, AND FRAME TO REMAIN.
	EXISTING DOOR AND FRAME TO BE REMOVED AND DISPOSED OF. TRANSOM TO REMAIN. PROTECT EXISTING TRANSOM DURING WORK.
	EXISTING WINDOW TO BE REMOVED AND DISPOSED OF.
	EXISTING WINDOW TO REMAIN.
AC	AIR CONDITIONING UNIT IN WINDOW TO BE REMOVED,STORED, AND REINSTALLED IN NEW WINDOW.
	EXISTING LOUVER BELOW WINDOW OPENING TO REMAIN.

KEY PLAN

SCALE: N.T.S.



WESSLING ARCHITECTS
AIA-CSI-BOCA

350 GRANITE STREET, SUITE 1103, BRAINTREE, MA 02184
TEL. 617-773-8150 FAX 617-773-4902
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CONSULTANTS:

PROJECT:

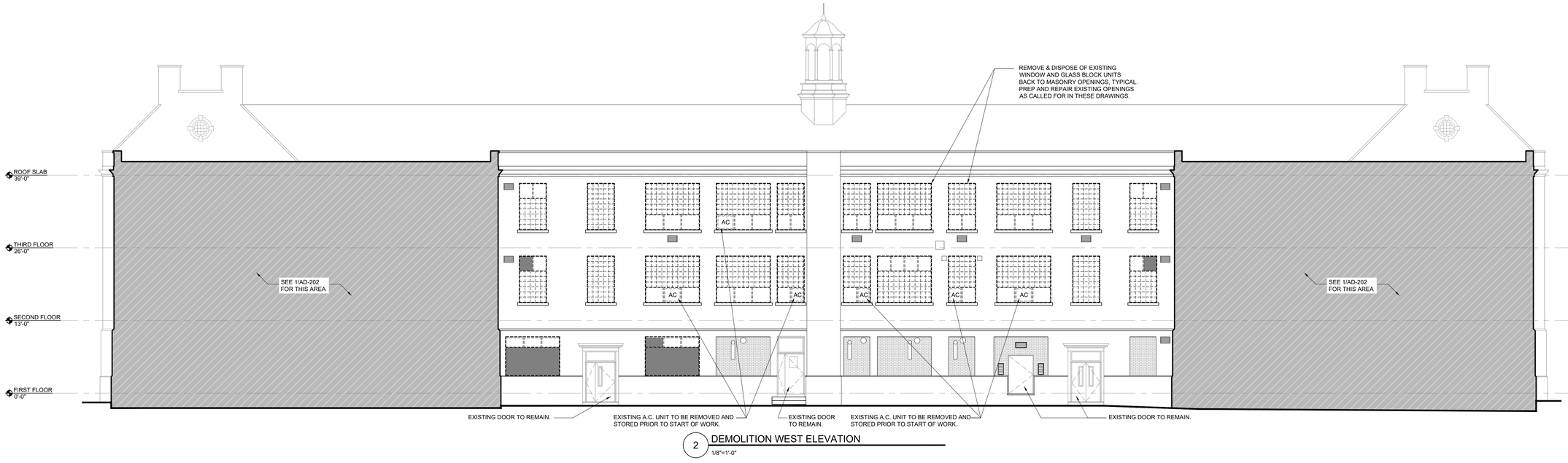
LYMAN B. GOFF MIDDLE SCHOOL WINDOW REPLACEMENT

974 NEWPORT AVE.
PAWTUCKET, RI 02861

CLIENT:

PAWTUCKET SCHOOL DEPARTMENT

286 MAIN ST.
PAWTUCKET, RI 02860



2 DEMOLITION WEST ELEVATION

1/8"=1'-0"

1 DEMOLITION WEST ELEVATION

1/8"=1'-0"

NOT FOR CONSTRUCTION

PROFESSIONAL

PREPARED BY A LICENSED ARCHITECT

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MARK	DATE	DESCRIPTION
	12-12-22	BID SET

ISSUE:

PROJECT NO.:	22081
DRAWN BY:	AC/PB
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

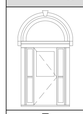
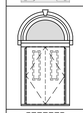
DEMOLITION WEST ELEVATIONS

SHEET:

AD-202

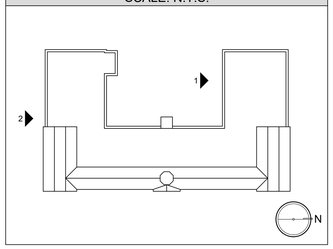
DO NOT SCALE DRAWING

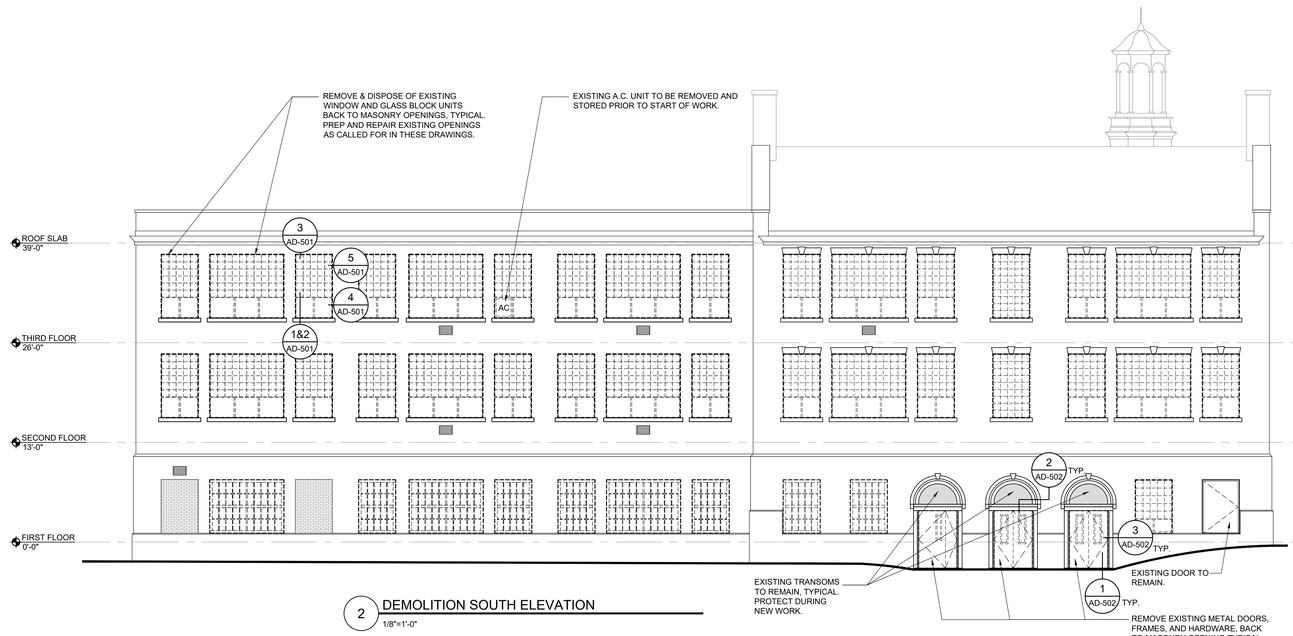
SYMBOL LEGEND

	EXISTING TRANSOM, DOOR, AND FRAME TO REMAIN.
	EXISTING DOOR AND FRAME TO BE REMOVED AND DISPOSED OF. TRANSOM TO REMAIN. PROTECT EXISTING TRANSOM DURING WORK.
	EXISTING WINDOW TO BE REMOVED AND DISPOSED OF.
	EXISTING WINDOW TO REMAIN.
AC	AIR CONDITIONING UNIT IN WINDOW TO BE REMOVED,STORED, AND REINSTALLED IN NEW WINDOW.
	EXISTING LOUVER BELOW WINDOW OPENING TO REMAIN.

KEY PLAN

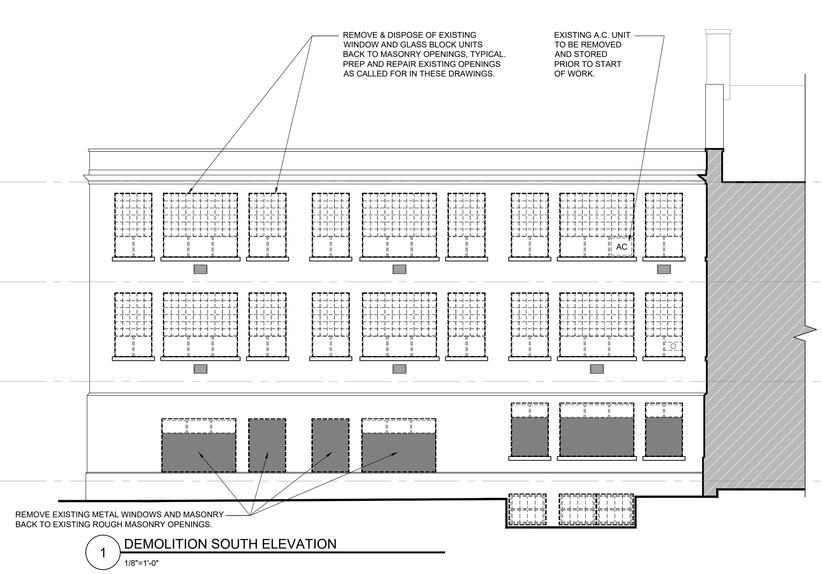
SCALE: N.T.S.





2 DEMOLITION SOUTH ELEVATION

1/8"=1'-0"



1 DEMOLITION SOUTH ELEVATION

1/8"=1'-0"

WESSLING ARCHITECTS
AIA-CSI-BOCA

350 GRANITE STREET, SUITE 1103, BRAINTREE, MA 02184
TEL. 617-773-8150 FAX 617-773-4902
www.wesslingarchitects.com

CONSULTANTS:

PROJECT:

LYMAN B. GOFF MIDDLE SCHOOL WINDOW REPLACEMENT

974 NEWPORT AVE.
PAWTUCKET, RI 02861

CLIENT:

PAWTUCKET SCHOOL DEPARTMENT

286 MAIN ST.
PAWTUCKET, RI 02860

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MARK	DATE	DESCRIPTION
	12-12-22	BID SET

ISSUE:

PROJECT NO.:	22081
DRAWN BY:	AC/PB
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

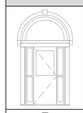
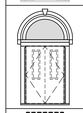
DEMOLITION SOUTH ELEVATIONS

SHEET:

AD-203

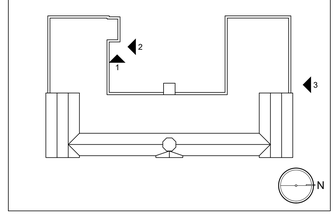
DO NOT SCALE DRAWING

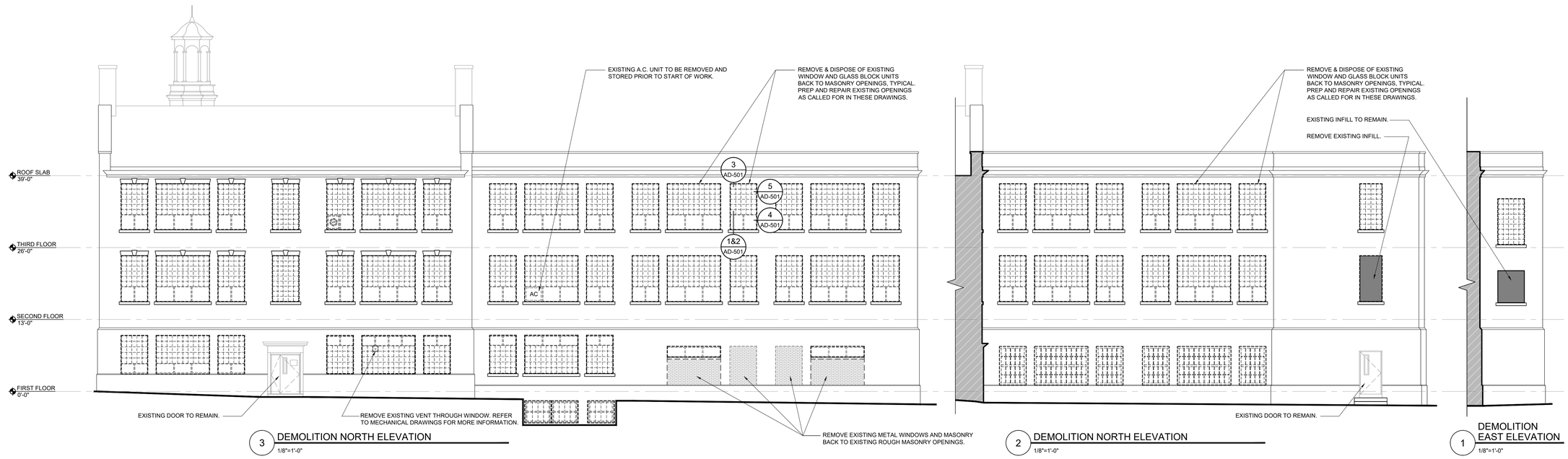
SYMBOL LEGEND

	EXISTING TRANSOM, DOOR, AND FRAME TO REMAIN.
	EXISTING DOOR AND FRAME TO BE REMOVED AND DISPOSED OF. TRANSOM TO REMAIN. PROTECT EXISTING TRANSOM DURING WORK.
	EXISTING WINDOW TO BE REMOVED AND DISPOSED OF.
	EXISTING WINDOW TO REMAIN.
AC	AIR CONDITIONING UNIT IN WINDOW TO BE REMOVED,STORED, AND REINSTALLED IN NEW WINDOW.
	EXISTING LOUVER BELOW WINDOW OPENING TO REMAIN.

KEY PLAN

SCALE: N.T.S.





3 DEMOLITION NORTH ELEVATION
1/8"=1'-0"

2 DEMOLITION NORTH ELEVATION
1/8"=1'-0"

1 DEMOLITION EAST ELEVATION
1/8"=1'-0"

WESSLING ARCHITECTS
AIA-CSI-BOCA

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CONSULTANTS:

PROJECT:

LYMAN B. GOFF MIDDLE SCHOOL WINDOW REPLACEMENT

974 NEWPORT AVE.
PAWTUCKET, RI 02861

CLIENT:

PAWTUCKET SCHOOL DEPARTMENT

286 MAIN ST.
PAWTUCKET, RI 02860

NOT FOR CONSTRUCTION

PROFESSIONAL

PREPARED BY A LICENSED ARCHITECT
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MARK	DATE	DESCRIPTION
	12-12-22	BID SET
ISSUE:		

PROJECT NO.:	22081
DRAWN BY:	AC/PB
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

DEMOLITION NORTH AND EAST ELEVATIONS

SHEET:

AD-204

DO NOT SCALE DRAWING

NEW ELEVATION REPAIR LEGEND

NOTE: LOCATIONS IDENTIFIED ON THE ELEVATIONS ARE REPRESENTATIVE OF THE TYPES OF REPAIRS. CARRY MINIMUM ALLOWANCES AND UNIT PRICES BEYOND THOSE AREAS IDENTIFIED ON THE ELEVATIONS. REFER TO G-001 GENERAL REFERENCE SHEET AND SPECIFICATIONS FOR MORE INFORMATION.

A / #	CONDITION ITEM BUBBLE: A = ITEM # = LINEAR FEET (LF), SQUARE FEET (SF), CUBIC FEET (CF) OR UNIT
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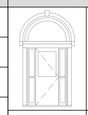
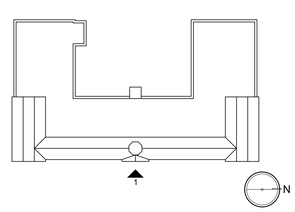
CL / 1	REPAIR CRACK IN LIMESTONE SILL (LINEAR FEET) SEE DETAIL 4/A-504.
SC / #	REPAIR SPALLED CONCRETE (SQUARE FEET) SEE DETAIL 1/A-504.
MJ / #	REMOVE AND REPLACE DETERIORATED MORTAR JOINT (LINEAR FEET) SEE DETAIL 5/A-504.
CB / #	REMOVE AND REPLACE CRACKED BRICK (LINEAR FEET) SEE DETAIL 9/A-504.
DW / #	REMOVE AND REPLACE DETERIORATED WOOD TRIM (AREA)
FS / #	REMOVE AND REPLACE BACKER ROD AND SEALANT (LINEAR FEET)
RL / #	CLEAN RUSTED LINTEL AND PAINT (UNIT) SEE DETAILS 3/A-501, 3/A-502, AND 10/A-504.
RS / #	CLEAN RUST STAINING (SQUARE FEET)
ES / #	CLEAN ENVIRONMENTAL STAINING (SQUARE FEET)
	EXISTING CRACK EXTENTS

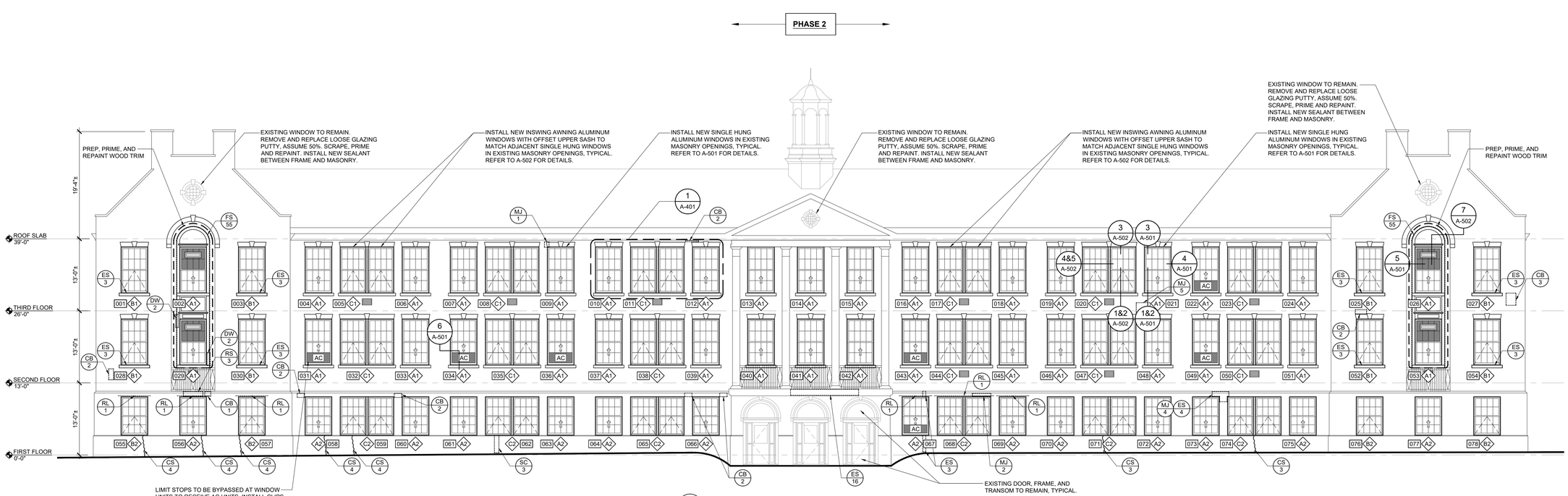
SYMBOL LEGEND

	EXISTING DOOR, FRAME AND TRANSOM TO REMAIN.
	NEW DOOR AND FRAME WITH EXISTING TRANSOM TO REMAIN.
	NEW SINGLE HUNG WINDOW.
	NEW INSWING WINDOW.
	EXISTING WINDOW TO REMAIN.
	VENT PIPE / FLUE THROUGH WINDOW. SEE DETAIL 6/A-502.
	AIR CONDITIONING UNIT IN WINDOW. SEE DETAIL 6/A-501.
	EXISTING LOUVER BELOW WINDOW OPENING TO REMAIN.
	AREA OF METAL PANEL WITH APPLIED MUNTINS WITHIN WINDOW.
	NEW VENTILATION LOUVER THROUGH WINDOW WITHIN METAL PANEL. SEE DETAIL 7/A-502.

KEY PLAN

SCALE: N.T.S.





1 NEW EAST ELEVATION
1/8"=1'-0"

NOTE: PROVIDE MOCK-UP OF EACH WINDOW TYPE INSTALLATION FOR ARCHITECT AND OWNER REVIEW AND APPROVAL.

WESSLING ARCHITECTS
AIA-CSI-BOCA
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TEL. 617-773-8150 FAX 617-773-4902
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CONSULTANTS:

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ISSUE:

PROJECT NO.:	22081
DRAWN BY:	AC
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

NEW EAST ELEVATION

SHEET:

A-201

DO NOT SCALE DRAWING

NEW ELEVATION REPAIR LEGEND

NOTE: LOCATIONS IDENTIFIED ON THE ELEVATIONS ARE REPRESENTATIVE OF THE TYPES OF REPAIRS. CARRY MINIMUM ALLOWANCES AND UNIT PRICES BEYOND THOSE AREAS IDENTIFIED ON THE ELEVATIONS. REFER TO G-001 GENERAL REFERENCE SHEET AND SPECIFICATIONS FOR MORE INFORMATION.

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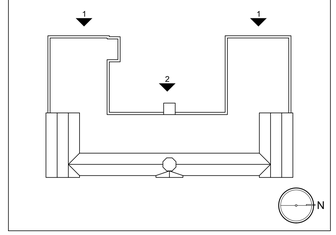
RS / #	CLEAN RUST STAINING (SQUARE FEET)
ES / #	CLEAN ENVIRONMENTAL STAINING (SQUARE FEET)
	EXISTING CRACK EXTENTS

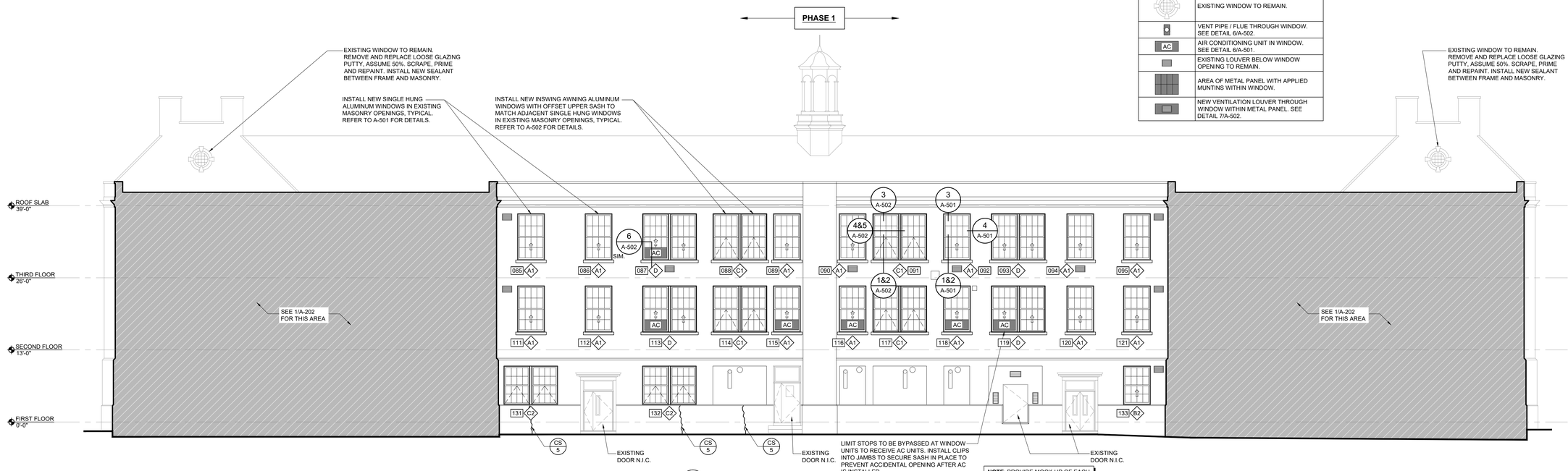
SYMBOL LEGEND

	EXISTING DOOR, FRAME AND TRANSOM TO REMAIN.
	NEW DOOR AND FRAME WITH EXISTING TRANSOM TO REMAIN.
	NEW SINGLE HUNG WINDOW.
	NEW INSWING WINDOW.
	EXISTING WINDOW TO REMAIN.
	VENT PIPE / FLUE THROUGH WINDOW. SEE DETAIL 6/A-502.
AC	AIR CONDITIONING UNIT IN WINDOW. SEE DETAIL 6/A-501.
	EXISTING LOUVER BELOW WINDOW OPENING TO REMAIN.
	AREA OF METAL PANEL WITH APPLIED MUNTINS WITHIN WINDOW.
	NEW VENTILATION LOUVER THROUGH WINDOW WITHIN METAL PANEL. SEE DETAIL 7/A-502.

KEY PLAN

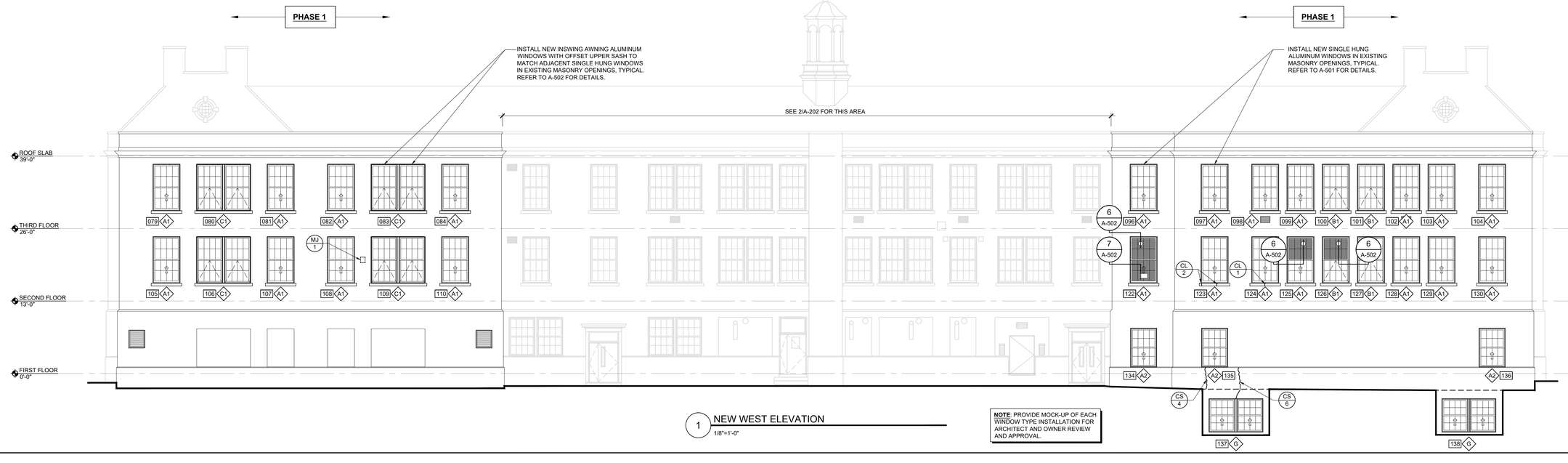
SCALE: N.T.S.





2 NEW WEST ELEVATION
1/8"=1'-0"

NOTE: PROVIDE MOCK-UP OF EACH WINDOW TYPE INSTALLATION FOR ARCHITECT AND OWNER REVIEW AND APPROVAL.



1 NEW WEST ELEVATION
1/8"=1'-0"

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ISSUE:	12-12-22	BID SET

PROJECT NO.:	22081
DRAWN BY:	AC
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

NEW WEST ELEVATIONS

SHEET:

A-202

DO NOT SCALE DRAWING

NEW ELEVATION REPAIR LEGEND

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ES / #	CLEAN ENVIRONMENTAL STAINING (SQUARE FEET)
~~	EXISTING CRACK EXTENTS

SYMBOL LEGEND

	EXISTING DOOR, FRAME AND TRANSOM TO REMAIN.
	NEW DOOR AND FRAME WITH EXISTING TRANSOM TO REMAIN.
	NEW SINGLE HUNG WINDOW.
	NEW INSWING WINDOW.
	EXISTING WINDOW TO REMAIN.
	VENT PIPE / FLUE THROUGH WINDOW. SEE DETAIL 6/A-502.
AC	AIR CONDITIONING UNIT IN WINDOW. SEE DETAIL 6/A-501.
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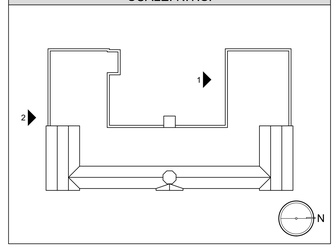
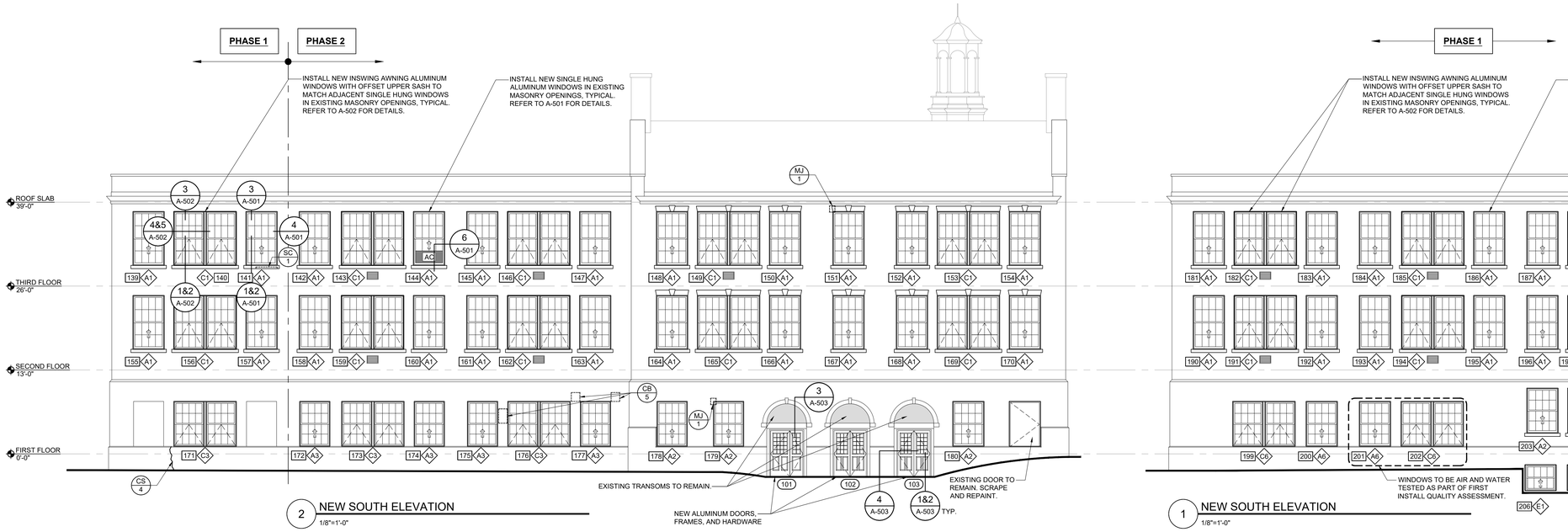
	NEW VENTILATION LOUVER THROUGH WINDOW WITHIN METAL PANEL. SEE DETAIL 7/A-502.

KEY PLAN

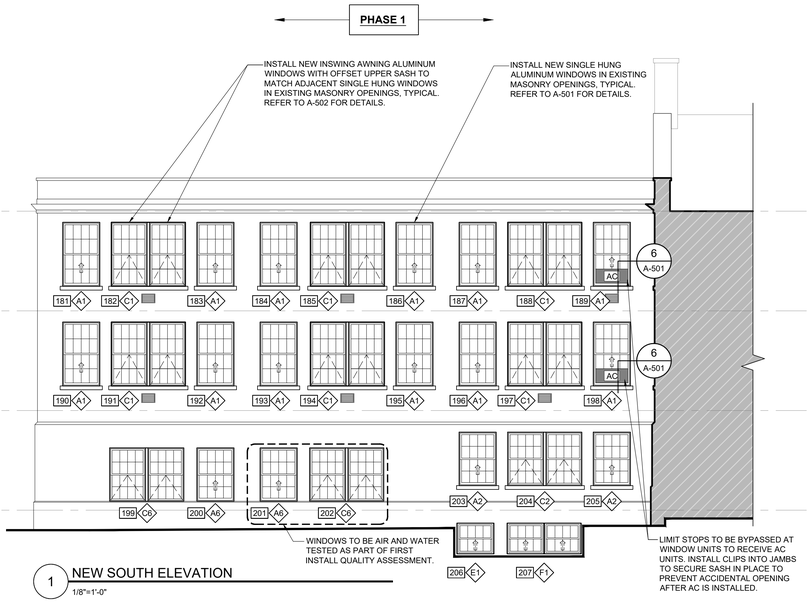
SCALE: N.T.S.





2 NEW SOUTH ELEVATION
1/8"=1'-0"

NOTE: PROVIDE MOCK-UP OF EACH WINDOW TYPE INSTALLATION FOR ARCHITECT AND OWNER REVIEW AND APPROVAL.



1 NEW SOUTH ELEVATION
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DRAWN BY:	AC
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

NEW SOUTH ELEVATIONS

SHEET:

A-203

DO NOT SCALE DRAWING

Drawing name: J:_SJW2022\22081 goff middle school window replacement\00-construction documents\architecture\AutoCAD\goff middle school\Sheets\22081 A-203 New South Elevations.dwg
Dec 12, 2022 - 10:08am
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NEW ELEVATION REPAIR LEGEND

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SYMBOL LEGEND

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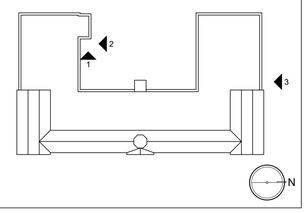
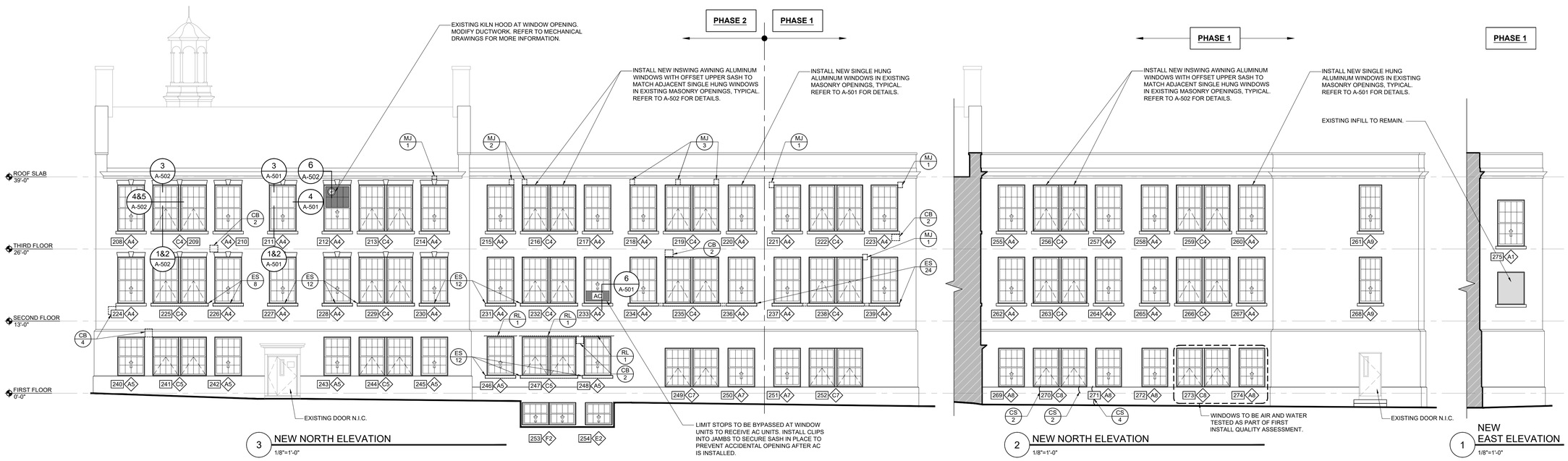
	NEW VENTILATION LOUVER THROUGH WINDOW WITHIN METAL PANEL. SEE DETAIL 7/A-502.

KEY PLAN

SCALE: N.T.S.





3 NEW NORTH ELEVATION
1/8"=1'-0"

NOTE: PROVIDE MOCK-UP OF EACH WINDOW TYPE INSTALLATION FOR ARCHITECT AND OWNER REVIEW AND APPROVAL.

2 NEW NORTH ELEVATION
1/8"=1'-0"

NOTE: PROVIDE MOCK-UP OF EACH WINDOW TYPE INSTALLATION FOR ARCHITECT AND OWNER REVIEW AND APPROVAL.

1 NEW EAST ELEVATION
1/8"=1'-0"

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DRAWN BY:	AC
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

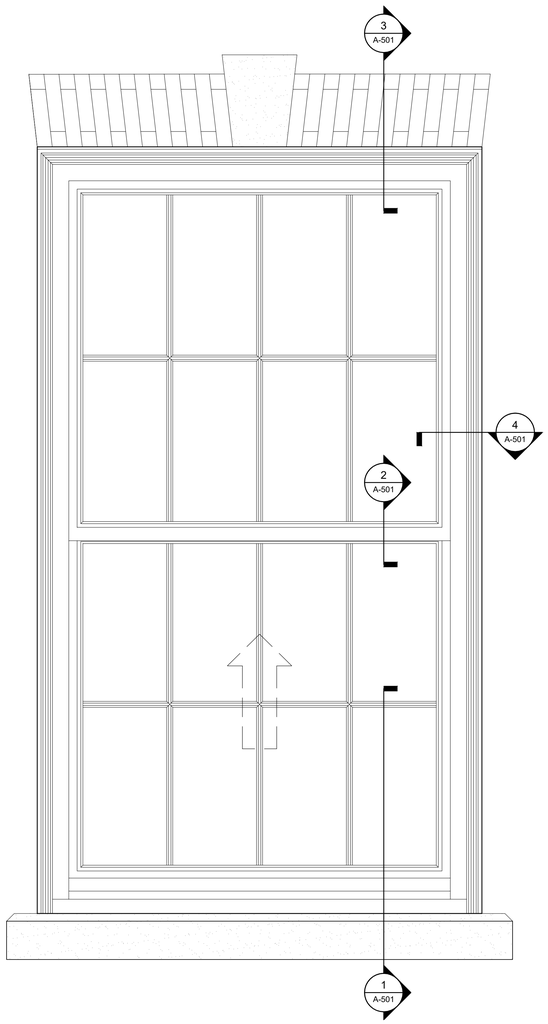
SHEET TITLE:

NEW NORTH AND EAST ELEVATIONS

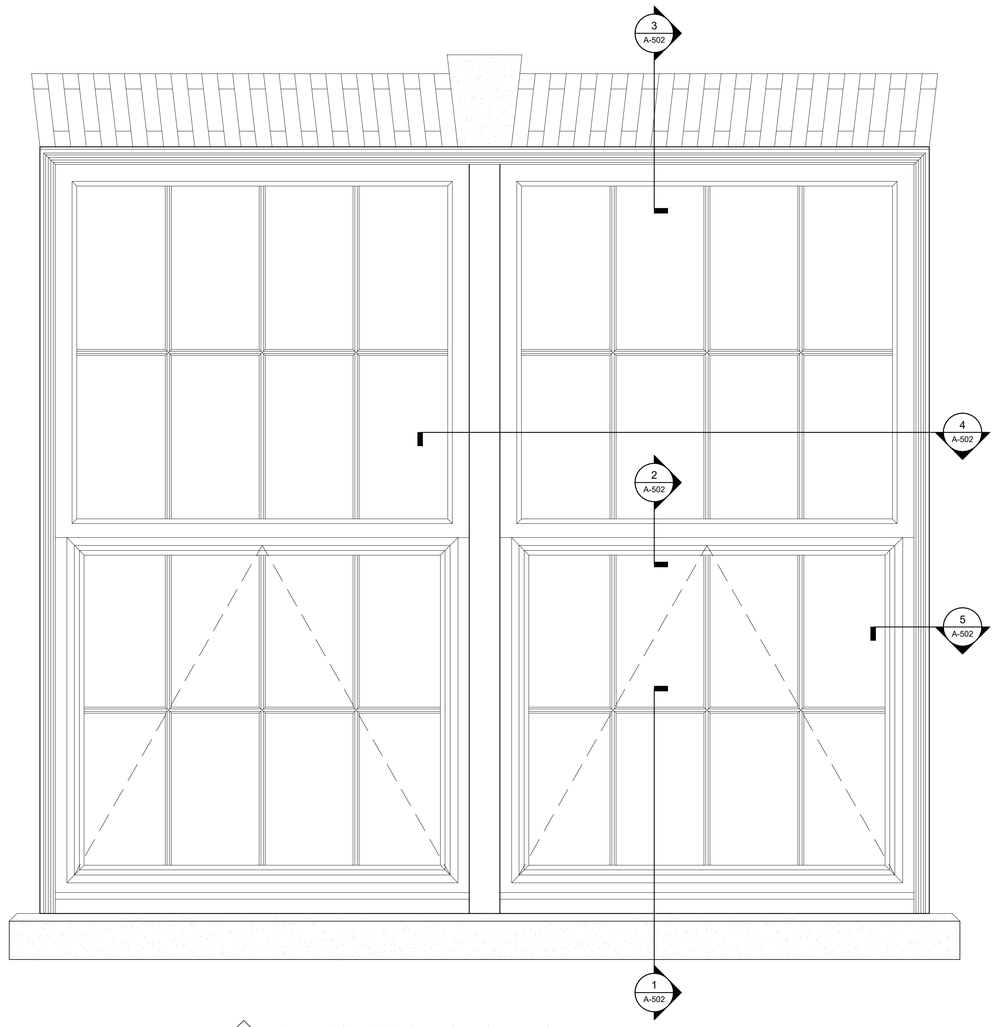
SHEET:

A-204

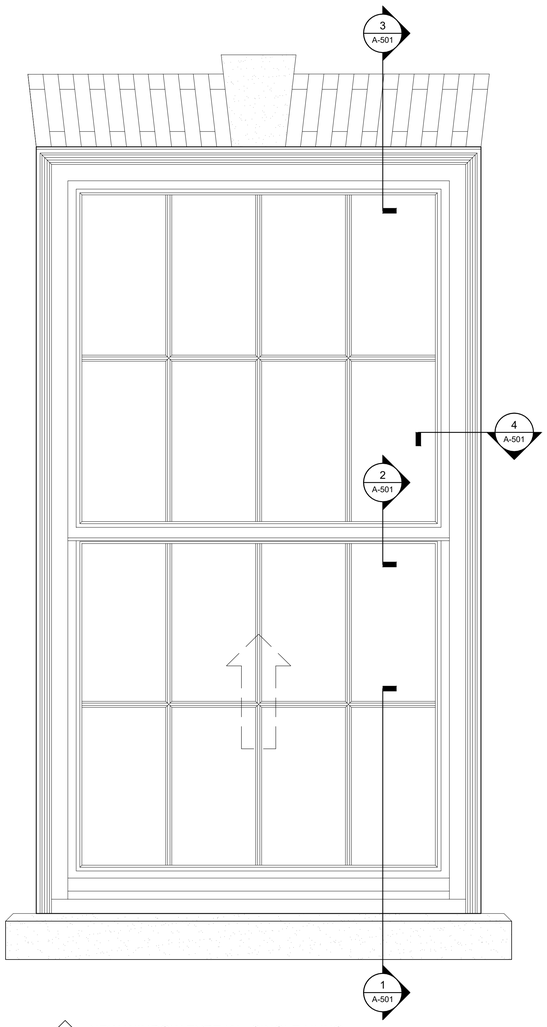
DO NOT SCALE DRAWING



C NEW WINDOW TYPE 'C' - IN-SWING AWNING



1 NEW TYPICAL WINDOW BAY
1 1/2"=1'-0"



A NEW WINDOW TYPE 'A' - SINGLE HUNG

NOTE: REFER TO DETAILS 5+6/A-501 + 6/A-502 AND ELEVATIONS FOR INFORMATION RELATED TO AC UNITS, LOUVERS, FLUES SET WITHIN WINDOWS

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PROJECT NO.:	22081
DRAWN BY:	LAP
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

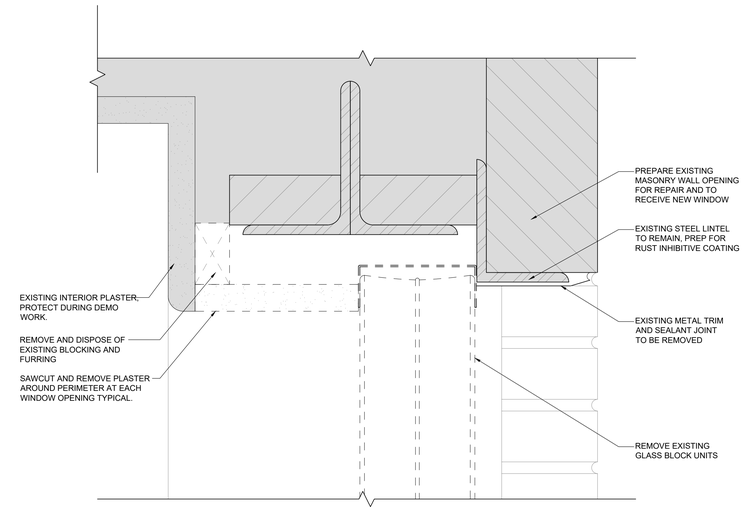
SHEET TITLE:

NEW TYPICAL WINDOW BAY

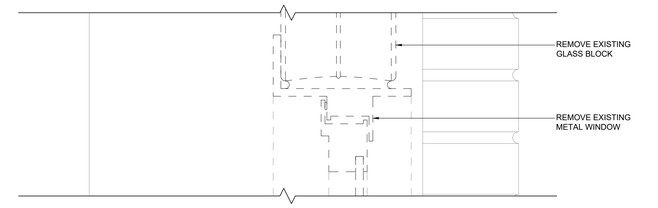
SHEET:

A-401

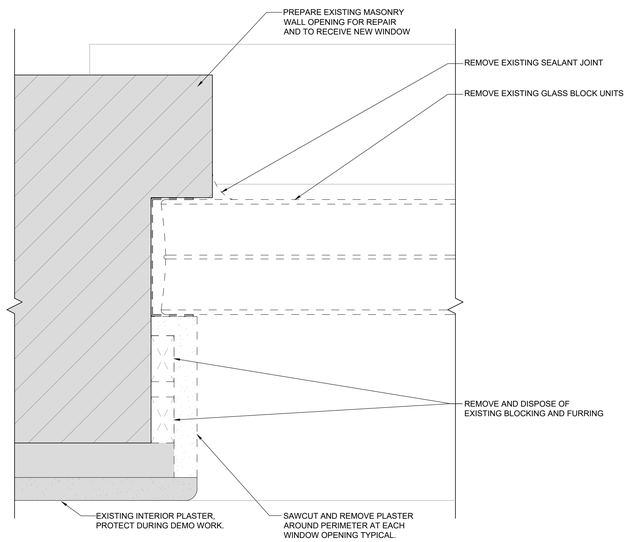
DO NOT SCALE DRAWING



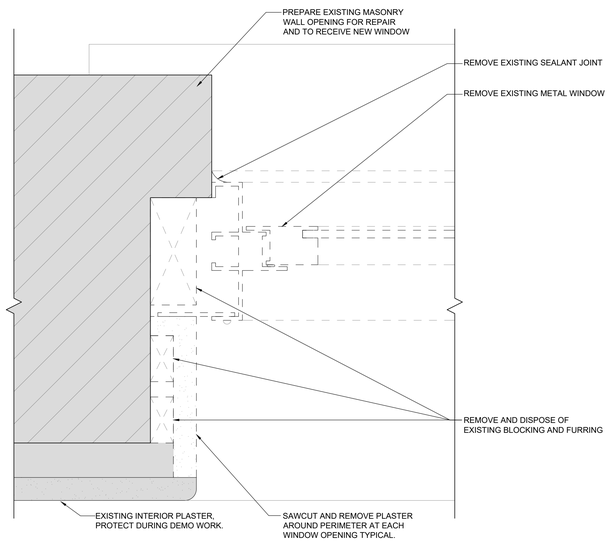
3 DEMOLITION GLASS BLOCK - HEAD DETAIL
6" = 1'-0"



2 DEMOLITION METAL WINDOW - GLASS BLOCK TRANSITION DETAIL
6" = 1'-0"

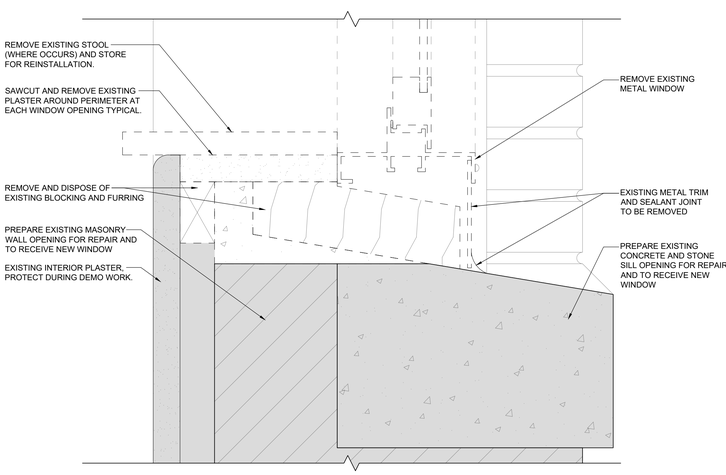


5 EXISTING GLASS BLOCK - JAMB DETAIL
6" = 1'-0"



4 DEMOLITION METAL WINDOW - JAMB DETAIL
6" = 1'-0"

NOTE: REMOVE ALL EXISTING INTERIOR SILL MATERIALS, SHELVING, AND ROLLER SHADES AT WINDOW OPENINGS, TYPICAL. TURN EXISTING SHADES OVER TO SCHOOL FOR SALVAGE.



1 DEMOLITION METAL WINDOW - SILL DETAIL
6" = 1'-0"

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350 GRANITE STREET, SUITE 1103, BRAINTREE, MA 02184
TEL. 617-773-8150 FAX 617-773-4902
www.wesslingarchitects.com

CONSULTANTS:

PROJECT:

LYMAN B. GOFF MIDDLE SCHOOL WINDOW REPLACEMENT

974 NEWPORT AVE.
PAWTUCKET, RI 02861

CLIENT:

PAWTUCKET SCHOOL DEPARTMENT

286 MAIN ST.
PAWTUCKET, RI 02860

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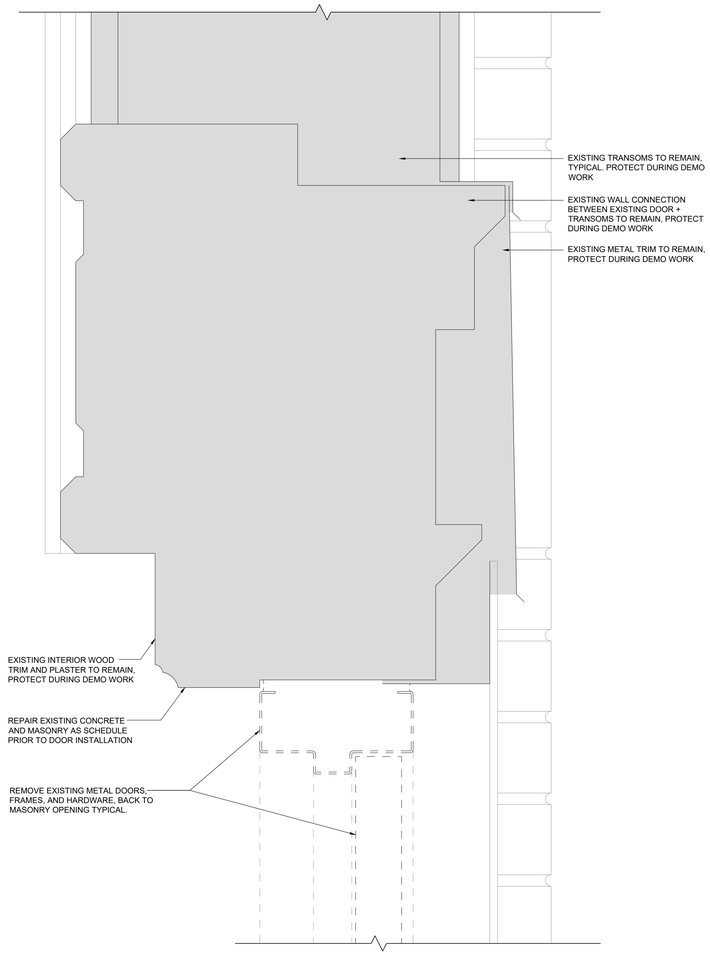
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

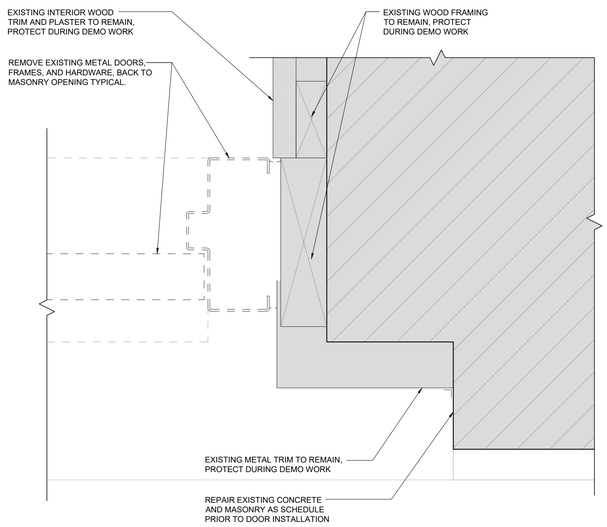
SHEET TITLE:
DEMOLITION WINDOW DETAILS

SHEET:
AD-501

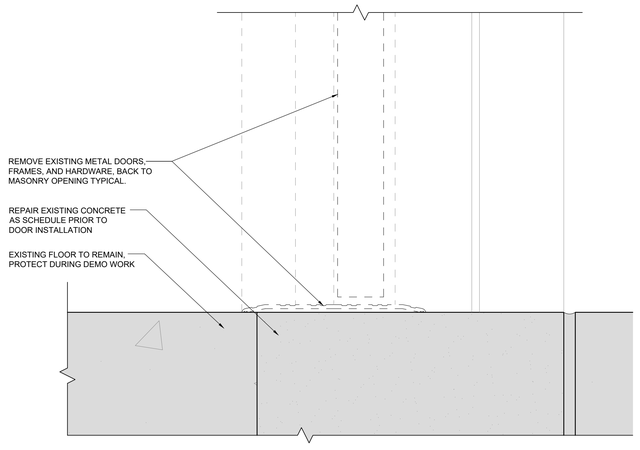
DO NOT SCALE DRAWING



2 DEMOLITION DOOR - HEAD DETAIL
6" = 1'-0"



3 DEMOLITION DOOR - JAMB DETAIL
6" = 1'-0"



1 DEMOLITION DOOR - SILL DETAIL
6" = 1'-0"

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DEMOLITION DOOR DETAILS

SHEET:

AD-502

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Dec 12, 2022 - 10:10am
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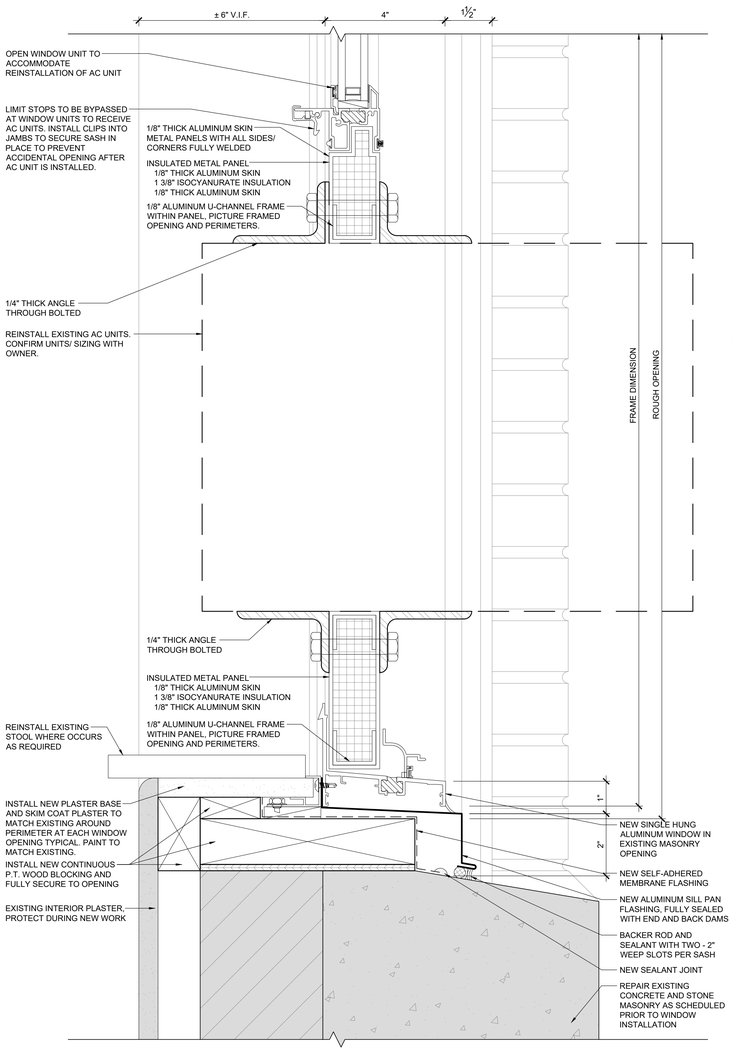
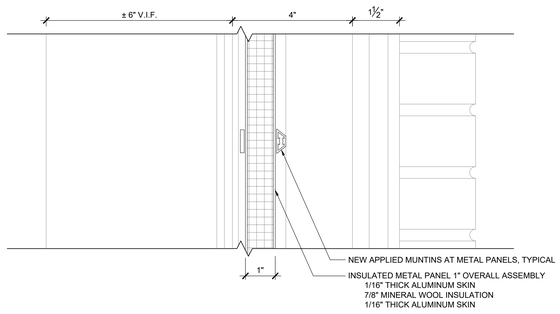
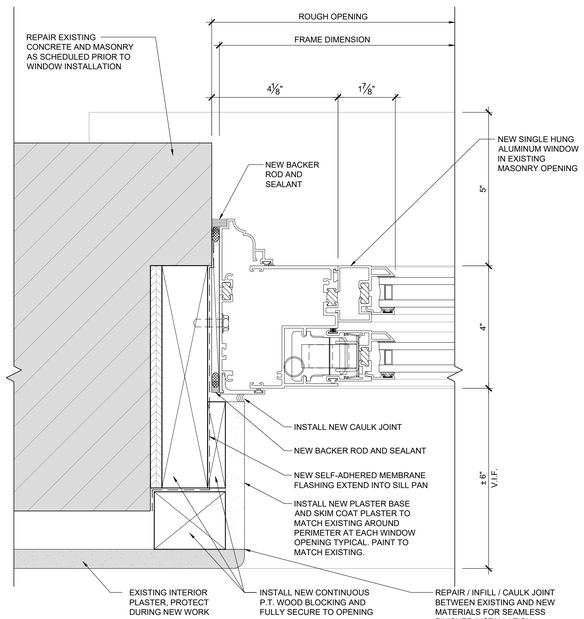


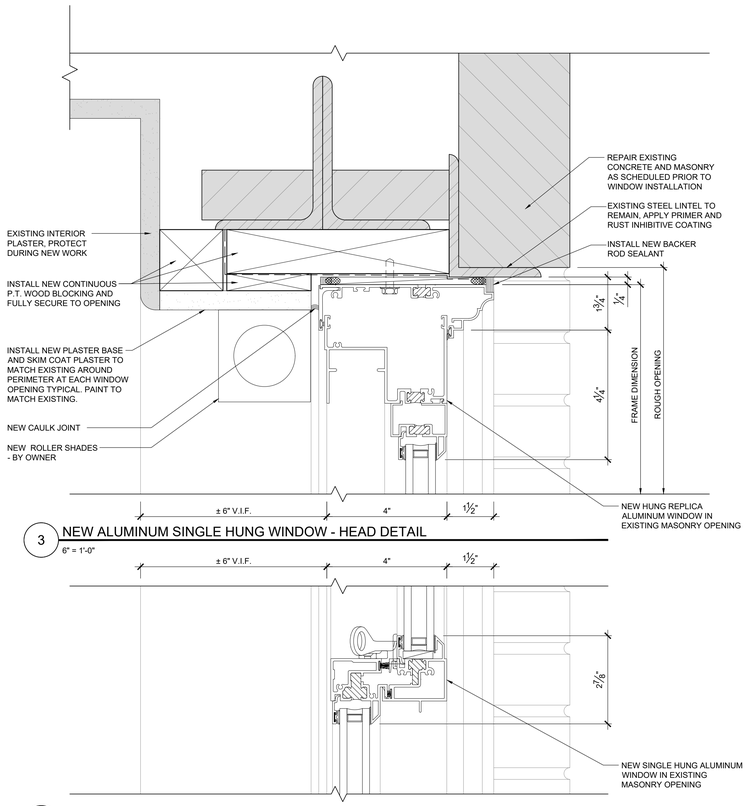
6 NEW ALUMINUM SINGLE HUNG WINDOW - SILL DETAIL AT AC UNIT
6" = 1'-0"



5 NEW INSULATED METAL PANEL AT WINDOW SASH DETAIL
6" = 1'-0"

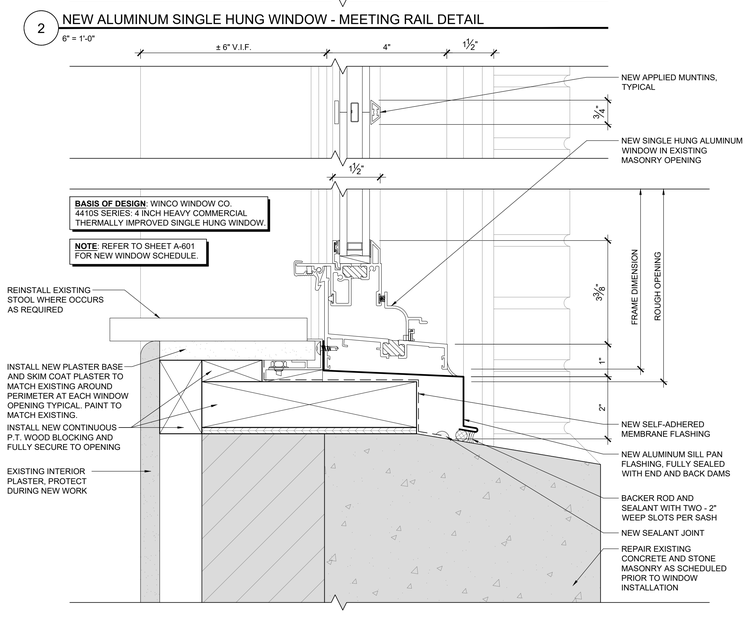


4 NEW ALUMINUM SINGLE HUNG WINDOW - JAMB DETAIL
6" = 1'-0"



3 NEW ALUMINUM SINGLE HUNG WINDOW - HEAD DETAIL
6" = 1'-0"

2 NEW ALUMINUM SINGLE HUNG WINDOW - MEETING RAIL DETAIL
6" = 1'-0"



1 NEW ALUMINUM SINGLE HUNG WINDOW - SILL DETAIL
6" = 1'-0"

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NEW SINGLE HUNG WINDOW DETAILS

SHEET:

A-501

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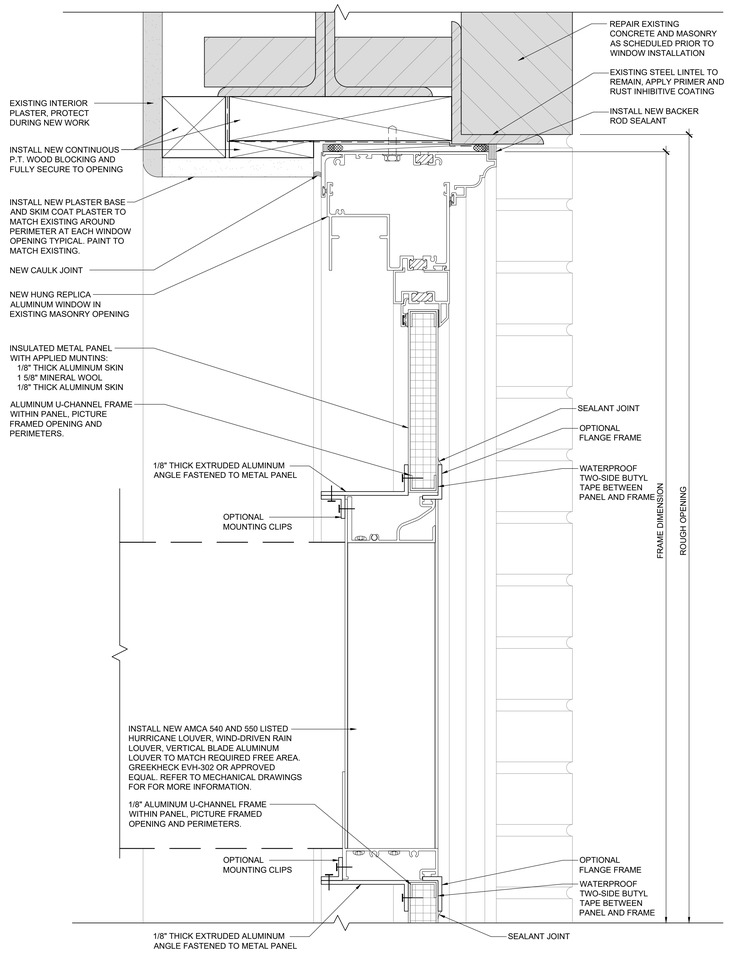
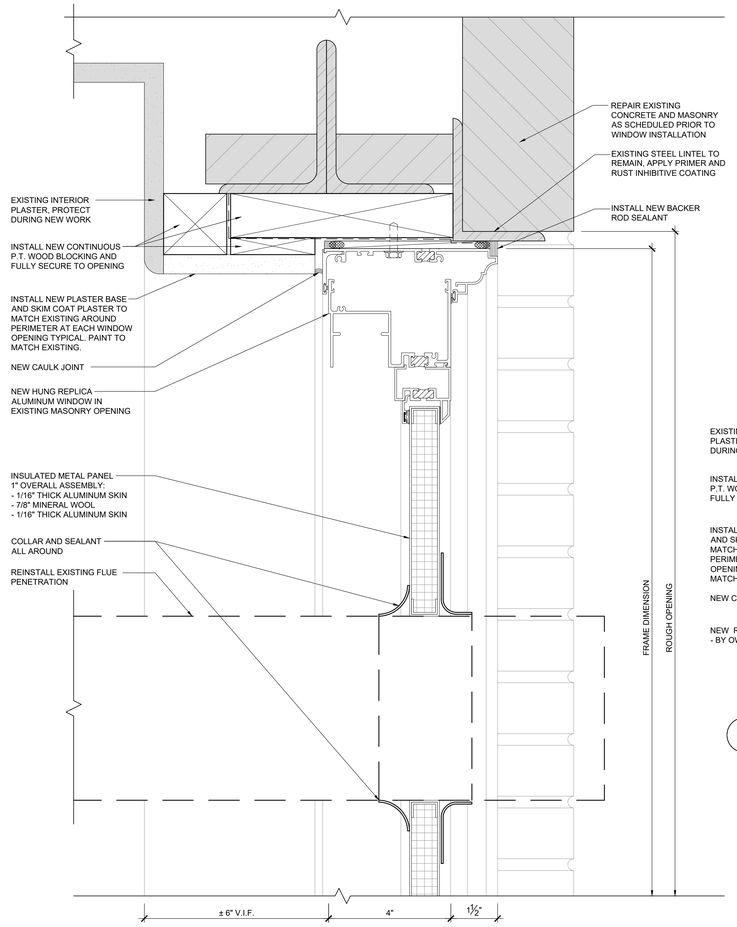
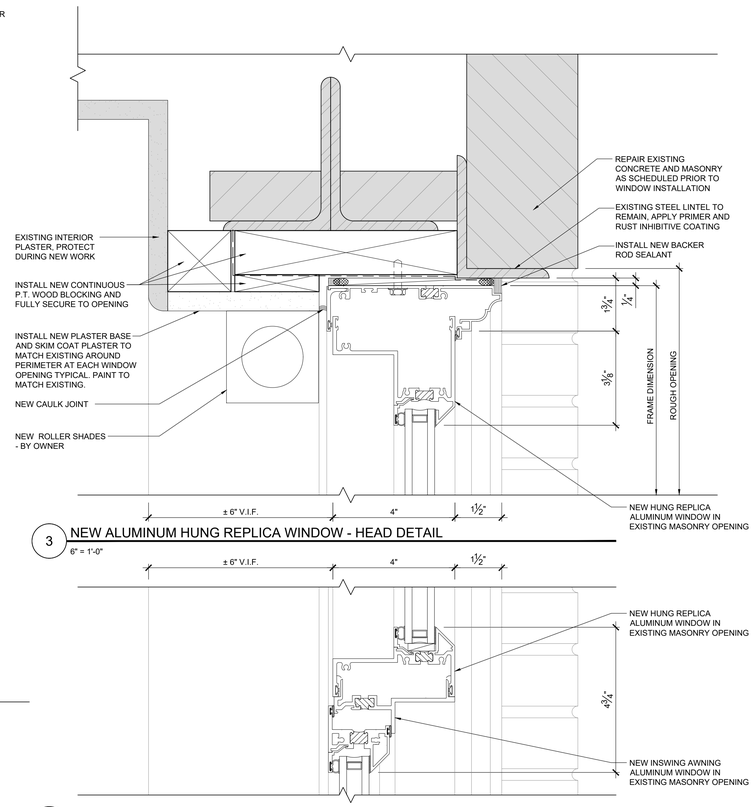


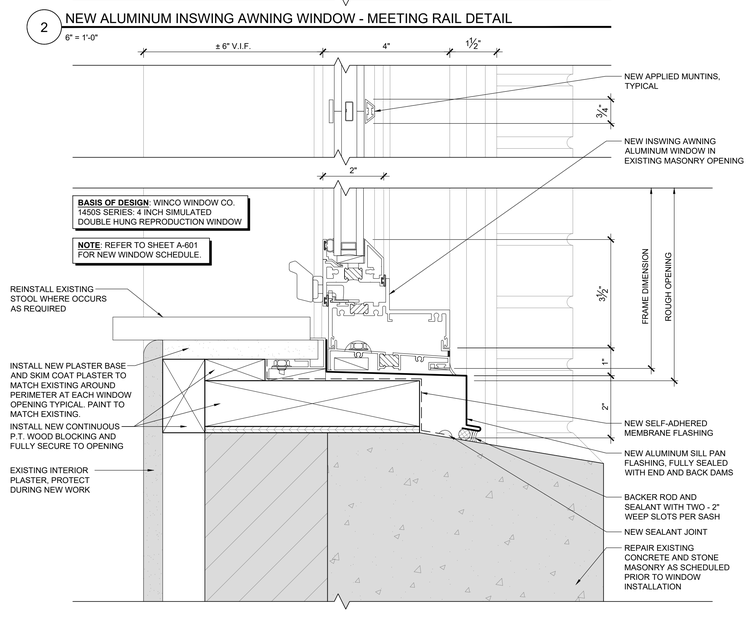
7 NEW ALUMINUM HUNG REPLICA AWNING WINDOW - LOUVER AT WINDOW SASH
6" = 1'-0"



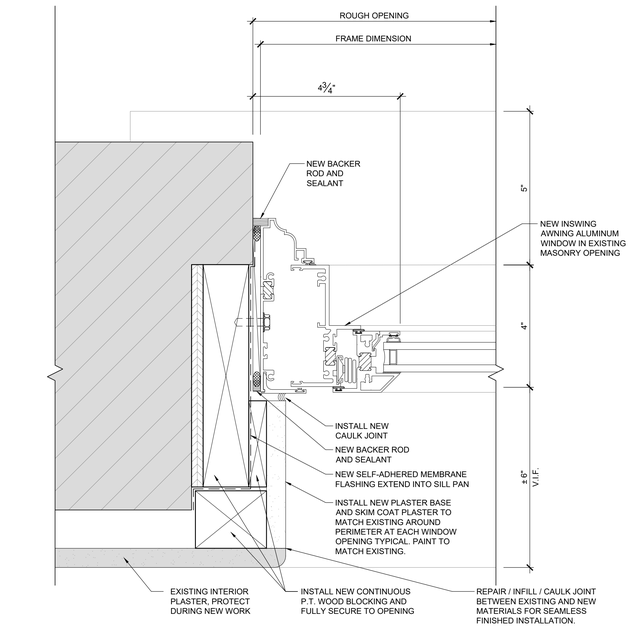
6 NEW ALUMINUM HUNG REPLICA AWNING WINDOW - FLUE AT METAL PANEL
6" = 1'-0"



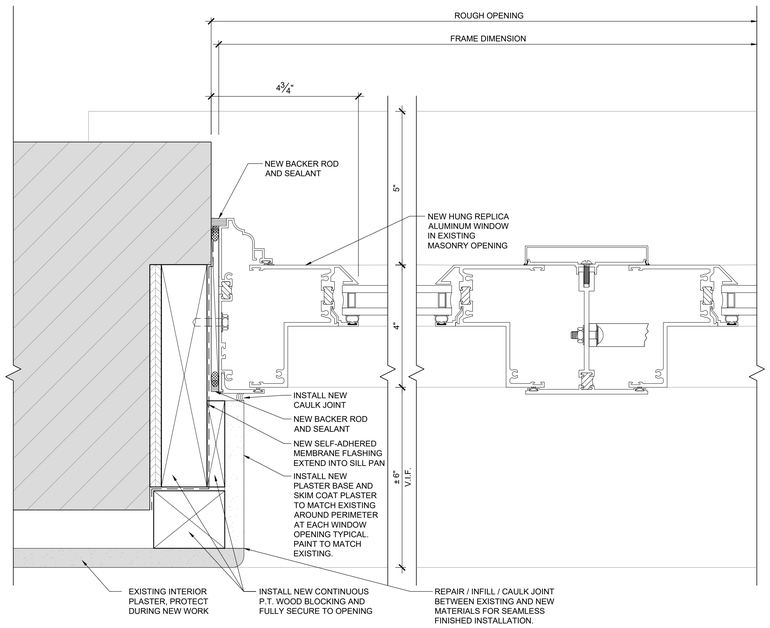
3 NEW ALUMINUM HUNG REPLICA WINDOW - HEAD DETAIL
6" = 1'-0"



2 NEW ALUMINUM INSWING AWNING WINDOW - MEETING RAIL DETAIL
6" = 1'-0"



5 NEW ALUMINUM INSWING AWNING WINDOW - JAMB DETAIL
6" = 1'-0"



4 NEW ALUMINUM HUNG REPLICA AWNING WINDOW - JAMB AND VERTICAL MULLION DETAILS
6" = 1'-0"

1 NEW ALUMINUM INSWING AWNING WINDOW - SILL DETAIL
6" = 1'-0"

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NEW INSWING AWNING WINDOW DETAILS

SHEET:

A-502

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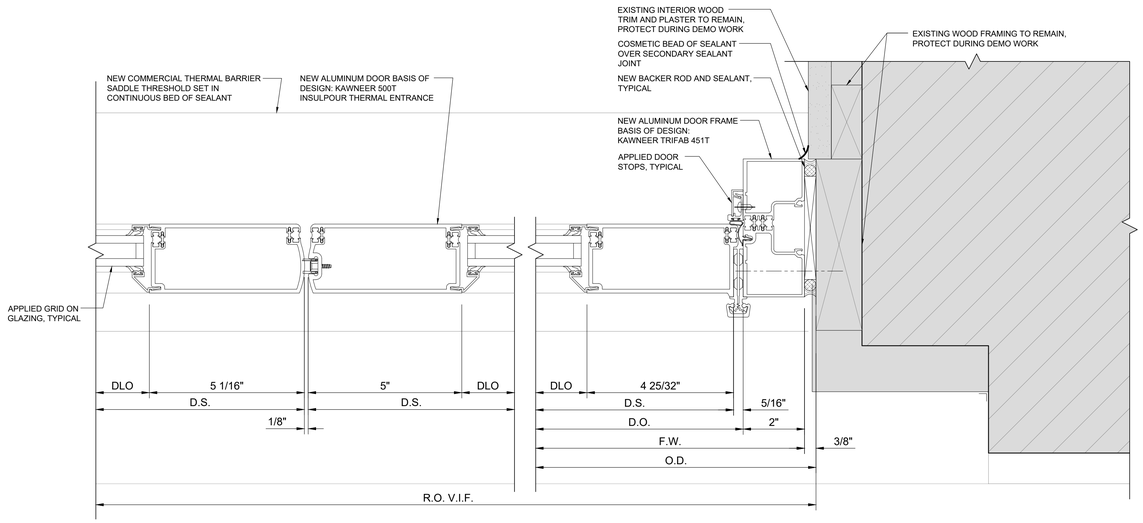
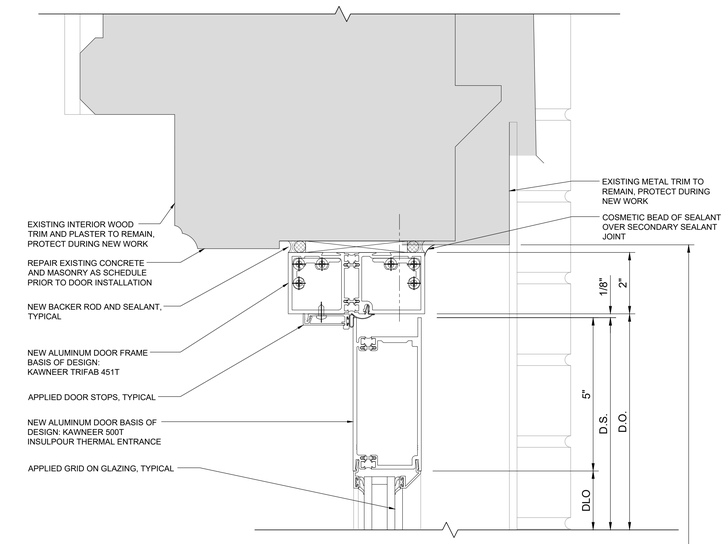
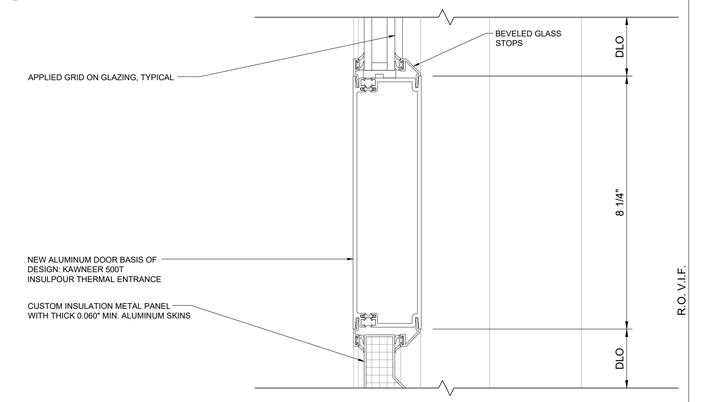


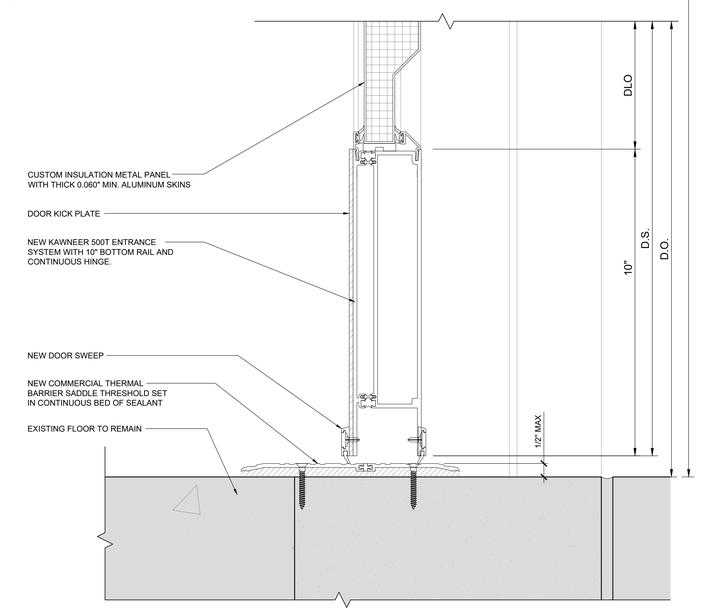
4 PROPOSED ALUMINUM DOOR - MEETING STILE AND JAMB DETAILS
6" = 1'-0"



3 PROPOSED ALUMINUM DOOR - HEAD DETAIL
6" = 1'-0"



2 PROPOSED ALUMINUM DOOR - CROSS RAIL DETAIL
6" = 1'-0"



1 PROPOSED ALUMINUM DOOR - SILL DETAIL
6" = 1'-0"

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NEW DOOR DETAILS

SHEET:

A-503

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BRICK REPLACEMENT NOTES:

1.ALL NEW BRICKS TO MATCH EXISTING ADJACENT TO REMAIN IN 1.SIZE, SHAPE, COLOR, TEXTURE, PROFILE, ETC AS CLOSE AS POSSIBLE (TYP). ALL NEW MORTAR SHALL MATCH EXISTING ADJACENT TO REMAIN IN HARDNESS, COLOR, TEXTURE, TOOLING, ETC (TYP). NEW MORTAR MUST BE SOFTER THAN EXISTING BRICK.

2.HORIZONTAL MORTAR JOINTS MAY BE SAWCUT. A TUCK-POINTER'S TOOTHING CHISEL SHOULD BE USED TO CUT OUT THE MORTAR IN VERTICAL JOINTS WHICH SURROUNDS THE AFFECTED UNITS. FOR EASE OF REMOVAL, THE UNITS TO BE REMOVED CAN BE BROKEN. ONCE THE UNITS ARE REMOVED, ALL OF THE OLD MORTAR SHOULD BE CAREFULLY CHISELED OUT AND ALL DUST AND DEBRIS SHOULD BE SWEPT OUT WITH A BRUSH. IF THE UNITS ARE LOCATED IN THE EXTERIOR WYTHE OF A CAVITY WALL, CARE MUST BE EXERCISED NOT TO ALLOW DEBRIS TO FALL INTO THE CAVITY.

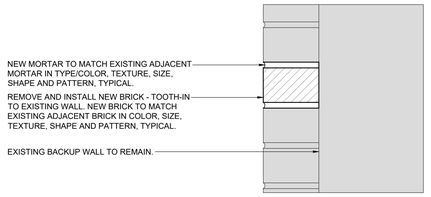
3.PROVIDE RELIEF CUTS THROUGH THE MIDDLE OF THE EXISTING DAMAGED BRICK MASONRY UNIT.

4.CONTRACTOR IS RESPONSIBLE FOR ALL SHORING AS REQUIRED.

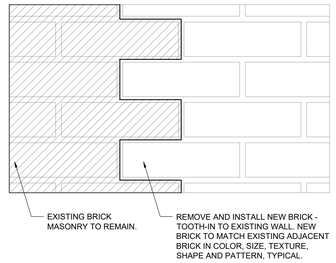
5.REMOVE EXISTING BRICK MASONRY TO MINIMUM OF HALF THE EXISTING DEPTH (4" ± V.I.F.). REMOVE ALL DUST AND DEBRIS FROM THE AREA. CONTRACTOR RESPONSIBLE NOT TO DAMAGE INTERIOR SIDE OF BRICK MASONRY DURING REMOVAL & REPLACEMENT OF BRICK MASONRY UNITS.

6.NOTIFY ARCHITECT OF ANY AND ALL REINFORCEMENT ENCOUNTERED IMMEDIATELY. MINIMUM FOR EXPOSED REINFORCEMENT - WIRE BRUSH AND CLEAN AND APPLY CORROSION INHIBITOR TO ALL EXPOSED SIDES. STRENGTHENING OF EXISTING REINFORCEMENT WILL BE DETERMINED ON A CASE BY CASE BASIS.

7.BRICK SURFACES IN THE WALL SHOULD BE DAMPENED BEFORE THE NEW UNITS ARE PLACED BUT THE MASONRY SHOULD ABSORB ALL SURFACE MOISTURE TO ENSURE A GOOD BOND. THE APPROPRIATE SURFACES OF THE SURROUNDING BRICKWORK AND THE REPLACEMENT BRICK SHOULD BE BUTTERED WITH MORTAR. IF CELL(S) IN BRICK UNIT WERE SOLID-FILLED WITH MORTAR, THEN THE NEW SHALL BE SOLID-FILLED WITH MORTAR. THE REPLACEMENT BRICK SHOULD BE CENTERED IN THE OPENING AND PRESSED INTO POSITION. THE EXCESS MORTAR SHOULD BE REMOVED WITH A TROWEL. POINTING AROUND THE REPLACEMENT BRICK WILL HELP TO ENSURE FULL HEAD AND BED JOINTS. WHEN THE MORTAR BECOMES "THUMBPRINT" HARD, THE JOINTS SHOULD BE TOOLED TO MATCH THE ORIGINAL PROFILE.



8 BRICK UNIT REPLACEMENT DETAIL
3"=1'-0"



NOTE: DO NOT DAMAGE EXISTING ADJACENT BRICK MASONRY TO REMAIN. BRICKS DAMAGED BY THE CONTRACTOR DURING WORK ARE TO BE REMOVED AND REPAIRED AT THE CONTRACTOR'S EXPENSE.

10 EXTENT OF LINTEL REPAIR DETAIL
3"=1'-0"

BRICK REPLACEMENT NOTES:

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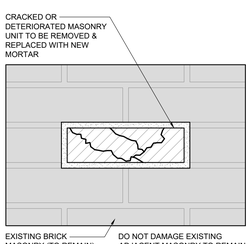
2.HORIZONTAL MORTAR JOINTS MAY BE SAWCUT. A TUCK-POINTER'S TOOTHING CHISEL SHOULD BE USED TO CUT OUT THE MORTAR IN VERTICAL JOINTS WHICH SURROUNDS THE AFFECTED UNITS. FOR EASE OF REMOVAL, THE UNITS TO BE REMOVED CAN BE BROKEN. ONCE THE UNITS ARE REMOVED, ALL OF THE OLD MORTAR SHOULD BE CAREFULLY CHISELED OUT AND ALL DUST AND DEBRIS SHOULD BE SWEPT OUT WITH A BRUSH. IF THE UNITS ARE LOCATED IN THE EXTERIOR WYTHE OF A CAVITY WALL, CARE MUST BE EXERCISED NOT TO ALLOW DEBRIS TO FALL INTO THE CAVITY.

3.PROVIDE RELIEF CUTS THROUGH THE MIDDLE OF THE EXISTING DAMAGED BRICK MASONRY UNIT.

4.CONTRACTOR IS RESPONSIBLE FOR ALL SHORING AS REQUIRED.



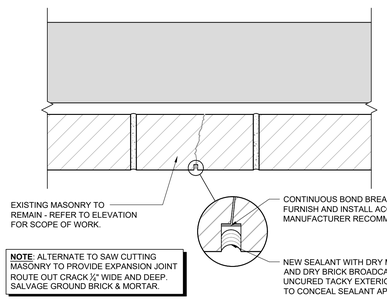
5.REMOVE EXISTING BRICK MASONRY TO MINIMUM OF HALF THE EXISTING DEPTH (4" ± V.I.F.). REMOVE ALL DUST AND DEBRIS FROM THE AREA. CONTRACTOR RESPONSIBLE NOT TO DAMAGE INTERIOR SIDE OF BRICK MASONRY DURING REMOVAL & REPLACEMENT OF BRICK MASONRY UNITS.

6.NOTIFY ARCHITECT OF ANY AND ALL REINFORCEMENT ENCOUNTERED IMMEDIATELY. MINIMUM FOR EXPOSED REINFORCEMENT - WIRE BRUSH AND CLEAN AND APPLY CORROSION INHIBITOR TO ALL EXPOSED SIDES. STRENGTHENING OF EXISTING REINFORCEMENT WILL BE DETERMINED ON A CASE BY CASE BASIS.

7.BRICK SURFACES IN THE WALL SHOULD BE DAMPENED BEFORE THE NEW UNITS ARE PLACED BUT THE MASONRY SHOULD ABSORB ALL SURFACE MOISTURE TO ENSURE A GOOD BOND. THE APPROPRIATE SURFACES OF THE SURROUNDING BRICKWORK AND THE REPLACEMENT BRICK SHOULD BE BUTTERED WITH MORTAR. IF CELL(S) IN BRICK UNIT WERE SOLID-FILLED WITH MORTAR, THEN THE NEW SHALL BE SOLID-FILLED WITH MORTAR. THE REPLACEMENT BRICK SHOULD BE CENTERED IN THE OPENING AND PRESSED INTO POSITION. THE EXCESS MORTAR SHOULD BE REMOVED WITH A TROWEL. POINTING AROUND THE REPLACEMENT BRICK WILL HELP TO ENSURE FULL HEAD AND BED JOINTS. WHEN THE MORTAR BECOMES "THUMBPRINT" HARD, THE JOINTS SHOULD BE TOOLED TO MATCH THE ORIGINAL PROFILE.

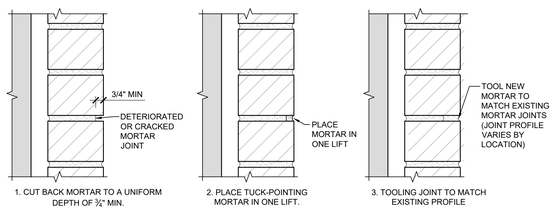
9 CRACKED BRICK UNIT REPLACEMENT
3"=1'-0"

7 BRICK TOOTH-IN DETAIL
3"=1'-0"



NOTE: ALTERNATE TO SAW CUTTING MASONRY TO PROVIDE EXPANSION JOINT ROUTE OUT CRACK ½" WIDE AND DEEP. SALVAGE GROUND BRICK & MORTAR.

6 CRACKED BRICK REPAIR - ROUT AND SEAL
3"=1'-0"

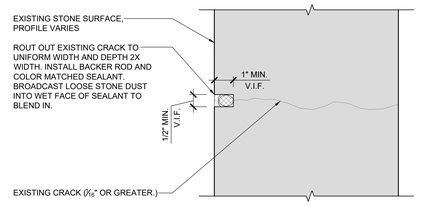


1) EXISTING BRICK MORTAR SHALL BE CUT BACK TO SOUND MORTAR BY MEANS OF A TOOTHING CHISEL OR A SPECIAL POINTER'S GRINDER TO A DEPTH OF ¾" OR 2 TO 2 1/2 TIMES THE WIDTH OF THE VERTICAL JOINTS. CARE MUST BE TAKEN NOT TO DAMAGE THE BRICK EDGES.
2) ALL DUST AND DEBRIS MUST BE REMOVED FROM THE JOINT BY BRUSHING, BLOWING WITH AIR AND RINSING WITH WATER.
3) ANY LOOSE AND DETERIORATED MORTAR BEYOND THE MINIMUM DEPTH SHALL BE REMOVED. MORTAR SHALL BE REMOVED CLEANLY FROM MASONRY LEAVING SQUARE CORNERS AND A FLAT SURFACE AT THE BACK OF THE CUT.
4) BEFORE FILLING JOINTS, ANY BRICKS THAT ARE LOOSE SHALL BE RESET. ANY EXISTING BRICKS THAT ARE DAMAGED SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. THE JOINTS SHALL BE FINALLY CLEANED OUT BY GENTLY FLUSHING WITH WATER TO REMOVE ALL LOOSE PARTICLES AND DUST.
5) AT TIME OF FILLING, THE JOINTS SHALL BE DAMPENED PER MANUFACTURER'S RECOMMENDATIONS TO PREVENT TOO-RAPID SETTING OF MORTAR. NO STANDING WATER SHOULD BE PRESENT.

NOTE: REFER TO UNIT PRICING FOR ADDITIONAL INFORMATION.

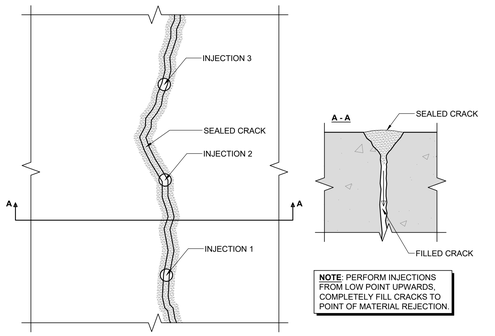
NOTE: CLEAN OUT JOINT AFTER MORTAR REMOVAL.

5 BRICK MORTAR JOINT RE-POINTING DETAIL
3"=1'-0"



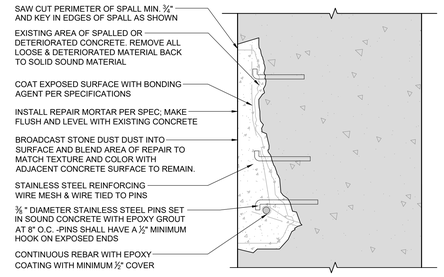
NOTE: NEW AREA OF STONE/MASONRY REPAIR SHALL MATCH EXISTING ADJACENT MASONRY IN PROFILE, TEXTURE AND FINISH.

4 STONE CRACK REPAIR - REPAIR MORTAR
3"=1'-0"



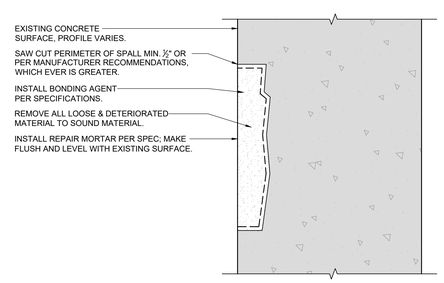
NOTE: PERFORM INJECTIONS FROM LOW POINT UPWARDS, COMPLETELY FILL CRACKS TO POINT OF MATERIAL REJECTION.

3 EPOXY CRACK INJECTION DETAIL
1'-0"=1'-0"



NOTE: NEW AREA OF CONCRETE REPAIR SHALL MATCH EXISTING ADJACENT CONCRETE IN PROFILE, TEXTURE AND FINISH.

2 CONCRETE SPALL REPAIR - SEVERE
3"=1'-0"



NOTE: NEW AREA OF CONCRETE REPAIR SHALL MATCH EXISTING ADJACENT CONCRETE IN PROFILE, TEXTURE AND FINISH.

1 CONCRETE SPALL REPAIR - MODERATE
3"=1'-0"

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PROJECT:

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974 NEWPORT AVE.
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CLIENT:

PAWTUCKET SCHOOL DEPARTMENT

286 MAIN ST.
PAWTUCKET, RI 02860

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PREPARED BY A LICENSED ARCHITECT
Any changes to this item can be a violation of the law unless altered by a licensed architect. Any alteration made to this item must be accompanied by a specific description of change or changes made; date change was made, as well as the seal of the licensed architect who made or oversaw the changes.

MARK	DATE	DESCRIPTION
	12-12-22	BID SET

ISSUE:

PROJECT NO.:	22081
DRAWN BY:	LAP/AC
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

REPAIR DETAILS

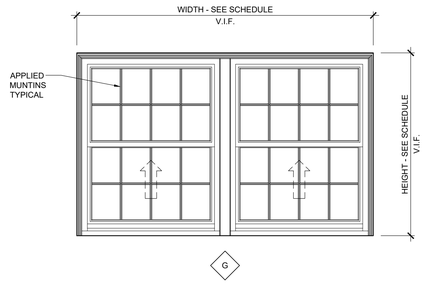
SHEET:

A-504

DO NOT SCALE DRAWING

NEW WINDOW ELEVATIONS

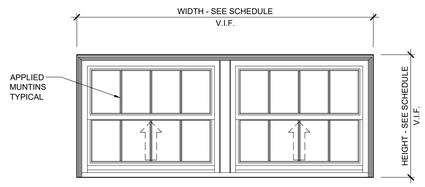
SCALE: ½" = 1'-0"



G

WINDOW G

NOTE: REFER TO ELEVATIONS FOR SCOPE OF WORK LOCATIONS.



Fx

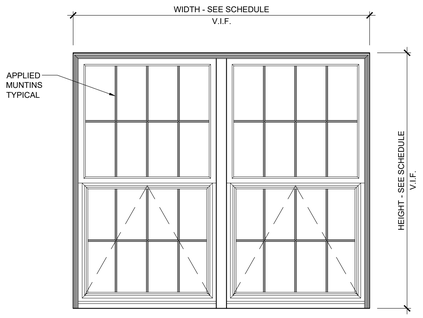
WINDOW F

NOTE: REFER TO ELEVATIONS FOR SCOPE OF WORK LOCATIONS.

Ex

WINDOW E

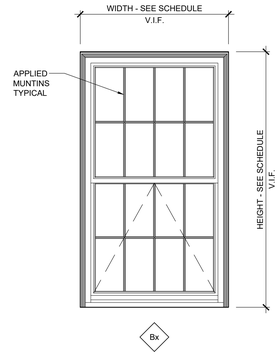
NOTE: REFER TO ELEVATIONS FOR SCOPE OF WORK LOCATIONS.



Cx

WINDOW C

NOTE: REFER TO ELEVATIONS FOR SCOPE OF WORK LOCATIONS.



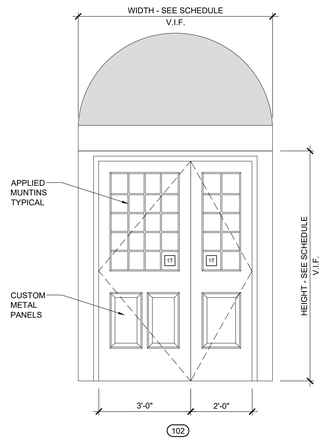
Bx

WINDOW B

NOTE: REFER TO ELEVATIONS FOR SCOPE OF WORK LOCATIONS.

NEW DOOR ELEVATIONS

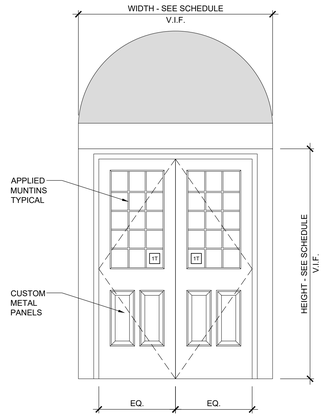
SCALE: ½" = 1'-0"



102

DOOR 101

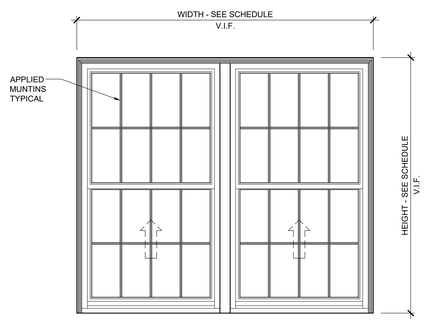
NOTE: REFER TO ELEVATIONS FOR SCOPE OF WORK LOCATIONS.



101 103

DOORS 102 AND 103

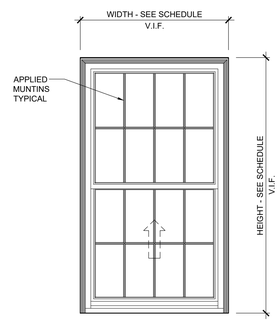
NOTE: REFER TO ELEVATIONS FOR SCOPE OF WORK LOCATIONS.



D

WINDOW D

NOTE: REFER TO ELEVATIONS FOR SCOPE OF WORK LOCATIONS.



Ax MP WHERE REQUIRED

1T WHERE REQUIRED

WINDOW A

NOTE: REFER TO ELEVATIONS FOR SCOPE OF WORK LOCATIONS.

NEW WINDOW TYPE SCHEDULE

MARK	ROUGH OPENING		QTY (V.I.F.)	OPERATION	GLZ TYPE	LITES	DETAIL				NOTES
	WIDTH (± V.I.F.)	HEIGHT (± V.I.F.)					HEAD	JAMB	SILL	MTG RAIL	
A1	58"	100"	105	DH	1	8 OVER 8	3/A-501	4/A-501	1/A-501	2/A-501	APPLIED MUNTINS
A2	58"	84"	22	DH	1	8 OVER 8	3/A-501	4/A-501	1/A-501 SIM.	2/A-501	APPLIED MUNTINS
A3	58"	84"	4	DH	3	8 OVER 8	3/A-501	4/A-501	1/A-501 SIM.	2/A-501	APPLIED MUNTINS AUDITORIUM
A4	58"	100"	30	DH	1N	8 OVER 8	3/A-501	4/A-501	1/A-501 SIM.	2/A-501	APPLIED MUNTINS NORTH ELEVATION
A5	58"	84"	6	DH	1	8 OVER 8	3/A-501	4/A-501	1/A-501 SIM.	2/A-501	APPLIED MUNTINS
A6	58"	84"	2	FIXED	2	8 OVER 8	3/A-501 SIM.	4/A-501 SIM.	1/A-501 SIM.	2/A-501 SIM.	APPLIED MUNTINS GYMNASIUM
A7	58"	84"	2	FIXED	1N, 2	8 OVER 8	3/A-501 SIM.	4/A-501 SIM.	1/A-501 SIM.	2/A-501 SIM.	APPLIED MULLIONS GYMNASIUM, NORTH ELEVATION
A8	58"	84"	4	DH	1N, 3	8 OVER 8	3/A-501	4/A-501	1/A-501 SIM.	2/A-501	APPLIED MULLIONS AUDITORIUM, NORTH ELEVATION
A9	48"	100"	2	DH	1N	8 OVER 8	3/A-501	4/A-501	1/A-501	2/A-501	APPLIED MULLIONS NORTH ELEVATION
B1	58"	100"	12	AWN	1	8 OVER 8	3/A-502	5/A-502	1/A-502	2/A-502	APPLIED MUNTINS
B2	58"	84"	5	AWN	1	8 OVER 8	3/A-502	5/A-502	1/A-502 SIM.	2/A-502	APPLIED MUNTINS
C1	116"	100"	36	AWN	1	16 OVER 16 / (2) 8 OVER 8	3/A-502	4&5/A-502	1/A-502	2/A-502	APPLIED MUNTINS
C2	116"	84"	9	AWN	1	16 OVER 16 / (2) 8 OVER 8	3/A-502	4&5/A-502	1/A-502 SIM.	2/A-502	APPLIED MUNTINS
C3	116"	84"	3	AWN	3	16 OVER 16 / (2) 8 OVER 8	3/A-502	4&5/A-502	1/A-502	2/A-502	APPLIED MUNTINS AUDITORIUM
C4	116"	100"	14	AWN	1N	16 OVER 16 / (2) 8 OVER 8	3/A-502	4&5/A-502	1/A-502	2/A-502	APPLIED MUNTINS NORTH ELEVATION
C5	116"	84"	3	AWN	1N	16 OVER 16 / (2) 8 OVER 8	3/A-502	4&5/A-502	1/A-502 SIM.	2/A-502	APPLIED MUNTINS NORTH ELEVATION
C6	116"	84"	2	FIXED	2	16 OVER 16 / (2) 8 OVER 8	3/A-502 SIM.	4&5/A-502 SIM.	1/A-502 SIM.	2/A-502 SIM.	APPLIED MUNTINS GYMNASIUM
C7	116"	84"	2	FIXED	1N, 2	16 OVER 16 / (2) 8 OVER 8	3/A-502 SIM.	4&5/A-502 SIM.	1/A-502 SIM.	2/A-502 SIM.	APPLIED MUNTINS GYMNASIUM, NORTH ELEVATION
C8	116"	84"	2	AWN	1N, 3	16 OVER 16 / (2) 8 OVER 8	3/A-502	4&5/A-502	1/A-502 SIM.	2/A-502	APPLIED MUNTINS AUDITORIUM, NORTH ELEVATION
D	116"	100"	4	DH	1	16 OVER 16 / (2) 8 OVER 8	3/A-501	4&5/A-501	1/A-501	2/A-501	APPLIED MUNTINS
E1	58"	48"	1	DH	1	4 OVER 4	3/A-501	4/A-501	1/A-501 SIM.	2/A-501	APPLIED MUNTINS IN AREAWAY
E2	58"	48"	1	DH	1N	4 OVER 4	3/A-501	4/A-501	1/A-501 SIM.	2/A-501	APPLIED MUNTINS IN AREAWAY, NORTH ELEVATION
F1	116"	48"	1	DH	1	8 OVER 8 / (2) 4 OVER 4	3/A-501	4/A-501	1/A-501 SIM.	2/A-501	APPLIED MUNTINS IN AREAWAY
F2	116"	48"	1	DH	1N	8 OVER 8 / (2) 4 OVER 4	3/A-501	4/A-501	1/A-501 SIM.	2/A-501	APPLIED MUNTINS IN AREAWAY, NORTH ELEVATION
G	116"	72"	2	DH	1	16 OVER 16 / (2) 8 OVER 8	3/A-501	4/A-501	1/A-501 SIM.	2/A-501	APPLIED MUNTINS IN AREAWAY

PERFORMANCE REQUIREMENTS

AIR		0.20 CFM/FT^2
WATER		6.0 LB/FT^2 MINIMUM
MINIMUM STRUCTURAL PRESSURE		60 LB/FT^2
DEFLECTION DESIGN PRESSURE		L / 175
U-VALUE		0.45
SHG COEFFICIENT	SEW	0.51
	N	0.38
DESIGN PRESSURE		40 PSF (ZONE 4 - FIELD WALL PRESSURE) 47 PSF (ZONE 5 - CORNER PRESSURE)
PRODUCT DESIGNATION		H-HC40 (MINIMUM)

WINDOW AND FRAME DESCRIPTION

OPERATION	SINGLE HUNG WINDOW - VERTICAL SLIDING
GRIDS	APPLIED DIVIDED LITES
FRAME	ALUMINUM

GLAZING TYPES

MARK	NOTES
1	1" VISION I.G.U. - SHGC 0.51 (SEW)
1T	1" VISION I.G.U. - TEMPERED
1N	1" VISION I.G.U. - SHGC 0.38 (N)
2	CATEGORY II LAMINATED
3	OBSCURED
MP	INSULATED METAL PANEL 1" OVERALL ASSEMBLY $^{3}/_{16}$" THICK ALUMINUM SKIN $^{7}/_{8}$" ISOCYANURATE INSULATION OR MINERAL WOOL $^{3}/_{16}$" THICK ALUMINUM SKIN

NEW DOOR SCHEDULE

MARK	ROUGH OPENING		QTY (V.I.F.)	GLZ TYPE	LITES	DETAIL				HARDWARE SET	NOTES
	WIDTH (± V.I.F.)	HEIGHT (± V.I.F.)				HEAD	JAMB	SILL	CROSS RAIL		
101	76"	90"	1	1T / MP	30	3/A-503	4/A-503	1/A-503	2/A-503	1	LEVER HANDLE AT EXTERIOR PANIC HARDWARE AT INTERIOR MAG SAFE LOCK AND READER AT DOOR FRAME
102	76"	90"	1	1T / MP	30	3/A-503	4/A-503	1/A-503	2/A-503	2	-
103	76"	90"	1	1T / MP	30	3/A-503	4/A-503	1/A-503	2/A-503	2	-

WESSLING ARCHITECTS
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CONSULTANTS:

PROJECT:

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CLIENT:

PAWTUCKET SCHOOL DEPARTMENT

286 MAIN ST.
PAWTUCKET, RI 02860

NOT FOR CONSTRUCTION

PROFESSIONAL

MARK	DATE	DESCRIPTION
	12-12-22	BID SET
ISSUE:		

PROJECT NO.:	22081
DRAWN BY:	LAP/AC
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

WINDOW AND DOOR SCHEDULES

SHEET:

A-601

DO NOT SCALE DRAWING

NEW WINDOW SCHEDULE - NORTH ELEVATIONS A-204

MARK	TYPE	NOTES
208	A4	-
209	C4	-
210	A4	-
211	A4	TEMPERED GLASS
212	A4	KILN HOOD AT WINDOW OPENING; MODIFY DUCTWORK - REFER TO MECHANICAL DRAWINGS FOR MORE INFORMATION. FIX WINDOW CLOSED.
213	C4	-
214	A4	-
215	A4	-
216	C4	-
217	A4	-
218	A4	-
219	C4	-
220	A4	TEMPERED GLASS
221	A4	TEMPERED GLASS
222	C4	-
223	A4	-
224	A4	-
225	C4	-
226	A4	-
227	A4	TEMPERED GLASS
228	A4	-
229	C4	-
230	A4	-
231	A4	-
232	C4	-
233	A4	AC UNIT - REFER TO DETAIL 6/A-501
234	A4	-
235	C4	-
236	A4	-
237	A4	-
238	C4	-
239	A4	-
240	A5	TEMPERED AND OBSCURED GLASS (EXERCISE ROOM)
241	C5	TEMPERED AND OBSCURED GLASS (EXERCISE ROOM)
242	A5	TEMPERED AND OBSCURED GLASS (EXERCISE ROOM)
243	A5	OBSCURED GLASS
244	C5	OBSCURED GLASS
245	A5	OBSCURED GLASS
246	A5	OBSCURED GLASS
247	C5	OBSCURED GLASS
248	A5	OBSCURED GLASS
249	C7	CATEGORY II LAMINATED GLASS; FIX WINDOW CLOSED (GYMNASIUM)
250	A7	CATEGORY II LAMINATED GLASS; FIX WINDOW CLOSED (GYMNASIUM)
251	A7	CATEGORY II LAMINATED GLASS; FIX WINDOW CLOSED (GYMNASIUM)
252	C7	CATEGORY II LAMINATED GLASS; FIX WINDOW CLOSED (GYMNASIUM)
253	F2	-
254	E2	-
255	A4	-
256	C4	-
257	A4	-
258	A4	-
259	C4	-
260	A4	-
261	A9	TEMPERED GLASS
262	A4	-
263	C4	-
264	A4	-
265	A4	-
266	C4	-
267	A4	-
268	A9	TEMPERED GLASS
269	A8	OBSCURED GLASS (AUDITORIUM)
270	C8	OBSCURED GLASS (AUDITORIUM)
271	A8	OBSCURED GLASS (AUDITORIUM)
272	A8	OBSCURED GLASS (AUDITORIUM)
273	C8	OBSCURED GLASS (AUDITORIUM)
274	A8	OBSCURED GLASS (AUDITORIUM)

NEW WINDOW SCHEDULE - EAST ELEVATION 1/A-204

MARK	TYPE	NOTES
275	A1	TEMPERED GLASS

NEW WINDOW SCHEDULE - SOUTH ELEVATIONS A-203

MARK	TYPE	NOTES
139	A1	-
140	C1	-
141	A1	-
142	A1	-
143	C1	-
144	A1	AC UNIT - REFER TO DETAIL 6/A-501
145	A1	-
146	C1	-
147	A1	-
148	A1	-
149	C1	-
150	A1	-
151	A1	TEMPERED GLASS
152	A1	-
153	C1	-
154	A1	-
155	A1	-
156	C1	-
157	A1	TEMPERED GLASS
158	A1	TEMPERED GLASS
159	C1	-
160	A1	-
161	A1	-
162	C1	-
163	A1	-
164	A1	-
165	C1	-
166	A1	-
167	A1	TEMPERED GLASS
168	A1	-
169	C1	-
170	A1	-
171	C3	OBSCURED GLASS
172	A3	OBSCURED GLASS (AUDITORIUM)
173	C3	OBSCURED GLASS (AUDITORIUM)
174	A3	OBSCURED GLASS (AUDITORIUM)
175	A3	OBSCURED GLASS (AUDITORIUM)
176	C3	OBSCURED GLASS (AUDITORIUM)
177	A3	OBSCURED GLASS (AUDITORIUM)
178	A2	-
179	A2	TEMPERED GLASS
180	A2	TEMPERED GLASS
181	A1	-
182	C1	-
183	A1	-
184	A1	-
185	C1	-
186	A1	-
187	A1	-
188	C1	-
189	A1	AC UNIT - REFER TO DETAIL 6/A-501
190	A1	-
191	C1	-
192	A1	-
193	A1	-
194	C1	-
195	A1	-
196	A1	-
197	C1	-
198	A1	AC UNIT - REFER TO DETAIL 6/A-501
199	C6	CATEGORY II LAMINATED GLASS; FIX WINDOW CLOSED (GYMNASIUM)
200	A6	CATEGORY II LAMINATED GLASS; FIX WINDOW CLOSED (GYMNASIUM)
201	A6	CATEGORY II LAMINATED GLASS; FIX WINDOW CLOSED (GYMNASIUM)
202	C6	CATEGORY II LAMINATED GLASS; FIX WINDOW CLOSED (GYMNASIUM)
203	A2	OBSCURED GLASS
204	C2	OBSCURED GLASS
205	A2	OBSCURED GLASS
206	E1	-
207	F1	-

NEW WINDOW SCHEDULE - WEST ELEVATIONS A-202

MARK	TYPE	NOTES
079	A1	-
080	C1	-
081	A1	-
082	A1	-
083	C1	-
084	A1	-
085	A1	OBSCURED GLASS
086	A1	TEMPERED GLASS
087	D	AC UNIT - REFER TO DETAIL 6/A-501
088	C1	-
089	A1	-
090	A1	-
091	C1	-
092	A1	-
093	D	-
094	A1	TEMPERED GLASS
095	A1	OBSCURED GLASS
096	A1	TEMPERED GLASS
097	A1	-
098	A1	-
099	A1	-
100	B1	-
101	B1	-
102	A1	-
103	A1	-
104	A1	-
105	A1	-
106	C1	-
107	A1	-
108	A1	-
109	C1	-
110	A1	-
111	A1	OBSCURED GLASS
112	A1	TEMPERED GLASS
113	D	AC UNIT - REFER TO DETAIL 6/A-501
114	C1	-
115	A1	AC UNIT - REFER TO DETAIL 6/A-501
116	A1	AC UNIT - REFER TO DETAIL 6/A-501
117	C1	OBSCURED GLASS
118	A1	AC UNIT - REFER TO DETAIL 6/A-501
119	D	AC UNIT - REFER TO DETAIL 6/A-501
120	A1	TEMPERED GLASS
121	A1	OBSCURED GLASS
122	A1	HOT WATER TANK WITH VENT AND INTAKE THROUGH WINDOW - REFER TO DETAIL 6&7/A-502; FIX WINDOW CLOSED.
123	A1	-
124	A1	-
125	A1	KITCHEN EQUIPMENT UNIT WITH VENT THROUGH WINDOW - REFER TO DETAIL 6/A-502; FIX WINDOW CLOSED.
126	B1	KITCHEN EQUIPMENT UNIT WITH VENT THROUGH WINDOW - REFER TO DETAIL 6/A-502; FIX WINDOW CLOSED.
127	B1	-
128	A1	-
129	A1	OBSCURED GLASS
130	A1	-
131	C2	OBSCURED GLASS
132	C2	TEMPERED AND OBSCURED GLASS
133	B2	OBSCURED GLASS
134	A2	OBSCURED GLASS
135	A2	OBSCURED GLASS
136	A2	OBSCURED GLASS
137	G	OBSCURED GLASS
138	G	OBSCURED GLASS

NEW WINDOW SCHEDULE - EAST ELEVATION A-201

MARK	TYPE	NOTES
001	B1	-
002	A1	VENTILATION UNIT WITH LOUVER THROUGH WINDOW - REFER TO DETAIL 7/A-502
003	B1	-
004	A1	-
005	C1	-
006	A1	-
007	A1	-
008	C1	-
009	A1	-
010	A1	-
011	C1	-
012	A1	-
013	A1	-
014	A1	-
015	A1	-
016	A1	-
017	C1	-
018	A1	-
019	A1	-
020	C1	-
021	A1	-
022	A1	AC UNIT - REFER TO DETAIL 6/A-501
023	C1	-
024	A1	-
025	B1	-
026	A1	VENTILATION UNIT WITH LOUVER THROUGH WINDOW - REFER TO DETAIL 7/A-502
027	B1	-
028	B1	-
029	A1	VENTILATION UNIT WITH LOUVER THROUGH WINDOW - REFER TO DETAIL 7/A-502
030	B1	-
031	A1	AC UNIT - REFER TO DETAIL 6/A-501
032	C1	-
033	A1	-
034	A1	AC UNIT - REFER TO DETAIL 6/A-501
035	C1	-
036	A1	AC UNIT - REFER TO DETAIL 6/A-501
037	A1	-
038	C1	-
039	A1	-
040	A1	TEMPERED GLASS
041	A1	TEMPERED GLASS
042	A1	TEMPERED GLASS
043	A1	AC UNIT - REFER TO DETAIL 6/A-501
044	C1	-
045	A1	-
046	A1	-
047	C1	-
048	A1	-
049	A1	AC UNIT - REFER TO DETAIL 6/A-501
050	C1	-
051	A1	-
052	B1	-
053	A1	VENTILATION UNIT WITH LOUVER THROUGH WINDOW - REFER TO DETAIL 7/A-502
054	B1	-
055	B2	-
056	A2	-
057	B2	-
058	A2	-
059	C2	-
060	A2	-
061	A2	-
062	C2	-
063	A2	-
064	A2	-
065	C2	-
066	A2	-
067	A2	AC UNIT - REFER TO DETAIL 6/A-501
068	C2	-
069	A2	-
070	A2	-
071	C2	-
072	A2	-
073	A2	-
074	C2	-
075	A2	-
076	B2	TEMPERED AND OBSCURED GLASS (EXERCISE ROOM)
077	A2	TEMPERED AND OBSCURED GLASS (EXERCISE ROOM)
078	B2	TEMPERED AND OBSCURED GLASS (EXERCISE ROOM)

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PREPARED BY A LICENSED ARCHITECT
Any changes to this item can be a violation of the law unless altered by a licensed architect. Any alteration made to this item must be accompanied by a specific description of change or changes made; date change was made, as well as the seal of the licensed architect who made or oversaw the changes.

MARK	DATE	DESCRIPTION
	12-12-22	BID SET

ISSUE:

PROJECT NO.:	22081
DRAWN BY:	LAP/AC
CHECKED BY:	SAW/JSG
DRAWING SCALE:	AS NOTED

SHEET TITLE:

WINDOW SCHEDULE

SHEET:

A-602

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HVAC GENERAL NOTES:

1. THE FOLLOWING NOTES ARE GENERAL IN NATURE. IF A CONFLICT OCCURS BETWEEN THESE NOTES AND THE SPECIFICATIONS, THE MORE STRINGENT SHALL APPLY.

2. EXAMINE ALL DRAWINGS AND THE SPECIFICATION FOR THE WORK REQUIREMENTS OF THIS SECTION. REFER TO THE SCOPE OF WORK SUMMARY IN SPECIFICATIONS.

3. HVAC WORK IS INDICATED DIAGRAMMATICALLY. EXACT LOCATIONS OF ALL COMPONENTS SHALL BE DETERMINED IN THE FIELD AND BY ACTUAL BUILDING CONDITIONS. EQUIPMENT OR DUCTS INTERFERING WITH OTHER INSTALLATIONS SHALL BE RELOCATED AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER. THERMOSTAT LOCATIONS SHALL BE APPROVED BY THE ARCHITECT BEFORE THE INSTALLATION.

4. ALL WORK SHALL MEET OR EXCEED THE LATEST REQUIREMENTS OF ALL NATIONAL, STATE, COUNTY MUNICIPAL AND OTHER AUTHORITIES EXERCISING JURISDICTION OVER CONSTRUCTION WORK OF THE PROJECT. ALL REQUIRED PERMITS SHALL BE OBTAINED, PAID FOR, AND MADE AVAILABLE AT THE COMPLETION OF THE WORK.

5. INSTALLATION PROCEDURES, METHODS, AND CONDITIONS SHALL COMPLY WITH THE LATEST REQUIREMENTS OF THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).

6. THE HVAC CONTRACTOR SHALL GUARANTEE WORK IN WRITING FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE AGAINST DEFECTS IN MATERIALS, WORKMANSHIP AND INSTALLATION. THE HVAC CONTRACTOR SHALL CORRECT DEFECTIVE WORK AT NO ADDITIONAL COST TO THE OWNER AND PROVIDE EQUIPMENT WARRANTIES TO THE OWNER IN FULL FORCE.

7. PRIOR TO PURCHASING ANY EQUIPMENT OR MATERIALS, THE PRODUCT DATA SHALL BE SUBMITTED FOR REVIEW. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND WITHOUT BLEMISH OR DEFECT. SUBSTITUTED EQUIPMENT OR OPTIONAL EQUIPMENT WHERE PERMITTED AND APPROVED, MUST CONFORM TO SPACE REQUIREMENTS. ANY SUBSTITUTED EQUIPMENT THAT CANNOT MEET SPACE REQUIREMENTS, WHETHER APPROVED OR NOT, SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

8. THE HEATING, VENTILATING AND AIR CONDITIONING TRADE IS REQUIRED TO SUPPLY ALL NECESSARY SUPERVISION AND COORDINATION INFORMATION TO ANY OTHER TRADES WHO ARE TO SUPPLY WORK TO ACCOMMODATE THE HEATING, VENTILATING AND AIR CONDITIONING INSTALLATIONS. WORK SHALL BE PERFORMED IN COOPERATION WITH OTHER TRADES ON THE PROJECT AND SO SCHEDULED AS TO ALLOW TIMELY AND EFFICIENT COMPLETION OF THE PROJECT.

9. CUTTING, CORING, DRILLING AND PATCHING OF HOLES AND OPENINGS IN ALL THE STRUCTURAL WALLS FOR THE WORK OF SUB-TRADES SHALL BE PERFORMED BY THE PARTICULAR SUBCONTRACTOR WHEN THE LARGEST DIMENSION OF THE OPENING IS 4 INCHES OR LESS. IF THE LARGEST DIMENSION OF THE OPENING EXCEEDS 4 INCHES, THE GENERAL CONTRACTOR SHALL PERFORM THE CUTTING AND PATCHING FOR THE WORK OF THE SUBCONTRACTOR. ALL SUCH WORK SHALL BE COORDINATED WITH THE G.C.

10. ALL WORK SHALL BE INSTALLED SO THAT PARTS REQUIRING PERIODIC INSPECTION, OPERATION, MAINTENANCE AND REPAIR ARE READILY ACCESSIBLE. MINOR DEVIATION FROM THE DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES OF SUBSTANTIAL MAGNITUDE SHALL NOT BE MADE PRIOR TO WRITTEN APPROVAL FROM THE ENGINEER/ARCHITECT.

11. THE DRAWINGS ARE DIAGRAMMATIC. THE CONTRACTOR SHALL REVIEW EQUIPMENT INSTALLATION MANUAL TO UNDERSTAND THE EQUIPMENT SERVICE SPACE REQUIRED BEFORE WORK IS COMMENCED. THIS CONTRACTOR SHALL COORDINATE LOCATION OF ACCESS PANELS IN CEILINGS, WALLS, FLOORS ETC WITH GC. THE PANELS SHALL BE FURNISHED BY HVAC CONTRACTOR AND INSTALLED BY GC.

12. THIS TRADE SHALL COORDINATE DUCT AND EQUIPMENT INSTALLATION WITH EXISTING EQUIPMENT, DUCTS, AND PIPING. THIS TRADE SHALL COORDINATE ALL CONFLICTS WITH OTHER TRADES IN THE FIELD PRIOR TO INSTALLATION AT NO EXTRA COST TO THE OWNER.

13. G.C. SHALL HIRE A LICENSED PLUMBER TO PERFORM THE PLUMBING PART OF MECHANICAL WORK RELATED TO WATER HEATER & KITCHEN OVEN.

14. G.C. SHALL REACTIVE THE UNIT VENTILATOR's, AC's, HOT WATER HEATER, KITCHEN OVENS AND HOOD AFTER RECONNECTING AND ENSURE ITS OPERATING PROPERLY.

15. G.C. RESPONSIBILITY IS TO REMOVE AND REINSTALL UNIT VENTILATOR, HOT WATER HEATER, KITCHEN OVENS AND HOOD TO ACCOMMODATE WINDOW INSTALLATION METHOD.

HVAC Ductwork Symbols & Abbreviations

SYMBOL	DESCRIPTION
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
FLA	FULL LOAD AMPS
FLR	FLOOR
FPM	FEET PER MINUTE
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
HEX	HEAT EXCHANGER
HP	HEAT PUMP/HORSE POWER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
ID	INSIDE DIAMETER
LAT	LEAVING AIR TEMPERATURE
LD	LINEAR DIFFUSER
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSAND BTU PER HOUR
MAU	MAKE-UP AIR UNIT
NO	NORMALLY OPEN (FAIL POSITION)
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER
P	PUMP
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP
PSI	POUNDS PER SQUARE INCH
RG	RETURN GRILLE
RPM	REVOLUTIONS PER MINUTE
SP	STATIC PRESSURE (INCHES OF WATER)
SR	SUPPLY REGISTER
RTU	ROOFTOP UNIT
TG	TRANSFER GRILLE
TYP	TYPICAL
WB	WET-BULB TEMPERATURE °F
WMS	WIRE MESH SCREEN
RD	RADIATION DAMPER
TYP.	TYPICAL
SS	STAINLESS STEEL

HVAC Ductwork Symbols & Abbreviations

SYMBOL	DESCRIPTION
———	NEW PIPING, DUCTWORK, EQUIPMENT, ETC. (LINE WEIGHT)
═══	LINED DUCTWORK
———	EXISTING PIPING, DUCTWORK, EQUIPMENT, ETC. (LINE WEIGHT)
//////	EXISTING PIPING, DUCTWORK, EQUIPMENT, ETC. (TO BE REMOVED)
	CONNECT NEW TO EXISTING
	SUPPLY/OUTSIDE AIR DUCT UP
	RETURN/EXHAUST DUCT UP
	SUPPLY/OUTSIDE AIR DUCT DOWN
	RETURN/EXHAUST DUCT DOWN
	EXHAUST DUCT UP
	SUPPLY DIFFUSER
	RETURN/EXHAUST REGISTER
FD	FIRE DAMPER
FSD	COMBINATION FIRE DAMPER/SMOKE DAMPER
VD	MANUAL VOLUME DAMPER
MD	MOTORIZED DAMPER
Z	ZONE DAMPER
H	HUMIDISTAT
S	SWITCH SERVING FAN
OS	OCCUPANCY SENSOR
T	THERMOSTAT
TA	REMOTE AVERAGING THERMOSTAT
TR	REVERSE ACTING THERMOSTAT
TS	REMOTE TEMPERATURE SENSOR W/ UNIT
U	UNDER CUT DOOR
L	LOUVERED DOOR
C	THERMOSTAT/CONTROLLER
AFF	ABOVE FINISHED FLOOR
AS	AIR SEPARATOR
B	BOILER
BHP	BRAKE HORSEPOWER
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
CD	CEILING DIFFUSER/CONDENSATE
CFM	CUBIC FEET PER MINUTE
CO	CLEANOUT
CT	COOLING TOWER
CUH	CABINET UNIT HEATER
C/W	COMPLETE WITH
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
DB	DRY BULB TEMPERATURE °F
DN	DOWN
EA	EXHAUST AIR
EF	EXHAUST FAN
EG	EXHAUST GRILLE
ER	EXHAUST REGISTER
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN

HVAC Piping Symbols

SYMBOL	DESCRIPTION
— CWS —	CONDENSER WATER SUPPLY
— CWR —	CONDENSER WATER RETURN
— HWS —	HOT WATER SUPPLY
— HWR —	HOT WATER RETURN
— CD —	CONDENSATE DRAIN
	DIRECTION OF DOWNWARD PITCH 1/8"/FOOT
	DIRECTION OF FLOW
	ELBOW TURNED DOWN
	ELBOW TURNED UP

* NOT ALL SYMBOLS MAY BE USED

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PROFESSIONAL

MARK	DATE	DESCRIPTION
	12-12-22	BID SET

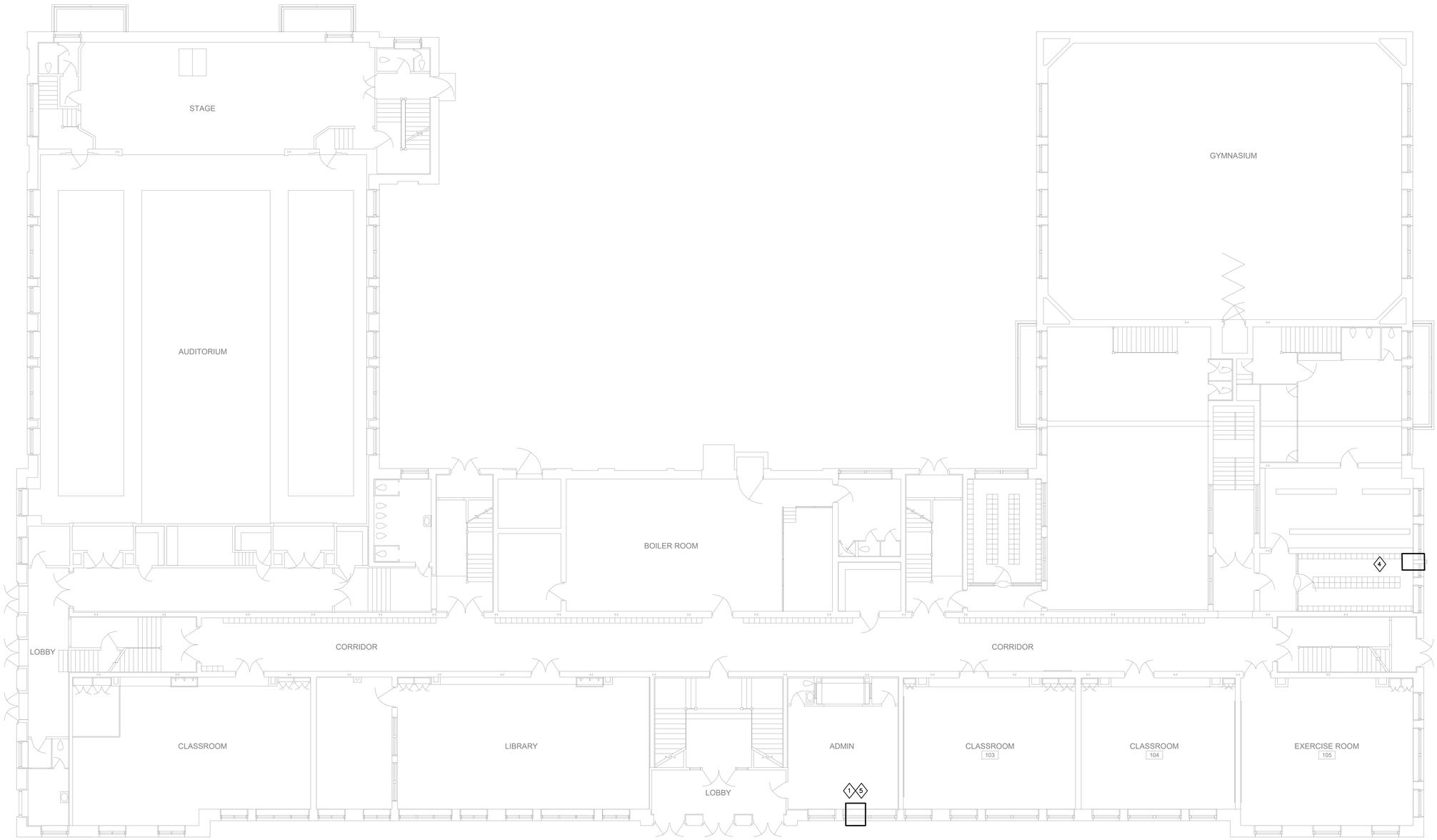
ISSUE:

PROJECT NO.:	22120
DRAWN BY:	JRR
CHECKED BY:	NS
DRAWING SCALE:	AS NOTED

SHEET TITLE:
MECHANICAL SYMBOL LEGEND AND NOTES

SHEET:
M-0.00

DO NOT SCALE DRAWING



1 Mechanical Level 1 Demo Plan

Scale: 1/8"=1'-0"

DEMOLITION NOTES:

1. REMOVE AND STORE EXISTING AC UNIT. RECONNECT ELECTRIC WIRING/CONDUIT AS NEEDED TO SAFELY DISCONNECT AND RECONNECT UNIT. SEE NEW WORK PLAN FOR DETAILS.
2. DISCONNECT DUCTWORK FROM UNIT VENTILATOR. REMOVE AND DISPOSE LOUVER & DUCT. RECONNECT ELECTRIC WIRING/CONDUIT/PIPING AS NEEDED TO SAFELY DISCONNECT AND RECONNECT UNIT. SEE NEW WORK PLAN FOR DETAILS.
3. DISCONNECT DUCTWORK FROM HOOD. REMOVE AND DISPOSE LOUVER & DUCT. RECONNECT ELECTRIC WIRING/CONDUIT AS NEEDED TO SAFELY DISCONNECT AND RECONNECT UNIT. SEE NEW WORK PLAN FOR DETAILS.
4. REMOVE & DISPOSE EXISTING DRYER DUCT WITH LOUVER.
5. SEE PICTURES ON M-2.00 FOR MORE DETAILS.

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	12-12-22	BID SET

ISSUE:

PROJECT NO.:	22120
DRAWN BY:	JRR
CHECKED BY:	NS
DRAWING SCALE:	1/8"=1'-0"

SHEET TITLE:

MECHANICAL LEVEL 1 FLOOR DEMO PLAN

SHEET:

MD-1.00

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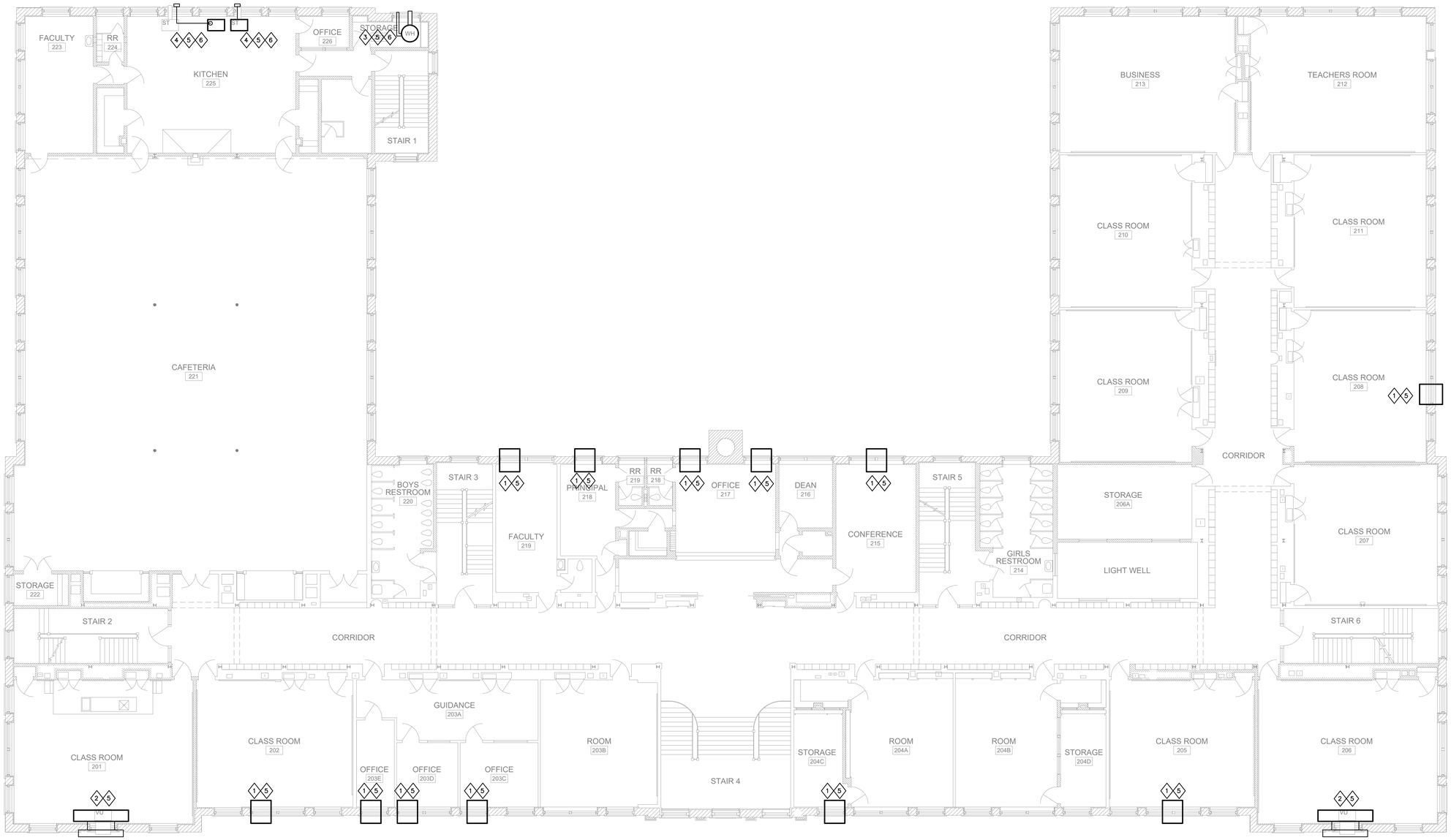

1 Mechanical Level 2 Demo Plan

Scale: 1/8"=1'-0"

DEMOLITION NOTES:

1. REMOVE AND STORE EXISTING AC UNIT. RECONNECT ELECTRIC WIRING/CONDUIT AS NEEDED TO SAFELY DISCONNECT AND RECONNECT UNIT. SEE NEW WORK PLAN FOR DETAILS.
2. DISCONNECT DUCTWORK FROM UNIT VENTILATOR. REMOVE AND DISPOSE LOUVER & DUCT. RECONNECT ELECTRIC WIRING/CONDUIT/PIPING AS NEEDED TO SAFELY DISCONNECT AND RECONNECT UNIT. SEE NEW WORK PLAN FOR DETAILS.
3. DISCONNECT WATER HEATER WITH POWER VENT FAN AND VENT PIPES. LICENSED PLUMBER TO DEACTIVATE THE EXISTING NATURAL GAS FIRED WATER AND REMOVE EXISTING FLUE PIPE AND SLEEVE THRU WINDOW SCHEDULED FOR REPLACEMENT. LICENSED PLUMBER SHALL CUT AND CAP EXISTING WATER AND NATURAL GAS PIPING EXTENDING ACROSS EXISTING WINDOW OPENING IF NEEDED. SLEEVE AND FLUE PIPE TO BE STORED AND UPON WINDOW REPLACEMENT THE LICENSED PLUMBER SHALL REINSTALL SLEEVE AND FLUE PIPE, REACTIVE THE WATER HEATER, CONFIRM HEATER IS OPERATING PROPERLY AND RECONNECT EXISTING WATER AND NATURAL GAS CUT AND CAPPED DURING WINDOW REMOVAL. RECONNECT ELECTRIC WIRING/CONDUIT/PIPING AS NEEDED TO SAFELY DISCONNECT AND RECONNECT UNIT. SEE NEW WORK PLAN FOR DETAILS.
4. DISCONNECT DUCTWORK FROM EXISTING OVEN. REMOVE AND DISPOSE EXHAUST DUCTS. LICENSED PLUMBER TO DEACTIVATE THE EXISTING NATURAL GAS FIRED OVEN AND REMOVE EXISTING FLUE PIPE AND SLEEVE THRU WINDOW SCHEDULED FOR REPLACEMENT. LICENSED PLUMBER SHALL CUT AND CAP EXISTING NATURAL GAS PIPING EXTENDING ACROSS EXISTING WINDOW OPENING IF NEEDED, REACTIVE THE OVEN, CONFIRM OVEN IS OPERATING PROPERLY AND RECONNECT EXISTING NATURAL GAS CUT AND CAPPED DURING WINDOW REMOVAL. RECONNECT ELECTRIC WIRING/CONDUIT/PIPING AS NEEDED TO SAFELY DISCONNECT AND RECONNECT UNIT. SEE NEW WORK PLAN FOR DETAILS.
5. SEE PICTURES ON M-2.00 FOR MORE DETAILS.
6. G.C. SHALL HIRE A LICENSED PLUMBER TO PERFORM THE PLUMBING PART OF MECHANICAL WORK RELATED TO WATER HEATER & KITCHEN OVEN AS PER THE LATEST NATIONAL CODES.

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PROFESSIONAL

MARK	DATE	DESCRIPTION
ISSUE:	12-12-22	BID SET

PROJECT NO.:	22120
DRAWN BY:	JRR
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DRAWING SCALE:	1/8"=1'-0"

SHEET TITLE:

MECHANICAL LEVEL 2 FLOOR DEMO PLAN

SHEET:

MD-1.01

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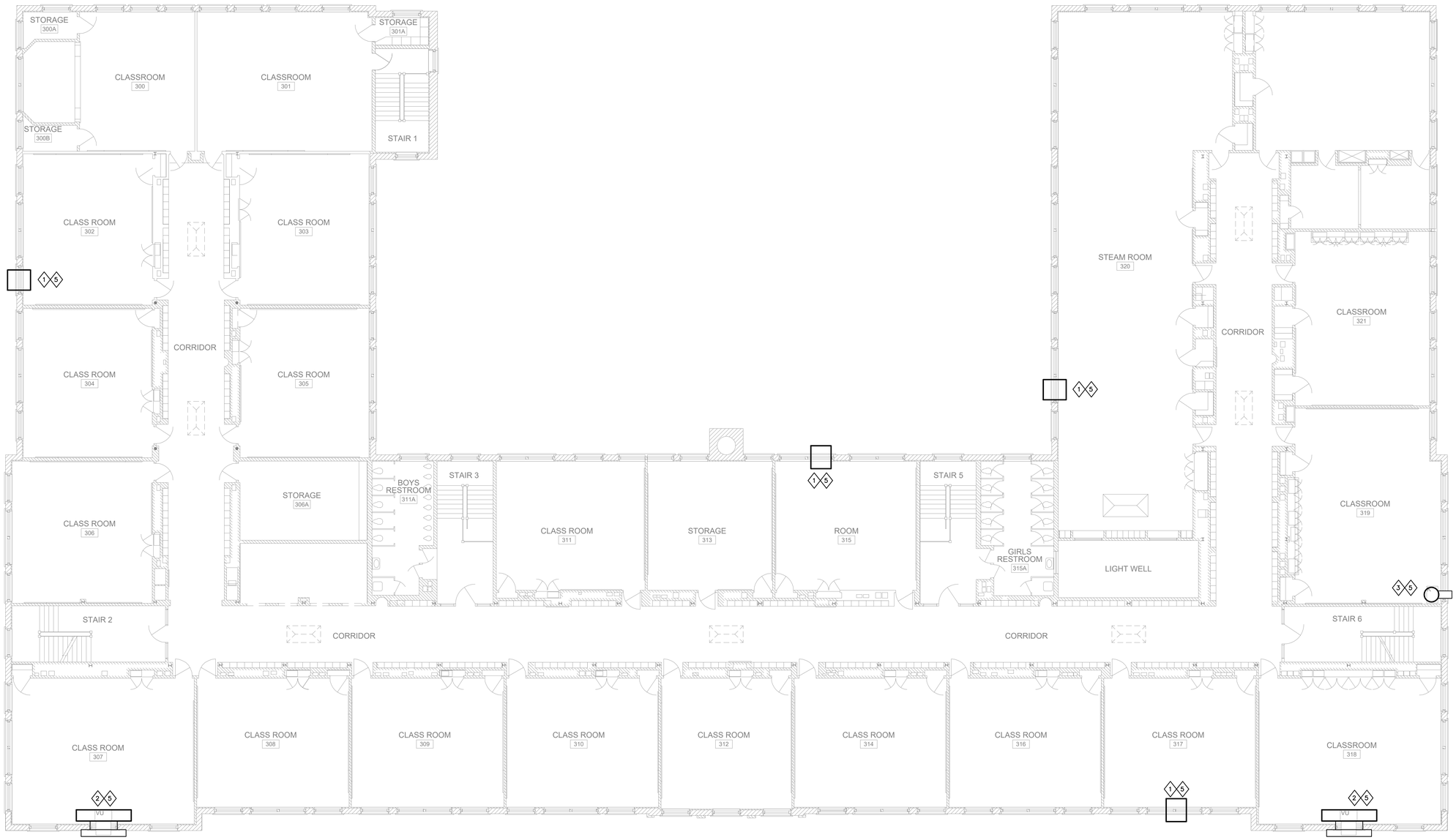

1 Mechanical Level 3 Demo Plan

Scale: 1/8"=1'-0"

DEMOLITION NOTES:

1. REMOVE AND STORE EXISTING AC UNIT. RECONNECT ELECTRIC WIRING/CONDUIT AS NEEDED TO SAFELY DISCONNECT AND RECONNECT UNIT. SEE NEW WORK PLAN FOR DETAILS.
2. DISCONNECT DUCTWORK FROM UNIT VENTILATOR. REMOVE AND DISPOSE LOUVER & DUCT. RECONNECT ELECTRIC WIRING/CONDUIT/PIPING AS NEEDED TO SAFELY DISCONNECT AND RECONNECT UNIT. SEE NEW WORK PLAN FOR DETAILS.
3. DISCONNECT DUCTWORK FROM EXISTING HOOD. REMOVE AND DISPOSE LOUVER & DUCT. RECONNECT ELECTRIC WIRING/CONDUIT AS NEEDED TO SAFELY DISCONNECT AND RECONNECT UNIT. SEE NEW WORK PLAN FOR DETAILS.
4. REMOVE & DISPOSE EXISTING DRYER DUCT WITH LOUVER.
5. SEE PICTURES ON M-2.00 FOR MORE DETAILS.

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MARK	DATE	DESCRIPTION
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DRAWING SCALE:	1/8"=1'-0"

SHEET TITLE:

MECHANICAL LEVEL 3 FLOOR DEMO PLAN

SHEET:

MD-1.02

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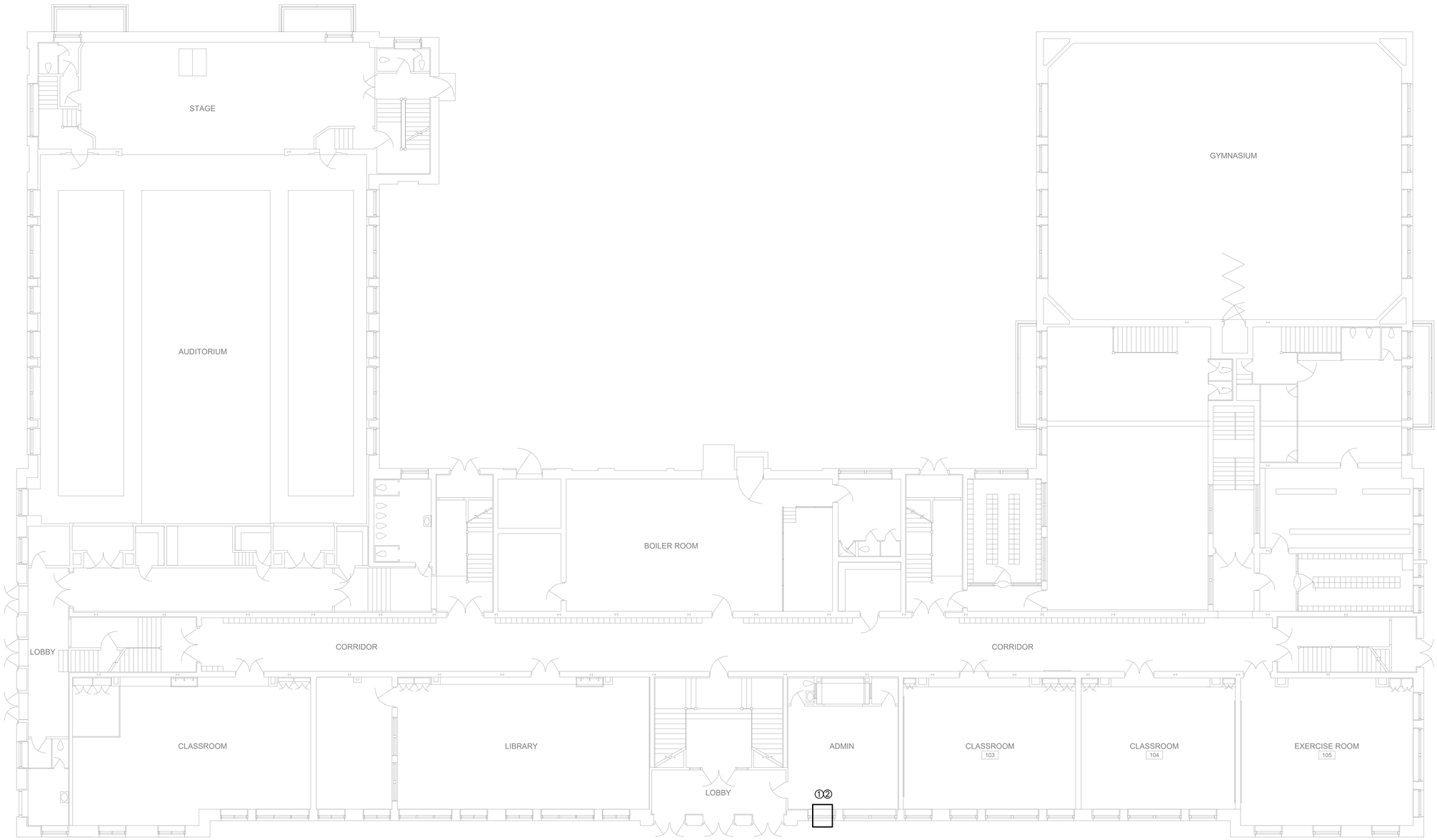

1 Mechanical Level 1 New Plan

Scale: 1/8"=1'-0"

NEW WORK NOTES:

① REINSTALL AC UNIT IN NEW WINDOW WITH BASE BELOW, SEE ARCHITECTURAL ELEVATIONS FOR EXACT LOCATION, NEW BASE DETAIL, CLIPS REQUIREMENT & BASE COLOR. AC UNIT SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATION SO CONDENSATE SPILL BY GRAVITY TO OUTSIDE FROM DRAIN PAN. RECONNECT ELECTRIC WIRING/CONDUIT AS NEEDED, SEE ELECTRICAL PLANS FOR MORE DETAILS.

② THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR TO PROVIDE ALL NECESSARY POWER WIRING AND LOCAL DISCONNECTS TO MEET CODE REQUIREMENTS. SEE ELECTRICAL DRAWINGS FOR DETAILS.

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SHEET TITLE:

MECHANICAL LEVEL 1 FLOOR NEW PLAN

SHEET:

M-1.00

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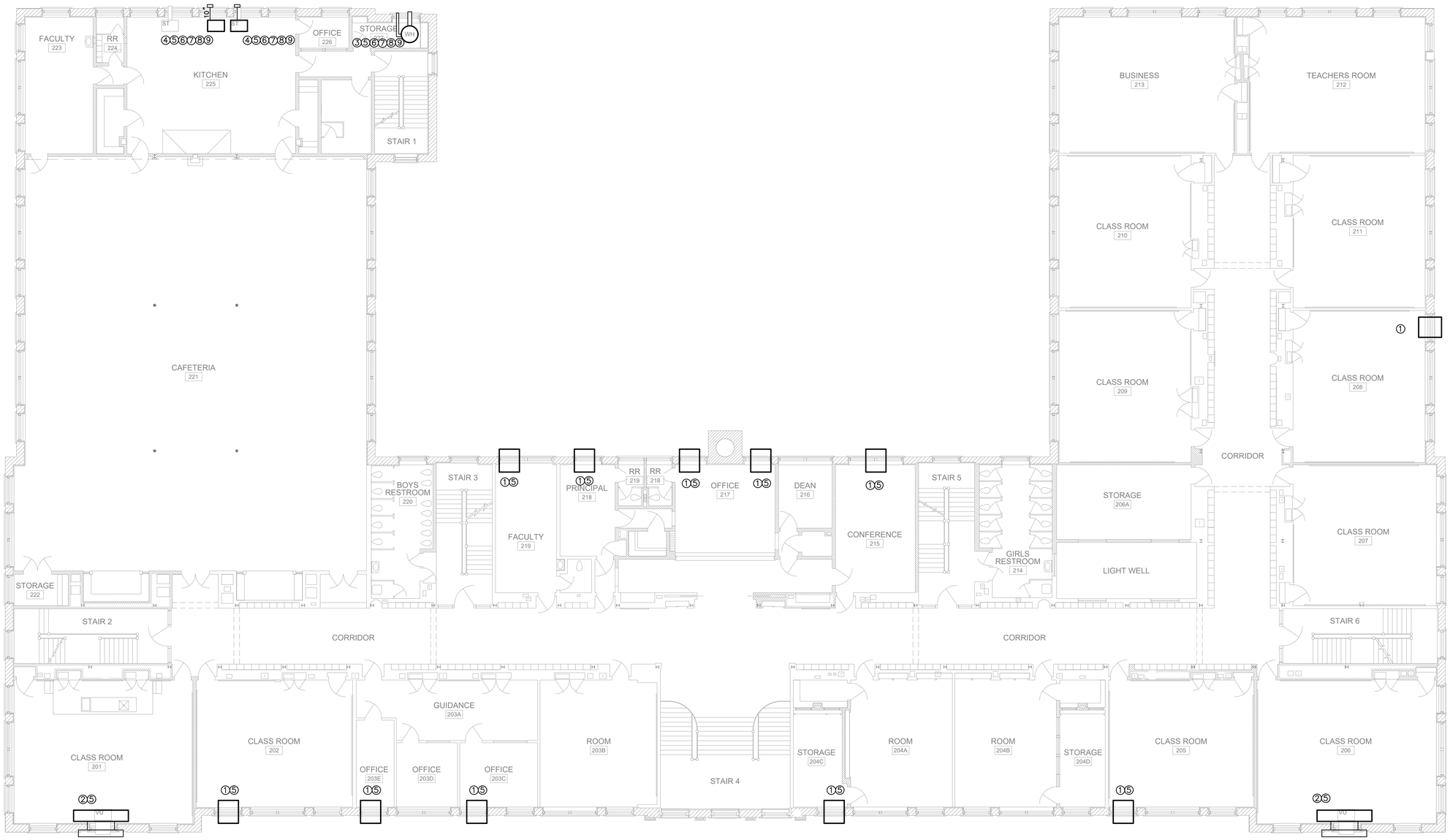

1 Mechanical Level 2 New Plan

Scale: 1/8"=1'-0"

NEW WORK NOTES:

1. REINSTALL AC UNIT IN NEW WINDOW WITH BASE BELOW, SEE ARCHITECTURAL ELEVATIONS FOR EXACT LOCATION, NEW BASE DETAIL, CLIPS REQUIREMENT & BASE COLOR. AC UNIT SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATION SO CONDENSATE SPILL BY GRAVITY TO OUTSIDE FROM DRAIN PAN. RECONNECT ELECTRIC WIRING/CONDUIT AS NEEDED, SEE ELECTRICAL PLANS FOR MORE DETAILS.
2. RECONNECT UNIT VENTILATOR BEHIND THE NEW WINDOW, PROVIDE NEW LOUVER WITH A MINIMUM FREE AREA 1.0 SQ. FT. AND SHALL BE 36"X12". THE LOUVER IS BASED ON GREENHECK MODEL EVH-302. FINAL SIZE, STYLE, COLOR AND LOCATION SHALL BE APPROVED BY THE ARCHITECT. PROVIDE NEW DUCT WITH INSULATION TO CONNECT THE LOUVER TO UNIT. RECONNECT PIPING TO UNIT VENTILATOR. RECONNECT & EXTEND ELECTRIC WIRING/CONDUIT/PIPING/HANGERS AS NEEDED.
3. RECONNECT EXISTING WATER HEATER WITH POWER VENT FAN AND FLUE PIPE. PROVIDE 4" NEW OUTSIDE AIR LOUVER WITH BACK DRAFT DAMPER AND INSTALL AT LOW LEVEL. RECONNECT ELECTRIC WIRING/CONDUIT/PIPING AS NEEDED TO SAFELY DISCONNECT AND RECONNECT UNIT.
4. RECONNECT EXISTING OVEN. PROVIDE NEW EXHAUST DUCT WITH HANGERS, SIZE SHALL MATCH OLD DUCT. PROVIDE NEW LOUVER INSIDE THE NEW WINDOW AT HIGH LEVEL. LOUVER SHALL BE ROUND & CONSTRUCTED FROM SS. EXTEND DUCT HORIZONTALLY MINIMUM 1 FT FROM WINDOW OUTER SIDE. RECONNECT ELECTRIC WIRING/CONDUIT/PIPING AS NEEDED TO SAFELY DISCONNECT AND RECONNECT UNIT.
5. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR TO PROVIDE ALL NECESSARY POWER WIRING AND LOCAL DISCONNECTS TO MEET CODE REQUIREMENTS. SEE ELECTRICAL DRAWINGS FOR DETAILS.
6. G.C. SHALL HIRE A LICENSED PLUMBER TO PERFORM THE PLUMBING PART OF MECHANICAL WORK RELATED TO WATER HEATER & KITCHEN OVEN AS PER THE LATEST NATIONAL CODES.
7. ANY NEW LOUVER INSTALLED IN NEW WINDOW & EXHAUSTING HOT GASES SHALL BE INSTALLED WITHIN INSULATED ALUMINUM PLATE, FINAL SIZE, COLOR LOCATION SHALL BE APPROVED BY ARCHITECT.
8. ALL EXHAUST LOUVERS SHALL BE LOCATED A MINIMUM OF 3FT AWAY FROM OPERABLE PORTION OF WINDOWS/DOORS & 10FT AWAY FROM ALL OUTDOOR AIR INTAKES.
9. G.C. SHALL VERIFY THE APPLIANCE CATEGORY BASED ON EXISTING EQUIPMENT & PROVIDE VENT PIPE MATERIAL/SIZE AS PER MANUFACTURER'S RECOMMENDATION. ALL JOINTS AND SEAMS MUST BE GAS-TIGHT FOR CATEGORY III APPLIANCE.

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DRAWING SCALE:	1/8"=1'-0"

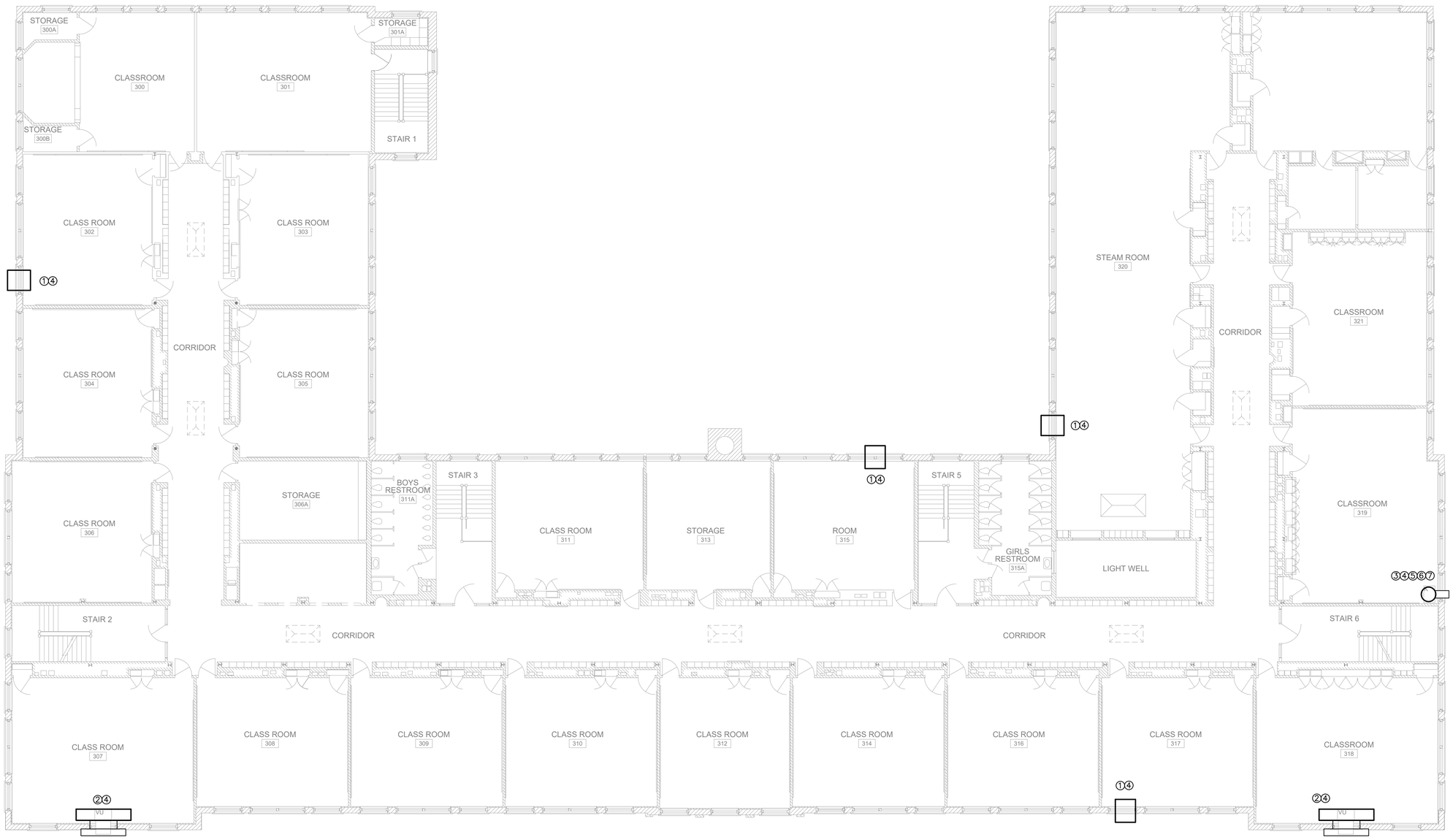
SHEET TITLE:

MECHANICAL LEVEL 2 FLOOR NEW PLAN

SHEET:

M-1.01

DO NOT SCALE DRAWING



1 Mechanical Level 3 New Plan

Scale: 1/8"=1'-0"

NEW WORK NOTES:

1. REINSTALL AC UNIT IN NEW WINDOW WITH BASE BELOW, SEE ARCHITECTURAL ELEVATIONS FOR EXACT LOCATION, NEW BASE DETAIL, CLIPS REQUIREMENT & BASE COLOR. AC UNIT SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATION SO CONDENSATE SPILL BY GRAVITY TO OUTSIDE FROM DRAIN PAN. RECONNECT ELECTRIC WIRING/CONDUIT AS NEEDED, SEE ELECTRICAL PLANS FOR MORE DETAILS.
2. RECONNECT UNIT VENTILATOR BEHIND THE NEW WINDOW, PROVIDE NEW LOUVER WITH A MINIMUM FREE AREA 1.0 SQ. FT. AND SHALL BE 36"X12". THE LOUVER IS BASED ON GREENHECK MODEL EVH-302. FINAL SIZE, STYLE, COLOR AND LOCATION SHALL BE APPROVED BY THE ARCHITECT. PROVIDE NEW DUCT WITH INSULATION TO CONNECT THE LOUVER TO UNIT. RECONNECT PIPING TO UNIT VENTILATOR. RECONNECT & EXTEND ELECTRIC WIRING/CONDUIT/PIPING/HANGERS AS NEEDED.
3. RECONNECT EXISTING HOOD. PROVIDE NEW EXHAUST DUCT WITH HANGERS, SIZE SHALL MATCH OLD DUCT. PROVIDE NEW LOUVER INSIDE THE NEW WINDOW AT HIGH LEVEL. LOUVER SHALL BE ROUND & CONSTRUCTED FROM SS. EXTEND DUCT HORIZONTALLY MINIMUM 1 FT FROM WINDOW OUTER SIDE. RECONNECT ELECTRIC WIRING/CONDUIT/PIPING AS NEEDED TO SAFELY DISCONNECT AND RECONNECT UNIT.
4. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR TO PROVIDE ALL NECESSARY POWER WIRING AND LOCAL DISCONNECTS TO MEET CODE REQUIREMENTS. SEE ELECTRICAL DRAWINGS FOR DETAILS.
5. ANY NEW LOUVER INSTALLED IN NEW WINDOW & EXHAUSTING HOT GASES SHALL BE INSTALLED WITHIN INSULATED ALUMINUM PLATE, FINAL SIZE, COLOR LOCATION SHALL BE APPROVED BY ARCHITECT.
6. ALL EXHAUST LOUVERS SHALL BE LOCATED A MINIMUM OF 3FT AWAY FROM OPERABLE PORTION OF WINDOWS/DOORS & 10FT AWAY FROM ALL OUTDOOR AIR INTAKES.
7. G.C. SHALL VERIFY THE APPLIANCE CATEGORY BASED ON EXISTING EQUIPMENT & PROVIDE VENT PIPE MATERIAL/SIZE AS PER MANUFACTURER'S RECOMMENDATION. ALL JOINTS AND SEAMS MUST BE GAS-TIGHT FOR CATEGORY III APPLIANCE.

CONSULTANTS:

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PROJECT:

LYMAN B. GOFF MIDDLE SCHOOL WINDOW REPLACEMENT

974 NEWPORT AVE.
PAWTUCKET, RI 02861

CLIENT:

PAWTUCKET SCHOOL DEPARTMENT

286 MAIN ST.
PAWTUCKET, RI 02860

PROFESSIONAL

MARK	DATE	DESCRIPTION
	12-12-22	BID SET

ISSUE:

PROJECT NO.:	22120
DRAWN BY:	JRR
CHECKED BY:	NS
DRAWING SCALE:	1/8"=1'-0"

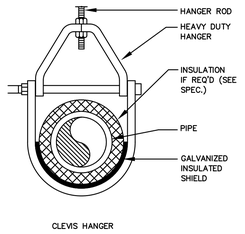
SHEET TITLE:

MECHANICAL LEVEL 3 FLOOR NEW PLAN

SHEET:

M-1.02

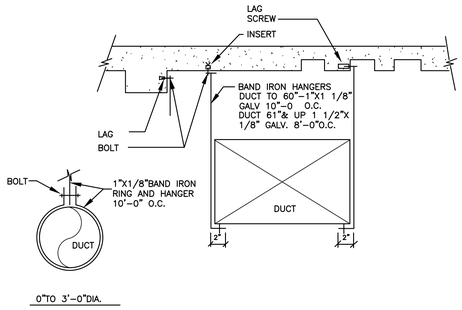
DO NOT SCALE DRAWING



CLEVIS HANGER

PIPE HANGER ATTACHMENT DETAIL

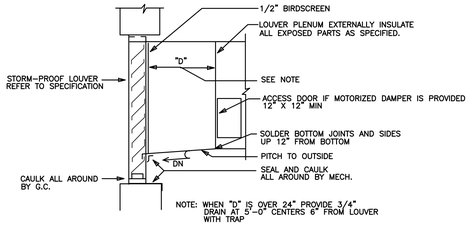
Scale: None



0"TO 3'–0"DIA.

STANDARD HANGING DETAIL

Scale: None

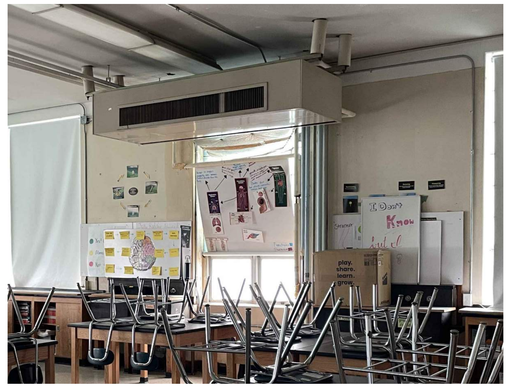


TYPICAL LOUVER CONNECTION DETAIL

Scale: None

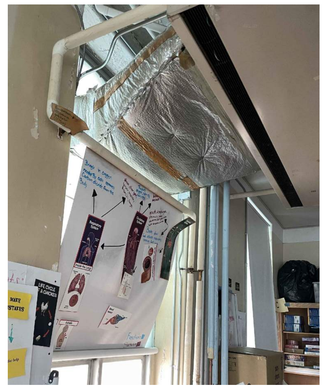
PIC–1 AC UNIT WITH BASE (GENERAL PICTURE)

Scale: None



PIC–2 UNIT VENTILATOR – ROOM 206

Scale: None

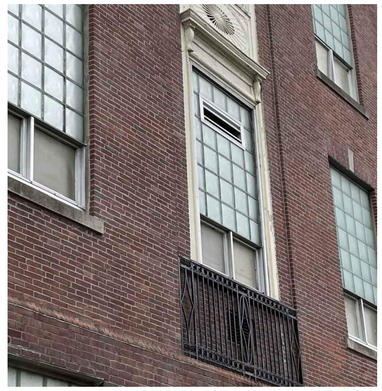


PIC–3 UNIT VENTILATOR – ROOM 206

Scale: None

PIC–4 UNIT VENTILATOR – ROOM 206

Scale: None



PIC–5 UNIT VENTILATOR LOUVER – ROOM 201

Scale: None

PIC–6 WATER HEATER – ROOM 227

Scale: None

PIC–7 KITCHEN DUCTS/PIPING – ROOM 225

PIC–8 KITCHEN DUCTS/PIPING – ROOM 225

Scale: None

PIC–9 HOOD DUCT – ROOM 319

Scale: None

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PROFESSIONAL

MARK	DATE	DESCRIPTION
	12-12-22	BID SET
ISSUE:		

PROJECT NO.:	22120
DRAWN BY:	JRR
CHECKED BY:	NS
DRAWING SCALE:	AS NOTED

SHEET TITLE:

MECHANICAL DETAILS & PICTURES

SHEET:

M-2.00

DO NOT SCALE DRAWING

PART 1 - GENERAL

1.1 GENERAL CONDITIONS

A. ALL SECTIONS OF DIVISION I GENERAL CONDITION REQUIREMENTS SHALL HEREBY BE MADE PART OF THIS SECTION OF THE SPECIFICATION.

B. EXAMINE ALL DRAWINGS AND ALL OTHER SECTIONS OF THE SPECIFICATION FOR THE REQUIREMENTS FOR THE WORK OF THIS SECTION.

C. ALL WORK SHOWN IN THE DRAWINGS AND SPECIFICATIONS SHALL BE INCLUDED UNDER THE BASE BID, EXCEPT WHERE THERE IS SPECIFIC REFERENCE TO EXCLUSION AND INCORPORATION IN OTHER QUOTATIONS.

D. HVAC WORK IS INDICATED DIAGRAMMATICALLY. EXACT LOCATIONS OF ALL COMPONENTS SHALL BE DETERMINED IN THE FIELD AND BY ACTUAL BUILDING CONDITIONS. EQUIPMENT OR DUCTS INTERFERING WITH OTHER INSTALLATIONS SHALL BE RELOCATED AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.

1.2 DESCRIPTION OF WORK

A. THE HVAC SCOPE FOR THIS PROJECT INCLUDES GENERALLY, BUT IS NOT LIMITED TO THE FOLLOWING:

1. LOW PRESSURE DUCTWORK DISTRIBUTION SYSTEMS
2. DUCTWORK INSULATION SYSTEMS
3. TESTING AND BALANCING - AIR AND WATER SYSTEMS
4. LOUVERS

1.3 CODES, PERMITS, AND INSPECTIONS

A. ALL WORK SHALL MEET OR EXCEED THE LATEST REQUIREMENTS OF ALL NATIONAL, STATE, COUNTRY MUNICIPAL AND OTHER AUTHORITIES EXERCISING JURISDICTION OVER CONSTRUCTION WORK OF THE PROJECT.

B. ALL REQUIRED INSPECTION CERTIFICATES SHALL BE OBTAINED, PAID FOR, AND MADE AVAILABLE AT THE COMPLETION OF THE WORK. MUNICIPAL PERMIT AND INSPECTION FEES ARE WAIVED ALTHOUGH ALL APPLICABLE PERMITS AND INSPECTIONS ARE REQUIRED.

C. ANY PORTION OF THE WORK, WHICH IS NOT SUBJECT TO THE APPROVAL OF AN AUTHORITY HAVING JURISDICTION, SHALL BE GOVERNED BY THE APPLICABLE SECTIONS OF THE OVERALL NATIONAL FIRE PROTECTION ASSOCIATION.

D. INSTALLATION PROCEDURES, METHODS, AND CONDITIONS SHALL COMPLY WITH THE LATEST REQUIREMENTS OF THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).

1.4 GUARANTEES AND CERTIFICATIONS

A. THE HVAC CONTRACTOR SHALL GUARANTEE WORK IN WRITING FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE AGAINST DEFECTS IN MATERIALS, WORKMANSHIP AND INSTALLATION. THE HVAC CONTRACTOR SHALL CORRECT DEFECTIVE WORK AT NO ADDITIONAL COST TO THE OWNER AND PROVIDE EQUIPMENT WARRANTIES TO THE OWNER IN FULL FORCE. PROVIDE FIVE-YEAR WARRANTY FOR COMPRESSORS. SEE PRODUCT SPECIFICATION PARAGRAPHS FOR MORE INFORMATION ON WARRANTIES.

B. CERTIFICATION SHALL BE SUBMITTED ATTESTING TO THE FACT THAT SPECIFIED PERFORMANCE CRITERIA ARE MET BY ALL ITEMS OF HEATING AND AIR CONDITIONING EQUIPMENT.

1.5 SHOP DRAWINGS AND OTHER INFORMATION REQUIRED

A. PRIOR TO PURCHASING ANY EQUIPMENT OR MATERIALS, SIX (6) COPIES OF COMPLETE SUBMITTALS SHALL BE SUBMITTED FOR REVIEW, INCLUDING THE FOLLOWING MINIMUM INFORMATION:

1. DRAWINGS, DIMENSIONS, AND WEIGHTS.
2. MINIMUM CLEARANCES FOR PROPER OPERATION AND SERVICE.
3. MINIMUM PERFORMANCE DATA AS REQUIRED BY THE DRAWINGS AND SPECIFICATIONS. SUBMITTED INFORMATION SHALL INCLUDE SYMBOLS SHOWN ON DRAWING EF-1, ACCU-1, ETC. THE PURPOSE OF SHOWING THE SYMBOLS IS IDENTIFICATION WHICH SPECIFIED PRODUCT IS SUBMITTED FOR REVIEW. WITHOUT PROPER SYMBOLS INDICATED, THE SUBMITTALS WILL NOT BE REVIEWED.

B. PRIOR TO ASSEMBLING OR INSTALLING THE WORK, THE FOLLOWING SHALL BE SUBMITTED FOR REVIEW:

1. SCALE DRAWINGS SHOWING ALL PIPING AND DUCT RUNS WITH SIZES AND ELEVATIONS SHOWN ON COMPOSITE DRAWINGS WITH INDICATION OF COORDINATION WITH OTHER TRADES. THIS SUBMISSION SHALL CONSIST OF 3 PAPER PRINTS. IF REQUESTED BY GENERAL CONTRACTOR, AUTOCAD FILES OF MEP/FP DRAWINGS WILL BE MADE AVAILABLE FOR A COST OF $50.00 PER DRAWING. FILES WILL BE MADE AVAILABLE AFTER GENERAL CONTRACTOR SIGNS A WB&A DISCLAIMER PROVIDED BY WB&A.
2. CATALOG INFORMATION, FACTORY ASSEMBLY DRAWINGS AND FIELD INSTALLATION DRAWINGS AS REQUIRED FOR A COMPLETE EXPLANATION AND DESCRIPTION OF ALL ITEMS OF EQUIPMENT.

NOTE: THE HVAC CONTRACTOR SHALL PROVIDE A DUPLICATE COPY OF THE OPERATING MANUALS FOR ALL CONTROLS, A DUPLICATE COPY OF THE MAINTENANCE MANUALS FOR ALL EQUIPMENT AND CONTROLS, AND REDUCED SCALE DRAWINGS SHOWING THE HVAC DISTRIBUTION SYSTEM.

1.6 SEPARATION OF WORK BETWEEN TRADES

A. THE FOLLOWING ITEMS SHALL BE FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR:

1. MOTORS FOR MECHANICAL EQUIPMENT
2. CONTROLS FOR MECHANICAL EQUIPMENT
3. HOISTING AND RIGGING
4. FASTENINGS AND SUPPORTS
5. ROOF OPENING FLASHING
6. FIELD TOUCH UP PAINTING OF DAMAGED SHOP COATS
7. RUBBISH REMOVAL

B. THE FOLLOWING ITEMS SHALL BE FURNISHED AND INSTALLED BY OTHER TRADES:

1. CUTTING OF OPENINGS IN FLOOR, WALLS AND ROOF
2. LOUVERS IN OUTSIDE WALLS AND ROOF VENTS
3. ENCLOSURES/SHAFTS OF DUCTS
4. PIPING ENCLOSURES
5. CONCRETE PADS FOR EQUIPMENT
6. POWER FOR HVAC EQUIPMENT

C. THE HEATING, VENTILATING AND AIR CONDITIONING TRADE IS REQUIRED TO SUPPLY ALL NECESSARY SUPERVISION AND COORDINATION INFORMATION TO ANY OTHER TRADES WHO ARE TO SUPPLY WORK TO ACCOMMODATE THE HEATING, VENTILATING AND AIR CONDITIONING INSTALLATIONS.

1.7 EQUIPMENT AND MATERIALS

A. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND WITHOUT BLEMISH OR DEFECT.

B. IT IS THE INTENT OF THESE SPECIFICATIONS THAT WHEREVER A MANUFACTURER OF A PRODUCT IS SPECIFIED, AND THE TERMS "OTHER APPROVED" OR "OR APPROVED EQUAL" OR "EQUAL" ARE USED, THE SUBSTITUTED ITEM MUST CONFORM IN ALL RESPECTS TO THE SPECIFIED ITEM.

C. SUBSTITUTED EQUIPMENT OR OPTIONAL EQUIPMENT WHERE PERMITTED AND APPROVED, MUST CONFORM TO SPACE REQUIREMENTS. ANY SUBSTITUTED EQUIPMENT THAT CANNOT MEET SPACE REQUIREMENTS, WHETHER APPROVED OR NOT, SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. ANY MODIFICATIONS OF RELATED SYSTEMS AS A RESULT OF SUBSTITUTIONS SHALL BE MADE AT THE CONTRACTORS EXPENSE.

1.8 INTERPRETATION OF THE DRAWINGS AND SPECIFICATIONS

A. AS USED IN THE DRAWINGS AND SPECIFICATIONS FOR THIS WORK, CERTAIN NON-TECHNICAL WORDS SHALL BE UNDERSTOOD TO HAVE SPECIFIC MEANINGS AS FOLLOWS REGARDLESS OF INDICATIONS TO THE CONTRARY IN THE GENERAL CONDITIONS OR OTHER DOCUMENTS GOVERNING THE WORK.

"FURNISH" PURCHASE AND DELIVER TO THE PROJECT SITE COMPLETE WITH EVERY NECESSARY APPURTENANCE AND SUPPORT, ALL AS PART OF THIS WORK. PURCHASING SHALL INCLUDE PAYMENT OF ALL SALES TAXES AND OTHER SURCHARGES AS MAY BE REQUIRED TO ASSURE THAT PURCHASED ITEMS ARE FREE OF ALL LIENS, CLAIMS OR ENCUMBRANCES.

"INSTALL" UNLOAD AT THE DELIVERY POINT AT THE SITE AND PERFORM EVERY OPERATION NECESSARY TO ESTABLISH SECURE MOUNTING AND CORRECT OPERATION AT THE PROPER LOCATION IN THE PROJECT, ALL AS PART OF THIS WORK.

"PROVIDE" "FURNISH" AND "INSTALL".

"NEW" MANUFACTURED WITHIN THE PAST TWO YEARS AND HAS NEVER BEEN USED.

B. EXCEPT WHERE MODIFIED BY A SPECIFIC NOTATION TO THE CONTRARY, IT SHALL BE UNDERSTOOD THAT THE INDICATION AND/OR DESCRIPTION OF ANY ITEM IN THE DRAWINGS OR SPECIFICATIONS FOR THIS WORK CARRIES WITH IT THE INSTRUCTION TO FURNISH, INSTALL AND CONNECT THE ITEMS AS PART OF THE WORK, REGARDLESS OF WHETHER OR NOT THIS INSTRUCTION IS EXPLICITLY STATED.

C. TO THE EXTENT THAT THEY GOVERN THE BASIC WORK, THE SPECIFICATIONS ALSO GOVERN CHANGE ORDER WORK.

D. NO EXCLUSION FROM, OR LIMITATION IN, THE SYMBOLISM USED ON THE DRAWINGS FOR THIS WORK OR THE LANGUAGE USED IN THE SPECIFICATIONS FOR THIS WORK SHALL BE INTERPRETED AS A REASON FOR OMITTING THE APPURTENANCES OR ACCESSORIES NECESSARY TO COMPLETE ANY REQUIRED SYSTEM OR ITEM OF EQUIPMENT.

E. THE DRAWINGS FOR THIS WORK UTILIZE SYMBOLS AND SCHEMATIC DIAGRAMS WHICH HAVE NO DIMENSIONAL SIGNIFICANCE. THE WORK SHALL, THEREFORE, BE INSTALLED TO FULFILL THE DIAGRAMMATIC INTENT EXPRESSED ON THE DRAWINGS, BUT IN CONFORMITY WITH THE DIMENSIONS INDICATED ON THE FINAL WORKING DRAWINGS; FIELD LAYOUTS AND SHOP DRAWINGS OF ALL TRADES.

F. CERTAIN DETAILS APPEAR ON THE DRAWINGS FOR THIS WORK WHICH ARE SPECIFIC WITH REGARD TO THE DIMENSIONS AND POSITIONING OF THE WORK. THESE ARE INTENDED ONLY FOR GENERAL INFORMATION PURPOSES. THEY DO NOT OBVIATE FIELD COORDINATION FOR INDIVIDUAL ITEMS OF THE INDICATED WORK.

G. INFORMATION AS TO GENERAL CONSTRUCTION AND ARCHITECTURAL FEATURES AND FINISHES SHALL BE DERIVED FROM STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS ONLY.

H. THE USE OF WORDS IN THE SINGULAR SHALL NOT BE CONSIDERED AS LIMITING WHERE OTHER INDICATIONS DENOTE THAT MORE THAN ONE ITEM IS REFERRED TO.

1.9 COORDINATION

A. WORK SHALL BE PERFORMED IN COOPERATION WITH OTHER TRADES ON THE PROJECT AND SO SCHEDULED AS TO ALLOW SPEEDY AND EFFICIENT COMPLETION OF THE PROJECT.

B. THIS CONTRACTOR SHALL FURNISH TO OTHER TRADES ADVANCE INFORMATION ON LOCATIONS AND SIZES OF ALL FRAMES, BOXES, SLEEVES, AND OPENINGS NEEDED FOR HIS OWN WORK, AND ALSO FURNISH INFORMATION AND SHOP DRAWINGS NECESSARY TO PERMIT TRADES AFFECTED BY THIS CONTRACTOR'S WORK TO INSTALL THEIR WORK PROPERLY AND WITHOUT DELAY.

C. WHERE THERE IS EVIDENCE THAT WORK OF THIS CONTRACTOR WILL INTERFERE WITH THE WORK OF OTHER TRADES, THIS CONTRACTOR SHALL ASSIST IN WORKING OUT SPACE CONDITIONS TO MAKE SATISFACTORY ADJUSTMENTS.

D. THIS CONTRACTOR SHALL, WITH THE APPROVAL OF THE ENGINEER AND WITHOUT EXTRA COST TO THE OWNER, MAKE MODIFICATIONS IN HIS WORK AS REQUIRED BY STRUCTURAL INTERFERENCE. THIS CONTRACTOR SHALL PAY ALL EXPENSES TO THE GENERAL CONTRACTOR FOR ADDITIONAL OPENINGS, OR RELOCATING OR ENLARGING EXISTING OPENINGS THROUGH CONCRETE FLOORS, WALLS, BEAMS AND ROOF REQUIRED FOR THIS WORK WHICH WAS NOT PROPERLY COORDINATED.

E. IF THIS CONTRACTOR INSTALLS HIS WORK BEFORE COORDINATING WITH OTHER TRADES SO AS TO CAUSE INTERFERENCE WITH THE WORK SUCH TRADES, HE SHALL MAKE ALL NECESSARY CHANGES IN HIS WORK TO CORRECT THE CONDITIONS WITHOUT EXTRA COST TO THE OWNER.

F. THIS CONTRACTOR SHALL VISIT THE SITE TO ASCERTAIN AND APPRISE HIMSELF OF THE ACTUAL FIELD CONDITIONS UNDER WHICH THE WORK HAS TO BE PERFORMED. ALL WORK SHOWN ON THE DRAWINGS IS DIAGRAMMATIC IN NATURE AND THEIR ACTUAL LOCATION AND ELEVATION SHALL BE VERIFIED IN THE FIELD. ANY DEVIATIONS NECESSARY AS A RESULT OF FIELD INTERFERENCES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND RESOLVED EXPEDITIOUSLY, AT NO ADDITIONAL COST TO THE OWNER.

G. THE CONTRACTOR SHALL PROTECT ALL MATERIALS AND WORK OF OTHER TRADES FORM DAMAGE THAT MAY BE CAUSED BY HIS WORK AND SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGES WITHOUT EXTRA COST TO THE OWNER.

H. SLEEVES, INSERTS, ANCHOR BOLTS AND SIMILAR ITEMS SET INTO THE MASONRY STRUCTURE OR THE WORK OF OTHER TRADES SHALL BE FURNISHED AND INSTALLED BY THIS CONTRACTOR. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SUCH ITEMS NECESSARY TO HANGED OR SUPPORT HIS EQUIPMENT.

I. WHEN, IN ORDER TO ACCOMMODATE THIS CONTRACTOR'S WORK, FINISHED MATERIALS AND WORK OF OTHER TRADES MUST BE CUT OR FITTED IN THE SHOP THIS CONTRACTOR SHALL FURNISH THE NECESSARY DRAWINGS FOR TRANSMITTAL TO THE TRADES WHOSE MATERIALS MUST BE CUT OR FITTED.

J. CUTTING, CORING, DRILLING AND PATCHING OF HOLES AND OPENINGS FOR THE WORK OF SUB-TRADES SHALL BE PERFORMED BY THE PARTICULAR SUBCONTRACTOR WHEN THE LARGEST DIMENSION OF THE OPENING IS LESS THAN 4 INCHES. IF THE LARGEST DIMENSION OF THE OPENING IS 4 INCHES OR MORE, THE GENERAL CONTRACTOR SHALL PERFORM THE CUTTING AND PATCHING FOR THE WORK OF THE SUBCONTRACTOR. FOR CUTTING AND PATCHING SEE SECTION 01045.

K. EXACT LOCATION OF DIFFUSERS, GRILLES AND THERMOSTATS SHALL BE APPROVED BY THE ARCHITECT BEFORE THEIR INSTALLATION. SEE ARCHITECT'S DRAWINGS FOR MORE INFORMATION.

L. ALL PIPING AND DUCTWORK SHALL BE INSULATED AS PER CODE. WEATHER PROOF MATERIAL OVER THE INSULATION SHALL BE PROVIDED ON COMPONENTS EXPOSED TO OUTSIDE

M. ALL WORK SHALL BE INSTALLED SO THAT PARTS REQUIRING PERIODIC INSPECTION, OPERATION, MAINTENANCE AND REPAIR ARE READILY ACCESSIBLE. MINOR DEVIATION FROM THE DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES OF SUBSTANTIAL MAGNITUDE SHALL NOT BE MADE PRIOR TO WRITTEN APPROVAL FROM THE ENGINEER. THE CONTRACTOR SHALL DETERMINE LOCATIONS OF ALL ACCESS PANELS REQUIRED FOR THE PROJECT. LOCATIONS SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR AND APPROVED BY THE ARCHITECT. ACCESS PANELS SHALL BE FURNISHED BY HVAC TRADE AND INSTALLED BY GENERAL CONTRACTOR.

PART 2 - PRODUCTS

2.1 PREINSULATED PIPING

A. PROVIDE PREINSULATED PIPING BY PITTSBURGH CORNING (PITTCON), RICWIL OR PERMA-PIPE FOR UNDERGROUND (HOT) (CHILLED) WATER (STEAM) (CONDENSATE) SERVICE WHERE SHOWN ON DRAWINGS, WITH THERMOSETTING FIBROUS-GLASS-REINFORCED PLASTIC (FRP) OUTER CASING, GLASS FOAM INSULATION AS SPECIFIED IN PIPING INSULATION PARAGRAPH, AND STEEL CARRIER PIPE AS SPECIFIED FOR APPLICABLE SERVICE IN PIPING PARAGRAPH. PIPE SHALL BE 40-FT. STRAIGHT SECTIONS WITHOUT FITTINGS.

B. PROVIDE STRUCTURAL INSULATING CEMENT SUPPORT GUIDES ON 10-FT. CENTERS. GUIDES SHALL BE 1" WIDE AND SAME DIAMETER AS PIPE. INSTALL AS RECOMMENDED BY MANUFACTURER.

C. PROVIDE OVAL, PREFABRICATED EXPANSION ELLS WITH OVAL SUPPORT GUIDES INCORPORATED IN ELLS.

D. PROVIDE STEEL PLATE ANCHORS WELDED TO CARRIER PIPE AND BONDED TO FRP CASING. PLATE SHALL BE 3/8" FOR PIPE SIZES THROUGH 6", ½" FOR 8 THROUGH 16" PIPE AND 3/4" FOR 18 THROUGH 30" PIPE. PROVIDE HOLES IN ANCHORS BETWEEN CARRIER AND CASING, FOR DRAIN AND VENT. POUR CONCRETE THRUST BLOCKS AT ANCHORS AS RECOMMENDED BY MANUFACTURER.

E. PROVIDE COMPRESSIBLE SILICON RUBBER, ADJUSTABLE GLAND SEALS BETWEEN CARRIER AND CASING, SUITABLE FOR 450 DEGREES F.

F. PROVIDE ½" NPS VENT AND DRAIN CONNECTIONS ON VERTICAL CENTER LINES OF CASING WHERE PIPE TERMINATES INSIDE BUILDING OR MANHOLE WALL, AT LEAST 3" INSIDE WALL.

G. PROVIDE FRP LEAK PLATE FUSION WELDED TO CASING, PROTRUDING 3" BEYOND OUTSIDE CASING DIAMETER, WHERE PIPE PENETRATES BUILDING WALL, AS CLOSE AS POSSIBLE TO CENTER OF WALL.

H. PROVIDE POLYESTER RESIN END SEALS WELDED TO OUTSIDE CASING AND BONDED TO CARRIER TO SEAL INSULATION TERMINATIONS.

I. PROVIDE STEEL HEAD PLATES WELDED TO CARRIER PIPE AND TO STEEL SLEEVE OF SAME SIZE AS CASING, AT ANCHORS WITHIN 5 FT. OF PIPING TERMINAL ENDS. CASING SHALL BE WOUND ON AND BONDED TO STEEL SLEEVE. WELD DRAIN AND VENT CONNECTIONS TO SLEEVE.

2.2 PIPE INSULATION

A. INSULATION SHALL BE 5 LB./CF NOMINAL FIBROUS GLASS INSULATION WITH FACTORY-APPLIED FIRE RETARDANT VAPOR BARRIER JACKET WITH K FACTOR OF 0.21 AT 75 DEGREES F. MEAN TEMPERATURE BY OWENS CORNING, CERTAIN-TEED, MANVILLE OR KNAUF, INSTALLED AS REQUIRED BY MANUFACTURER. ASTM E-84 FIRE HAZARD RATINGS SHALL BE 25 FLAME SPREAD, 50 SMOKE DEVELOPED AND 50 FUEL CONTRIBUTED.

B. APPLY INSULATION AFTER SYSTEMS HAVE BEEN TESTED, PROVED TIGHT AND APPROVED BY ARCHITECT. REMOVE DIRT, SCALE, OIL, RUST AND FOREIGN MATTER PRIOR TO INSTALLATION OF INSULATION.

C. NO LEAKS IN VAPOR BARRIER OR VOIDS IN INSULATION WILL BE ACCEPTED.

D. INSULATION AND VAPOR BARRIER ON PIPING WHICH PASSES THROUGH WALLS OR PARTITIONS SHALL PASS CONTINUOUSLY THROUGH SLEEVE, EXCEPT THAT PIPING BETWEEN FLOORS AND THROUGH FIRE WALLS OR SMOKE PARTITIONS SHALL HAVE SPACE ALLOWED FOR APPLICATION OF APPROVED PACKING BETWEEN SLEEVES AND PIPING, TO PROVIDE FIRE STOP AS REQUIRED BY NFPA. SEAL ENDS TO PROVIDE CONTINUOUS VAPOR BARRIER WHERE INSULATION IS INTERRUPTED.

E. INSULATE FLEXIBLE CONNECTIONS TO SAME THICKNESS AND WITH SAME MATERIAL AS ADJOINING PIPE INSULATION.

F. PROVIDE FIBROUS DUAL TEMPERATURE INSULATION WITH FACTORY APPLIED VAPOR BARRIER JACKET ON STEAM, OUTDOOR CONDENSER WATER, OUTDOOR COOLING TOWER DRAIN AND MAKEUP, CONDENSATE, CHILLED WATER, DRAIN, HOT AND COLD WATER PIPING, EXCEPT AS SPECIFIED OTHERWISE.

G. DRAIN PIPING OTHER THAN PVC PIPING AND OUTDOOR COOLING TOWER DRAIN PIPING SHALL HAVE ½" THICK INSULATION. INSULATION THICKNESS FOR INDOOR STEAM, STEAM CONDENSATE, CHILLED WATER, CONDENSER WATER, HOT WATER AND COLD WATER PIPING SHALL BE AS FOLLOWS:

1. REFRIGERANT PIPING DIAMETERS OF 4.0" AND LESS SHALL INSULATION WITH A THICKNESS OF 1.0" AND A CONDUCTIVITY OF 0.27 AT 75 °F.
2. ALL HOT WATER PIPING SHALL BE PROVIDED WITH INSULATION 1.5" THICK.

H. INSULATION ON BELOW-GROUND (NOT BURIED) STEAM AND CONDENSATE PIPING OF PRESSURES GREATER THAN 10 PSIG SHALL BE 11 LB./CU. FT. DENSITY, MOLDED HYDROUS CALCIUM SILICATE FASTENED WITH 16 GAUGE ANNEALED WIRE ON 18" CENTERS. EXPOSED COVERING SHALL BE FINISHED WITH 8 OZ. CANVAS JACKET.

I. INSULATION FOR PREFABRICATED PIPING SPECIFIED IN PREINSULATED PIPING PARAGRAPH SHALL BE CELLULAR GLASS OF 1-1/2" THICKNESS FOR 6" CHILLED WATER AND 2-1/2" HOT WATER, AND 1" THICKNESS FOR 2-1/2" CHILLED WATER, FOAMGLAS BY PITTSBURGH CORNING OR APPROVED EQUAL, WITH MAXIMUM K-FACTOR OF 0.35. INSULATION SHALL MEET APPLICABLE REQUIREMENTS OF THIS PARAGRAPH.

J. PROVIDE LONGITUDINAL LAP AND 6" WIDE VAPOR BARRIER JOINT SEAL STRIPS SECURED WITH APPROVED ADHESIVE.

K. SEAL ENDS OF PIPE INSULATION AND SEAL INSULATION TO PIPE WITH APPROVED FIRE RETARDANT VAPOR BARRIER, AT FLANGES, VALVES AND FITTINGS AND AT INTERVALS OF NO MORE THAN 21 FEET ON CONTINUOUS RUNS OF PIPING.

L. SECURE COVERS ON CONCEALED PIPE WITH METAL BANDS AT LEAST 3/4" WIDE AND NO MORE THAN 18" APART, SPACED TO HOLD ENDS AND CENTERS OF EACH SECTION.

M. INSULATION ON OUTDOOR CONDENSER WATER PIPING, COOLING TOWER DRAIN, AND MAKEUP PIPING SHALL BE 2" FIBERGLASS. INSULATION ON OTHER OUTDOOR PIPING SHALL BE TWICE THE THICKNESS LISTED IN TABLE A ABOVE, BUT NOT MORE THAN 4". WATERPROOF WITH 0.016" THICK ALUMINUM JACKET WITH 2" TRANSVERSE AND LONGITUDINAL LAPPED SEAMS ORIENTED TO SHED WATER. FILL SEAMS WITH WEATHERPROOF ADHESIVE. SECURE JACKET WITH 1" WIDE ALUMINUM DRAW-BANDS ON 12" CENTERS.

N. INSULATION ON FITTINGS, VALVES, AND FLANGES

1. FITTINGS, VALVES AND FLANGES SHALL BE INSULATED WITH PRE-CUT, FACTORY-SUPPLIED FIBROUS GLASS, BY CERTAIN-TEED, KNAUF, OWENS CORNING OR MANVILLE.
2. FITTINGS, VALVES AND FLANGES SHALL BE INSULATED WITH SAME MATERIAL AND TO SAME THICKNESS AS ADJOINING PIPE INSULATION.
3. PIPE FITTINGS SHALL BE PRE-TESTED, CLEAN AND DRY BEFORE INSULATION.
4. INSTALLATION OF INSULATION ON FITTINGS SHALL BE AS FOLLOWS, IN ORDER:
   a. WRAP INSULATION AROUND FITTING AND TUCK ENDS INTO FITTING THROAT.
   b. EDGES OF ADJACENT INSULATION SHALL BE TUFTED AND TUCKED IN, TO FULLY INSULATE FITTING TO THICKNESS OF ADJACENT PIPE INSULATION. USE TWO OR MORE THICKNESS IS NECESSARY.
   c. IF TWO LAYERS OF INSULATION ARE USED ON FITTINGS, WRAP AND SECURE FIRST LAYER WITH TWINE BEFORE APPLYING SECOND LAYER.
   d. TOP LAYER OF INSULATION SHALL BE COVERED WITH ONE PIECE, PVC, MOLDED JACKET COVER. SECURE COVER WITH STAINLESS STEEL TACK FASTENERS INSERTED INTO JACKET THROAT OVERLAP SEAM.
   e. TAPE JOINTS WITH PRESSURE-SENSITIVE VAPOR BARRIER TAPE; TAPE SHALL EXTEND 2" ON EITHER SIDE OF JOINT.
5. PRIOR TO TAPING OF JOINTS ON CHILLED WATER AND CONDENSER WATER LINES, APPLY VAPOR BARRIER MASTIC (BRUSHED ON) TO FITTING COVER, THROAT OVERLAP AND EDGES. ALSO APPLY VAPOR BARRIER MASTIC TO PIPE INSULATION JACKET ENDS.

O. INSULATION FOR FITTINGS, VALVES AND FLANGES SHALL BE MITERED PIPE INSULATION OR MOLDED FITTINGS AS FOLLOWS:

1. CONCEALED PIPING: MOLDED FITTINGS MADE SMOOTH WITH INSULATING CEMENT. 8 OZ. CANVAS JACKET SATURATED WITH APPROVED LAGGING ADHESIVE.
2. EXPOSED PIPING: 1/4" COAT OF INSULATING CEMENT OVER INSULATION, TROWELLED SMOOTH. 8 OZ. CANVAS JACKET SATURATED WITH APPROVED LAGGING ADHESIVE.
3. UNDERGROUND/OUTDOORS: WEATHERPROOF, WITH TWO 1/8" WET COATS OF BREATHER TYPE MASTIC, REINFORCED WITH GLASS FABRIC EXTENDING 2" ONTO EITHER SIDE OF ADJACENT INSULATION.

P. REFRIGERATION LINE INSULATION

1. SUCTION LINES AND OUTDOOR LIQUID LINES SHALL BE INSULATED WITH 3/4" THICK RIGID CLOSED CELL FOAM INSULATION, ARMSTRONG RIGID ARMAFLEX, MANVILLE, OWENS CORNING OR HALSTEAD/NOMACO (INSULTUBE), EXCEPT IN COMPUTER ROOM PLENA.
2. INSTALLATION SHALL MEET MANUFACTURER'S RECOMMENDATIONS. SEAL BUTT JOINTS WITH INSULATION MANUFACTURERS APPROVED ADHESIVE.
3. OUTSIDE ABOVE GROUND INSULATION SHALL BE PROTECTED WITH TWO COATS OF APPROVED VINYL LACQUER COATING OVER WOVEN GLASS MESH ADHERED TO INSULATION WITH INSULCOLOR OR APPROVED EQUAL LAGGING ADHESIVE, AS RECOMMENDED BY MANUFACTURER.
4. REFRIGERANT PIPING IN HUNG CEILING AND UNDERFLOOR SUPPLY AND RETURN PLENA SHALL BE INSULATED WITH 1" THICK FIBROUS GLASS INSULATION THAT MEETS APPLICABLE REQUIREMENTS OF THIS PARAGRAPH.

2.3 PIPE HANGERS AND SUPPORTS

A. PROVIDE PIPE STANDS, SUPPORTS, HANGERS AND OTHER SUPPORTING APPLIANCES AS NECESSARY TO SUPPORT WORK REQUIRED BY CONTRACT DOCUMENTS.

B. SECURE VERTICAL PIPING TO BUILDING CONSTRUCTION TO PREVENT SAGGING OR SWINGING.

C. SPACE HANGERS FOR HORIZONTAL PIPING AS FOLLOWS:

1. UP TO 1-1/4": PROVIDE 3/8" DIAMETER ROD, SPACED AT 8'-0" ON CENTER (MAXIMUM SPACING).

D. HORIZONTAL COPPER TUBING SHALL HAVE MAXIMUM HANGER SPACING OF 6' FOR TUBING 1-1/4" DIA. AND SMALLER AND 10' FOR TUBING 1-1/2" AND LARGER. MAXIMUM SPACING FOR PVC PIPE HANGERS SHALL BE 4'.

E. REDUCE SPACING TO A MAXIMUM OF 10' - 0" APART, REGARDLESS OF PIPE SIZE, AS NECESSARY FOR FITTINGS, VALVES AND OTHER CONCENTRATED LOADS.

F. SUPPORT PIPING 3" DIA. AND LARGER FROM STRUCTURE WITH PIPE ROLL HANGERS WITH ADJUSTABLE STEEL ROD HANGERS, SIZED TO ACCOMMODATE INSULATION.

G. SUPPORT PIPING 2-1/2" DIA. AND UNDER FROM STRUCTURE WITH CARPENTER AND PATTERSON FIG. 100 CLEVIS HANGERS OR APPROVED EQUAL, WITH ONE ½" ADJUSTABLE STEEL ROD; OR, FROM SIDE WALL BY EXPANSION SHIELDS, ANGLE IRON BRACKETS AND RODS.

H. HANGERS SHALL BE BY CARPENTER & PATTERSON, F & S, OR GRINNELL CO. FIGURE NUMBERS OF CARPENTER AND PATTERSON ARE SPECIFIED TO ESTABLISH STANDARDS OF QUALITY FOR PERFORMANCE AND MATERIALS.

I. PROVIDE SPRING HANGERS WITH TRAVEL STOPS AS SPECIFIED IN VIBRATION ISOLATION PARAGRAPH WHERE NECESSARY AND WHERE SHOWN ON DRAWINGS.

J. PIPE SUPPORTS FOR INSULATED HIGH-TEMPERATURE PIPING SHALL HAVE WELDED INSERTS OF EQUAL THICKNESS TO INSULATION TO PREVENT COMPRESSION OF INSULATION. OTHER INSULATED PIPE SHALL HAVE 10" SHIELDS AT HANGERS, COMPOSED OF 180 DEGREE COVERAGE OF GALVANIZED SHEET METAL AND HIGH DENSITY, PRE-FORMED, RIGID INSULATION. WHERE ROLLERS ARE REQUIRED, SHIELD SHALL BE STEEL PIPE.

K. HANGERS FOR HORIZONTAL LINES SHALL BE VERTICALLY ADJUSTABLE TO OBTAIN PITCH REQUIREMENTS OF PIPING PARAGRAPH.

2.4 SLEEVES AND PENETRATIONS

A. PIPE SLEEVES

1. SLEEVES THROUGH FLOORS AND THROUGH EXTERIOR, STRUCTURAL AND FIRE-RATED CONSTRUCTION SHALL BE HOT-DIPPED GALVANIZED SCHEDULE 40 STEEL PIPE.
2. SLEEVES THROUGH PARTITIONS AND NON-FIRE-RATED CONSTRUCTION SHALL BE 26 GAUGE GALVANIZED STEEL WITH LOCK LONGITUDINAL SEAMS, OR APPROVED PLASTIC PIPE.
3. PROVIDE WATERPROOFING MEMBRANE LOCKING DEVICES AT FLOORS. PROVIDE 150 LB. SLIP-ON WELDING FLANGES AT EXTERIOR WALL PENETRATIONS.

B. DUCT SLEEVES AND OPENINGS

1. SLEEVES THROUGH FLOORS, THROUGH EXTERIOR STRUCTURE, THROUGH FIRE-RATED CONSTRUCTION AND THROUGH SMOKE PARTITIONS THAT REQUIRE SMOKE DAMPERS SHALL BE SCHEDULE 40 GALVANIZED STEEL PIPE FOR ROUND DUCT AND SHALL MEET SMACNA FIRE DAMPER AND HEAT STOP GUIDE FOR RECTANGULAR AND FLAT OVAL DUCTS. FIREPROOF PACKING SHALL BE APPLIED TO SEAL ANY OPENINGS BETWEEN SLEEVE AND WALL. MATERIALS SHALL MAINTAIN THE FIRE RATING OF THE WALL, AND SHALL BE INSTALLED IN ACCORDANCE WITH THE SMACNA FIRE DAMPER AND HEAT STOP GUIDE.
2. OPENINGS IN WALLS, PARTITIONS AND OTHER FIRE-RATED CONSTRUCTION THAT DO NOT REQUIRE SMOKE DAMPERS SHALL MEET NFPA 90A, SECTION 3-3.8.
3. MATERIALS FOR PREPARED OPENINGS IN PARTITIONS SHALL MATCH CONSTRUCTION PENETRATED.

C. PIPE SLEEVE PACKING

1. PACKING BETWEEN THE PIPE AND THE SLEEVE (OR WALL OR SLAB OPENING) IN FIRE RATED WALLS OR SLABS SHALL BE A COMBINATION OF FIREPROOF INSULATION AND FIREPROOF CAULK. THE COMBINATION OF MATERIALS SHALL HAVE THE SAME FIRE RATING, IN HOURS, AS THE WALL OR SLAB, AS TESTED IN ACCORDANCE WITH THE LATEST EDITION OF ASTME-119. THE COMBINATION OF MATERIALS SHALL BE CLASSIFIED BY UL, (FILL, VOID OR CAVITY MATERIALS) FOR THE FIRE RATING REQUIRED AND SHALL BE LISTED AS A NUMBERED SYSTEM IN THE UL BUILDING MATERIALS DIRECTORY. FIBERGLASS SHALL NOT BE USED AS THE INSULATION MATERIAL.
2. ACCEPTABLE FIREPROOF INSULATION MATERIALS SHALL BE KAOLIN (KAOWOOL BY BABCOCK AND WILCOX); CERAMIC FIBER BLANKET (FIBERFRAX BY STANDARD OIL) OR FIRE RATED MINERAL WOOL (THERMAFIBER BY USG). ACCEPTABLE FIREPROOF CAULKS SHALL BE SILICONE (FIRESTOP

2.8 SHEET METAL DUCTWORK

A. REFERENCE STANDARDS

1. MATERIAL, CONSTRUCTION AND INSTALLATION SHALL MEET REQUIREMENTS OF MOST RECENT EDITIONS OF THE FOLLOWING STANDARDS AND REFERENCES, EXCEPT FOR MORE STRINGENT REQUIREMENTS SPECIFIED OR SHOWN ON DRAWINGS.
2. SMACNA HVAC DUCT CONSTRUCTION STANDARDS (METAL AND FLEXIBLE) SHALL BE APPLICABLE TO SHEET METAL DUCTWORK, DUCT LINERS, ADHESIVES, FASTENERS, AND FLEXIBLE DUCTWORK
3. SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL SHALL BE APPLICABLE TO DUCT LEAKAGE TESTING.
4. NFPA 90 SHALL BE APPLICABLE TO FIRE DAMPERS AND FIRE RESISTANCE STANDARDS FOR DUCTS AND LINERS.
5. SMACNA GUIDELINES FOR WELDING SHEET METAL SHALL BE APPLICABLE TO WELDED GALVANIZED DUCT, BLACK IRON DUCT, AND STAINLESS STEEL DUCT.

B. GENERAL

1. PROVIDE SUPPORTING AND HANGING DEVICES NECESSARY TO ATTACH ENTIRE HVAC SYSTEM INCLUDING DUCTWORK AND EQUIPMENT, AND TO PREVENT VIBRATION.
2. PROVIDE VERTICAL AND HORIZONTAL SUPPORTS AS REQUIRED BY CODES TO MEET MINIMUM APPLICABLE EARTHQUAKE RESISTANCE STANDARDS.
3. DUCTWORK SHALL BE FREE FROM VIBRATION UNDER ALL CONDITIONS OF OPERATION.
4. DIMENSIONS SHOWN ON DRAWINGS FOR LINED DUCTWORK ARE NET INSIDE DIMENSIONS. INCREASE DUCTWORK TO ACCOMMODATE LINING REQUIREMENTS.
5. PIPE OR CONDUIT CROSSING DUCT
   a. NO PIPE, CONDUIT, HANGER, ARCHITECTURAL ELEMENT NOR STRUCTURAL MEMBER SHALL PASS THROUGH DUCT WITHOUT ARCHITECT'S WRITTEN APPROVAL.
   b. WHERE IT IS IMPOSSIBLE TO RE_ROUTE PIPE OR CONDUIT AND WHEN WRITTEN APPROVAL HAS BEEN OBTAINED, INCREASE DUCT SIZE TO MAINTAIN CONSTANT CROSS-SECTIONAL AREA AT POINT OF INTERFERENCE. PROVIDE STREAMLINED ENCLOSURE FOR PIPE OR CONDUIT, AS ILLUSTRATED IN SMACNA.
6. WHEN MAKING OFFSETS AND TRANSFORMATIONS NECESSARY TO ACCOMMODATE STRUCTURAL CONDITIONS, PRESERVE FULL CROSS_SECTIONAL AREA OF DUCTWORK SHOWN ON DRAWINGS.
7. DUCTWORK CONSTRUCTION
   a. ALL DUCTWORK SYSTEMS SHALL BE CONSTRUCTED AND SEALED IN ACCORDANCE WITH SMACNA STANDARDS FOR THE SPECIFIED PRESSURE-VELOCITY CLASSIFICATIONS.
   b. DUCTWORK SYSTEMS SHALL HAVE PRESSURE-VELOCITY CLASSIFICATIONS AS FOLLOWS:

DUCT SYSTEM	MATERIAL	SMACNA PRESSURE CLASS	PRESS	SMACNA SEAL CLASS	VELOCITY (FPM)	METHOD OF CONSTRUCTIO N
SUPPLY DUCTWORK FOR LOW PRESSURE SYSTEMS AND DOWNSTREAM OF VAV TERMINAL	GALVANIZE D STEEL	2"	POS	B	<2500	
RETURN DUCTWORK FOR LOW PRESSURE SYSTEMS	GALVANIZE D STEEL	2"	NEG	B	<2500	
GENERAL, LOW PRESSURE EXHAUST DUCTWORK	GALVANIZE D STEEL	2"		B	<2500	
TOILET EXHAUST DUCTWORK	GALVANIZE D STEEL	2"		B	<2500	
DRYER EXHAUST DUCTWORK	ALUMINUM	2"		B	<2500	
COMMERCIAL KITCHEN EXHAUST	BLACK IRON	6"	NEG	A	>2000	WELDED

*FOR NEGATIVE PRESSURES OVER 3" W.G., REFER TO SMACNA ROUND AND RECTANGULAR INDUSTRIAL DUCT CONSTRUCTION STANDARDS FOR JOINT AND INTERMEDIATE REINFORCEMENT REQUIREMENTS.

8. DUCTS REQUIRED TO BE CONTINUOUSLY WELDED AND WITH ALL PENETRATIONS SEALED (DAMPER RODS, ACCESS DOORS, ETC.) SHALL BE LIQUID-TIGHT AND SHALL BE AIRTIGHT. THE LEAKAGE TEST SHALL YIELD A ZERO LEAK RATE ALL WELDING SHALL USE INERT GAS SHIELDING WITH FILLER ROD EQUAL TO OR EXCEEDING THE BASE METAL PROPERTIES.
9. SUPPORT
   a. SPACE HANGERS AS REQUIRED BY SMACNA (8 FT MAX) FOR HORIZONTAL DUCT ON 8 FT. CENTERS, UNLESS CONCENTRATED LOADINGS REQUIRE CLOSER SPACING.
   b. SUPPORT VERTICAL DUCT ON EACH FLOOR OR SLAB IT PENETRATES.
   c. SUPPORTS FOR DUCTWORK AND EQUIPMENT SHALL BE GALVANIZED UNLESS SPECIFIED OTHERWISE.
10. CONNECTIONS
   a. CONNECT INLETS AND OUTLETS OF HEAT RECOVERY UNITS AND FANS TO DUCTWORK WITH FLEXIBLE CONNECTIONS UNLESS FAN HAS VIBRATION ISOLATOR MOUNTS INSIDE UNIT WITH FLEXIBLE CONNECTIONS.
   b. INDOORS, FLEXIBLE CONNECTIONS SHALL BE NEOPRENE_COATED FIBROUS GLASS FIRE RETARDANT FABRIC, BY VENTFABRICS, OR DURODYNE. OUTDOORS, FLEXIBLE CONNECTIONS SHALL BE DUPONT HYPALON_COATED FIBROUS GLASS FIRE _ WEATHER _ AND UV_ RESISTANT BY VENTFABRICS OR DURODYNE.
   c. SECURE FLEXIBLE CONNECTIONS TIGHTLY TO AIR HANDLERS WITH METAL BANDS. BANDS SHALL BE SAME MATERIAL AS DUCT CONSTRUCTION.
   d. CONNECTIONS FROM TRUNK TO BRANCH DUCTS SHALL BE AS DETAILED ON DRAWINGS.
11. CONSTRUCTION
   a. NO SHARP METAL EDGES SHALL EXTEND INTO AIR STREAMS.
   b. INSTALL DRIVE SLIPS ON AIR_LEAVING SIDE OF DUCT WITH SHEET METAL SCREWS ON 6" CENTERS.
   c. SPIN IN COLLARS SHALL NOT BE USED.
12. JOINTS
   a. LONGITUDINAL LOCK SEAMS SHALL BE DOUBLE_LOCKED AND FLATTENED TO MAKE TIGHT JOINTS.
   b. MAKE TRANSVERSE JOINTS, FIELD CONNECTIONS, COLLAR ATTACHMENTS AND FLEXIBLE CONNECTIONS TO DUCTS AND EQUIPMENT WITH SHEET METAL SCREWS OR BOLTS AND NUTS. DO NOT USE RIVETS AND STAPLES.
13. PREFABRICATED TRANSVERSE DUCT JOINTS
   a. TRANSVERSE JOINTS IN GALVANIZED SHEET METAL DUCTWORK MAY BE MADE WITH GALVANIZED GASKETED FRAME AND ANGLE DUCT JOINT SYSTEM BY DUCTMATE, TDF, TDC, OR APPROVED EQUAL. ANGLES SHALL BE AT LEAST 20 GAUGE. PREFABRICATED TRANSVERSE DUCT JOINTS SHALL NOT BE USED FOR DUCT 16 GA. AND HEAVIER, NOR FOR DUCT 23 GA. OR LIGHTER.
   b. SECURE ANGLES TO DUCT WITH SCREWS (USING CLUTCHED ARBOR) OR SPOT_WELDS SPACED AS RECOMMENDED BY MANUFACTURER FOR DUCT PRESSURE CLASS.
14. ELBOWS AND BENDS
   a. ELBOWS AND BENDS FOR RECTANGULAR DUCTS SHALL HAVE CENTERLINE RADIUS OF 1.5 TIMES DUCT WIDTH WHEREVER POSSIBLE. ELBOWS FOR GREASE EXHAUST SHALL BE FULL RADIUS. TURNING VANES AND MITERED ELBOWS ARE NOT ALLOWED IN GREASE DUCTS.
   b. WHERE CENTERLINE RADIUS IS LESS THAN 1.5 TIMES DUCT WIDTH (ON SUPPLY, RETURN AND EXHAUST DUCTWORK), ELBOWS SHALL BE RADIUS THROAT WITH RADIUS HEEL AND FULL LENGTH SPLITTER VANES WHEN REQUIRED. WHEN CENTERLINE RADIUS (R) DIVIDED BY THE DUCT WIDTH (W) IS LESS THAN 1.5, PROVIDE THE FOLLOWING NUMBER OF SPLITTER VANES: R/W BETWEEN 1.49 AND 0.7 = 1; R/W BETWEEN 0.69 AND 0.6 = 2; R/W BETWEEN 0.59 AND 0.55 = 3. MINIMUM INSIDE RADIUS (NOT CENTERLINE) SHALL BE 2". INSTALL VANES IN ACCORDANCE WITH SMACNA.
   c. FOR ROUND DUCTWORK PROVIDE STAMPED ELBOWS, WITH CENTERLINE RADII EQUAL TO 1-1/2 TIMES DUCT DIAMETER. PROVIDE GORED ELBOWS AS FOLLOWS:
      1) 0 - 36 ELBOW ANGLE, 2 GORES.
      2) 37 - 72 ELBOW ANGLE, 3 GORES.
      3) 73 - 90 ELBOW ANGLE, 5 GORES.
15. ACCESS PANELS/DOORS
   a. PROVIDE PROPER PRESSURE AND LEAKAGE RATED, GASKETED, DUCT MOUNTED ACCESS PANELS/DOORS. IN INSULATED DUCTS, ACCESS DOORS SHALL BE INSULATED DOUBLE WALL. GAUGES OF DOOR MATERIALS, NO. OF HINGES, NO. AND TYPE OF DOOR LOCKS SHALL BE AS REQUIRED BY THE SMACNA DUCT CONSTRUCTION STANDARDS. UNHINGED DOORS SHALL BE CHAINED TO FRAME WITH A MINIMUM LENGTH OF 6" TO PREVENT LOSS OF DOOR. DOOR METAL SHALL BE THE SAME AS THE ATTACHED DUCT MATERIAL. THE MINIMUM SIZES ARE:
      1) FIRE DAMPERS _ 12" X 12", OR LARGER.
      2) AUTOMATIC CONTROL DAMPERS _ 6" X 6" MINIMUM.
      3) MANUAL VOLUME DAMPERS 2 SF AND LARGER _ 6" X 6" MINIMUM.
      4) AT ADDITIONAL LOCATIONS INDICATED ON DRAWINGS, OR SPECIFIED ELSEWHERE _ 12" X 12" MINIMUM.
      5) FLOW MEASURING STATIONS - 12" X 12" OR LARGER.
      6) PROVIDE, AS AN ALTERNATE, ACCESS DOOR FOR ALL SUPPLY AIR DUCTWORK UPSTREAM AND DOWNSTREAM OF EACH ELBOW AND TEE AND AT INTERVALS OF APPROXIMATELY 40 FT. TO ALLOW MAXIMUM REACH OF 20 FT. IN STRAIGHT HORIZONTAL RUNS FOR CLEANING - 24" X 24" UNLESS DUCT SIZE IS SMALLER IN WHICH CASE LARGEST SIZE POSSIBLE SHALL BE USED (MIN. 6" X 6").
   b. ACCESS DOORS ARE NOT SHOWN ON THE DRAWINGS, BUT SHALL BE PROVIDED IN ACCORDANCE WITH THE ABOVE.
16. EXTRACTORS SHALL HAVE ADJUSTING ROD AND LOCKNUT ON OUTSIDE OF DUCT.
17. CONNECTIONS TO ROOF FANS:
   a. SHALL BE AT LEAST 22 GA. GALVANIZED STEEL SOLDERED WATERTIGHT.
   b. SOLDER SIDE SEAMS AT LEAST 12" UP FROM BOTTOM.
   c. PROVIDE SUITABLE DIELECTRIC GASKETS TO JOIN DISSIMILAR MATERIALS.
18. PLENUMS AND CONNECTIONS TO LOUVERS:
   a. SHALL BE 18 GA. MINIMUM CROSS_BROKEN AND PROPERLY REINFORCED WITH GALVANIZED ANGLE IRONS TO SMACNA REQUIREMENTS.
   b. SHALL HAVE BOTTOM AND CORNER SEAMS SOLDERED WATERTIGHT AT LEAST 12" UP FROM BOTTOM.
   c. SHALL HAVE NEOPRENE GASKETS OR OTHER NON_CORROSIBLE MATERIAL TO MAKE CONNECTIONS TO LOUVERS WATERTIGHT.
   d. SHALL PITCH CONNECTION BACK TOWARDS THE LOUVER. PROVIDE HALF_COUPLING DRAIN CONNECTION AT BOTTOM OF PLENUM UNLESS NOTED OTHERWISE. PIPE DRAIN TO NEAREST FLOOR DRAIN.
   e. SHALL HAVE UNUSED PORTIONS OF LOUVERS BLOCKED-OFF WITH SHEET METAL; SEALED AIR_ AND WATER_TIGHT; INSULATED WITH 2" THICK 6_LB. DENSITY RIGID OR BOARD INSULATION.
19. FLEXIBLE DUCTWORK
   a. FLEXIBLE DUCTWORK, CONNECTING TO UNINSULATED OR UNLINED DUCT, SHALL BE VINYL COATED FIBERGLASS CLOTH 0.0057" MINIMUM THICKNESS, 25 STRANDS PER INCH MINIMUM THREAD COUNT WITH CORROSION RESISTANT HELICAL WIRE REINFORCEMENT. FLEX DUCT SHALL BE U.L. RATED FOR 12" W.C. POSITIVE PRESSURE, 2" W.C. NEGATIVE PRESSURE WITH A MAXIMUM VELOCITY OF 4000 FPM. FLEXIBLE DUCT SHALL BE LISTED AS A CLASS 1 CONNECTOR ACCORDING TO UL 181 AND SHALL MEET THE REQUIREMENTS OF NFPA 90A _ MAXIMUM ASTM E_84 FIRE HAZARD RATING SHALL BE 25 FLAME SPREAD, 50 FUEL CONTRIBUTED AND 50 SMOKE DEVELOPED . UNINSULATED FLEXIBLE DUCT SHALL BE EQUIVALENT TO FLEXMASTER TYPE 4.
   b. FLEXIBLE DUCT CONNECTED TO INSULATED OR LINED DUCT SHALL BE INSULATED WITH 1, 1/2", 1/2 LB. DENSITY FIBERGLASS INSULATION AND FLAME RETARDANT (UL LISTED) VAPOR BARRIER, MEETING ASTM E-84 RATING.
   c. SUBMITTAL SHALL INCLUDE DATA ON CORE, IN ADDITION TO OTHER DATA LISTED ABOVE REQUIRED TO ENSURE THAT SUBMITTED PRODUCT MEETS THE REQUIREMENTS OF THESE SPECIFICATIONS.
   d. IF FLEXDUCT OTHER THAN THE MODELS LISTED ABOVE IS SUBMITTED, A SAMPLE OF THE FLEX SHALL BE SUBMITTED TO THE ARCHITECT. THE ARCHITECT SHALL HAVE SOLE DISCRETION IN DETERMINING WHETHER THE SUBMITTED FLEX IS EQUIVALENT TO THAT OF THE NAMED ABOVE.
   e. FLEXIBLE DUCT SHALL BE AIRTIGHT, TRIPLE LOCK MECHANICALLY SPIRAL FORMED WITH SPIRAL CORRUGATION. MATERIAL SHALL BE 3003 ZERO TEMPER ALUMINUM, .0065" MINIMUM THICKNESS.
   f. PROVIDE SEALING COMPOUND AND METAL DRAW BANDS FOR INSTALLATION. SEE FURTHER PARAGRAPHS IN THIS SPECIFICATION, AND DETAILS FOR OTHER INSTALLATION REQUIREMENTS.

C. FLEXIBLE DUCT

1. PROVIDE SUPPORTS AT MANUFACTURER'S RECOMMENDED INTERVALS. SAG SHALL NOT EXCEED ½" PER FOOT OF SPACING BETWEEN SUPPORTS. DUCTS SHALL NOT EXCEED 4 FEET LONG AND SHALL BE USED FOR STRAIGHT RUN ONLY, NO OFFSETS OR TURNS.
2. HANGER AND SADDLE IN CONTACT WITH FLEXIBLE DUCT SHALL BE WIDE ENOUGH TO PREVENT RESTRICTION OF INTERNAL DUCT DIAMETER WHEN WEIGHT OF SUPPORTED SECTION RESTS ON HANGER OR SADDLE MATERIAL.
3. FACTORY INSTALLED SUSPENSION SYSTEMS INTEGRAL TO FLEXIBLE DUCT ARE ACCEPTABLE AS ALTERNATIVE HANGING METHOD WHEN MANUFACTURER'S RECOMMENDED PROCEDURES ARE FOLLOWED.
4. COLLARS TO WHICH FLEXIBLE DUCTS ARE ATTACHED SHALL BE AT LEAST 2" LONG. SLEEVES FOR JOINING SECTIONS OF FLEXIBLE DUCT SHALL BE AT LEAST 4" LONG.
5. APPLY SEALING COMPOUND TO METALLIC SURFACE AT CONNECTION OF FLEXIBLE DUCT WITH SHEET METAL DUCTS, COLLARS AND MIXING BOXES. SLIP FLEXIBLE DUCTWORK OVER SEALING COMPOUND. COMPLETE SEAL WITH ½" WIDE, COMMERCIALLY MADE METAL DRAW BANDS.

D. COMBINATION FIRE/SMOKE DAMPERS

1. COMBINATION FIRE/SMOKE DAMPERS SHALL BE PROVIDED AND INSTALLED WHERE INDICATED ON DRAWINGS AND WHERE REQUIRED BY CODE AND LOCAL AUTHORITIES. REFER TO ARCHITECTS CONSTRUCTION DOCUMENTS TO IDENTIFY FIRE RATED WALLS AND SMOKE BARRIERS.
2. THE COMBINATION FIRE/SMOKE DAMPER (FSD) SHALL BE EQUAL TO OR BETTER THAN A RUSKIN MODEL FSD60 WITH ELECTRONICALLY CONTROLLED CLOSURE AND A TS150 FIRESTAT.
3. SEQUENCE OF OPERATION
   a. SMOKE CONDITION OPERATION - WHEN SMOKE IS DETECTED (VIA A SMOKE DETECTOR), DURING TESTING OR IF POWER FAILURE OCCURS, THE DAMPER WILL CLOSE AND REMAIN CLOSED. WHEN THE SMOKE SIGNAL CEASES (SMOKE DETECTOR RESET), THE TEST IS COMPLETED OR POWER IS RESTORED, THE DAMPER WILL AUTOMATICALLY RESET TO THE OPEN POSITION. THE DAMPER AUTOMATICALLY RESETS IF NUISANCE ALARMS OCCUR AND THE SYSTEM IS RESET.
   b. FIRE CONDITION OPERATION - WHEN TEMPERATURES IN EXCESS OF 165°F / 74°C ARE DETECTED, THE DAMPER WILL CLOSE AND LOCK, AT NO TIME SHALL THE DAMPER BE DISENGAGED FROM THE ACTUATOR. UPON CESSATION OF THE FIRE CONDITIONS, THE DAMPER CAN BE REOPENED BY PRESSING THE RESET BUTTON LOCATED ON THE DAMPER ASSEMBLY.

E. FIRE DAMPERS

1. FIRE DAMPERS SHALL BE INSTALLED IN THE DUCTWORK WHERE INDICATED ON THE DRAWINGS AND REQUIRED BY THE CODE AND LOCAL AUTHORITIES. SEE ARCHITECT'S CONSTRUCTION DOCUMENTS TO IDENTIFY FIRE-RATED WALLS AND FLOORS.
2. FIRE DAMPERS SHALL BE CONSTRUCTED AND INSTALLED WITH VISIBLE FUSIBLE LINKS IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS AND THE UNDERWRITERS'.
3. INSPECTION AUTHORITIES HAVING JURISDICTION IN THE LOCALITY. FIRE DAMPERS SHALL BE BUCKLEY MODEL 150A OR 150B (VERTICAL OR HORIZONTAL) AS MANUFACTURED BY BUCKLEY ASSOCIATES (781-878-5000) SHEET METAL WORKERS LOCAL 17 OR APPROVED EQUAL.
4. DAMPERS SHALL MEET NATIONAL FIRE PROTECTION ASSOCIATION REQUIREMENTS AS OUTLINED IN THE CURRENT N.F.P.A. BULLETIN 90-A. DAMPERS SHALL BEAR THE UNDERWRITERS' LABEL. DAMPERS SHALL BE INSTALLED WITH METAL SLEEVES AND FRAMING ANGLES. ALL DAMPERS SHALL BE INSTALLED IN ACCORDANCE WITH THE MEANS BY WHICH THEY WERE U.L. TESTED.
5. FREE AREA MUST EQUAL OR EXCEED THAT OF THE SPECIFIED PRODUCT.
6. IF ADDITIONAL WALL OR/AND CEILING/FLOOR FRAMING FOR DAMPER INSTALLATION IS REQUIRED COORDINATE FRAMING INSTALLATION WITH GC.
7. HVAC CONTRACTOR SHALL COORDINATE FIRE DAMPER ACCESS PANEL LOCATIONS WITH GENERAL CONTRACTOR.

F. VOLUME DAMPERS

1. NOTE: VOLUME DAMPERS ARE NOT SHOWN ON DRAWINGS, BUT DAMPERS SHALL BE PROVIDED AS NECESSARY FOR SYSTEM BALANCING AND AS REQUIRED BY THIS SPECIFICATION.
2. PROVIDE MANUAL ADJUSTABLE VOLUME DAMPERS, WITH EXTENDED MOUNT INDICATING AND LOCKING QUADRANTS:
   a. ON EACH SUPPLY, RETURN AND EXHAUST DUCT TAKE_OFF.
   b. AT EACH TAKE-OFF TO REGISTER, GRILLE OR DIFFUSER (THESE ARE NOT SHOWN ON THE DRAWINGS). VOLUME DAMPER SHALL BE AS FAR AWAY FROM DIFFUSER OR GRILLE AS POSSIBLE FOR SYSTEM BALANCING.
3. DAMPERS SHALL BE ½" SMALLER IN BOTH DIMENSIONS OR 1" SMALLER DIAMETER THAN SIZE OF DUCT IN WHICH THEY ARE INSTALLED; E.G., USE 23_½" BY 23_½" DAMPER FOR 24" SQUARE DUCT.
4. DAMPERS LARGER THAN 12" IN HEIGHT SHALL BE OPPOSED MULTI_BLADE.
5. DAMPER BLADES SHALL BE TWO GAUGES HEAVIER THAN ADJOINING DUCTWORK, AND SHALL BE RIVETED TO SUPPORTING RODS. HEM OVER EDGES PARALLEL TO RODS.
6. BRACKETS SHALL BE GALVANIZED METAL, SECURED TO DUCTWORK WITH SHEET METAL SCREW WITH LOCKING QUADRANT ARMS (SEE SEAL CLASS SECTION FOR ADDITIONAL REQUIREMENTS). PROVIDE 2" HANDLE EXTENSION FOR ALL DAMPERS ON EXTERNALLY INSULATED DUCTWORK.

G. GRAVITY BACKDRAFT DAMPERS

1. BACKDRAFT DAMPERS SHALL HAVE 12 GA. GALVANIZED STEEL CHANNEL FRAME WITH 14 GA. GALVANIZED PRESS FORMED STEEL SUB FRAME AND 16 GA. REINFORCED GALVANIZED STEEL BLADES WITH EDGE SEALS. DAMPERS SHALL BE DESIGNED FOR VELOCITIES UP TO 3,500 FPM.
2. COUNTER-BALANCE ARMS SHALL BE 2 X ¼ X 12" LG. HOT ROLLED STEEL BAR EXTERNAL TO DAMPER. COUNTER-WEIGHTS SHALL BE 2" DIA. HOT ROLLED STEEL BAR ATTACHED TO COUNTER-BALANCE ARMS. AXLES SHALL BE ½" DIA. CADMIUM PLATED STEEL CONTINUOUS RODS WITH ½" DIA. BALL BEARINGS. DAMPERS SHALL HAVE PLATED STEEL CENTER BRACKETS; BRASS PIVOTS; 5/16" PLATED STEEL LINKAGE ROD. PROVIDE LINKAGE ON PANELS 31" TO 48" WIDE. DAMPER SHALL HAVE ALL WELDED CONSTRUCTION.
3. DAMPERS SHALL BE AS MANUFACTURED BY VENT PRODUCTS (MODEL 3200) OR EQUIVALENT BY AMERICAN WARMING AND VENTILATING, AIR BALANCE OR RUSKIN.

H. MOTORIZED DAMPERS

1. CONTROL DAMPERS MEETING THE FOLLOWING SPECIFICATIONS SHALL BE FURNISHED AND INSTALLED WHERE SHOWN ON PLANS AND/OR AS DESCRIBED.
2. DAMPERS SHALL CONSIST OF: A 16-GAUGE GALVANIZED STEEL CHANNEL FRAME WITH 5 IN. DEPTH; AIRFOIL SHAPED, GALVANIZED STEEL DOUBLE SKIN CONSTRUCTION BLADES (14-GAUGE EQUIVALENT THICKNESS); BLADES SHALL BE COMPLETELY SYMMETRICAL RELATIVE TO THEIR AXLE PIVOT POINT, PRESENTING IDENTICAL RESISTANCE TO AIRFLOW IN EITHER DIRECTION OR PRESSURE ON EITHER SIDE OF THE DAMPER; 1/2 IN. DIAMETER PLATED STEEL AXLES RUNNING IN SYNTHETIC (ACETAL) SLEEVE BEARINGS; SILICONE BLADE SEALS; FLEXIBLE STAINLESS STEEL JAMB SEALS; AND LEAKAGE RATE EXTERNAL (OUT OF THE AIRSTREAM) BLADE-TO-BLADE LINKAGE.
3. DAMPER MANUFACTURER'S PRINTED APPLICATION AND PERFORMANCE DATA INCLUDING PRESSURE, VELOCITY AND TEMPERATURE LIMITATIONS SHALL BE SUBMITTED FOR APPROVAL SHOWING DAMPER SUITABLE FOR PRESSURES TO 8 IN. WATER GAGE, VELOCITIES TO 4000 FPM AND TEMPERATURES TO 250°F. TESTING AND RATINGS TO BE IN ACCORDANCE WITH AMCA STANDARD 500-D. BASIS OF DESIGN IS GREENHECK MODEL VCD-33.
4. DAMPER AIR LEAKAGE SHALL NOT BE GREATER THAN 3 CFM/SQ. FT. @ 1 IN. WATER GAGE.
5. TESTING AND RATINGS SHALL BE PER AMCA STANDARD 500-D.

I. DIFFUSERS, REGISTERS, AND GRILLES

1. PROVIDE STEEL DIFFUSERS, REGISTERS AND GRILLES FOR SUPPLY, RETURN AND EXHAUST OUTLETS, OF SIZE, TYPE AND DESIGN SHOWN ON DRAWINGS. ACCEPTABLE MANUFACTURERS SHALL BE TITUS, METALAIRE, NAILOR, OR APPROVED EQUAL.
2. EQUIPMENT SHALL BE TESTED AND RATED PER ASHRAE 91-70.
3. EQUIPMENT SHALL HANDLE AIR QUANTITIES AT OPERATING VELOCITIES:
   a. WITH MAXIMUM DIFFUSION WITHIN SPACE SUPPLIED OR EXHAUSTED.
   b. WITHOUT OBJECTIONABLE AIR MOVEMENT AS DETERMINED BY ARCHITECT.
   c. WITH SOUND PRESSURE LEVEL NOT TO EXCEED NC 30 OR AS SPECIFIED ON DRAWINGS.
4. SUPPLY, RETURN AND EXHAUST OUTLETS SHALL HAVE OPPOSED BLADE VOLUME DAMPERS OPERABLE FROM FRONT.
5. SUPPLY REGISTERS SHALL HAVE TWO SETS OF DIRECTIONAL CONTROL BLADES.
6. DIFFUSERS WITHIN SAME ROOM OR AREA SHALL BE OF SAME TYPE AND STYLE TO PROVIDE ARCHITECTURAL UNIFORMITY.
7. SURFACE MOUNT DIFFUSERS, REGISTERS AND GRILLES SHALL BE FURNISHED WITH GASKETS AND INSTALLED WITH FACES SET LEVEL AND PLUMB, TIGHTLY AGAINST MOUNTING SURFACE.
8. FINISH SHALL BE AS DIRECTED BY ARCHITECT.
9. COORDINATE DIFFUSERS, REGISTERS AND GRILLES WITH CEILING AND WALL CONSTRUCTION. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LENGTHS AND FOR FRAMING AND MITERING ARRANGEMENTS THAT MAY DIFFER FROM THOSE SHOWN ON HVAC DRAWINGS.

J. CEILING DIFFUSERS FOR MOUNTING IN FIRE-RATED FLOOR CEILING ASSEMBLIES

1. THE PRODUCTS SHALL BE CLASSIFIED BY UNDERWRITERS' LABORATORIES FOR USE IN FIRE-RATED FLOOR/CEILING AND OR ROOF/CEILING ASSEMBLIES WITH UP TO A 3 HOUR RATING.
2. THE DISCHARGE PATTERN SHALL BE 4-WAY HORIZONTAL AND SHALL BE ADJUSTED BY DROPPING THE PERFORATED FACE AND ROTATING THE PATTERN DEFLECTORS. REMOVABLE FACE SHALL HAVE SPRING CLIPS FOR EASY ACCESS TO THE DAMPER.
3. THE PERFORATED FACE SHALL HAVE 3/16" (5) DIAMETER HOLES ON 1/4" (6) STAGGERED CENTERS.
4. THE FINISH SHALL BE AW APPLIANCE WHITE.
5. EACH DIFFUSER SHALL BE PROVIDED WITH A VOLUME DAMPER ACCESSIBLE FOR DIFFUSER FACE FOR AIR VOLUME ADJUSTMENT.

K. AIRFLOW AND TEMPERATURE MEASUREMENT DEVICES

1. REFERENCES
   a. UL 873 - TEMPERATURE AND AIRFLOW INDICATING EQUIPMENT
2. SUBMITTALS
   a. SUBMIT PRODUCT DATA SHEETS FOR AIRFLOW MEASURING DEVICES INDICATING MINIMUM PLACEMENT REQUIREMENTS, SENSOR DENSITY, SENSOR DISTRIBUTION, AND INSTALLED ACCURACY TO THE HOST CONTROL SYSTEM.
      1) DEVICES WHOSE ACCURACY IS THE COMBINED ACCURACY OF THE TRANSMITTER AND SENSOR PROBES MUST DEMONSTRATE THAT THE TOTAL ACCURACY MEETS THE PERFORMANCE REQUIREMENTS OF THIS SPECIFICATION THROUGHOUT THE MEASUREMENT RANGE.
   b. SUBMIT A SCHEDULE OF AIRFLOW MEASURING DEVICES INDICATING COMPLIANCE WITH SPECIFIED ACCURACY AT MINIMUM AND MAXIMUM AIRFLOW RATES.
   c. SUBMIT INSTALLATION, OPERATION AND MAINTENANCE DOCUMENTATION.
3. QUALIFICATIONS
   a. MANUFACTURER: THE COMPANY MANUFACTURING THE PRODUCTS SPECIFIED IN THIS SECTION SHALL HAVE A MINIMUM OF TEN YEARS EXPERIENCE PRODUCING PRODUCTS OF THIS TYPE.
4. SYSTEM RESPONSIBILITY
   a. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL COSTS ASSOCIATED WITH ANY AND ALL CHANGES RESULTING FROM THE USE OF A SUPPLIER OTHER THAN THE LISTED ACCEPTABLE MANUFACTURER.
5. WARRANTY
   a. PROVIDE A MANUFACTURER'S PARTS WARRANTY FOR 36 MONTHS FROM THE DATE OF UNIT SHIPMENT.
6. DELIVERY, STORAGE, AND HANDLING
   a. ALL HANDLING AND STORAGE PROCEDURES SHALL BE PER MANUFACTURER'S RECOMMENDATIONS
   b. AIRFLOW MEASURING DEVICES SHALL BE KEPT CLEAN AND DRY, PROTECTED FROM WEATHER AND CONSTRUCTION TRAFFIC.
7. PRODUCTS INCLUDED IN THIS SECTION
   a. DUCT AND PLENUM MOUNTED AIRFLOW MEASUREMENT DEVICES.
   b. FAN INLET MOUNTED AIRFLOW MEASUREMENT DEVICES.
8. ACCEPTABLE MANUFACTURERS
   a. EBTRON, INC. MODEL GTX116-P AND GTX116-F (BASIS OF DESIGN).
      1) ALTERNATIVES REQUESTING ACCEPTANCE AS "EQUALS" LESS THAN 60 DAYS PRIOR TO BID DATE OR PRODUCTS SUBMITTED IN NON-CONFORMANCE WITH THE REQUIREMENTS OF THIS SPECIFICATION WILL NOT BE CONSIDERED.
      2) FOR ANY PRODUCT TO BE CONSIDERED FOR SUBSTITUTION A WRITTEN SECTION-BY-SECTION DETAILED EXCEPTIONS/COMPLIANCE DOCUMENT SHALL BE SUBMITTED TO THE ENGINEER BEFORE ANY APPROVAL WILL BE CONSIDERED.
   b. PROVIDE AIRFLOW/TEMPERATURE MEASUREMENT DEVICES (ATMD) WHERE INDICATED ON THE PLANS. FAN INLET MEASUREMENT DEVICES SHALL NOT BE SUBSTITUTED FOR DUCT OR PLENUM MEASUREMENT DEVICES INDICATED ON THE PLANS.
   c. EACH ATMD SHALL CONSIST OF ONE OR MORE SENSOR PROBES AND A SINGLE, REMOTELY MOUNTED, MICROPROCESSOR-BASED TRANSMITTER CAPABLE OF INDEPENDENTLY PROCESSING UP TO 16 INDEPENDENTLY WIRED SENSOR ASSEMBLIES. EACH SENSOR ASSEMBLY SHALL CONTAIN TWO INDIVIDUALLY WIRED, HERMETICALLY SEALED BEAD-IN-GLASS THERMISTORS. THERMISTORS SHALL BE MOUNTED IN THE SENSOR ASSEMBLY USING A MARINE-GRADE, WATERPROOF EPOXY. THERMISTOR LEADS SHALL BE PROTECTED AND NOT EXPOSED TO THE ENVIRONMENT. THE AIRFLOW RATE OF EACH SENSOR ASSEMBLY SHALL BE EQUALLY WEIGHTED AND AVERAGED BY THE TRANSMITTER PRIOR TO OUTPUT. THE TEMPERATURE OF EACH SENSOR ASSEMBLY SHALL BE VELOCITY WEIGHTED AND AVERAGED BY THE TRANSMITTER PRIOR TO OUTPUT. EACH TRANSMITTER SHALL HAVE A 16-CHARACTER ALPHA-NUMERIC DISPLAY CAPABLE OF DISPLAYING AIRFLOW, TEMPERATURE, SYSTEM STATUS, CONFIGURATION SETTINGS AND DIAGNOSTICS. DEVICES USING CHIP-IN-GLASS OR DIODE-CASE CHIP THERMISTORS ARE NOT ACCEPTABLE. DEVICES USING LESS THAN TWO THERMISTORS IN EACH SENSOR ASSEMBLY ARE NOT ACCEPTABLE.
      DEVICES USING PLATINUM WIRE RTDS ARE NOT ACCEPTABLE. DEVICES HAVING ELECTRONIC CIRCUITRY MOUNTED IN OR AT THE SENSOR PROBE ARE NOT ACCEPTABLE. PITOT TUBES AND ARRAYS ARE NOT ACCEPTABLE. VORTEX SHEDDING DEVICES ARE NOT ACCEPTABLE.
   d. ALL SENSOR PROBES
      1) EACH SENSOR ASSEMBLY SHALL INDEPENDENTLY DETERMINE THE AIRFLOW RATE AND TEMPERATURE AT EACH MEASUREMENT POINT.
      2) EACH SENSOR ASSEMBLY SHALL BE CALIBRATED AT A MINIMUM OF 16 AIRFLOW RATES AND 3 TEMPERATURES TO STANDARDS THAT ARE TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST).
      3) AIRFLOW ACCURACY SHALL BE +/-2% OF READING OVER THE ENTIRE OPERATING AIRFLOW RANGE.
         a) DEVICES WHOSE ACCURACY IS THE COMBINED ACCURACY OF THE TRANSMITTER AND SENSOR PROBES MUST DEMONSTRATE THAT THE TOTAL ACCURACY MEETS THE PERFORMANCE REQUIREMENTS OF THIS SPECIFICATION THROUGHOUT THE MEASUREMENT RANGE.
      4) TEMPERATURE ACCURACY SHALL BE +/-0.15° F OVER THE ENTIRE OPERATING TEMPERATURE RANGE OF -20° F TO 160° F.
      5) THE OPERATING HUMIDITY RANGE FOR EACH SENSOR P

PART 3 -EXECUTION

3.1 DEMOLITION

A. GENERAL

1. THE CONTRACTOR SHALL COMPLETELY FAMILIARIZE HIMSELF WITH ALL EXISTING BUILDING AND SITE CONDITIONS AND LIMITATIONS WHICH MAY HAVE A BEARING ON THE OPERATIONS HEREIN SPECIFIED, AND SHALL INCLUDE ALL WORK REQUIRED TO COMPLETE THE PROJECT AS SHOWN ON THE DRAWINGS AND BE REQUIRED BY THE SPECIFICATIONS. NO EXTRA COMPENSATION WILL BE ALLOWED FOR UNFORESEEN CONDITIONS THAT CAN BE DETERMINED FROM A CAREFUL EXAMINATION OF THE SITE, BUILDING, DRAWINGS AND SPECIFICATIONS.

2. ITEMS OF VALUE WHICH ARE NOT INDICATED TO BE RETURNED TO THE OWNER SHALL BECOME THE PROPERTY OF THE CONTRACTOR. STORAGE OR SALE OF THE ITEMS ON THE PROJECT SITE IS PROHIBITED.

3. PROTECTION: ENSURE THE SAFE PASSAGE OF PERSONS IN AND AROUND THE BUILDING DURING DEMOLITION. PREVENT INJURY TO PERSONS AND DAMAGE TO PROPERTY. PROVIDE ADEQUATE SHORING AND BRACING TO PREVENT COLLAPSE. IMMEDIATELY REPAIR DAMAGED PROPERTY TO THE CONDITION BEFORE BEING DAMAGED. TAKE EFFECTIVE MEASURES TO PREVENT WINDBLOWN DUST.

4. UTILITIES: MAINTAIN ALL UTILITIES EXCEPT THOSE REQUIRING REMOVAL OR RELOCATION. KEEP UTILITIES IN SERVICE AND PROTECT FROM DAMAGE. DO NOT INTERRUPT UTILITIES SERVING USED AREAS WITHOUT FIRST OBTAINING PERMISSION FROM THE UTILITY COMPANY AND THE OWNER. PROVIDE TEMPORARY SERVICES AS REQUIRED.

B. REGULATORS REQUIREMENTS

STRICTLY COMPLY WITH APPLICABLE CODES, REGULATIONS AND REQUIREMENTS OF AUTHORITY HAVING JURISDICTION.

C. HANDLING OF MATERIALS

REMOVE SALVAGE AND DEBRIS FROM THE SITE AS IT ACCUMULATES. DO NOT STORE, SELL, BURN, OR OTHERWISE DISPOSE OF DEBRIS ON SITE. REMOVE ALL MATERIALS IN SUCH MANNER AS TO PREVENT SPILLAGE. KEEP ALL PAVEMENTS AND AREAS ADJACENT TO AND LEADING FROM THE SITE, CLEAN AND FREE OF MUD, DIRT, AND DEBRIS AT ALL TIMES.

D. INSPECTIONS

PRIOR TO COMMENCEMENT OF SELECTIVE DEMOLITION WORK, INSPECT AREAS IN WHICH WORK WILL BE PERFORMED. PHOTOGRAPH EXISTING CONDITIONS TO STRUCTURE SURFACES, EQUIPMENT OR TO SURROUNDING PROPERTIES WHICH COULD BE MISCONSTRUCTED AS DAMAGE RESULTING FROM SELECTIVE DEMOLITION WORK; FILE WITH OWNER'S REPRESENTATIVE PRIOR TO STARTING WORK.

E. TRANSFER OF RESPONSIBILITY AND DISPOSITION OF MATERIALS

UPON RECEIPT OF NOTICE TO PROCEED WITH THE WORK, THE TILE TO ALL MATERIALS FOR DEMOLITION SHALL BE VESTED IN THE CONTRACTOR WHEREUPON THE OWNER WILL NOT BE RESPONSIBLE FOR THE CONDITION, LOSS, OR DAMAGE TO SAID PROPERTY.

F. DISPOSAL OF DEMOLISHED MATERIALS

REMOVE UNUSED FIXTURE AND ALL PIPING SERVICING FIXTURE INCLUDING ABANDONED PIPING NOT ASSOCIATED WITH SAID FIXTURE. REMOVE PIPING BACK TO THE NEXT LIVE BRANCH WILL NOT OBSTRUCT THE NEW WORK. TRANSPORT AND LEGALLY DISPOSE OF MATERIALS OFF SITE.

G. CLEAN-UP AND REPAIR

1. UPON COMPLETION OF DEMOLITION WORK, REMOVE TOOLS, EQUIPMENT AND DEMOLISHED MATERIALS FROM SITE. REMOVE PROTECTIONS AND LEAVE INTERIOR AREAS BROOM CLEAN.

2. REPAIR DEMOLITION PERFORMED IN EXCESS OF THAT REQUIRED. RETURN STRUCTURES AND SURFACES TO REMAIN IN CONDITION EXISTING PRIOR TO COMMENCEMENT OF SELECTIVE DEMOLITION WORK. REPAIR ADJACENT CONSTRUCTION OR SURFACES SOILED OR DAMAGED BY SELECTIVE DEMOLITION WORK.

3.2 INSTALLATION OF PIPING INSULATION

A. INSTALL INSULATION PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS, AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT INSULATION SERVICE ITS INTENDED PURPOSE.

B. INSTALL INSULATION ON PIPE SYSTEMS SUBSEQUENT TO INSTALLATION OF HEAT TRACING, PAINTING, TESTING, AND ACCEPTANCE OF TESTS.

C. INSTALL INSULATION MATERIALS WITH SMOOTH AND EVEN SURFACES. INSULATE EACH CONTINUOUS RUN OF PIPING WITH FULL-LENGTH UNITS OF INSULATION, WITH SINGLE CUT PIECE TO COMPLETE RUN. DO NOT USE CUT PIECES OR SCRAPS ABUTTING EACH OTHER.

D. CLEAN AND DRY PIPE SURFACES PRIOR TO INSULATING. BUTT INSULATION JOINTS FIRMLY TOGETHER TO ENSURE COMPLETE AND TIGHT FIT OVER SURFACES TO BE COVERED.

E. MAINTAIN INTEGRITY OF VAPOR-BARRIER JACKETS ON PIPE INSULATION, AND PROTECT TO PREVENT PUNCTURE OR OTHER DAMAGE.

F. COVER VALVES, FITTINGS AND SIMILAR ITEMS IN EACH PIPING SYSTEM WITH EQUIVALENT THICKNESS AND COMPOSITION OF INSULATION AS APPLIED TO ADJOINING PIPE RUN. INSTALL FACTORY MOLDED, PRECUT OR JOB FABRICATED UNITS (AT INSTALLER'S OPTION) EXCEPT WHERE SPECIFIC FORM OR TYPE IS INDICATED.

G. EXTEND PIPING INSULATION WITHOUT INTERRUPTION THROUGH WALLS, FLOORS AND SIMILAR PIPING PENETRATIONS, EXCEPT WHERE OTHERWISE INDICATED.

H. BUTT PIPE INSULATION AGAINST PIPE HANGER INSULATION INSERTS. FOR HOT PIPES, APPLY 3 INCH WIDE VAPOR BARRIER TAPE OR BAND OVER THE BUTT JOINTS. FOR COLD PIPING APPLY WET COAT OF VAPOR BARRIER LAP CEMENT ON BUTT JOINTS AND SEAL JOINTS WITH 3 INCH WIDE VAPOR BARRIER TAPE OR BAND.

3.3 INSTALLATION OF DUCTWORK INSULATION

A. INSTALL INSULATION PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS, AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT INSULATION SERVES ITS INTENDED PURPOSE.

B. INSTALL INSULATION MATERIALS WITH SMOOTH AND EVEN SURFACES.

C. CLEAN AND DRY DUCTWORK PRIOR TO INSULATING. BUTT INSULATION JOINTS FIRMLY TOGETHER TO ENSURE COMPLETE AND TIGHT FIT OVER SURFACES TO BE COVERED.

D. MAINTAIN INTEGRITY OF VAPOR-BARRIER ON DUCTWORK INSULATION, AND PROTECT IT TO PREVENT PUNCTURE AND OTHER DAMAGE.

E. EXTEND DUCTWORK INSULATION WITHOUT INTERRUPTION THROUGH WALLS, FLOORS AND SIMILAR DUCTWORK PENETRATIONS, EXCEPT WHERE OTHERWISE INDICATED.

F. LINED DUCTWORK

1. EXCEPT AS OTHERWISE INDICATED, OMIT INSULATION ON DUCTWORK WHERE INTERNAL INSULATION OR SOUND ABSORBING LININGS HAVE BEEN INSTALLED.

G. DUCTWORK EXPOSED TO WEATHER

1. PROTECT OUTDOOR INSULATION FROM WEATHER BY INSTALLING OUTDOOR PROTECTIVE FINISH OR JACKETING AS RECOMMENDED BY MANUFACTURER.

H. CORNER ANGLES

1. EXCEPT FOR OVEN AND HOOD EXHAUST DUCT INSULATION, INSTALL CORNER ANGLES ON EXTERNAL CORNERS OF INSULATION ON DUCTWORK TO EXPOSED FINISHED SPACES BEFORE COVERING WITH JACKETING.

3.5 SYSTEM TESTING, ADJUSTING, AND BALANCING

A. SUMMARY

1. TESTING, ADJUSTING AND BALANCING (TAB) OF THE AIR CONDITIONING SYSTEMS AND RELATED ANCILLARY EQUIPMENT WILL BE PERFORMED BY AN IMPARTIAL TECHNICALLY QUALIFIED TAB FIRM.

2. THE FIRM SHALL BE CAPABLE OF PERFORMING THE SERVICES SPECIFIED AT THE LOCATION OF THE FACILITY DESCRIBED WITHIN THE TIME SPECIFIED, OF PREPARING AND SUBMITTING THE DETAILED REPORT OF THE ACTUAL FIELD WORK PERFORMED, AND FOLLOWING UP THE BASIC WORK AS MAY BE REQUIRED.

B. QUALIFICATIONS

1. THE FIRM SHALL BE ONE WHICH IS ORGANIZED TO PROVIDE PROFESSIONAL SERVICES OF THIS SPECIFIED TYPE IN THE STATE OF MASSACHUSETTS.

2. THE FIRM SHALL HAVE OPERATED A MINIMUM OF FIVE (5) YEARS UNDER ITS CURRENT FIRM NAME, AND SHALL BE IN GOOD STANDING WITH THE STATE OF MA. THE FIRM SHALL SUBMIT THEIR FULL INCORPORATED NAME, CHARTER NUMBER AND TAXPAYER'S I.D. NUMBER FOR PROPER VERIFICATION OF THE FIRM'S STATUS.

3. THE FIRM SHALL BE CAPABLE OF PROVIDING A PERFORMANCE BOND, BY A BONDING COMPANY LICENSED TO DO BUSINESS IN THE STATE OF MA, IF DETERMINED BY THE OWNER THAT SUCH A BOND IS REQUIRED. THE AMOUNT OF THE BOND WHICH MAY BE REQUIRED SHALL BE EQUAL TO THE COST OF THE PROPOSAL SUBMITTED, OR IN THE CASE OF MORE THAN ONE PROPOSAL, THE SUM OF ALL SUCH PROPOSALS AND ANY AWARDED WORK IN PROGRESS.

4. ALL PERSONNEL USED ON THE JOB SITE SHALL BE EITHER PROFESSIONAL ENGINEERS OR ENGINEERING TECHNICIANS, WHO SHALL HAVE BEEN PERMANENT, FULL TIME EMPLOYEES OF THE FIRM FOR A MINIMUM OF SIX (6) MONTHS PRIOR TO THE START OF WORK FOR THIS SPECIFIC PROJECT.

5. THE TAB FIRM SHALL SUBMIT BIOGRAPHICAL DATA ON THE INDIVIDUAL PROPOSED TO DIRECTLY SUPERVISE THE TAB WORK, AS WELL AS OTHER PERSONNEL SCHEDULED TO PERFORM THE TECHNICAL WORK UNDER THE CONTRACT. IT SHALL ALSO SUBMIT A BACKGROUND RECORD OF AT LEAST FIVE YEARS OF SPECIALIZED EXPERIENCE IN THE FIELD OF AIR AND HYDRONIC SYSTEM BALANCING, AND SHALL POSSESS PROPERLY CALIBRATED INSTRUMENTATION. THE SUPERVISORY PERSONNEL FOR THE TAB FIRM SHALL BE REGISTERED ENGINEERS IN THE MECHANICAL FIELD AND ALL OF THE EMPLOYEES USED IN THE TAB FIRM SHALL BE PERMANENT, FULL-TIME EMPLOYEES OF THE FIRM.

C. REFERENCES

1. AABC - NATIONAL STANDARDS FOR TESTING AND BALANCING HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS, SIXTH EDITION 2002.

2. ASHRAE - 2011 HVAC APPLICATIONS CHAPTER 38: TESTING, ADJUSTING AND BALANCING.

3. ANSI/ASHRAE STANDARD 111 - 2008 - PRACTICES FOR MEASUREMENT, TESTING, ADJUSTING AND BALANCING OF BUILDINGS, HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION SYSTEMS.

D. DOCUMENTS

1. THE TAB FIRM SHALL, AS A REQUIREMENT OF THE TAB CONTRACT, ARRANGE WITH THE ARCHITECT / OWNER / ENGINEER TO COMPILE ONE SET OF MECHANICAL, SPECIFICATIONS, ALL PERTINENT CHANGE ORDERS, AND THE FOLLOWING:

a. ONE COMPLETE SET OF DRAWINGS LESS THE STRUCTURAL SHEETS.
b. ONE SET OF MECHANICAL FLOOR PLANS OF THE CONDITIONED SPACES. THESE DRAWINGS SHALL BE OZALID TYPE (BLUE OR BLACK ON LIGHT BACKGROUND) REPRODUCTIONS TO FACILITATE MARKING.

2. APPROVED SUBMITTAL DATA ON EQUIPMENT INSTALLED, AND RELATED CHANGES AS REQUIRED TO ACCOMPLISH THE TEST PROCEDURES OUTLINED IN PARAGRAPHS 1.06 THROUGH 1.10 OF THIS SPECIFICATION WILL BE AVAILABLE THROUGH THE CONSTRUCTION SUPERVISOR.

E. RESPONSIBILITIES OF THE TAB FIRM

1. THE TAB PERSONNEL SHALL CHECK, ADJUST, AND BALANCE THE COMPONENTS OF THE AIR CONDITIONING SYSTEM WHICH WILL RESULT IN OPTIMAL NOISE, TEMPERATURE, AND AIRFLOW CONDITIONS IN THE CONDITIONED SPACES OF THE BUILDING WHILE THE EQUIPMENT OF THE SYSTEM IS OPERATING ECONOMICALLY. THIS IS INTENDED TO BE ACCOMPLISHED AFTER THE SYSTEM COMPONENTS ARE INSTALLED AND OPERATING AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. IT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO PLACE THE EQUIPMENT INTO SERVICE. VARIABLE AIR VOLUME SYSTEMS SHALL BE BALANCED IN ACCORDANCE WITH AABC 1989 STANDARD, FIFTH EDITION.

2. LIAISON AND EARLY INSPECTION

a. THE TAB FIRM PERSONNEL ON THE JOB SHALL ACT AS LIAISON BETWEEN THE OWNER, ARCHITECT AND CONTRACTOR. THE FOLLOWING REVIEWS (OBSERVATIONS) AND TESTS SHALL BE PERFORMED BY THE TAB AGENCY:
   1) DURING THE DESIGN STAGE, BEFORE THE DOCUMENTS ARE FINALIZED, REVIEW THE MECHANICAL DRAWINGS AND SPECIFICATIONS FOR BALANCEABILITY AND PROVIDE COMMENTARY.
   2) DURING CONSTRUCTION, REVIEW ALL HVAC SUBMITTALS SUCH AS CONTROL DIAGRAMS, AIR HANDLING DEVICES, ETC., THAT PERTAIN TO COMMISSIONING WORK AND BALANCEABILITY.
   3) ALLOW FOR A FIXED NUMBER OF TRIPS TO THE PROJECT SITE, OVER AND ABOVE THOSE REQUIRED FOR TESTING AND BALANCING FOR INSPECTION OF INSTALLATION OF THE MECHANICAL PIPING SYSTEMS, SHEET METAL WORK, TEMPERATURE CONTROLS AND OTHER COMPONENT PARTS OF THE HEATING, AIR CONDITIONING AND VENTILATING SYSTEMS DURING THE CONSTRUCTION STAGE. THESE INSPECTIONS SHALL BE MADE PRIOR TO AND/OR AT THE ABOVE CEILING INSPECTION. COMMENTARY WILL BE PROVIDED FOR EACH OBSERVATION.
   4) TEST ONE (1) OF EACH SPECIFIED TYPE OF TERMINAL BOX FOR PERFORMANCE CAPABILITY AND LEAKAGE. THE SHIPMENT OF THE BOX TO THE TAB AGENCY'S LAB WILL BE AT THE MANUFACTURER'S COST AND THE TEST PERIOD WILL BE FOR THREE (3) WEEKS FROM RECEIPT OF THE BOX. SUBMITTAL DATA WILL NOT BE APPROVED UNTIL BOX TESTING PASSES. IF THE SAMPLE BOX IS REJECTED FOR ANY REASON THE SECOND TEST WILL BE AT THE CONTRACTOR'S COST AND THE TIME ALLOWED WILL RESTART WHEN THE BOX IS RECEIVED AT THE TAB AGENCY.
   5) TEST 10% OF EACH SPECIFIED TERMINAL BOXES TYPE FOR CASING AND DAMPER LEAKAGE WHEN THE SHIPMENT ARRIVES AT THE PROJECT SITE. ALL TESTING (EXCEPT FOR THE INITIAL BOXES) SHALL BE PERFORMED ON SITE. BOXES REQUIRING RE-TESTING WILL BE CHARGED TO THE CONTRACTOR AT THE UNIT PRICE PROVIDED TO THE OWNER.
   6) TEST ONE (1) LAB CONFIGURATION INCLUDING FUME HOOD WITH AIR VALVE, GENERAL EXHAUST AIR WITH AIR VALVE AND SUPPLY AIR WITH AIR VALVE FOR PERFORMANCE CAPABILITY THROUGH A FULL RANGE OF INLET PRESSURES. THE TRACKING CAPABILITY OF THE EXHAUST AIR VERSUS THE SUPPLY AIR WILL BE WITH THE SUBMITTED HOOD SASH FULLY OPEN AND AS THE SASH IS CLOSED IN 2" INCREMENTS UNTIL FULLY CLOSED. TRACK THE THREE (3) VALVE'S RESPONSE TIME IN RELATION TO SASH MOVEMENT AND THE LAB DIFFERENTIAL.

b. DURING THE BALANCING PROCESS, AS ABNORMALITIES AND MALFUNCTIONS OF EQUIPMENT OR COMPONENTS ARE DISCOVERED BY THE TAB PERSONNEL, THE CONSTRUCTION SUPERVISOR SHALL BE ADVISED IN WRITING SO THAT THE CONDITION CAN BE CORRECTED BY THE MECHANICAL CONTRACTOR. THE WRITTEN DOCUMENT NEED NOT BE FORMAL, BUT MUST BE UNDERSTANDABLE AND LEGIBLE. DATA FROM MALFUNCTIONING EQUIPMENT SHALL NOT BE RECORDED IN THE FINAL TAB REPORT. THE TAB FIRM SHALL NOT INSTRUCT OR DIRECT THE CONTRACTOR IN ANY OF THE WORK, BUT WILL MAKE SUCH REPORTS AS ARE NECESSARY TO THE OWNER.

F. FINAL AIR BALANCE

1. GENERAL: WHEN SYSTEMS ARE COMPLETE AND READY FOR OPERATION, THE TAB CONSULTANT WILL PERFORM A FINAL AIR BALANCE FOR ALL AIR SYSTEMS AND RECORD THE RESULTS. THE OUTSIDE, SUPPLY, EXHAUST AND RETURN AIR VOLUME FOR EACH AIR HANDLING UNIT, SUPPLY FAN AND EXHAUST FAN AND THE SUPPLY, EXHAUST OR RETURN AIR VOLUME FOR EACH DISTRIBUTION DEVICE SHALL BE ADJUSTED TO WITHIN +5% OF THE VALUE SHOWN ON THE DRAWINGS. AIR HANDLING UNIT AND FAN VOLUMES SHALL BE ADJUSTED BY CHANGING FAN SPEED AND ADJUSTING VOLUME DAMPERS ASSOCIATED WITH THE UNIT. AIR DISTRIBUTION DEVICE VOLUME SHALL BE ADJUSTED USING THE SPIN-IN TAP DAMPER FOR FLEXIBLE DUCT CONNECTED DEVICES AND THE DEVICE OBD FOR DUCT CONNECTED DEVICES. AIR DISTRIBUTION DEVICES SHALL BE BALANCED WITH AIR PATTERNS AS SPECIFIED. DUCT VOLUME DAMPERS SHALL BE ADJUSTED TO PROVIDE AIR VOLUME TO BRANCH DUCTS WHERE SUCH DAMPERS ARE SHOWN. THE GENERAL SCOPE OF BALANCING BY THE TAB CONSULTANT WILL INCLUDE, BUT IS NOT LIMITED TO, THE FOLLOWING:

a. FILTERS: CHECK AIR FILTERS AND FILTER MEDIA AND BALANCE ONLY SYSTEM WITH ESSENTIALLY CLEAN FILTERS AND FILTER MEDIA. THE CONTRACTOR SHALL INSTALL NEW FILTERS AND FILTER MEDIA PRIOR TO THE FINAL AIR BALANCE.
b. BLOWER SPEED: MEASURE RPM AT EACH FAN OR BLOWER TO DESIGN REQUIREMENTS. WHERE A SPEED ADJUSTMENT IS REQUIRED, THE CONTRACTOR SHALL MAKE ANY REQUIRED CHANGES.
c. AMPERE READINGS: MEASURE AND RECORD FULL LOAD AMPERES FOR MOTORS.
d. STATIC PRESSURE: STATIC PRESSURE GAINS OR LOSSES SHALL BE MEASURED ACROSS EACH SUPPLY FAN, COOLING COIL, HEATING COIL, RETURN AIR FAN, AIR HANDLING UNIT FILTER AND EXHAUST FAN. THESE READINGS SHALL BE MEASURED AND RECORDED FOR THIS REPORT AT THE FURTHEST AIR DEVICE OR TERMINAL UNIT FROM THE AIR HANDLER SUPPLYING THAT DEVICE. STATIC PRESSURE READINGS SHALL ALSO BE PROVIDED FOR SYSTEMS WHICH DO NOT PERFORM AS DESIGNED.
e. EQUIPMENT AIR FLOW: ADJUST AND RECORD EXHAUST, RETURN, OUTSIDE AND SUPPLY AIR CFM (S) AND TEMPERATURES, AS APPLICABLE, AT EACH FAN, BLOWER AND COIL.
f. COIL TEMPERATURES: SET CONTROLS FOR FULL COOLING AND FOR FULL HEATING LOADS. READ AND RECORD ENTERING AND LEAVING DRY BULB AND WET BULB TEMPERATURES (COOLING ONLY) AT EACH COOLING COIL, HEATING COIL AND HVAC TERMINAL UNIT. AT THE TIME OF READING RECORD WATER FLOW AND ENTERING AND LEAVING WATER TEMPERATURES (IN VARIABLE FLOW SYSTEMS ADJUST THE WATER FLOW TO DESIGN FOR ALL THE ABOVE READINGS).
g. ZONE AIR FLOW: ADJUST EACH ZONE OF MULTI-ZONE UNITS, EACH HVAC TERMINAL UNIT AND AIR HANDLING UNIT FOR DESIGN CFM.
h. OUTLET AIR FLOW: ADJUST EACH EXHAUST INLET AND SUPPLY DIFFUSER, REGISTER AND GRILLE TO WITHIN +5% OF DESIGN AIR CFM. INCLUDE ALL TERMINAL POINTS OF AIR SUPPLY AND ALL POINTS OF EXHAUST. NOTE: FOR LABS AND ROOMS THAT ARE NEGATIVE EXHAUST AIR FLOW SHALL BE SET TO DESIGN +10% AND SUPPLY TO DESIGN -5%. POSITIVE AREAS WILL HAVE OPPOSITE TOLERANCES.
i. PITOT TUBE TRAVERSES: FOR USE IN FUTURE TROUBLESHOOTING BY MAINTENANCE PERSONNEL, ALL EXHAUST DUCTS, MAIN SUPPLY DUCTS AND RETURN DUCTS SHALL HAVE AIR VELOCITY AND VOLUME MEASURED AND RECORDED BY THE TRAVERSE METHOD. LOCATIONS OF THESE TRAVERSE TEST STATIONS SHALL BE DESCRIBED ON THE SHEET CONTAINING THE DATA.
j. MAXIMUM AND MINIMUM AIR FLOW ON TERMINAL BOXES.

G. SOUND VIBRATION AND ALIGNMENT

1. SOUND: READ AND RECORD SOUND LEVELS AT UP TO 15 LOCATIONS IN THE BUILDING DESIGNATED BY THE ENGINEER. ALL MEASUREMENTS SHALL BE MADE USING AN OCTAVE BAND ANALYZER. ALL TESTS SHALL BE CONDUCTED WHEN THE BUILDING IS QUIET IN THE PRESENCE OF THE ENGINEER, IF HE SO DESIRES.

2. VIBRATION: READ AND RECORD VIBRATION FOR ALL WATER CIRCULATING PUMPS, AIR HANDLING UNITS, AND FANS WHICH HAVE MOTORS LARGER THAN 10 HP. INCLUDE EQUIPMENT VIBRATION, BEARING HOUSING VIBRATION, FOUNDATION VIBRATION, BUILDING STRUCTURE VIBRATION, AND OTHER TESTS AS DIRECTED BY THE ENGINEER. READINGS WILL BE MADE USING PORTABLE IRD (OR APPROVED EQUAL) EQUIPMENT CAPABLE OF FILTERING OUT VARIOUS UNWANTED FREQUENCIES AND STANDARD REPORTING FORMS. MAXIMUM VIBRATION AT ANY POINT LISTED ABOVE, OR SPECIFIED, SHALL NOT EXCEED 1 MIL ON FANS AND 1 MIL ON PUMPS UNLESS OTHERWISE SPECIFIED. EQUIPMENT MANUFACTURERS SHALL RECTIFY ALL SYSTEMS EXCEEDING VIBRATION TOLERANCES.

H. TESTING OF TEMPERATURE CONTROL SYSTEMS

1. IN THE PROCESS OF PERFORMING THE TAB WORK, THE TAB AGENCY SHALL:

a. WORK WITH THE TEMPERATURE CONTROL CONTRACTOR TO ENSURE THE MOST EFFECTIVE TOTAL SYSTEM OPERATION WITHIN THE DESIGN LIMITATIONS, AND TO OBTAIN MUTUAL UNDERSTANDING OF INTENDED CONTROL PERFORMANCE.
b. VERIFY THAT ALL CONTROL DEVICES ARE PROPERLY CONNECTED.
c. VERIFY THAT ALL DAMPERS, VALVES AND OTHER CONTROLLED DEVICES ARE OPERATED BY THE INTENDED CONTROLLER.
d. VERIFY THAT ALL DAMPERS AND VALVES ARE IN THE POSITION INDICATED BY THE CONTROLLER (OPEN, CLOSED OR MODULATING).
e. VERIFY THE INTEGRITY OF VALVES AND DAMPERS IN TERMS OF TIGHTNESS OF CLOSE-OFF AND FULL-OPEN POSITIONS. THIS INCLUDES DAMPERS IN MULTI-ZONE UNITS, TERMINAL BOXES AND FIRE/SMOKE DAMPERS.
f. OBSERVE THAT ALL VALVES ARE PROPERLY INSTALLED IN THE PIPING SYSTEM IN RELATION TO DIRECTION OF FLOW AND LOCATION.
g. OBSERVE THE CALIBRATION OF ALL CONTROLLERS.
h. VERIFY THE PROPER APPLICATION OF ALL NORMALLY OPENED AND NORMALLY CLOSED VALVES.
i. OBSERVE THE LOCATIONS OF ALL THERMOSTATS AND HUMIDISTATS FOR POTENTIAL ERRATIC OPERATION FROM OUTSIDE INFLUENCES SUCH AS SUNLIGHT, DRAFTS OR COLD WALLS.
j. OBSERVE THE LOCATIONS OF ALL SENSORS TO DETERMINE WHETHER THEIR POSITION WILL ALLOW THEM TO SENSE ONLY THE INTENDED TEMPERATURES OR PRESSURES OF THE MEDIA. CONTROL CONTRACTOR WILL RELOCATE AS DEEMED NECESSARY BY THE TAB AGENCY.
k. VERIFY THAT THE SEQUENCE OF OPERATION FOR ANY CONTROL MODE IS IN ACCORDANCE WITH APPROVED SHOP DRAWINGS AND SPECIFICATIONS. VERIFY THAT NO SIMULTANEOUS HEATING AND COOLING OCCURS.
l. VERIFY THAT ALL CONTROLLER SETPOINTS MEET THE DESIGN INTENT.
m. CHECK ALL DAMPERS FOR FREE TRAVEL
n. VERIFY THE OPERATION OF ALL INTERLOCK SYSTEMS.
o. PERFORM VARIABLE VOLUME SYSTEM VERIFICATION TO ASSURE THE SYSTEM AND ITS COMPONENTS TRACK WITH CHANGES FROM FULL FLOW TO MINIMUM FLOW.

2. A SYSTEMATIC LISTING OF THE ABOVE TESTING AND VERIFICATION SHALL BE INCLUDED IN THE FINAL TAB REPORT.

3.6 CLEANING AND PROTECTING

1. IT SHALL BE THIS TRADE'S RESPONSIBILITY TO STORE HIS MATERIALS IN A MANNER THAT WILL MAINTAIN AN ORDERLY CLEAN APPEARANCE. IF OR WHICH TRAINING IS REQUIRED. THE AGENDA DESCRIBES THE TRAINING SCOPE, DURATION, AND METHODS, ALONG WITH THE NAME AND QUALIFICATIONS.

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PROFESSIONAL

MARK	DATE	DESCRIPTION
	12-12-22	BID SET

ISSUE:

PROJECT NO.:	22120
DRAWN BY:	JRR
CHECKED BY:	NS
DRAWING SCALE:	AS NOTED

SHEET TITLE:

MECHANICAL SPECIFICATIONS

SHEET:

M-3.02

DO NOT SCALE DRAWING

LIGHTING FIXTURES

SYMBOL	DESCRIPTION	NOTES
FP 1a	WALL OR CEILING MOUNTED LIGHTING FIXTURE	UPPER CASE LETTERS INDICATE FIXTURE TYPE. REFER TO FIXTURE SCHEDULE FOR MANUFACTURER SUBSCRIPT LOWER CASE LETTERS INDICATE SWITCH CONTROL ASSOCIATIONS FR 1a FP 1a SHADING OF FIXTURES THUS: FR FP FP FP INDICATES FIXTURE ON NIGHT/EMERGENCY CIRCUIT OR EMERGENCY BATTERY BACK UP BALLAST WHERE APPLICABLE, CONTRACTOR SHALL CONFIRM LOCATION OF REMOTE EMERGENCY BALLAST WITH ARCHITECT PRIOR TO PURCHASE AND INSTALLATION. EMERGENCY BALLAST SHALL BE SIMILAR TO BODINE B30ST OR B30 WITH INTEGRAL INDICATOR LIGHT TEST SWITCH. PROVIDE 2 LAMP APPLICATION WHERE APPLICABLE.
	EXTERIOR POLE MOUNTED FIXTURE	CONTRACTOR SHALL FURNISH AND INSTALL EMERGENCY TRANSFER RELAY ON ALL SWITCHED EMERGENCY FIXTURES CONTRACTOR SHALL PROVIDE ALL MOUNTING HARDWARE APPLICABLE TO CEILING, WALL, AND FLOOR TYPE INTO WHICH FIXTURE IS INSTALLED. CONTRACTOR SHALL COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL INTERIOR/EXTERIOR ELEVATIONS CONTRACTOR SHALL COORDINATE AND CONFIRM K RATING OF LAMPS TO ACHIVE COLOR AS DESIRED PER ARCHITECT AND OWNER/TENANT CONTRACTOR SHALL FURNISH AND SUPPLY ANY STEP DOWN TRANSFORMERS FOR ANY LOW VOLTAGE LIGHTING CONTRACTOR SHALL FURNISH AND INSTALL 0-10V DIMMING BALLAST FOR LED FIXTURES

EXIT/EMERGENCY LIGHTING

SYMBOL	DESCRIPTION	NOTES
EB	EMERGENCY LIGHTING WITH BATTERY UNIT	ALL EMERGENCY BATTERY PACKS SHALL HAVE REMOTE HEAD CAPABILITY UNLESS NOTED OTHERWISE
	DUAL REMOTE EMERGENCY LIGHTING HEAD	
	CEILING MOUNTED EXIT SIGN	ALL EXIT SIGNS SHALL BE FURNISHED WITH INTERNAL, 90 MINUTE BATTERY UNLESS NOTED OTHERWISE
	WALL MOUNTED EXIT SIGN	APPLICATION OF SHADED QUADRANTS AND ARROWS THUS: INDICATE LETTERED FACE AND DIRECTIONAL CHEVERONS AS REQUIRED

SWITCHING/LIGHTING/DEVICE CONTROL

SYMBOL	DESCRIPTION	NOTES
S_{WP}	SINGLE POLE SWITCH	20A 120-277V AC "WP" – INDICATES WEATHER PROOF SUBSCRIPT LOWER CASE LETTERS INDICATE SWITCH CONTROL ASSOCIATIONS SUBSCRIPT UPPER CASE LETTERS DENOTE SWITCH TYPE AS LISTED IN NON-STANDARD SWITCHES UNLESS NOTED OTHERWISE SWITCHES SHALL BE MOUNTED 48" TO CENTER LINE AFF
SP	SINGLE POLE SWITCH WITH PILOT LIGHT	
S2	DOUBLE POLE SWITCH	
S3	THREE-WAY SWITCH	
S4	FOUR-WAY SWITCH	
ST	SPRING WOUND INTERVAL TIME SWITCH WITHOUT HOLD	TORK OR EQUAL 30 MIN MAX
KS	KEY SWITCH LINE VOLTAGE	LEVITON OR EQUAL PROVIDE 0-10V DIMMER WHERE REQUIRED FOR LED LIGHTING FIXTURES
D	0-10V SLIDE DIMMER	LEVITON ILLUMATECH #IP710-LF
	CEILING MOUNTED CORRIDOR OCCUPANCY SENSOR (80' oc)	WATT STOPPER: W-2000H
	CEILING MOUNTED DUAL TECHNOLOGY SENSOR (1,600 sf)	WATT STOPPER: DT-300
	CEILING MOUNTED OCCUPANCY SENSOR WHEATHERPROOF	WATT STOPPER: HB300 HB-L2W
OS	WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR	WATT STOPPER: DSW-301
OS	WALL MOUNTED DUAL TECHNOLOGY DUAL RELAY SENSOR	WATT STOPPER: DSW-302
	CEILING MOUNTED WIRELESS RECEPTACLE TRANSMITTER	WATT STOPPER: WRC-TX SERIES
	WALL MOUNTED DIMMABLE OCCUPANCY SENSOR	WATT STOPPER: (0-10V) PW-311 (120/277) PW-100D FURNISH AND INSTALL BALLAST COMPATIBLE WITH DIMMABLE SENSOR
	CEILING MOUNTED ON/OFF DAYLIGHT HARVEST SENSOR	WATT STOPPER: LS-102
TR	SELF POWERED TRANSFER RELAY	ILC TR SERIES OR EQUAL CONTRACTOR SHALL FURNISH AND INSTALL ALL RELAYS AND MODULES TO COMPLETE SYSTEM INSTALLATION
TC	7 DAY ASTRONOMICAL PROGRAMMABLE TIME CLOCK	TORK OR EQUAL CONTRACTOR SHALL COORDINATE AND CONFIRM PROGRAMMING SCHEDULE WITH OWNER
LV	LOW VOLTAGE 1, 3, AND 4 WAY MOMENTARY SWITCH	WATT STOPPER: DCC2 SERIES OR EQUAL CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY POWER PACKS, RELAYS, CABLES, CONTROL MODULES, WIRING, AND CONTACTORS TO COMPLETE SYSTEM INSTALLATION
LCRP	LIGHTING CONTROL RELAY PANEL	WATT STOPPER: LPB SERIES OR EQUAL
MS	GUEST ROOM CARD KEY SWITCH	WATT STOPPER: HS SERIES OR EQUAL

TELECOMMUNICATION SYSTEMS

SYMBOL	DESCRIPTION	NOTES
MHNC	MODULAR HOME NETWORK CENTER PROVIDE (1) DEDICATED 120V CIRCUIT AND DUPLEX RECEPTACLE	MODULAR HOME NETWORKING CENTER SHALL BE LEVITON 47608-AHT, 4761L-T12, 4761M-EX5, 47690-462, AND 47605-4CS IN 49605-3GW ENCLOSURE OR EQUAL WITH 120V CIRCUIT.
	WALL MOUNTED DATA OUTLET	4"x4" SQUARE OUTLET BOX WITH 1"C, PULL STRING AND PROTECTIVE BUSHING TO ABOVE ACCESSIBLE CEILING
	WALL MOUNTED COMBINATION TEL/DATA OUTLET	P – DENOTES PUBLIC PAY PHONE W – DENOTES POWER FEED F – DENOTES MODULAR FURNITURE BEZEL (2)VOICE,(2)DATA OUTLETS BY OTHERS
	WALL MOUNTED TEL OUTLET	
T	FIRE RATED FURNITURE FEED POKE THROUGH DEVICE FOR TEL/DATA CONNECTIONS TO ELECTRIFIED FURNITURE	
T	4" SQUARE OUTLET BOX WITH 1 1/2" GROMMETTED HOLE COVERPLATE FOR TEL/DATA CONNECTION TO ELECTRIFIED FURNITURE PARTITIONS, MOUNTED 8" AFF	
TV	WALL MOUNTED CABLE TV OUTLET	4"x4" SQUARE OUTLET BOX WITH 1" CONDUIT STUBBED 6" ABOVE ACCESSIBLE CEILING SEE ARCH PLAN FOR MOUNTING HEIGHT

WIRING DEVICES – RECEPTACLES

SYMBOL	DESCRIPTION	NOTES
1	WALL DUPLEX CONVENIENCE OUTLET MTD 18" AFF	20A/125V, 2P, 3W, GNDG., NEMA 5-20R SHADING OF SYMBOL THUS: SUBSCRIPT LOWER CASE LETTERS INDICATE SWITCH CONTROL ASSOCIATIONS
	CEILING MOUNTED DUPLEX CONVENIENCE OUTLET	SHADING OF SYMBOL THUS:
IG	ISOLATED GROUND DUPLEX CONVENIENCE OUTLET	INDICATES RECEPTACLE MTD 6" ABOVE COUNTER TO CENTER LINE OR 48" AFF UNLESS NOTED OTHERWISE, CONFIRM DEVICE MOUNTING HEIGHT WITH ARCHITECTURAL ELEVATION PLANS AND/OR CMR 521 9.5.6 AND 39.3.1
	WALL DOUBLE DUPLEX CONVENIENCE OUTLET	"WP" – INDICATES WEATHER PROOF "GFI" DENOTES SELF REGULATING GROUND FAULT INTERRUPTING TYPE RECEPTACLE
	WALL MTD SINGLE CONVENIENCE OUTLET	ALL POWER OUTLET FACEPLATES SHALL BE LABELED WITH CIRCUIT NUMBER AND PANEL DESIGNATION FEEDING OUTLET
	HOSPITAL GRADE DUPLEX CONVENIENCE OUTLET	PASS & SEYMOUR 2095-HGTR OR EQUAL
USB	DUPLEX RECEPTACLE WITH (2) USB PORTS	HUBBELL: USB20X2 OR EQUAL CONFIRM DEVICE AND FACEPLATE COLOR WITH ARCHITECT
	PLUG LOAD (WIRELESS) CONTROLLABLE RF DUPLEX RECEPTACLE DUAL CONTROL	LEGRAND: RF263526CDW OR EQUAL CONFIRM DEVICE AND FACEPLATE COLOR WITH ARCHITECT
	PLUG LOAD (WIRELESS) CONTROLLABLE RF DUPLEX RECEPTACLE HALF CONTROL	LEGRAND: RF263526CHW OR EQUAL CONFIRM DEVICE AND FACEPLATE COLOR WITH ARCHITECT FURNISH AND INSTALL PLUG LOAD POWER PACK AND WIRELESS RECEPTACLE CONTROL TRANSMITTERS
9	WALL MOUNTED SPECIAL PURPOSE POWER RECEPTACLE	NUMERAL WITHIN SQUARE DENOTES RECEPTACLE TYPE AS LISTED IN SCHEDULE OF NON-STANDARD RECEPTACLES CONFIRM NEMA PLUG CONFIGURATION WITH OWNER AND TENANTS REPRESENTATIVE
P	FIRE RATED FURNITURE FEED POKE THROUGH DEVICE FOR POWER CONNECTIONS TO ELECTRIFIED FURNITURE	
P	4" SQUARE OUTLET BOX TO OUTLETS LOCATED IN FURNITURE PARTITIONS (SEE FLOOR PLANS)	

WIRING DEVICES – MISCELLANEOUS

SYMBOL	DESCRIPTION	NOTES
PP	2 CHANNEL PWR/DATA POWER POLE WITH ELEC DEVICES AND PLATES	LEGRAND TELE-POWER SERIES OR EQUAL
	2 PIECE SURFACE MTD RACEWAY WITH 20A DUPLEX RECEPTACLES CONFIRM SPACING WITH ARCHITECT	LEGRAND OR EQUAL UNLESS NOTED OTHERWISE, ALL RACEWAY SHALL BE METAL
	2 PIECE MULTI-CHANNEL RACEWAY WITH 20A DUPLEX RECEPTACLES AND DATA OUTLETS CONFIRM SPACING WITH ARCHITECT	LEGRAND OR EQUAL UNLESS NOTED OTHERWISE, ALL RACEWAY SHALL BE METAL
	FLUSH FLOOR MOUNTED POWER/DATA CONVIENCE RECEPTACLES	POKE THRU APPLICATION: 2 HOUR RATED, LEGRAND RC SERIES OR EQUAL, COORDINATE FINAL POWER AND TEL/DATA TERMAINTIONS WITH TENANT FLOOR TRENCH APPLICATION: DEEP RECTANGULAR CAST IRON BOX LEGRAND EVOLUTION SERIES OR EQUAL PROVIDE 1"C FROM TEL/DATA TO 6" ABOVE ACCESSIBLE CEILING. CONTRACTOR SHALL SUPPLY ALL COVERS AND PLATES TO COMPLETE INSTALLATION

JUNCTION BOXES

SYMBOL	DESCRIPTION	NOTES
J	CEILING MOUNTED JUNCTION BOX	
J	WALL MOUNTED JUNCTION BOX	
J	SURFACE MOUNTED JUNCTION BOX	
J	FLUSH FLOOR MOUNTED JUNCTION BOX	
J	JUNCTION BOX WITH FLEXIBLE CONNECTION TO EQUIPMENT	P – DENOTES POWER FEED C – DENOTES COMMUNICATIONS FEED

MOTORS AND CONTROLS

SYMBOL	DESCRIPTION	NOTES	
	MOTOR	COMPLETE INFO. FOR MOTOR IS INDICATED BY APPLICATION OF INDEXING SYMBOLS REFERENCE TO SCHEDULE OF MECHANICAL EQUIPMENT	
	MAGNETIC MOTOR STARTER COMPLETE W/ THERMAL OVERLOAD PROTECTION	SUBSCRIPT INDICATES NEMA SIZE	COMPLETE INFORMATION FOR CONTROL ITEMS IS INDICATED BY THE APPLICATION OF INDEXING SYMBOL REFERENCE APPLIED TO ASSOCIATED EQUIP.
	MANUAL MOTOR STARTER (THERMAL OVERLOAD SWITCH)		
VFD	VARIABLE FREQUECY DRIVE	REFER TO HVAC SCHEDULE FOR MOTOR LOAD HORSEPOWER SIZE	
CP	CONTROL PANEL (MECHANICAL EQUIP)	FURNISHED AND INSTALLED BY OTHERS, WIRED BY THE ELECTRICAL CONTRACTOR	

DISTRIBUTION EQUIPMENT

SYMBOL	DESCRIPTION	NOTES
	SURFACE MOUNTED PANEL	
	FLUSH MOUNTED PANEL	
TVSS	SURGE SUPPRESSION	PROVIDE PER SPECIFICATIONS
T	TRANSFORMER	SEE ELECTRICAL PLANS FOR KVA RATING
M	METER SOCKET AND METER	METER SOCKET PROVIDED BY CONTRACTOR PROVIDED BY LOCAL UTILITY CO.
M	CHECK METER	E-MON/D-MON CLASS 2000 OR EQUAL. MATCH BUILDING STANDARD
	OVERCURRENT AND/OR SWITCHING DEVICE "WP" – INDICATES WEATHER PROOF	COMPLETE INFORMATION FOR DEVICES IS INDICATED BY APPLICATION OF TAG SYMBOLS 30 – INDICATES UNFUSED SWITCH 30 – FRAME SIZE 30/15 – INDICATES FUSED SWITCH 30 – FRAME SIZE 15 – FUSE SIZE CB – INDICATES ENCLOSED CIRCUIT BREAKER
	WALL MOUNTED EMERGENCY POWER OFF BUTTON WITH SHIELD	SAFETY TECHNOLOGY INTERNATIONAL OR EQUAL

BRANCH CIRCUITRY

SYMBOL	DESCRIPTION	NOTES
	LIGHTING AND APPLIANCE BRANCH CIRCUITRY CONCEALED ABOVE	ARROW HEAD INDICATES HOME RUN CIRCUITRY TO 20A-1P CIRCUIT BREAKER (UNLESS NOTED OTHERWISE) NUMBER OF ARROW HEADS INDICATE NUMBER OF BRANCH POLES REQUIRED IN PANEL
	LIGHTING AND APPLIANCE BRANCH CIRCUITRY CONCEALED BELOW	CROSS MARKS INDICATE NUMBER OR NO. 12 WIRES IN 3/4" CONDUIT PLUS GROUND. ABSENCE OF CROSSMARKS INDICATES 2#12, 1#12 GROUND
	LIGHTING AND APPLIANCE BRANCH RUN EXPOSED	HOME RUNS ARE INDICATED THUS: L12 – 1, 3, 5
	INDIVIDUAL RUN TURNING UP	"L12" DENOTES PANEL DESIGNATION. "1,3,5" DENOTES CIRCUIT NO'S 1,3,5 CONTAINING 20A. 1P. CB'S IN PANELBOARD
	INDIVIDUAL RUN TURNING DOWN	CONDUIT RUNS REQUIRING CIRCUIT BREAKER GREATER THAN 20A-1P WIRE SIZE GREATER THAN NO. 12 AND CONDUIT SIZE GREATER THAN 3/4" ARE NOTED NOTED THUS: L12–1, 3, 5 50A 3P 4 #4, 1 #8 GROUND 1-1/4" CONDUIT
	INDIVIDUAL RUN TURNING UP&DOWN	

GENERAL CIRCUITRY

SYMBOL	DESCRIPTION	NOTES
	BUSWAY	
	CIRCUIT BREAKER BUS PLUG, BREAKERS AS INDICATED	
	BUSWAY FEED/ LUG CONNECTION	
-PE-	IDENTIFICATION OF INDIVIDUAL RUN OTHER THAN BRANCH CIRCUITRY OR SECONDARY FEEDERS	PE – PRIMARY ELECTRIC SE – SECONDARY ELECTRIC TEL – TELEPHONE TV – TELEVISION CATV – CABLE TELEVISION E – EMERGENCY

SECONDARY FEEDERS

SYMBOL	DESCRIPTION	NOTES
	FEEDER RUN CONCEALED ABOVE	ARROW HEAD INDICATES HOME RUN TO PANEL BOARD
	FEEDER RUN CONCEALED BELOW	FEEDER SIZING SHOWN ON POWER RISER DIAGRAM
	FEEDER RUN AS PER SPECIFIC NOTATION	

TAG SYMBOLS

SYMBOL	DESCRIPTION	NOTES
	INDEX SYMBOL	HEXAGONAL SYMBOLS CONTAINING TWO UPPER CASE LETTERS INDICATE REFERENCE TO A SCHEDULE OF SPECIAL EQUIPMENT HEXAGONAL SYMBOLS CONTAINING UPPER CASE LETTERS AND NUMERICALS INDICATE REFERENCE TO SCHEDULE OF MECHANICAL EQUIPMENT HEXAGONAL SYMBOLS CONTAINING NUMERICALS ONLY INDICATE REFERENCE TO AN EXPLANATION OF ELECTRICAL WORK REQUIREMENT
	GANGING CROSS REFERENCE	THE NOTED INDICATION ADJACENT TO A DEVICE DENOTES THAT THE DEVICE IS TO BE GANGED IN A BOX WITH ANOTHER DEVICE SIMILARLY NOTED AT THE SAME LOCATION ON ANOTHER DRAWING
( )	SPECIAL MOUNTING HEIGHT INDICATIONS	DIMENSION NOTED IN PARENTHESIS ADJACENT TO ANY ITEM OF THE DRAWINGS INDICATES THE HEIGHT OF IT'S HORIZONTAL CENTERLINE ABOVE FINISHED FLOOR

EXISTING ELECTRICAL EQUIPMENT

SYMBOL	DESCRIPTION	NOTES
ETR	EXISTING TO REMAIN	ALL EXISTING TO REMAIN LIGHTING SHALL BE CLEANED AND RELAMPED CONTRACTOR SHALL VERIFY THAT ALL EXISTING TO REMAIN ELECTRICAL DEVICES ARE OPERATIONAL & FUNCTIONAL. IF ETR DEVICES ARE NOT OPERATIONAL, IT SHALL BE REPLACED WITH A NEW DEVICE OF THAT TYPE. ALL REPLACED DEVICES SHALL MATCH EXISTING CONTRACTOR SHALL EXTEND AND CONNECT EXISTING WIRING TO NEW LOCATION OF RELOCATED EQUIPMENT. CONTRACTOR SHALL REPLACE EXISTING WIRING BACK TO SOURCE IF NECESSARY IF EXISTING WIRING DOES NOT REACH RELOCATED EQUIPMENT. CONTRACTOR SHALL EVALUATE CONDITION OF EXISTING WIRING AND REPLACE IF NECESSARY.
X	EXISTING EQUIPMENT TO BE REMOVED	
XR	EXISTING EQUIPMENT TO BE REMOVED AND RELOCATED	
RX	NEW LOCATION OF RELOCATED EXISTING EQUIPMENT	
RR	REMOVE EXISTING DEVICE AND REINSTALL NEW DEVICE IN SAME LOCATION	
	DOTTED DENOTES EXISTING ELECTRICAL EQUIPMENT	

NURSE / EMERGENCY CALL SYSTEMS

SYMBOL	DESCRIPTION	NOTES
NC	NURSE CALL PATIENT PULL CHORD	
NC	NURSE CALL PATIENT DOME LIGHT	
NC	NURSE CALL DUTY STAFF STATION	
NCAP	NURSE CALL ANNUNCIATOR PANEL	
EC	EMERGENCY CALL PULL CORD	
EC	EMERGENCY CALL DOME LIGHT	
EC	EMERGENCY CALL REMOTE STATION	
ECCP	EMERGENCY CALL COMMUNICATION PANEL	
AED	AUTOMATIC EXTERNAL DEFIBRILLATOR POWER CONNECTION	PROVIDE DEDICATED 120V POWER CONNECTION. CONFIRM LOCATION AND QUANTITY WITH ARCHITECT AND TENANT REPRESENTATIVE

AREA OF RESCUE/REFUGE SYSTEM

SYMBOL	DESCRIPTION	NOTES	
ARCU	VANDAL RESISTANT AREA OF RESCUE MAIN CONTROL PANEL	CORNELL: A-4204 SERIES OR EQUAL	CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY POWER PACKS AND EXPANSION SWITCHES TO COMPLETE SYSTEM. PROVIDE 120V POWER AT EACH DEVICE CONFIRM ARCU ZONE QUANTITY WITH RB STATION QUANTITIES ON FLOOR PLANS POWER PACK: CORNELL: B-5248A WITH BATTERY OR P-512243A WITH LIFE SAFETY CIRCUIT OR EQUAL
ARA	AREA OF RESCUE INDICATOR LIGHT WITH BATTERY BACKUP	CORNELL: SN-B SERIES OR EQUAL	
RB	VANDAL RESISTANT AREA OF RESCUE CALL STATION	CORNELL: 42018/V SERIES OR EQUAL	

FIRE ALARM SYSTEM

SYMBOL	DESCRIPTION	NOTES
F	MANUAL FIRE ALARM PULL STATION	
	VISUAL ONLY FIRE ALARM DEVICE	
F	COMBINATION AUDIO AND VISUAL FIRE ALARM DEVICE	
F C	CEILING MOUNTED AUDIO AND VISUAL FIRE ALARM DEVICE	
S	WALL MOUNTED FIRE ALARM SPEAKER	
S	WALL MOUNTED FIRE ALARM SPEAKER AND STROBE	
M	WALL MOUNTED MINI-HORN	
M	WALL MOUNTED FIRE ALARM MINI-HORN/STROBE	
LF	LOW FREQUENCY ALARM 520HZ IN ALL ROOMS USED FOR SLEEPING	
F	FIRE ALARM MASTER BOX	
K	KNOX BOX	
B	ROTATING FIRE ALARM BEACON LIGHT	
EB	ELECTRIC BELL PROVIDE (1) DEDICATED 120V CIRCUIT	
FF	FIRE FIGHTER FIRE EMERG PHONE	
BS	LOW FREQUENCY ALARM GENERATOR AND BED SHAKER IN EACH HEARING IMPARED UNIT SIMILAR TO LIFETONE HL PLUG IN MODEL OR EQUAL	
CO	CEILING MOUNTED CARBON MONOXIDE DETECTOR	
FACP	FIRE ALARM CONTROL PANEL	
FAA	FIRE ALARM ANNUNCIATOR PANEL	
RTS	REMOTE TEST STATION	
R	REMOTE INDICATOR ALARM DEVICE	
S	SMOKE DETECTOR	DETECTOR TYPE SUBSCRIPT: L LOCAL 120V DETECTOR WITH INTEGRAL BATTERY BACKUP R RECEIVER UNIT T TRANSMITTER UNIT D IN DUCT DETECTOR E ELEVATOR RECALL B BEAM TYPE PHOTOELECTRIC SA SUPPLY AIR DUCT DETECTOR RA RETURN AIR DUCT DETECTOR CO COMBINATION SMOKE/CARBON MONOXIDE DETECTOR
H	HEAT DETECTOR	
S	WALL MOUNTED: SMOKE DETECTOR HEAT DETECTOR CARBON MONOXIDE	
FS	SPRINKLER SYSTEM MONITOR FS WATER FLOW TS TAMPER SWITCH PS DRY ALARM PRESSURE SWITCH	MONITOR TYPE: MM MONITORING MODULE CM CONTROL MODULE
DH	MAGNETIC DOOR HOLDER	PROVIDE CONNECTION TO DOOR HARDWARE INTEGRAL HOLDERS
SK	SMOKE EXHAUST FAN KEY SWITCH	
I	ADDRESSABLE CONTROL OR MONITOR MODULE	MODULE SUBSCRIPT TYPE: C CONTROL MODULE M MONITOR MODULE

SECURITY/INTERCOM/ACCESS SYSTEMS

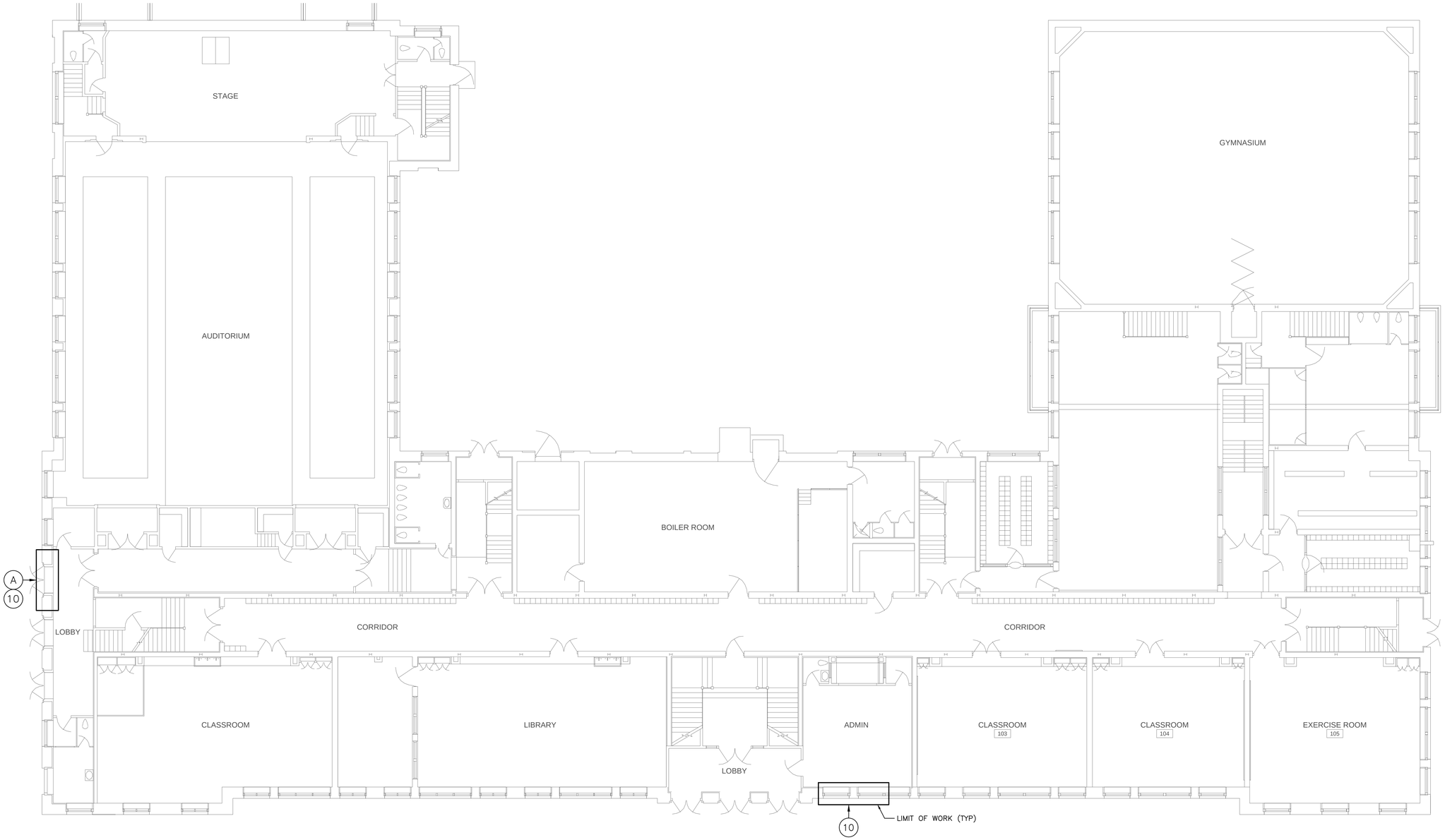
SYMBOL	DESCRIPTION	NOTES
DB PB	ILLUMINATED DOOR BELL PUSH BUTTON	EDWARDS C200 SERIES KIT OR EQUAL
DB C	DOOR BELL CHIME/BELL	CONTRACTOR SHALL PROVIDE 120V AT CHIME/BELL LOCATION
	HEARING IMPAIRED PHONE STROBE	WHEELOCK PS11AWPW OR EQUAL
	HEARING IMPAIRED INTERCOM STROBE	WHEELOCK RSSG24110NW OR EQUAL
	HEARING IMPAIRED DOORBELL STROBE	WHEELOCK RSSG24110NW OR EQUAL
CR	PROXIMITY CARD READER	UNLESS NOTED OTHERWISE, CONTRACTOR SHALL FURNISH AND INSTALL BACKBOX AT DEVICE LOCATION AND 1" CONDUIT ABOVE NEAREST ACCESSIBLE CEILING
KP	KEY PAD	
DC	DOOR CONTACT	
ES	ELECTRIC DOOR STRIKE	
LA	LOCAL DOOR ALARM	
MD	WALL MOUNTED MOTION DETECTOR	
MD	CEILING MOUNTED MOTION DETECTOR	
SP	CEILING MOUNTED PUBLIC ADDRESS SPEAKER	
CCTV	CLOSED CIRCUIT TELEVISION CAMERA	
HC	HANDICAP ACCESS PUSH BUTTON	
SCP	SECURITY CONTROL PANEL	CONTRACTOR SHALL PROVIDE 120V AT ALL MAIN SYSTEM PANEL LOCATIONS
IAP	INTRUSION ALARM PANEL	
INTP	MAIN VIDEO INTERCOM PANEL	REFER TO SPECIFICATIONS
IS	VIDEO INTERCOM STATION TALK/ACCESS	
VC	INTERCOM SPEAKER VOLUME CONTROL	
CO S	COMBINATION SMOKE DETECTOR/ CARBON MONOXIDE VISUAL ALARM FOR HEARING IMPAIRED. BRK MODEL SL177 OR EQUAL	
S	COMBINATION SMOKE DETECTOR/ VISUAL ALARM FOR HEARING IMPAIRED.	
H	COMBINATION HEAT DETECTOR/ VISUAL ALARM FOR HEARING IMPAIRED.	

GENERAL NOTES

1. ALL CONDUITS AND EQUIPMENT SHALL BE INSTALLED AND GROUND IN ACCORDANCE WITH THE LATEST RULES AND REGULATIONS OF THE APPLICABLE LOCAL AND NATIONAL CODES.
2. CONDUIT RUNS ARE SHOWN DIAGRAMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND STRUCTURAL CONDITIONS. EXPOSED CONDUITS SHALL BE INSTALLED PARRALEL TO BEAMS AND WALLS. EMPTY CONDUITS SHALL HAVE NYLON PULL LINE.
3. CONDUITS SHALL BE TERMINATED SO AS TO PERMIT NEAT CONNECTIONS TO MOTORS AND OTHER EQUIPMENT.
4. NO CONDUIT SMALLER THAN 3/4", NOR WIRE SIZE SMALLER THAN #12 A.W.G. FOR POWER SHALL BE USED UNLESS OTHERWISE NOTED.
5. THE WIRING DIAGRAMS, QUANTITY AND SIZE OF THE WIRES AND CONDUIT REPRESENT A SUGGESTED ARRANGEMENT BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS ACCEPTABLE TO THE CONSTRUCTION MANAGER MAY BE MADE BY THE CONTRACTOR TO ACCOMMODATE EQUIPMENT ACTUALLY PURCHASED. THE BASIC SEQUENCE AND METHOD OF CONTROL MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND/OR SPECIFICATIONS.
6. SWITCHES SHALL BE MOUNTED 4'-0" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED. RECEPTACLES SHALL BE MOUNTED 18" AFF.
7. ALL SURFACE MOUNTED PANELS AND PANELBOARDS ON THE INSIDE OF EXTERIOR WALLS ABOVE GRADE OR IN OTHER LOCATIONS CONSIDERED AS DAMP, SHALL BE MOUNTED SO AS TO MAINTAIN A 1/4" AIR SPACE BETWEEN THE ENCLOSURE AND THE WALL.
8. ALL PANELBOARDS SHALL BE MOUNTED SO THAT THE DISTANCE FROM THE TOP CIRCUIT BREAKER OPERATING HANDLE TO THE FLOOR SHALL NOT EXCEED 6'-6".
9. LIGHTING FIXTURES SHALL BE MOUNTED ACCORDING TO THE MOUNTING HEIGHT GIVEN ON THE INTERIOR ELEVATIONS. THE DISTANCE BEING MEASURED FROM THE BOTTOM OF THE LIGHTING FIXTURE TO THE FINISHED FLOOR.
10. FOR LOCATION OF HVAC, PLUMBING, FIRE PROTECTION, AND MISCELLANEOUS EQUIPMENT SEE RESPECTIVE TRADE DRAWINGS.
11. ALL CONDUIT RUNS CROSSING EXPANSION JOINTS SHALL HAVE EXPANSION OR EXPANSION AND DEFLECTION TYPE FITTINGS AS REQUIRED. FOR EXACT LOCATIONS OF EXPANSION JOINTS SEE STRUCTURAL DRAWINGS.
12. ALL MOTOR STARTER CONTROL TRANSFORMERS SHALL BE SIZED TO PROVIDE SUFFICIENT VOLT-AMPERE CAPACITY FOR OPERATING ALL ELECTRICAL DEVICES ASSOCIATED WITH CONTROL OF THE MOTOR, IN ADDITION TO THE STARTER COIL. IT SHALL INCLUDE RELAYS, TIMERS, MOTOR HEATERS, INDICATING LIGHTS, ETC.
13. CONDUIT AND WIRE (NOT SHOWN) FOR FIXTURES, SWITCHES AND/OR RECEPTACLES SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AND SHALL BE:
    a. 3/4" (MIN.) CONDUIT RUN.
    1. EXPOSED IN UNFINISHED AREAS.
    2. CONCEALED ABOVE HUNG CEILINGS AND IN WALLS IN FINISHED AREAS.
    b. NO.12 (MIN.) Cu WIRE (MIN.) TYPE "THWN/THWN" # OF WIRES AS REQUIRED.
14. FOR EQUIPMENT PAD CONSTRUCTION DETAILS SEE STRUCTURAL DRAWINGS.
15. ALL 120V BRANCH CIRCUITS GREATER THAN 100 LINEAR FEET SHALL BE #10AWG MIN.
16. THE ELECTRICAL CONTRACTOR SHALL PROVIDE LAYOUTS FOR ALL ELECTRICAL ROOMS BASED ON ACTUAL EQUIPMENT OF MANUFACTURER SELECTED, SUBMIT FOR REVIEW PRIOR TO INSTALLATION.
17. PROVIDE ELECTRICAL OUTLET PLATE GASKET SEALS AT RECEPTACLES, SWITCHES AND OTHER ELECTRICAL BOXES ON EXTERIOR WALLS AND ON INTERIOR WALLS BETWEEN CONDITIONED AND NON-CONDITIONED SPACES.
18. THE ELECTRICAL CONTRACTOR SHALL SUBMIT A PLAN FOR APPROVAL SHOWING 18. ALL ELECTRICAL TELEPHONE, SECURITY, FIRE ALARM COMMUNICATION AND OTHER SYSTEMS CONDUITS IN SLAB AND ABOVE CEILING ETC., COORDINATE WITH OTHER TRADES AND BUILDING'S STRUCTURE TO AVOID ANY CONFLICT.
19. ALL TERMINATION LUGS SHALL BE SIZED ACCORDINGLY TO ACCOMMODATE INDICATED CONDUCTORS.
20. THE ELECTRICAL CONTRACTOR SHALL SUBMIT PLANS FOR APPROVAL SHOWING ALL COMMUNICATIONS EQUIPMENT AND DEVICES THROUGHOUT THE BUILDING. THE ELECTRICAL CONTRACTOR SHALL ALSO LABEL AND IDENTIFY ALL CONDUITS THAT SERVE DIFFERENT SYSTEMS.
21. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL LIGHT FIXTURES.
22. COORDINATE LOCATIONS OF ALL LIGHT FIXTURES IN MECHANICAL AND ELECTRICAL ROOMS WITH LAYOUT OF EQUIPMENT, PIPING AND DUCTWORK.
23. ALL EXIT SIGNS SHALL BE UNSWITCHED.
24. ALL SWITCHED LIGHT FIXTURES CIRCUITED TO A NORMAL/EMERGENCY CIRCUIT ARE TO BE WIRED WITH AN EMERGENCY BY-PASS RELAY.
25. ALL 20 AMPERE, SINGLE POLE CIRCUITS SHALL BE PROVIDED WITH A SEPARATE FULL SIZE NEUTRAL CONDUCTOR.
26. CONFIRM EXACT POWER REQUIREMENTS AND CONNECTION LOCATIONS FOR ALL EQUIPMENT WITH THE PLUMBING, FIRE PROTECTION, HVAC AND GENERAL CONTRACTOR.
27. PROVIDE AN SOU KIT FOR ALL MECH EQUIPMENT RATED LESS THAN 1/2HP (TYP).
28. CERTAIN SYMBOLS IN THE SYMBOL LIST DO NOT APPEAR ELSEWHERE IN THE DRAWINGS, SUCH SYMBOLS ARE INCLUDED TO PERMIT INTERPRETATIONS TO BE MADE IN THE EVENT OF DESIGN CHANGES.
29. ELECTRICAL CONTRACTOR SHALL MAINTAIN RATING OF ANY CEILING, WALL, FLOOR OR ANY BUILDING STRUCTURE THAT ANY ELECTRICAL SYSTEM PENETRATES. SEE ARCHITECTURAL PLAN FOR RATINGS.
30. ELECTRICAL CONTRACTOR SHALL CONFIRM THAT ALL SUBMITTED LED DRIVERS ARE FCC COMPLIANT AND THAT ALL SUBMITTED LIGHTING FIXTURES ARE UL LISTED.

ABBREVIATIONS

ABBR	ABBREVIATIONS	L	LENGTH
A/AMP	AMPERE	LA	LIGHTNING ARRESTOR
AC	ALTERNATING CURRENT	LP	LIGHTING PANEL
A/C	AIR CONDITIONING	LTG	LIGHTING
AFF	ABOVE FINISHED FLOOR	LV	LOW VOLTAGE
AFG	ABOVE FINISHED GRADE		
ARCH	ARCHITECTURAL	M	METER
ATC	AUTOMATIC TEM



1 Electrical Level 1 Plan

Scale: 1/8"=1'-0"

ELECTRICAL NOTES:

1. LIMIT OF WORK LINE INDICATES THE APPROXIMATE AREA OF RENOVATION THAT ELECTRICAL SYSTEMS MAY BE RELOCATED OR REMOVED. SCOPE OF DEMOLITION SHOWN ON PLANS ARE PARTIAL ONLY FOR THE CONTRACTORS CONVENIENCE AND NOT INTENDED TO SHOW ALL EXISTING CONDITIONS. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS TO INCLUDE ALL NECESSARY WORK TO MODIFY AND EXTEND EXISTING SYSTEMS, WIRING, ETC. AS REQUIRED TO ACCOMMODATE THE NEW ARCHITECTURAL FLOOR PLAN.
2. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY AND CONFIRM EXISTING RACEWAY, WIRING, AND DEVICES, WITHIN SCOPE OF WORK, THAT SHALL BE REMOVED, REPLACED, OR RELOCATED FOR THE DEMOLITION / REMOVAL OF EXISTING WINDOWS AND THE INSTALLATION OF NEW WINDOWS. CONFIRM SCOPE WITH ARCH
3. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE 20' OF EXISTING, INACTIVE, RACEWAY AND CONDUCTORS FROM EXISTING WINDOW TO NEW 4"x4" JUNCTION BOX. CONFIRM LOCATION OF NEW JUNCTION BOX WITH ARCHITECT.
4. ANY ELECTRICAL SYSTEMS PASSING THROUGH OR CONTAINED WITHIN AREAS OF DEMOLITION AND CONSTRUCTION WHICH ARE TO REMAIN SHALL BE RE-ROUTED AS NECESSARY TO AVOID ANY CONFLICTS.
5. COORDINATE DEMOLITION WORK WITH OTHER SYSTEMS WITH ASSOCIATED ELECTRICAL WORK WITH OTHER TRADES AND THE ARCHITECT PRIOR TO DEMOLITION.
6. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ANY NECESSARY RE-FEEDING OF EQUIPMENT OR DEVICES TO MAINTAIN CIRCUIT CONTINUITY OF EXISTING EQUIPMENT REMAINING.
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8. PROVIDE BLANK PLATES AT EXISTING WALLS FOR UNUSED OUTLETS. UNUSED SWITCH LOCATIONS SHALL BE PATCHED BY GENERAL CONTRACTOR. COORDINATE BLANK PLATE COLOR WITH ARCHITECT.
9. COORDINATE DE-ENERGIZATION OF ANY BASE BUILDING SYSTEMS WITH SCHOOL FACILITIES.
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12. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND RECONNECT ANY ELECTRICAL SYSTEMS CURRENTLY SERVING ACTIVE WINDOW MECHANICAL UNITS. CONFIRM & COORDINATE WITH MECHANICAL CONTRACTOR
13. ALL SURFACE MOUNTED RACEWAY AND BACK BOXES SHALL BE GALVANIZED RIGID STEEL.

A Exterior Lobby Door #2

Scale: None

CONSULTANTS:

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PROJECT:

LYMAN B. GOFF MIDDLE SCHOOL WINDOW REPLACEMENT

974 NEWPORT AVE.
PAWTUCKET, RI 02861

CLIENT:

PAWTUCKET SCHOOL DEPARTMENT

286 MAIN ST.
PAWTUCKET, RI 02860

PROFESSIONAL

MARK	DATE	DESCRIPTION
	12-12-22	BID SET
ISSUE:		

PROJECT NO.:	22120
DRAWN BY:	PMG
CHECKED BY:	SJ
DRAWING SCALE:	AS NOTED

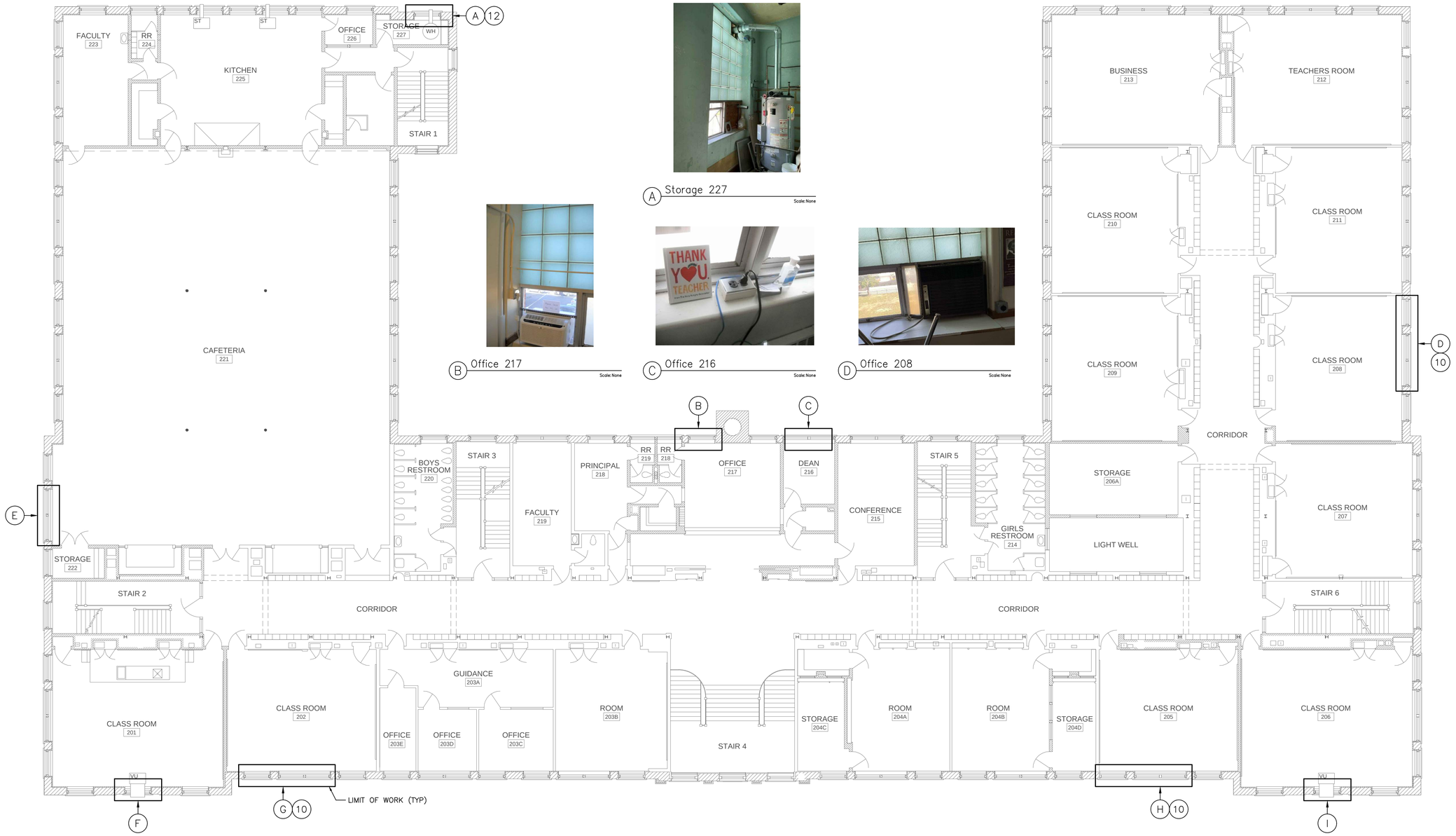
SHEET TITLE:

ELECTRICAL LEVEL 1 POWER FLOOR PLAN

SHEET:

E-1.0

DO NOT SCALE DRAWING



A Storage 227
Scale: None

B Office 217
Scale: None

C Office 216
Scale: None

D Office 208
Scale: None

1 Electrical Level 2 Plan

Scale: 1/8"=1'-0"

ELECTRICAL NOTES:

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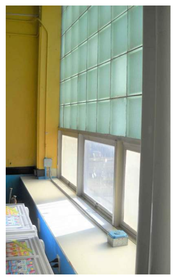
13. ALL SURFACE MOUNTED RACEWAY AND BACK BOXES SHALL BE GALVANIZED RIGID STEEL.



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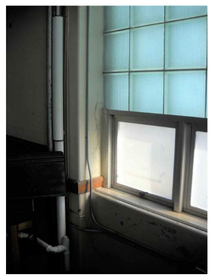

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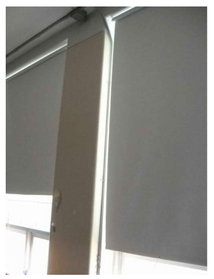

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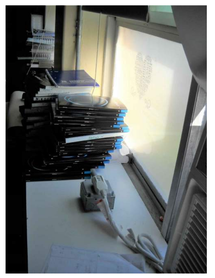

H Classroom 205
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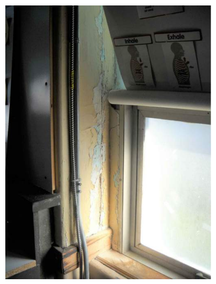

I Classroom 206
Scale: None

CONSULTANTS:

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PROJECT:

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CLIENT:

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286 MAIN ST.
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PROFESSIONAL

MARK	DATE	DESCRIPTION
ISSUE:	12-12-22	BID SET

PROJECT NO.:	22120
DRAWN BY:	PMG
CHECKED BY:	SJ
DRAWING SCALE:	AS NOTED

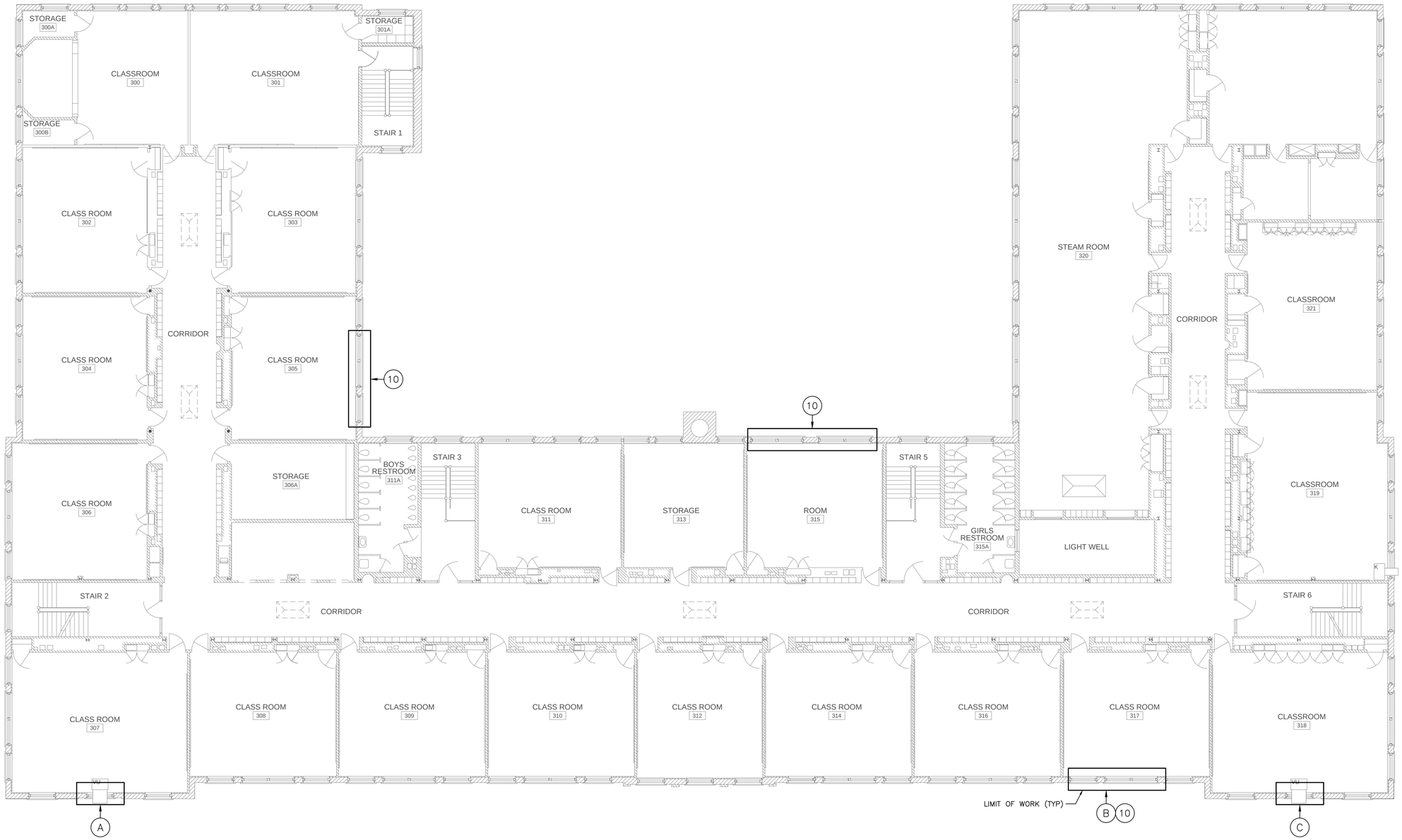
SHEET TITLE:

ELECTRICAL LEVEL 2 POWER FLOOR PLAN

SHEET:

E-1.1

DO NOT SCALE DRAWING



1 Electrical Level 3 Plan

Scale: 1/8"=1'-0"

ELECTRICAL NOTES:

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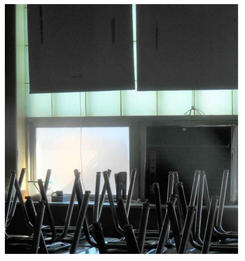
A Classroom 307
Scale: None



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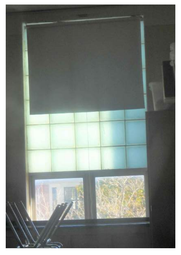

C Classroom 318
Scale: None

CONSULTANTS:

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PROFESSIONAL

MARK	DATE	DESCRIPTION
ISSUE:	12-12-22	BID SET

PROJECT NO.:	22120
DRAWN BY:	PMG
CHECKED BY:	SJ
DRAWING SCALE:	AS NOTED

SHEET TITLE:

ELECTRICAL LEVEL 3 POWER FLOOR PLAN

SHEET:

E-1.2

DO NOT SCALE DRAWING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. ALL OF THE CONTRACT DOCUMENTS, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISIONS 1 GENERAL REQUIREMENTS, APPLY TO THE WORK OF THIS SECTION.

B. EXAMINE ALL DRAWINGS AND ALL OTHER SECTIONS OF THE SPECIFICATIONS FOR REQUIREMENTS AFFECTING THE WORK OF THIS SECTION.

1.2 SCOPE

A. PROVIDE ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT FOR THE INSTALLATION OF THE COMPLETE AND FULLY OPERATIONAL ELECTRICAL SYSTEM AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN.

B. THE WORK INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

1. FEEDERS, BRANCH CIRCUIT WIRING AND RACEWAYS.
2. CONDUIT, WIRE, BOXES, FITTINGS, HANGERS AND SUPPORTS.
3. SWITCHES, RECEPTACLES, SPECIAL PURPOSE OUTLETS AND WALL PLATES.
4. SAFETY DISCONNECTS SWITCHES, NON–FUSED AND FUSED WITH FUSES.
5. SYSTEM GROUNDING.
6. POWER CONNECTIONS TO ALL PLUMBING, MECHANICAL, AND ALL OTHER EQUIPMENT
7. NAMEPLATES ON ALL MAJOR ELECTRICAL EQUIPMENT AND COMPONENTS.
8. DATA, COMPUTER AND TELEPHONE DUPLEX BOXES WITH PULL STRING TO TELEPHONE BACKBOARD.
9. SEAL PENETRATIONS BETWEEN FOUNDATION FLOORS AND WALLS WITH FIRE RETARDANT MATERIAL.
10. SEAL ALL CABLES AND CONDUITS FOR WATER/MOISTURE PENETRATION USING OZ GEDNEY PRODUCTS. REFER TO RACEWAYS SECTION FOR DETAIL.
11. OBTAIN ALL PERMITS AND ASSOCIATED FEES.
12. TESTING OF ALL ELECTRICAL SYSTEMS.
13. ACCESS PANELS (FURNISH ONLY).
14. COORDINATION BETWEEN ELECTRICAL AND OTHER TRADES.

1.3 DEFINITIONS

A. AS USED IN THIS SECTION, PROVIDE MEANS FURNISH AND INSTALL AND POS MEANS PROVIDED UNDER OTHER SECTIONS.

B. AS USED IN THE DRAWINGS AND SPECIFICATIONS FOR ELECTRICAL WORK, CERTAIN NON_TECHNICAL WORDS SHALL BE UNDERSTOOD TO HAVE SPECIFIC MEANINGS AS FOLLOWS REGARDLESS OF INDICATIONS TO THE CONTRARY IN THE GENERAL CONDITIONS OR OTHER DOCUMENTS GOVERNING THE ELECTRICAL WORK:

FURNISH PURCHASE AND DELIVER TO THE PROJECT SITE COMPLETE WITH EVERY NECESSARY APPURTENANCE AND SUPPORT, ALL AS PART OF THIS WORK. PURCHASING SHALL INCLUDE PAYMENT OF ALL SALES TAXES AND OTHER SURCHARGES AS MAY BE REQUIRED TO ASSURE THAT PURCHASED ITEMS ARE FREE OF ALL LIENS, CLAIMS OR ENCUMBRANCES.

INSTALL UNLOAD AT THE DELIVERY POINT AT THE SITE AND PERFORM EVERY OPERATION NECESSARY TO ESTABLISH SECURE MOUNTING AND CORRECT OPERATION AT THE PROPER LOCATION IN THE PROJECT, ALL AS PART OF THIS WORK

PROVIDE FURNISH AND INSTALL.

NEW MANUFACTURED WITHIN THE PAST TWO YEARS AND NEVER BEFORE USED.

C. EXCEPT WHERE MODIFIED BY A SPECIFIC NOTATION TO THE CONTRARY, IT SHALL BE UNDERSTOOD THAT THE INDICATION AND/OR DESCRIPTION OF ANY ELECTRICAL ITEM IN THE DRAWINGS OR SPECIFICATIONS FOR ELECTRICAL WORK CARRIES WITH IT THE INSTRUCTION TO FURNISH, INSTALL AND CONNECT THE ITEM AS PART OF THE ELECTRICAL WORK, REGARDLESS OF WHETHER OR NOT THIS INSTRUCTION IS EXPLICITLY STATED.

D. IT SHALL BE UNDERSTOOD THAT THE SPECIFICATIONS AND DRAWINGS FOR ELECTRICAL WORK ARE COMPLIMENTARY AND ARE TO BE TAKEN TOGETHER FOR A COMPLETE INTERPRETATION OF THE ELECTRICAL WORK EXCEPT THAT INDICATIONS ON THE DRAWINGS, WHICH REFER TO AN INDIVIDUAL ELEMENT OF WORK, TAKE PRECEDENCE OVER THE SPECIFICATIONS WHERE THEY CONFLICT WITH SAME.

1.4 WORK BY OTHERS

A. THE FOLLOWING IS RELATED WORK SPECIFIED ELSEWHERE:

1. HVAC EQUIPMENT INCLUDING PROVIDING INDIVIDUAL MOTOR STARTERS, ADJUSTABLE FREQUENCY DRIVES, CONTROL WIRING, VARIABLE SPEED SWITCHES AND DEVICES SHALL BE PROVIDED BY HVAC CONTRACTOR.
2. TELEPHONE/COMPUTER/DATA ALONG WITH WIRING, DEVICES AND FINAL TERMINATIONS BY OWNERS' COMMUNICATIONS VENDOR.
3. TEMPERATURE CONTROL WIRING BY HVAC CONTRACTOR.
4. CHARGES FOR POWER CONSUMED BY THE TEMPORARY LIGHT AND POWER SYSTEM FOR CONSTRUCTION WILL BE PAID BY THE GENERAL CONTRACTOR.
5. ACCESS PANELS, WHERE REQUIRED, ARE FURNISHED BY THE GENERAL CONTRACTOR AND COORDINATED WITH THIS SECTION.
6. ALL DUCT SMOKE DETECTORS SHALL BE SUPPLIED BY THE ELECTRICAL CONTRACTOR AND INSTALLED BY THE MECHANICAL CONTRACTOR, WIRED TO THE FIRE ALARM SYSTEM BY THE ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL INCLUDE REMOTE TEST PANELS.

1.5 CODES, PERMITS & STANDARDS

A. PROVIDE ALL PERMITS AND LICENSES, OBTAIN AND PAY ALL CERTIFICATES OF INSPECTION AS REQUIRED BY REGULATORY AGENCIES AND SUBMIT FOR APPROVAL.

B. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND DESIGNED, CONSTRUCTED, INSTALLED AND TESTED IN ACCORDANCE WITH THE SPECIFICATION AND THE FOLLOWING STANDARDS:

1. RHODE ISLAND ELECTRICAL CODE (NEC).
2. NATIONAL ELECTRICAL CODE (NEC)
3. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
4. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
5. UNDERWRITERS LABORATORY (UL)
6. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
7. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
8. AMERICANS WITH DISABILITIES ACT (ADA)
9. NATIONAL ELECTRIC SAFETY CODE (NESC)
10. NEC ARTICLE 110 – FLASH PROTECTION
11. RHODE ISLAND BUILDING CODE
12. INTERNATIONAL BUILDING CODE (IBC)

1.6 PROTECTION AND CLEANING

A. ALL ELECTRICAL EQUIPMENT AND DEVICES IN THE EXISTING BUILDING IN WHICH THE ELECTRICAL WORK IS TO BE DONE UNDER CONTRACT, SHALL BE PROTECTED FROM SCRATCHES, PAINT, CEMENT, ETC. UNTIL THE WORK IS COMPLETED.

B. WHERE ELECTRICAL EQUIPMENT AND/OR DEVICES ARE INDICATED TO BE ABANDONED AND THE OWNER ELECTS TO SALVAGE SPECIFIC ITEMS, SAID ITEMS SHOULD BE DELIVERED TO STORAGE ON SITE AT A LOCATION DESIGNATED BY THE OWNER.

C. EXPOSED SURFACES OF ELECTRICAL EQUIPMENT & LIGHTING FIXTURES SHALL BE CLEANED UPON COMPLETION OF THE WORK.

D. ALL DEBRIS AND MATERIAL RESULTING FROM ELECTRICAL WORK SHALL BE REMOVED FROM THE PROPERTY EACH AND EVERY DAY AND SHALL BE DISPOSED OF IN A LEGAL MANNER. WORKSPACE SHALL BE LEFT CLEAN AS ELECTRICAL WORK IS COMPLETED.

E. DAMAGES TO COVERS AND TRIMS OF ELECTRICAL EQUIPMENT SHALL BE REPAIRED AND PAINTED WITH TOUCH–UP PAINT SUPPLIED BY THE EQUIPMENT MANUFACTURER TO THE SATISFACTION OF THE OWNER'S DESIGNATED REPRESENTATIVE OR THE ARCHITECT OR THE EQUIPMENT SHALL BE REPLACED WITH NEW.

1.7 INTERPRETATION OF PLANS

A. ALL WORK SHOWN ON THE PLANS IS INTENDED TO BE APPROXIMATELY CORRECT TO SCALE BUT FIGURED DIMENSIONS AND DETAILED DRAWINGS ARE TO BE FOLLOWED IN EVERY CASE. THE DRAWINGS SHALL BE TAKEN AS DIAGRAMMATIC. RACEWAYS, WIRING AND GENERAL METHODS OF ROUTING ARE SHOWN BUT IS NOT INTENDED TO SHOW EVERY OFFSET AND FITTING NOR EVERY STRUCTURAL DIFFICULTY THAT MAY BE ENCOUNTERED. TO CARRY OUT THE TRUE INTENT AND PURPOSES OF THE PLANS, SUPPLY AND INSTALL ALL COMPONENTS NECESSARY TO PROVIDE COMPLETE WORKING SYSTEMS, READY FOR USE WITH NO ADDITIONAL COST TO THE OWNER.

1.8 SHOP DRAWINGS

A. DEFINITIONS

1. SHOP DRAWINGS ARE INFORMATION PREPARED BY THE CONTRACTOR TO ILLUSTRATE PORTIONS OF THE WORK IN MORE DETAIL THAN SHOWN IN THE CONTRACT DOCUMENTS.
2. COORDINATION DRAWINGS ARE DETAILED, LARGE–SCALE LAYOUT SHOP DRAWINGS SHOWING HVAC, ELECTRICAL, PLUMBING AND FIRE PROTECTION WORK SUPERIMPOSED IN ORDER TO IDENTIFY CONFLICTS AND ENSURE INTER–COORDINATION OF MECHANICAL, ELECTRICAL, ARCHITECTURAL, STRUCTURAL AND OTHER WORK

B. SUBMITTAL COVER SHEET

1. SHOP DRAWINGS SHALL BE SUBMITTED ACCORDING TO SPECIFICATION SECTION WITH A SEPARATE COVER SHEET COMPLETED FOR EACH PRODUCT, RATHER THAN ONE COVER SHEET FOR MULTIPLE PRODUCTS, WHETHER OR NOT SUPPLIED BY ONE MANUFACTURER OR VENDOR.

C. SUBMITTAL PROCEDURES AND FORMAT

1. REVIEW SUBMITTAL PACKAGES FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND THEN SUBMIT TO ARCHITECT FOR REVIEW.

2. PROVIDE ADDITIONAL COPIES OF REVIEWED SHOP DRAWINGS AS REQUIRED FOR FULL DISTRIBUTION.

3. SHOP DRAWINGS SHOWING LAYOUTS OF SYSTEMS SHALL CONTAIN SUFFICIENT PLANS, ELEVATIONS, SECTIONS, DETAILS AND SCHEMATICS TO DESCRIBE WORK CLEARLY. THEY SHALL BE ¾" = 1'–0? SCALE UNLESS SPECIFIED OTHERWISE. SHEET METAL SHOP DRAWINGS SHALL BE 3/8? = 1' –0 AND SHALL INDICATE WORK OF OTHER SECTIONS WHERE INTERFERENCES ARE POSSIBLE. PROVIDE LARGER SCALE DETAILS AS NECESSARY. SHEET METAL DRAWINGS SHALL SHOW ELEMENTS OF ARCHITECTS REFLECTED CEILING PLAN, EXPOSED DUCTWORK, WALLS AND PARTITIONS, DIFFUSERS, REGISTERS, GRILLES, FIRE DAMPERS, SLEEVES AND OTHER ASPECTS OF CONSTRUCTION AS NECESSARY FOR COORDINATION.

4. ALL FIREWALLS AND SMOKE PARTIONS MUST BE HIGHLIGHTED ON THE SHEET METAL DRAWINGS FOR APPROPRIATE COORDINATION.

5. SHOP DRAWINGS SHOWING MANUFACTURER'S PRODUCT DATA SHALL CONTAIN DETAILED DIMENSIONAL DRAWINGS, ACCURATE AND COMPLETE DESCRIPTION OF CONSTRUCTION MATERIALS, MANUFACTURER'S PUBLISHED PERFORMANCE CHARACTERISTICS AND CAPACITY RATINGS (PERFORMANCE DATA, ALONE, IS NOT ACCEPTABLE), ELECTRICAL REQUIREMENTS AND WIRING DIAGRAMS. DRAWINGS SHALL CLEARLY INDICATE LOCATION (TERMINAL BLOCK OR WIRE NUMBER), VOLTAGE AND FUNCTION FOR ALL FIELD TERMINATIONS, AND OTHER INFORMATION NECESSARY TO DEMONSTRATE COMPLIANCE WITH ALL REQUIREMENTS OF CONTRACT DOCUMENTS.

D. ACCEPTABLE MANUFACTURERS

1. ALTERNATE MANUFACTURERS ARE ACCEPTABLE ONLY IF, AS A MINIMUM, THEY:

A. MEET ALL PERFORMANCE CRITERIA LISTED IN THE SCHEDULES AND OUTLINED IN THE SPECIFICATION.

B. HAVE IDENTICAL OPERATING CHARACTERISTICS TO THOSE CALLED FOR IN THE SPECIFICATION.

C. FIT WITHIN THE AVAILABLE SPACE IT WAS DESIGNED FOR, INCLUDING SPACE FOR MAINTENANCE AND COMPONENT REMOVAL, WITH NO MODIFICATION TO EITHER SPACE OR THE PRODUCT. CLEARANCES TO WALLS, CEILINGS AND OTHER EQUIPMENT SHALL BE AT LEAST EQUAL TO THOSE SHOWN ON THE DESIGN DRAWINGS.

D. FOR ROOFTOP MOUNTED EQUIPMENT AND FOR EQUIPMENT MOUNTED IN AREAS WHERE STRUCTURAL MATTERS ARE A CONSIDERATION, THE PRODUCTS MUST HAVE A WEIGHT NO GREATER THAN THE PRODUCT LISTED IN THE SCHEDULES OR SPECIFICATIONS.

E. PRODUCTS MUST ADHERE TO ALL ARCHITECTURAL CONSIDERATIONS INCLUDING, BUT NOT LIMITED TO: BEING OF THE SAME COLOR AS THE PRODUCT SCHEDULED OR SPECIFIED, FITTING WITHIN ARCHITECTURAL ENCLOSURES AND DETAILS, AND FOR DIFFUSERS, LIGHTING AND PLUMBING FIXTURES–BEING THE SAME SIZE AND OF THE SAME PHYSICAL APPEARANCE AS SCHEDULE OR SPECIFIED PRODUCTS.

E. DEVIATIONS

1. CONCERNING DEVIATIONS OTHER THAN SUBSTITUTIONS, PROPOSED DEVIATIONS FROM CONTRACT DOCUMENTS SHALL BE REQUESTED INDIVIDUALLY IN WRITING WHETHER DEVIATIONS RESULT FROM FIELD CONDITIONS, STANDARD SHOP PRACTICE, OR OTHER CAUSE. SUBMIT LETTER WITH TRANSMITTAL OF SHOP DRAWINGS, WHICH FLAGS THE DEVIATION TO THE ATTENTION OF THE ARCHITECT.

2. WITHOUT LETTERS FLAGGING THE DEVIATION TO THE ARCHITECT, IT IS POSSIBLE THAT THE ARCHITECT MAY NOT NOTICE SUCH DEVIATION OR MAY NOT REALIZE ITS RAMIFICATIONS. THEREFORE, IF SUCH LETTERS ARE NOT SUBMITTED TO THE ARCHITECT, THE CONTRACTOR SHALL HOLD THE ARCHITECT AND HIS CONSULTANTS HARMLESS FOR ANY AND ALL ADVERSE CONSEQUENCES RESULTING FROM THE DEVIATIONS BEING IMPLEMENTED. THIS SHALL APPLY REGARDLESS OF WHETHER THE ARCHITECT HAS REVIEWED OR APPROVED SHOP DRAWINGS CONTAINING THE DEVIATION, AND WILL BE STRICTLY ENFORCED.

3. APPROVAL OF PROPOSED DEVIATIONS, IF ANY, WILL BE MADE AT THE DISCRETION OF THE ARCHITECT.

F. RESPONSIBILITY

1. INTENT OF SUBMITTAL REVIEW IS TO CHECK FOR CAPACITY, RATING, AND CERTAIN CONSTRUCTION FEATURES. CONTRACTOR SHALL ENSURE THAT WORK MEETS REQUIREMENTS OF CONTRACT DOCUMENTS REGARDING INFORMATION THAT PERTAINS TO FABRICATION PROCESSES OR MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION; AND FOR COORDINATION OF WORK OF THIS AND OTHER SECTIONS. WORK SHALL COMPLY WITH SUBMITTALS MARKED ?REVIEWED? TO EXTENT THAT THEY AGREE WITH CONTRACT DOCUMENTS. SUBMITTAL REVIEW SHALL NOT DIMINISH RESPONSIBILITY UNDER THIS CONTRACT FOR DIMENSIONAL COORDINATION, QUANTITIES, INSTALLATION, WIRING, SUPPORTS AND ACCESS FOR SERVICE, NOR SHOP DRAWING ERRORS OR DEVIATIONS FROM REQUIREMENTS OF CONTRACT DOCUMENTS. THE ARCHITECT'S NOTING OF SOME ERRORS WHILE OVERLOOKING OTHERS WILL NOT EXCUSE THE CONTRACTOR FROM PROCEEDING IN ERROR. CONTRACT DOCUMENTS REQUIREMENTS ARE NOT LIMITED, WAIVED NOR SUPERSEDED IN ANY WAY BY REVIEW.

2. INFORM SUBCONTRACTORS, MANUFACURERS, SUPPLIERS, ETC. OF SCOPE AND LIMITED NATURE OF REVIEW PROCESS AND ENFORCE COMPLIANCE WITH CONTRACT DOCUMENTS.

3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL DRAWINGS AND SPECIFICATIONS THOROUGHLY DURING BID PROCESS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT VIA RFI (REQUEST FOR INFORMATION) IF ANY CONFLICTS ARISE, FAILURE TO IDENTIFY THE DISCREPANCIES DURING THE BID PROCESS SHALL DISQUALIFY THE CONTRACTOR FOR CLAIMING ANY ADDITIONAL COMPENSATION.

4. SHOP DRAWINGS FOR ENTIRE DISTRIBUTION SYSTEM WILL NOT BE SUBMITTED UNTIL AFTER THE COMPLETION OF THE SHORT CIRCUIT STUDY. EQUIPMENT AIC RATING SHALL MATCH WITH THE RESULTS OF THE STUDY. SERIES RATING OF DEVICES WILL NOT BE ACCEPTED.

G. SCHEDULE: INCORPORATE SHOP DRAWING REVIEW PERIOD INTO CONSTRUCTION SCHEDULE SO THAT WORK IS NOT DELAYED. CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR DELAYS CAUSED BY NOT INCORPORATING THE FOLLOWING SHOP DRAWING REVIEW TIME REQUIREMENTS INTO HIS PROJECT SCHEDULE. WORKING DAYS LISTED REFERENCE THE TIME IN THE ENGINEER'S OFFICE. IT DOES NOT INCLUDE TRANSMITTAL TIME FOR REVIEW EACH TIME SHOP DRAWING IS SUBMITTED OR RESUBMITTED.

H. LIST OF PROPOSED EQUIPMENT AND MATERIALS

1. WITHIN FOUR WEEKS AFTER AWARD OF CONTRACT AND BEFORE ORDERING MATERIALS OR EQUIPMENT, SUBMIT COMPLETE LIST OF PROPOSED MATERIALS AND EQUIPMENT AND INDICATE MANUFACTURER'S NAMES AND ADDRESSES. NO CONSIDERATION WILL BE GIVEN TO PARTIAL LISTS SUBMITTED OUT OF SEQUENCE.

I. SUBMIT SHOP DRAWINGS IN PDF FORMAT AND ELECTRONICALLY FOR THE FOLLOWING:

1. PANELBOARDS
2. LOAD CENTERS
3. CIRCUIT BREAKERS AND ENCLOSURES
4. SWITCHBOARD
5. DISCONNECT SWITCHES
6. CONDUIT, WIRE, FEEDERS, CABLES AND BRANCH CIRCUIT WIRING
7. MANUAL MOTOR STARTERS
8. WIRE WAYS, OUTLET BOXES, COVERS
9. SWITCHES, RECEPTACLES, SPECIAL PURPOSE DEVICES AND PLATES
10. LIGHTING FIXTURES AND LAMPS
11. FIRE ALARM SYSTEM (ADDRESSABLE)
12. APARTMENT ENTRY SYSTEM
13. SHORT–CIRCUIT ANALYSIS
14. PROTECTIVE DEVICE TIME CURRENT COORDINATION ANALYSIS
15. ARC FLASH HAZARD ANALYSIS.

1.9 SUBMITTAL DOCUMENTATION REQUIREMENTS

A. FURNISH DOCUMENTATION ASSOCIATED WITH THIS BID PROPOSAL AND CONTRACT INCLUDING SUBMITTALS, SHOP DRAWINGS, O&M MANUALS, AND TEST REPORTS AS FOLLOWS. THESE REQUIREMENTS ARE IN ADDITION TO SUBMITTAL REQUIREMENTS STATED ELSEWHERE AND SHALL NOT DEPRIVE THE OWNER OF RIGHTS UNDER OTHER PROVISIONS OF THE CONTRACT DOCUMENTS.

1. SUBMIT SIX (6) HARD COPIES OF DOCUMENTATION FOR REVIEW.
2. SUBMIT DOCUMENTS IN PORTABLE DOCUMENT FORMAT (PDF).
3. SUBMIT DOCUMENTS IN AUTOCAD – LATEST VERSION FOR DRAWINGS AND MICROSOFT WORD (LATEST VERSION) FOR TEXT FORMAT WHEN REQUESTED.

B. PROVIDE A COMPLIANCE REVIEW OF EACH SECTION OF THE SPECIFICATIONS, DRAWINGS AND ADDENDA. THE COMPLIANCE REVIEW SHALL BE A PARAGRAPH–BY–PARAGRAPH REVIEW OF THE SPECIFICATIONS WITH THE FOLLOWING INFORMATION; ?C?, ?D? OR ?E? MARKED IN THE MARGIN OF THE ORIGINAL SPECIFICATIONS AND ANY SUBSEQUENT ADDENDA.

1. ?C?: COMPLY WITH NO EXCEPTIONS.
2. ?D?: COMPLY WITH DEVIATIONS. FOR EACH AND EVERY DEVIATION, PROVIDE A NUMBERED FOOTNOTE WITH REASONS FOR THE PROPOSED DEVIATION AND HOW THE INTENT OF THE SPECIFICATION CAN BE SATISFIED.
3. ?E?: EXCEPTION, DO NOT COMPLY. FOR EACH AND EVERY EXCEPTION, PROVIDE A NUMBERED FOOTNOTE WITH REASONS AND POSSIBLE ALTERNATIVES.

C. UNLESS A DEVIATION OR EXCEPTION IS SPECIFICALLY NOTED IN THE COMPLIANCE REVIEW, IT IS ASSUMED THAT THE BIDDER IS IN COMPLETE COMPLIANCE WITH THE PLANS AND SPECIFICATIONS. DEVIATIONS OR EXCEPTIONS TAKEN IN COVER LETTERS, SUBSIDIARY DOCUMENTS, BY OMISSION OR BY CONTRADICTION DO NOT RELEASE THE BIDDER FROM BEING IN COMPLETE COMPLIANCE, UNLESS THE EXCEPTION OR DEVIATION HAS BEEN SPECIFICALLY NOTED IN THE COMPLIANCE REVIEW. BIDDERS MAY SUBMIT THE LATEST STATE–OF–THE–ART COMPONENTS AND THEIR STANDARD CONTROL COMPONENTS IN LIEU OF THE SPECIFIED ITEMS. THE A/E AND OWNER WILL REVIEW DEVIATIONS FROM THE SPECIFICATIONS.

1.10 CONTINUITY OF SERVICES

A. WORK UNDER THIS SECTION INCLUDES NEW WORK AND WORK ON EXISTING SYSTEMS WITHIN EXISTING BUILDING. PERFORM SUCH WORK SO AS NOT TO INTERFERE WITH THE OWNERS OPERATION. WHERE WORK NECESSITATES INTERRUPTION OF SERVICE(S), SCHEDULE OUTAGES WITH THE OWNER AND ENGINEER AND PERFORM THE WORK AT SUCH TIME(S) AS THEY SHALL DIRECT.

1.11 RECORD DRAWINGS

A. FOR THE DURATION OF THE CONTRACT THE ELECTRICAL CONTRACTOR SHALL MAINTAIN A COMPLETE SET OF CONTRACT DRAWINGS. ALL COMPLETED WORK AND ALL DEVIATIONS FROM THE CONTRACT DOCUMENTS SHALL BE RECORDED CLEARLY AND ACCURATELY. RECORD DRAWINGS SHALL BE TURNED OVER TO THE OWNER UPON COMPLETION OF THE WORK.

B. ELECTRONIC FILES ARE AVAILABLE TO FACILITATE THE PREPARATION OF RECORD DRAWINGS. THESE FILES ARE SOLELY FOR USE OF THE ELECTRICAL CONTRACTOR AND MAY NOT BE A FULL REPRESENTATION OF THE SCOPE OF WORK. THESE FILES ARE AVAILABLE FROM WOZNY/BARBAR & ASSOCIATES, INC. AT A COST OF $50.00 PER DRAWING FILE.

1.12 COORDINATION

A. IT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO COORDINATE WITH ALL OTHER TRADES AND PARTIES TO AVOID CONFLICTS. NO ADDITIONAL CHARGES WILL BE APPROVED DUE TO LACK OF COORDINATION OR FIELD VERIFICATION OF THE EXISTING CONDITIONS.

1.13 TEMPORARY FACILITIES

A. THE ELECTRICAL CONTRACTOR SHALL PROVIDE, AT HIS OWN EXPENSE, HIS OWN FIELD OFFICE, FURNISH ALL TOOLS, EQUIPMENT, SCAFFOLDING AND TEMPORARY CONSTRUCTION REQUIRED FOR THE EXECUTION OF THE ELECTRICAL WORK.

D. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR, THE UTILITY COMPANY AND INCLUDE ALL COSTS ASSOCIATED WITH THE INSTALLATION OF TELEPHONES FOR THE CONSTRUCTION PERIOD. INCLUDE TELEPHONE SERVICE FOR ALL CONSTRUCTION TRAILERS.

1.14 COORDINATION DRAWINGS

A. BEFORE MATERIALS ARE PURCHASED OR WORK BEGUN, THE ELECTRICAL CONTRACTOR SHALL PREPARE COORDINATION DRAWINGS SHOWING THE SIZE AND LOCATION OF ELECTRICAL EQUIPMENT AND CONDUIT RUNS AND OTHER EQUIPMENT RELATED TO THE ELECTRICAL WORK.

B. COORDINATION DRAWINGS ARE FOR THE GENERAL CONTRACTOR'S AND THE ENGINEER'S USE DURING CONSTRUCTION AND SHALL NOT BE CONSTRUED AS REPLACING ANY SHOP, AS BUILT OR RECORD DRAWINGS REQUIRED ELSEWHERE IN THIS CONTRACT DOCUMENT.

1.15 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

A. INSTRUCT TO THE OWNER'S SATISFACTION SUCH PERSONS AS THE OWNER DESIGNATES, IN THE PROPER OPERATION AND MAINTENANCE OF THE SYSTEMS AND THEIR PARTS.

B. FURNISH OPERATING AND MAINTENANCE MANUALS AND FORWARD SAME TO THE ENGINEER FOR TRANSMITTAL TO THE OWNER.

C. OPERATING INSTRUCTIONS SHALL BE SPECIFIC FOR EACH SYSTEM AND SHALL INCLUDE COPIES OF POSTED SPECIFIC INSTRUCTIONS.

D. FOR MAINTENANCE PURPOSES, PROVIDE SHOP DRAWINGS, PARTS LISTS, SPECIFICATIONS AND MANUFACTURER'S MAINTENANCE BULLETINS FOR EACH PIECE OF EQUIPMENT.

E. PROVIDE NAME, ADDRESS AND TELEPHONE NUMBER OF THE MANUFACTURER'S REPRESENTATIVE AND SERVICE COMPANY FOR EACH PIECE OF EQUIPMENT SO THAT SERVICE OR SPARE PARTS CAN BE READILY OBTAINED.

1.16 WORKMANSHIP

A. THE ENTIRE WORK INSTALLED IN THIS SPECIFICATION AND AS SHOWN ON THE DRAWINGS SHALL BE CONSTRUCTED AND FINISHED IN EVERY RESPECT IN A WORKMANLIKE AND COMPLETE MANNER. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO INSTALL COMPLETE SYSTEMS. ALL SUCH PARTS AS REQUIRED COMPLETING THE SYSTEMS IN ACCORDANCE WITH THE BEST TRADE PRACTICE AND THE SATISFACTION OF THE OWNER'S ENGINEER SHALL BE INSTALLED.

B. OBTAIN DETAILED INFORMATION FROM THE MANUFACTURERS OF APPARATUS AS TO THE PROPER METHOD OF INSTALLING AND CONNECTING EQUIPMENT. OBTAIN ALL INFORMATION FROM THE GENERAL CONTRACTOR AND OTHER SUBCONTRACTORS, WHICH MAY BE NECESSARY TO FACILITATE WORK AND THE COMPLETION OF THE WHOLE PROJECT.

C. REMOVE DAILY, ALL RUBBISH AND DEBRIS AND ALL REFUSE FROM WORKMEN'S LUNCHES AND AT COMPLETION REMOVE ALL HIS SURPLUS MATERIALS, AND LEAVE IN CLEAN CONDITION ACCEPTABLE TO THE OWNER'S ENGINEER.

1.17 PROTECTION

A. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR HIS WORK AND EQUIPMENT UNTIL FINALLY INSPECTED, TESTED AND ACCEPTED. CAREFULLY STORE MATERIALS AND EQUIPMENT, WHICH ARE NOT IMMEDIATELY INSTALLED AFTER DELIVERY TO SITE.

1.18 EXAMINATION OF SITE AND CONTRACT DOCUMENTS

A. BEFORE SUBMITTING PRICES OR BEGINNING WORK, THOROUGHLY MAKE AN EXAMINATION OF THE SITE.

B. NO CLAIM FOR EXTRA COMPENSATION WILL BE RECOGNIZED IF DIFFICULTIES ARE ENCOUNTERED WHICH AN EXAMINATION OF SITE CONDITIONS PRIOR TO EXECUTING CONTRACT WOULD HAVE REVEALED.

C. THESE SPECIFICATIONS ALONG WITH CONTRACT DOCUMENTS DESCRIBE THE ELECTRICAL SYSTEMS. THE ELECTRICAL CONTRACTOR IS REQUIRED TO PROVIDE COMPLETE AND OPERATING SYSTEMS FOR ALL EQUIPMENT MENTIONED.

D. ELECTRICAL EQUIPMENT REQUIRED FOR THE SUCCESSFUL OPERATION OF ANY OF THE PARTICULAR TYPES OF OWNER'S EQUIPMENT MENTIONED SHALL BE FURNISHED AND INSTALLED.

E. BE RESPONSIBLE FOR ALL MATERIALS DELIVERED TO THE SITE IN CONNECTION WITH THE WORK AND PAY ALL CHARGES FOR CARTAGE, SCAFFOLDS, PLANKING, RIGGING AND ERECTING. TAKE EVERY PRECAUTION NECESSARY TO PROTECT EQUIPMENT AND INSTALLATION IN ADDITION TO PLUGGING AND PROTECTING OPEN ENDS OF ALL PIPES, OUTLET BOXES, PANEL BOXES, AND JUNCTION BOXES. ALL EQUIPMENT SHALL BE STORED IN A CLEAN DRY PLACE TO PRESERVE THE QUALITY OF MATERIAL BEING USED. EQUIPMENT AND/OR MATERIALS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER. ANY SCAFFOLDING OVER 8'–0" IN HEIGHT WILL BE SUPPLIED BY THE GENERAL CONTRACTOR.

F. ALL MATERIALS AND EQUIPMENT REQUIRED BY THIS SPECIFICATION SHALL BE NEW, CLEAN AND FREE FROM DEFECTS AT THE TIME OF INSTALLATION. THE MANUFACTURER AND UNDERWRITER'S LABEL SHALL APPEAR ON ALL MATERIAL AND EQUIPMENT UNLESS OTHERWISE APPROVED, IN WRITING, BY OWNER.

1.19 SUBSTITUTION OF MATERIALS OR EQUIPMENT

A. IF THE ELECTRICAL CONTRACTOR WISHES TO USE MATERIALS OR EQUIPMENT OTHER THAN THOSE SPECIFICALLY DESIGNATED HEREIN, AS BEING EQUAL TO THOSE SO SPECIFICALLY DESIGNATED: BEFORE PURCHASING AND/OR FABRICATION, HE SHALL SUBMIT THE PROPOSED SUBSTITUTION IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL CONDITIONS, AND THE DECISION OF WHETHER OR NOT IT IS EQUAL TO THAT SPECIFIED SHALL BE DETERMINED BY THE OWNER.

B. UNLESS REQUESTS FOR SUBSTITUTION ARE MADE IN ACCORDANCE WITH THE ABOVE INSTRUCTIONS AND THE INSTRUCTIONS OF THE GENERAL CONDITIONS, SUPPORTED BY SUFFICIENT PROOF OF EQUALITY, THE SUCCESSFUL CONTRACTOR WILL BE REQUIRED TO FURNISH SPECIFICALLY NAMED ITEMS DESIGNATED UNDER THE BASE BID.

C. IF THE APPARATUS OR MATERIALS SUBSTITUTED FOR THOSE SPECIFIED NECESSITATE CHANGES OR ADDITIONAL CONNECTIONS, PIPING SUPPORTS OR CONSTRUCTION: SAME SHALL BE PROVIDED AND THE ELECTRICAL CONTRACTOR SHALL ASSUME THE COST AND THE ENTIRE RESPONSIBILITY THERETO.

D. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE HVAC, PLUMBING AND FIRE PROTECTION CONTRACTORS WITH REGARD TO FEEDER, RACEWAY, AND CIRCUIT BREAKER AND DISCONNECT SWITCH SIZES. IF A SUBSTITUTION OF HVAC, PLUMBING AND FIRE PROTECTION EQUIPMENT IS PROPOSED BY A SUBCONTRACTOR, IT SHALL BECOME THE RESPONSIBILITY OF THAT SUBCONTRACTOR TO COORDINATE WITH THE ELECTRICAL CONTRACTOR ANY AND ALL CHANGES WITH REGARD TO FEEDER, RACEWAY, AND CIRCUIT BREAKER AND DISCONNECT SWITCH SIZES. THE SHOP DRAWINGS SHALL CLEARLY INDICATE WHAT CHANGES ARE REQUIRED AND ANY ADDITIONAL COSTS ASSOCIATED WITH THIS CHANGE. IF COORDINATION DOES NOT OCCUR, THE SUBCONTRACTOR PROPOSING THE CHANGE SHALL BE RESPONSIBLE FOR ALL COSTS THAT OCCUR DUE TO THE SUBSTITUTION.

E. WHENEVER THE CONTRACTOR SECURES APPROVAL FOR CHANGING ANY ITEMS AND SUCH CHANGE INVOLVES A CORRESPONDING CHANGE OR ADJUSTMENT IN ANY ADJACENT OR RELATED ITEM, THE RESPONSIBILITY FOR MAKING THE REQUIRED CHANGE, OR SEEING THAT IT IS MADE, RESTS WITH THE CONTRACTOR. THE COST OF THESE CHANGES AND/OR ADJUSTMENTS SHALL BE PAID FOR BY THE CONTRACTOR UNLESS IT IS OTHERWISE AGREED, IN WRITING, AT THE TIME THE CHANGE IS APPROVED. THE ACCEPTANCE OF ANY CHANGE WILL NOT, IN ANY WAY, RELIEVE THE CONTRACTOR F

1.38 TEMPORARY POWER AND LIGHTING

A. THE ELECTRICAL SUBCONTRACTOR SHALL FURNISH AND INSTALL FEEDERS OF SUFFICIENT SIZE FROM THE UTILITY COMPANY'S POWER LINES FOR THE ELECTRIC LIGHT AND POWER REQUIREMENTS FOR THE BUILDING WHILE UNDER CONSTRUCTION AND UNTIL THE PERMANENT FEEDERS AND RELATED EQUIPMENT HAVE BEEN INSTALLED AND ARE IN OPERATION. TEMPORARY LIGHTING SHALL BE BASED ON A MINIMUM OF PROVIDING AT LEAST ONE 100 WATT INCANDESCENT LAMP FOR EACH 1,000 SQUARE FEET OF FLOOR AREA. SUFFICIENT WIRING, LAMPS, AND OUTLETS SHALL BE INSTALLED TO INSURE PROPER LIGHTING IN ALL ROOMS, SPACE, STAIRWELLS, AND CORRIDORS. MINIMUM SIZED LAMP USED SHALL BE 100 WATT. WHERE HIGHER LIGHTING INTENSITIES ARE REQUIRED BY FEDERAL OR STATE STANDARDS OF LAWS OR OTHERWISE SPECIFIED, THE ABOVE SPECIFIED WATTAGE SHALL BE INCREASED TO PROVIDE THESE INCREASED INTENSITIES. REFER TO SECTION 01510 – TEMPORARY UTILITIES FOR ADDITIONAL WORK.

B. ALL NECESSARY TRANSFORMERS, METERS, CABLES, PANELBOARDS, SWITCHES, TEMPORARY LAMP REPLACEMENTS AND ACCESSORIES REQUIRED FOR THE TEMPORARY LIGHT AND POWER INSTALLATION SHALL BE PROVIDED BY THE ELECTRICAL SUBCONTRACTOR.

C. THE ELECTRICAL SUBCONTRACTOR SHALL PROVIDE AND MAINTAIN ON EACH FLOOR OF THE BUILDING, A FEEDER OR FEEDERS OF SUFFICIENT CAPACITY FOR THE REQUIREMENTS OF THE ENTIRE FLOOR AND HE SHALL PROVIDE A SUFFICIENT NUMBER OF OUTLETS, LOCATED AT CONVENIENT POINTS, SO THAT EXTENSION CORDS OF NOT OVER 50 FT. IN LENGTH WILL REACH ALL WORK REQUIRING TEMPORARY LIGHT OR POWER.

D. THE ELECTRICAL SUBCONTRACTOR SHALL INSTALL AND MAINTAIN THE WIRING AND ACCESSORIES FOR THE OFFICES OF THE GENERAL CONTRACTOR AND THE CLERK OF THE WORKS AS SPECIFIED IN THE CONTRACT FORM.

E. ALL TEMPORARY ELECTRICAL WORK SHALL MEET THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE ARTICLE 305 TEMPORARY WIRING, THE LOCAL UTILITY COMPANY, AND ALL FEDERAL STANDARDS AND LAWS.

F. ALL TEMPORARY WIRING AND ACCESSORIES THERETO INSTALLED BY THE ELECTRICAL SUBCONTRACTOR SHALL BE REMOVED AFTER THEIR PURPOSES HAVE BEEN SERVED.

G. THE GENERAL CONTRACTOR WILL PAY FOR THE COST OF ELECTRIC ENERGY CONSUMED BY HIMSELF AND BY ALL OF HIS SUBCONTRACTORS, UNLESS OTHERWISE INDICATED.

H. ALL LAMPS INSTALLED IN PERMANENT LIGHTING FIXTURES AND USED FOR LIGHTING DURING CONSTRUCTION SHALL BE REPLACED BY THE ELECTRICAL SUBCONTRACTOR JUST PRIOR TO DATE OF USE AND OCCUPANCY OR FINAL ACCEPTANCE.

I. PROVIDE ALL TEMPORARY LIGHTING AND POWER REQUIRED ABOVE DURING THE NORMAL WORKING HOURS OF THE PROJECT OR A TOTAL OF TEN (10) HOURS PER NORMAL WORKING DAY; SATURDAYS, SUNDAYS AND LEGAL HOLIDAYS ARE EXCLUDED. THE TEN HOURS PER DAY SHALL INCLUDE MANNING THE TEMPORARY POWER AND LIGHTING 2 HOUR BEFORE AND 2 HOUR AFTER A NORMAL EIGHT (8) HOUR WORKING DAY. IN ADDITION TO THE ABOVE, PROVIDE AND MAINTAIN, TO THE SATISFACTION OF THE LOCAL AUTHORITIES HAVING JURISDICTION, ALL TEMPORARY LIGHTING AND POWER THAT MAY BE REQUIRED FOR SAFETY PURPOSES. THE ELECTRICAL SUBCONTRACTOR WILL BE COMPENSATED BY THE GENERAL CONTRACTOR FOR ANY ADDITIONAL STANDBY TIME, MATERIALS OR EQUIPMENT REQUIRED BY THE GENERAL CONTRACTOR OR OTHER SUBCONTRACTORS BEYOND THE NORMAL WORKING HOURS, AS DEFINED ABOVE.

PART 2 – PRODUCTS

2.1 GENERAL

A. ALL MATERIALS AND EQUIPMENT NECESSARY TO MAKE THE INSTALLATION COMPLETE IN EVERY DETAIL SHALL BE FURNISHED AND INSTALLED UNDER THIS CONTRACT WHETHER OR NOT SPECIFICALLY SPECIFIED HEREIN. ALL MATERIALS AND EQUIPMENT SHALL BE NEW. THE ELECTRICAL CONTRACTOR SHALL INCLUDE ALL WIRING FOR MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS, WIRING PROTECTION SYSTEMS AND WIRING FOR ALL EQUIPMENT SPECIFIED.

B. IT IS THE INTENT OF THE SPECIFICATIONS THAT ONE MANUFACTURER BE SELECTED, NOT A COMBINATION, FOR ANY PARTICULAR SYSTEM. FOR EXAMPLE, ALL WIRE OF ONE MANUFACTURER, ALL SWITCHES OF ONE MANUFACTURER, ETC., EXCEPT SPECIFIC MATERIAL CLASSIFICATIONS IN WHICH DELIVERY TIME BECOMES A PROBLEM THE OWNER'S ENGINEER MAY; GIVE SPECIFIC EXEMPTION FROM THE REQUIREMENTS.

C. WHERE MATERIALS, EQUIPMENT, APPARATUS OR OTHER PRODUCTS ARE SPECIFIED BY MANUFACTURER, BRAND NAME, TYPE OR CATALOG NUMBER, SUCH DESIGNATION IS TO ESTABLISH STANDARDS OF PERFORMANCE, QUALITY, TYPE AND STYLE.

2.6 PULL BOXES, WIREWAYS, AND CHANNELS

A. PULL BOXES SHALL BE CODE GAUGE GALVANIZED STEEL WITH SCREW COVERS TO MATCH. PULL BOXES AND WIRE WAYS SHALL BE AS REQUIRED BY NEC AND/OR JOB CONDITIONS WITH STEEL BARRIERS SEPARATING SYSTEMS.

B. WIRE WAYS SHALL BE GALVANIZED STEEL, MANUFACTURED STANDARD SECTIONS AND FITTINGS, WITH COMBINATION HINGED AND SCREW COVERS.

C. STEEL CHANNEL SUPPORTS SHALL BE MINIMUM 1–5/8 INCH MOLD STRIP WITH MIN .105 INCH WALL THICKNESS, UNISTRUT P1000, KINDORF, HUSKY PRODUCTS, OR EQUAL.

2.7 RACEWAYS

A. ELECTRIC METALLIC TUBING (EMT) SHALL BE ELECTRO GALVANIZED OR SHERADIZED STEEL. TUBING SHALL BE AS MANUFACTURED BY PYLE NATIONAL, ALLIED TUBE AND CONDUIT CORP., WHEATLAND TUBE COMPANY OR EQUAL.

B. FLEXIBLE METAL CONDUIT SHALL BE GALVANIZED STEEL WITH SEPARATE COPPER GROUNDING CONDUCTOR. LIQUID–TIGHT FLEXIBLE METAL CONDUIT SHALL BE SIMILAR, BUT WITH EXTRUDED MOISTURE AND OIL PROOF OUTER JACKET OF POLYVINYL CHLORIDE PLASTIC. FLEXIBLE METAL CONDUIT LESS THAN 6–FEET LONG MAY BE USED TO CONNECT ALL LIGHTING FIXTURES. MOTORS AND OTHER EQUIPMENT MAY BE CONNECTED IN LENGTH; NOT EXCEEDING 18 INCHES. LIQUIDTIGHT FLEXIBLE METAL CONDUIT SHALL BE USED FOR ALL MECHANICAL EQUIPMENT OR OTHER ROTATING EQUIPMENT SUBJECTED TO MOISTURE.

C. PVC SCHEDULE 40 CONDUIT SHALL BE USED FOR ALL UNDERGROUND WIRING. USE GALVANIZED STEEL SWEEPS AND STUB–UPS.

D. COUPLINGS AND CONNECTORS FOR ELECTRICAL METALLIC TUBING SHALL BE GALVANIZED STEEL COMPRESSION TYPE.

E. STEEL SUPPORT RODS OR SUPPORT BOLTS FOR CONDUITS SHALL BE 1/8" DIAMETER FOR EACH INCH OR FRACTION THEREOF OF DIAMETER OF CONDUIT SIZE, BUT NO ROD OR BOLT SHALL BE LESS THAN 1/4" IN DIAMETER.

F. CONDUIT ENDS SHALL BE CUT SQUARE AND REAMED TO REMOVE BURRS AND SHARP EDGES. OFFSETS AND BENDS FOR CHANGES IN ELEVATION OF EXPOSED CONDUIT RUNS SHALL BE MADE AT WALLS OR BEAMS AND NOT IN OPEN SPACES BETWEEN WALLS OR BEAMS. CONDUITS SHALL BE ROUTED SO AS NOT TO INTERFERE WITH THE OPERATION OR MAINTENANCE OF ANY EQUIPMENT. THE ENTIRE JOB SHALL BE DONE IN A NEAT AND WORKMANLIKE MANNER, AS APPROVED BY THE ENGINEER. STEEL SUPPORTS OR RACKS SHALL BE GALVANIZED STEEL CHANNEL AND FITTINGS, UNISTRUT, KINDORF, HUSKY PRODUCTS COMPANY, OR EQUAL.

G. CONDUITS SHALL BE ROUTED IN THE FIELD SO AS TO BE COORDINATED WITH THE BUILDING STRUCTURE. EXPOSED CONDUIT SHALL BE RUN IN STRAIGHT LINES PARALLEL TO WALLS, BEAMS AND COLUMNS AND WITH RIGHT ANGLE BENDS AND THREADED CONDUIT FITTINGS.

H. CONDUITS PENETRATING THE BUILDING SHALL BE SEALED WITH SEALING BUSHINGS AND SHALL BE PROVIDED WITH PRESSURE DISCS, LOCKING COLLAR, SEALING RING ETC. SIMILAR TO OZ GEDNEY TYPE CSBE, CSB, CSBG ETC. SEALING DESIGN SHALL BE SEGMENTAL, SEAL ALL CABLES ENTERING THE BUILDING WITH CABLE TERMINATORS SIMILAR TO USING OZ–GEDNEY CRC, FR, HRK, HRE, HPE, KR, GRK, GRE, GPE (WHICHEVER IS APPROPRIATE), THE SEALING COMPOUND SHALL BE OZ–GEDNEY SEALING INSULATING COMPOUND AS MANUFACTURED BY OZ–GEDNEY. CONDUITS AND CABLES SHALL BE SEALED COMPLETELY TO PREVENT WATER, MOISTURE PENETRATION.

2.9 WIRE AND CABLE

A. ALUMINUM

1. WIRE AND CABLE LARGER THAN #6 AWG, UTILIZED AS FEEDERS SHALL BE ALUMINUM.
2. PROVIDE SINGLE CONDUCTOR WIRE AND CABLE WITH 600V INSULATION. WIRE SIZE #4 AWG AND LARGER SHALL BE STRANDED. CONDUCTORS SHALL BE ALUMAFLEX ALUMINUM ALLOY COMPACT STRANDED, INSULATED WITH HEAT AND MOISTURE RESISTANT PVC, JACKETED WITH ABRASION, MOISTURE, GASOLINE AND OIL RESISTANT NYLON.
3. WIRE AND CABLE SHALL BE TYPE THHN–THWN–2 BUILDING WIRE, 600V, RATED FOR 75 DEGREES C. IN WET LOCATIONS AND 90 DEGREES C. IN DRY LOCATIONS.
4. FLEXIBLE METAL CLAD CABLE TYPE MC WITH GREEN EQUIPMENT GROUND SHALL BE USED IN APARTMENT FEEDERS WHERE INDICATED. MC CABLE SHALL BE MANUFACTURED BY SOUTHWIRE AFC OR EQUAL.
5. TYPE SE CABLE, STYLE R, SHALL BE USED FOR APARTMENT FEEDERS WHERE INDICATED. INSTALLATION SHALL COMPLY WITH THE RHODE ISLAND ELECTRICAL CODE ARTICLE 338 AND 334.
6. WIRE AND CABLE SHALL BE MANUFACTURED BY SOUTHWIRE, GENERAL CABLE CO., OR EQUAL.
7. SERVICE ENTRANCE CABLE – TYPE SER

A. SUMMARY

1) THIS SPECIFICATION DESCRIBES SERVICE ENTRANCE CABLE, TYPE SER EMPLOYING THREE INDIVIDUAL TYPE THHN/THWN–2 CIRCUIT CONDUCTORS AND A STRANDED UNINSULATED GROUNDING CONDUCTOR SUITABLE FOR OPERATING AT A MAXIMUM CONDUCTOR TEMPERATURE OF 75°C AND AT A POTENTIAL OF 600 VOLTS. TYPE SER CABLE SHALL BE LISTED AND MARKED FOR USE IN CABLE TRAYS AND COMPLY WITH UL 854, 1685 AND 1581 VERTICAL TRAY FLAME TESTS FOR USE AS AN INTERIOR EXPOSED FEEDER CABLE FOR DWELLING UNIT LOAD CENTERS. INSTALLATION SHALL ALSO COMPLY WITH THE RHODE ISLAND ELECTRIC CODE ARTICLES 338 AND 334.

2) DESIGN IS BASED ON ESSEX TO ESTABLISH STANDARDS OF QUALITY FOR MATERIALS AND PERFORMANCE. ACCEPTABLE ALTERNATE MANUFACTURERS ARE SOUTHWIRE AND GENERAL CABLE.

3) APPLICABLE SPECIFICATIONS

A) THE FOLLOWING SPECIFICATIONS FROM A PART OF THIS SPECIFICATION TO THE EXTENT SPECIFIED HERE IN:

1) UNDERWRITERS LABORATORIES STANDARD 44 FOR RUBBER–INSULATED WIRES AND CABLES.

2) RHODE ISLAND ELECTRICAL CODE ARTICLE 338.

4) CONDUCTORS

A) THE INSULATED AND UNINSULATED CONDUCTORS SHALL BE STRANDED UNCOATED COPPER PER UL STANDARD 83.

5) SEPARATOR

A) A SUITABLE SEPARATOR OVER THE CONDUCTOR MAY BE USED AT THE OPTION OF THE MANUFACTURER.

6) INSULATION

A) EACH INSULATED CIRCUIT CONDUCTOR SHALL BE A TYPE THHN/THWN–2 CONDUCTOR COMPLYING WITH THE REQUIREMENTS OF UL STANDARD 44 FOR PHYSICAL AND ELECTRICAL PROPERTIES AND INSULATION THICKNESSES.

7) ASSEMBLY

A) THREE TYPE THHN/THWN, CROSSLINKED–POLYETHYLENE–INSULATED COLOR CODED CONDUCTORS SHALL BE TWISTED WITH A SUITABLE LAY, FILLERS AS REQUIRED, AND A STRANDED UNINSULATED COPPER GROUNDING CONDUCTOR IN ONE INTERSTICE. THE ASSEMBLED CONDUCTORS SHALL BE BOUND WITH A GLASS REINFORCED TAPE COVERING AS REQUIRED BY UL STANDARD 854

8) SHEATH

A) THE ASSEMBLED CONDUCTORS SHALL BE COMPLETELY ENCLOSED IN A PVC PROTECTIVE SHEATH COMPLYING WITH THE PHYSICAL REQUIREMENTS OF UL.

9) IDENTIFICATION

A) THE CABLE SHALL BE IDENTIFIED BY SURFACE MARKING INDICATING MANUFACTURER'S IDENTIFICATION, NUMBER AND SIZE OF INSULATED AND UNINSULATED CONDUCTORS, TYPE OF INDIVIDUAL CONDUCTORS, VOLTAGE RATING, UL SYMBOL, FLAME TEST/TRAY USE AND CABLE TYPE.

10) TESTS

A) THE COMPLETED CABLE SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF UL STANDARD 854 FOR TYPE E

11) LABELS

A) THE CABLE SHALL BEAR UNDERWRITERS LABORATORIES TYPE SE LABEL

12) USE

A) THE CABLE SHALL BE RUN HORIZONTALLY ON A FLOOR ONLY AND NOT PASS THROUGH A RATED FLOOR ASSEMBLY.

2. PROVIDE SINGLE CONDUCTOR WIRE AND CABLE WITH 600V INSULATION. WIRE SIZE #8 AWG AND LARGER SHALL BE STRANDED. WIRE OF SIZE SMALLER THAN #8 AWG SHALL BE SOLID. CONDUCTORS SHALL BE SOFT DRAWN COPPER WITH CONDUCTIVITY OF NOT LESS THAN 98% OF ANSI STANDARD FOR ANNEALED COPPER.
3. WIRE AND CABLE SHALL BE TYPE THWN–THHN BUILDING WIRE, 600V, RATED FOR 75 DEGREES C. IN WET LOCATIONS AND 90 DEGREES C. IN DRY LOCATIONS.
4. FLEXIBLE METAL CLAD CABLE TYPE MC WITH GREEN EQUIPMENT GROUND MAY BE USED IN AREAS ABOVE HUNG CEILINGS AND IN WALL PARTITIONS WHERE ALLOWED BY CODE. MC CABLE SHALL BE MANUFACTURED BY AFC OR EQUAL.

2.11 WIRING DEVICES

A. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED IN THE WORK INCLUDED, BUT NOT LIMITED, TO THE FOLLOWING:

1. WIRING DEVICES:
   A. PASS AND SEYMOUR/LEGRAND
   B. BRYANT ELECTRIC
   C. COOPER INDUSTRIES
   D. HUBBELL
   E. LEVITON

B. DUPLEX RECEPTACLES SHALL BE COMMERCIAL GRADE RATED FOR 125 VOLTS, 15 OR 20 AMPERES WHERE LOCATED TOTALLY WITHIN AN APARTMENT, CONDOMINIUM OR TOWNHOUSE AND APPROVED BY ARCHITECT/ENGINEER/OWNER. RECEPTACLES SHALL HAVE WIRE BUNDLING CLAMPS ON ALL TERMINALS INCLUDING GROUND; TERMINAL SCREWS SHALL BE #10. A FULL WRAP–AROUND STEEL BRIDGE STRAP SHALL BE PROVIDED WITH LOCKING FINGER TABS TO SECURE THE FACE.

1. PASS & SEYMOUR
2. HUBBELL
3. LEVITON

C. DUPLEX RECEPTACLES WITH GROUND FAULT CIRCUIT INTERRUPTER CHARACTERISTICS SHALL BE RATED FOR 125 VOLTS, 20 AMPERES WITH 20 AMPERE FEED THROUGH AMPERES UNLESS OTHERWISE INDICATED ON CONTRACT DRAWINGS, AND SHALL CONFORM TO THE REVISED 2003 UL 943 STANDARD. ALL RECEPTACLES SHALL HAVE 7SAFETOUCH7 PROTECTION THAT WILL DISCONNECT POWER TO THE RECEPTACLE IF CRITICAL COMPONENTS ARE DAMAGED AND GROUND FAULT PROTECTION IS LOST. ALL RECEPTACLES SHALL HAVE 7TRIP INDICATOR7 LIGHT TO IDENTIFY A TRIPPED CONDITION. ALL RECEPTACLES IN BATHROOMS/TOILETS, WITHIN 6' 07 OF SINK LOCATIONS, EXTERIOR OUTLETS, UTILITY VAULT, IN WET AREAS, ETC. SHALL BE GROUND FAULT TYPE WHETHER INDICATED ON THE DRAWINGS OR NOT. PROVIDE WEATHERPROOF WHILE–IN–USE COVERS FOR EXTERIOR OUTLETS.

1. PASS & SEYMOUR: 2094
2. COOPER: XGF20
3. LEVITON: 8898

D. TOGGLE SWITCHES SHALL BE FULL SIZED, HEAVY DUTY AC TYPE RATED FOR 120/277 VOLTS, 20 AMPERES AND COMPLY WITH DECORA STYLE BY LEVITON. MOUNTING STRAP SHALL BE ONE–PIECE NICKEL PLATED STEEL WITH INTEGRAL GROUND. TERMINALS SHALL EXTERNAL SCREW–PRESSURE PLATE BACK AND SIDE WIRED TO ACCEPT # 14 – #10 AWG WIRE. CONTACTS SHALL BE SILVER ALLOY.

F. ALL WIRING DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH NEC ARTICLE 210.

2.12 WIRING DEVICE PLATES

A. ALL NORMAL POWER WIRING DEVICE PLATES SHALL BE HIGH IMPACT STAINLESS STEEL:

1. PASS & SEYMOUR: TP SERIES (3/16 ? WIDER/LONGER THAN STANDARD TO ACCOMMODATE CAPTIVE SCREWS FOR SINGLE GANG
2. HUBBELL: P SERIES
3. LEVITON: 80700 SERIES

B. DEVICE PLATE SCREWS SHALL BE OF THE SAME COLOR FINISH AS THE DEVICE PLATE.

2.13 OUTLET BOXES AND ACCESSORIES

A. PROVIDE GALVANIZED SHEET STEEL OUTLET BOXES FOR ALL OUTLETS UNLESS OTHERWISE NOTED

B. FIXTURE OUTLET BOXES SHALL HAVE 3/8" SOLID MALE FIXTURE STUDS AND AUXILIARY FIXTURE STEMS SHALL BE SUPPORTED FROM 3/8" MALE FIXTURE STUDS.

C. ALL OUTLET BOXES FOR CONCEALED WORK SHALL BE GALVANIZED, STAMPED STEEL; THOSE FOR FIXTURES, FURNISHED WITH A FIXTURE STUD.

D. OUTLET BOXES SHALL BE OF SIZE AND TYPE TO ACCOMMODATE (1) STRUCTURAL CONDITIONS; (2) SIZE AND NUMBER OF RACEWAYS, CONDUCTORS OR CABLES ENTERING AND (3) DEVICES OR FIXTURES FOR WHICH REQUIRED.

E. INSTALL BLANK PLATES ON ALL OUTLET BOXES, IN WHICH NO APPARATUS IS INSTALLED, WHICH DO NOT INTEGRALLY PROVIDE A COVER FOR THE BOX. SERIES RATING OF DEVICES WILL NOT BE ACCEPTED.

F. SPECIAL CARE SHALL BE TAKEN TO SET ALL BOXES CORRECTLY SQUARE AND TRUE WITH THE BUILDING FINISH.

G. ELECTRICAL NON–METALLIC TUBING (ENT), FITTINGS, BOXES AND SUPPORT HARDWARE CAN BE USED WHEN ALLOWED BY CODE AND APPROVED BY OWNER.

H. BOXES

1. BOXES USED WITHED ENT SHALL BE LISTED AND/OR CERTIFIED.
2. NON–METALLIC MUD BOXES SHALL BE AVAILABLE

A. MUD BOXES WITH TWO 1?, FOUR ½? AND SIX PORTS SHALL BE AVAILABLE

B. MUD BOXES WITH QUICK CONNECT PORTS SHALL BE MOLDED OUT OF POLYCARBONATE

C. MUD BOXES WITH REMOVABLE BACK SHALL BE AVAILABLE

D. MUD BOX TYPES SHALL INCLUDE;

1) CEILING BOX LISTED FOR FIXTURE SUPPORT UP TO 50 LBS. AND CEILING FAN SUPPORT UP TO 35 LBS.

2) ONE GANG
3) TWO GANG
4) 4 SQUARE

2.16 NAMEPLATES

A. NAMEPLATES CONSISTING OF BLACK PLASTIC WITH WHITE CENTER, LETTERING TO BE 1/4" HIGH, ENGRAVED THROUGH TO WHITE LAYER AND PROPERLY FASTENED WITH BRASS SCREWS SHALL BE PROVIDED FOR THE FOLLOWING EQUIPMENT:

1. ALL PANEL BOARDS AND DISTRIBUTION EQUIPMENT.
2. TERMINAL CABINETS.
3. JUNCTION BOXES LARGER THAN 4–11/16".

2.17 DISCONNECT SWITCHES

A. ALL SAFETY SWITCHES SHALL BE NEMA TYPE HD AND UNDERWRITERS' LABORATORIES LISTED

B. ALL SWITCHES SHALL HAVE SWITCH BLADES WHICH ARE FULLY VISIBLE IN OF OFF POSITION WITH THE DOOR OPEN. ALL CURRENT CARRYING PARTS SHALL BE PLATED THROUGH ELECTROLYTIC PROCESSED TO RESIST CORROSION AND PROMOTE COOL OPERATION.

C. SWITCHES SHALL BE QUICK–MAKE AND QUICK–BREAK SUCH THAT, DURING NORMAL OPERATION OF THE SWITCH, THE OPERATION OF THE CONTACTS SHALL BE NOT CAPABLE OF BEING RESTRAINED BY THE OPERATING HANDLE AFTER THE CLOSING OR OPENING ACTION OF THE CONTACTS HAS STARTED. THE HANDLE AND MECHANISM SHALL BE AN INTEGRAL PART OF THE BOX, NOT THE COVER, WITH POSITIVE PADLOCKING PROVISIONS IN THE OFF POSITION.

D. SWITCHES SHALL BE FURNISHED IN NEMA 1 GENERAL PURPOSE ENCLOSURES UNLESS NEMA 3R (RAINTIGHT) OR NEMA 4 AS REQUIRED BY ENVIRONMENT. ENCLOSURES SHALL BE OF CODE GAUGE (UL 98) SHEET STEEL (NEMA 1) OR CODE GAUGE PHOSPHATE TREATMENT AND GRAY BAKED ENAMEL FINISH.

E. SWITCHES SHALL BE HORSEPOWER RATED FOR 600 VOLTS AC AND ALL SWITCHES SHALL BE FUSED TYPE WITH DUAL ELEMENT FUSES.

F. SAFETY SWITCHES SHALL BE SQUARE D CLASS 3130 OR APPROVED EQUAL AS MANUFACTURED BY GENERAL ELECTRIC OR CUTLER HAMMER.

2.18 FUSES

A. FUSES SHALL BE NON–RENEWABLE TYPE, UL CLASS J UP TO 600 AMP, AND CLASS L OVER 600 AMP. FUSES SHALL BE CURRENT LIMITING TYPE WITH A MINIMUM INTERRUPTING RATING OF 200,000 RMS AMP.

B. FUSES SHALL NOT BE USED IN ANY SWITCHBOARDS OR PANEL BOARDS UNLESS ADEQUATE A.C. RATED CIRCUIT BREAKERS ARE NOT AVAILABLE.

C. FUSES SHALL BE MANUFACTURED BY BUSSMAN, GOULD SHAWMUT, LITTLE FUSE OR EQUAL

2.21 GROUNDING REQUIREMENTS

A. GROUND ALL SYSTEMS AND EQUIPMENT IN ACCORDANCE WITH BEST INDUSTRY PRACTICE, THE REQUIREMENTS OF NFPA 70.

B. THE GROUND BUS OF THE MAIN SWITCHBOARD SHALL BE CONNECTED TO THE MAIN GROUNDING ELECTRODE SPECIFIED BELOW BY MEANS OF INSULATED CONDUCTORS RUN IN CONDUIT.

C. THE MAIN GROUNDING ELECTRODE SHALL BE AN ACCESSIBLE POINT ON THE NEAREST METALLIC MAIN WATER SERVICE PIPE. CONNECTION SHALL BE MADE ON THE STREET SIDE OF THE MAIN VALVE UTILIZING A GROUND CLAMP OF A TYPE SPECIFICALLY MANUFACTURED FOR THE PURPOSE. BONDING JUMPERS SHALL BE PROVIDED AROUND THE WATER METERS AND AROUND INSULATING JOINTS AND/OR SECTIONS.

D. ESTABLISH A GROUND BONDING CONNECTION FROM THE EFFECTIVELY GROUNDED STRUCTURAL BUILDING STEEL TO EACH COLD WATER MAINS ENTERING THE BUILDING. EACH BONDING CONNECTION SHALL CONSIST OF INSULATED CONDUCTORS RUN IN CONDUIT

E. THE WATER PIPE GROUND SHALL BE SUPPLEMENTED BY AN ADDITIONAL ELECTRODE CONSISTING OF (3) BURIED 3/4" DIAMETER BY 10'–0" LONG COPPERWELD GROUND RODS SPACED 10'–0" APART, AND PROVIDED IN SUFFICIENT QUANTITY SO AS TO HAVE MEASURED RESISTANCE TO GROUND OF NOT MORE THAN 10 OHMS. PROVIDE INDEPENDENT CERTIFICATION CONFIRMING THIS. ESTABLISH A BONDING CONNECTION FROM THE ELECTRODE CONSISTING OF GREEN INSULATED CONDUCTORS RUN IN CONDUIT AND SIZED AS INDICATED HEREINAFTER FOR MAIN AND SUPPLY SIDE OF SERVICE BONDING JUMPERS.

F. PROVIDE GROUNDING BONDS BETWEEN ALL METALLIC CONDUITS OF THE LIGHT AND POWER SYSTEM WHICH ENTER AND LEAVE CABLE CHAMBERS OR OTHER NON–METALLIC CABLE PULLING AND SPLICING BOXES. ACCOMPLISH THIS BY EQUIPPING THE CONDUITS WITH BUSHINGS OF THE GROUNDING TYPE INDIVIDUALLY CROSS CONNECTED.

G. BOND METALLIC CONDUITS CONTAINING GROUNDING ELECTRODE CONDUCTORS AND MAIN BONDING CONDUCTORS TO THE GROUND BUS SERVICE ENCLOSURE AND/OR GROUNDING ELECTRODE AT BOTH ENDS OF EACH RUN UTILIZING GROUNDING BUSHINGS AND JUMPERS

H. ALL QUALIFY CONCRETE–ENCASED GROUNDING ELECTRODES SHALL BE CONNECTED TO THE GROUNDING SYSTEM OF THE BUILDING IN ACCORDANCE WITH THE REQUIREMENTS OF NEC

I. PROVIDE GROUNDING BONDS FOR ALL METALLIC CONDUITS OF THE LIGHT AND POWER SYSTEM WHICH TERMINATE IN PITS BELOW EQUIPMENT FOR WHICH A GROUND BUS IS SPECIFIED. ACCOMPLISH THIS BY EQUIPPING THE CONDUITS WITH BUSHINGS OF THE GROUNDING TYPE CONNECTED INDIVIDUALLY TO THE GROUND BUS.

J. PROVIDE SUPPLEMENTARY GROUND BONDING WHERE METALLIC CONDUITS TERMINATE AT METAL CLAD EQUIPMENT (OR AT THE METAL PULL BOX OF EQUIPMENT) FOR WHICH A GROUND BUS IS SPECIFIED. ACCOMPLISH THIS BY EQUIPPING THE CONDUITS WITH BUSHINGS OF THE GROUNDING TYPE CONNECTED INDIVIDUALLY BY MEANS OF JUMPERS TO THE GROUND BUS. EXCLUDE THE JUMPERS WHERE DIRECTED. THIS EXCLUSION WILL BE REQUIRED WHERE AN ISOLATED GROUND FOR ELECTRONIC EQUIPMENT IS TO BE MAINTAINED

K. EACH GROUNDING TYPE BUSHING SHALL HAVE THE MAXIMUM GROUND WIRE ACCOMMODATION AVAILABLE IN STANDARD MANUFACTURE FOR THE PARTICULAR CONDUIT SIZE. CONNECTION TO BUSHING SHALL BE WITH WIRE OF THIS MAXIMUM SIZE.

L. BONDING CONDUCTORS ON THE LOAD SIDE OF THE SERVICE DEVICE AND EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED IN RELATION TO THE FUSES OR TRIP SIZE OF THE OVERCURRENT DEVICE SUPPLYING THE CIRCUIT.

M. THE CENTRAL EQUIPMENT FOR THE FIRE PROTECTIVE ALARM SYSTEM AND TELEPHONE SYSTEM SHALL HAVE ITS GROUNDING TERMINAL CONNECTED TO THE GROUNDING ELECTRODE BY MEANS OF A NO. 6 GREEN CODED INSULATED CONDUCTOR, RUN IN 3/4" CONDUIT. UTILIZE A GROUND CLAMP OF A TYPE SPECIFICALLY MANUFACTURED FOR THE PURPOSE

N. PROVIDE GROUNDING BONDS FOR ALL METAL PARTS, INCLUDING ALL METAL PARTS OF THE ELECTRICAL EQUIPMENT ASSOCIATED WITH THE WATER–CIRCULATING SYSTEM OF THE POOL, ALL METAL PARTS OF THE POOL STRUCTURE, AND ALL FIXED METAL PARTS, WHICH INCLUDE CONDUIT AND PIPING, METAL DOOR FRAMES, AND METAL WINDOW FRAMES, WITHIN 5 FEET OF THE INSIDE WALLS OF THE POOL AND NOT SEPARATED BY A PERMANENT BARRIER. ALL POOL GROUNDING SHALL BE IN ACCORDANCE WITH ARTICLE 680 OF THE NEC, STATE CODE OR LOCAL CODE, WHICHEVER IS THE MORE STRINGENT.

2.22 PHASING AND COLOR CODING

A. THE INSULATION OR COVERING OF EACH WIRE OR CABLE SHALL BE COLOR CODED SO AS TO PROVIDE FOR CIRCUIT IDENTIFICATION AS SPECIFIED BELOW:

120/208 V CIRCUITS	PHASE CIRCUITS
BLACK	A
RED	B
BLUE	C
WHITE	NEUTRAL
GREEN	EQUIPMENT GROUND

B. COLOR CODING SHALL BE ACHIEVED BY ONE OF THE FOLLOWING METHODS:

1. THE INSULATION OR COVERING SHALL BE CODED DURING MANUFACTURE BY USE OF ONE OF THE FOLLOWING METHODS:

A. COLORED COMPOUNDS.

B. COLORED COATINGS.

2. IN SIZES AND INSULATION TYPES WHERE FACTORY APPLIED COLORS ARE NOT AVAILABLE, WIRES AND CABLES SHALL BE COLOR CODED BY THE APPLICATION OF COLORED PLASTIC TAPES IN OVERLAPPING TURNS AT ALL TERMINAL POINTS, AND IN ALL BOXES IN WHICH SPLICES ARE MADE.

C. THE SAME COLORED CABLE SHALL BE CONNECTED TO THE SAME PHASE THROUGHOUT THE PROJECT.

D. IN GENERAL, BUILDING LOAD CENTERS AND PANELBOARDS SHALL BE PHASED "A", "B", "C", LEFT TO RIGHT. THE NEUTRAL, ALTHOUGH IT MAY BE IN DIFFERENT LOCATIONS FOR DIFFERENT EQUIPMENT, SHALL BE IDENTIFIED.

2.23 MOLDED CASE CIRCUIT BREAKERS

A. MOLDED CASE TYPE CIRCUIT BREAKERS SHALL CONSIST OF MANUALLY OPERATED QUICK–MAKE QUICK–BREAK MECHANICALLY TRIP FREE OPERATING MECHANISMS FOR SIMULTANEOUS OPERATION OF ALL POLES, WITH CONTACTS, ARC INTERRUPTERS AND TRIP ELEMENTS FOR EACH POLE, ALL ENCLOSED IN MOLDED PHENOLIC PLASTIC CASES.

1. THEIR TRIPPING UNITS SHALL BE OF THE "THERMAL MAGNETIC" TYPE HAVING BIMETALLIC ELEMENTS FOR TIME DELAY OVERLOAD PROTECTION AND MAGNETIC ELEMENTS FOR SHORT CIRCUIT PROTECTION.
2. THEY SHALL BE MANUALLY OPERABLE BY MEANS OF TOGGLE TYPE OPERATING HANDLES HAVING "TRIPPED" POSITION MIDWAY BETWEEN THE "ON–OFF? POSITION.
3. THEY SHALL EACH BE CONTAINED IN AN INDIVIDUAL CASE ENCLOSING ONLY THE NUMBER OF POLES REQUIRED FOR THE PARTICULAR BREAKER.
4. ALL PANELS AND INDIVIDUALLY MOUNTED CIRCUIT BREAKERS SHALL HAVE SHORT CIRCUIT RATINGS EXCEEDING THE AVAILABLE SHORT CIRCUIT OR THE VALUES INDICATED IN THE POWER SYSTEM STUDIES IN THIS SECTION BY A FACTOR OF 1.2 WITH A MINIMUM AS FOLLOWS:

   A. 240V CLASS PANELS/BREAKERS

      1) 10 KAIC WHERE SHOWN FED BY A 150 KVA OR LESS TRANSFORMER

      2) 22 KAIC WHERE SHOWN FED BY A 300 KVA OR LESS TRANSFORMER

5. THEY SHALL BE OF THE "BOLTED–IN" TYPE.
6. WHERE NECESSARY, TO ACCOMMODATE OTHER REQUIREMENTS, THEIR FRAME SIZES SHALL BE INCREASED TO CONFORM TO SUCH REQUIREMENTS, FRAME SIZES BEING INDICATED ONLY AS A REFERENCE TO THE MINIMUM ACCEPTABLE INTERRUPTING RATINGS NOTED ABOVE.
7. WHERE SINGLE POLE IN TR